



West Penn's Exhibit 2	62	106
Deed with Right of Way		
West Penn's Exhibit 3	65	106
2023 Notification		
West Penn's Exhibit 4	68	106
2024 Planned Work Letter		
West Penn's Exhibit 5	70	106
2025 Work Plan Letter		
West Penn's Exhibit 6	72	106
ANSI Standards		
West Penn's Exhibit 7	75	106
Integrated Vegetation Management-ISA		
West Penn's Exhibit 8	81	106
Manufacturer Label- Escort XP		
West Penn's Exhibit 9	82	106
Manufacturer Label-Method		
West Penn's Exhibit 10	82	106

Manufacturer Label-Liberate		
West Penn's Exhibit 11	83	106
Manufacturer Label-Arsenal		
West Penn's Exhibit 12	84	106
2019 HVFC Application		
West Penn's Exhibit 13	84	106
2024 Application of Herbicide		
West Penn's Exhibit 14	109	137
CV of Salvatore Quattrocchi		
West Penn's Exhibit 15	100	--*
Sheets		

\* Late-filed Exhibit

**Docket No. C-2024-3050741**

**Christopher S. McGinnis v. FirstEnergy Pennsylvania Electric Company**

**The Hon. Emily DeVoe**

**Hearing: Thursday, February 13, 2025; 10:00 a.m.**

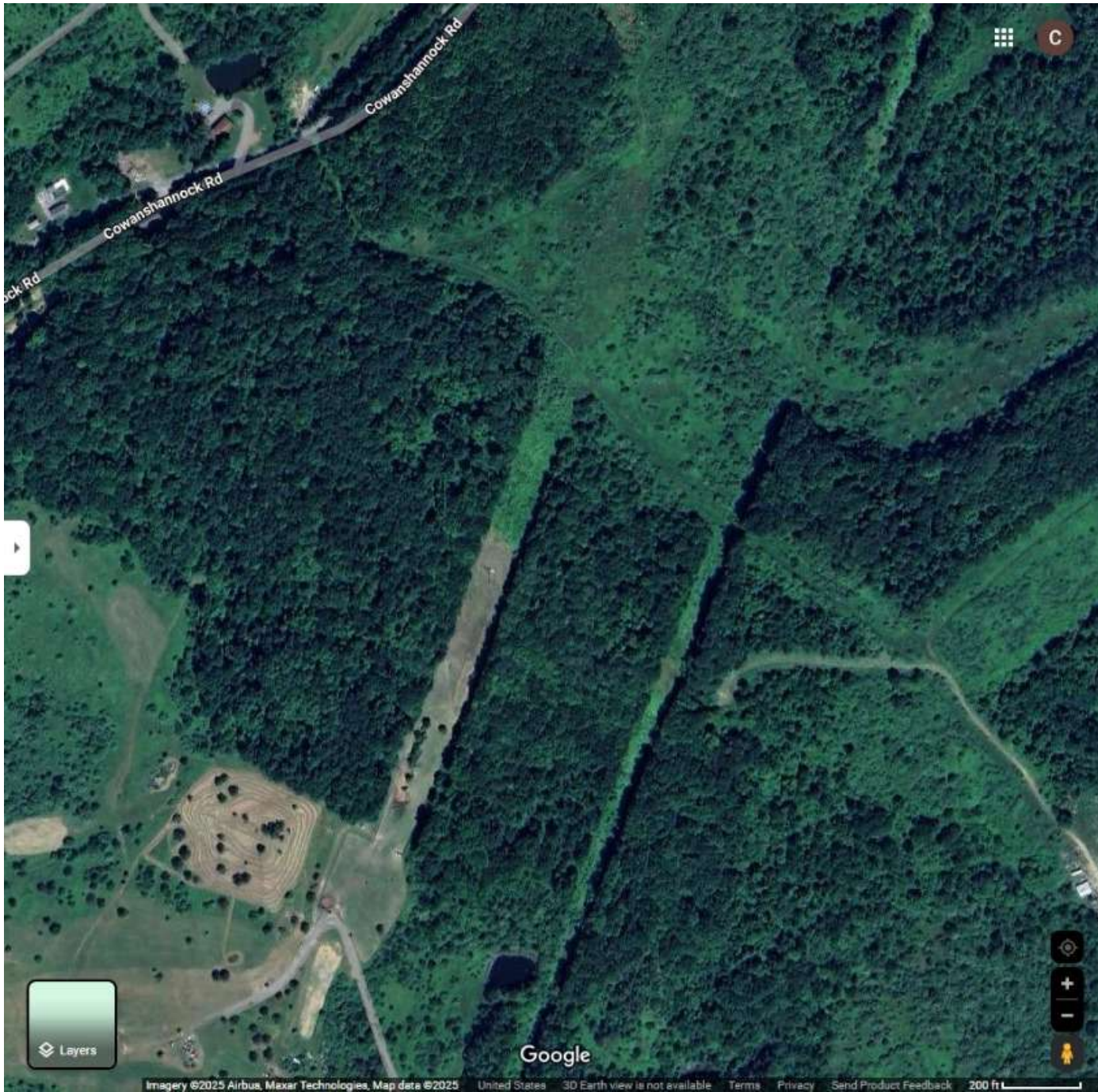
**Call-in Hearing No.: 888.547.8922; PIN: 74903461**

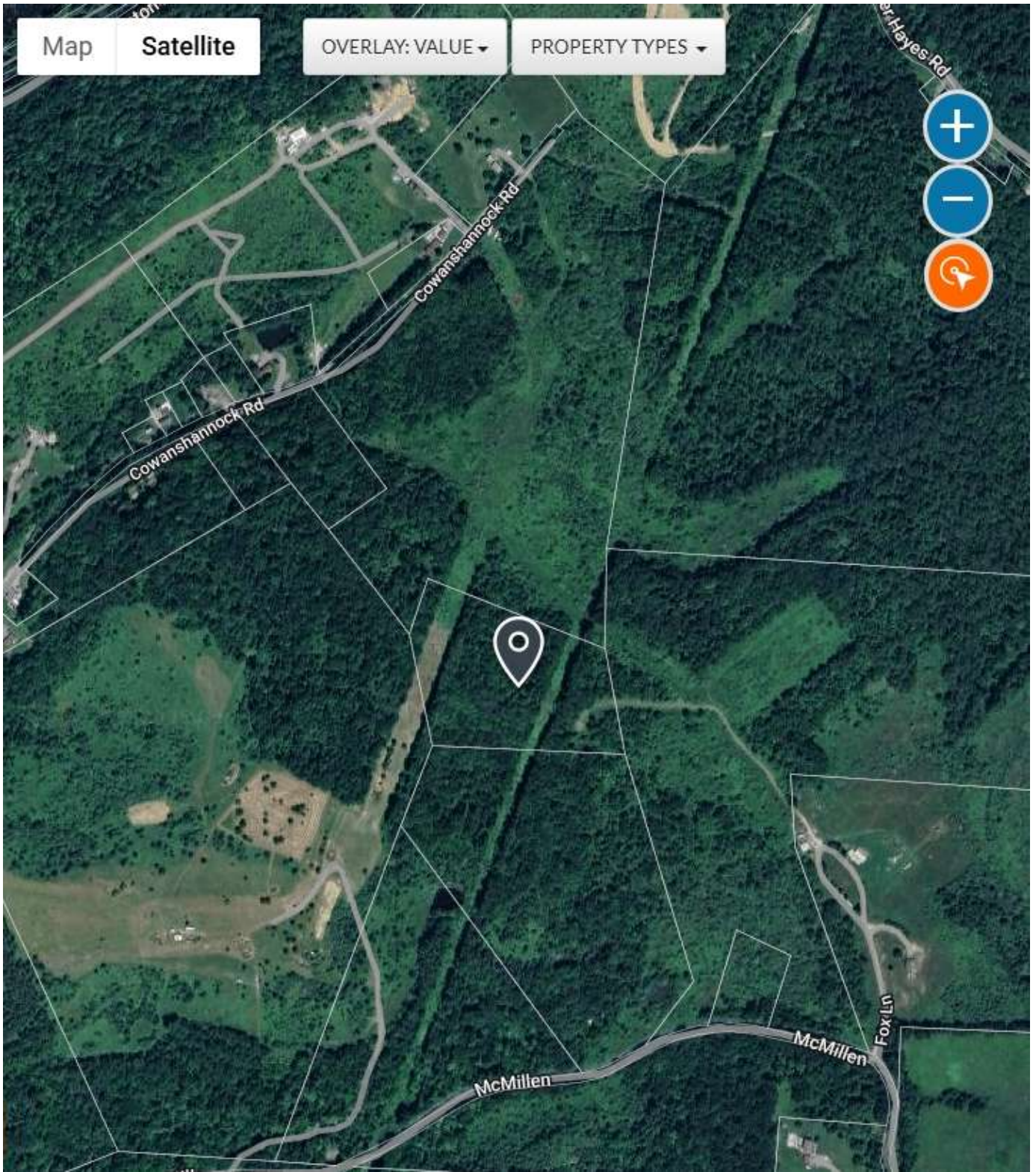
**PROPOSED HEARING EXHIBITS OF FE PA (WEST PENN RATE DISTRICT)**

1. Aerial Photos of McGinnis Property
2. Recorded Deed and Easement for Property
3. 2023 Cycle Notification prior to McGinnis ownership
4. Certified Letter: General Notification and signature Feb. 2024
5. Property Owner 2024 Work Plan
6. ANSI A300: Standard Practices Vegetation Maintenance
7. Best Practices-Integrated Vegetation Practices
8. Specimen Label for Escort XP
9. Specimen Label for Method240SL
10. Specimen Label for Liberate Adjuvant
11. Specimen Label for Arsenal
12. 2019 HVF Concentration
13. 2024 LVF Concentration
14. CV for Expert Witness Salvatore Quattrocchi

tabbles









# County of Armstrong

Recorder of Deeds  
Register of Wills  
Clerk of Orphans' Court

Sandra L. Romanowski, First Deputy  
Lori A. Hirst, Second Deputy

500 Market Street, Kittanning, PA 16201  
724.548.3220 Phone | 724.548.3236 Fax  
email: mhilleman@co.armstrong.pa.us

Marianne Hileman | Recorder of Deeds  
Register of Wills | Clerk of Orphans' Court

Instrument Number - 202110896  
Recorded On 9/16/2021 At 12:58:31 PM

\* Total Pages - 4

\* Instrument Type - DEED  
Invoice Number - 2285750 User - MH  
\* Grantor - FOX, MARY J  
\* Grantee - MCGINNIS, CHRISTOPHER S  
\* Customer - CINDY CALARIE

**\* FEES**

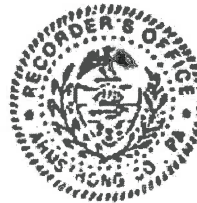
STATE TRANSFER TAX	\$69.03
STATE WRIT TAX	\$0.50
STATE J.C.S / A.T.J	\$40.25
COUNTY RECORDING FEES	\$13.00
AFFORDABLE HOUSING-15%	\$1.95
AFFORDABLE HOUSING-85%	\$11.05
DEMOLITION FUND	\$15.00
COUNTY IMP FUND	\$2.00
RECORDER IMP FUND	\$3.00
ARMSTRONG SCHOOL DISTRICT	\$34.52
RAYBURN TOWNSHIP	\$34.51
TOTAL PAID	\$224.81

This is a certification page  
**DO NOT DETACH**  
This page is now part  
of this legal document.

**RETURN DOCUMENT TO:**

CINDY CALARIE  
P O BOX 717  
KITTANNING, PA 16201

I hereby CERTIFY that this document is recorded in the Recorder's Office of Armstrong County, Pennsylvania.



*Marianne Hileman*  
Marianne Hileman, Recorder of Deeds

\* - Information denoted by an asterisk may change during the verification process and may not be reflected on this page.

Book: 5477 Page: 429



5477 429

Return to:  
Cindy L. Calarie, Esquire  
P.O. Box 717  
Kittanning, PA 16201

FOR RECORDING PURPOSES ONLY

# THIS DEED

MADE the 15th day of September, in the year 2021,

Between:

MARY J. FOX, widow, of Rayburn Township, Armstrong County,  
Pennsylvania

(Grantor)

and

CHRISTOPHER S. MCGINNIS, of Boggs Township, Armstrong  
County, Pennsylvania

(Grantee)

Witnesseth, that in consideration of payment by the Grantee to the Grantor the sum of **SIX THOUSAND NINE HUNDRED THREE (\$6,903.00) DOLLARS**, the Grantor does hereby grant, sell and convey to the Grantee,

*ALL* that certain piece, parcel or tract of land situate in Rayburn Township, Armstrong County, Pennsylvania, known and designated as Lot No. 1 in the H. & M. Fox #1 Plan of Subdivision recorded on August 13, 2021, in the Office of the Recorder of Deeds of Armstrong County, Pennsylvania in Plat Book Volume 8, Page 552, Slide 939, further bounded and described as follows:

**BEGINNING** at an iron pin South 65 degrees 33' 13" East 808.50 feet to an iron pin; thence South 11 degrees 24' 59" East 462.38 feet to an iron pin; thence North 83 degrees 15' 41" West 829.04 feet to an iron pin; thence North 09 degrees 44' 19" West 479.63 feet to an iron pin; thence North 19 degrees 26' 47" East 231.00 feet to an iron pin, the place of beginning.

**CONTAINING** 10.62 acres.

**BEING** Armstrong County Tax Map Parcel No. 39-107.00-01-24.007

**UNDER AND SUBJECT TO** all exceptions, reservations, restrictions, rights of way, leases, easements, covenants and conveyances which are apparent from physical inspection of said property and/or which are of record.

**UNDER AND SUBJECT TO** Clean & Green dated April 15, 1999 and recorded in Armstrong County Record Book 2019 at page 145.

**GRANTING** unto the Grantee herein, his heirs and assigns a 50-foot right-of-way to be used in common with Armstrong County Tax Map Nos. 107.00-01-24.002 and 107.00-01-24 leading from Township Road 823 through the above recited parcels. Said right-of-way is subject to the condition that the parties shall share cost of maintaining said right-of-way with the owners of said properties above recited, with the grantee herein being responsible for only a pro-rated share of the cost of maintenance of the right-of-way to the extent it crosses the property herein conveyed. The right-of-way description is provided in Plat Book 8, Page 552, Slide 939.

**BEING** a part of the same parcel of land which was conveyed to Harold J. Fox and Mary J. Fox, his wife, by deed from Barbara L. Roseboom dated August 31, 1998 and recorded in Armstrong County Record Book 1861 at page 267. Harold J. Fox passed away on July 6, 2020, thereby vesting sole title to the above referenced real estate in his wife, his surviving spouse by act of law.

**GRANTOR** has no actual knowledge of any "hazardous waste" as that term is defined in the Act of July 7, 1980, P.L. 97, 35 P.S. Section 6018.405 et seq., having been disposed, and none is presently being disposed on or about the property described in this Deed.

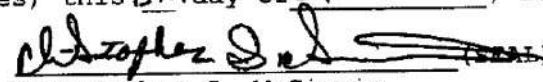
**TOGETHER WITH** the appurtenances: TO HAVE AND TO HOLD the same to and for the use of the said Grantee, his heirs and assigns, forever AND THE SAID GRANTOR, for herself, her heirs and assigns, does hereby covenant and agree that she will **GENERALLY WARRANT AND FOREVER DEFEND** the property herein conveyed.

NOTICE

The undersigned grantee (grantees) hereby certified that he/they know and understand that he/they may not be obtaining the right of protection against subsidence resulting from coal mining operations, and that the purchased property may be protected from damage due to mine subsidence by a private contract with the owners of the economic interests in the coal.

Witnesses signatures of grantee (grantees) this 15th day of September, 2021.



  
Christopher S. McGinnis

This document may not sell, convey, transfer, include or insure the title to the coal and right of support underneath the surface land described or referred to herein, and the owner or owners of such coal may have the complete legal right to remove all of such coal and in that connection, damage may result to the surface of the land and any house, building, or other structure on or in such land. The inclusion of this notice does not enlarge, restrict or modify any legal rights or estates otherwise created, transferred excepted or reserved by this instrument. [This notice is set forth pursuant to Act No. 255, approved September 10, 1965, as amended.]

IN WITNESS WHEREOF, the Grantor has set his hand and seal, the day and year first above written.

WITNESS:

*[Handwritten signature]*

*Mary J. Fox*  
\_\_\_\_\_  
MARY J. FOX

COMMONWEALTH OF PENNSYLVANIA )

) SS:

COUNTY OF ARMSTRONG )

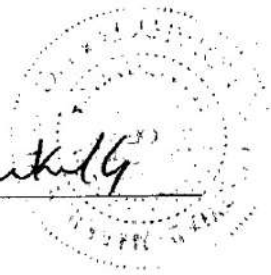
On this, the 15th day of September, 2021, before me, a Notary public, the undersigned officer, personally appeared MARY J. FOX, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that she executed the same for the purpose therein contained.

In Witness Whereof, I set my hand and official seal.

My Commission Expires:

Commonwealth of Pennsylvania - Notary Seal  
Cheryl D. Markilinski, Notary Public  
Armstrong County  
My commission expires December 6, 2023  
Commission number 1102258  
Member, Pennsylvania Association of Notaries

*Cheryl D. Markilinski*  
\_\_\_\_\_  
Notary Public



CERTIFICATE OF RESIDENCE

I hereby certify that the precise residence of the Grantee is 267 Williamson Road, Templeton, PA 16259.

NT. *[Handwritten signature]*  
\_\_\_\_\_  
Attorney for Grantee

ch32

RIGHT OF WAY AGREEMENT

422-139

In consideration of the payment of the sum of One Dollar by West Penn Power Company, a corporation of the Commonwealth of Pennsylvania, the receipt of which is acknowledged, and of the covenants and agreements herein-after mentioned, ~~I/we~~, grantor S herein, do grant unto the said West Penn Power Company, an easement, 100 feet in width, to construct, operate, repair, maintain, remove and rebuild a portion of an electric transmission system consisting of such poles, wires, cables, telephone wires, anchors, guys and fixtures, as the said West Penn Power Company may deem necessary including the right, from time to time, to install additional wires, cables, telephone wires and fixtures, together with the right to install anchor guys beyond the limits of said easement, over, under, and upon land situate in Reynolds Township, Armstrong County, Pennsylvania, adjoining properties of Imp. Road - Ellis B. Fitzgerald - James Cannon Hein.

West Penn Power Company is also granted the right of ingress to and egress from the said easement at any time, using as far as practicable existing roads. West Penn Power Company is also granted the right to cut and trim or remove all trees and undergrowth within the limits of said easement as well as any hazardous trees beyond said limits, by such methods as West Penn Power Company may determine. All brush to be burned and timber cut into saw log lengths.

West Penn Power Company agrees to pay all damage to grantor's property, including fence and crop damage, caused by the operation, additions to, repairing, maintaining, removing and rebuilding of said transmission system, provided notice in writing is given to the said company within thirty (30) days after such damage occurs.

The grantor S, however, reserve — the right and privilege to use the above described easement for agricultural and all other purposes that will not interfere with the use or occupation of said easement by West

C.K. Reg. 2-4-58

Penn Power Company, provided that no buildings or structures other than fences will be located or constructed by grantor \_\_\_ on said easement.

As consideration for the above grant, West Penn Power Company agrees to pay to the grantor \$ Five Hundred — 00/100 Dollars (\$500.00) on or before Feb. 18, 1958, otherwise this agreement shall be null and void.

This document expresses the entire agreement between the parties and it shall be binding upon and inure to the benefit of both parties, their heirs, successors and assigns, the parties hereto agreeing to be legally bound by it.

Signed, sealed and delivered this 18 day of Feb, 1957.

WITNESSED:

LEAH ZELIGSON.

W. L. Strand

\* Leah Zeligson (SEAL) ✓

W. L. Strand

\* Jesse D. Zeligson (SEAL) ✓

\_\_\_\_\_

\_\_\_\_\_ (SEAL)

\_\_\_\_\_

\_\_\_\_\_ (SEAL)

Address of grantor S

3320 Jubel St. Pittsburgh 13, Pa

\* Jesse D. Zeligson died 11-19-57

422-140



STATE OF Pennsylvania )  
 : SS  
COUNTY OF Allegheny )

On this, the 18 day of Feb, 19 57,  
before me, a Notary Public, the undersigned officer, personally appeared

Leah Zeligsohn and Isaac D. Zeligsohn, her husband  
known to me (or satisfactorily proven) to be the person s whose name s  
are subscribed to the within instrument and acknowledged that they  
executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

William L. Stroud (SEAL)

Notary Public  
WILLIAM L. STROUD, Notary Public  
Borough of Kittanning  
Armstrong County, Pennsylvania  
My Commission Expires: December 9, 1957



My commission expires:

RECORDED MARCH 29, 1957 AT 10:11 A.M.  
ROBERT H. POWERS, RECORDER

STATE OF \_\_\_\_\_ )  
 : SS  
COUNTY OF \_\_\_\_\_ )

On this, the \_\_\_\_\_ day of \_\_\_\_\_, 19 \_\_\_\_\_,  
before me, a Notary Public, the undersigned officer, personally appeared

\_\_\_\_\_ known to me (or satisfactorily proven) to be the person \_\_\_\_\_ whose name \_\_\_\_\_  
\_\_\_\_\_ subscribed to the within instrument and acknowledged that \_\_\_\_\_  
executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

\_\_\_\_\_ (SEAL)  
Notary Public

My Commission expires:

RECORDED  
ARMSTRONG CO., PA.  
MAR 29 10 11 AM 1957

906

**RIGHT OF WAY AGREEMENT**

*Armstrong - Kitzmeyer*

*Leah Zeligsohn and  
Yvonne D. Zeligsohn*

to

**WEST PENN POWER COMPANY**

Date *Feb. 18, 1957*

*Rayburn* Township

*Armstrong* County

*msl*

OTTO W. SANDER, ASST. SUPERVISOR OF REAL ESTATE  
WEST PENN POWER CO.  
CABIN HILL  
GREENSBURG, PA.

*Ad 400*

STATE OF PENNSYLVANIA  
COUNTY OF ARMSTRONG

Recorded in the office for the recording of Deeds, Etc., in  
and for the said County, on the 29th day  
Mar. A. D. 19 57 in Deed Book  
Book, Vol. 422 Page 139  
Witness my hand and seal of said office the day foras.

*Robert H. Powers*

*E. J.*

ID	From Span	To Span	Property Owner (First Name)	Property Owner (Last Name)	Property Address	City	State	Zip	Mailing Address	City	State	Zip	Parcel
385-1	75	76			800 Cabin Hill Dr	Greensburg	PA	15601	800 Cabin Hill Dr	Greensburg	PA	15601	29-130.20-06-01,29-130.20-06-11
385-2	75	75			110 Ashe Dr	Kitanning	PA	16201	110 Ashe Dr	Kitanning	PA	16201	29-130.20-06-58, 29-130.20-06-55
385-3	74	74			Ashe Dr	Kitanning	PA	16201	1801 Elmerston Ave	Harrisburg	PA	17110	29-130.20-06-57.001
385-4					108 Boyd Rd	Kitanning	PA	16201	108 Boyd Rd	Kitanning	PA	16201	29-130.20-06-58
385-5	75	75			Garnetts Run	Kitanning	PA	16201	187 Northpointe Blvd	Freeport	PA	16229	29-143.00-01-17
385-6					444 Silas Hollow Rd	Kitanning	PA	16201	444 Silas Hollow Rd	Kitanning	PA	16201	29-130.20-06-59
385-7					210 Garnetts Run Rd	Kitanning	PA	16201	210 Garnetts Run Rd	Kitanning	PA	16201	29-143.00-01-17,002,29-143.05-01-52
385-8					230 Garnetts Eun Rd	Kitanning	PA	16201	230 Garnetts Eun Rd	Kitanning	PA	16201	29-143.05-01-53
385-9	89	89			223 Garnetts Run Rd	Kitanning	PA	16201	223 Garnetts Run Rd	Kitanning	PA	16201	29-143.05-01-51
385-10	89	89			241 Garnetts Run Rd	Kitanning	PA	16201	241 Garnetts Run Rd	Kitanning	PA	16201	29-143.05-01-54
385-11					162 Hill Top Ln	Kitanning	PA	16201	162 Hill Top Ln	Kitanning	PA	16201	29-143.05-01-50,29-143.05-01-48
385-12	87	88			161 Hilltop Ln	Kitanning	PA	16201	161 Hilltop Ln	Kitanning	PA	16201	29-143.05-01-35
385-13					181 Hilltop Ln	Kitanning	PA	16201	181 Hilltop Ln	Kitanning	PA	16201	29-143.05-01-11.007
385-14	65	65			160 Goathill Rd	Kitanning	PA	16201	160 Goathill Rd	Kitanning	PA	16201	29-143.05-01-11.006,29-143.05-01-11
385-15	65	66			190 Hilltop Rd	Kitanning	PA	16201	190 Hilltop Rd	Kitanning	PA	16201	29-143.05-01-10
385-16					583 Tarrtown Rd	Kitanning	PA	16201	583 Tarrtown Rd	Kitanning	PA	16201	29-143.00-01-06
385-17	64	64			TarrtownRd	Kitanning	PA	16201	1040 Second St	Kitanning	PA	16201	29-143.00-01-05
385-18					TarrtownRd	Kitanning	PA	16201	Box 77	McGrann	PA	16238	29-131.00-01-46
385-19					123 Bullington Dr	Kitanning	PA	16201	123 Bullington Dr	Kitanning	PA	16201	29-131.00-01-33,29-131.00-01-26
385-20	14	58			TarrtownRd	Kitanning	PA	16226	2310 Pleasant View Dr	Ford City	PA	16226	29-131.00-01-13,29-131.00-01-13
385-21	58	58			111 Bullington Dr	Kitanning	PA	16201	111 Bullington Dr	Kitanning	PA	16201	29-131.10-01-22
385-22					TarrtownRd	Kitanning	PA	16201	13700 Steas Route 422E	Kitanning	PA	16201	29-131.00-01-01.003
385-23	47	86			TarrtownRd	Kitanning	PA	16201	PO Box 1022	Kitanning	PA	16201	29-131.00-01-01,39-107.00-01-55
385-24					TarrtownRd	Kitanning	PA	16201	333 N McKean St	Kitanning	PA	16201	39-119.00-01-51
385-25					Troy Hill Rd	Kitanning	PA	44442	PO Box 6	New Middletown	OH	44442	39-119.00-01-54
385-26					Troy Hill Rd	Kitanning	PA	16201	104 Valley View Dr	Kitanning	PA	16201	39-119.00-01-43
385-27					Troy Hill Rd	Kitanning	PA	23219	1021 E Cary St	Richmond	VA	23219	39-119.00-01-32
385-28	47	48			412 Troy Hill Rd	Kitanning	PA	16201	412 Troy Hill Rd	Kitanning	PA	16201	39-119.00-01-19
385-29					336 Ping Wing Hollow Rd	Kitanning	PA	16201	336 Ping Wing Hollow Rd	Kitanning	PA	16201	39-119.00-01-17
385-30					274 Iron Bridge Rd	Kitanning	PA	16201	274 Iron Bridge Rd	Kitanning	PA	16201	39-107.00-01-54
385-31					305 Iron Bridge Rd	Kitanning	PA	16201	305 Iron Bridge Rd	Kitanning	PA	16201	39-107.00-01-42
385-32					127 McMullen Rd	Kitanning	PA	16201	127 McMullen Rd	Kitanning	PA	16201	39-107.00-01-35
385-33	42	43			118 Fifth St	Kitanning	PA	16201	118 Fifth St	Kitanning	PA	16201	39-107.00-01-24,005
385-34					126 Fox Lane	Kitanning	PA	16201	126 Fox Lane	Kitanning	PA	16201	39-107.00-01-24
385-35					104 Metzer Dr	Kitanning	PA	16201	104 Metzer Dr	Kitanning	PA	16201	39-107.00-01-12
385-36					333 Cowanshannock Rd	Kitanning	PA	16201	333 Cowanshannock Rd	Kitanning	PA	16201	39-107.00-01-08
385-37					221 Cowanshannock Rd	Kitanning	PA	16201	221 Cowanshannock Rd	Kitanning	PA	16201	39-107.00-01-07
385-38					Cowanshannock Rd	Kitanning	PA	16214	633 Mayfield Rd	Clarien	PA	16214	39-107.00-01-08
385-39	33	37			Cowanshannock Rd	Kitanning	PA	16201	PO Box 1022	Kitanning	PA	16201	12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-09
385-40	37	37			Cowanshannock Rd	Kitanning	PA	14824	Suite 200 1200C Scottsville Rd	Rochester	NY	14624	12-095.00-01-23, 12-095.00-01-31
385-41					Cowanshannock Rd	Kitanning	PA	16201	PO Box 1022	Kitanning	PA	16201	12-095.00-01-02, 47-071.00-02-62, 47-071.00-02-57
385-42	27	29			Point Rd	Kitanning	PA	16053	247 Leslie Rd	Rosifrow	PA	16053	12-083.00-01-25
385-43					Point Rd	Kitanning	PA	16262	182 Deer Run Rd	Worthington	PA	16282	12-083.00-01-19
385-44					111 Point Pl	Kitanning	PA	16201	111 Point Pl	Kitanning	PA	16201	47-083.00-01-22
385-45	19	23			Spring run Rd	Kitanning	PA	15601	800 Cabin Hill Dr	Greensburg	PA	15601	47-083.00-06-54, 47-083.00-06-53
385-46	13	14			152 Spring Run Rd	Adrian	PA	16210	152 Spring Run Rd	Adrian	PA	16210	47-071.00-02-50
385-47	5	7			Spring run Rd	Adrian	PA	16210	800 Cabin Hill Rd	Greensburg	PA	15601	47-059.00-01-27
385-48	9	10			Spring run Rd	Adrian	PA	16210	4388 Route 981	Avonmore	PA	15618	47-071.00-02-26

<<ID>>	<<First Name>>	<<Last Name>>	<<Address>>	<<City>>	<<State>>	<<Zip Code>>	<<Corridor>>	<<Op. Co.>>	<<Contact Name>>	<<Contact Phone>>	<<Return Mailing Contact Name>>	<<Return Street Address>>	<<Return City>>	<<Return State>>	<<Return Zip>>	<<Company>>	<<Title>>	<<Property Address>>	<<Property City>>	<<Property State>>	<<Property Zip Code>>	<<Parcel>>
385-1			800 Cabin Hill Dr	Greensburg	PA	15601	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	800 Cabin Hill Dr	Greensburg	PA	15601	29-130.20-06-01, 29-130.20-06-11
385-2			110 Ashe Dr	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	110 Ashe Dr	Kittanning	PA	16201	29-130.20-06-56, 29-130.20-06-55, 29-130.20-06-57, 29-130.20-06-58
385-3			1601 Elmerton Ave	Harrisburg	PA	17110	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Ashe Dr	Kittanning	PA	16201	29-130.20-06-87, 29-130.20-06-87, 29-130.20-06-87, 29-130.20-06-87
385-4			108 Boyd Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	108 Boyd Rd	Kittanning	PA	16201	29-130.20-06-58
385-5			187 Northgate Blvd	Frederick	PA	16229	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Garretts Run	Kittanning	PA	16201	29-143.05-01-17, 29-143.05-01-18, 29-143.05-01-19
385-6			444 Olive Hollow Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	444 Olive Hollow Rd	Kittanning	PA	16201	29-143.05-01-54, 29-143.05-01-54, 29-143.05-01-54, 29-143.05-01-54
385-7			210 Garretts Run Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	210 Garretts Run Rd	Kittanning	PA	16201	17.002, 29-143.05-01-52, 29-143.05-01-53, 29-143.05-01-53, 29-143.05-01-53, 29-143.05-01-51, 29-143.05-01-51, 29-143.05-01-51, 29-143.05-01-51
385-8			230 Garretts Run Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	230 Garretts Run Rd	Kittanning	PA	16201	29-143.05-01-83, 29-143.05-01-83, 29-143.05-01-83, 29-143.05-01-83
385-9			223 Garretts Run Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	223 Garretts Run Rd	Kittanning	PA	16201	29-143.05-01-51, 29-143.05-01-51, 29-143.05-01-51, 29-143.05-01-51
385-10			241 Garretts Run Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	241 Garretts Run Rd	Kittanning	PA	16201	29-143.05-01-54, 29-143.05-01-54, 29-143.05-01-54, 29-143.05-01-54
385-11			162 Hill Top Ln	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	162 Hill Top Ln	Kittanning	PA	16201	50, 29-143.05-01-48, 29-143.05-01-48, 29-143.05-01-48, 29-143.05-01-48
385-12			161 Hilltop Ln	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	161 Hilltop Ln	Kittanning	PA	16201	29-143.05-01-38, 29-143.05-01-38, 29-143.05-01-38, 29-143.05-01-38
385-13			181 Hilltop Ln	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	181 Hilltop Ln	Kittanning	PA	16201	29-143.05-01-11, 29-143.05-01-11, 29-143.05-01-11, 29-143.05-01-11
385-14			160 Gosnell Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	160 Gosnell Rd	Kittanning	PA	16201	11, 006, 29-143.05-01-01, 29-143.05-01-01, 29-143.05-01-01, 29-143.05-01-01
385-15			190 Hilltop Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	190 Hilltop Rd	Kittanning	PA	16201	29-143.05-01-10, 29-143.05-01-10, 29-143.05-01-10, 29-143.05-01-10
385-16			203 Tarnow Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	203 Tarnow Rd	Kittanning	PA	16201	29-143.00-01-05, 29-143.00-01-05, 29-143.00-01-05, 29-143.00-01-05
385-17			1640 Second St	Morgantown	PA	16236	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16201	29-131.00-01-46, 29-131.00-01-46, 29-131.00-01-46, 29-131.00-01-46
385-18			Box 77	Morgantown	PA	16236	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16201	33, 29-131.00-01-26, 33, 29-131.00-01-26, 33, 29-131.00-01-26, 33, 29-131.00-01-26
385-19			123 Buffington Dr	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	123 Buffington Dr	Kittanning	PA	16201	29-131.00-01-13, 29-131.00-01-13, 29-131.00-01-13, 29-131.00-01-13
385-20			2310 Pleasant View Dr	Ford City	PA	16226	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16226	29-131.00-01-22, 29-131.00-01-22, 29-131.00-01-22, 29-131.00-01-22
385-21			111 Buffington Dr	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	111 Buffington Dr	Kittanning	PA	16201	29-131.00-01-13, 29-131.00-01-13, 29-131.00-01-13, 29-131.00-01-13
385-22			13706 State Route 422E	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16201	29-131.00-01-01, 29-131.00-01-01, 29-131.00-01-01, 29-131.00-01-01
385-23			Po Box 1022	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16201	55, 39-119.00-01-51, 39-119.00-01-51, 39-119.00-01-51, 39-119.00-01-51
385-24			333 N Mckean St	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Tarnow	Kittanning	PA	16201	44, 44, 39-119.00-01-54, 39-119.00-01-54, 39-119.00-01-54, 39-119.00-01-54
385-25			Po Box 8	New Market	OH	44442	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Troy Hill Rd	Kittanning	PA	16201	39-119.00-01-43, 39-119.00-01-43, 39-119.00-01-43, 39-119.00-01-43
385-26			104 Valley Ln	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Troy Hill Rd	Kittanning	PA	16201	39-119.00-01-32, 39-119.00-01-32, 39-119.00-01-32, 39-119.00-01-32
385-27			1021 E Cary St	Richmond	VA	23219	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Troy Hill Rd	Kittanning	PA	16201	39-119.00-01-19, 39-119.00-01-19, 39-119.00-01-19, 39-119.00-01-19
385-28			612 Troy Hill Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	612 Troy Hill Rd	Kittanning	PA	16201	39-107.00-01-17, 39-107.00-01-17, 39-107.00-01-17, 39-107.00-01-17
385-29			25	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Rd	Kittanning	PA	16201	39-107.00-01-54, 39-107.00-01-54, 39-107.00-01-54, 39-107.00-01-54
385-30			274 Iron Bridge Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	274 Iron Bridge Rd	Kittanning	PA	16201	39-107.00-01-42, 39-107.00-01-42, 39-107.00-01-42, 39-107.00-01-42
385-31			305 Iron Bridge Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	305 Iron Bridge Rd	Kittanning	PA	16201	39-107.00-01-35, 39-107.00-01-35, 39-107.00-01-35, 39-107.00-01-35
385-32			127 Monahan Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	127 Monahan Rd	Kittanning	PA	16201	24, 24, 39-107.00-01-24, 39-107.00-01-24, 39-107.00-01-24, 39-107.00-01-24
385-33			118 Fifth St	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	118 Fifth St	Kittanning	PA	16201	39-107.00-01-12, 39-107.00-01-12, 39-107.00-01-12, 39-107.00-01-12
385-34			126 Fox Lane	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	126 Fox Lane	Kittanning	PA	16201	39-107.00-01-06, 39-107.00-01-06, 39-107.00-01-06, 39-107.00-01-06
385-35			104 Mawer Dr	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	104 Mawer Dr	Kittanning	PA	16201	39-107.00-01-07, 39-107.00-01-07, 39-107.00-01-07, 39-107.00-01-07
385-36			Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Rd	Kittanning	PA	16201	39-107.00-01-06, 39-107.00-01-06, 39-107.00-01-06, 39-107.00-01-06
385-37			Rd	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Rd	Kittanning	PA	16201	39-107.00-01-07, 39-107.00-01-07, 39-107.00-01-07, 39-107.00-01-07
385-38			233 Mayfield Rd	Carlisle	PA	16214	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Cowanhamock Rd	Kittanning	PA	16214	12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15, 12-095.00-01-15
385-39			Po Box 1022	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Cowanhamock Rd	Kittanning	PA	16201	12-095.00-01-31, 12-095.00-01-31, 12-095.00-01-31, 12-095.00-01-31
385-40			Route 200 1200C Scotsville Rd	Rochester	NY	14624	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Cowanhamock Rd	Kittanning	PA	14624	12-095.00-01-02, 12-095.00-01-02, 12-095.00-01-02, 12-095.00-01-02
385-41			Po Box 1022	Kittanning	PA	16201	Tmsu-385	West Penn Power	Dave Mccann	814-448-0559	Justin Piluga	502 Hansen Ave.	Lyndora	PA	15045	Davey Tree Experts	Lead Work Planner	Cowanhamock Rd	Kittanning	PA	16201	12-095.00-01-02, 12-095.00-01-02, 12-095.00-01-02, 12-095.00-01-02
385-42	</																					

Corridor Name: \_\_\_\_\_  
 Corridor Number: \_\_\_\_\_  
 Operating Company: \_\_\_\_\_  
 Voltage: \_\_\_\_\_  
 Yr Circuit Completed: \_\_\_\_\_  
 Contractor: \_\_\_\_\_

From Structure Number	To Structure Number	Dx Underbuilt or Common (U, CD, CT, N)	Property Owner (First Name)	Property Owner (Last Name)	Address	City	State	Zip	Comments	Parcel # (s)
*	*				190 Hilltop Rd	Kittanning	PA	16201	190 Hilltop Rd Kittanning Pa 16201, , Spans 65-66	29-143.05-01-10
*	*				593 Tarrtown Rd	Kittanning	PA	16201	593 Tarrtown Rd Kittanning Pa 16201, , Spans -	29-143.00-01-06
*	*				Tartownrd	Kittanning	PA	16201	1040 Second St Kittanning Pa 16201, , Spans 64-64	29-143.00-01-05
*	*				Tartownrd	Kittanning	PA	16201	Box 77 Mgrann Pa 16236, , Spans -	29-131.00-01-46
*	*				123 Buffington Dr	Kittanning	PA	16201	123 Buffington Dr Kittanning Pa 16201, , Spans -	29-131.00-01-33,29-131.00-01-26
*	*				Tartownrd	Kittanning	PA	16226	2310 Pleasant View Dr Ford City Pa 16226, , Spans 14-58	29-131.00-01-13,29-131.00-01-13
*	*				111 Buffington Dr	Kittanning	PA	16201	111 Buffington Dr Kittanning Pa 16201, , Spans 58-58	29-131.10-01-22
*	*				Tartownrd	Kittanning	PA	16201	13700 State Route 422E Kittanning Pa 16201, , Spans -	29-131.00-01-01,003
*	*				Tartownrd	Kittanning	PA	16201	Po Box 1022 Kittanning Pa 16201, , Spans 47-50	29-131.00-01-01,39-107.00-01-55
*	*				Tartownrd	Kittanning	PA	16021	333 N Mckean St Kittanning Pa 16021, , Spans -	39-119.00-01-51
*	*				Troy Hill Rd	Kittanning	PA	44442	Po Box 8 New Middletown Oh 44442, , Spans -	39-119.00-01-54
*	*				Troy Hill Rd	Kittanning	PA	16201	104 Valley View Dr Kittanning Pa 16201, , Spans -	39-119.00-01-43
*	*				Troy Hill Rd	Kittanning	PA	23219	1021 E Cary St Richmond Va 23219, , Spans -	39-119.00-01-32
*	*				412 Troyhill Rd	Kittanning	PA	16201	412 Troyhill Rd Kittanning Pa 16201, , Spans 47-48	39-119.00-01-19
*	*				336 Ping Wing Hollow Rd	Kittanning	PA	16201	336 Ping Wing Hollow Rd Kittanning Pa 16201, , Spans -	39-119.00-01-17
*	*				274 Iron Bridge Rd	Kittanning	PA	16201	274 Iron Bridge Rd Kittanning Pa 16201, , Spans -	39-107.00-01-54
*	*				305 Iron Bridge Rd	Kittanning	PA	16201	305 Iron Bridge Rd Kittanning Pa 16201, , Spans -	39-107.00-01-42
*	*				127 Mcmillen Rd	Kittanning	PA	16201	127 Mcmillen Rd Kittanning Pa 16201, , Spans -	39-107.00-01-35
*	*				118 Fifth St	Kittanning	PA	16201	118 Fifth St Kittanning Pa 16201, , Spans 42-43	39-107.00-01-24,005
*	*				126 Fox Lane	Kittanning	PA	16201	126 Fox Lane Kittanning Pa 16201, , Spans -	39-107.00-01-24
*	*				104 Mateer Dr	Kittanning	PA	16201	104 Mateer Dr Kittanning Pa 16201, , Spans -	39-107.00-01-12
*	*				333 Cowanshannock Rd	Kittanning	PA	16201	333 Cowanshannock Rd Kittanning Pa 16201, , Spans -	39-107.00-01-06
*	*				221 Cowanshannock Rd	Kittanning	PA	16201	221 Cowanshannock Rd Kittanning Pa 16201, , Spans -	39-107.00-01-07
*	*				Cowanshannock Rd	Kittanning	PA	16214	633 Mayfield Rd Clarion Pa 16214, , Spans -	39-107.00-01-08

Corridor: kv														
From Span	To Span	First Name	Last Name	Property Address	City	State	Zip	Certified letter (Y/N)	DC # ID	1st	2nd	3rd	Parcel #	Comments
75	76			800 Cabin Hill Dr	Greensburg	Pa	15601						29-130.20-06-01,29-130.20-06-11	
75	75			110 Ashe Dr	Kittanning	Pa	16201						29-130.20-06-56, 29-130.20-06-55	
74	74			Ashe Dr	Kittanning	Pa	16201						29-130.20-06-57.001	
75	75			108 Boyd Rd	Kittanning	Pa	16201						29-130.20-06-58	
				Garretts Run	Kittanning	Pa	16201						29-143.00-01-17	
				444 Silvis Hollow Rd	Kittanning	Pa	16201						29-130.20-06-59	
				210 Garretts Run Rd	Kittanning	Pa	16201						29-143.00-01-17.002,29-143.05-01-52	
				230 Garretts Eun Rd	Kittanning	Pa	16201						29-143.05-01-53	
69	69			223 Garretts Run Rd	Kittanning	Pa	16201						29-143.05-01-51	
69	69			241 Garretts Run Rd	Kittanning	Pa	16201						29-143.05-01-54	
				162 Hill Top Ln	Kittanning	Pa	16201						29-143.05-01-50,29-143.05-01-48	
67	68			161 Hilltop Ln	Kittanning	Pa	16201						29-143.05-01-35	
				181 Hilltop Ln	Kittanning	Pa	16201						29-143.05-01-11.007	
				160 Goathill Rd	Kittanning	Pa	16201						29-143.05-01-11.006,29-143.05-01-11	
65	66			190 Hilltop Rd	Kittanning	Pa	16201						29-143.05-01-10	
65	66			593 Tartown Rd	Kittanning	Pa	16201						29-143.00-01-06	
64	64			Tartownrd	Kittanning	Pa	16201						29-143.00-01-05	
				Tartownrd	Kittanning	Pa	16201						29-131.00-01-46	
				123 Buffington Dr	Kittanning	Pa	16201						29-131.00-01-33,29-131.00-01-26	
14	58			Tartownrd	Kittanning	Pa	16226						29-131.00-01-13,29-131.00-01-13	
58	58			111 Buffington Dr	Kittanning	Pa	16201						29-131.10-01-22	
				Tartownrd	Kittanning	Pa	16201						29-131.00-01-01.003	
47	56			Tartownrd	Kittanning	Pa	16201						29-131.00-01-01,39-107.00-01-55	
				Tartownrd	Kittanning	Pa	16021						39-119.00-01-51	
				Troy Hill Rd	Kittanning	Pa	44442						39-119.00-01-54	
				Troy Hill Rd	Kittanning	Pa	16201						39-119.00-01-43	
				Troy Hill Rd	Kittanning	Pa	23219						39-119.00-01-32	
47	48			412 Troyhill Rd	Kittanning	Pa	16201						39-119.00-01-19	
				336 Ping Wing Hollow Rd	Kittanning	Pa	16201						39-119.00-01-17	
				274 Iron Bridge Rd	Kittanning	Pa	16201						39-107.00-01-54	
				305 Iron Bridge Rd	Kittanning	Pa	16201						39-107.00-01-42	
				127 Mcmillen Rd	Kittanning	Pa	16201						39-107.00-01-35	
													39-107.00-01-24.005	
42	43			118 Fifth St	Kittanning	Pa	16201						39-107.00-01-24	
				126 Fox Lane	Kittanning	Pa	16201						39-107.00-01-12	
				104 Mateer Dr	Kittanning	Pa	16201						39-107.00-01-12	
				333 Cowanshannock Rd	Kittanning	Pa	16201						39-107.00-01-06	
				221 Cowanshannock Rd	Kittanning	Pa	16201						39-107.00-01-07	
				Cowanshannock Rd	Kittanning	Pa	16214						39-107.00-01-08	
													12-095.00-01-15,12-095.00-01-15,12-095.00-01-15,12-095.00-01-15,12-095.00-01-09	
33	37			Cowanshannock Rd	Kittanning	Pa	16201						12-095.00-01-23,12-095.00-01-31	
37	37			Cowanshannock Rd	Kittanning	Pa	14624						12-095.00-01-02,47-071.00-02-62,47-071.00-02-57	
				Cowanshannock Rd	Kittanning	Pa	16201						12-083.00-01-25	
27	29			Point Rd	Kittanning	Pa	16053						12-083.00-01-19	
				Point Rd	Kittanning	Pa	16262						47-083.00-01-22	
				111 Point Pl	Kittanning	Pa	16201						47-083.00-01-22	
													47-083.00-06-04,47-083.00-06-03	
19	23			Spring Run Rd	Kittanning	Pa	15601						47-071.00-02-50	
13	14			152 Spring Run Rd	Adrian	Pa	16210						47-059.00-01-27	
5	7			Spring Run Rd	Adrian	Pa	16210						47-071.00-02-26	
9	10			Spring Run Rd	Adrian	Pa	16210						29-143.00-01-17.002, 29-143.05-01-52	
69	74			Spring Run Rd	Adrian	Pa	16210							

**FirstEnergy / West Penn Power 385-50**  
Attn: Justin Pitluga, Tmu-385  
502 Hansen Ave.  
Lyndora, Pa. 16045



Christopher S McGinnis  
267 Williamson Rd  
Templeton, PA 16259

## **Re: Notification of Planned Transmission Line Work**

Regarding Property at:  
**267 Williamson Rd, 39-107.00-01-24.007**

Dear Christopher S McGinnis:

West Penn Power, a FirstEnergy company (the "Company"), has identified you as a property owner with a transmission line right-of-way ("ROW") crossing your property. These transmission lines provide power to thousands of electric customers and are vital reliability links with other utilities. Maintaining transmission line ROWs that are free of incompatible vegetation is necessary to provide safe and reliable electric service.

The purpose of this letter is to notify you that vegetation management work is planned for your property. A professional tree company has been contracted to perform the vegetation management work. Your cooperation in accomplishing this important task will be greatly appreciated.

Federal and state regulations require the Company and other operators to properly maintain transmission lines in order to provide for the safe and reliable operation of the transmission system. This requires reliability inspections and routine vegetation maintenance. Vegetation maintenance practices involve identifying incompatible vegetation and trees located within the transmission line ROWs and removing those that interfere or may potentially interfere with the operation of the transmission facilities. Trees adjacent to the ROW that are unhealthy, leaning, or significantly encroaching the corridor also could be targeted for removal.

The Company's comprehensive vegetation management program involves multiple widely used forestry procedures and techniques to safely and effectively maintain the transmission line ROW.

As part of the vegetation management process, tree company work planners use special symbols. For example, hash marks "=" identify the edge of the ROW; trees to be removed are marked with a "X"; and trees to be pruned are identified with a vertical line "I".

Healthy trees along the edge with limbs encroaching the ROW may be pruned back using a method known as "Ground to Sky" pruning. This work is accomplished manually by tree crews or mechanically using a helicopter equipped with an aerial saw. Branches that fall onto access roads, maintained yard areas, agricultural fields or in streams during the manual or aerial pruning operation will be cleaned up, or moved to adjacent wooded areas by ground crews shortly after the pruning is performed.

The stumps/stubble of the cleared vegetation will be treated with an EPA-registered herbicide to minimize re-sprouting and root suckering that typically follows mechanical removal. Nearly 60 years

of university and industry research has shown that herbicide use on ROWs can create optimum plant and wildlife habitats. Ultimately, using herbicides to target specific vegetation results in transmission line corridors that are clear of incompatible vegetation, with no effect on adjacent or nearby properties.

Herbicides also may be applied directly to the leaves or stems of smaller incompatible vegetation. This control method may be applied in several ways. A ground application where personnel use either backpack sprayers, or ATVs and truck-mounted equipment can be used to apply herbicides along fence rows, tower bases, and other light density brush areas. In high density brush and less accessible areas, a helicopter equipped with a specialized microfoil boom may be used. This spray boom delivers the herbicides as droplets in a rainfall-style pattern. This enables the pilot to precisely place the herbicides on the targeted incompatible vegetation within the ROW boundaries.

For aerial applications, buffer zones will be left on both sides of streams, state and heavily traveled roads, cultivated fields, pastures, orchards and residences. If needed, a ground application will follow with an herbicide application targeting incompatible vegetation within these buffer areas. Aerial applications will be done primarily in the early morning or evening hours by helicopter when weather conditions permit. All applications will be performed within the Company's transmission line ROW and only where incompatible brush exists. Crops, gardens, fruit orchards, Christmas tree farms, and pasture areas will not be treated. All herbicides used on ROWs are applied by state-certified applicators or under the supervision of a certified applicator.

As part of our inspection, compatible shrubs that do not interfere with transmission facilities are not disturbed. The ideal transmission line ROW includes a diverse mixture of grasses, low growing shrubs and other ground cover preferred by birds, deer and small animals to promote a thriving wildlife habitat. In this way, well-managed transmission line ROWs provide food and cover wildlife need to survive.

Below is a general timeline for vegetation maintenance activities:

- Landowner notification – (Receipt of this letter is your notification)
- Work Planners marking trees (Between January – June - approximately 2 weeks to 45 days of receiving letter)
- Tree Work, if applicable – Tree Removal, Tree Pruning, and Brush Mowing (January – December)
- Aerial Saw Pruning, if applicable – (March – November)
- Herbicide Application, if applicable (June – September)

While this letter provides important information about the Company's vegetation management program, its contents and the work performed shall not in any way limit or change the rights or privileges included in any easements granted to the Company and recorded in the County Recorder's office.

We appreciate your understanding and cooperation in our ongoing efforts to provide safe and reliable electric service to our customers. If you have any questions, concerns or special conditions, please contact: **Jim Goldinger 724-954-9715**

Sincerely,

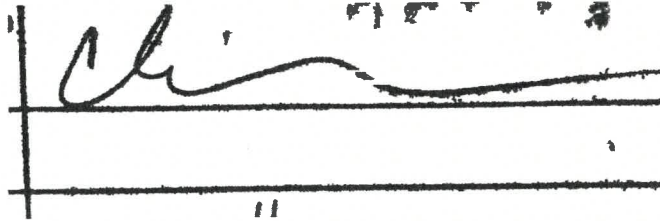
Jim Goldinger  
Davey Tree Experts  
Lead Work Planner  
Tmu-385

Date Produced: 02/12/2024

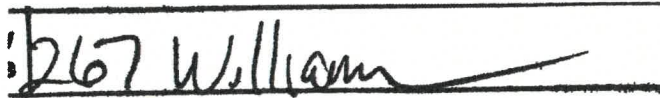
LETTERSTREAM:

The following is the delivery information for Certified Mail™/RRE item number 9214 8901 4298 0492 9306 71. Our records indicate that this item was delivered on 02/07/2024 at 10:41 a.m. in TEMPLETON, PA 16259. The scanned image of the recipient information is provided below.

Signature of Recipient :  
(Authorized Agent)



Address of Recipient :



Thank you for selecting the Postal Service for your mailing needs. If you require additional assistance, please contact your local post office or Postal Service representative.

Sincerely,  
United States Postal Service

Annual Inspection

Annual Inspection #2-17537833 Span: 41

- Annual Inspection 2-17537833
- Contractor Assignment
- Work Planning
- Contractor Work
- Followup

Brush Density: Medium  
 Herb. Treatment: LVF  
 Corridor Width: 105.0  
 % Sustainable Brush: 100

Mow  
 Handcut  
 12 FT Brush - Cut  
 12 FT Brush - RFI  
 100 FT Zone  
 Yard Tree  
 Marked ROW  
 Special Conditions  
 Flagger Needed  
 Call Ahead  
 Relocation (See Form)  
 Stump Grinding (See Form)  
 Chipper  
 Other

Comment: access from fox Ln/ ntw/ Chris McGinnis wants no spray to yellow ribbon

Off Corridor Tree Tracking

A1 (6-9)	A2 (10-13)	A3 (14-16)	B (17-20)	C (21-23)	D (24-26)	T&M
Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

On Corridor Tree Tracking / Widening

A1 (6-9)	A2 (10-13)	A3 (14-16)	B (17-20)	C (21-23)	D (24-26)	T&M
Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Recorded By: Goldinger, Jim      Date: 2024-02-27



- Annual Inspection 2-17537833
- Contractor Assignment
- Work Planning
- Contractor Work
- Followup

Rework  Addon  Approved

Conditions Found  Brush on R/W  Clean Up  Dead Tree  
 Marked Vegetation  Priority Tree  Side Trim  
 Vines  Other

Comments

Performed from Air

Location

Completed By  Date

Herbicide 2-17537899

Crew Oscar Badillo Lopez  
Ready for Inspection Jun 15, 2024

Contractor Assignment

Comments

Work Planning

Tree Vendor Follow Up (for partial spans only)

Contractor Work

Inspected By Stahl, Shawn Date 2024-06-16

Herbicide

Special Conditions: Consult all span and property owner comments before proceeding



- Annual Inspection 2-17537834
- Contractor Assignment
- Work Planning
- Contractor Work
- Followup

Brush Density Medium Corridor Width 100.0  
 Herb. Treatment LVF % Sustainable Brush 40

Mow  Ground To Sky  
 Handcut  Widening  
 12 FT Brush - Cut  12 FT Brush - RFI  100 FT Zone  Yard Tree  Marked ROW  
 Special Conditions  Flagger Needed  Call Ahead  Relocation (See Form)  
 Stump Grinding (See Form)  Chipper  Other

Comment: floor to Chris McGinnis's property Chris wants no spray from Don's property to yellow ribbon/ ok to pull removal back into woods and cut up

Off Corridor Tree Tracking

A1 (6-9)	A2 (10-13)	A3 (14-16)	B (17-20)	C (21-23)	D (24-26)	T&M
Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim
<input type="checkbox"/> 1 <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

On Corridor Tree Tracking / Widening

A1 (6-9)	A2 (10-13)	A3 (14-16)	B (17-20)	C (21-23)	D (24-26)	T&M
Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim	Rmv Trim
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

Recorded By Goldinger, Jim Date 2024-02-12

Annual Inspection #2-17537834 Span: 42

Annual Inspection 2-17537834

Rework  
 Addon  
 Approved

Brush on R/W  
 Clean Up  
 Dead Tree

Conditions Found  
 Marked Vegetation  
 Priority Tree  
 Side Trim

Vines  
 Other

Comments

Performed from Air

Location

Completed By Pitluga, Justin      Date 2024-07-10

Contractor Assignment  
 Work Planning  
 Contractor Work  
 Followup

Attach Files...  
Map Fix...  
Property Owners...  
OK  
Cancel

Herbicide #2-17537900 Span: 42

Herbicide 2-17537900 Crew DT29WP  
Ready for Inspection Sep 5, 2024

Contractor Assignment  
 Work Planning  
 Contractor Work  
 Herbicide

Comments  
LMA no herb work required

Tree Vendor Follow Up (for partial spans only)

Inspected By Kalgren, Timothy Date 2024-09-09

Special Conditions: Consult all span and property owner comments before proceeding

Attach Files... Map Fix... Property Owners... OK Cancel



*ANSI A300 (Part 7)-2012  
Revision of ANSI A300 (Part 7)-2006*

*for Tree Care Operations –  
Tree, Shrub, and Other Woody Plant  
Management – Standard Practices  
(Integrated Vegetation Management  
a. Utility Rights-of-way)*

*ANSI A300 (Part 7)-2012 Integrated Vegetation Management a. Utility Rights-of-way  
Revision of ANSI A300 (Part 7)-2006*



American National Standard  
for Tree Care Operations –

**Tree, Shrub, and Other Woody Plant Management  
Standard Practices  
(Integrated Vegetation Management  
a. Utility Rights-of-way)**

Secretariat  
Tree Care Industry Association, Inc.

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A300 (Part 7)-2012

**Foreword** This foreword is not part of American National Standard A300 (Part 7)-2012 *Integrated Vegetation Management (IVM)* standards.

ANSI A300 Standards are divided into multiple parts, each focusing on a specific aspect of woody plant management (e.g. Pruning, Soil Management, Supplemental Support Systems, etc.)

These standards are used to develop written specifications for work assignments. They are not intended to be used as specifications in and of themselves. Management objectives may differ considerably and therefore must be specifically defined by the user. Specifications are then written to meet the established objectives and must include measurable criteria.

ANSI A300 standards apply to professionals who provide for, or supervise the management of, trees, shrubs, and other woody landscape plants. Intended users include businesses, government agencies, property owners, property managers, and utilities. The standard does not apply to agriculture, horticultural production, or silviculture, except where explicitly noted otherwise.

This standard has been developed by the Tree Care Industry Association (TCIA), an ANSI-accredited Standards Developing Organization (SDO). TCIA is secretariat of the ANSI A300 standards, and develops standards using procedures accredited by the American National Standards Institute (ANSI).

Consensus for standards writing was developed by the Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Management Operations – Standard Practices, A300 (ASC A300).

Prior to 1991, various industry associations and practitioners developed their own standards and recommendations for tree care practices. Recognizing the need for a standardized, scientific approach, green industry associations, government agencies and tree care companies agreed to develop consensus for an official American National Standard.

The result – ANSI A300 standards – unify and take authoritative precedence over all previously existing tree care industry standards. ANSI requires that approved standards be developed according to accepted principles, and that they be reviewed and, if necessary, revised every five years.

TCIA was accredited as a standards developing organization with ASC A300 as the consensus body on June 28, 1991. ASC A300 meets regularly to write new, and review and revise existing, ANSI A300 standards. The committee includes industry representatives with broad knowledge and technical expertise from residential and commercial tree care, utility, municipal and federal sectors, landscape and nursery industries, and other interested organizations.

Suggestions for improvement of this standard should be forwarded to: ANSI A300 Secretary, c/o Tree Care Industry Association, Inc., 136 Harvey Road - Suite 101, Londonderry, NH 03053.

ANSI A300 (Part 7)-2012 *Integrated Vegetation Management a. Utility Rights-of-Way* was approved as an American National Standard by ANSI on August 23, 2012. ANSI approval does not require unanimous approval by ASC A300.

*(Continued)*

The ASC A300 had the following members as of August 23, 2012:

<i>Dane Buell, Chair (SavATree, Inc.)</i>	<i>Bob Rouse, Secretary (Tree Care Industry Association, Inc.)</i>
<i>Organizations Represented</i>	<i>Name of Representative</i>
<i>Alliance for Community Trees American Forests</i>	<i>Carrie Gallagher (Alt.) Guy Meilleur</i>
<i>American Nursery and Landscape Association</i>	<i>Joseph Murray (Alt.) Warren Quinn</i>
<i>American Society of Consulting Arborists</i>	<i>Craig J. Regelbrugge (Alt.) Stephen Miller</i>
<i>American Society of Landscape Architects Asplundh Tree Expert Company</i>	<i>Donald Godt (Alt.) Ron Loughton</i>
<i>Bartlett Tree Expert Company</i>	<i>Geoff Kempler Peter Fengler (Alt.)</i>
<i>Davey Tree Expert Company</i>	<i>Peter Becker Dr. Thomas Smiley (Alt.)</i>
<i>International Society of Arboriculture</i>	<i>Chris Kilias Grant Jones (Alt.)</i>
<i>Professional Grounds Management Society Professional Land Care Network</i>	<i>Dr. Richard Hauer Sharon Lilly (Alt.)</i>
<i>Society of Municipal Arborists</i>	<i>Thomas Shaner Alice Carter</i>
<i>Tree Care Industry Association</i>	<i>Sabeena Hickman (Alt.) Gordon Mann</i>
<i>USDA Forest Service</i>	<i>Nolan Rundquist (Alt.) Mark Stennes</i>
<i>Utility Arborist Association</i>	<i>Steve Mays Jr. (Alt.) Keith Cline</i>
	<i>Ed Macie (Alt.) Matthew Simons Bill Rees (Alt.)</i>

*Additional organizations and individuals:*

*Michael Galvin (Observer)  
Peter Gerstenberger (Observer)  
Sabeena Hickman (Observer)  
Andy Hillman (Observer)  
Myron Laible (Observer)  
National Park Service (Observer)  
Beth Palys (Observer)  
Richard Rathjens (Observer)  
Mary Reynolds (Observer)  
Richard Roux (NFPA-780 Liaison)  
Don Zimer (Observer)*

**ASC A300 mission statement:**

Mission: To develop consensus performance standards based on current research and sound practice for writing specifications to manage trees, shrubs, and other woody plants.

American National Standard  
for Tree Care Operations –

## Part 7 Integrated Vegetation Management (IVM) a. Utility Rights-of-way

Subclause 1.1 to 1.3 excerpted from ANSI  
A300 (Part 1) – 2008 *Pruning*

### 1 ANSI A300 standards

#### 1.1 Scope

ANSI A300 standards present performance stan-  
dards for the care and management of trees,  
shrubs, and other woody plants.

#### 1.2 Purpose

ANSI A300 performance standards are intended  
for use by federal, state, municipal and private  
entities including arborists, property owners, prop-  
erty managers, and utilities for developing written  
specifications.

#### 1.3 Application

ANSI A300 performance standards shall apply to  
any person or entity engaged in the management  
of trees, shrubs, or other woody plants.

### 70 Part 7 – Integrated Vegetation Management (IVM) standards

#### 70.1 Purpose

The purpose of this document is to provide stan-  
dards for developing specifications to implement  
an integrated approach to management of vegeta-  
tion on utility rights-of-way.

#### 70.2 Reasons for Integrated Vegetation Management (IVM)

The reason for integrated vegetation management  
is to create, promote, and conserve sustainable  
plant communities that are compatible with the  
intended use of the site, and discourage incompat-  
ible plants that may pose concerns, including safe-  
ty, security, access, fire hazard, utility service reli-  
ability, emergency restoration, visibility, line-of-sight

requirements, regulatory compliance, and environ-  
mental, or other specific concerns.

### 70.3 Implementation

70.3.1 Specifications for integrated vegetation  
management should be written and administered  
by a vegetation manager.

70.3.2 IVM specifications shall be adhered to.

### 70.4 Safety

70.4.1 IVM shall be implemented by a qualified  
vegetation manager, familiar with the practices and  
hazards of vegetation management and the equip-  
ment used in such operations.

70.4.2 This standard shall not take precedence  
over applicable industry safe work practices.

70.4.3 Operations shall comply with applicable  
Federal and State Occupational Safety and Health  
standards, ANSI Z133, as well as federal, state  
and local laws and regulations.

### 71 Normative references

ANSI A300 for Tree Care Operations – Tree,  
Shrub, and Other Woody Plant Management –  
Standard Practices

ANSI Z133, Arboriculture – Safety Requirements

29 CFR 1910, General Industry

29 CFR 1910.268, Telecommunications

29 CFR 1910.269, Electric Power Generation &  
Distribution

29 CFR 1910.331-335, Electrical Safety

FIFRA (Federal Insecticide, Fungicide, and  
Rodenticide Act)

NERC Standard FAC-003-1, Transmission  
Vegetation Management Program

72 Definitions (The definitions are consid-  
ered part of the ANSI A300 Part 7 standard)

72.1 action threshold: A point at which the  
level of incompatible plant species, density, height,

- location or condition threatens the stated management objectives and requires the implementation of a control method(s).
- 72.2 biological control methods:** Management of vegetation by establishment and conservation of compatible, stable plant communities using plant competition, allelopathy, animals, insects, or pathogens.
- 72.3 chemical control methods:** Management of incompatible vegetation through the use of herbicides or growth regulators.
- 72.4 cultural control methods:** Management of vegetation through alternative use of right-of-way that precludes the growth of incompatible vegetation through the use of crops, pastures, parks or other managed landscapes.
- 72.5 integrated vegetation management (IVM):** A system of managing plant communities in which compatible and incompatible vegetation is identified, action thresholds are considered, control methods are evaluated, and selected control(s) are implemented to achieve a specific objective. Choice of control methods is based on effectiveness, environmental impact, site characteristics, safety, security and economics.
- 72.6 maintenance cycle:** Planned interval between vegetation management activities.
- 72.7 manual control method:** Control of vegetation using hand-operated tools.
- 72.8 mechanical control methods:** Control of vegetation using equipment-mounted saws, mowers, or other devices.
- 72.9 non-selective management:** Methods used to control vegetation within a prescribed area without regard to retaining compatible vegetation.
- 72.10 right-of-way reclamation:** Reestablishing IVM on a right-of-way that is not currently managed to the full extent of its easement or ownership rights and intended purpose. Conditions on a right-of-way in need of reclaiming include tall, dense amounts of undesirable vegetation, and utility facilities that are inaccessible. Reclamation usually involves initial non-selective methods of mowing or hand-cutting, or broadcast application of herbicides.
- 72.11 selective management:** Methods used to control specific vegetation within a prescribed area while retaining compatible vegetation.
- 72.12 shall:** As used in this standard denotes a mandatory requirement.
- 72.13 should:** As used in this standard denotes an advisory recommendation.
- 72.14 specifications:** A detailed, measurable plan or proposal for performing a work activity or providing a product, usually a written document.
- 72.15 standard, ANSI A300:** The performance parameters established by industry consensus as a rule for the measure of extent, quality, quantity, value or weight used to write specifications.
- 72.16 utility facilities:** Any privately, publicly, or cooperatively owned line, structure, or system for producing, transmitting, or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, or storm water, which directly or indirectly serves the public.
- 72.17 utility right-of-way:** A corridor of land over or through which utility facilities are located. The utility may own the land in fee, own easements, or have certain franchise, prescription, or license rights to construct and maintain utility facilities.
- 72.18 vegetation, compatible:** Vegetation that is desirable and/or suitable to the intended use of the site.
- 72.19 vegetation, incompatible:** Vegetation that is undesirable, presents a safety hazard, or is unsuitable to the intended use of the site.
- 72.20 vegetation manager:** An individual engaged in the profession of vegetation management who, through appropriate experience, education, and related training, possesses the competence to provide for or supervise an integrated vegetation management program.
- 73 IVM a. Utility Rights-of-way practices**
- 73.1 Communication**
- 73.1.1 Communication with various stakeholders such as underlying or adjacent property owners,**

customers, and regulators regarding IVM activities should be proactive; and shall be in compliance with federal, state, and local regulations.

**73.2 Set IVM objectives**

**73.2.1** The vegetation manager (VM) shall define the objectives based on the intended purpose and use of the site.

**73.3 Evaluate site**

**73.3.1** The site shall be inspected to evaluate existing conditions to determine what type of control method(s), if any, is appropriate to meet defined objectives.

**73.3.2** Pre-control evaluations should consider right-of-way use, type of utility facility, general conditions, ownership, intended uses of the site, adjacent land use, existing vegetation, topography, soils, fire risk, sensitive or protected areas, water resources, sensitive or protected species, and regulations.

**73.3.3** Vegetation that is compatible or incompatible with the objectives should be identified.

**73.3.4** Post-control evaluations should monitor efficacy and appropriateness of methods used, general site conditions, other impacts of treatments, and provide recommendations for future actions.

**73.3.5** The results of site evaluation should be documented.

**73.4 Determine action thresholds**

**73.4.1** The vegetation manager shall define action thresholds that initiate implementation of control methods to achieve management objectives.

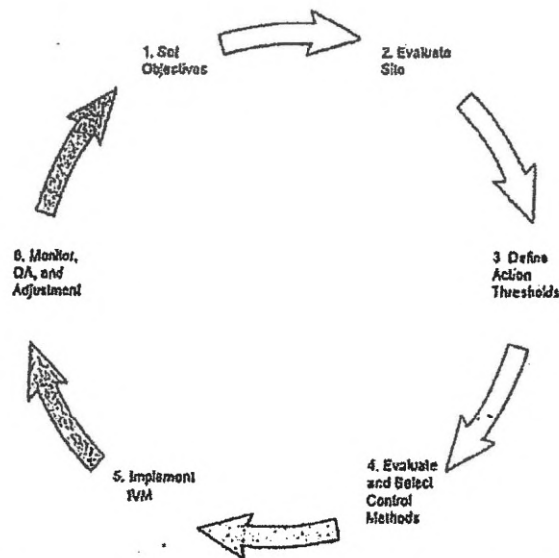
**73.5 Evaluate and select control methods**

**73.5.1** Efficacy of IVM control methods should be considered when scheduling implementation.

**73.5.2** Control methods should promote compatible vegetation.

**73.5.3** The vegetation manager shall choose from available management/control methods and specify appropriate management/methods.

**73.5.3.1** Control method selection should be



**Figure 1:** The following IVM flow chart illustrates the IVM process as represented in the ANSI A300 Part 7 standard. Each element is explained in this standard.

based on pre-control evaluations, expected growth rates, utility facility priority, economics, regulations, and specified objectives.

#### 73.5.4 Selective management

73.5.4.1 The vegetation manager should employ selective management of vegetation whenever there is sufficient compatible vegetation actively growing on the right-of-way.

73.5.4.2 Where rights-of-way cross surface water resources, selective management should be utilized to create a buffer, retaining as much compatible vegetation as possible.

73.5.4.3 When incompatible vegetation with the potential for re-sprouting is manually-controlled, herbicide should be applied to the remaining stump.

#### 73.5.5 Non-selective management

73.5.5.1 Right-of-way reclamation utilizing non-selective methods should be implemented as an initial step toward developing selective management on the site as conditions allow.

#### 73.5.6 Mechanical control methods

73.5.6.1 When performing non-selective management, including right-of-way reclamation, mechanical clearing methods should be considered.

73.5.6.2 Where rights-of-way cross surface water resources, selective management should be utilized to create a buffer, retaining as much compatible vegetation as possible.

#### 73.5.7 Chemical control methods

##### 73.5.7.1 Materials

73.5.7.2 Materials shall be used in accordance with federal, state, and local laws and regulations.

73.5.7.3 Materials shall be applied according to manufacturers' labels.

73.5.7.4 Consideration shall be given to utilizing products that minimize the risk to humans and the environment.

73.5.7.5 Consideration shall be given to reducing the amount of materials utilized over time.

73.5.7.6 Materials and methods should be selected to reduce the chance of target vegetation (or organism) developing resistance.

#### 73.5.8 Cultural control methods

73.5.8.1 Cultural control methods should be implemented as incompatible vegetation is controlled, and as conditions allow.

#### 73.5.9 Biological control methods

73.5.9.1 Biological control methods should be implemented as site conditions allow.

#### 73.6 IVM Implementation

73.6.1 All local, state, and Federal laws and regulations regarding public and worker safety shall be followed.

73.6.2 Specifications developed for IVM shall be adhered to.

73.6.3 Maintenance cycles should be based on existing vegetation, expected growth rates, past control methods, and action thresholds.

#### 73.7 Monitoring, Quality Assurance, and Adjustment

73.7.1 An IVM program shall include monitoring and quality assurance to ensure that best practices are followed, objectives of IVM are met, and that all specifications are adhered to.

73.7.2 The results of IVM treatments and of the quality assurance program should be clearly documented.

73.7.3 Results and findings from monitoring and quality assurance shall be used to adjust and improve the IVM program.

#### 74 IVM application

##### 74.1 Initial clearing of rights-of-way

74.1.1 When planning, designing, and constructing new rights-of-way, consideration should be given to future vegetation management needs.

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74.1.2 When rights-of-way are being initially established, written easements should be secured defining rights to implement IVM methods as necessary to meet objectives.

74.2 Tools and equipment

74.2.1 IVM equipment used to implement the program shall be in proper working condition.

74.2.2 Equipment shall be used according to manufacturers' instructions.

75 Tree pruning and tree removal

75.1 Tree pruning shall comply with the Utility Pruning subclause in the ANSI A300 Part 1 – Pruning standard.

75.2 Trees and tree branches with the potential to affect utility facilities should be monitored for risk, and pruned or removed as appropriate (refer to ANSI A300 Part 9 – *Tree Risk Assessment*). Monitoring intervals, action thresholds, and methods for mitigation shall be determined by the type of facility, regulatory requirements, and available resources.

**Annex A - Wire Zone – Border Zone Concept (This annex is not part of the ANSI A300 Part 7 standard)**

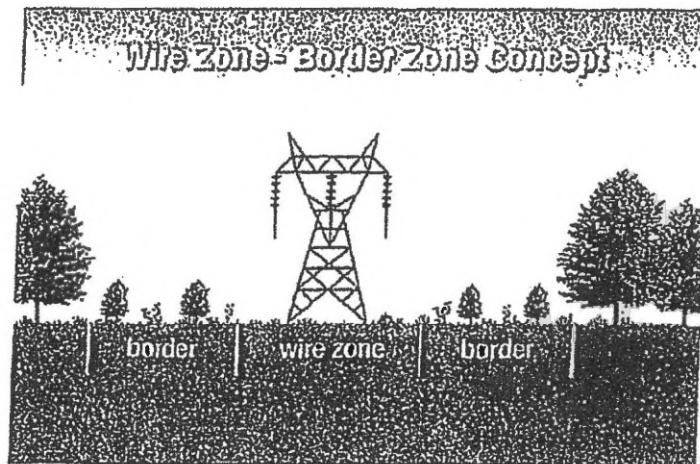
The wire zone – border zone concept is a proven IVM method that ensures the reliability of electric supply lines while promoting stable, compatible plant communities and improved wildlife habitat on suitable electric utility rights-of-way. This concept delineates the portion of the right-of-way beneath the conductors (wire zone) from the portion on either side (border zone), and prescribes different management strategies for each area. Annex A provides supplemental information about this concept.

**A-1 Annex A Glossary**

**A-1.1 border zone:** Portion of electric utility right-of-way on either side of the wire zone and extending to the outer edge of the established right-of-way, selectively managed to include a mix of compatible herbaceous and woody vegetation below a specified height.

**A-1.2 wire zone:** Portion of electric utility right-of-way directly beneath electric supply lines and extending outward to a utility-specified distance, managed to promote only low-growing, primarily herbaceous vegetation.

**A-2** The wire zone – border zone concept requires the use of separate management strategies for the wire zone and border zone, which may not be optimum for all sites. The concept is especially useful in areas where ecological concerns, such as visual impact and wildlife diversity, are a consideration. When properly implemented, use of the wire zone – border zone concept will not affect the reliability of utility facilities. The vegetation manager must determine the suitability of a particular site or right-of-way for management using the wire zone – border zone concept, taking into account topography, fire risk, and other factors.



**Figure A-2: Wire Zone – Border Zone Concept:** This diagram is provided for informational purposes only and is not drawn to scale or intended for use as a specification detail.

During initial establishment, especially on rights-of-way that have not been regularly maintained, or contain minimal or no compatible vegetation, non-selective methods may be used; however, the effect of these methods on surrounding land owners and other stakeholders must be carefully considered.

A-3 In the border zone, incompatible vegetation is selectively controlled, and compatible vegetation that will not grow above a specified height is conserved. By retaining a greater variety of vegetation types, wildlife habitat is improved, and the visual impact to the right-of-way is softened.

A-4 In the wire zone, maintaining low-growing, primarily herbaceous cover allows access to utility infrastructure for inspection, repair, and maintenance, and for inspection of vegetation on and off the right-of-way. In addition, the wire zone is often ideal for wildlife species that prefer a meadow-like habitat.

A-5 When wire height is adequate, selected woody vegetation may be incorporated into the wire zone as facilities cross deep valleys, canyons, mountainsides or other similar terrain. Additionally, such vegetation may be retained as buffers for bodies of water, visual screening, or for other specified reasons, as long as vegetation management objectives are met.

A-6 Over the long term, the wire zone -- border zone concept increasingly makes use of cultural and biological control methods to develop relatively stable plant communities in each zone, thus minimizing the need for other IVM control methods. These plant communities attract and aid in the establishment of stable wildlife populations, which in turn may further enhance biological controls. The wire zone -- border zone concept can be implemented in most areas; however, the need for additional control methods, as well as the species of flora and fauna present, will vary depending on local climate and site conditions.

**Annex B - Applicable ANSI A300 Part 7 Interpretations (This annex is not part of the ANSI A300 Part 7 standard)**

The following interpretations apply to the ANSI A300 Part 7 IVM standard.

**B-1 Interpretation of "shall"**

"A mandatory requirement" is the common definition of "shall" used in the standards development community and the common definition of "shall" used in ANSI standards. A mandatory requirement is not optional and must be followed for ANSI A300 compliance.

**B-2 Interpretation of "should"**

"An advisory recommendation" is the common definition of "should" used in the standards development community and the common definition of "should" used in ANSI standards. An advisory notice is not a mandatory requirement. Advisory recommendations may not be followed when defensible reasons for non-compliance exist.

**B-3 Use of the terms "hazard tree" and "danger tree"**

**B-3.1** In electric utility vegetation management, the terms "hazard tree" and "danger tree" are frequently used to describe trees that pose discernable risk to utility facilities.

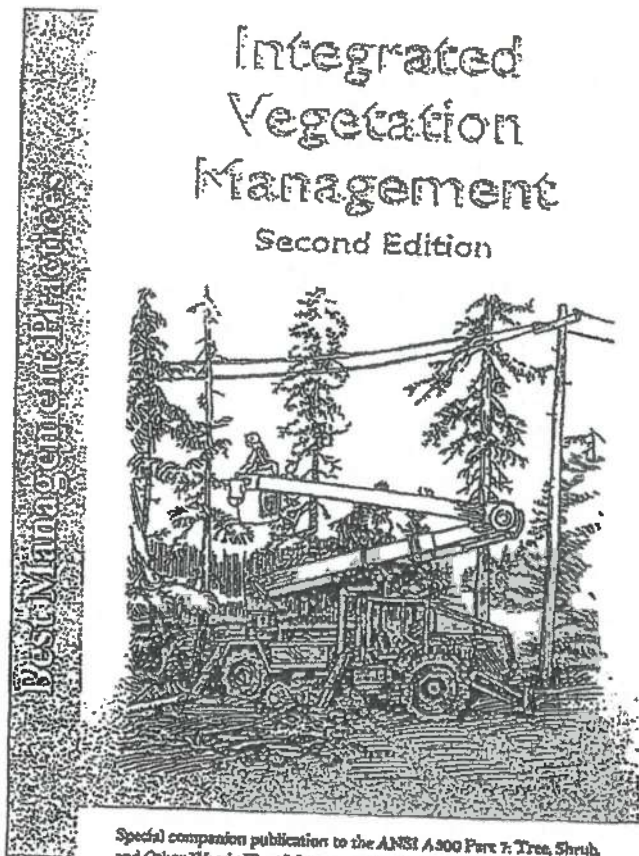
**B-3.2 Annex B Glossary**

**B-3.2.1 hazard tree:** A structurally unsound tree that could strike a target when it falls. As used here, the target of concern is electrical supply lines.

**B-3.2.2 danger tree:** A tree on or off the right-of-way that could come into contact with electric supply lines by growing into, falling into, swaying into, or sagging.

**B-3.3** While this glossary reflects industry consensus, there remain regional differences in interpreting the meaning of "hazard tree" and "danger tree." ANSI A300 standards promote tree risk management and discourage the use of the term "hazard," preferring instead to refer to specific levels of risk posed (see ANSI A300 Part 9 – *Tree Risk Assessment*) following general risk assessment concepts outlined in international standards (ISO).

**B-3.4** Trees identified as hazard or danger trees may be pruned or removed as appropriate.



INTEGRATED VEGETATION MANAGEMENT

**INTEGRATED VEGETATION  
MANAGEMENT  
FOR UTILITY RIGHTS-OF-WAY**  
Second Edition 2014

Randall H. Miller

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## Table of Contents

Purpose	.....
Acknowledgments	.....
Introduction	.....
IVM Defined	.....
Safety	.....
1. Communication	.....
Internal Communication	.....
Communication with External Stakeholders	.....
2. Planning and Implementation	.....
Set Objectives	.....
Site Evaluations	.....
Work Load Evaluations	.....
Comprehensive Evaluations	.....
Tree Risk Assessment	.....
Point Sample Evaluations	.....
Define Action Thresholds	.....
Minimum Clearances	.....
Evaluate and Select Control Methods	.....
Manual Control Methods	.....
Mechanical Control Methods	.....
Machine Types	.....
Chemical Control Methods	.....
Tree Growth Regulators	.....
Herbicides	.....
Closed Chain of Custody	.....
Selectivity	.....
Herbicide Application Methods	.....
Individual Stem Treatment	.....
Broadcast Treatment	.....
Aerial Treatments	.....
Biological Control Methods	.....
Cultural Control Methods	.....
Engineering Solutions	.....
Wire-Barrier Zone Concept	.....
Pipe-Zone Border Zone	.....
Implement Control Methods	.....
Initial Clearing and Replantation	.....

Clearances.....	28
Debris Disposal.....	28
Monitor Treatment and Quality Assurance.....	29
Record Keeping.....	29
3. IVM Application.....	31
Environmental Protection.....	31
Species of Concern.....	31
Wetlands.....	31
Stream Protection.....	31
Buffers.....	31
Archaeological or Cultural Sites.....	31
4. Tree Pruning and Removal.....	32
5. Summary.....	33
6. Glossary.....	34
Selected References.....	39
About the Author.....	44

## Purpose

The International Society of Arboriculture (ISA) has developed Best Management Practices (BMPs) for the purpose of interpreting standards and providing guidelines of practice for arborists, tree and the people who employ their services.

Because trees and other plants are unique living organisms, as well as the ecosystems in which they live—are variable by all practices can be successfully applied in all cases. A qualified utility vegetation manager should write or review contracts and actions using national standards and this BMP. Departures from this should be made with careful consideration of the objectives and supporting rationale.

This BMP is for the selection and application of methods and for vegetation control for electric rights-of-way projects and g rights-of-way. It also serves as a companion publication for the vegetation management portion of the *American National Standard Care Operations—Tree, Shrub, and Other Woody Plant Management Standard Practices (Integrated Vegetation Management a. Utility-of-Way)* (ANSI A300, Part 7).

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2

## Introduction

Unmanaged vegetation growing near utility rights-of-way can damage utility facilities and cause problems with safety, reliability, access, and service restoration, regulatory compliance, security, and lines can also compromise compliance with environmental, legal, and other requirements.

Vegetation interference with power lines is one of the most common causes of electrical outages on distribution systems, and has initiated several major transmission grid failures that have subjected millions of people to lengthy power outages. Vegetation can cause electric service interruptions when it contacts high voltage conductors or comes sufficiently close to create a spark. Vegetation and conductors can come too close together when they are blown into one another by high winds, or when lines stretch and sag during high temperatures, heavy snow, or ice buildup (Figure 1). During dry conditions, vegetation sparking-over with power lines can start wildfires. Vegetation also provides access for children, workers, and others to high voltage overhead lines, potentially resulting in direct or indirect contact that can cause serious injury or death.

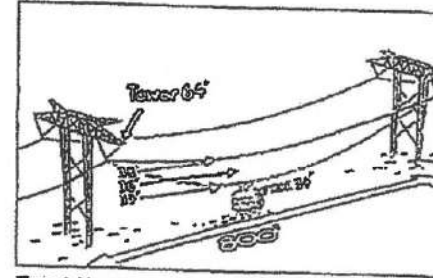


Figure 1. Line sag.

Vegetation can interfere with access to, and maintenance of, utility facilities. For example, underground pipelines can be obstructed by vegetation, making it impossible to detect leaks from the ground or air.

Utilities must comply with federal, state or provincial, and local regulations that require vegetation control in proximity to electric and gas lines. For example, in the United States, the North American Electric

3

standard contains clearance requirements for critical transmission lines. Moreover, the Energy Policy Act of 2005<sup>1</sup> contains provisions for electric system reliability standards, including those for vegetation management. Based on this provision, the Federal Energy Regulatory Commission has adopted the NERC *Transmission Vegetation Management Program* standard (NERC 2008), which essentially gives the NERC standard the force of law. Another important regulation is the National Electrical Safety Code (NESC [IEEE 2012]), section 218, of which requires utilities to prune or remove trees that may damage ungrounded supply conductors.

Many utilities manage millions of trees across thousands of miles (kilometers) of line. That means in every mile (1.6 km) of line, a utility can potentially have hundreds of trees, any one of which could compromise public safety and electrical service reliability. It is impossible to completely secure an electrical system from that level of exposure. Nevertheless, vegetation managers have a responsibility to make a reasonable effort to maintain vegetation to reduce risks to both the public and utilities. The integrated vegetation management (IVM) best management practices outlined in this publication are tools for use toward that objective.

The intent of this publication is to serve as a companion to ANSIA300 Part 7: *Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Integrated Vegetation Management at Electric Utility Rights-of-Way)* (ANSI 2012). It is designed to provide practitioners with what industry experts consider to be the most appropriate integrated vegetation management (IVM) techniques to apply to utility right-of-way projects. Integrated vegetation management best practices can also be used to fulfill other objectives, such as vegetation control on gas pipeline rights-of-way, and activities outside the scope of utility right-of-way management—including restoring ecosystems, improving wildlife habitat, preserving cultural resources, protecting successional plant species, controlling invasive weeds, and other actions. Determining the best technique for a particular project takes experience and knowledge because natural conditions are dynamic. Therefore, this publication is not intended as a substitute for the expertise of a utility vegetation manager.

<sup>1</sup> United States Congress. PL 109-58, enacted August 8, 2005, section 1211

vegetation management, who through education and related training, has the competence to design, implement, or supervise an IVM program. The expertise of a utility vegetation manager contrasts with that of an arborist insofar as the utility vegetation manager focuses on ecosystems, while arborists concentrate on individual trees. For the purposes of this publication, the utility vegetation manager is a utility employee or their contract representative who will set objectives, evaluate site conditions, make decisions on action thresholds and control methods, and perform quality assurance once work is complete.

#### IVM Defined

*ANSIA300 Part 7* defines IVM as a system of managing plant communities in which managers set objectives, identify compatible and incompatible vegetation, consider action thresholds, and evaluate, select, and implement the most appropriate control method or methods to achieve their established objectives. The choice of control method or methods is based on considerations of their environmental impact and anticipated effectiveness, along with site characteristics, security, economics, current land use, and other factors.

Nowak (2013) offers a more in-depth definition of IVM, as a system for controlling undesirable vegetation that is consistent with principles and practices of Integrated Pest Management (IPM), designed to achieve specific management objectives, and continually improve processes. It is used to systematically choose, justify, selectively implement, and monitor different types of vegetation management treatments. Treatment selection is based on the control method's effectiveness, economic viability, and environmental impact, along with its suitability for safety, site characteristics, security, socio-economics, and other factors. IVM uses combinations of methods to promote sustainable plant communities that are compatible with the intended use of the site, and to control, discourage, or prevent establishment of incompatible plants that may pose safety, security, access, fire hazard, utility service reliability, emergency restoration, visibility, line-of-sight requirements, regulatory compliance, environmental, or other specific concerns.

The key steps of IVM consistent with IPM are:

- 1) Gaining science-based understanding of incompatible vegetation and ecosystem dynamics;
- 2) Setting management objectives and tolerance levels based on institutional requirements and broad stakeholder input.

- 3) Selecting treatments from a variety of options, including biological, chemical, manual, mechanical, and cultural control methods—and applying them to promote desirable desired plant communities, with an emphasis on management through biological controls, and
- 4) Monitoring treatments to determine their necessity and effectiveness in creating desired plant communities and achieving management objectives. IVM is a sustainable management method for utility rights-of-way because it balances socioeconomic and environmental considerations.

IVM is not a set of rigid prescriptions based upon set time periods, repeated unselective mowing, or broadcast spraying across entire right-of-way widths without the objective of establishing diverse, compatible plant communities.

#### Safety

Utility vegetation management operations can be dangerous without rigorous training and strict adherence to proper safety procedures. For that reason, utility vegetation managers need to inspire a culture of safety throughout their organizations. They should employ only qualified professionals who have demonstrated their ability to work according to accepted safe practices, or qualified trainees dedicated to learning safe work practices.

In the United States, the Occupational Safety and Health Administration (OSHA) requires employers to train their workers in electric safety<sup>1</sup>. Annex B of the *American National Standard for Arboricultural Operations—Safety Requirements* (ANSI Z133-2012) contains guidelines for standard performance and safety training for qualified line clearance arborists. OSHA 1910.269 and ANSI Z133 complement one another on governing electric safety in arboricultural operations, with OSHA 1910.269 requiring electric safety training and ANSI Z133 offering guidance on how that training should be provided.

<sup>1</sup> OSHA, United States Department of Labor, 1910.269, *Electric Power Generation, Transmission and Distribution*, Accessed August 2013 <[http://www.osha-slc.gov/pls/ednweb/ednweb.pl?show\\_document?p\\_table=STANDARDS&p\\_id=995](http://www.osha-slc.gov/pls/ednweb/ednweb.pl?show_document?p_table=STANDARDS&p_id=995)>

## I. Communication

Communication is essential to planning and implementing a successful vegetation management program. Proper communication should be open and interactive. It involves a formal, documented communication strategy for each phase of planning and implementation. The plan needs to entail more than just relating work instructions to vegetation crews. It should designate primary and secondary objectives and involve all stakeholders: management, other utility departments, planners, contractors, vegetation management crews, property owners, public land managers, appropriate governmental officials, members of organizations dedicated to related causes, and others.

#### Internal Communication

Communication within a utility's vegetation management department needs to be clear and concise to ensure everyone understands the desired results. Specifications and performance goals should delegate decision-making authority throughout the organization.

Communication among vegetation managers and workers ought to be both written and verbal. Written instruction should include the information needed to successfully complete a project, including specifications, policies and procedures, details about customers concerned, and locations of environmentally sensitive or archeological areas. Appropriate communication also involves post-work debriefings to review challenges and prevent problems from recurring.

Communication among utility decision makers, including executives, engineers, corporate communications, operations managers, vegetation management staff, and other utility departments should include why, where, when, and how IVM projects will be conducted. The discussion should emphasize the importance of the benefits of implementing IVM best practices. This is important because people within an organization but outside of the vegetation management department can help set priorities, anticipate and prevent potential problems, expand the communication network, and provide historical perspectives. Communicating with operations staff during work can also add a margin of safety. By knowing there is a vegetation management job underway, they may be able to respond more quickly to incidents and accidents than they would if they were unaware of the project.

Communication among utility vegetation managers, contract general foremen, supervisors, and workers should be both written and verbal. Written instructions ought to include the information needed to successfully

complete a project, including specifications, policies and procedures, details about known stakeholders, locations of environmentally or culturally sensitive areas, applicable laws and regulations, and any other considerations of consequence. Moreover, debriefings should be planned to review challenges and lessons learned for future projects.

#### Communication with External Stakeholders

Public land managers, property owners, regulators, interest groups, and other affected parties often have legitimate concerns in utility vegetation management activities. It is important to communicate with them about the need for, benefits of, and science behind IVM to clarify expectations. Members of the vegetation management team, including crew members, should know the facts about the program, and be prepared to answer basic questions and refer more complex issues through proper channels. Communication should begin well in advance of work and involve listening to and understanding people's specific concerns. Modifications may be implemented to address legitimate issues, and these secondary objectives may be achieved provided those changes do not sacrifice primary management objectives of safety, reliability, and access.

Affected property owners and known stakeholders should be notified of upcoming work. Notification can be electronic or by mail, public notice, door hanger, personal visit, or other manner. In some cases, the best approach uses a combination of methods. Notification should include a brief explanation of when work is planned, why it needs to be done, its general location, a description of the project (e.g., mowing, herbicide, manual or other method), potential crew types, crew numbers, and other information that might help people understand the job. If property owners cannot be met in person, electronic or written notices may be used that contain contact numbers for use by those who need more information. In most cases, notification can be a proactive effort that informs stakeholders of the benefits of an IVM program.

Work on governmentally-managed property can involve administrative procedures that take months of advance work, including navigating through permit processes and the concerns of specialists who have responsibility for stewardship over public lands. Vegetation managers should educate land specialists on how IVM helps balance stewardship considerations with the need for providing safe, reliable service.

## 2. Planning and Implementation

ANSI A300, Part 7 offers a systematic way of planning and implementing a vegetation management program. It is applicable to distribution as well as transmission projects and consists of six elements:

1. Set Objectives
2. Evaluate the Site
3. Define Action Thresholds
4. Evaluate and Select Control Methods
5. Implement Control Methods
6. Monitor Treatment and Quality Assurance

Decisions are required in setting objectives, defining action thresholds, and evaluating and selecting control methods. The process is cyclical (Figure 2), because managing dynamic systems is ongoing. Managers must have the flexibility to adjust their plans at each stage as new information becomes available and circumstances evolve.

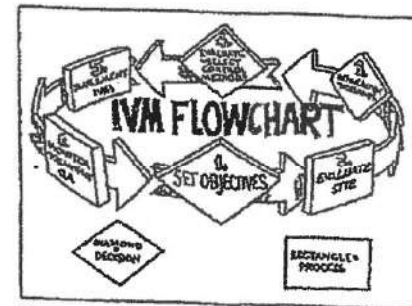


Figure 2. A300 Part 7 IVM flowchart.

### Set Objectives

Objectives should be clearly defined and documented by the vegetation manager and be based on the intended purpose and use of the site. They should be SMART: specific, measurable, attainable, realistic, and timely. It is best to establish objectives that are precise and explain exactly what needs to be done, who needs to do it, and where it needs to be done. The objectives are measurable so progress can be impartially determined. Unattainable or irrelevant goals are pointless, and timeliness requires deadlines to drive completion of the goal (Duran 1981).

Examples of objectives for electric utilities can include promoting safety, preventing outages caused by vegetation growing into transmission facilities and minimizing them from trees growing outside the right-of-way, maintaining regulatory compliance, protecting structures and security, restoring electric service during emergencies, maintaining access and clear lines of sight, protecting the environment, and facilitating cost effectiveness. Metrics should be applied to each goal. For instance, a dollar per mile or acre goal could be set for a particular control method's cost effectiveness.

Objectives for pipelines can involve safety, route identification, testing, encroachments, and maintenance and inspection, particularly aerial and ground patrol needed for leak detection. Route identification is particularly important for underground facilities, which are only identified by above-ground markers or valves, and measuring stations adjacent to the pipeline, which can be easily hidden by unmaintained vegetation that has become overgrown. On gas pipeline rights-of-way, it's often best to select smaller, lower-growing plant species that are typically more sensitive to gas than larger, taller-growing trees in order to facilitate early gas leak detection. Border zone (see *Wire-border Zone Concept*) species could be selected that do not interfere with access for inspection, maintenance, or cause root obstruction. Tree roots may interfere with underground pipelines by compromising the coating integrity of some lines (Stedman and Brockbank 2012). A comparison of electric and pipeline rights-of-way concerns is presented in Table 1.

Objectives should be based on site factors, such as vegetation type, in addition to human, equipment, and financial resources. Objectives will vary from utility to utility and project to project, depending on line voltage or pipeline capacity and criticality, as well as logistical, topographical, environmental, fiscal, social, and political considerations. However, where it is appropriate, the overriding focus should be on environmentally-sound, cost-effective control of species that could potentially conflict with the facility, while promoting compatible, early successional, sustainable, plant communities.

Table 1. Electric vs. pipeline rights-of-way concerns (adapted from Appelt and Garman 2004)

Electric rights-of-way	Pipeline rights-of-way
Electric right-of-way identification is obvious with lines and tall structures	Pipeline right-of-way identification for underground facilities is by markers, valves, and measuring stations that are easily obstructed by vegetation
Tree height under and to the side of lines, as well as distance to the side, affects safety and reliability	Trees block access and obstruct views
	Root intrusion (integrity of pipeline coating)

### Site Evaluations

Site evaluations are used to assess field conditions for planning purposes. Planning can range from establishing programmatic strategies to setting detailed, tactical operational requirements for individual projects. The data can be applied to establishing or modifying objectives, setting budgets, or determining human, material and equipment resource requirements. Careful preparation is needed to ensure that valuable time and resources are directed toward obtaining useful information, but not wasted collecting unnecessary details. Site evaluations can identify a variety of factors, including potential safety issues, applicable regulations, workload, line or pipe type, voltage and criticality, funding, labor and equipment resource availability, height of the wire from the ground, right-of-way width, land ownership and use, fire risk, vulnerable or protected areas, presence of species of concern, water resources, archaeological or cultural sites, topography, soils, and other matters.

Evaluations provide information on site characteristics that exist at the time an assessment is conducted. On dynamic systems such as those associated with IVM, information can quickly become out-of-date; meaning regularly-scheduled updates are required. Schedules should be based on anticipated vegetation growth, line design and construction, predominant species of vegetation, environmental factors, political considerations, budgetary parameters, and operational issues.

### Work Load Evaluations

Workload evaluations are inventories of vegetation that could have a bearing on management objectives. Depending on those objectives and available resources, utilities can either conduct comprehensive or point sample evaluations. Workload assessments can collect data on an array of vegetation characteristics, such as location, height, density, species, size, condition,

tree risk, and clearance from conductors. Evaluations should be conducted considering voltage, conductor sag from ambient temperatures and loading, and the potential influence of wind on line sway.

#### Comprehensive Evaluations

Comprehensive evaluations account for all vegetation that could potentially affect management objectives. Program level comprehensive evaluations can be made of all target vegetation on a system, while project level evaluations focus on vegetation relevant to a specific job. Comprehensive evaluations provide the advantage of supplying a complete set of data upon which to base management decisions. On the other hand, comprehensive surveys can be impractical for utilities with large numbers of trees, limited human and financial resources, or both.

#### Tree Risk Assessment

Utilities should conduct assessments to identify trees or tree parts that could fail and threaten their facilities. Large numbers of trees managed by utilities present challenges in tree risk assessment and risk mitigation. Utilities often manage hundreds of trees for each mile (1.6 km) of right-of-way. Given the constraints that resource limitations can impose, it is unreasonable to expect them to monitor every tree that could potentially conflict with utility facilities, identify all those with existing defects that pose an unacceptable level of risk, and proactively remedy the risks they present. Moreover, utilities may be hindered from reducing potential tree risks by property owner opposition. The only plausible course of action is for utilities to manage risk rather than eliminate it (UAA 2009).

Utilities should develop and implement plans for patrolling and inspecting trees that could affect their facilities on a regularly scheduled basis. Standard inspections cover the strike zone, and identify trees with obvious defects among those trees sufficiently tall to hit facilities should they fall. FAC-003 (NERC 2008) requires North American utilities to inspect designated lines annually<sup>2</sup>. Evaluations may be conducted by ground, air, or both. Aerial inspections may be made using light detection and ranging (LiDAR [UAA 2009]). These inspections serve as Level 1, or limited visual assessments. Level 1 assessments are conducted from a specified perspective to identify

<sup>2</sup> Lines 200 kV or greater or those designated by a planning coordinator as an element of an interconnection reliability operating limit or by the Western Electricity Coordinating Council (WECC) as an element of a path designated by or as an element of a WECC interconnection path (NERC 2008).

trees among a large population that have an imminent or probable likelihood of failure (Smiley, Matheny, and Lilly 2011).

If an initial level 1 assessment identifies a need for greater scrutiny, utilities may specify more detailed inspections or patrols, including a level 2, or basic assessment (Smiley, Matheny, and Lilly 2011). For utility application, a level 2 assessment is a detailed, 360-degree, ground-based, visual inspection of the above-ground portion of a tree and its surrounding site to identify structural defects that could affect utility facilities. For the sake of efficiency, level 1 and level 2 assessments can be conducted simultaneously for trees requiring additional scrutiny.

Trees that have been identified as posing an unacceptable level of risk require an abatement plan. Each utility should have a plan and procedure in place for assessing and addressing high-risk trees, which specifies responsibility for prescribing and executing the plan (UAA 2009). When trees that pose an imminent threat to subject transmission facilities are identified, FAC-003 (NERC 2008) requires transmission owners to notify the appropriate switching authority that vegetation is likely to cause an outage at any moment.

Utility arborists interested in more detailed tree risk assessment information are directed to the *Utility Best Management Practices Tree Risk Assessment and Abatement for Fire-prone States and Provinces in the Western Region of North America* (UAA 2009) and the International Society of Arboriculture's *Best Management Practices: Tree Risk Assessment* (Smiley, Matheny, and Lilly 2011).

#### Point Sample Evaluations

Point sampling offers an alternative for utilities for which comprehensive inventories are impractical. While point sampling is inappropriate for hazard tree mitigation, it is cost effective, and has a proven track record for reasonable accuracy for other types of workload evaluation. It can be used to project the total amount of work from a representative sample. A common method involves dividing a management area (a system or project) into equal-sized units and selecting a random sample sufficient to statistically represent the total work quantity. Random selection eliminates the chance of bias on the part of the investigator. Every plant or plant community of interest within each selected area is inventoried, with collected data used to forecast the total workload.

#### Define Action Thresholds

Vegetation managers shall define action thresholds that initiate implementation of control methods to achieve management objectives. Action thresholds

are vegetation height, density, location, or condition targets that trigger specific control methods. Since thresholds will vary from utility to utility and project to project, they should be set by a utility vegetation manager. Thresholds should be established in advance to meet objectives and be based on the results of site evaluations. A cycle based on an established period of time is often not an appropriate action threshold, because changes in growth rates, facility use, and land development will affect when vegetation needs to be controlled. Consequently, inspection and maintenance schedules should be based on existing vegetation, expected growth rates, past control methods, and action thresholds.

#### *Minimum Clearances*

Minimum clearance requirements may be established by regulatory oversight, or by individual utilities, to achieve management objectives. When establishing minimum clearances for energized conductors, practitioners must at least consider:

- the potential growth of vegetation
- the combined movement of vegetation and conductors in high wind
- sag of conductors due to elevated temperatures or icing

Vegetation managers must be aware that IVM requires a broader, more preventative approach than simply maintaining minimum clearances.

The objective of most IVM programs includes preventing the establishment of incompatible vegetation. Trees that have grown to the point where spark-over or an interruption to service is likely at any moment indicate a breakdown of the IVM program. Action thresholds in IVM are used to determine when incompatible vegetation control is necessary long before it has the potential to violate minimum clearance requirements or cause a service interruption. Using an IVM approach is both economically and environmentally sound because preventing establishment of incompatible vegetation is both less costly and less intrusive than removing or pruning large, established trees.

#### *Evaluate and Select Control Methods*

Control methods are the processes through which managers achieve objectives. The most suitable control methods are those that best achieve management objectives at a particular site. Many cases call for a combination of methods. Managers have a variety of controls from which to choose, including manual, mechanical, chemical (herbicide and tree growth regulators), biological, and cultural options. The ultimate objective is to maintain

a desirable plant community with available tools, emphasizing biological and ecological control.

#### *Manual Control Methods*

Manual methods are performed by workers using hand-carried tools, such as chain saws, handsaws, pruning shears, and other devices to control incompatible vegetation. The advantage of manual techniques is that they are selective and can be applied where others may not be appropriate. On the other hand, manual techniques can be inefficient, less safe, more intrusive, more expensive, and not as environmentally friendly as other methods.

#### *Mechanical Control Methods*

Mechanical controls are done using machines. They are efficient and cost effective, particularly for clearing dense vegetation during initial right-of-way establishment or for reclaiming neglected or overgrown rights-of-way. On the other hand, machines may have a greater negative environmental impact than other control methods. Mechanical control methods can be nonselective; destroy compatible vegetation; disturb sensitive areas such as wetlands, archeologically rich localities or developed areas; establish a seedbed for and dispersal of incompatible plants through ground agitation; and carry seasonal restrictions to prevent harm to nesting wildlife and the environment. Machines can leave behind petroleum products from normal operations,

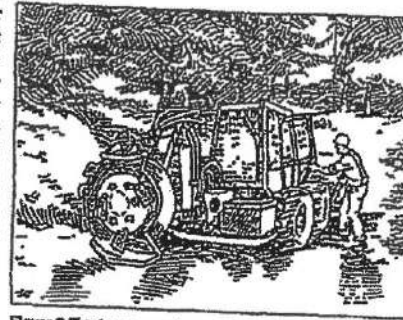


Figure 3. Tractor-mounted mower.

leaks, and spills. Furthermore, heavy equipment use can be risky to use on steep terrain, where it can be unstable and contribute to erosion. To safely achieve desired end results, machinery must be properly maintained and run by skilled equipment operators.

#### Machine Types

There are many machines that can be used for IVM. Machines efficiently remove undesirable vegetation on large-scale operations, such as initial right-of-way clearing or reclamation. Examples include:

- *Mowers* (Figures 3 and 4) not only remove and grind brush, but they can also fell small trees. Grinding and scattering improves aesthetics, facilitates debris decomposition, reduces fuel loads, and minimizes fire hazard. Appropriate timing and frequency can affect plant community development.

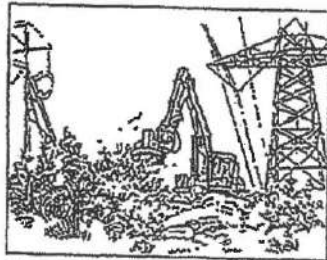


Figure 4. Excavator-mounted mower.

- *Shears* are whole tree removal devices mounted on heavy equipment. Shears can fell, lift, and stack trees (Figure 5).



Figure 5. Felling-buncher.

- *Mechanized pruning* can be done with all-terrain vehicles equipped with an extendable boom (commonly 75 ft or 25 m) that can extend a circular saw blade (Figure 6). It can also be done with an array of blades slung beneath a helicopter. These devices can prune trees quickly and efficiently. However, it can be difficult to be precise with mechanized pruning equipment. Wounds that result are inappropriate for landscape or high-value trees. Consequently, mechanical pruning equipment use should be limited to rural or remote areas.



Figure 6. Mechanical pruner.



Figure 7. Off-road aerial lift.

- *Aerial lifts* can provide production efficiencies and safety. They can be mounted on a variety of chassis, from trucks to all-terrain vehicles, which can work off road (Figure 7).

#### Chemical Control Methods

Chemicals must be applied by qualified applicators according to label directions. Applicators are not only required to read and comply with label instructions, but also all other laws and regulations pertaining to chemical use. Label instructions for personal protective equipment (PPE) are particularly important. Most commonly used herbicide formulations only require long-sleeved shirts, long pants, and shoes and socks. Some formulations require resistant gloves and protective eye wear. Preference should be given to using chemicals that minimize risk to humans and the environment. Emphasis shall also be given to techniques that reduce the amount of material applied over time.

#### Tree Growth Regulators

Tree growth regulators (TGRs) are substances designed to reduce growth rates by interfering with natural plant processes. By slowing growth rates of some fast-growing species, TGRs can be helpful where removals or cover type conversion are prohibited or impractical, such as in urban forest applications. TGRs have not been demonstrated to be economically effective on large-scale, rural transmission facilities; however, they have proven useful in specific locations, primarily on distribution lines.

### Herbicides

Herbicides control plants by interfering with specific botanical biochemical pathways. There are a variety of herbicides, each of which affect plants in different ways and behave variously in the environment, depending on the formulation and characteristics of the active ingredient. While appropriate herbicide use reduces the need for future intervention, misused herbicides can carry environmental risks due to drift, leaching, and volatilization.

When properly applied, herbicides are effective and efficient, while minimizing soil disturbance and enhancing plant and wildlife diversity. Herbicide application can benefit wildlife by improving forage as well as escape and nesting cover. In some instances, noxious weed control is a desirable objective on utility rights-of-way that can be satisfied through herbicide treatment.

Herbicide use can control individual plants that are prone to re-sprout or sucker after removal. When trees that re-sprout or sucker are removed without herbicide treatment, dense thickets develop—impeding access, swelling workloads, increasing costs, blocking lines-of-site, and degrading wildlife habitat (Figure 3). Treating suckering plants allows compatible early successional species to dominate the right-of-way and out-compete incompatible species, ultimately reducing work.

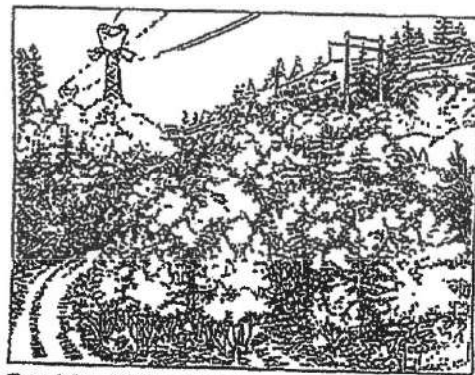


Figure 2. Sprouting from cut stumps.

### Closed Chain of Custody

Traditionally, herbicides have been supplied in concentrated forms in non-reusable containers. This requires handling open containers of concentrate on job sites for mixing and loading. Advances in chemistry and application methods have significantly reduced the volume of herbicide solutions applied. These advances have made it practical to adopt a closed chain of custody concept in which ready-to-use and diluted concentrate formulations are utilized in closed delivery systems (Figure 5)—a practice that further protects the applicator and environment (Goodfellow and Holt 2011).

The closed chain of custody concept includes herbicide shipping, distribution, storage, and mixing, and includes returning empty containers for refilling and reuse. It involves four cycles (Goodfellow and Holt 2011):

- **Container cycle:** supply containers are returned, refilled, and reused
- **Integrity cycle:** closed connections at the transfer points between supply containers, mix tank, and application equipment
- **Documentation cycle:** a container tracking system that establishes an auditable record documenting movement of herbicides and containers
- **Herbicide cycle:** use of customer blends containing the required active ingredient and adjuvants

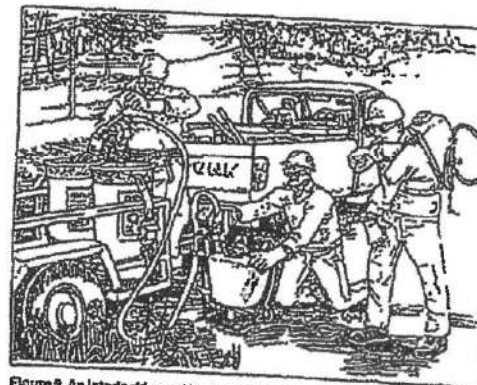


Figure 3. An interlocking unit connection between fill hose and backpack is preferred.

The Utility Arborist Association (UAA) and ISA have produced best management practices for closed chain of custody for herbicides in the utility vegetation management industry (Goodfellow and Holr 2011). Readers are encouraged to consult these best practices for further information on the subject.

#### Selectivity

Herbicides can be selective or nonselective depending on their type. Selective herbicides only control specific kinds of plants when applied according to the label. For example, synthetic auxins are a class of selective herbicides that control broadleaved plants, but do not harm grass species. By contrast, nonselective herbicides work on both broadleaved plants and grasses.

Application techniques can be either selective or nonselective. Selective applications are used against specific plants or pockets of plants. Nonselective techniques target areas rather than individual plants (see *Herbicide Application Methods*). Nonselective use of nonselective herbicides eliminates all plants in the application area. Nonselective use of a selective herbicide controls treated plants that are sensitive to the herbicide, without affecting plants with low sensitivity. Selective use of either would only control targeted vegetation. Selective use is preferable unless target vegetation density is high.

#### Herbicide Application Methods

Herbicide application methods are categorized by the quantity of herbicide used, the character of the target, vegetation density, and site parameters. Dyes can be used in the herbicide mix to mark areas that have been treated. Application methods include individual stem, broadcast, and aerial treatments.

#### Individual Stem Treatment

Individual stem treatments are selective applications. They include stump, basal, injection, fill (hack and squirt), selective foliar, and side-pruning applications (Table 2). Because they are applied selectively, proper individual

Table 2. Herbicide treatment methods.

Individual Stem	Broadcast	Aerial
Stump	High volume foliar	Fixed wing
Basal	Low volume foliar	Rotary wing
Injection	Cut stubble	
Fill	Bar ground	
Selective foliar (low and high volumes)		
Sidepruning		

stem applications work well to avoid damage to sensitive or off target plants. However, this treatment is impractical for large areas or for sites dominated by undesirable species.

Stump applications are a common individual stem treatment in which herbicides are applied to the cut stump surface around the cambium and top side of the bark (Figure 10).

Water-based formulations require immediate stump treatment, while vegetable oil-based herbicides can be put on hours, days, or even weeks after cutting.

Injection involves injecting herbicide into a tree, while fill treatments consist of herbicide application into wounds made in the trunk. Injections or fill treatments are especially useful against large incompatible trees to be left standing for wildlife.

Basal applications often use an herbicide in a vegetable oil carrier applied to the base and encircling stems and the root collars (Figure 11). The vegetable oil penetrates the bark, carrying the herbicide into the plant. Although basal applications can be made year round, dormant treatment is often best on deciduous



Figure 10. Stump treatments are a common individual stem treatment where herbicides are applied to the cut stump surface around the cambium and top side of the bark.



Figure 11. Basal application

plants, when they do not have foliage that can obstruct access to individual stems and are not covered by snow or ice.

Selective foliar applications are done by spraying foliage and shoots of specific target plants (Figure 12). They can be either low or high volume treat-

ments. For low volume applications, comparatively high concentrations of herbicide active ingredient are made in lower volumes of water than would be used with high volume treatment. Foliar applications are only made during the active growing season, normally late spring to early fall.

Chemical side pruning is a technique where non-translocatable herbicides are applied to foliage of specific branches growing toward the electric facility, causing them to defoliate and eventually be shed by the tree.

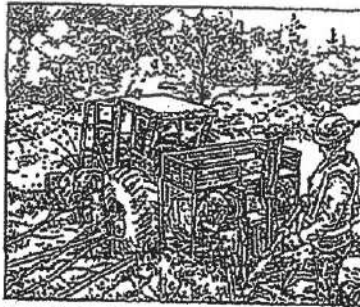


Figure 12. Selective foliar application.

#### Broadcast Treatment

Broadcast treatments are nonselective because they control all plants sensitive to a particular herbicide in a treatment area. They can provide a degree of selectivity if used with selective herbicides. Even then, broadcast treatments do not differentiate between compatible and incompatible plants that the herbicide controls. Broadcasting is particularly useful to control large infestations of incompatible vegetation (including invasive species) in rights-of-way or along access roads.

Broadcast techniques include high- or low-volume foliar, cut-stubble, and bare-ground applications. High-volume foliar applications are similar to high-volume selective foliar applications. The difference is that broadcast high-volume foliar treatments target a broad area of incompatible species rather than individual plants or pockets of plants. Low-volume foliar treatments are applied similarly, but with specialized nozzles and thin inversion formulations that minimize volume and spray drift.

Cut-stubble applications are made (using either high- or low-volume broadcast treatments) over areas that have just been mowed. Bare-ground treatments are used for clearing all plant material in a prescribed area, such as in substations or around poles, to protect against fire. Bare-ground applications are usually granular or liquid applications following mechanical removal of vegetation, or used as a pre-emergent in maintaining gravelled areas, such as substation enclosures.

#### Aerial Treatments

Aerial treatments are made by helicopter (rotary wing) or small airplanes (fixed wing). Rotary wing aircraft provide the most accuracy, because helicopters can hover, are more maneuverable, and can fly more slowly than airplanes. However, airplanes are less expensive to operate than helicopters. Aerial control methods are nonselective, but may provide a level of selectivity if used with proper herbicides. Aerial applications can be useful in remote or difficult-to-access sites, and can be quick and cost effective, especially if large areas need to be treated. They can also be used where incompatible vegetation dominates a right-of-way or vegetation height limits ground-based treatments. The primary disadvantage of aerial application is that it carries the threat of off-target drift. To limit drift, work must be performed under low-wind conditions with specialized nozzles and formulations.

#### Biological Control Methods

Biological control is management of vegetation by establishing and conserving compatible, stable plant communities, using plant competition, animals, insects, or pathogens. For example, some plants, including certain grasses, release chemicals that suppress other plant species growing around them. Known as allelopathy, this characteristic can serve as a type of biological control against incompatible species. Promoting wildlife populations is also a form of biological control. Birds, rodents, and other animals can encourage compatible plant communities by eating seeds or shoots of undesirable plants.

A biological control known as cover-type conversion provides a competitive advantage to short-growing, early successional plants, allowing them to thrive and successfully compete against unwanted tree species for sunlight, essential elements, and water. Early successional plant communities are relatively stable and tree-resistant. This control method reduces the amount of work, including herbicide application, with each successive treatment. While it is a type of biological control, cover-type conversion may require the use of one or more other control methods—such as manual, mechanical, herbicide, or cultural—depending on conditions.

Tree-resistant communities are often created in two stages. The first involves nonselectively clearing the right-of-way of undesirable trees using the best applicable control method or combination of methods. The second stage involves developing a tree-resistant plant community using selective techniques, including herbicide applications, that opens an area to sunlight and encourages an often long-dormant seed reservoir of compatible species to germinate. In the long run, this type of biological control is the most desirable method, at least where it can be done effectively.

#### *Cultural Control Methods*

Cultural methods modify habitat to discourage incompatible vegetation and establish and manage desirable, early successional, and other compatible plant communities. Examples of cultural control include seeding, planting low-growing crops, and establishing pastures, prairies, compatible landscapes, and other managed areas. Fertilization and irrigation are techniques that may be used to help establish low-growing, compatible plant communities.

#### *Engineering Solutions*

While they are not vegetation control methods, engineering solutions can provide relief from vegetation-power line conflicts. They can include relocating, reconstructing, or burying lines. The disadvantage of engineering solutions is that they are often unaffordable for adjacent property owners or not cost-effective for utilities and their ratepayers. They can also have detrimental environmental impacts if inappropriately applied (Goodfellow 1995).

#### *Wire-Border Zone Concept*

The wire-border zone concept is a management philosophy that can be applied through cultural control. W.C. Bramble and W.R. Byrnes developed the concept in the mid-1980s out of research begun in 1952 on a transmission right-of-way in the Pennsylvania State Game Lands 33 Research and Demonstration project (Yahner and Humick 2004).

The wire zone is the section of a utility transmission right-of-way under the wires and extending on both sides to a specified distance (Bramble, Yahner and Byrnes 1992). The standard way to establish the wire zone is by a set measure (e.g., 10 ft [3 m] or another length) on each side of the wires. Goodfellow (2013) suggests demarcating the wire zone under the wires at a distance equal to 60% of phase-to-phase spacing on the border side of the outside conductors. The wire zone is managed to promote a low-growing plant community dominated by grasses, herbs, and small shrubs (e.g., under 3 ft [1 m] in height at maturity).

The border zone is the remainder of the right-of-way (Figure 13). It is managed to establish small trees and tall shrubs (under 25 ft [7.5 m] in height at maturity). The concept may be modified to accommodate side slope (Figure 14). When properly managed, diverse, tree-resistant plant communities develop in wire and border zones. These plant communities not only protect the electric facility and reduce long-term maintenance, but also enhance wildlife habitat, forest ecology, and aesthetic values.

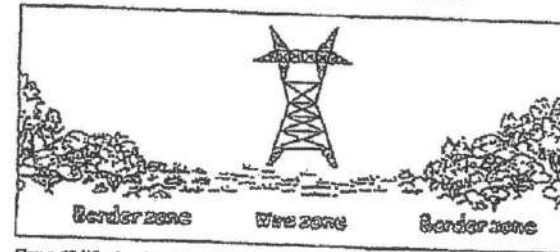


Figure 13. Wire-border zone.

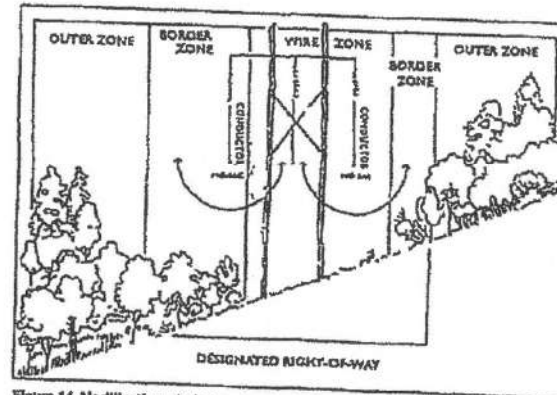


Figure 14. Modification of wire-border zone for side slopes.

Although the wire-border zone concept is a best practice in many instances, it is not necessarily universally suitable. For example, standard wire-border zone prescriptions may be unnecessary where lines are high off the ground, such as across low valleys or canyons. One way to accommodate topography changes is to vary zones based on wire height. For example, vertical zones could be established over low valleys, or canyon bottoms, or other areas where conductors are high above the ground (e.g., 100 ft [30 m]), or height managers deem appropriate for a specific region, where only a few trees are likely to be tall enough to conflict with the lines (Figure 15). In those instances, trees that potentially interfere with transmission lines can be removed selectively on a case-by-case basis. In areas where the wire is lower, perhaps between 50-100 ft (15-30 m) over the ground, a border zone community could be developed throughout the right-of-way. Where the line is lower, less than 50 ft (15 m) off the ground, for example, managers could apply a full wire-border zone prescription. These modifications have many advantages. Removing fewer trees in valleys and canyons has environmental benefits. Streams often course through the valleys and canyons where lines are likely to be elevated. Leaving timber or border zone communities in valley and canyon bottoms helps shelter this valuable riparian habitat (see *Stream Protection*). It also has economic benefits, as unnecessarily removing trees is a waste of money.

Strict adherence to wire-border zone methodology may also be inappropriate in some fire protection jurisdictions, where border zone establishment is often discouraged out of concern it could provide ladder fuels to the adjacent forest. In these and other cases, management objectives could call for a perennial meadow or prairie plant community throughout the right-of-way. Meadows and

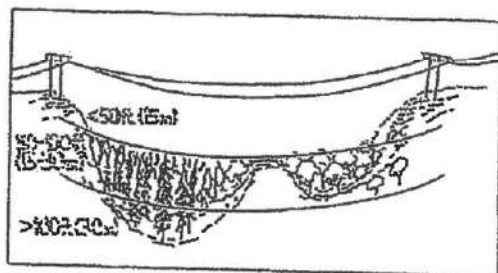


Figure 15. Wire-border zone for elevation of wire off ground.

prairies are legitimate, tree-resistant plant communities that can be established through IVM. The wire-border zone concept is a useful tool in situations where it meets management objectives as determined by utility vegetation managers.

#### Pipe zone-border zone

The wire-border zone concept can be modified to meet IVM objectives on many pipeline rights-of-way (Figure 16). The height and type of vegetation should meet management objectives. Over the pipe zone, native prairie forbs and grasses may be encouraged. Dense, low-growing, gas-sensitive, green cover could also be introduced into the pipe zone if desired. Taller-growing, compatible vegetation can be managed on the edges of the pipeline right-of-way, where it will not interfere with maintenance or pipe integrity. If prairie or other grasses are so tall that they interfere with testing or maintenance, a narrow path directly over the pipe can be mowed, without disturbing the remainder of

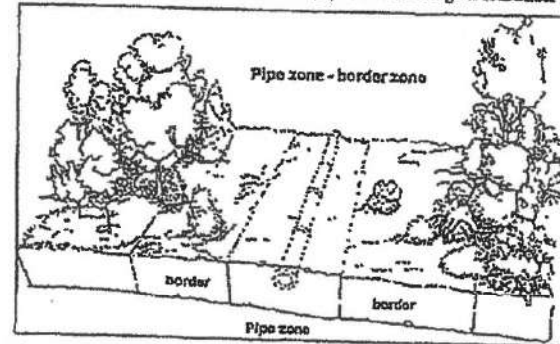


Figure 16. Pipe-border zone.

the right-of-way. This would result in the need for periodic strip-mowing, with low economic and environmental costs and greater benefits for certain wildlife species (Stedman and Brockbank 2012, Johnstone 2012).

#### Implement Control Methods

All laws and regulations governing IVM practices and specifications written by utility vegetation managers must be followed. Integrated vegetation manage-

ment control methods should be implemented on regular work schedules, which are based on established objectives and completed assessments. Work should progress systematically, using control measures determined to be best for varying conditions at specific locations along a right-of-way. Some considerations used in developing schedules include the importance and type of line, vegetation clearances, workloads, growth rate of predominant vegetation, geography, accessibility, and in some cases, time elapsed since the last scheduled work.

#### *Initial Clearing and Reclamation*

Initial clearing of new and reclaiming of neglected rights-of-way requires nonselective techniques, at least in areas dominated by incompatible vegetation. Subsequent projects on those rights-of-way can selectively target incompatible plants, working toward cover-type conversion.

#### *Clearances*

The system operator should establish and document appropriate clearance distances or vegetation heights to be achieved at the time of work. A utility vegetation manager should determine appropriate vegetation conditions, including clearances, throughout the system. Following work, vegetation on the right-of-way should consist of a height and species mix that meets management objectives, including reducing electric and gas safety and service-reliability threats, protecting the environment, and controlling costs. Achieving mandated minimum vegetation clearance distances (such as the minimum vegetation clearance distance [MVCD] in FAC-003 [NERC 2008]), while technically in compliance with regulations, is not in and of itself a best management practice. Nor should it be used as a limitation for managing vegetation on a right-of-way, or evaluating the efficacy of IVM operations. Doing so would allow the establishment of incompatible trees on the right-of-way, which would require periodic topping or severe pruning. In addition to creating unacceptable ongoing risk to facilities, tree maintenance operations can unnecessarily place workers at risk. Managers should bear in mind that clearances are just one objective out of many. The best practice is to remove incompatible trees, encourage compatible vegetation, and ensure—through ongoing monitoring and maintenance—that trees do not become established in these areas or have opportunities to violate minimum clearance requirements.

#### *Debris Disposal*

Debris such as logs and slash that result from IVM operations should be handled in a manner compatible with adjoining land use, terrain, aesthetics, wildlife habitat, and fire risk. Logs may be recoverable for firewood or

timber products, and are often best left for the property owner or as wildlife habitat. Slash can be placed into piles, windrowed along rights-of-way edges, or lopped and scattered. Some jurisdictions may limit the height and length of slash piles. Neither slash nor logs should be placed below the high water mark of streams or other bodies of water, unless requested by a competent authority. Logs should not be moved from the work site if they are likely to be infested with an epidemic-causing disease or insect pest. Where appropriate (e.g., in remote areas or in wildlife management areas), dead standing timber that cannot strike the line or violate mandated minimum clearance requirements can be left as wildlife habitat.

#### *Monitor Treatment and Quality Assurance*

An effective IVM program must have documented processes to evaluate results. Evaluations can involve quality assurance while work is underway and after it is completed. Monitoring for quality assurance should begin shortly after work begins to correct any possible miscommunication or misunderstanding on the part of crew members. Early and consistent observation and evaluation also provides an opportunity to modify the plan, if necessary, in time for a successful outcome.

Utility vegetation management programs should have systems and procedures in place for documenting and verifying that vegetation management work was completed to specifications. Post-control reviews can be comprehensive or based on a statistically representative sample. The results should be compared to objectives, referencing the baseline surveys completed earlier in the planning process. A review of environmental, customer, archeological, or other outcomes may also be necessary, along with property owner and stakeholder surveys. This final review can identify additional work to be completed or highlight opportunities for improved management. The first step in the IVM process of planning and setting objectives then begins again (Figure 2).

#### *Record Keeping*

Records are necessary for quality assurance and future planning. The type of information needed is best determined by the utility vegetation manager. Relevant data commonly includes details on land ownership, the date of pre-notification, and access routes. Records should be digitized and reflect dates of communication, names of stakeholders, and the nature of discussions with them, including any commitments. Records should also be maintained on the type and voltage of line or pipeline capacity, along with work dates,

methods, and location. Where appropriate, records should be maintained on threatened and endangered species and other considerations.

Herbicide records are required by law. Applicators should identify themselves, note the herbicide trade name, the active ingredient, and in the United States, the EPA number. Applicators also need to track the amount of herbicide applied, the location of the application, weather conditions at the time of treatment, how many trees or acres were treated, and other relevant factors.

### 3. IVM Application

#### Environmental Protection

##### *Species of Concern*

Vegetation management should not disturb or harm species of concern (i.e., rare, threatened, endangered, or otherwise protected species). Utility vegetation managers need to obey appropriate guidelines and regulations. Often, simple adjustments can be made to protect sensitive species without compromising desired outcomes.

##### *Wetlands*

Wetlands should be worked using suitable control methods. If herbicides are to be applied, only those labeled for use over water may be used in wetlands.

##### *Stream Protection*

To protect streams, incompatible vegetation may need to be selectively pruned or removed, or treated with appropriate herbicide to gradually establish a compatible riparian plant community. Equipment may only use existing or designated stream crossings.

##### *Buffers*

Stream crossings of right-of-way corridors, surface water supply reservoirs, and drinking water wells and springs need to be protected by buffers. Buffers should retain as much compatible vegetation as possible. If herbicides are needed within the buffer, only those appropriate for the site should be applied. Machine work should be avoided in buffers as equipment may leak or spill petroleum products, causing pollution or erosion. Utility vegetation managers, working along with competent authorities, should determine appropriate distances for particular buffers.

##### *Archeological or Cultural Sites*

Vegetation management activities should not disturb known archeological or cultural sites. When necessary, archeological sites should be located and marked, and a plan established to adequately protect them during work. Field data inventories of known sites should be kept on file. Practices that won't damage the sites, such as manual cutting and backpack or aerial herbicide applications, should be considered for use at these locations.

#### 4. Tree Pruning and Removal

Pruning for clearance of trees within pipeline and electric transmission rights-of-way is generally inconsistent with IVM management objectives. However, it may be necessary in rare cases involving legal restrictions. Electric distribution lines are often maintained with pruning as a part of an overall IVM strategy. When pruning is necessary, it should be conducted according to the most current version of the ANSI A300, Part 1: *Tree, Shrub, and Other Plant Management—Standard Practices (Pruning)* and ISA's *Best Management Practices: Utility Pruning of Trees* (Kempter 2004). Structurally unsound or dead trees located off the right-of-way in remote areas may be left for wildlife by reducing them in height so they will no longer strike the electric facility should they fall.

#### 5. Summary

Integrated vegetation management—as presented in ANSI A300 Part 7 (ANSI 2012), and when implemented according to principles established by the work of peer-reviewed researchers, long-standing demonstration projects, and successful utility programs—offers a systematic way of planning and implementing a comprehensive, cost-effective, environmentally-sound vegetation management program that meets primary utility objectives and addresses legitimate stakeholder concerns. It consists of six elements:

1. Set Objectives
2. Evaluate the Site
3. Define Action Thresholds
4. Evaluate and Select Control Methods
5. Implement Control Methods
6. Monitor Treatment and Quality Assurance

Managers should select control options to best promote management objectives. Tree-resistant plant communities can be a desirable objective to reduce long-term workloads and costs because, once established, they out-compete incompatible plants. When effectively applied, IVM is a systematic, preventive strategy that results in site-specific treatments to meet management objectives. A sound program includes documented processes to evaluate results, which should involve both monitoring for quality assurance while work is underway and after it is completed. However, the overriding focus should be on environmentally-sound, cost-effective control of species that potentially conflict with the electric facility, while promoting compatible, early successional, sustainable plant communities.

## 6. Glossary

**abatement plan**—a process for reducing vegetation risk.

**action thresholds**—a point at which the level of incompatible plant species, density, height, location, or condition threatens the stated management objectives and requires implementation of a control method(s).

**allelopathy**—the production of chemicals by one plant species that can suppress or kill other species.

**ANSI A300**—the *American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices*. American national arboricultural consensus standard series for tree care operations.

**biological methods**—management of vegetation by establishment and conservation of compatible, stable plant communities using plant competition, allelopathy, animals, insects, or pathogens. Cover-type conversion is a type of biological control.

**best management practices**—in the context of utility vegetation management, a best management practice is the most effective, safe, economical, and environmentally sound procedure or procedures for maintaining utility rights-of-way. *Best Management Practices* is also the title of a series of booklets produced and published by the International Society of Arboriculture, which serve as companion documents to the ANSI A300 series.

**border zone**—a section of a transmission or pipeline right-of-way that extends from the wire or pipe zone to the right-of-way edge. The border zone is managed to promote a low-growing plant community of forbs, tall shrubs, and low-growing trees below a specified height (e.g., 25 ft or 7.5 m).

**brush**—standing woody stems (live or dead) less than 4 in (10 cm) in diameter at breast height (4.5 ft [1.35 m]).

**bulk transmission**—see *transmission lines*.

**chemical control methods**—management of incompatible vegetation through the use of herbicides or growth regulators.

**closed chain of custody**—an end-to-end process of documented ownership for herbicides, adjuvants, and containers from manufacturer through application, and the return of returnable, reusable containers to a customer blender for refilling and reuse (Goodfellow and Holt 2011).

**compatible vegetation**—vegetation that is desirable or consistent with the intended use of the site. For example, plant species that will never grow sufficiently close to violate minimum clearance distances with electric conductors.

**cover-type conversion**—a type of biological control where a stable, tree-resistant plant community is developed using selective techniques that opens an area to sunlight and encourages desirable plants to out-compete undesirable vegetation in a right-of-way.

**cultural methods**—management of vegetation through alternative use of the right-of-way that precludes growth of incompatible vegetation through establishment of crops, pastures, prairies, parks, successful cover-type conversion, or other managed landscape.

**debris**—material such as slash, logs, or chips left after right-of-way clearing or maintenance operations.

**distribution lines**—high voltage lines generally energized between 4kV and 22kV, but can range from 600v to 35kV. Distribution lines usually serve commercial and residential customers.

**early-successional plant communities**—plant communities that first develop following disturbance. Succession is the replacement of one plant community by another. Cover-type conversion in a utility context inhibits successional progress past an early stage.

**frilling**—a method of herbicide application where tools are used to remove the bark of target woody plants, and herbicide is applied to the wound.

**hack and squirt**—see *frilling*.

**hazard tree**—a tree that has been assessed and found to be likely to fall and cause an unacceptable degree of injury, damage, or disruption. Hazard trees pose a high or extreme risk (Smiley, Matheeny and Lilly 2011).

**herbicide**—a pesticide used to kill, slow, or suppress plant growth by interfering with botanical pathways.

**imminent threat**—a vegetation condition that could cause damage or interruption of service to overhead energized facilities or pipelines at any moment.

**incompatible vegetation**—vegetation that is undesirable, unsafe, or interferes with the intended use of the site.

**integrated pest management (IPM)**—an ecologically-based strategy for long-term damage prevention caused by pests using a combination of techniques such as biological, cultural, chemical, and genetic control.

**integrated vegetation management (IVM)**—a system of managing plant communities based in IPM, where managers identify compatible and incompatible vegetation, consider action thresholds, evaluate control methods, and select and implement controls to achieve specific objectives. The choice of control methods is based on the anticipated effectiveness, environmental impact, site characteristics, safety, security, economics, and other factors.

**ISA**—International Society of Arboriculture.

**kV**—1000 volts.

**level 1 or limited visual tree risk assessment**—periodic, visual assessment of trees within the strike zone, in order to identify obvious defects that could cause a tree or tree part to fall directly on an overhead high-voltage conductor. Level 1 assessments are conducted from a specified perspective such as foot, vehicle, or aerial patrol to identify a tree or trees among a population that have an imminent or probable likelihood of failure (Smiley, Matheny and Lilly 2011).

**level 2 or basic tree risk assessment**—detailed visual inspection of a tree and surrounding site that may include the use of simple tools. It requires that a tree risk assessor walk completely around the tree trunk looking at the site, aboveground roots, trunk, and branches (Smiley, Matheny and Lilly 2011).

**line**—a distribution or transmission electric facility including wire, poles, and attachments.

**logs**—woody stems greater than 6 in (15 cm) in diameter that result from tree or large branch removal.

**low-growing plant community**—a population of plants that have a low mature height (e.g., 3 ft [1 m] or less). Examples include grasses, shrubs, forbs, and herbs. Low-growing plant communities can often effectively compete with trees and tall-growing shrubs for sunlight, essential elements, and moisture. Once established, low-growing plant communities are relatively self-sustaining and can be maintained with a minimum of intervention.

**maintenance cycle**—planned length of time that must be maintained between vegetation management activities.

**manual methods**—vegetation cutting or removal using tools carried by hand.

**mechanical methods**—vegetation removal using machines such as mowers, rubber-tire or tracked tractors, or excavators.

**minimum vegetation clearance distance (MVCD)**—a calculated minimum distance stated in feet (or meters) to prevent spark-over, for various altitudes and operating voltages, that is used in the design of transmission facilities. Keeping vegetation from entering this space will prevent transmission outages.

**National Electrical Safety Code® (NESC)**—a standard in the United States covering basic provisions for safeguarding persons from hazards resulting from installation, operation, or maintenance of conductors and equipment in electric supply stations, overhead and underground electric supply, and communication lines. It also contains work rules for construction, maintenance and operations of electric supply, and communication lines and equipment.

**nonselective management**—method of controlling vegetation without regard to whether or not the vegetation is desirable or undesirable.

**pipe zone-border zone**—an adaptation of the wire-border zone concept for pipeline rights-of-way. The pipe zone is an inspection area corresponding to the wire zone and is comprised of low-growing species (Stedman and Brockbank 2012).

**right-of-way**—a corridor of land used for a specific purpose such as an electric transmission or pipe line. (plural: rights-of-way.)

**right-of-way reclamation**—establishing IVM on a right-of-way that has not been managed to the full extent of its easement or ownership rights and intended purpose. Reclamation usually involves initial nonselective control techniques.

**risk**—the combination of the likelihood of an event and the severity of the potential consequences. In the context of IVM, risk is the likelihood of trees, tree parts, or other vegetation falling onto—or growing into—utility facilities, causing damage and/or interrupting utility services, combined with the severity of the potential consequences.

**selective management**—methods used to target undesirable vegetation while retaining desirable vegetation.

**slash-non-standing debris** less than 6 in (15 cm) in diameter left after right-of-way clearing operations.

**spark-over**—a luminous discharge of electricity through a gap between two conductive objects (e.g., a power line and a tree).

**specification**—in the context of IVM, a document containing detailed, measurable plans and requirements needed for an effective vegetation management program. Must be written by a utility vegetation manager.

stakeholder—a person or group that has a legitimate interest in a project or organization.

strike zone—360-degree area around a tree equal to that tree's height. Constitutes a space upon which a tree could fall if it failed.

subtransmission lines—high-voltage lines generally energized between 69 and 161 kV. They can be as low as 35 kV. Subtransmission lines connect bulk transmission substations to industrial customers or distribution substations.

transmission lines—high voltage lines that are critical to regional electric reliability. They are generally energized between 230 kV and 765 kV, although some transmission lines are energized as low as 69 kV. Transmission lines connect generation and bulk transmission substations.

transmission grid—interconnection of transmission lines used to deliver electricity from power plants to transmission substations or to transfer electricity to other utilities or regions.

tree growth regulator (TGR)—chemical that can be applied to trees that slows terminal growth by reducing cell elongation.

utility vegetation manager—a professional with the proper experience, education, and training to successfully establish or supervise an integrated vegetation management program.

wetland—land where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities living in and on the soil.

windrow—in the context of utility vegetation management, slash or debris raked or stacked in a row to the side of a right-of-way. The term evokes a row of hay raked up to dry before being rolled or baled.

wire zone—section of a utility transmission right-of-way directly under the wires, and extending to a utility specified distance (e.g., 60% of phase spacing, 10 ft or 3 m) on each side. The wire zone is typically managed to sustain a low-growing forb, grass, herb, and shrub plant community.

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### About the Author

Randall H. Miller is Director of Vegetation Management at PacifiCorp. He is currently Chair Elect of the TREE Fund Board of Trustees. He has served as President of the Utility Arborist Association, on the Editorial Board of the *Journal of Arboriculture & Urban Forestry*, the International Society of Arboriculture's Certification Test Committee, as Chair of the Edison Electric Institute Vegetation Management Task Force, President of the Oregon Urban and Community Forest Council and as a member of Utah Community Forest Council Board.

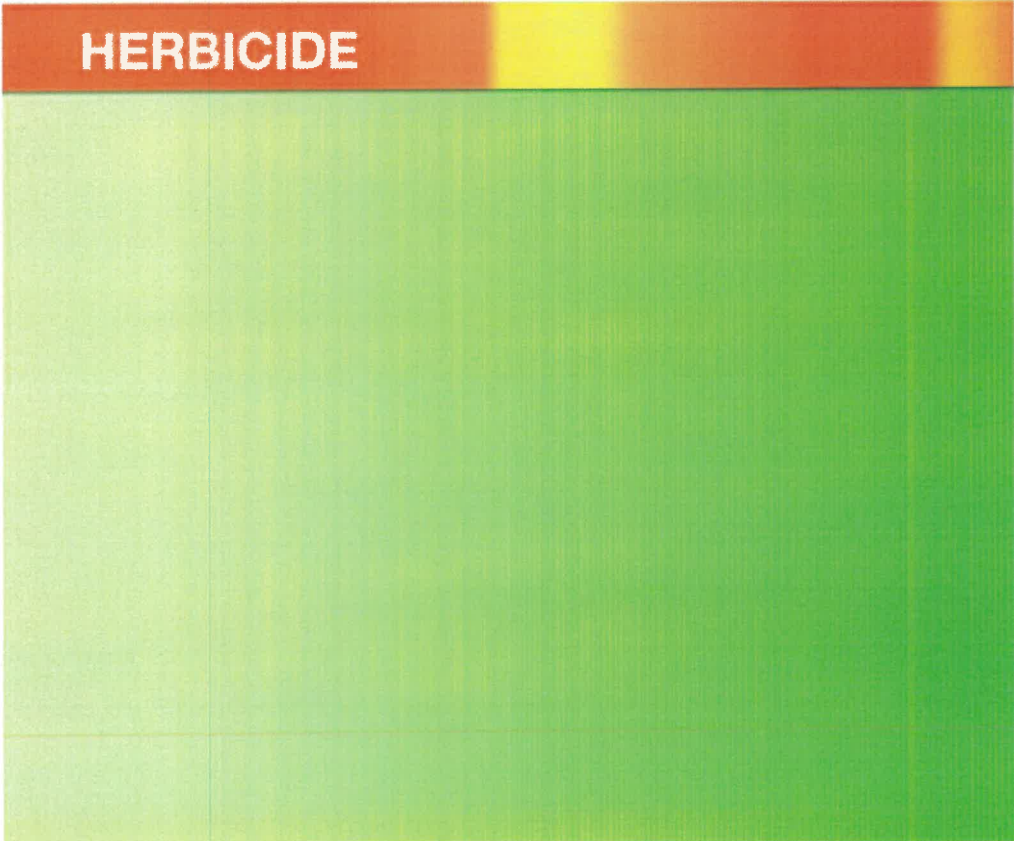
He joined PacifiCorp in 1993, and has been their System Forester since 1999. He earned his bachelor's degree in horticulture from the University of Wisconsin-Madison and master's degree in urban forestry from the University of Wisconsin-Stevens Point. He is an ISA Certified Arborist<sup>®</sup> and an ISA Certified Arborist Utility Specialist<sup>™</sup>. He received the 2001 ISA Pacific Northwest Chapter Utility Arborist Award, the 2005 ISA R.W. Harris Author's Citation, the 2007 Utility Arborist Association President's Award, the 2007 ISA Pacific Northwest Chapter President's Award, and the 2008 Utah Chapter Distinguished Service Award. He has over 60 arboricultural-related writing credits to date.



METSULFURON-METHYL GROUP 2 HERBICIDE



Escort<sup>®</sup>  
XP



Dry Flowable	
Active Ingredient	By Weight
Metsulfuron methyl	
Methyl 2-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate	60%
Other Ingredients	40%
<b>TOTAL</b>	<b>100%</b>
EPA Reg. No. 432-1549	

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)  
See Panel for First Aid Instructions and Booklet for Complete Precautionary Statements and Directions for Use.

**FIRST AID**

**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-334-7577 for emergency medical treatment information.

Nonrefillable Container  
Net Weight  
**1 Pound**  
**85798669**  
85796941C 210224AV1

Produced for:  
Bayer Environmental Science  
A Division of Bayer CropScience LP  
5000 CentreGreen Way, Suite 400  
Cary, NC 27513



## PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**CAUTION!** Causes eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or spray mist.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants.
- Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### USER SAFETY RECOMMENDATIONS

**USERS SHOULD:** Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

### ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.

This herbicide is injurious to plants at extremely low concentrations. Nontarget plants may be adversely effected from drift and run-off.

#### GROUNDWATER ADVISORY

Metsulfuron-methyl is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

#### SURFACE WATER ADVISORY

This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for weeks after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of metsulfuron-methyl from runoff water and sediment. Runoff of this product will be greatly reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

#### NON-TARGET ORGANISM ADVISORY

This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated area. Protect the forage and habitat of non-target organisms by minimizing spray drift. For further guidance and instructions on how to minimize spray drift, refer to the Spray Drift Management section of this label.

#### WINDBLOWN SOIL PARTICLES

ESCORT® XP HERBICIDE has the potential to move off-site due to wind erosion. Soils that are subject to wind erosion usually have a high silt and/or fine to very fine sand fractions and low organic matter content. Other factors which can affect the movement of windblown soil include the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, and drainage patterns. Avoid applying ESCORT® XP HERBICIDE if prevailing local conditions may be expected to result in off-site movement.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

ESCORT® XP Herbicide must be used only in accordance with instructions on this label or in separately published Bayer CropScience LP instructions.

Bayer CropScience LP will not be responsible for losses or damages resulting from the use of this product in any manner not specified on this label. User assumes all risks associated with such non-specified use.

Do not apply more than 4 ounces of ESCORT® XP HERBICIDE (0.15 pounds of the active ingredient metsulfuron-methyl) per acre per year.

Do not use on food or feed crops except as specified by this label or supplemental labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

For any requirements specific to your State or Tribe, consult the agency in your State responsible for pesticide regulation.

#### PRODUCT INFORMATION

ESCORT® XP HERBICIDE is a dispersible granule that is mixed in water and applied as a spray by ground or aerial application.

ESCORT® XP HERBICIDE is registered for the control of annual and perennial weeds and unwanted woody plants on private, public and military lands, on rights-of-way, industrial sites, non-crop areas, ditchbanks of dry drainage ditches, certain types of unimproved turf grass, and conifer and hardwood plantations, including grazed areas on these sites. Do not use on irrigation ditches.

ESCORT® XP HERBICIDE controls weeds and woody plants primarily by postemergent activity. Although ESCORT® XP HERBICIDE has preemergence activity, best results are generally obtained when ESCORT® XP HERBICIDE is applied to foliage after emergence or dormancy break. Generally, for the control of annual weeds, ESCORT® XP HERBICIDE provides the best results when applied to young, actively growing weeds. For the control of perennial weeds, applications made at the bud/bloom stage or while the target weeds are in the fall rosette stage may provide the best results. The use rate depends upon the weed species and size at the time of application.

The degree and duration of control may depend on the following:

- weed spectrum and infestation intensity
- weed size at application
- environmental conditions at and following treatment
- soil pH, soil moisture, and soil organic matter

ESCORT® XP HERBICIDE may be applied on conifer and hardwood plantations, and non-crop sites that contain areas of temporary surface water caused by the collection of water between planting beds, in equipment ruts, or in other depressions created by management activities. It is permissible to treat intermittently flooded low lying sites, seasonally dry flood plains and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps and bogs after water has receded as well as seasonally dry flood deltas. DO NOT make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams, and canals.

#### BIOLOGICAL ACTIVITY

ESCORT® XP HERBICIDE is absorbed primarily through the foliage of plants, and by the roots to a lesser degree. Plant cell division is generally inhibited in sensitive plants within a few hours following uptake. Two to 4 weeks after application, leaf growth slows followed by discoloration and tissue death. The final effects on annual weeds are evident about 4 to 6 weeks after application. The ultimate affect on perennial weeds and woody plants occurs in the growing season following application.

Warm, moist conditions following treatment promote the activity of ESCORT® XP HERBICIDE, while cold, dry conditions may reduce or delay activity. Weeds and brush hardened off by cold weather or drought stress may not be controlled. Weed and brush control may be reduced if rainfall occurs soon after application.

#### ADJUVANTS

The use of a surfactant is recommended to enhance the control of susceptible plants, except where noted. Apply at a minimum rate (concentration) of 1/4% volume/volume (1 quart per 100 gallons of spray solution), or at the manufacturer's recommended rate. Use only EPA approved surfactants containing at least 80% active ingredient. Certain types of surfactants, such as those incorporating acetic acid (i.e. I-700), may not be compatible with ESCORT® XP HERBICIDE and may result in decreased performance. Certain surfactants may not be suitable for use on desirable plants, such as turf and conifers, listed on this label. Consult the surfactant manufacturer's label for appropriate uses.

#### INVASIVE SPECIES MANAGEMENT

This product may be considered for use on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants.

Effective EDRR systems address invasions by eradicating the invader where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is recommended, a Rapid Response needs to be taken to quickly contain, deny reproduction, and if possible eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response.

#### WEED RESISTANCE MANAGEMENT

ESCORT® XP HERBICIDE contains the active ingredient metsulfuron-methyl which is a Group 2 HERBICIDE based on the mode of action classification system of the Weed Science Society of America. When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected.

Follow the best management practices listed below to delay the development of herbicide resistant weeds.

- Fields should be scouted prior to application to identify the weed species present and their growth stage to determine if the intended application will be effective. Fields should be scouted after application to verify that the treatment was effective.
- Identify weeds present in the field through scouting and field history and understand their biology. The weed-control program should consider all of the weeds present.
- Suspected herbicide-resistant weeds may be identified by these indicators:
  - Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
  - A spreading patch of non-controlled plants of a particular weed species; and
  - Surviving plants mixed with controlled individuals of the same species.
- Contact your local sales representative, crop advisor, or extension agent to find out if suspected resistant weeds to this MOA have been found in your region. If resistant biotypes of target weeds have been reported, use the application rates of this product specified for your local conditions. Tank mix products so that there are multiple effective mechanisms of actions for each target weed.
- Report any incidence of non-performance of this product against a particular weed species to your Bayer distributor, Bayer representative or call 1-800-331-2867.
- If resistance is suspected, treat weed escapes with an herbicide having a different mechanism of action and/or use non-chemical means to remove escapes, as practical, with the goal of preventing further seed production.
- Use a diversified approach toward weed management. Whenever possible incorporate multiple weed-control practices such as mechanical cultivation, biological management practices, and crop rotation.
- To the extent possible, do not allow weed escapes to produce seeds, roots, or tubers.
- Difficult to control weeds may require sequential applications of herbicides with differing mechanisms of action.

- Apply this herbicide at the correct timing and rate needed to control the most difficult weeds in the field.
- Use a broad spectrum soil-applied herbicide with a mechanism of action that differs from this product as a foundation in a weed-control program.
- Do not use more than two applications of this or any other herbicide with the same mechanism of action within a single growing season unless mixed with an herbicide with another mechanism of action with an overlapping spectrum for the difficult-to-control weeds.

#### INTEGRATED PEST MANAGEMENT

This product may be used as part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants, or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

#### PREPARING FOR USE - Site Specific Considerations

Understanding the risks associated with the application of ESCORT® XP Herbicide is essential to aid in preventing off-site injury to desirable vegetation and agricultural crops. The risk of off-site movement, both during and after application, may be affected by a number of site specific factors such as the nature, texture and stability of the soil, the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, drainage patterns, and other local physical and environmental conditions. A careful evaluation of the potential for off-site movement from the intended application site, including movement of treated soil by wind or water erosion, must be made prior to using ESCORT® XP HERBICIDE. This evaluation is particularly critical where desirable vegetation or crops are grown on neighboring land for which the use of ESCORT® XP HERBICIDE is not labeled. If prevailing local conditions may be expected to result in off-site movement and cause damage to neighboring desirable vegetation or agricultural crops, do not apply ESCORT® XP HERBICIDE.

Before applying ESCORT® XP HERBICIDE the user must read and understand all label directions, precautions and restrictions completely, including these requirements for a site specific evaluation. If you do not understand any of the instructions or precautions on the label, or are unable to make a site specific evaluation yourself, consult your local agricultural dealer, cooperative extension service, land managers, professional consultants, or other qualified authorities familiar with the area to be treated. If you still have questions regarding the need for site specific considerations, please call 1-800-331-2867.

#### TANK MIXES

ESCORT® XP HERBICIDE may be tank mixed with other herbicides registered for the use sites described in this label. Use only those tank mix partners which are labeled for the appropriate use site. When tank mixing, use the most restrictive label limitations for each of the products being used in the tank mix.

#### AGRICULTURAL USES

##### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls
- Shoes plus socks

#### CONIFER PLANTATIONS

##### Application Information

ESCORT® XP HERBICIDE is registered for the control of many species of weeds and deciduous trees on sites where conifers are growing or are to be planted. Apply by ground equipment or by air (helicopter only). Refer to the "Weeds Controlled" and "Brush Species Controlled" for a listing of susceptible species.

##### Application Timing

Apply ESCORT® XP HERBICIDE after weeds have emerged or after undesirable hardwoods have broken winter dormancy and have reached the point of full leaf expansion.

##### Conifer Site Preparation

###### --Application Before Transplanting

After consulting the "Weeds Controlled" and "Brush Species Controlled" tables, apply the rates of ESCORT® XP HERBICIDE specified for the most difficult to control species on the site.

**Southeast**—Apply up to 4 ounces per acre for loblolly and slash pines. Transplant the following planting season.

**Northeast and Lake States**—Apply up to 2 ounces per acre for red pine. Transplant the following planting season. Apply up to 2 ounces per acre for black, white and Norway spruce. Transplant the following spring.

**West**—Apply up to 2 ounces per acre prior to planting Douglas Fir, Sitka Spruce, Western Red Cedar, Western Hemlock, Ponderosa Pine, and Grand Fir in the Coast Rangeland and western slope of the Cascades in Oregon and Washington. These conifer species listed can be planted anytime after application. Other conifer species can be planted providing the user has prior experience indicating acceptable tolerance to ESCORT® XP HERBICIDE soil residues.

Without prior experience, it is recommended that other species be planted on a small scale to determine selectivity before large-scale plantings are made as unacceptable injury may occur. Bayer CropScience LP will not assume responsibility for injury to any conifer species not listed on this label.

##### Tank Mix Combinations—

For broader spectrum control, the following products may be used in combination with ESCORT® XP HERBICIDE.

##### Glyphosate (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 2 to 10 quarts of glyphosate per acre. Refer to the product container for a list of species controlled.

##### Imazapyr (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 10 to 24 fluid ounces of imazapyr per acre. Loblolly and slash pines may be transplanted the planting season following application. This combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophornbeam, persimmon, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, and red maple.

##### Glyphosate (4 pound active per gallon) + Imazapyr (4 pound active per gallon)

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with 16 to 64 fluid ounces of glyphosate and 10 to 12 fluid ounces of imazapyr per acre. Slash and loblolly pines may be transplanted the planting season following application. This combination controls cherry, dogwood, elms, oaks (red and water), persimmon, sassafras, sweetgum and suppresses hickory.

##### VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE per acre with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. Loblolly and slash pines may be transplanted the planting season following application. Refer to the product container for a list of species controlled.

##### OUST® EXTRA HERBICIDE

Tank mix 1/2 to 1 1/2 ounces of ESCORT® XP HERBICIDE with 2 to 3 ounces of Oust® Extra HERBICIDE per acre for herbaceous weed control. Refer to the product container and the "Weeds Controlled" section of this label for a listing of the weeds controlled. Loblolly and slash pines may be transplanted the planting season following application. Tank mix 2 ounces of ESCORT® XP HERBICIDE with 3 ounces of Oust® Extra HERBICIDE per acre for herbaceous weed control and early spring suppression of bull thistle and Canada thistle in the Coast Rangeland and western slope of the Cascade Mountains. Douglas fir may be transplanted at least 90 days following application.

##### Release--Hardwood Control and Suppression

ESCORT® XP HERBICIDE may be used for application over the top of established slash and loblolly pine to control the species listed in "Weeds Controlled" and "Brush Species Controlled" section of this label. Apply 1 to 4 ounces per acre to control the species indicated, including kudzu.

##### Tank Mix Combinations—

For broader spectrum control the following products may be used in combination with ESCORT® XP HERBICIDE.

##### Imazapyr (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 8 to 16 fluid ounces of imazapyr per acre for application to loblolly pine. Refer to the imazapyr label regarding the use of surfactants and the appropriate application timing with respect to the age and development stage of the pines. This combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophornbeam, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, persimmon, and red maple.

##### VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. This combination may be applied to loblolly and slash pines.

##### Release--Herbaceous Weed Control

ESCORT® XP HERBICIDE may be applied to transplanted loblolly and slash pine for the control of herbaceous competition. Consult the "Weeds Controlled" for a listing of the susceptible species and application rates. Best results are obtained when ESCORT® XP HERBICIDE is applied just before weed emergence until shortly after weed emergence.

##### Tank Mix Combinations—

For broader spectrum control the following products may be used in combination with ESCORT® XP HERBICIDE.

##### Imazapyr (4 pound active per gallon)

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with 4 fluid ounces of imazapyr per acre. The tank mix may be used on loblolly pine.

##### VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. This combination may be applied to loblolly and slash pines.

##### Release - Directed Spray in Conifers

###### Western US

To release conifers from competing brush species, such as, blackberry, salmonberry, snowberry, thimbleberry and wild roses, mix 2 to 4 ounces of ESCORT® XP HERBICIDE per 100 gallons of spray solution. Direct spray onto the foliage of competing brush species using a knapsack or backpack sprayer. For best results, apply any time after the brush species have reached full leaf stage but before autumn coloration. For best results at application, the majority of the brush must be less than six feet in height to help ensure adequate spray coverage. Thorough coverage of the target foliage is necessary to optimize results. Care must be taken to direct the ESCORT® XP HERBICIDE spray solution away from the conifer foliage.

###### NOTE:

ESCORT® XP HERBICIDE may cause temporary yellowing and or growth suppression when the spray solution contacts conifer foliage. The use of a surfactant with ESCORT® XP HERBICIDE may improve brush control results. When using a surfactant with ESCORT® XP HERBICIDE, extra precaution must be taken to avoid contact with conifer foliage. Excessive drift onto conifers may result in severe injury.

##### IMPORTANT PRECAUTIONS—CONIFER PLANTATIONS ONLY

- Applications of ESCORT® XP HERBICIDE made to conifers that are suffering from loss of vigor caused by insects, diseases, drought, winter damage,

animal damage, excessive soil moisture, planting shock, or other stresses may injure or kill the trees.

- Applications of ESCORT® XP HERBICIDE made for herbaceous release must only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- Do not apply ESCORT® XP HERBICIDE to conifers grown as ornamentals.
- ESCORT® XP HERBICIDE applications may result in damage and mortality to other species of conifers when they are present on sites with those listed in the preceding specifications for conifer plantations.

**HARDWOOD PLANTATIONS**

**Application Information**

ESCORT® XP HERBICIDE may be used at rates of up to 2 ounces per acre for the control of many weed species on sites where yellow poplar is growing or is to be planted, and on sites where red alder is to be planted. Apply by ground equipment or by air (helicopter only). Refer to the "Weeds Controlled" sections of this label for a listing of susceptible species.

**Application Timing**

ESCORT® XP HERBICIDE may be applied as a site preparation treatment prior to planting red alder or yellow poplar. As a prior to planting site preparation treatment for red alder, ESCORT® XP HERBICIDE may be tank mixed with other herbicides labeled for this use.

ESCORT® XP HERBICIDE may also be applied over-the-top of planted yellow poplar seedlings after the soil has settled around the root system, but before the seedlings have broken dormancy (prior to bud break).

**Release--Herbaceous Weed Control**

ESCORT® XP HERBICIDE may be applied to yellow poplar for the control of herbaceous competition. Consult the "Weeds Controlled" for a listing of the susceptible species and specified application rates. Best results are obtained when ESCORT® XP HERBICIDE is applied just before weed emergence until shortly after weed emergence.

**Tank Mix Combinations—**

Tank mix 1/2 ounce of ESCORT® XP HERBICIDE with 4 to 6 pints of VELPAR® L VU HERBICIDE as directed on the package label for "RELEASE--HERBACEOUS WEED CONTROL" in pine plantations in the eastern U.S. Follow the VELPAR® L VU Herbicide label directions regarding altering the application rate by soil texture.

**IMPORTANT PRECAUTIONS—HARDWOOD PLANTATIONS ONLY**

- Application of Velpar® L VU Herbicide and ESCORT® XP HERBICIDE made to yellow poplar that are suffering from loss of vigor caused by insects, disease, drought, winter damage, animal damage, excessive soil moisture, planting shock, or other stresses may injure or kill the seedlings.
- Applications of ESCORT® XP HERBICIDE made for release must only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- The use of surfactant is not recommended for applications made over the tops of trees.
- Careful consideration must be given by an experienced and knowledgeable forester to match the requirements of yellow poplar and/or red alder to the conditions of the site. Treatment of yellow poplar and/or red alder planted on a site inadequate to meet its requirements may injure or kill the seedlings.

**PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)**

ESCORT® XP HERBICIDE is registered for the control of broadleaf weeds, brush and several woody vine species in the establishment, maintenance, and restoration of pasture, rangeland, and Conservation Reserve Program (CRP).

ESCORT® XP HERBICIDE may be tank mixed with other pesticides labeled for use in pasture, rangeland, and CRP. Read and follow the labels on all products used in the tank mix. Observe the most restrictive precautions on each of the product's labels. Application of ESCORT® XP HERBICIDE to pasture, rangeland and CRP may be made by ground or air. Use a sufficient volume of water to ensure thorough coverage of the targeted weeds with the equipment being used. In Idaho, Oregon and Washington use a minimum application volume of 3 gallons of spray solution per acre.

**APPLICATION INFORMATION FOR GRASS ESTABLISHMENT IN PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)**

ESCORT® XP HERBICIDE is registered for the control or suppression of broadleaf weeds to aid in the establishment of the following perennial native or improved grasses planted in pasture, rangeland, and acres enrolled in the Conservation Reserve Program (CRP):

Blue Gramma	Lovegrasses-	Wheatgrasses-	Wildrye grass-
Bluestems-	Atherstone	bluebunch	Russian
Big	Sand	crested	
Little	Weeping	intermediate	
Plains	Wilman	pubescent	
Sand	Orchardgrass	Siberian	
WW Spar	Sideoats gramma	slender	
Buffalograss	Switchgrass-	steambank	
Green sprangletop	Blackwell	tall	
Kleingrass		thickspike	
		western	

Maximize potential for grass establishment by consulting with the Natural Resource and Conservation Service of other government agencies or local experts concerning planting techniques and other cultural practices.

Performance from ESCORT® XP HERBICIDE may not always be satisfactory due to the inability of newly planted grass stands to sufficiently compete with weeds and the severity of weed pressure in new grass stands.

An additional HERBICIDE application or mowing may be needed.

**Use Rates and Application Timing for Grass Establishment in Pasture, Rangeland and CRP Preplant (prior to planting) or Preemergence (after planting but before grass emergence)**

Do not use more than 1/10 ounce/acre of ESCORT® XP HERBICIDE for grass establishment in pasture, rangeland, and CRP. Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre on all labeled grasses except orchardgrass and Russian wildrye grass. Do not apply ESCORT® XP HERBICIDE preplant or preemergence to orchardgrass and Russian wildrye grass as severe crop injury may result.

**Early postemergence to new plantings**

Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre, plus a non-ionic surfactant at the rate of 2 to 4 pints/100 gallons of spray solution on all labeled grasses anytime after grass emergence.

Do not use a spray adjuvant other than non-ionic surfactant. Because grass species differ in time of emergence, apply only after the majority of grasses are in the 3 to 4 leaf stage.

**Postemergence to stands with 1 – 5 leaf grasses planted the previous season.**

Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre plus a non-ionic surfactant at the rate of 2 to 4 pints/100 gallons of spray solution on all labeled grasses when the majority of the grasses have one or more leaves.

Do not use a spray adjuvant other than non-ionic surfactant.

**APPLICATION INFORMATION FOR ESTABLISHED GRASSES IN PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)**

**Use Rates for Established Grasses in Pasture, Rangeland, and CRP**

Apply up to 1 2/3 ounces ESCORT® XP HERBICIDE per acre as a broadcast application to established grasses in pasture, rangeland and CRP. For spot applications, use 1 ounce per 100 gallons of water. Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year in pasture, rangeland, and CRP.

Refer to the Weeds Controlled section of the section 3 label for a listing of the weeds controlled by ESCORT® XP HERBICIDE and the appropriate use rate to obtain control.

**Application Timing – Established Grasses in Pasture, Rangeland, and CRP**

ESCORT® XP HERBICIDE may be applied to established native grasses such as bluestems and grama, and on other established grasses such as bermudagrass, bluegrass, orchardgrass, bromegrass, fescue and timothy that were planted the previous growing season (or earlier) and are fully tillered, unless otherwise directed on this label. Specific application timing information on several of these grass species follows:

Grass	Minimum time from Grass establishment ESCORT® XP HERBICIDE application
Bermudagrass	2 months
Bluegrass, bromegrass, Orchardgrass	6 months
Timothy	12 months
Fescue	24 months

**Rotation Intervals in Pasture, Rangeland, and CRP for Overseeding and Renovation**

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate on Pasture, Rangeland, and CRP (oz per A)	Minimum Rotation Interval (months)
AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV	Alfalfa, red clover, white clover, sweet clover, bermudagrass, bluegrass, ryegrass, tall fescue	1/10 to 3/10	4
	Wheat (except durum)	1/10 to 3/10	1
	Durum, barley, oat	1/10 to 3/10	10
ALL STATES NOT INCLUDED ABOVE	Red clover, white clover, and sweet clover	1/10 to 2/10	12
	Bermudagrass, bluegrass, ryegrass	1/10 to 2/10	6
	Tall Fescue	1/10 to 2/10	18
	Wheat (except durum)	1/10 to 2/10	1
	Durum, barley, oat	1/10 to 2/10	10

(continued)

**Rotation Intervals in Pasture, Rangeland, and CRP for Overseeding and Renovation** (continued)

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate on Pasture, Rangeland, and CRP (oz per A)	Minimum Rotation Interval (months)
ALL AREAS WITH SOIL PH OF 7.5 OR LESS	Russian wildrye	1/10 to 1/2	1
	Green needlegrass, switchgrass, sheep fescue	1/10 to 1	1
	Meadow brome, smooth brome, alta fescue, red fescue, meadow foxtail, orchardgrass, Russian wildrye, timothy	1/10 to 1	2
ALL AREAS WITH SOIL PH OF 7.9 OR LESS	Alkali sacaton, mountain brome, blue grama, thickspike wheatgrass	1/10 to 1	1
	Sideoats grama, switchgrass	1/10 to 1/2	2
	Western wheatgrass	1/10 to 1	2
	Sideoats grama, switchgrass, big bluestem	1/10 to 1	3

**Fescue Precautions:**

Note that ESCORT® XP HERBICIDE may temporarily stunt tall fescue, cause it to turn yellow, or cause seedhead suppression. To minimize these symptoms, take the following precautions:

- Do not use more than 4/10 ounce/acre of ESCORT® XP HERBICIDE.
- Tank mix ESCORT® XP HERBICIDE with 2,4-D.
- Use the lowest specified rate for target weeds.
- Use a non-ionic surfactant at 1/2 to 1 pint per 100 gallons of spray solution.
- Make application later in the spring after the new growth is 5 to 6 inches tall, or in the fall.
- Do not use surfactant when liquid nitrogen is used as a carrier.
- Do not use a spray adjuvant other than non-ionic surfactant.

The first cutting yields may be reduced due to seedhead suppression resulting from treatment with ESCORT® XP HERBICIDE.

**Timothy Precautions:**

Timothy should be at least 6 inches tall at application and be actively growing. Applications of ESCORT® XP HERBICIDE to timothy under any other conditions may cause crop yellowing and/or stunting. To minimize these symptoms, take the following precautions:

- Do not use more than 4/10 ounce/acre ESCORT® XP HERBICIDE.
- Tank mix ESCORT® XP HERBICIDE with 2, 4-D.
- Use the lowest specified rate for target weeds.
- Use a non-ionic surfactant at 1/2 pint per 100 gallons of spray solution (1/16%).
- Make applications in the late summer or fall.
- Do not use surfactant when liquid nitrogen is used as a carrier.
- Do not use spray adjuvant other than non-ionic surfactant.

Application of ESCORT® XP HERBICIDE to Pensacola bahiagrass, ryegrass (Italian or perennial), and Garrison's creeping foxtail may cause severe injury to and/or loss of forage.

**Other Pasture and Rangeland Grasses**

Varieties and species of forage grasses differ in their tolerance to herbicides. When using ESCORT® XP HERBICIDE on a particular grass for the first time, limit use to a small area. If no injury occurs throughout the season, larger acreage may be treated the following season.

Broadleaf forage species, such as alfalfa and clover, are highly sensitive to ESCORT® XP HERBICIDE and will be severely stunted or injured by ESCORT® XP HERBICIDE.

**SPOT TREATMENTS**

ESCORT® XP HERBICIDE may be used for use as spot treatment to control noxious and troublesome weeds on pasture, rangeland, and CRP.

**Application Information**

ESCORT® XP HERBICIDE may be used to control many species of weeds, including noxious weeds, in forage grasses growing on pasture, rangeland, and CRP. Refer to the "Weeds Controlled" section of the package label or supplemental labeling for a listing of susceptible weed species. If the sprayer is calibrated, consult the package label or other supplemental labeling to select the application rate per acre of ESCORT® XP HERBICIDE appropriate for the target weeds. Or mix one gram of ESCORT® XP HERBICIDE per one gallon of water along with a suitable surfactant. Spray to the point of wetting the entire surface of the target weeds, approximately 40 gallons of solution per acre. When applied in this manner there is no grazing restrictions following the use of ESCORT® XP HERBICIDE. Applications may be made at anytime of the year, except when the soil is frozen.

**CROP ROTATION**

Before using ESCORT® XP HERBICIDE, carefully consider your crop rotation plans and options. For rotational flexibility, do not treat all of your pasture, rangeland, or CRP acres at the same time.

**Minimum Rotational Intervals**

Minimum rotation intervals\* are determined by the rate of breakdown of ESCORT® XP HERBICIDE applied. ESCORT® XP HERBICIDE breakdown in the soil is affected by soil pH, presence of soil microorganisms, soil temperature, and soil moisture. Low soil pH, high soil temperature, and high soil moisture increase ESCORT® XP HERBICIDE breakdown in soil, while high soil pH, low soil temperature, and low soil moisture slow ESCORT® XP HERBICIDE breakdown.

Of these 3 factors, only soil pH remains relatively constant. Soil temperature, and to a greater extent, soil moisture, can vary significantly from year to year and from area to area. For this reason, soil temperatures and soil moisture should be monitored regularly when considering crop rotations.

\* The minimum rotation interval represents the period of time from the last application to the anticipated date of the next planting.

**Soil pH Limitations**

ESCORT® XP HERBICIDE should not be used on soils having a pH above 7.9, as extended soil residual activity could extend crop rotation intervals beyond normal. Under certain conditions, ESCORT® XP HERBICIDE could remain in the soil for 34 months or more, injuring wheat and barley. In addition, other crops planted in high-pH soils can be extremely sensitive to low concentrations of ESCORT® XP HERBICIDE.

**Checking Soil pH**

Before using ESCORT® XP HERBICIDE, determine the soil pH of the areas of intended use. To obtain a representative pH value for the test area, take several 0" to 4" samples from different areas of the field and analyze them separately. Consult local extension publications for additional information on recommended soil sampling procedures.

**BIOASSAY**

A field bioassay must be completed before rotating to any crop or grass species/variety not listed in the Rotation Intervals Table, or if the soil pH is not in the specified range, or if the use rate applied is not specified in the table.

To conduct a field bioassay, grow test strips of the crop(s) or grass(es) you plan to grow the following year in fields previously treated with ESCORT® XP HERBICIDE. Crop or grass response to the bioassay will indicate whether or not to rotate to the crop(s) or grass(es) grown in the test strips.

If a field bioassay is planned, check with your local Agricultural dealer or BAYER CROPS SCIENCE LP representative for information detailing the field bioassay procedure.

**GRAZING/HAYING**

When used as directed, there is no grazing or haying restriction for use rates of 1 2/3 ounces per acre and less.

Coveralls, shoes plus socks must be worn if cutting within 4 hours of treatment.

**IMPORTANT PRECAUTIONS**

- Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year on pasture, rangeland, or CRP.
- Grass species or varieties may differ in their response to various herbicides. BAYER CROPS SCIENCE LP recommends that you first consult your state experiment station, university, or extension agent as to sensitivity to any herbicide. If no information is available, limit the initial use of ESCORT® XP HERBICIDE to a small area. Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE so the final stand may not reflect the seed ratio.
- Under certain conditions such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. ESCORT® XP HERBICIDE should not be applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage as grass injury may result. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.
- Applications of ESCORT® XP HERBICIDE to pasture, rangeland, and CRP undersown with legumes may cause injury to the legumes. Legumes in a seeding mixture may be severely injured or killed following an application of ESCORT® XP HERBICIDE.
- Applications made to some established grasses may cause temporary stunting, yellowing or seedhead suppression (i.e. fescue, timothy).
- Applications made to newly established grasses less than 2 years from seeding may result in injury or loss.
- Do not apply to forage grasses known to be sensitive to ESCORT® XP HERBICIDE such as ryegrass (Italian and perennial), bahia or Garrison's creeping foxtail.
- Broadleaf forage species, such as alfalfa and clover, are highly sensitive to ESCORT® XP HERBICIDE and will be severely injured or killed.
- The control of weeds in wheel track areas may be reduced if ground applications are made when dry, dusty field conditions exist. The addition of 2,4-D or MCPA should improve weed control under these conditions.

**NON-AGRICULTURAL USES**

**NON-AGRICULTURAL USE REQUIREMENTS**

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow others to enter the treated area until sprays have dried.

**Non-crop industrial weed control and selective weed control in turf (industrial, unimproved only) are not within the scope of the Worker Protection Standard.**

**NON-CROP SITES**

**Application Information**

ESCORT® XP HERBICIDE is registered for weed control on private, public and military lands as follows: Uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas); uncultivated agricultural areas non-crop producing (including farmyards, fuel storage

areas, fence rows, soil bank land, and barrier strips); industrial sites outdoor (including lumberyards, pipeline and tank farms) including grazed areas on these sites. It may also be used for the control of certain noxious and troublesome weeds.

Consult the "Weeds Controlled" and "Brush Species Controlled" tables to determine the appropriate application rate. ESCORT® XP HERBICIDE may be applied in tank mixture with other herbicides labeled for use on non-crop sites. Fully read the labels and follow all directions and restrictions on each label.

Applications may be made by ground or air. Use a sufficient volume of water to ensure thorough coverage of the target vegetation with the application equipment being used.

#### NATIVE GRASSES

ESCORT® XP HERBICIDE is registered for weed control and suppression in the establishment and maintenance of native grasses. It may be used where blue grama, bluestems (big, little, plains, sand, ww spar) bromegrasses (meadow), buffalograss, green sprangletop, indiagrass, kleingrass, lovegrasses (atherstone, sand, weeping, wilman), orchardgrass, sideoats grama, switchgrass (blackwell), wheatgrass (bluebunch, intermediate, pubescent, Siberian, slender, stream-band, tall, thickspike, western), and Russian wildrye are established. It may also be applied over these species in the seedling stage, except for orchardgrass and Russian wildrye.

When used as directed, there are no grazing or haying restrictions for use rates of 1 2/3 ounces per acre or less. At use rates greater than 1 2/3 ounces per acre and up to 3 1/3 ounces per acre, forage grasses may be cut for hay, fodder or green forage and fed to livestock, including lactating animals, 3 days after treatment.

#### Rotation Intervals for Overseeding and Renovation

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate (oz per A)	Minimum Rotation Interval (months)
AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV	Alfalfa, red clover, white clover, sweet clover, bermudagrass, bluegrass, ryegrass, tall fescue	1/10 to 3/10	4
	Wheat (except durum)	1/10 to 3/10	1
	Durum, barley, oat	1/10 to 3/10	10
ALL STATES NOT INCLUDED ABOVE	Red clover, white clover, and sweet clover	1/10 to 2/10	12
	Bermudagrass, bluegrass, ryegrass	1/10 to 2/10	6
	Tall Fescue	1/10 to 2/10	18
	Wheat (except durum)	1/10 to 2/10	1
	Durum, barley, oat	1/10 to 2/10	10
ALL AREAS WITH SOIL PH OF 7.5 OR LESS	Russian wildrye	1/10 to 1/2	1
	Green needlegrass, switchgrass, sheep fescue	1/10 to 1	1
	Meadow brome, smooth brome, alta fescue, red fescue, meadow foxtail, orchardgrass, Russian wildrye, timothy	1/10 to 1	2
ALL AREAS WITH SOIL PH OF 7.9 OR LESS	Alkali sacaton, mountain brome, blue grama, thickspike wheatgrass	1/10 to 1	1
	Sideoats grama, switchgrass	1/10 to 1/2	2
	Western wheatgrass	1/10 to 1	2
	Sideoats grama, switchgrass, big bluestem	1/10 to 1	3

#### Application Information

Apply ESCORT® XP HERBICIDE at the rate of 1/10 ounce per acre for the control and suppression\* of bur buttercup (testiculate), common purslane, common sunflower\*, cutleaf eveningprimrose\*, flixweed\*, lambsquarters\* (common and slimleaf), marestail\*, pigweed (redroot and tumble), snow speedwell, tansy-mustard\* and tumble mustard (Jim Hill mustard).

\*Suppression is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas.

Degree of suppression will vary with the size of weed and environmental conditions following treatment.

#### Application Timing

For established grasses, apply when weeds are in the seedling stage.

For grasses in the seedling stage, apply preplant or preemergence where the soil (seed bed) has been cultivated.

#### IMPORTANT PRECAUTIONS—NATIVE GRASSES

• Grass species or varieties may differ in their response to various herbicides. If no information is available, limit the initial use of ESCORT® XP HERBICIDE to a small area. Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE, so the final stand may not reflect the seed ratio.

• Under certain conditions such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. Injury may result when ESCORT® XP HERBICIDE is applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.

#### GRASS REPLANT INTERVALS

Following an application of ESCORT® XP HERBICIDE to non-crop areas, the treated sites may be replanted with various species of grasses at the intervals listed below.

For soils with a pH of 7.5 or less, observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Brome, Meadow	1/2—1	2
	1—2	3
Brome, Smooth	1/2—1	2
	1—2	4
Fescue, Alta	1/2—1	2
	1—2	4
Fescue, Red	1/2—1	2
	1—2	4
Fescue, Sheep	1/2—1	1
	1—2	4
Foxtail, Meadow	1/2—1	2
	1—2	4
Green Needlegrass	1/2—2	1
	1/2—1	2
Orchardgrass	1—2	4
	1/2—1	1
Russian wildrye	1	2
	2	3
Switchgrass	1/2—1	1
	1—2	3
Timothy	1/2—1	2
	1—2	4
Wheatgrass, Western	1/2—1	2
	1—2	3

For soils with a pH of 7.5 or greater observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Alkali Sacaton	1/2—1	1
	1—2	3
Bluestem, Big	1/2—2	3
Brome, Mountain	1/2—1	1
	1—2	2
Grama, Blue	1/2—2	1
Grama, Sideoats	1/2	2
	>1/2	>3
Switchgrass	1/2	2
	>1/2	>3
Wheatgrass, Thickspike	1/2—2	1
Wheatgrass, Western	1—2	2
	1/2—1	3

The specified intervals are for applications made in the Spring to early Summer. Because ESCORT® XP HERBICIDE degradation is slowed by cold or frozen soils, applications made in the late Summer or Fall should consider the intervals as beginning in the Spring following treatment.

Testing has indicated that there is considerable variation in response among the species of grasses when seeded into areas treated with ESCORT® XP HERBICIDE. If species other than those listed above are to be planted into areas treated with ESCORT® XP HERBICIDE, a field bioassay must be performed, or previous experience may be used, to determine the feasibility of replanting treated sites.

**ADDITIONAL GRASS INFORMATION**

**APPLICATION INFORMATION FOR GRASS ESTABLISHMENT**

ESCORT® XP HERBICIDE may be used for the control or suppression of broadleaf weeds to aid in the establishment of the following perennial native or improved grasses:

Blue Grama	Buffalograss	Orchardgrass	Wheatgrasses –	Wildrye grass –
Bluestems –	Green sprangletop	Sideoats grama	bluebunch	Russian
big	Kleingrass	Switchgrass –	crested	
little	Lovegrasses –	Blackwell	intermediate	
plains	Atherstone		pubescent	
sand	sand		Siberian	
WW spar	weeping		slender	
	Wilman		steambank	
			tall	
			thickspike	
			western	

Maximize potential for grass establishment by consulting with the Natural Resource and Conservation Service of other government agencies or local experts concerning planting techniques and other cultural practices.

Performance from ESCORT® XP HERBICIDE may not always be satisfactory due to the inability of newly planted grass stands to sufficiently compete with weeds and the severity of weed pressure in new grass stands.

An additional herbicide application or mowing may be needed.

**Use Rates and Application Timing for Grass Establishment Preplant (prior to planting) or Preemergence (after planting but before grass emergence)**

Do not use more than 1/10 ounce per acre of ESCORT® XP HERBICIDE for grass establishment.

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre on all labeled grasses except orchardgrass and Russian wildrye grass. Do not apply ESCORT® XP HERBICIDE preplant or preemergence to orchardgrass and Russian wildrye grass as severe crop injury may result.

**Early postemergence to new plantings**

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre, plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution on all labeled grasses anytime after grass emergence.

Do not use a spray adjuvant other than non-ionic surfactant.

Because grass species differ in time of emergence, apply only after the majority of grasses are in the 3 to 4 leaf stage.

**Postemergence to stands with 1 – 5 leaf grasses planted the previous season**

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution, on all labeled grasses when the majority of the grasses have one or more leaves.

Do not use a spray adjuvant other than non-ionic surfactant.

**APPLICATION INFORMATION FOR ESTABLISHED GRASSES**

**Use Rates for Established Grasses**

Apply up to 1 ounce ESCORT® XP HERBICIDE per acre as a broadcast application to established grasses. For spot applications, use 1 ounce per 100 gallons of water. Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year.

Refer to the Weeds Controlled section of this label for a listing of the weeds controlled by ESCORT® XP HERBICIDE and the appropriate use rate to obtain control.

**Application Timing – Established Grasses**

ESCORT® XP HERBICIDE may be applied to established native grasses such as bluestems and grama, and on other established grasses such as bermudagrass, bluegrass, orchardgrass, bromegrass, fescue and timothy that were planted the previous growing season (or earlier) and are fully tillered, unless otherwise directed on this label. Specific application timing information on several of these grass species follows:

Grass	Minimum time from Grass establishment ESCORT® XP HERBICIDE application
Bermudagrass	2 months
Bluegrass, bromegrass, Orchardgrass	6 months
Timothy	12 months
Fescue	24 months

**Fescue and Timothy Precautions**

When used on fescue and timothy grasses, ESCORT® XP HERBICIDE may cause reduced first cutting yields due to temporary stunting, leaf yellowing, or seed head suppression. To help minimize these symptoms, follow the information below:

- Use the lowest labeled rate for the target weeds.
- Tank mix 2,4-D with ESCORT® XP HERBICIDE applications.
- Apply ESCORT® XP HERBICIDE at no more than 4/10 ounce per acre.

- Make applications when the grasses are 5 to 6 inches tall in late summer or fall.
- Use only a non-ionic surfactant at 1/2 pint per 100 gallons of spray solution.
- When liquid nitrogen is the spray carrier, do not include the surfactant.

**Other Grasses:**

Application of ESCORT® XP HERBICIDE to Pensacola bahiagrass, ryegrass (Italian or perennial) and Garrison's creeping foxtail may cause severe injury to and/or loss of forage.

Varieties and species of forage grasses differ in their tolerance to herbicides. When using ESCORT® XP HERBICIDE on a particular grass for the first time, limit use to a small area. If no injury occurs throughout the season, larger acreage may be treated the following season.

Broadleaf forage species, such as alfalfa and clover, are highly sensitive to ESCORT® XP Herbicide and will be severely stunted or injured by ESCORT® XP HERBICIDE.

**CROP ROTATION**

Before using ESCORT® XP Herbicide, carefully consider your crop rotation plans and options.

**Minimum Rotational Intervals**

Minimum rotation intervals\* are determined by the rate of breakdown of ESCORT® XP HERBICIDE applied. ESCORT® XP HERBICIDE breakdown in the soil is affected by soil pH, presence of soil microorganisms, soil temperature, and soil moisture. Low soil pH, high soil temperature, and high soil moisture increase ESCORT® XP HERBICIDE breakdown in soil, while high soil pH, low soil temperature, and low soil moisture slow ESCORT® XP HERBICIDE breakdown.

Of these 3 factors, only soil pH remains relatively constant. Soil temperature, and to a greater extent, soil moisture, can vary significantly from year to year and from area to area. For this reason, monitor soil temperature and soil moisture on a regular basis when considering any crop rotations.

\* The minimum rotation interval represents the period of time from the last application to the anticipated date of the next planting.

**Soil pH Limitations**

ESCORT® XP HERBICIDE must not be used on soils having a pH above 7.9, as extended soil residual activity could extend crop rotation intervals beyond normal. Under certain conditions, ESCORT® XP HERBICIDE could remain in the soil for 34 months or more, injuring wheat and barley. In addition, other crops planted in high-pH soils can be extremely sensitive to low concentrations of ESCORT® XP HERBICIDE.

**Checking Soil pH**

Before using ESCORT® XP Herbicide, determine the soil pH of the areas of intended use. To obtain a representative pH value for the test area, take several 0" to 4" samples from different areas of the field and analyze them separately. Consult local extension publications for additional information on recommended soil sampling procedures.

**BIOASSAY**

A field bioassay must be completed before rotating to any crop or grass species/variety not listed in the Rotation Intervals Table, or if the soil pH is not in the specified range, or if the use rate applied is not specified in the table.

To conduct a field bioassay, grow test strips of the crop(s) or grass(es) you plan to grow the following year in fields previously treated with ESCORT® XP HERBICIDE. Crop or grass response to the bioassay will indicate whether or not to rotate to the crop(s) or grass(es) grown in the test strips.

If a field bioassay is planned, check with your local Agricultural dealer or Bayer CropScience LP representative for information detailing the field bioassay procedure.

**IMPORTANT PRECAUTIONS**

- Grass species or varieties may differ in their response to various herbicides. If no information is available, limit the initial use of ESCORT® XP HERBICIDE to a small area.
- Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE so the final stand may not reflect the seed ratio.
- Under certain conditions, such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures, prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. ESCORT® XP HERBICIDE applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage can result in grass injury. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.
- Applications of ESCORT® XP HERBICIDE to lands undersown with legumes may cause injury to the legumes. Legumes in a seeding mixture may be severely injured or killed following an application of ESCORT® XP HERBICIDE.
- The control of weeds in wheel track areas may be reduced if ground applications are made when dry, dusty field conditions exist. The addition of 2,4-D or MCPA may improve weed control under these conditions.

## WEEDS CONTROLLED

### 1/3 to 1/2 ounce per acre

Annual sowthistle	Common groundsel	Goldenrod	Smallseed falseflax
Aster	Common purslane	Lambsquarters	Smooth pigweed
Bahiagrass	Common yarrow	Marestail/horseweed****	Sweet clover
Beebalm	Conical catchfly	Maximillion sunflower	Tansymustard
Bittercress	Corn cockle	Miners lettuce	Treacle mustard
Bitter sneezeweed	Cow cockle	Pennsylvania smartweed	Tumble mustard
Blackeyed-susan	Crown vetch	Plains coreopsis	Wild carrot
Blue mustard	Dandelion	Plantain	Wild garlic
Bur buttercup	Dogfennel	Redroot pigweed	Wild lettuce
Chicory	False chamomile	Redstem filaree	Wild mustard
Clover	Fiddleneck tarweed	Rough fleabane	Wooly croton
Cocklebur	Field pennycress	Shepherd's purse	Wood sorrel
Common chickweed	Flxweed	Silky crazyweed (locoweed)	Yankeweed

### 1/2 to 1 ounce per acre

Blackberry	Curly dock	Honeysuckle	Seaside arrowgrass
Black henbane	Dewberry	Multiflora rose and other wild roses	Sericea lespedeza
Broom snakeweed*	Dyer's woad	Musk thistle***	Tansy ragwort
Buckhorn plantain	Garlic mustard	Oxeye daisy	Teasel
Bull thistle	Gorse	Plumeless thistle	Wild caraway
Common crupina	Halogeton	Prostrate knotweed	
Common sunflower	Henbit	Rosering gaillardia	

### 1 to 2 ounces per acre

Common mullein	Lupine	Purple scabious	Sulphur cinquefoil
Common tansy	Old world climbing fern (Lygodium)	Scotch thistle	Western salsify
Field bindweed**	Perennial pepperweed	Scouringrush	Whitetop (hoary cress)
Greasewood	Poison hemlock	Salsify	Wild iris
Gumweed	Purple loosestrife	Snowberry	
Houndstongue		St. Johnswort	

### 1 1/2 to 2 ounces per acre

Canada thistle**	Duncecap larkspur	Tall larkspur	Yellow toadflax**
Dalmation toadflax**	Russian knapweed**	Wild parsnip	

### 2 ounces per acre

Onionweed

### 3 to 4 ounces per acre

Kudzu

\* Apply fall through spring.

\*\* Suppression, which is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas. Apply as a full coverage spray for best performance.

\*\*\* Certain biotypes of musk thistle are more sensitive to ESCORT® XP HERBICIDE and may be controlled with rates of 1/4 to 1/2 ounce per acre. Treatments of ESCORT® XP HERBICIDE may be applied from rosette through bloom stages of development.

\*\*\*\* Certain biotypes of marestail/horse tail are less sensitive to ESCORT® XP HERBICIDE and may be controlled by tank mixes with herbicides with a different mode of action.

## Problem Weed Control

For broader spectrum control and for use on certain biotypes of broadleaf weeds which may be resistant to ESCORT® XP HERBICIDE and herbicides with the same mode of action, the following tank mixes may be used.

### Dicamba + 2,4-D

Weed	Rate of ESCORT® XP HERBICIDE	Rate of dicamba (fluid ounces/acre)	Rate of 2,4-D (fluid ounces/acre)
Kochia control	1/2	8	16
Spotted knapweed control	1/2	8	16
Rush skeletonweed suppression	1	8	16

## INDUSTRIAL TURFGRASS UNIMPROVED ONLY

### Application Information

ESCORT® XP HERBICIDE is registered for selective weed control in unimproved industrial turfgrass where certain grasses are well established and desired as ground cover. ESCORT® XP HERBICIDE may also be used for the control of certain noxious and troublesome weeds in turfgrass.

In addition to conventional spray equipment, ESCORT® XP HERBICIDE may also be applied with invert emulsion equipment. When using an invert emulsion, mix the prescribed rate of ESCORT® XP HERBICIDE in the water phase.

Consult the "Weeds Controlled" table to determine which weeds will be controlled by the following application rates:

Turfgrass Type	Rate of ESCORT® XP HERBICIDE (ounces/acre)
Fescue and Bluegrass	¼ to ½
Crested Wheatgrass and Smooth Brome	¼ to 1
Bermudagrass	¼ to 2

### Application Timing

Applications may be made at anytime of the year except when the soil is frozen.

When a spring application is made on fescue or bluegrass, a second application may be made during the summer after full seedhead maturation.

### Growth Suppression and Seedhead Inhibition (Chemical Mowing)

#### Application Information

ESCORT® XP HERBICIDE may be used for growth suppression and seedhead inhibition in well established fescue and bluegrass turfgrass at the use rate of 1/4 to 1/2 ounce per acre.

#### Tank Mix Combination

ESCORT® XP HERBICIDE may be tank mixed with "Embark" for improved performance in the regulation of growth and seedhead suppression. Tank mix 1/4 to 1/2 ounce of ESCORT® XP HERBICIDE with 1/8 to 1/4 pint of "Embark".

#### Application Timing

Application may be made after at least 2 to 3 inches of new growth has emerged until the appearance of the seed stalk.

## IMPORTANT PRECAUTIONS

### —INDUSTRIAL TURFGRASS ONLY

- An application of ESCORT® XP HERBICIDE may cause temporary discoloration (chlorosis) or stunting of the turfgrasses. Use the lower specified rates for minimum discoloration or stunting.
- With fescue and bluegrass, sequential applications made during the same or consecutive growth periods (i.e. spring and fall) may result in excessive injury to turfgrass.
- Excessive injury may result when ESCORT® XP HERBICIDE is applied to turfgrass that is under stress from drought, insects, disease, cold temperatures (winter injury) or poor fertility.
- ESCORT® XP HERBICIDE is not recommended for use on bahiagrass.

## BRUSH CONTROL

### Application Information

ESCORT® XP HERBICIDE is registered for the control of undesirable brush growing in non-crop areas including grazed areas on these sites. Applications may be made by air, high volume ground application, low volume ground application and ultra-low volume ground application. Except as noted for multiflora rose, ESCORT® XP HERBICIDE must be applied as a spray to the foliage.

The application volume required will vary with the height and density of the brush and the application equipment used. Generally, aerial applications will require 15 to 25 gallons of water per acre; high volume ground application will require 100 to 400 gallons of water per acre; low volume ground application will require 20 to 50 gallons of water per acre; and ultra-low volume ground application will require 10 to 20 gallons of water per acre.

Regardless of the application volume and equipment used, thorough coverage of the foliage, particularly the terminal growing points, is necessary to optimize results.

#### BRUSH SPECIES CONTROLLED

Species	High Volume Rate (ounces/100 gallon)	Broadcast Rate (ounces/acre)
Ash	1—2	1—3
Aspen	1—2	1—3
Black locust	1—2	1—3
Blackberry	1—2	1—3
Camelthorn	1—2	1—3
Cherry	1—2	1—3
Cottonwood	1—2	2—3
Eastern red cedar	1—2	2—3
Elder	1—2	2—3
Elm	1—2	1—3
Firs	3	1—2
Hawthorn	1—2	1—3
Honeysuckle	1—2	1/2—1
Mulberry	1—2	2—3
Multiflora rose	1—2	1—3
Muscadine (wild grape)	1—2	2—3
Oaks	1—2	1—3
Ocean spray (Holodiscus)	1—2	2—3
Osage orange	1—2	2—3
Red maple	1—2	2—3
Salmonberry	1/2—1	1—3
Snowberry	1/2—1	1—3
Spruce (black and white)	3	2—3
Thimbleberry	1/2—1	1—3
Tree of heaven (Ailanthus)	1—2	1—2
Wild roses	1/2—1	1—3
Willow	1/2—1	1—3
Yellow poplar	1/2—1	1—3

For low volume and ultra-low volume ground applications, mix 4 to 8 ounces of ESCORT® XP HERBICIDE per 100 gallons of spray solution.

#### Application Timing

Make a foliar application of the specified rate of ESCORT® XP HERBICIDE during the period from full leaf expansion in the spring until the development of full leaf coloration on deciduous species to be controlled. Coniferous species may be treated at anytime during the growing season.

#### Spot Treatment

ESCORT® XP HERBICIDE may be used for the control of many species of weeds including noxious/invasive weeds in certain established grasses growing on non-crop areas.

Refer to the "Weeds Controlled" section for a listing of susceptible weed species and the application rate per acre per the target weed.

Or, mix one gram of ESCORT® XP HERBICIDE per one gallon of water along with a surfactant. Spray to the point of wetting the entire surface of the target weeds, approximately 40 gallons of solution per acre.

#### Tank Mix Combinations—

ESCORT® XP HERBICIDE may be tank mixed with any product labeled for non-crop brush control at the application rates specified on the companion product's label for the pests specified on the product's companion label. Read and follow the label instructions of both products when tank mixing. Follow the most restrictive limitations of any of the product labels being tank mixed.

#### Low Rate Applications

##### Imazapyr (2 pound active per gallon)

Combine 1 to 2 ounces of ESCORT® XP HERBICIDE with 1 to 4 pints of imazapyr herbicide per acre and apply as a broadcast spray. For aerial applications use a minimum of 15 gallons per acre spray volume. In addition to species listed above controlled by ESCORT® XP HERBICIDE, this combination controls black gum, hophornbeam, sassafras, sweetgum, Vaccinium species, dogwood, myrtle dahoon, hickories, and persimmon.

##### Picloram\* (2 pound active per gallon) + Imazapyr (2 pound active per gallon)

Combine 1 to 1 1/2 ounce of ESCORT® XP HERBICIDE with 2 to 8 fluid ounces of imazapyr and 1 to 2 pints of picloram per 100 gallons of water. Apply as a high volume spray. This tank mix controls cherry, elms, box elder, maples, hackberry, redbud, ash, oaks (including shingle oak), black locust, and sassafras. \*Picloram is a restricted use pesticide.

#### Spotgun Basal Soil Treatment

For control of multiflora rose, prepare a spray suspension of ESCORT® XP HERBICIDE by mixing 1 ounce per gallon of water. Mix vigorously until the ESCORT® XP HERBICIDE is dispersed and agitate periodically while applying the spray suspension.

Apply the spray preparation with an exact delivery handgun applicator. Apply at the rate of 4 milliliters for each 2 feet of rose canopy diameter. Direct the treatment to the soil within 2 feet of the stem union. When treating large plants and more than one delivery is required, make applications on opposite sides of the plant.

For best results, make applications from early spring to summer.

#### IMPORTANT PRECAUTIONS

##### —NON-CROP BRUSH ONLY

- When using tank mixtures of ESCORT® XP HERBICIDE with companion herbicides, read and follow all use instructions, application rates, warnings, and precautions appearing on the labels. Follow the most restrictive label instructions for each of the herbicides used.

#### SPRAY EQUIPMENT

Low rates of ESCORT® XP HERBICIDE can kill or severely injure most crops. Following an ESCORT® XP HERBICIDE application, the use of spray equipment to apply other pesticides to crops on which ESCORT® XP HERBICIDE is not registered may result in their damage. The most effective way to reduce this crop damage potential is to use dedicated mixing and application equipment.

#### MIXING INSTRUCTIONS

1. Fill the tank 1/4 to 1/3 full of water.
2. While agitating, add the required amount of ESCORT® XP HERBICIDE.
3. Continue agitation until the ESCORT® XP HERBICIDE is fully dispersed, at least 5 minutes.
4. Once the ESCORT® XP HERBICIDE is fully dispersed, maintain agitation and continue filling tank with water. ESCORT® XP HERBICIDE must be thoroughly mixed with water before adding any other material.
5. As the tank is filling, add tank mix partners (if desired) then add the necessary volume of nonionic surfactant. Always add surfactant last.
6. If the mixture is not continuously agitated, settling will occur. If settling occurs, thoroughly re-agitate before using.
7. ESCORT® XP HERBICIDE spray preparations are stable if they are pH neutral or alkaline and stored at or below 100° F.
8. If ESCORT® XP HERBICIDE and a tank mix partner are to be applied in multiple loads, pre-slurry the ESCORT® XP HERBICIDE in clean water prior to adding to the tank. This will prevent the tank mix partner from interfering with the dissolution of the ESCORT® XP HERBICIDE.

#### PRODUCT PRECAUTIONS

- When used as directed, there is no grazing or haying restriction for use rates of 1 2/3 ounces per acre or less. At use rates greater than 1 2/3 ounces per acre and up to 3 1/3 ounces per acre, forage grasses may be cut for hay, fodder or green forage and fed to livestock, including lactating animals, 3 days after treatment.
- Injury to or loss of desirable trees or other plants may result if spray equipment is drained or flushed on or near these trees or plants, or on areas where their roots may extend, or in locations where the product may be washed or moved into contact with their roots.
- Treatment of powdery, dry soil or light, sandy soil when there is little likelihood of rainfall soon after treatment may result in off target movement and possible damage to susceptible crops when soil particles are moved by wind or water. Injury to crops may result if treated soil is washed, blown, or moved onto land used to produce crops. Exposure to ESCORT® XP HERBICIDE may injure or kill most crops. Injury may be more severe when the crops are irrigated. Do not apply ESCORT® XP HERBICIDE when these conditions are identified and powdery, dry soil or light or sandy soils are known to be prevalent in the area being treated.
- Applications made where runoff water flows onto agricultural land may injure crops. Applications made during periods of intense rainfall, to soils saturated with water, to surfaces paved with materials such as asphalt or concrete, or to soils through which rainfall will not readily penetrate may result in runoff and movement of ESCORT® XP HERBICIDE.
- Do not treat frozen or snow covered soil.
- Leave treated soil undisturbed to reduce the potential for ESCORT® XP HERBICIDE movement by soil erosion due to wind or water.

#### PRODUCT RESTRICTIONS

- Do not use on lawns, walks, driveways, tennis courts, or similar areas.
- Do not apply through any type of irrigation system.
- Do not use this product in the following counties of Colorado: Saguache, Rio Grande, Alamosa, Costilla and Conejos.
- Do not use this product in California.

#### SPRAYER CLEANUP

Spray equipment must be cleaned before ESCORT® XP HERBICIDE is sprayed. Follow the cleanup procedures specified on the labels of previously applied products. If no directions are provided, follow the six steps outlined below.

When multiple loads of ESCORT® XP HERBICIDE are applied, it is recommended that at the end of each day of spraying, the interior of the tank be rinsed with fresh water and then partially filled, and the boom and hoses flushed. This will prevent the buildup of dried pesticide deposits that can accumulate in the application equipment.

1. Drain tank; thoroughly rinse spray tanks, boom, and hoses with clean water. Loosen and physically remove any visible deposits.
2. Fill the tank with clean water and 1 gallon of ammonia (contains 3% active minimum) for every 100 gallons of water. Flush the hoses, boom, and nozzles with the cleaning solution. Then add more water to completely fill the tank. Circulate the cleaning solution through the tank and hoses for at least 15 minutes. Flush the hoses, boom, and nozzles again with the cleaning solution, and then drain the tank.
3. Remove the nozzles and screens and clean separately in a bucket containing cleaning agent and water.
4. Repeat step 2.

- Rinse the tank, boom, and hoses with clean water.
- Dispose of the rinsate on a labeled site or at an approved waste disposal facility. If a commercial cleaner is used follow the commercial cleaner directions for rinsate disposal.

**Notes:**

- Mixing chlorine bleach with ammonia can cause dangerous gases to form. Clean spray equipment outdoors.
- Use steam cleaning or other commercial cleaners to facilitate the removal of any caked pesticide deposits.
- When ESCORT® XP HERBICIDE is tank mixed with other pesticides, all cleanout procedures for each product must be examined and the most rigorous procedure must be followed.
- In addition to this cleanout procedure, all pre-cleanout guidelines on subsequently applied products must be followed as per the individual product labels.

**SPRAY DRIFT MANAGEMENT**

Aerial Applications:

- Do not release spray at a height greater than 10 ft above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser droplet size (ASABE S572.1).
- The boom length must not exceed 65% of the wingspan for airplanes or 75% of the rotor blade diameter for helicopters.
- Applicators must use ½ swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

Ground Boom Applications:

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or target vegetation unless making an industrial turf, pasture and rangeland applications, in which case applicators may apply with a nozzle height no more than 4 feet above the crop or target vegetation.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

Boom-less Ground Applications:

- Applicators are required to use a Medium or coarser droplet size (ASABE S572.1) for all applications.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

**SPRAY DRIFT ADVISORIES**

Boom-less Ground Applications:

- Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

Handheld Technology Applications:

- Take precautions to minimize spray drift.

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

**IMPORTANCE OF DROPLET SIZE**

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

**Controlling Droplet Size – Ground Boom**

- Volume** - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure** - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle** - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

**Controlling Droplet Size – Aircraft**

- Adjust Nozzles** - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

**BOOM HEIGHT – Ground Boom**

Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. For ground equipment, the boom should remain level with the crop and have minimal bounce.

**RELEASE HEIGHT - Aircraft**

Higher release heights increase the potential for spray drift. When applying aurally to crops, do not release spray at a height greater than 10 ft above the crop canopy, unless a greater application height is necessary for pilot safety.

**SHIELDED SPRAYERS**

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

**TEMPERATURE AND HUMIDITY**

When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

**TEMPERATURE INVERSIONS**

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.

**WIND**

Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS. Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

**AIR ASSISTED (AIR BLAST) FIELD CROP SPRAYERS**

Air assisted field crop sprayers carry droplets to the target via a downward directed air stream. Some may reduce the potential for drift, but if a sprayer is unsuitable for the application and/or set up improperly, high drift potential can result. It is the responsibility of the applicator to determine that a sprayer is suitable for the intended application, that it is configured properly, and that drift potential has been minimized.

Note: Air assisted field sprayers can affect product performance by affecting spray coverage and canopy penetration. Read the specific crop use and application equipment instructions to determine if an air assisted field crop sprayer can be used.

**SENSITIVE AREAS**

Making applications when there is a sustained wind moving away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is an effective way to minimize the effect of spray drift.

**DRIFT CONTROL ADDITIVES**

Using product compatible drift control additives can reduce drift potential. When a drift control additive is used, read and carefully observe cautionary statements and all other information on the additive's label. If using an additive that increases viscosity, ensure that the nozzles and other application equipment will function properly with a viscous spray solution. Preferred drift control additives have been certified by the Chemical Producers and Distributors Association (CPDA).

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage and disposal.

**Pesticide Storage:** Store product in original container only. Store in a cool, dry place.

**Pesticide Disposal:** Waste resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

**Container Handling:**

Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

**Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds):** Nonrefillable container. Do not reuse or refill this container.

Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Plastic and Metal Containers (Capacity Greater Than 50 Pounds):** Nonrefillable container. Do not reuse or refill this container. Triple

rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, for Plastic Containers,

offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Plastic and Metal Containers, e.g., Intermediate Bulk Containers (IBC) (Size or Shape Too Large to be Tipped, Rolled or Turned**

**Upside Down):** Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying the contents from this container into application equipment or mix tank and before final disposal using the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions

(continued)

## STORAGE AND DISPOSAL *(continued)*

are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Paper or Plastic Bags, Fiber Sacks including Flexible Intermediate Bulk Containers (FIBC) or Fiber Drums With Liners:** Nonrefillable container. Do not reuse or refill this container. Completely empty paper or plastic bag, fiber sack or drum liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer for recycling if available or dispose of empty paper or plastic bag, fiber sack or fiber drum and liner in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances.

**Refillable Fiber Drums With Liners:** Refillable container (fiber drum only). Refilling Fiber Drum: Refill this fiber drum with ESCORT® XP HERBICIDE containing metsulfuron methyl only. Do not reuse this fiber drum for any other purpose. Cleaning before refilling is the responsibility of the refiller. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Disposing of Fiber Drum and/or Liner: Do not reuse this fiber drum for any other purpose other than refilling (see preceding). Cleaning the container (liner and/or fiber drum) before final disposal is the responsibility of the person disposing of the container. Offer the liner for recycling if available or dispose of liner in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. If drum is contaminated and cannot be reused, dispose of it in the manner required for its liner. To clean the fiber drum before final disposal, completely empty the fiber drum by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer the fiber drum for recycling if available or dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances.

**All Other Refillable Containers:** Refillable container. Refilling Container: Refill this container with ESCORT® XP HERBICIDE containing metsulfuron methyl only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn out threads and closure devices. If damage is found, do not use the container, contact BAYER CROPSCIENCE LP at the number below for instructions. Check for leaks after refilling and before transporting. If leaks are found, do not reuse or transport container, contact BAYER CROPSCIENCE LP at the number below for instructions. Disposing of Container: Do not reuse this container for any other purpose other than refilling (see preceding). Cleaning the container before final disposal is the responsibility of the person disposing of the container. To clean the container before final disposal, use the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour, or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Outer Foil Pouches of Water Soluble Packets (WSP):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or, dispose of the empty outer foil pouch in the trash as long as WSP is unbroken. If the outer pouch contacts the formulated product in any way, the pouch must be triple rinsed with clean water. Add the rinsate to the spray tank and dispose of the outer pouch as described previously.

Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, or in the event of a major spill, fire or other emergency, contact BAYER CROPSCIENCE LP at 1-800-334-7577, day or night.

Bayer (reg'd), the Bayer Cross (reg'd), ESCORT® and Oust® are registered trademarks of Bayer. Velpar® is a registered trademark of Tessenderlo Kerley, Inc. used under license by Bayer. Embark is a registered trademark of PBI Gordon Corporation.

### CONDITIONS OF SALE AND LIMITATIONS OF WARRANTY AND LIABILITY

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness, plant injury, other property damage, as well as other unintended consequences may result because of factors beyond the control of Bayer CropScience LP. Those factors include, but are not limited to, weather conditions, presence of other materials or the manner of use or application. All such risks shall be assumed by the user or buyer.

**DISCLAIMER OF WARRANTIES:** TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, THAT EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of Bayer CropScience LP is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP DISCLAIMS ANY LIABILITY WHATSOEVER FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

**LIMITATIONS OF LIABILITY:** TO THE EXTENT CONSISTENT WITH APPLICABLE LAW THE EXCLUSIVE REMEDY OF THE USER OR BUYER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE PAID, OR AT BAYER CROPSCIENCE LP'S ELECTION, THE REPLACEMENT OF PRODUCT.

For product information call: 1-800-331-2867

DO NOT USE PLANT MATERIAL TREATED WITH METHOD® 240SL HERBICIDE FOR MULCH OR COMPOST

RESPONDENT'S EXHIBIT  
9



# Method® 240SL

## HERBICIDE

Soluble Liquid  
For Non-Crop Use

<b>ACTIVE INGREDIENT:</b>	By Weight
Potassium salt of aminocyclopyrachlor	
Potassium salt of 6-amino-5-chloro-2-cyclopropyl-4-pyrimidinecarboxylic acid*	25%
<b>OTHER INGREDIENTS:</b>	75%
<b>TOTAL:</b>	100%

\*Acid Equivalent: 6-Amino-5-chloro-2-cyclopropyl-4-pyrimidinecarboxylic acid  
- 2 pounds acid per gallon or 21.2%

EPA Reg. No. 432-1565

**KEEP OUT OF REACH  
OF CHILDREN  
CAUTION**

Not for sale, sale into, distribution, and/or use in Nassau and Suffolk counties of New York State. Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

See Back Panel for First Aid Instructions and Booklet for Complete Precautionary Statements and Directions for Use.

Nonrefillable Container  
Net Contents  
**2.5 Gallons**  
**84099295**  
84942561D 200928AV1

## FIRST AID

<b>If in eyes:</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
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Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-334-7577 for emergency medical treatment information.

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### CAUTION

Causes moderate eye irritation. Avoid contact with eyes or clothing. Mixers, loaders, and applicators must wear long-sleeved shirt and long pants, shoes plus socks. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

#### ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

#### Surface Water Advisory

This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for several months after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of aminocyclopyrachlor from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours.

#### Ground Water Advisory

Aminocyclopyrachlor has properties and characteristics associated with chemicals detected in ground water. This chemical may leach into ground water if used in areas where soils are permeable, particularly where the water table is shallow.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

METHOD® 240SL HERBICIDE must be used only in accordance with directions on this label or in separately published BAYER CROPS SCIENCE LP directions.

BAYER CROPS SCIENCE LP will not be responsible for losses or damages resulting from the use of this product in any manner not specifically directed by BAYER CROPS SCIENCE LP. User assumes all risks associated with such non-directed use.

METHOD 240SL HERBICIDE contains aminocyclopyrachlor. When applied alone or in combination with other products containing aminocyclopyrachlor, do not apply more than a total of 0.28 lb ae of active ingredient per acre per year.

### PRODUCT INFORMATION

METHOD 240SL HERBICIDE is a soluble liquid that is mixed in water and applied as a spray. METHOD 240SL HERBICIDE may be applied by aerial or ground equipment for control of broadleaf weeds and woody species, including many terrestrial and riparian invasive and noxious weeds. METHOD 240SL HERBICIDE is registered for weed and brush control on private, public, and military lands as follows: non-crop areas such as airports, highways/roadsides, railroad, pipeline and utility rights-of-way, sewage disposal areas, industrial areas, such as electrical substations, rail yards or other industrial rock areas, farmyards, fuel storage areas, fence rows, non-irrigation ditch banks, barrier strips, lumberyards, pumping stations and tank farms, restoration areas, natural areas, wildlife management areas, wildlife openings, and wildlife habitats. METHOD 240SL HERBICIDE may be used for the release or restoration of native perennial grasses and in established industrial turf grasses.

This product may be applied to terrestrial non-crop sites and unimproved turf sites that contain areas of temporary surface water, caused by collection of water in equipment ruts or in other depressions created by management activities. It is permissible to treat intermittently flooded low lying sites, seasonally dry flood plains, and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps, and bogs after water has receded, as well as seasonally dry flood deltas. METHOD 240SL HERBICIDE may be applied up to the water's edge. Do not apply directly to water and take precautions to minimize overspray to open water when treating vegetation near the water's edge.

METHOD 240SL HERBICIDE provides preemergence and/or postemergence control of the broadleaf weeds, vines, and brush species listed in the WEEDS CONTROLLED section of the label. For perennial species on the label, a postemergence application should be used. For best postemergence performance, a methylated seed oil (MSO) adjuvant should be included to the spray solution. Excessive wetting of the target plant is not necessary but good spray coverage of the target plant is needed for best results. Weeds hardened off by cold weather or drought stress may not be controlled.

METHOD 240SL HERBICIDE is non-corrosive to spray equipment.

### BIOLOGICAL ACTIVITY

METHOD 240SL HERBICIDE is quickly taken up by the leaves, stems, and roots of plants. The effects of METHOD 240SL HERBICIDE may be seen on plants from within a few hours to a few days. The most noticeable symptom is a bending and twisting of stems and leaves. Other advanced symptoms include severe necrosis, stem thickening, growth stunting, leaf crinkling, calloused stems and leaf veins, leaf-cupping, and enlarged roots. Death of treated broadleaf plants may require several more weeks and up to several months for some woody plant species. METHOD 240SL HERBICIDE is rain-fast at 1 hour after application.

### IMPORTANT RESTRICTIONS

- Do not apply METHOD 240SL HERBICIDE within the root zone of desirable trees and/or shrubs unless injury or loss can be tolerated. Root zones of desirable trees/shrubs may extend beyond the tree canopy.
- Do not apply this product if site-specific characteristics and conditions exist that could contribute to movement and unintended root zone exposure to desirable trees or vegetation, unless injury or loss can be tolerated.
- Do not make applications when circumstances favor movement from treatment site.
- Do not apply METHOD 240SL HERBICIDE to highways/roadsides or other non-crop areas during periods of intense rainfall or where prevailing soils are either saturated with water or of a type through which rainfall will not readily penetrate, as this may result in off-site movement.
- Do not apply or otherwise permit this product or sprays containing this product to come into contact with any non-target crop or desirable vegetation.
- Do not apply in or on dry or water containing irrigation ditches or canals including their outer banks.
- Do not apply through any type of irrigation system.
- Do not contaminate water intended for irrigation. To avoid injury to crops or other desirable vegetation, do not treat or allow spray drift or run-off to fall onto banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water

that may be used for irrigation purposes.

- Do not apply METHOD 240SL HERBICIDE when powdery dry soil or light or sandy soils are known to be prevalent in the area to be treated. Treatment of powdery dry soil and light sandy soils, when there is little likelihood of rainfall soon after treatment, may result in off target movement and possible damage to susceptible crops and desirable vegetation when soil particles are moved by wind or water. Injury to crops or desirable vegetation may result if treated soil is washed, blown, or moved onto land used to produce crops or land containing desirable vegetation.
- Do not apply when the soil is frozen or covered with snow.
- Do not use on lawns, walks, paved driveways, tennis courts, or similar areas.
- Do not apply more than 18 fluid ounces (0.28 pound ae) per acre per year.
- Do not graze or feed forage, hay, or straw from treated areas to livestock.
- Do not use plant material treated with this product for mulch or compost.
- Do not plant the treated sites for at least one year after the METHOD 240SL HERBICIDE application if non-crop sites treated with METHOD 240SL HERBICIDE are to be converted to a food, feed, or fiber agricultural crop, or to a horticultural crop. A field bioassay must then be completed before planting the desired crop.

### **IMPORTANT PRECAUTIONS**

- Certain species, in particular, may be sensitive to low levels of METHOD 240SL HERBICIDE including but not limited to conifers (such as Douglas fir, Norway spruce, ponderosa pine and white pine), deciduous trees (such as aspen, Chinese tallow, cottonwood, honey locust, magnolia, poplar species, redbud, silver maple, and willow species), and ornamental shrubs (such as arborvitae, burning bush, crape myrtle, forsythia, hydrangea, ice plant, magnolia, purple plum, and yew).
- Injury or loss of desirable trees or vegetation may result if METHOD 240SL HERBICIDE is applied on or near desirable trees or vegetation, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. Consider site-specific characteristics and conditions that could contribute to unintended root zone exposure to desirable trees or vegetation. Root zone areas of desirable trees or vegetation are affected by local conditions and can extend beyond the tree canopy. If further information is needed regarding root zone area, consult appropriate state extension service, professional consultant, or other qualified authority.
- Injury to or loss of desirable trees or vegetation may result if equipment is drained or flushed on or near these trees or vegetation or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- In non-crop areas adjacent to desirable vegetation, avoid overlapping spray applications and shut off spray to the spray boom while starting, turning, slowing, or stopping to avoid injury to desirable vegetation.
- Applications made where runoff water flows onto agricultural land may injure or kill crops such as, but not limited to, sugar beets, potatoes, tomatoes, tobacco, soybeans, field beans, alfalfa, grapes, peaches, almonds, and vegetables.
- Applications should be made only when there is little or no hazard from spray drift. Very small quantities of spray, which may not be visible, may seriously injure susceptible plants.
- Exposure to METHOD 240SL HERBICIDE may injure or kill most crops and may injure or kill desirable vegetation. Injury may be more severe when the crops or desirable vegetation are irrigated.
- Caution is advised when using this product in areas where loss of desirable conifer or deciduous trees and/or shrubs, as well as other broadleaf plants, including but not limited to legumes and wild flowers, cannot be tolerated. Without prior experience, it is necessary that small areas containing these plants be tested for tolerance to METHOD 240SL HERBICIDE and its soil residues before any large scale spraying occurs.
- Low rates of METHOD 240SL HERBICIDE can kill or severely injure most crops. Following a METHOD 240SL HERBICIDE application, the use of spray equipment to apply other pesticides to crops on which METHOD 240SL HERBICIDE is not registered may result in their damage. The most effective way to reduce this crop damage potential is to use dedicated mixing and application equipment.
- Leave treated soil undisturbed to reduce the potential for METHOD 240SL HERBICIDE movement by soil erosion due to wind or water.
- In the case of suspected off-site movement of METHOD 240SL HERBICIDE to cropland, soil samples should be quantitatively analyzed for METHOD 240SL HERBICIDE, or any other herbicide which could be having an adverse effect on the crop, in addition to conducting the field bioassay.
- METHOD 240SL HERBICIDE may suppress or severely injure certain established grasses, such as some brome grass and wheat grass species, especially when the grass plants are stressed by adverse environmental conditions. Areas that contain these grass plants should recover as environmental conditions for good grass growth occur.

### **FIELD BIOASSAY**

To conduct a field bioassay, grow to maturity test strips of the crop you plan to grow the following year. The test strips should cross the entire field including knolls and low areas. Crop response to the field bioassay will indicate whether or not to plant the crops grown in the test strips. If no crop injury (such as, poor germination, stunting, or chlorosis, malformation, or necrosis of leaves) or yield loss is evident from the crops grown in the test strips, the intended rotational crop may be planted. If herbicide symptoms or yield loss is observed, do not plant the crop.

### **TANK MIXTURES**

METHOD 240SL HERBICIDE may be tank mixed with other herbicides which are registered for the same use sites, methods of application, and timings as specified on this product label. Refer to the tank mix product label for any additional instructions or use restrictions. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. In addition, a spray adjuvant may be mixed with METHOD 240SL HERBICIDE when making postemergence applications. Refer to the adjuvant label for additional instructions or use restrictions.

### **ADJUVANTS**

**Methylated Seed Oils and Vegetable Oils:** A methylated seed oil (MSO) or vegetable oil based adjuvant may provide increased leaf absorption of METHOD 240SL HERBICIDE. Include the MSO or vegetable oil adjuvant at 1% v/v (1 gallon per 100 gallons of spray solution).

**Non-ionic Surfactants:** Use a non-ionic surfactant at a minimum rate of 0.25% v/v (1 quart surfactant per 100 gallons of spray solution). Surfactant products must contain at least 70% non-ionic surfactant.

**Invert Emulsions:** METHOD 240SL HERBICIDE may be applied as an invert emulsion. The spray solution results in an invert (water- in- oil) spray emulsion designed to minimize spray drift and spray run-off, resulting in more herbicide deposited on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

### **INVASIVE SPECIES MANAGEMENT**

This product may be used on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants. Effective EDRR systems address invasions by eradicating the invader

where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is recommended, a Rapid Response needs to be taken to quickly contain, deny reproduction, and, if possible, eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response provisions and allowed treatments in your area.

#### **HERBICIDE RESISTANCE MANAGEMENT**

Method 240SL contains aminocyclopyrachlor, a Group 4 Herbicide. Some naturally occurring weed biotypes that are resistant to aminocyclopyrachlor may exist due to genetic variability in a weed population. When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species, naturally-occurring resistant biotypes may survive, propagate, and become dominant in that area. Adequate control of these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action. Weed escapes that are allowed to go to seed will promote the spread of resistant biotypes.

To better manage herbicide resistance through delaying the proliferation and possible dominance of herbicide resistant weed biotypes, it is important to implement a diversified weed control strategy that includes the use of multiple herbicides with different sites of action in either tank-mix or sequential application. Also, incorporate non-chemical weed control practices where practical.

Report any incidence of non-performance of this product against a particular weed species to a Bayer representative or contact 1-800-331-2867. It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for further guidance on specific alternative cultural practices or herbicide recommendations in your area.

#### **INTEGRATED PEST MANAGEMENT**

This product may be used as part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants, or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

#### **APPLICATION INFORMATION**

METHOD 240SL HERBICIDE may be applied using low and high volume ground spray equipment, fixed-wing aircraft, or by helicopter. When applying by fixed-wing aircraft or helicopter, follow directions under the AERIAL APPLICATIONS section of this label; otherwise refer to GROUND APPLICATIONS section of this label.

For control of broadleaf weeds, woody plants, and vines, use METHOD 240SL HERBICIDE at rates of 4-18 fluid ounces per acre per year (0.063-0.28 lb ae/A/year). Refer to the WEEDS CONTROLLED table for specific rate information. Spray volumes should be selected in order to provide uniform and complete coverage of the target plants or application sites. Care should be taken to avoid runoff from all applications. For postemergence applications, include either a MSO or vegetable oil or a non-ionic surfactant as described in the ADJUVANTS section of this label.

**Invert Emulsions:** METHOD 240SL HERBICIDE may be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray run-off, resulting in more herbicide deposited on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

#### **SPRAY EQUIPMENT**

Be sure the sprayer is calibrated before use. Use a sufficient volume of water that will deliver a uniform spray pattern and coverage of the target brush or weeds.

The selected sprayer should be equipped with an agitation system to help keep METHOD 240SL HERBICIDE suspended in the spray tank. **Note:** Low rates of METHOD 240SL HERBICIDE can kill or severely injure most crops. Following an METHOD 240SL HERBICIDE application, the use of spray equipment to apply other pesticides to crops on which METHOD 240SL HERBICIDE is not registered may result in their damage.

#### **MIXING INSTRUCTIONS**

1. Fill the tank 1/3 to 1/2 full of water.
2. While agitating, add the required amount of METHOD 240SL HERBICIDE.
3. Continue agitation until the METHOD 240SL HERBICIDE is fully dispersed, at least 5 minutes.
4. Once the METHOD 240SL HERBICIDE is fully dispersed, maintain agitation and continue filling tank with water. METHOD 240SL HERBICIDE should be thoroughly mixed with water before adding any other material.
5. As the tank is filling, add tank mix partners (if desired) and then add the necessary volume of spray adjuvants. Always add spray adjuvants last.
6. If the mixture is not continuously agitated, settling will occur. If settling occurs, thoroughly re-agitate before using.
7. Apply METHOD 240SL HERBICIDE spray mixture within 24 hours of mixing to avoid product degradation.

#### **SPRAYER CLEANUP**

The spray equipment must be cleaned before METHOD 240SL HERBICIDE is sprayed. Follow the cleanup procedures specified on the labels of the previously applied products.

#### **AT THE END OF THE DAY**

It is recommended that, during periods when multiple loads of METHOD 240SL HERBICIDE are applied, at the end of each day of spraying the interior of the tank should be rinsed with fresh water and then partially filled and the boom and hoses flushed.

This will prevent the buildup of dried pesticide deposits which can accumulate in the application equipment.

1. Empty the tank and drain the sump completely.
2. Spray the tank walls with clean water using a minimum volume of 10% of the tank volume. Circulate the water through the lines, including all by-pass lines, for at least two minutes. Flush the boom well and empty the sprayer. Completely drain the sump.
3. Repeat step 2.
4. Remove the nozzles and screens and clean separately in a bucket containing water. The rinsate solution may be applied to the non-crop sites listed on this label. Do not exceed the maximum labeled use rate. If cleaners are used, consult the cleaner label for rinsate disposal instructions. If no instructions are given, dispose of the rinsate on site or at an approved waste disposal facility.

#### **Notes:**

1. Always start with a clean spray tank.
2. Steam-cleaning aerial spray tanks is recommended to facilitate the removal of any caked deposits.
3. When METHOD 240SL HERBICIDE is tank mixed with other pesticides, all cleanup procedures for each product should be examined, and the most rigorous procedure should be followed.
4. In addition to this cleanout procedure, all pre-cleanout guidelines on subsequently applied products should be followed as per the individual labels.
5. Low rates of METHOD 240SL HERBICIDE can kill or severely injure most crops. Following a METHOD 240SL HERBICIDE application, the use of spray equipment to apply other pesticides to crops on which METHOD 240SL HERBICIDE or its active ingredients are not

registered may result in their damage. The most effective way to reduce this crop damage potential is to use dedicated mixing and application equipment.

### **SPRAY DRIFT MANAGEMENT**

The interaction of many equipment and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all these factors when making application decisions.

AVOIDING SPRAY DRIFT IS THE RESPONSIBILITY OF THE APPLICATOR.

### **IMPORTANCE OF DROPLET SIZE**

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. The presence of sensitive species nearby, the environmental conditions, and pest pressure may affect how an applicator balances drift control and coverage. **APPLYING LARGER DROPLETS REDUCES DRIFT POTENTIAL, BUT WILL NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS!** See Wind, Temperature and Humidity, and Temperature Inversions sections of this label.

### **CONTROLLING DROPLET SIZE - GENERAL TECHNIQUES**

- Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure - Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. **WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER-CAPACITY NOZZLE INSTEAD OF INCREASING PRESSURE.**
- Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles.

### **CONTROLLING DROPLET SIZE - AIRCRAFT**

- Number of Nozzles - Use the minimum number of nozzles with the highest flow rate that provide uniform coverage.
- Nozzle Orientation - Orienting nozzles so that the spray is emitted backwards, parallel to the air stream will produce larger droplets than other orientations.
- Nozzle Type - Solid stream nozzles (such as disc and core with swirl plate removed) oriented straight back produce larger droplets than other nozzle types.
- Boom Length - The boom length should not exceed 3/4 of the wing or rotor length - longer booms increase drift potential.
- Application Height - Application more than 10 ft above the canopy increases the potential for spray drift.

### **BOOM HEIGHT**

Setting the boom at the lowest labeled height (if specified) that provides uniform coverage reduces the exposure of droplets to evaporation and wind. For ground equipment, the boom should remain level with the crop and have minimal bounce.

### **WIND**

Drift potential increases at wind speeds of less than 3 mph (due to inversion potential) or more than 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given wind speed. **AVOID GUSTY OR WINDLESS CONDITIONS.** Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

### **TEMPERATURE AND HUMIDITY**

When making applications in hot and dry conditions, set up equipment to produce larger droplets to reduce effects of evaporation.

### **SURFACE TEMPERATURE INVERSIONS**

Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind.

They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

### **SHIELDED SPRAYERS**

Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are preventing drift and not interfering with uniform deposition of the product.

### **SENSITIVE AREAS**

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

### **DRIFT CONTROL ADDITIVES**

Drift control additives may be used with all spray equipment with the exception of controlled droplet applicators. When a drift control additive is used, read and carefully observe cautionary statements and all other information on the label. It is recommended that drift control additives be certified by the Chemical Producers and Distributors Association (CPDA).

### **AERIAL APPLICATIONS**

When applying by air, apply only using nozzles which will deliver coarse or greater (VMD >350 microns) droplets as defined by ASABE S572 standard. Do not release spray at a height greater than 10 feet above the ground or canopy unless a greater height is required for aircraft safety. Do not apply when wind speed is greater than 10 mph. Do not apply during a temperature inversion.

For aerial applications near susceptible crops or other desirable plants, use a drift control additive as recommended by the manufacturer, or apply through a "Microfoil" or "Thru-Valve" boom, or use an equivalent drift control system. Thickened sprays prepared by using high viscosity invert systems, or other drift control systems, may be utilized if drift control is comparable to that obtained with drift control additives or the "Thru-Valve" boom. If a spray thickening agent is used, follow all recommendations and precautions on the product label. Do not use a thickening agent with the "Microfoil" boom or other systems that cannot accommodate thick sprays.

METHOD 240SL HERBICIDE may be applied by either fixed-wing aircraft or helicopter spray equipment. Fixed-wing aircraft and helicopters can be used to apply METHOD 240SL HERBICIDE; however, do not make applications by fixed-wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area or, when treating open tracts of land, spray drift as a result of fixed wing aircraft application can be tolerated.

The application volume required will vary with the height and density of the brush and the application equipment used.

Generally, aerial applications will require 15 to 25 gallons of spray solution per acre.

Regardless of the application volume or spray equipment used, thorough coverage of the foliage is necessary to optimize control results.

All precautions and restrictions should be taken to minimize or eliminate spray drift.

## GROUND APPLICATIONS BROADCAST

When making a broadcast application by ground, apply only using nozzles which will deliver coarse or greater (VMD >350 microns) droplets as defined by ASABE S572 standard. Do not apply with a nozzle height greater than 4 feet above the ground or canopy unless necessitated by the application equipment. Apply with the spray boom or nozzle height as low as possible. Do not apply when wind speed is greater than 10 mph. Apply 10 gallons or more of spray per acre; use spray pressures no greater than are required to obtain adequate coverage. The use of drift control additives, shielded sprayers, or other drift control systems can help minimize spray drift. Do not apply during a temperature inversion.

## LOW-VOLUME FOLIAR APPLICATION

For low-volume applications, see Table 1 for use rate and mixing instructions. The rate of METHOD 240SL HERBICIDE should be adjusted according to the spray volume per acre and the size and plant density of the target brush species. Refer to the WEEDS CONTROLLED section for application rates. For best results, include a MSO adjuvant at the rate of 1% v/v. Good plant coverage is necessary for best results. Use spray nozzles and pressure that will aid the proper deposition of the spray solution. Apply in sufficient spray volume to help provide uniform spray distribution of spray particles over the area to be treated and to avoid spray drift. Generally, low volume ground applications will require 10 to 25 gallons per acre. The use of an even flat fan tip with a spray angle of 40 degrees or less, such as 4004 or 1504, will aid in proper spray deposition. In addition, cone or straight stream nozzles, such as the 5500 X3 or the 5500 X5 may be used. Use the higher rates for hard to control brush species. Do not apply more than 18 fluid ounces of METHOD 240SL HERBICIDE per acre per year.

Total Spray Volume	Method 240 SL rate per acre (fluid ounces)			
	4	8	12	18
Gallons per acre	Method 240 SL rate per 100 gallons of spray solution (fluid ounces)			
400	1	2	3	4.5
200	2	4	6	9
100	4	8	12	18
50	8	16	24	36
40	10	20	30	45
20	20	40	60	90
10	40	80	120	180

## HIGH VOLUME FOLIAR APPLICATION

For high-volume applications, see Table 1 for use rate and mixing instructions. Use the higher rates for hard to control brush species. Refer to the WEEDS CONTROLLED section for application rates. Higher spray volumes may be required for sites with high density brush. Generally, high volume ground applications will require 100 to 400 gallons per acre. Use sufficient spray volume to thoroughly and uniformly wet foliage and stems but don't over apply causing excessive run-off. The spray solution should reach the crown of the plants and trickle down into the canopy.

Do not apply more than 18 fluid ounces of METHOD 240SL HERBICIDE per acre per year.

## INDIVIDUAL PLANT TREATMENTS (IPT)

Apply METHOD 240SL HERBICIDE utilizing an application method which targets individual woody species including foliar applications, cut stump and stem treatments, injection or hack and squirt, or basal bark treatments.

## FOLIAR

The total spray volume should be adjusted according to the size and density of the target plant species. Where taller/denser vegetation is present, higher spray volumes may be necessary to ensure good coverage. Refer to the WEEDS CONTROLLED section of the label for specific use rate information. For best results include a MSO-type adjuvant at the rate of 1% v/v. Refer to Table 1 for mixing instructions. Spray the vegetation starting at the top and covering the sides. Ensure complete coverage of the plant for best results. Avoid spraying to the point of excessive runoff as injury to desirable species or ground cover may occur. Refer to Low and High – Volume Foliar Application sections above for application use directions and rates.

## CUT STUMP/ STEM TREATMENTS

Make a dilute solution by mixing 5 to 10 gallons of METHOD 240SL HERBICIDE in enough basal oil to make 100 gallons of spray mixture, or equivalent ratio. Some basal oils may be incompatible with METHOD 240SL HERBICIDE causing a precipitant to form. Test for compatibility by adding METHOD 240SL HERBICIDE to a small quantity of desired basal oil at the proper ratio, allow to stand for 30 minutes and check for physical incompatibility or precipitates. The addition of an emulsifier may be needed to ensure compatibility. Apply with a sprayer using low pressure and solid cone or flat fan nozzles. Spray the cut surface soon after cutting, thoroughly wetting the cambium layer next to the bark. On larger trees, treat only the outer 2-3 inches of the stump. On trees 3 inches or less in diameter treat the entire cut surface. In addition to the cut surface, treat the sides of the stump/stem and the root collar area to prevent resprouting. Apply anytime except when snow or water prevents treating to the ground line of the stump. Moisture stress may affect optimum control.

## INJECTION OR HACK AND SQUIRT

Inject or use a hatchet, machetes, or similar equipment to make downward cuts into the cambium (inner bark) of the stem in such a way as to make a "pocket" large enough to retain the applied solution. Cuts/injections may be made at a height convenient to the applicator. Make one cut/injection for every 2 inches of diameter at breast height (DBH) on the target stem. For example, an 8-inch DBH stem would require 4 cuts. Cuts should be made at equal intervals around the tree. Spray ½ - 1 milliliter (mL) of undiluted METHOD 240SL HERBICIDE into each cut.

## BASAL BARK TREATMENTS

Make a dilute solution by mixing 5 to 10 gallons of METHOD 240SL HERBICIDE in enough basal oil to make 100 gallons of spray mixture, or equivalent ratio. Some basal oils may be incompatible with METHOD 240SL HERBICIDE causing a precipitant to form. Test for compatibility by adding METHOD 240SL HERBICIDE to a small quantity of desired basal oil at the proper ratio, allow to stand for 30 minutes and check for physical incompatibility or precipitates. The addition of an emulsifier may be needed to ensure compatibility. Apply with a sprayer using low pressure and solid cone or narrow flat fan nozzles. Make applications to susceptible brush or tree species with stems less than 6 inches in basal diameter. Thoroughly wet the lower 12 to 18 inches of the trunk or stem (from ground line). Treat until run-off at the ground line is noticeable. Brush or trees with old or rough bark will require more spray solution than smooth young bark. Applications can be made anytime of the year except when snow or water prevents treating to the ground line of the brush or tree trunk.

## SPECIFIC USE DIRECTIONS CUT STUBBLE TREATMENTS

For the prevention of re-sprouting, after hand cutting or mechanical mowing of susceptible brush species along rights-of-way and other non-crop sites, apply a broadcast application of METHOD 240SL HERBICIDE up to 18 fluid ounces product per acre. Apply in a minimum of 20 gallons of water per acre. Make applications soon after cutting. The addition of a penetrating agent at 5% V/V or more can aid in uptake through the bark or exposed roots of the cut brush. For best results, make applications before or during periods of active root growth. Do not apply when the soil is frozen or covered by standing water or snow.

## BAREGROUND

METHOD 240SL HERBICIDE may be used in non-crop sites for bareground (total vegetation control) weed control. Preemergence or postemergence applications of METHOD 240SL HERBICIDE provide control of many annual and perennial broadleaf weeds. Apply at up to 18 fluid ounces product per acre in tank mixes with other products registered for use on bareground sites. Consult the manufacturer's labels for specific rates, weeds controlled, and use restrictions.

Make a thorough and uniform application with calibrated spray equipment per label directions. Apply at any time of the year. Use the higher rates of METHOD 240SL HERBICIDE for fall applications and in previously untreated areas or areas with high weed infestations. For postemergence applications always include a spray adjuvant. For faster brown-out or burn down results, add glyphosate or similar products to the tank. For added residual weed control, or to broaden the weed control spectrum, tank mix with other residual products registered for use on bareground sites. The level and length of control will depend on the herbicide rate applied, amount of rainfall, soil texture, and environmental and applications conditions.

## UNIMPROVED TURFGRASS

METHOD 240SL HERBICIDE may be used in non-crop industrial sites, such as utility rights-of-way and highways/roadsides, for general weed control in established industrial turf grasses. Apply METHOD 240SL HERBICIDE at rates of 4-18 fluid ounces product per acre. Rates exceeding 8 fluid ounces product per acre may result in unacceptable injury to desirable turfgrasses. Treatments made prior to the full green-up stage may delay green-up. Apply METHOD 240SL HERBICIDE by ground equipment only. Use a minimum of 10 gallons of water per acre. The addition of a MSO adjuvant may increase the potential for turf grass injury.

For species not listed below, determine the tolerance of the turfgrass by treating a small area at the desired application rate. Prior to treatment of larger areas, the treated area must be observed for any signs of herbicidal injury during 30 days of normal growing conditions to determine if the treatment is safe to the target species. The user assumes the responsibility for any plant damage or other liability resulting from use of METHO 240SL HERBICIDE on a turfgrass species not listed on this label.

TURFGRASS TYPE	APPLICATION RATE (FLUID OUNCES/ACRE)
Bermudagrass	4 to 8
Bahiagrass	4 to 8
Bluegrass, Kentucky	4 to 8
Tall Fescue	4 to 8
Ryegrass, perennial	4 to 8
Wheatgrass species <sup>1</sup>	4 to 7.5
Smooth brome <sup>1</sup>	4 to 7.5

<sup>1</sup> Injury from higher rates during the season of application may be severe.

Important: Temporary chlorosis (yellowing), reddening, stunting, droopy or twisted grass leaves, and seed head suppression may occur. Do not apply METHOD 240SL HERBICIDE until the grass becomes well established. Do not apply METHOD 240SL HERBICIDE to grass under stress from disease, insects, drought, or other environmental conditions.

## RESTORATION AREAS

METHOD 240SL HERBICIDE is labeled for the control of broadleaf weeds and brush, listed in the WEEDS CONTROLLED section, in areas as follows: non-crop areas such as airports, highways/roadsides, railroad, pipeline and utility rights-of-way, sewage disposal areas, industrial areas, such as electrical substations, rail yards or other industrial rock areas, farmyards, fuel storage areas, fence rows, non-irrigation ditch banks, barrier strips, lumberyards, pumping stations and tank farms, restoration areas, natural areas, wildlife management areas, wildlife openings, and wildlife habitats in unimproved industrial turf, on roadsides, airports, industrial sites, or on other similar non-crop sites in order to establish or release desirable introduced or native perennial grass species for site stabilization.

To maximize and extend the weed and brush control provided by METHOD 240SL HERBICIDE, it is critical that other vegetation management practices, including mowing, fertilization, etc., be incorporated into the restoration program to help extend or build on the weed control benefits and promote the growth of introduced or established grasses and/or desirable plants or plant communities.

Unacceptable injury may occur if METHOD 240SL HERBICIDE is applied before the introduced or native perennial grasses are well established. The grass must have a good secondary root system and show good vigor. METHOD 240SL HERBICIDE may suppress certain established grasses especially when the grass plants are stressed by adverse environmental conditions. Temporary reddening, stunting, droopy or twisted leaves may occur. Do not apply METHOD 240SL HERBICIDE to grass under stress from disease, insects, drought, or other environmental causes.

Apply METHOD 240SL HERBICIDE in the fall, before the soil freezes, or in the spring after the soil thaws. When applied at lower rates, METHOD 240SL HERBICIDE provides short-term control of weeds listed; when applied at higher rates, weed control spectrum is broadened and extended. Do not apply when the soil is frozen.

## WEEDS CONTROLLED

Use the higher spray volumes and herbicide rates for heavy weed and brush infestations, hard to control species, and tall brush or dense hardwood canopies. Do not apply more than 18 fluid ounces product broadcast per acre per year.

BROADLEAF WEEDS		Rate (fluid ounces per acre)
Bitter sneezeweed <sup>3</sup>	<i>Helenium amarum</i>	4 to 8
Clover, bush	<i>Lespedeza</i> sp.	
Clover, Dutch (white)	<i>Trifolium repens</i>	
Clover, large hop <sup>3</sup>	<i>Trifolium campestre</i>	
Croton, woolly <sup>3</sup>	<i>Croton capitatus</i>	
Dandelion, common	<i>Taraxacum officinale</i>	
Dogfennel <sup>3</sup>	<i>Eupatorium capillifolium</i>	
Henbit <sup>3</sup>	<i>Lamium amplexicaule</i>	
Ironweed, tall	<i>Vernonia gigantea</i>	
Lambsquarters, common <sup>3</sup>	<i>Chenopodium album</i>	

continued

**WEEDS CONTROLLED** (continued)

Use the higher spray volumes and herbicide rates for heavy weed and brush infestations, hard to control species, and tall brush or dense hardwood canopies. Do not apply more than 18 fluid ounces product broadcast per acre per year.

**BROADLEAF WEEDS**

**Rate (fluid ounces per acre)**

Lespedeza, common <sup>3</sup>	<i>Kummerowia striata</i>	
Lespedeza, hairy <sup>3</sup>	<i>Lespedeza hirta</i>	
Lespedeza, sericea	<i>Lespedeza cuneata</i>	
Lettuce, prickly	<i>Lactuca serriola</i>	
Lettuce, tall <sup>3</sup>	<i>Lactuca canadensis</i>	
Mullein, common	<i>Verbascum thapsus</i>	
Mullein, turkey	<i>Eremocarpus setigerus</i>	
Ragweed, western	<i>Ambrosia psilostachya</i>	
Sida, prickly <sup>3</sup>	<i>Sida spinosa</i>	
Sowthistle, common	<i>Sonchus oleraceus</i>	
Sowthistle, field <sup>3</sup>	<i>Sonchus arvensis</i>	
Spanish needle <sup>3</sup>	<i>Bidens alba</i>	
Speedwell <sup>3</sup>	<i>Veronica</i> spp.	
Starthistle, yellow	<i>Centaurea solstitialis</i>	
Sweetclover, yellow <sup>3</sup>	<i>Mellilotus officinalis</i>	
Vervain, blue <sup>3</sup>	<i>Verbena hastata</i>	
Chicory, wild	<i>Cichorium intybus</i>	8 to 18
Burclover, California	<i>Medicago polymorpha</i>	
Cocklebur, common <sup>3</sup>	<i>Xanthium strumarium</i>	
Common cat's ear	<i>Hypochoeris radicata</i>	
Common spikeweed <sup>3</sup>	<i>Centromadia pungens</i>	
Copperleaf <sup>3</sup>	<i>Acalypha</i> spp.	
Crownvetch, common <sup>3</sup>	<i>Coronilla varia</i>	
Cudweed <sup>3</sup>	<i>Gnaphalium</i> spp.	
Daisy, oxeye <sup>3</sup>	<i>Leucanthemum vulgare</i>	
Filaree, broadleaf	<i>Erodium botrys</i>	
Filaree, redstem	<i>Erodium cicutarium</i>	
Filaree, whitestem	<i>Erodium moschatum</i>	
Fleabane, hairy	<i>Erigeron bonariensis</i>	
Geranium, Carolina <sup>3</sup>	<i>Geranium carolinianum</i>	
Goldenaster <sup>3</sup>	<i>Heterotheca</i> spp.	
Hawkweed, orange	<i>Hieracium aurantiacum</i>	
Horsenettle, Carolina <sup>3</sup>	<i>Solanum carolinense</i>	
Knapweed, diffuse	<i>Centaurea diffusa</i>	
Knapweed, Russian	<i>Acroptilon repens</i>	
Knapweed, spotted	<i>Centaurea stoebe</i>	
Kochia (Up to 6 inches) <sup>1</sup>	<i>Kochia scoparia</i>	
Marestail/horseweed	<i>Conyza canadensis</i>	
Medic <sup>3</sup>	<i>Medicago</i> spp.	
Milkthistle, blessed	<i>Silybum marianum</i>	
Ragweed, common	<i>Ambrosia artemisiifolia</i>	
Rush skeletonweed	<i>Chondrilla juncea</i>	
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	
Spurge, leafy	<i>Euphorbia esula</i>	
Spurge, nodding <sup>3</sup>	<i>Euphorbia nutans</i>	
St. John's wort	<i>Hypericum perforatum</i>	
Thistle, Canada	<i>Cirsium arvense</i>	
Thistle, cotton	<i>Onopordum acanthium</i>	
Thistle, musk	<i>Carduus nutans</i>	
Thistle, Russian	<i>Salsola tragus</i>	
Toadflax, dalmatian	<i>Linaria dalmatica</i>	
Vetch	<i>Vicia</i> spp.	
Wild carrot <sup>3</sup>	<i>Daucus carota</i>	
Willow weed	<i>Epilobium paniculatum</i>	
Plantain	<i>Plantago</i> spp.	10 to 18
Aster, whiteheath	<i>Symphotrichum pilosum</i>	
Bindweed, field	<i>Convolvulus arvensis</i>	
Burdock, common <sup>3</sup>	<i>Arctium minus</i>	
Cinquefoil, sulfur	<i>Potentilla recta</i>	
Coast fiddleneck	<i>Amsinckia intermedia</i>	
Flixweed <sup>3</sup>	<i>Descurainia sophia</i>	
Fleabane, annual <sup>3</sup>	<i>Erigeron annuus</i>	
Goldenrod, Canada <sup>3</sup>	<i>Solidago canadensis</i>	12 to 18
Goldenrod, common <sup>3</sup>	<i>Solidago virgaurea</i>	
Gumweed, curlycup <sup>3</sup>	<i>Grindelia squarrosa</i>	
Hemlock, poison	<i>Conium maculatum</i>	
Honeysuckle, Japanese	<i>Lonicera japonica</i>	
Matchweed <sup>3</sup>	<i>Mat lippia</i>	
Medusahead	<i>Taeniatherum caput-medusae</i>	
Poison-ivy, eastern	<i>Toxicodendron radicans</i>	
Ragweed, giant <sup>3</sup>	<i>Ambrosia trifida</i>	
Teasel, common	<i>Dipsacus fullonum</i>	
Yarrow, common	<i>Achillea millefolium</i>	

continued

**WEEDS CONTROLLED** (continued)

Use the higher spray volumes and herbicide rates for heavy weed and brush infestations, hard to control species, and tall brush or dense hardwood canopies. Do not apply more than 18 fluid ounces product broadcast per acre per year.

<b>BRUSH</b>		<b>Rate (fluid ounces per acre)</b>
American beautyberry <sup>3</sup>	<i>Callicarpa americana</i>	
Ash (Green, White)	<i>Fraxinus</i> spp.	
Aspen, quaking <sup>3</sup>	<i>Populus tremuloides</i>	
Autumn Olive <sup>3</sup>	<i>Eleagnus umbellata</i>	
Baccharis, Eastern <sup>3</sup>	<i>Baccharis halimifolia</i>	
Brazilian pepper <sup>3</sup>	<i>Schinus terebinthifolius</i>	
Callery Pear <sup>3</sup>	<i>Pyrus calleryana</i>	
Catalpa, northern	<i>Catalpa speciosa</i>	
Cherry <sup>3</sup>	<i>Prunus</i> spp.	
Chinaberry <sup>3</sup>	<i>Melia azedarach</i>	
Chinese tallowtree <sup>3</sup>	<i>Triadica sebifera</i>	
Cottonwood	<i>Populus deltoides</i>	
Elder, box	<i>Acer negundo</i>	
Elm, American	<i>Ulmus americana</i>	
Grape, fox <sup>3</sup>	<i>Vitis labrusca</i>	
Grape, crimson gloryvine <sup>3</sup>	<i>Vitis coignetiae</i>	10 to 18
Grape, wild	<i>Vitis rotundifolia</i>	
Hackberry, common	<i>Celtis occidentalis</i>	
Lantana, largeleaf <sup>3</sup>	<i>Lantana camara</i>	
Locust, black	<i>Robinia pseudoacacia</i>	
Locust, honey	<i>Gleditsia triacanthos</i>	
Maple, red	<i>Acer rubrum</i>	
Maple, silver	<i>Acer sacharinum</i>	
Persimmon, common <sup>3</sup>	<i>Diospyros virginiana</i>	
Pine, loblolly <sup>3</sup>	<i>Pinus taeda</i>	
Poplar, yellow	<i>Liriodendron tulipifera</i>	
Sugarberry	<i>Celtis laevigata</i>	
Sumac	<i>Rhus</i> sp.	
Sycamore	<i>Acer pseudoplatanus</i>	
Tupelo, black	<i>Nyssa sylvatica</i>	
Willow	<i>Salix</i> spp.	
Blackberry/Dewberry <sup>3</sup>	<i>Rubus</i> spp.	
Buckthorn, common <sup>3</sup>	<i>Rhamnus carthartica</i>	
Oak, northern red	<i>Quercus borealis</i>	16
Pine, Virginia <sup>2</sup>	<i>Pinus virginiana</i>	
Sassafras	<i>Sassafras albidum</i>	
Huisache	<i>Acacia farnesiana</i>	
Lotebush <sup>3</sup>	<i>Ziziphus obtusifolia</i>	
Mesquite	<i>Prosopis juliflora</i>	18

<sup>1</sup>See specific weed directions.

<sup>2</sup>Suppression: a visual reduction in weed competition (reduced population or vigor) as compared to an untreated area.

<sup>3</sup>Not for use in California.

**Specific Weed Directions:**

Kochia: For non-selective applications, tank mixing glyphosate with METHOD 240 SL HERBICIDE may improve control under dry conditions.

Cogongrass: In highways/roadsides turfgrass sites, apply METHOD 240SL HERBICIDE at a minimum rate of 8 fluid ounces per acre for seedhead suppression of cogongrass. For suppression of vegetative growth, apply 16 to 18 fluid ounces per acre. The addition of imazapyr may improve control. For best results, make applications in the fall, prior to frost. Note: cogongrass biotypes may differ in their response to applications of METHOD 240SL HERBICIDE.

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage and disposal.

**Pesticide Storage:** Store product in original container only. Store in a cool, dry place.

**Pesticide Disposal:** Waste resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

**CONTAINER HANDLING:**

Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

**Nonrefillable Rigid Plastic and Metal Containers (Capacity Equal to or Less Than 5 Gallons):**

Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Rigid Plastic and Metal Containers (Capacity Greater Than 5 Gallons):** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and

continued

## STORAGE AND DISPOSAL *(continued)*

roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Rigid Plastic and Metal Containers, e.g., Intermediate Bulk Containers [IBC] (Size or Shape Too Large to be Tipped, Rolled or Turned Upside Down):** Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying the contents from this container into application equipment or mix tank and before final disposal using the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration, and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour, or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill or by incineration. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill or by other procedures approved by state and local authorities.

**All Refillable Containers:** Refillable container. Refilling Container: Refill this container with METHOD 240SL HERBICIDE containing aminocyclopyrachlor potassium salt only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn out threads and closure devices. If damage is found, do not use container; contact BAYER CROPSCIENCE LP at the number below for instructions. Check for leaks after refilling and before transporting. If leaks are found, do not reuse or transport container, contact BAYER CROPSCIENCE LP at the number below for instructions. Disposing of Container: Do not reuse this container for any other purpose other than refilling (see preceding). Cleaning the container before final disposal is the responsibility of the person disposing of the container. To clean the container before final disposal, use the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration, and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour, or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling, if available, or puncture and dispose of in a sanitary landfill or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill or by other procedures approved by state and local authorities.

Do not transport if container is damaged or leaking. If the container is damaged, leaking, or obsolete, or in the event of a major spill, fire, or other emergency, contact BAYER CROPSCIENCE LP at 1-800-334-7577, day or night.

## CONDITIONS OF SALE AND LIMITATIONS OF WARRANTY AND LIABILITY

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness, plant injury, other property damage, as well as other unintended consequences may result because of factors beyond the control of Bayer CropScience LP. Those factors include, but are not limited to, weather conditions, presence of other materials or the manner of use or application. All such risks shall be assumed by the user or buyer.

**DISCLAIMER OF WARRANTIES:** TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, THAT EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of Bayer CropScience LP is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP DISCLAIMS ANY LIABILITY WHATSOEVER FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

**LIMITATIONS OF LIABILITY:** TO THE EXTENT CONSISTENT WITH APPLICABLE LAW THE EXCLUSIVE REMEDY OF THE USER OR BUYER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE PAID, OR AT BAYER CROPSCIENCE LP'S ELECTION, THE REPLACEMENT OF PRODUCT.

Bayer (reg'd), the Bayer Cross (reg'd) and Method® are registered trademarks of Bayer.

For product information call: 1-800-331-2867

Produced for:  
Bayer Environmental Science  
A Division of Bayer CropScience LP  
5000 CentreGreen Way, Suite 400  
Cary, NC 27513

Bayer

2017-1717  
2017-09-20



# **LIBERATE™ ADJUVANT**

**Emulsifiable Concentrate**

**COMMERCIAL**

**READ THE LABEL BEFORE USING**

**WARNING: SKIN IRRITANT  
EYE IRRITANT**

**REGISTRATION NO. 29491  
PEST CONTROL PRODUCTS ACT**

**GUARANTEE:**  
Lecithin, methyl esters of fatty acids  
and alcohol ethoxylate.....100%

**Warning, contains the allergen soy**

**IN CASE OF EMERGENCY DUE TO A MAJOR SPILL, FIRE OR POISONING  
INVOLVING THIS PRODUCT CALL DAY OR NIGHT, 1-800-561-8273**

**Loveland Products, Inc.**

**Loveland Products Canada Inc.  
PO Box 5234 | 64137 Hwy 543 E  
High River, AB T1V 1M4  
1-800-328-4678**

**NET CONTENTS: 10 L**

## DIRECTIONS FOR USE

LIBERATE ADJUVANT is a non-ionic surfactant product which enhances the effectiveness of post applied herbicides and fungicide listed on this label. Use LIBERATE ADJUVANT as the required non-ionic surfactant as directed by the tank mix partners listed on this label.

MIXING INSTRUCTIONS: Fill the spray tank about half-full with water and add the required herbicide(s) or fungicide while agitator is running or bypass agitation is operating. Complete the filling of the tank with water and finally add LIBERATE ADJUVANT under constant agitation. Refer to specific tank mix herbicide(s) or fungicide labels for more details.

Apply LIBERATE ADJUVANT at the application rate specified below.

Crop	Tank Mix Partners	Amount of LIBERATE ADJUVANT	Remarks
Field Corn	Ultim + Distinct	0.25% v/v (2.5L/1000L spray mixture)	<b>Ultim Total Tank Mix</b> Mix products as directed on the tank mix partner labels.
	Accent + Distinct	0.25% v/v (2.5L/1000L spray mixture)	<b>Accent Total Tank Mix</b> Mix products as directed on the tank mix partner labels.
	Elim + Dual II Magnum+ Banvel II	0.2% v/v (2.0L/1000L spray mixture)	<b>Battalion Tank Mix</b> Mix products as directed on the tank mix partner labels.
	Accent + Peak + Banvel II	0.2% v/v (2.0L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Ultim + Aatrex 480 + Callisto	0.2% v/v (2.0L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
Soybeans	Pursuit	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Reflex	0.1% v/v (1.0L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
Canola	Pursuit	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Odyssey	0.25% v/v (2.5L/1000L spray mixture)	<b>Imazethapyr and imazamox tolerant canola (e.g. canola varieties with the Clearfield trait) only.</b> Mix

			products as directed on the tank mix partner label.
Field Peas	Pursuit	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Odyssey	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
Wheat	Everest	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Refine Extra	0.2% v/v (2.0L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Nimble	0.2% v/v (2.0L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
	Adrenalin	0.25% v/v (2.5L/1000L spray mixture)	<b>Imazamox tolerant wheat (e.g. wheat varieties with the Clearfield trait) only.</b> Mix products as directed on the tank mix partner label.
	Folicur 432F	0.125% v/v (1.25L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
Wheat, Barley and Creeping Red Fescue, Orchard Grass, Crested and Intermediate Wheat Grass, Pasture and Rangeland	Accurate	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
Wheat Barley, Summer Fallow	Nuance	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
As per the herbicide label	Curtail M Herbicide	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.

As per the herbicide label	Lontrel 360 Herbicide	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.
As per the herbicide label	Pardner Herbicide	0.25% v/v (2.5L/1000L spray mixture)	Mix products as directed on the tank mix partner label.

Follow the tank mix partner labels for complete use instructions and precautions.

## DIRECTIONS FOR USE WITH GLYPHOSATE:

### 1. PENETRATING SURFACTANT

USE	RATE	REMARKS
Use with any glyphosate product whose label does not prohibit the use of an alternative non-ionic surfactant.	Use 0.25-0.5% V/V (2.5 L - 5 L of Liberate Adjuvant per 1000 L spray mixture or 250 ml – 500 ml of Liberate Adjuvant per 100 L of spray mixture)	<p>Include Liberate Adjuvant in the spray solution with glyphosate only where a non-ionic surfactant is required and at the non-ionic surfactant rate specified on the glyphosate product label and that is within 0.25-0.5% v/v.</p> <p>Follow all directions and precautions on the tank mix partner label.</p>

### 2. DEPOSITION AID, DRIFT REDUCTION AGENT

USE	RATE	REMARKS
Use with any glyphosate product whose label does not prohibit the use of an alternative non-ionic surfactant.	Use 0.25-0.5% V/V (2.5 L - 5 L of Liberate Adjuvant per 1000 L spray mixture)	<p>Liberate Adjuvant improves deposition and reduces drift potential by producing a more uniform spray pattern. Liberate Adjuvant reduces the incidence of small droplets. Coarse sprays are less likely to drift, therefore, avoid combinations of pressure and nozzle type that will result in fine particles (mist).</p> <p>Follow all directions and precautions on the tank mix partner label.</p>

## PRECAUTIONS

KEEP OUT OF REACH OF CHILDREN.

Causes skin irritation. DO NOT get on skin. May irritate eyes. Avoid contact with eyes.

CAUTION: Do not graze the treated crops or cut for hay; there is not sufficient data available to support such use.

#### **FIRST AID**

**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

#### **TOXICOLOGICAL INFORMATION**

Treat symptomatically.

#### **STORAGE**

Container must be tightly closed during storage. The minimum recommended storage temperature for this material is 0°C (32°F). If allowed to freeze, warm to 21°C (70°F) and shake well.

#### **DISPOSAL**

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Follow provincial instruction for any required additional cleaning of the container prior to its disposal.
3. Make the empty container unsuitable for further use.
4. Dispose of the container in accordance with provincial requirements.
5. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for cleanup of spills.

#### **Recyclable containers**

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local

distributor/dealer or municipality for the location of the nearest collection site.

Before taking the container to the collection site:

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use.

If there is no container collection site in your area, dispose of the container in accordance with provincial requirements. For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

### **Returnable containers**

Do not reuse this container for any purpose. For disposal, this empty container may be returned to the point of purchase (distributor/dealer).

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

### **Refillable containers**

For disposal, this container may be returned to the point of purchase (distributor/dealer). It must be refilled by the distributor/dealer with the same product. Do not reuse this container for any other purpose.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

**NOTICE TO USER:** This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *PEST CONTROL PRODUCTS ACT* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

All product names are registered trademarks of their respective companies.

# ARSENAL<sup>®</sup>

herbicide



SPECIMEN

For control of undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland, and nonagricultural lands; and for establishment and maintenance of wildlife openings, release of unimproved Bermudagrass and Bahiagrass, bareground weed control, and for use under certain paved surfaces

**Active Ingredient:**

isopropylamine salt of imazapyr: (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)\* ..... 27.8%

**Other Ingredients:** ..... 72.2%

**Total:** ..... 100.0%

\* Equivalent to 22.6% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon

EPA Reg. No. 241-346

EPA Est. No.

**KEEP OUT OF REACH OF CHILDREN  
CAUTION/PRECAUCIÓN**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **First Aid, Precautionary Statements, Directions For Use, Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

**Net Contents:**

BASF Corporation  
26 Davis Drive  
Research Triangle Park, NC 27709



<b>FIRST AID</b>	
<b>If swallowed</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• <b>DO NOT</b> induce vomiting unless told to by a poison control center or doctor.</li> <li>• <b>DO NOT</b> give anything by mouth to an unconscious person.</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes.</li> <li>• Remove contact lenses, if present, after first 5 minutes; then continue rinsing eyes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth to mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>HOTLINE NUMBER</b>	
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information: 1-800-832-HELP (4357).	

## Precautionary Statements

### Hazards to Humans and Domestic Animals

**CAUTION.** Harmful if swallowed. Avoid contact with eyes or clothing.

### Personal Protective Equipment (PPE)

Some materials that are chemically resistant to this product are listed below. If you want more options, follow the instructions for **Category A** on an EPA chemical-resistance category selection chart.

**Mixers, loaders, applicators, and other handlers must wear:**

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions are given for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. **DO NOT** reuse them.

### Engineering Controls

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].

## USER SAFETY RECOMMENDATIONS

### Users should:

- Wash hands with plenty of soap and water before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Physical and Chemical Hazards

Spray solutions of **Arsenal® herbicide** must be mixed, stored, and applied only in stainless steel, fiberglass, plastic, and plastic-lined steel containers.

Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

### Environmental Hazards

This product is toxic to plants. Drift and runoff may be hazardous to plants in water adjacent to treated areas.

**DO NOT** apply to water except as specified in this label. Treatment of aquatic weeds may result in oxygen depletion or loss because of decomposition of dead plants. This oxygen loss may cause suffocation of some aquatic organisms. **DO NOT** treat more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas. **DO NOT** contaminate water when disposing of equipment washwater or rinsate.

This pesticide is toxic to vascular plants and must be used strictly in accordance with the drift precautions on the label.

## Directions For Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

**Arsenal® herbicide** must be used only in accordance with the instructions on the label attached to the container. Keep containers closed to avoid spills and contamination.

**DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**DO NOT** enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **48 hours**.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material
- Protective eyewear

### NONAGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**DO NOT** enter or allow others to enter treated areas until sprays have dried.

## STORAGE AND DISPOSAL

**DO NOT** contaminate water, food, or feed by storage or disposal.

### Pesticide Storage

**DO NOT** store below 10° F.

### Pesticide Disposal

Wastes resulting from the use of this product must be disposed of on-site or at an approved waste disposal facility.

### Container Handling

**Nonrefillable Container. DO NOT reuse or refill this container.** Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

**Triple rinse containers small enough to shake (capacity ≤ 5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

**Triple rinse containers too large to shake (capacity > 5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

**Pressure rinse as follows:** Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable Container.** Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

(continued)

## STORAGE AND DISPOSAL *(continued)*

### Container Handling *(continued)*

**Triple rinse as follows:** To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

### In Case of Emergency

In case of large-scale spillage regarding this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF Corporation 1-800-832-HELP (4357)

### Steps to be taken in case material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

## Product Information

**Arsenal® herbicide** is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland and nonagricultural lands. Aquatic sites consist of standing and flowing water, estuarine/marine, wetland, and riparian areas. Nonagricultural lands include private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, and sewage disposal areas); uncultivated agricultural areas - noncrop producing (including farmyards, fuel

storage areas, fence rows, nonirrigation ditchbanks, and barrier strips); industrial sites - outdoor (including lumberyards, pipeline and tank farms); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails). **Arsenal** may also be used for the release of unimproved Bermudagrass and Bahiagrass, for bareground weed control, and for use under certain paved surfaces.

### Herbicidal Activity

**Arsenal** will control most annual and perennial grass and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. **Arsenal** is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant with accumulation in the meristematic regions. For maximum activity, weeds should be growing vigorously at the time of application, and the spray solution should include a surfactant (see **Adjuvants** section for specific use directions). Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into and kills underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until 2 or more weeks after application. Complete kill of plants may not occur for several weeks. **Arsenal** applications are rainfast 1 hour after treatment.

## Product Use and Restrictions

Applications may be made for control of undesirable vegetation growing within specified aquatic sites, forestry sites, pasture/rangeland and nonagricultural lands. Aquatic sites consist of standing and flowing water; estuarine/marine, wetland, and riparian areas; for control of most annual and perennial grass weeds, broadleaf weeds, vines and brambles, and hardwood brush and trees for forestry site preparation and release of conifers from woody and herbaceous competition. **Arsenal** may also be used for selective woody and herbaceous weed control in natural regeneration of certain conifers (see **Conifer Release Treatment**).

Nonagricultural lands include private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, and sewage disposal areas); uncultivated agricultural areas - noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditchbanks, and barrier strips); industrial sites - outdoor (including lumberyards, pipeline and tank farms); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails).

## Restrictions and Limitations

- **DO NOT** use on food crops.
- **DO NOT** apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond, or reservoir.
- **DO NOT** apply to water used for irrigation except as described in **Product Use and Restrictions** section of this label.
- Keep from contact with fertilizers, insecticides, fungicides, and seeds.
- **DO NOT** drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the treated soil may be washed or moved into contact with their roots.
- **DO NOT** use on lawns, walks, driveways, tennis courts, or similar areas.
- **DO NOT** side trim desirable vegetation with this product unless severe injury and plant death can be tolerated. Prevent drift of spray to desirable plants.
- Clean application equipment after using this product by thoroughly flushing with water.

## Nonagricultural Lands and Forestry Sites

- **DO NOT** apply more than 1.5 lbs acid equivalent (ae) imazapyr (equivalent to 96 fl ozs of **Arsenal® herbicide**) per acre per year.

## Pasture/Rangeland Sites

- For spot treatment only.
- **DO NOT** treat more than 1/10 of the available area to be grazed or cut for hay.
- **DO NOT** apply more than 0.75 lb ae imazapyr (equivalent to 48 fl ozs of **Arsenal**) per acre per year.

## Aquatic Sites

- **DO NOT** apply more than 1.5 lbs ae imazapyr (equivalent to 96 fl ozs of **Arsenal**) per acre per year.
- **Public waters** - Application of **Arsenal** to water can only be made by federal or state agencies, such as Water Management District personnel, municipal officials, and the U.S. Army Corps of Engineers, or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the state or local government. Treatment to other than non-native invasive species is limited to only those plants that have been determined to be a nuisance by a federal or state government entity.
- **Permitting** - Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- **Private waters** - Applications may be made to private waters that are still, such as ponds, lakes, and drainage ditches where there is minimal or no outflow to public waters.
- **Aerial application** - Aerial application to aquatic sites is restricted to helicopter only.

- **Irrigation water** - Application to water used for irrigation that results in **Arsenal** residue greater than 1.0 ppb **MUST NOT** be used for irrigation purposes for 120 days after application or until **Arsenal** residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less. When applications are made within 500 feet of an active irrigation intake, **DO NOT** irrigate for at least 24 hours following application to allow for dissipation.

## Recreational Use of Water in Treatment Area

There are no restrictions on the use of water in the treatment area for recreational purposes, including swimming and fishing.

## Livestock Use of Water in/from Treatment Area

There are no restrictions on livestock consumption of water from the treatment area.

## Restrictions for Potable Water Intakes

**DO NOT** apply **Arsenal** directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as a lake, pond, or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off during application and for a minimum of 48 hours after application. These aquatic applications may be made only in cases where there are alternative water sources or holding ponds that would permit turning off an active potable water intake for a minimum period of 48 hours after applications.

**NOTE:** Existing potable water intakes that are no longer in use, such as those replaced by connections to wells or a municipal water system, are not considered to be active potable water intakes. This restriction does not apply to intermittent, inadvertent overspray of water in terrestrial use sites.

## Quiescent or Slow-moving Waters

In lakes and reservoirs, **DO NOT** apply **Arsenal** within 1 mile of an active irrigation water intake during the irrigation season. Applications less than 1 mile from an active irrigation water intake may be made during the off-season if the irrigation intake will remain inactive for a minimum of 120 days after application or until **Arsenal** residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less.

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## Precautions for Avoiding Injury to Nontarget Plants

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Untreated desirable plants can be affected by root uptake of **Arsenal® herbicide** from treated soil. Injury or loss of desirable plants may result if **Arsenal** is applied on or near desirable plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. When making application along shorelines where desirable plants may be present, use caution to avoid spray contact with their foliage or spray application to the soil in which they are rooted. Shoreline plants that have roots which extend into the water in an area where **Arsenal** has been applied generally will not be adversely affected by uptake of the herbicide from the water.

If treated vegetation is to be removed from the application site, **DO NOT** use the vegetative matter as mulch or compost on or around desirable species.

### Managing Off-target Movement

#### Aerial Application

- Applicators are required to use a coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the wingspan or 90% of the rotor-blade diameter to reduce spray drift.
- Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

#### Ground Boom Application

- Applicators are required to use a nozzle height below 4 feet above the ground or plant canopy and coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

#### Wind Erosion

Avoid treating powdery, dry, or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

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## Adjuvants

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Postemergence applications of **Arsenal** require the addition of a spray adjuvant. When making aquatic applications, only spray adjuvants approved or appropriate for aquatic use must be used.

### Nonionic Surfactant

Use a nonionic surfactant (NIS) at the rate of 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with a hydrophilic-to-lipophilic balance (HLB) ratio between 12 and 17 with at least 70% surfactant in the formulated product. Alcohol, fatty acid, oil, ethylene glycol, or diethylene glycol should not be considered as surfactants to meet the above requirements.

### Methylated Seed Oil or Vegetable Oil Concentrate

Instead of a surfactant, a methylated seed oil (MSO) or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, mix MSO or vegetable-based seed oil concentrates at a rate of 1% of total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in **Arsenal** deposition and uptake by plants under moisture or temperature stress.

### Silicone-based Surfactant

See manufacturer's label for specific rates. Silicone-based surfactants may reduce the surface tension of the spray droplet allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

### Invert Emulsions

**Arsenal** can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray runoff, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

### Other

An antifoaming agent, spray pattern indicator, or drift-reducing agent may be applied at the product labeled rate if necessary or desired.

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## Tank Mixes

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**Arsenal** may be tank mixed with other herbicides.

Consult manufacturer's labels for specific rate restrictions and weeds controlled. Always follow the more restrictive label restrictions and precautions for all products used when making an application involving tank mixes.

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## Application Methods

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**Arsenal® herbicide** may be selectively applied using low-volume directed application techniques or may be broadcast-applied using ground equipment, watercraft, or aircraft. Aerial applications to aquatic sites must be made by helicopter. In addition, **Arsenal** may also be applied using cut-stump, cut-stem, and frill or girdle treatment techniques within nonagricultural lands, pasture/rangeland, and aquatic sites; see **Aerial Application** and **Ground Application** sections for additional details.

### Aerial Application

All precautions must be taken to minimize or eliminate spray drift. Both fixed-wing aircraft and helicopters can be used to apply **Arsenal** on nonagricultural lands, but only helicopters can be used for aquatic applications. **DO NOT** make applications by fixed-wing aircraft or helicopter unless appropriate buffer zones can be maintained to prevent spray drift out of the target area; or when treating open tracts of land, spray drift as a result of fixed-wing aircraft application can be tolerated. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a **Microfoil™ boom, Thru-Valve™ boom,** or raindrop nozzles, must be used and calibrated. Except when applying with a **Microfoil boom,** a drift control agent may be added at the specified label rate. **DO NOT** side trim with **Arsenal** unless death of treated tree can be tolerated.

Uniformly apply the specified amount of **Arsenal** in 2 to 30 gallons of water per acre. A foam-reducing agent may be added at the specified label rate, if needed.

Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

### Ground Application

#### Foliar Application

##### Low-volume Foliar Application

Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.5% to 5% **Arsenal** plus surfactant; see the **Adjuvants** section of this label for specific use directions. A foam-reducing agent may be applied at the specified label rate, if needed. For difficult-to-control species (see **Aquatic Weed Control** and **Terrestrial Weed Control** sections for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 3 quarts of **Arsenal** per acre in aquatic sites and nonagricultural lands and 1.5 quarts per acre in pasture/rangeland. Excessive wetting of foliage is not necessary.

For low-volume foliar application, select proper nozzles to avoid overapplication. Proper application is critical to ensure desirable results. Best results are achieved when spray covers the crown and approximately 70 percent of the plant. The use of an even, flat-fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Appropriate tip sizes include 4004E or 1504E. For a straight-stream and cone pattern, adjustable cone nozzles, such as 5500 X3 or 5500 X4, may be used. Attaching a rollover valve onto a Spraying Systems Model 30 gunjet or other similar spray gun allows for the use of both flat-fan and cone tips on the same gun.

Moisten, but **DO NOT** drench target vegetation causing spray solution to run off.

**Low-volume Foliar Application with Backpack.** For low-growing species, spray down on the crown, covering crown and penetrating approximately 70% of the plant.

For target species 4 to 8 feet tall, swipe the sides of target vegetation by directing spray to at least 2 sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For target species over 8 feet tall, lace sides of target vegetation by directing spray to at least 2 sides of the target in smooth zigzag motions from crown to bottom.

**Low-volume Foliar Application with Hydraulic Handgun Application Equipment.** Use the same technique as described for **Low-volume Foliar Application with Backpack.**

For broadcast application, simulate a gentle rain near the top of target vegetation allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution that contacts the understory may result in severe injury or death of plants in the understory.

##### High-volume Foliar Application

For optimum performance when spraying medium-density to high-density vegetation, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray runoff, causing increased ground cover injury and injury to desirable species.

To prepare the spray solution, thoroughly mix **Arsenal** in water and add a surfactant; see **Adjuvants** section for specific use directions and rates for surfactants. A foam-reducing agent may be added at the specified label rate, if needed. For difficult-to-control species (see **Aquatic Weed Control** and **Terrestrial Weed Control** sections for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 3 quarts of **Arsenal** per acre in aquatic sites and nonagricultural lands and 1.5 quarts per acre in pasture/rangeland. Uniformly cover the foliage of the vegetation to be controlled, but **DO NOT** apply to runoff. Excessive wetting of foliage is not necessary.

## Side Trimming

**DO NOT** side trim with **Arsenal® herbicide** unless severe injury or death of the treated tree can be tolerated. **Arsenal** is readily translocated and can result in death of the entire tree.

## Cut-surface Treatment

**Arsenal** may be used to control undesirable woody vegetation by applying the **Arsenal** solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of target woody vegetation. Application can be made any time of the year except during periods of heavy sap flow in the spring. **DO NOT** overapply solution causing runoff from the cut surface.

Injury may occur to desirable woody plants if shoots extend from the same root system or their root systems are grafted to those of the treated tree.

## Cut-surface Application with Dilute and Concentrate Solutions

**Arsenal** may be mixed as either a concentrate or dilute solution. The dilute solution may be used for application to the cut surface of the stump or to cuts on the stem of target woody vegetation. Concentrate solutions may be used for application to cuts on the stem. Use of the concentrate solution permits application to fewer cuts on the stem, especially for large-diameter trees. Follow application instructions for proper application techniques for each type of solution.

- To prepare a dilute solution, mix 8 to 12 fluid ounces of **Arsenal** with 1 gallon of water. A surfactant or penetrating agent may improve uptake through partially callused cambiums.
- To prepare a concentrate solution, mix 2 quarts of **Arsenal** with no more than 1 quart of water.

## Cut-stump Treatment

**Dilute Solution.** Spray or brush the solution onto the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

## Cut-stem Treatment (injection, hack-and-squirt)

**Dilute Solution.** Using standard injection equipment, apply 1 milliliter (mL) of solution at each injection site around the tree with no more than 1-inch intervals between cut edges. Ensure that the injector completely penetrates the bark at each injection site.

**Concentrate Solution.** Using standard injection equipment, apply 1 mL of solution at each injection site. Make at least 1 injection cut for every 3 inches of diameter at breast height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut, and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than 1 injection site, place the injection cuts at approximately equal intervals around the tree.

## Frill or Girdle Treatment

Using a hatchet, machete, or chainsaw, make cuts through the bark and completely around the tree to expose the cambium. The cut should angle downward extending into the cambium enough to expose at least 2 growth rings. Using a spray applicator or brush, apply a 25% to 100% solution of **Arsenal** into each cut until thoroughly wet. Avoid applying so much herbicide that runoff to the ground or water occurs.

## Forestry Use

### Site Preparation Treatment

**Arsenal** may be used to control labeled grass weeds, broadleaf weeds, vines and brambles, and woody brush and trees on forest sites in advance of regeneration for the following conifer crop species:

Common Name	Scientific Name	Rate (fl ozs/A)
Loblolly pine	<i>Pinus taeda</i>	48 to 80
Loblolly X pitch hybrid		
Longleaf pine	<i>Pinus palustris</i>	
Shortleaf pine	<i>Pinus echinata</i>	
Virginia pine	<i>Pinus virginiana</i>	
Slash pine	<i>Pinus elliotii</i>	40 to 64
Coastal redwood	<i>Sequoia sempervirens</i>	24 to 48
Douglas fir	<i>Pseudotsuga menziesii</i>	
Western hemlock	<i>Tsuga heterophylla</i>	
California red fir	<i>Abies magnifica</i>	24 to 40
California white fir	<i>Abies concolor</i>	
Jack pine	<i>Pinus banksiana</i>	24 to 32
Lodgepole pine	<i>Pinus contorta</i>	
Pitch pine	<i>Pinus rigida</i>	
Ponderosa pine	<i>Pinus ponderosa</i>	
Sugar pine	<i>Pinus lambertiana</i>	
White pine	<i>Pinus strobus</i>	
Black spruce	<i>Picea mariana</i>	
Red spruce	<i>Picea rubens</i>	
White spruce	<i>Picea glauca</i>	

Use the label rate of **Arsenal** per acre applied as a broadcast foliar spray for long-term control of labeled woody plants and residual control of herbaceous weeds. Within 4 to 6 weeks of treatment, grass and other herbaceous weeds will be controlled and may provide fuel to facilitate a site preparation burn, if desired, to control conifers or other species tolerant to the herbicide.

Apply the label rate of **Arsenal** per acre in 5 to 30 gallons total spray solution for helicopter applications or 5 to 100 gallons total spray solution for mechanical ground spray and backpack applications. Use a minimum of 0.5% by volume nonionic surfactant (NIS). Use the higher label rates of **Arsenal** and higher spray volumes when

controlling particularly dense or multilayered canopies of hardwood stands or difficult-to-control species.

In certain cases, tank mixes may be necessary for chemical control of conifers and other species tolerant to **Arsenal**<sup>®</sup> herbicide. Observe all precautions and restrictions on the product labels. Always follow the most restrictive label. Combinations with other products labeled for forest site preparation may kill certain plants such as legumes and blackberry, which are desirable for wildlife habitat.

Where quick initial brownout (deadening of foliage) is desired for burning, apply a tank mixture of 32 fl ozs to 64 fl ozs **Arsenal** with 16 fl ozs to 64 fl ozs glyphosate or 16 fl ozs to 48 fl ozs triclopyr ester per acre. For control of seedling pines, apply 32 fl ozs to 64 fl ozs **Arsenal** with 3 to 4 quarts glyphosate. For site preparation, rates less than 48 fl ozs **Arsenal** will provide suppression of hardwood brush and trees; some resprouting may occur.

**DO NOT** plant seedlings of black spruce (*Picea mariana*) or white spruce (*Picea glauca*) on sites broadcast-treated with **Arsenal** or into the treated zone of spot or banded applications for 3 months following application or injury may occur.

## Herbaceous Weed Control

Use **Arsenal** for selective weeding in the following conifers:

Common Name	Scientific Name	Rate (fl ozs/A)
Loblolly pine	<i>Pinus taeda</i>	12 to 20
Loblolly X pitch hybrid		
Virginia pine	<i>Pinus virginiana</i>	
Longleaf pine <sup>1</sup>	<i>Pinus palustris</i>	8 to 12
Slash pine <sup>1</sup>	<i>Pinus elliotii</i>	
Douglas fir <sup>1</sup>	<i>Pseudotsuga menziesii</i>	

<sup>1</sup> Use of surfactant is not recommended.

**Arsenal** may be applied as a broadcast treatment, banded over tree rows, or as a directed spray for release of young conifers from herbaceous weeds. To prevent possibility of conifer injury, **DO NOT** apply **Arsenal** when conifers are under stress from drought, disease, animal or winter injury, planting shock, or other stresses reducing conifer vigor. Broadcast applications may be made by helicopter, ground, or backpack sprayer. For difficult-to-control weeds, use the higher labeled rates. Where herbaceous weeds have overtopped conifer seedlings, a nonionic surfactant may be added to improve weed control (except for slash pine, long-leaf pine, and Douglas fir), at a rate not to exceed 0.5% of spray solution volume. Some minor conifer growth inhibition may be observed when herbaceous weed control treatments are made during periods of active conifer growth.

**Arsenal** may also be applied using backpack or handheld sprayers to control herbaceous weeds around individual conifer seedlings. Mix 0.8 fl oz to 1.2 fl ozs **Arsenal** and 0.2 oz nonionic surfactant per gallon of water. Direct the spray to the weeds and minimize the amount applied to

conifer foliage for best conifer tolerance. Ensure that maximum labeled rates per acre for previously listed crop species are not exceeded.

**Arsenal** may be tank mixed with sulfometuron to broaden the spectrum of weeds controlled. For loblolly pine, apply 8 fl ozs to 12 fl ozs **Arsenal** plus 1 oz to 2 ozs sulfometuron per acre. The application of **Arsenal** plus sulfometuron on other conifer species may cause growth suppression.

## Conifer Release Treatment

**Arsenal** may be applied as a broadcast or directed spray application for suppression of labeled brush, tree, and herbaceous weed species. Directed spray applications may be made with low-volume applications in conifer stands of all ages by targeting the unwanted vegetation and avoiding direct application to the conifer. Ensure that maximum labeled rates per acre listed for the following crop species are not exceeded.

### Broadcast Applications for release of the following conifers from hardwood competition:

Common Name	Scientific Name	Rate (fl ozs/A)
Loblolly pine <sup>3</sup>	<i>Pinus taeda</i>	24 to 40
Loblolly X pitch hybrid <sup>3</sup>		
Virginia pine <sup>3</sup>	<i>Pinus virginiana</i>	
Longleaf pine	<i>Pinus palustris</i>	24 to 32
Pitch pine	<i>Pinus rigida</i>	
Shortleaf pine	<i>Pinus echinata</i>	
Slash pine	<i>Pinus elliotii</i>	
White pine <sup>1</sup>	<i>Pinus strobus</i>	16 to 32
California red fir	<i>Abies magnifica</i>	16 to 24
California white fir	<i>Abies concolor</i>	
Lodgepole pine <sup>2</sup>	<i>Pinus contorta</i>	
Douglas fir <sup>2</sup>	<i>Pseudotsuga menziesii</i>	
Jack pine <sup>2</sup>	<i>Pinus banksiana</i>	12 to 24
Black spruce <sup>2</sup>	<i>Picea mariana</i>	
Red spruce <sup>2</sup>	<i>Picea rubens</i>	
White spruce <sup>2</sup>	<i>Picea glauca</i>	

<sup>1</sup> **DO NOT** make applications to white pine stands younger than three years old. To minimize potential white pine injury, release treatments should not be made prior to July 15.

<sup>2</sup> Applications should be made after formation of final conifer resting buds in the fall or height growth inhibition may occur.

<sup>3</sup> **Mid-rotation release:** For broadcast applications below the pine canopy in established stands of loblolly pine, loblolly X pitch hybrid, and Virginia pine, use 32 fl ozs to 64 fl ozs product per acre. For mid-rotation release of other species, use rates listed in chart above.

**For slash pine and longleaf pine, broadcast release treatments over the top of pines for the purpose of woody plant control must be made after August 15 and only in stands 2 through 5 years old. For applications over the top of slash pine and longleaf pine, DO NOT add surfactant and use lower labeled rates on sandy soils.**

Apply the label rate of **Arsenal® herbicide** per acre when making broadcast applications with helicopter or ground spray equipment. Refer to mixing and application instructions for proper spray volumes. A nonionic surfactant may be added at no more than 0.25% by volume.

Use the higher label rates of **Arsenal** when controlling particularly dense stands or difficult-to-control species.

Some minor conifer growth inhibition may be observed when release treatments are made during periods of active conifer growth. To minimize potential conifer height growth inhibition, **DO NOT** make broadcast applications to conifer stands except loblolly pine before the end of the second growing season. To minimize potential conifer height growth inhibition, broadcast release treatments may be made late in the growing season. To prevent possibility of conifer injury, **DO NOT** apply **Arsenal** when conifers are under stress from drought, disease, animal or winter injury, or other stresses reducing conifer vigor.

**Arsenal** may be used to release loblolly pine seedlings during the first growing season following planting or for one-year-old natural loblolly pine regeneration. For one-year-old loblolly pine release, apply 24 fl ozs to 40 fl ozs per acre of **Arsenal** after July 15. Rates below 32 fl ozs per acre are intended for hardwood growth suppression; expect hardwood resprouting.

### Spot Treatment of Undesirable Hardwood Vegetation

**Arsenal** may be used as a directed foliar or cut-stem application to control undesirable brush and hardwoods in the management of stands of all ages for the conifer species listed in the broadcast application section above. Refer to mixing and application instructions in the directed foliar or cut-stem sections above for proper use rates, equipment, and application techniques. **DO NOT** exceed maximum labeled rates per acre listed for crop species. Cut-stem applications may be used for spot treatment of undesirable hardwoods in Ponderosa pine stands using 24 fl ozs or less of **Arsenal** per acre.

Avoid direct application to desired plant species or injury may occur. Injury may occur to nontarget or desirable hardwoods or conifers if they extend from the same root system, or their root systems are grafted to those of the treated tree, or their roots extend into the treated zone.

### Late Rotation Vegetation Control in Western Conifer

In California, the Pacific Northwest and Inland Northwest, broadcast aerial applications of **Arsenal** up to 48 fl ozs per acre are permissible in conifer stands that are targeted for harvesting the year following treatment. Use minimum spray volume of 15 gallons per acre. Significant conifer injury or mortality must be expected. **DO NOT** use this treatment if conifer injury or mortality cannot be tolerated.

### Bag and Spray Application for Conifer Release

In Douglas fir and Ponderosa pine stands, broadcast applications of **Arsenal** up to 32 fl ozs per acre are permissible when the trees are covered by bags prior to the application. The bags must prevent the spray mix from contacting the conifer foliage. On sites with coarse textured soils (e.g. decomposed granite, pumice, sandy or rocky sites) or low levels of soil organic matter (generally 5% or less), significant conifer growth inhibition and mortality is possible. **DO NOT** use this treatment on these types of sites if conifer growth inhibition and mortality cannot be tolerated.

### Nonagricultural Land Use

**Arsenal** may be used for woody and herbaceous weed control in nonagricultural lands including private, public and military lands as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, and sewage disposal areas); uncultivated agricultural areas - noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditchbanks, and barrier strips); industrial sites - outdoor (including lumberyards, pipeline and tank farms); and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails).

Applications to nonagricultural lands are not applicable to treatment of commercial timber or other plants grown for sale or other commercial use, or for commercial seed production, or for research purposes.

### Brush Control

Use the specified rate of **Arsenal** with the preferred application technique for control of undesirable brush.

### Tank Mixes and Application Rates for Low-volume Foliar Brush Control\*

Target Vegetation	Arsenal Rate (% by volume)	Tank Mix
Mixed hardwoods without elm, locust, or pine	1.0 to 1.5	Surfactant
Mixed hardwoods containing elm, locust, and pine	0.5 to 1.0	<b>Accord®</b> at 2% to 3% by volume plus surfactant
Mixed hardwoods with locust and pine but no elm		<b>Krenite®</b> at 2% to 5% by volume plus surfactant
Mixed hardwoods with locust and elm but no pine		<b>Escort®</b> at 2 ozs/A or 2.3 grams/gal plus surfactant

\* Tank mixes with 2,4-D or products containing 2,4-D have resulted in reduced **Arsenal** efficacy.

## Backpack and Handheld Spray Mixing Guide

% solution	Product per gallon of mix (fl ozs)	Product per 4-gallon backpack (fl ozs)
0.25	0.3	1.3
0.5	0.6	2.6
1.0	1.3	5.1
2.0	2.6	10.2
3.0	3.8	15.4
5.0	6.4	25.6

### Measuring Chart

128 fluid ounces	=	1 gallon
16 fluid ounces	=	1 pint
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 pints	=	1 quart

## Selective Control of Undesirable Weeds in Unimproved Bermudagrass and Bahiagrass

**Arsenal® herbicide** may be used on unimproved Bermudagrass and Bahiagrass turf such as roadsides, utility rights-of-way, and other nonagricultural lands. **Arsenal** application on established common and coastal Bermudagrass and Bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the Bermudagrass and Bahiagrass. Treatment of Bermudagrass with **Arsenal** results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre.

Temporary yellowing of grass may occur when treatment is made after growth begins.

- **DO NOT** add surfactant in excess of the specified rate (1 fl oz per 25 gallons of spray solution).
- **DO NOT APPLY** to grass during its first growing season.
- **DO NOT APPLY** to grass under stress from drought, disease, insects, or other causes.

### Dosage Rate and Timing

**Bermudagrass.** Apply **Arsenal** at 6 fl ozs to 12 fl ozs per acre when Bermudagrass is dormant. Apply **Arsenal** at 6 fl ozs to 8 fl ozs per acre after Bermudagrass has reached full greenup. Applications made during greenup will delay greenup. Include a surfactant in the spray solution.

For additional preemergence control of annual grass and small-seeded broadleaf weeds, add **Pendulum® AquaCap™ herbicide** at the rate of 3.1 to 6.3 pints per acre. Consult the **Pendulum AquaCap** label for weeds controlled and for other use directions and precautions.

For control of Johnsongrass in Bermudagrass turf, apply **Arsenal** at 8 fl ozs per acre, plus **Roundup® herbicide** at 12 fl ozs per acre, plus surfactant. For additional control of broadleaves and vines, **Garlon® 3A herbicide** may be added to the above mix at 1 to 2 pints per acre. Observe all precautions and restrictions on the **Garlon 3A** and **Roundup** labels.

**Bahiagrass.** Apply **Arsenal** at 4 fl ozs to 8 fl ozs per acre when Bahiagrass is dormant or after grass has initiated greenup but has not exceeded 25% greenup. Include a surfactant in the spray solution; see **Adjuvants** section for specific use directions for surfactants.

### Weeds Controlled in Unimproved Bermudagrass and Bahiagrass

Common Name	Scientific Name
Bedstraw*	<i>Galium</i> spp.
Bishopweed*	<i>Ptilimnium capillaceum</i>
Buttercup*	<i>Ranunculus parviflorus</i>
Carolina geranium	<i>Geranium carolinianum</i>
Fescue	<i>Festuca</i> spp.
Foxtail	<i>Setaria</i> spp.
Little barley	<i>Hordeum pusillum</i>
Seedling Johnsongrass	<i>Sorghum halepense</i>
White clover	<i>Trifolium repens</i>
Wild carrot	<i>Daucus carota</i>
Yellow woodsorrel	<i>Oxalis stricta</i>

\* Use not permitted in California unless otherwise directed by supplemental labeling.

### Grass Growth and Seedhead Suppression

**Arsenal** may be used to suppress growth and seedhead development of certain turfgrass in unimproved areas. When **Arsenal** is applied to desirable turf, it may result in temporary turf damage and/or discoloration. Effects to the desirable turf may vary with environmental conditions. For optimum performance, apply before culm elongation. Applications may be made before or after mowing. If applied before mowing, allow at least 3 days of active growth before mowing. If applied after mowing, allow sufficient time for grass to recover before applying this product or injury may be amplified.

**DO NOT APPLY** to turf under stress (drought, cold, insect damage, etc.) or severe injury or death may occur.

**Bermudagrass.** Apply **Arsenal** at 6 fl ozs to 8 fl ozs per acre from early greenup to before seedhead initiation. **DO NOT** add surfactant for this application.

**Cool-season Unimproved Turf.** Apply **Arsenal** at 2 fl ozs per acre plus 0.25% nonionic surfactant. For increased suppression, **Arsenal** may be tank mixed with products such as **Embark® growth regulator** (8 fl ozs per acre). Tank mixes may increase injury to desired turf. Consult each product label for labeled turf species and other use directions and precautions. Tank mixes with 2,4-D or products containing 2,4-D may decrease the effectiveness of **Arsenal**.

## Total Vegetation Control where Bare Ground is Desired

**Arsenal**<sup>®</sup> herbicide is an effective herbicide for pre-emergence or postemergence control of many annual and perennial broadleaf and grass weeds where bare ground is desired. **Arsenal** is particularly effective on hard-to-control perennial grasses. **Arsenal** at 1.5 to 6 pints per acre can be used alone or in tank mix with herbicides approved for use in bare ground. The degree and duration of control are dependent on **Arsenal** rate used, tank mix partner, volume of carrier, soil texture, rainfall, and other conditions.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the more restrictive label restrictions and precautions for all products used when making an application involving tank mixes.

Applications of **Arsenal** may be made any time of the year. Use equipment calibrated to deliver desired gallons per acre spray volume and uniformly distribute the spray pattern over the treated area.

**Postemergence Application.** Always use a spray adjuvant (see **Adjuvants** section of this label) when making a postemergence application. For optimum performance on tough-to-control annual grass weeds, apply **Arsenal** at a total volume of 100 gallons per acre or less. For quicker burndown or brownout of target weeds, **Arsenal** may be tank mixed with **Roundup**<sup>®</sup> herbicide. Tank mixes with 2,4-D or products containing 2,4-D may reduce the performance of **Arsenal**. Always follow the most restrictive label restrictions and precautions for all products used when tank mixing.

**Spot Treatment.** **Arsenal** may be used as a follow-up treatment to control escapes or weed encroachment in a bareground situation. To prepare the spray solution, thoroughly mix in each gallon of water 0.5% to 5% **Arsenal** plus an adjuvant. For increased burndown, include **Roundup** as a tank mixture. For added residual weed control or to increase the weed spectrum, add **Pendulum**<sup>®</sup> **AquaCap**<sup>™</sup> herbicide, **Overdrive**<sup>®</sup> herbicide, or diuron. Always follow the most restrictive label restrictions and precautions for all products used when tank mixing.

## Control of Undesirable Weeds under Paved Surfaces

**Arsenal** can be used under asphalt, pond liners, and other paved areas, **ONLY** in industrial sites or where the pavement has a suitable barrier along the perimeter that prevents encroachment of roots of desirable plants.

Use **Arsenal** only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers, or other vegetative plant parts are present in the site, remove them by scalping with a grader blade to a depth sufficient to ensure their complete removal.

Follow **Arsenal** applications with paving as soon as possible. **DO NOT** apply where **Arsenal** may contact the roots of desirable trees or other plants.

**Arsenal** is not to be used under pavement on residential properties, such as driveways or parking lots, or for use in recreational areas, such as under bike or jogging paths, golf cart paths, or tennis courts, or where landscape plantings could be anticipated.

Injury or death of desirable plants may result if **Arsenal** is applied where roots are present or where roots may extend into the treated area. Roots of trees and shrubs may extend a considerable distance beyond the branch extremities (drip line).

Apply to the soil surface only when final grade is established. **DO NOT** move soil following **Arsenal** application.

Apply **Arsenal** in sufficient water (at least 100 gals per acre) to ensure thorough and uniform wetting of the soil surface, including shoulder areas. Add **Arsenal** at a rate of 3 quarts per acre (2.2 fluid ounces per 1000 square feet) to clean water in the spray tank during filling operation. Agitate before spraying.

If soil is not moist before treatment, incorporation of **Arsenal** is needed for herbicide activation. Incorporate **Arsenal** into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. **DO NOT** allow treated soil to wash or move into untreated areas.

## Spot Treatment and Crack-and-crevice Treatment

Use **Arsenal** as an initial or follow-up treatment to control weed escapes or weed encroachment in a bareground situation, including cracks and crevices in paved surfaces such as roadways, runways, and parking areas.

### Grass Pasture and Rangeland Spot Treatment Weed Control

For control of undesirable vegetation in grass pasture and rangeland, **Arsenal** may be applied as a spot treatment at a rate of 2 to 48 fluid ounces of product per treated acre using any of the described ground application methods. Spot applications to grass pasture and rangeland may not exceed more than 1/10 of the area to be grazed or cut for hay. See appropriate sections of this label for specific use directions for the application method and vegetation control desired. **DO NOT** apply more than 48 fluid ounces of **Arsenal** per acre per year.

## Grazing and Haying Restrictions

- There are no grazing restrictions following **Arsenal** application.
- **DO NOT** cut forage grass for hay for 7 days after **Arsenal** application.

## Rangeland Use Instructions

**Arsenal® herbicide** may be applied to rangeland for control of undesirable vegetation to achieve one or more of the following vegetation management objectives:

- Control of undesirable (nonnative, invasive, and noxious) plant species
- Control of undesirable vegetation to aid in the establishment of desirable rangeland plant species
- Control of undesirable vegetation to aid in the establishment of desirable rangeland vegetation following a fire
- Control of undesirable vegetation to reduce wildfire fuel
- Release of existing desirable rangeland plant communities from the competitive pressure of undesirable plant species
- Control of undesirable vegetation for wildlife habitat improvement

To ensure the protection of threatened and endangered plants when applying **Arsenal** to rangeland:

- Federal agencies must follow NEPA regulations to ensure protection of threatened and endangered plants.
- State agencies must work with the Fish and Wildlife Service or the Service's designated state conservation agency to ensure protection of threatened and endangered plants.
- Other organizations or individuals must operate under a habitat conservation plan if threatened or endangered plants are known to be present on the land to be treated.

See the appropriate section(s) of this label for specific use directions for the desired rangeland vegetation management objective.

**Arsenal** must only be applied to a given rangeland acre as specific weed problems arise. Long-term control of undesirable weed species ultimately depends on the successful use of land management practices that promote the growth and sustainability of desirable rangeland plant species.

## Rotational Crop Instructions

Rotational crops may be planted 12 months after applying **Arsenal** at the specified pasture and rangeland rate. Following 12 months after an **Arsenal** application and before planting any crop, a successful field bioassay must be completed. The field bioassay consists of a test strip of the intended rotational crop planted in the previously treated area in the grass pasture/rangeland and grown to maturity. The test strip should include low areas and knolls and include variations in soil type and pH within the treated area. If no crop injury is evident in the test strip, the intended rotational crop may be planted the following year.

Use of **Arsenal** in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various environmental and agronomic factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible.

## Aquatic Weed Control

**Arsenal** may be applied for control of floating and emergent undesirable vegetation (see **Aquatic Weeds Controlled** and **Terrestrial Weeds Controlled**) in or near bodies of water that may be flowing, nonflowing, or transient. **Arsenal** may be applied to aquatic sites that include lakes, rivers, streams, ponds, seeps, drainage ditches, canals, reservoirs, swamps, bogs, marshes, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites, riparian sites, and seasonal wet areas. See **Product Use and Restrictions** section of this label for restrictions and instructions on aquatic uses.

Read and observe the following directions if aquatic sites are present in nonagricultural lands and are part of the intended treatment area.

**Arsenal** must be applied to the emergent foliage of the target vegetation and has little-to-no activity on submerged aquatic vegetation. **Arsenal** concentrations resulting from direct application to water are not expected to be of sufficient concentration or duration to control target vegetation. Apply **Arsenal** to maximize spray interception by target vegetation while minimizing the amount of overspray that enters the water.

**Arsenal** does not control plants that are completely submerged or have a majority of their foliage under water.

**Arsenal** may be applied with surface or helicopter application equipment in a minimum of 2 gallons of water per acre. When applying by helicopter, follow directions under the **Aerial Application** section of this label; otherwise, refer to the **Ground Application** section when using surface equipment.

Applications to moving bodies of water should be made while traveling upstream to prevent concentration of this herbicide in water. **DO NOT** apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist.

When applying to target vegetation that covers a large percentage of the surface area of impounded water, treating the area in strips may avoid oxygen depletion because of decaying vegetation. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. If oxygen depletion is a concern, treat no more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas.

Avoid washoff of sprayed foliage by spray boat or recreational boat backwash for 1 hour after application.

Apply **Arsenal** at 1 to 3 quarts per acre depending on species present and weed density. **DO NOT** exceed the maximum label rate of 3 quarts per acre (1.5 lbs ae/A) per year. Use the higher labeled rates for heavy weed pressure. Consult **Aquatic Weeds Controlled** and **Terrestrial Weeds Controlled** for specific rates.

**Arsenal® herbicide** may be applied as a draw-down treatment in areas described above. Apply **Arsenal** to weeds after water has been drained and allow 14 days before reintroduction of water.

## Weeds Controlled

### Aquatic Weeds Controlled

**Arsenal® herbicide** will control the following target species as specified in the **Use Rates and Application Directions** column of the table. Rates are expressed in terms of product volume for broadcast applications and as a % solution for directed applications including spot treatments. **For % solution applications, DO NOT apply more than the equivalent of 3 quarts of Arsenal per acre.**

Common Name	Scientific Name	Use Rates and Application Directions
<b>Floating Weeds</b>		
*Floating heart	<i>Nymphodes</i> spp.	2 to 4 pints/A (0.5 to 1.0% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Frogbit	<i>Limnobium spongia</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Spatterdock	<i>Nuphar luteum</i>	Apply a tank mix of: 2 to 4 pints/A <b>Arsenal</b> + 4 to 6 pints/A glyphosate (0.5% <b>Arsenal</b> + 1.5% glyphosate) in 100 GPA water for best control. Ensure 100% coverage of actively growing emergent foliage.
*Water hyacinth	<i>Eichhornia crassipes</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water to actively growing foliage.
*Water lettuce	<i>Pistia stratiotes</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
<b>Emerged Weeds</b>		
*Alligatorweed	<i>Alternanthera philoxeroides</i>	1 to 4 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Arrowhead, duck-potato	<i>Sagittaria</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Bacopa, lemon	<i>Bacopa</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Parrot feather	<i>Myriophyllum aquaticum</i>	Foliage must be above water for sufficient <b>Arsenal</b> uptake. Apply 2 to 4 pints/A <b>Arsenal</b> to actively growing emergent foliage.
*Pennywort	<i>Hydrocotyle</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Pickerelweed	<i>Pontederia cordata</i>	2 to 3 pints/A (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Taro, wild Coco yam Dasheen Elephant's ear	<i>Colocasia esculentum</i>	4 to 6 pints/A (1.5% solution) applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.

\* Use not permitted in California unless otherwise directed by supplemental labeling.

(continued)

## Aquatic Weeds Controlled *(continued)*

Common Name	Scientific Name	Use Rates and Application Directions
<b>Emergent Weeds</b> <i>(continued)</i>		
*Water chestnut	<i>Trappa natans</i>	4 to 6 pints/A (1.5% solution) applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water lily	<i>Nymphaea odorata</i>	2 to 3 pints/A (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Water primrose	<i>Ludwigia uruguayensis</i>	4 to 6 pints/A (1.5% solution). Ensure 100% coverage of actively growing emergent foliage.
<b>Terrestrial/Marginal Weeds</b>		
*Aquatic nightshade Soda apple	<i>Solanum tampicense</i>	2 pints/A applied to foliage
*Bamboo, Japanese	<i>Phyllostachys</i> spp.	3 to 4 pints/A applied to foliage when plant is actively growing; before setting seedhead. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Beach, vitex	<i>Vitex rotundifolia</i>	5% solution + 1% MSO foliar spray 17% solution stem injection (hack and squirt)
Brazilian pepper Christmasberry	<i>Schinus terebinthifolius</i>	2 to 4 pints/A applied to foliage
Cattail	<i>Typha</i> spp.	2 to 4 pints/A (1% solution) applied to actively growing green foliage after full leaf elongation. Lower rates will control cattail in the North; higher rates are needed in the South.
Chinese tallow tree	<i>Sapium sebiferum</i>	16 to 24 fl ozs/A applied to foliage
Cogongrass	<i>Imperata cylindrica</i>	Burn foliage, till area; then fall-spray 2 quarts/A <b>Arsenal® herbicide</b> + MSO applied to new growth.
Cordgrass, prairie	<i>Spartina</i> spp.	4 to 6 pints/A applied to actively growing foliage
*Cutgrass	<i>Zizaniopsis miliacea</i>	4 to 6 pints/A applied to actively growing foliage
*Elephant grass Napier grass	<i>Pennisetum purpureum</i>	3 pints/A applied to actively growing foliage
*Flowering rush	<i>Butomus umbellatus</i> L.	2 to 3 pints/A applied to actively growing foliage
Giant reed Wild cane	<i>Arundo donax</i>	4 to 6 pints/A applied in spring to actively growing foliage
*Golden bamboo	<i>Phyllostachys aurea</i>	3 to 4 pints/A applied to foliage when plant is actively growing; before setting seedhead. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Junglerice	<i>Echinochloa colonum</i>	3 to 4 pints/A applied to actively growing foliage
Knapweed	<i>Centaurea</i> spp.	<b>Russian knapweed:</b> 2 to 3 pints/A + 1 quart/A MSO fall-applied after senescence begins
Knotweed, Japanese	<i>Polygonum cuspidatum</i> <i>Fallopia japonica</i>	3 to 4 pints/A applied postemergence to actively growing foliage

\* Use not permitted in California unless otherwise directed by supplemental labeling.

*(continued)*

## Aquatic Weeds Controlled *(continued)*

Common Name	Scientific Name	Use Rates and Application Directions
<b>Terrestrial/Marginal Weeds</b> <i>(continued)</i>		
Melaleuca Paperbark tree	<i>Melaleuca quinquenervia</i>	<ul style="list-style-type: none"> <li>• <b>Established stands</b> - Apply 6 pints/A <b>Arsenal</b><sup>®</sup> herbicide + 6 pints/A glyphosate + spray adjuvant. For best results, use 4 quarts/A MSO as an adjuvant.</li> <li>• <b>Ground foliar application</b> - Uniformly apply to ensure 100% coverage.</li> <li>• <b>Broadcast foliar control</b> - Apply aerially in a minimum of 2 passes at 10 gallons/A applied cross treatment.</li> <li>• <b>Spot treatment</b> - Use a 25% <b>Arsenal</b> + 25% solution of glyphosate + 1.25% MSO in water applied as a frill or stump treatment.</li> </ul>
*Nutgrass Kili'p'opu	<i>Cyperus rotundus</i>	2 pints/A <b>Arsenal</b> + 1 quart/A MSO applied early postemergence
*Nutsedge	<i>Cyperus</i> spp.	2 to 3 pints/A postemergence to foliage or preemergence incorporated; nonincorporated preemergence applications will not control.
Phragmites Common reed	<i>Phragmites australis</i>	4 to 6 pints/A applied to actively growing green foliage after full leaf elongation. Ensure 100% coverage. If stand has a substantial amount of old stem tissue, mow or burn; allow to regrow to approximately 5 feet tall before treatment. Lower rates will control phragmites in the North; higher rates are needed in the South.
*Poison hemlock	<i>Conium maculatum</i>	2 pints/A <b>Arsenal</b> + 1 quart/A MSO applied preemergence to early postemergence to rosette before flowering
Purple loosestrife	<i>Lythrum salicaria</i>	1 pint/A applied to actively growing foliage
Reed canarygrass	<i>Phalaris arundinacea</i>	3 to 4 pints/A applied to actively growing foliage
Rose, swamp	<i>Rosa palustris</i>	2 to 3 pints/A applied to actively growing foliage
Russian olive	<i>Elaeagnus angustifolia</i>	2 to 4 pints/A (1% solution) applied to foliage
Saltcedar Tamarisk	<i>Tamarix</i> spp.	<p><b>Aerial application</b> - 2 quarts <b>Arsenal</b> + 0.25% v/v NIS applied to actively growing foliage during flowering.</p> <p><b>Spot treatment</b> - Use 1% solution of <b>Arsenal</b> + 0.25% v/v NIS and spray to wet foliage. After application, wait at least 2 years before disturbing treated saltcedar. Earlier disturbance can reduce overall control.</p>
Smartweed	<i>Polygonum</i> spp.	2 pints/A applied early postemergence
Sumac	<i>Rhus</i> spp.	2 to 3 pints/A applied to foliage
Swamp morningglory Kangkong Water spinach	<i>Ipomoea aquatica</i>	1 to 2 pints/A <b>Arsenal</b> + 1 quart/A MSO applied early postemergence
Torpedo grass	<i>Panicum repens</i>	4 pints/A (1.0 to 1.5% solution). Ensure good coverage to actively growing foliage.
*White top Hoary cress	<i>Cardaria draba</i>	1 to 2 pints/A applied in spring to foliage during flowering
Willow	<i>Salix</i> spp.	2 to 3 pints/A <b>Arsenal</b> applied to actively growing foliage. Ensure good coverage.

\* Use not permitted in California unless otherwise directed by supplemental labeling.

## Terrestrial Weed Control

In terrestrial sites, **Arsenal**<sup>®</sup> herbicide will provide pre-emergence or postemergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by preemergence or postemergence applications of **Arsenal**. For established biennials and perennials, postemergence applications of **Arsenal** will provide the best control.

The rates shown below refer to broadcast applications and indicate the relative sensitivity of these weeds. The relative sensitivity should be referenced when preparing low-volume spray solutions (see **Low-volume Foliar Application** section of **Ground Application**); low-volume applications may provide control of the target species with less **Arsenal** per acre than is shown for the broadcast treatments. Use **Arsenal** only in accordance with the specific use directions on this label and the leaflet label.

Use the relative sensitivity of the species listed following to determine the relative risk of nontarget plant injury if any of the species listed following are considered to be desirable within the area to be treated.

**Resistant Biotypes.** Naturally occurring biotypes (a plant within a given species that has a slightly different but distinct genetic makeup from other plants of the same species) of some weeds listed on this label may not be effectively controlled. If naturally occurring resistant biotypes are present in an area, tank mix **Arsenal** or apply sequentially with an appropriate registered herbicide having a different mode of action to ensure control.

## Terrestrial Weeds Controlled

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Grass Weeds</b>		
<b>Apply 2 to 3 pts/A<sup>1</sup></b>		
Annual bluegrass	<i>Poa annua</i>	A
Broadleaf signalgrass	<i>Brachiaria platyphylla</i>	A
Canada bluegrass	<i>Poa compressa</i>	P
Downy brome	<i>Bromus tectorum</i>	A
Fescue	<i>Festuca</i> spp.	A/P
Foxtail	<i>Setaria</i> spp.	A
Italian ryegrass	<i>Lolium multiflorum</i>	A
Johnsongrass <sup>4</sup>	<i>Sorghum halepense</i>	P
Kentucky bluegrass	<i>Poa pratensis</i>	P
Napier grass <sup>5</sup>	<i>Pennisetum purpureum</i>	P
Orchardgrass	<i>Dactylis glomerata</i>	P
Paragrass	<i>Brachiaria mutica</i>	P
Quackgrass	<i>Agropyron repens</i>	P

(continued)

## Terrestrial Weeds Controlled (continued)

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Grass Weeds (continued)</b>		
<b>Apply 2 to 3 pts/A<sup>1</sup> (continued)</b>		
Sandbur	<i>Cenchrus</i> spp.	A
Smooth brome	<i>Bromus inermis</i>	P
Vaseygrass	<i>Paspalum urvillei</i>	P
Wild oats	<i>Avena fatua</i>	A
Witchgrass	<i>Panicum capillare</i>	A
<b>Apply 3 to 4 pts/A<sup>1</sup></b>		
Barnyardgrass	<i>Echinochloa crus-galli</i>	A
Beardgrass	<i>Andropogon</i> spp.	P
Bluegrass, annual	<i>Poa annua</i>	A
Bulrush <sup>5</sup>	<i>Scirpus validus</i>	P
Cheat	<i>Bromus secalinus</i>	A
Cogongrass	<i>Imperata cylindrica</i>	P
Crabgrass	<i>Digitaria</i> spp.	A
Crowfootgrass	<i>Dactyloctenium aegyptium</i>	A
Fall panicum	<i>Panicum dichotomiflorum</i>	A
Goosegrass	<i>Eleusine indica</i>	A
Itchgrass	<i>Rottboellia exaltata</i>	A
Lovegrass <sup>4</sup>	<i>Eragrostis</i> spp.	P
Maidencane <sup>5</sup>	<i>Panicum hemitomon</i>	A
Panicum, browntop	<i>Panicum fasciculatum</i>	A
Panicum, Texas	<i>Panicum texanum</i>	A
Prairie threeawn	<i>Aristida oligantha</i>	P
Sandbur, field	<i>Cenchrus incertus</i>	A
Signalgrass	<i>Brachiaria platyphylla</i>	A
Wild barley	<i>Hordeum</i> spp.	A
Woolly cupgrass	<i>Eriochloa villosa</i>	A

<b>Apply 4 to 6 pts/A<sup>1</sup></b>		
Bahiagrass	<i>Paspalum notatum</i>	P
Bermudagrass <sup>3, 4</sup>	<i>Cynodon dactylon</i>	P
Big bluestem	<i>Andropogon gerardii</i>	P
Dallisgrass	<i>Paspalum dilatatum</i>	P
Feathertop	<i>Pennisetum villosum</i>	P
Guineagrass	<i>Panicum maximum</i>	P
Saltgrass <sup>3</sup>	<i>Distichlis stricta</i>	P
Sand dropseed	<i>Sporobolus cryptandrus</i>	P
Sprangletop	<i>Leptochloa</i> spp.	A
Timothy	<i>Phleum pratense</i>	P
Wirestem muhly	<i>Muhlenbergia frondosa</i>	P

<sup>1</sup> Use higher rate where heavy or well-established infestations occur.

<sup>2</sup> Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup> Use a minimum of 75 GPA.

<sup>4</sup> Use higher labeled rates.

<sup>5</sup> Use not permitted in California unless otherwise directed by supplemental labeling.

## Terrestrial Weeds Controlled *(continued)*

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Broadleaf Weeds</b>		
<b>Apply 2 to 3 pts/A<sup>1</sup></b>		
Burdock	<i>Arctium</i> spp.	B
Carolina geranium	<i>Geranium carolinianum</i>	A
Carpetweed	<i>Mollugo verticillata</i>	A
Clover	<i>Trifolium</i> spp.	A/P
Common chickweed	<i>Stellaria media</i>	A
Common ragweed	<i>Ambrosia artemisiifolia</i>	A
Dandelion	<i>Taraxacum officinale</i>	P
Dogfennel	<i>Eupatorium capillifolium</i>	A
Filaree	<i>Erodium</i> spp.	A
Fleabane	<i>Erigeron</i> spp.	A
Hoary vervain	<i>Verbena stricta</i>	P
Indian mustard	<i>Brassica juncea</i>	A
Kochia	<i>Kochia scoparia</i>	A
Lambsquarters	<i>Chenopodium album</i>	A
Lespedeza <sup>3</sup>	<i>Lespedeza</i> spp.	P
Miner's lettuce	<i>Montia perfoliata</i>	A
Mullein	<i>Verbascum</i> spp.	B
Nettleleaf goosefoot	<i>Chenopodium murale</i>	A
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>	P
Pepperweed	<i>Lepidium</i> spp.	A
Pigweed	<i>Amaranthus</i> spp.	A
Puncturevine	<i>Tribulus terrestris</i>	A
Russian thistle	<i>Salsola kali</i>	A
Smartweed	<i>Polygonum</i> spp.	A/P
Sorrell	<i>Rumex</i> spp.	P
Sunflower	<i>Helianthus</i> spp.	A
Sweet clover	<i>Melilotus</i> spp.	A/B
Tansymustard	<i>Descurainia pinnata</i>	A
Western ragweed	<i>Ambrosia psilostachya</i>	P
Wild carrot	<i>Daucus carota</i>	B
Wild lettuce	<i>Lactuca</i> spp.	A/B
Wild parsnip	<i>Pastinaca sativa</i>	B
Wild turnip	<i>Brassica campestris</i>	B
Woollyleaf bursage	<i>Franseria tomentosa</i>	P
Yellow woodsorrel	<i>Oxalis stricta</i>	P

*(continued)*

## Terrestrial Weeds Controlled *(continued)*

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Broadleaf Weeds <i>(continued)</i></b>		
<b>Apply 3 to 4 pts/A<sup>1</sup></b>		
Broom snakeweed <sup>4</sup>	<i>Gutierrezia sarothrae</i>	P
Bull thistle	<i>Cirsium vulgare</i>	B
Burclover	<i>Medicago</i> spp.	A
Chickweed, mouseear	<i>Cerastium vulgatum</i>	A
Clover, hop	<i>Trifolium procumbens</i>	A
Cocklebur	<i>Xanthium strumarium</i>	A
Cudweed	<i>Gnaphalium</i> spp.	A
Desert camelthorn	<i>Alhagi pseudalhagi</i>	P
Dock	<i>Rumex</i> spp.	P
Fiddleneck	<i>Amsinckia intermedia</i>	A
Goldenrod	<i>Solidago</i> spp.	P
Henbit	<i>Lamium amplexicaule</i>	A
Knotweed, prostrate	<i>Polygonum aviculare</i>	A/P
Pokeweed	<i>Phytolacca americana</i>	P
Purslane	<i>Portulaca</i> spp.	A
Pusley, Florida	<i>Richardia scabra</i>	A
Rocket, London	<i>Sisymbrium irio</i>	A
Rush skeletonweed <sup>4</sup>	<i>Chondrilla juncea</i>	B
Saltbush	<i>Atriplex</i> spp.	A
Shepherdspurse	<i>Capsella bursa-pastoris</i>	A
Spurge, annual	<i>Euphorbia</i> spp.	A
Stinging nettle <sup>4</sup>	<i>Urtica dioica</i>	P
Velvetleaf	<i>Abutilon theophrasti</i>	A
Yellow starthistle	<i>Centaurea solstitialis</i>	A
<b>Apply 4 to 6 pts/A<sup>1</sup></b>		
Arrowwood	<i>Pluchea sericea</i>	A
Canada thistle	<i>Cirsium arvense</i>	P
Giant ragweed	<i>Ambrosia trifida</i>	A
Gray rabbitbrush	<i>Chrysothamnus nauseosus</i>	P
Little mallow	<i>Malva parviflora</i>	B
Milkweed	<i>Asclepias</i> spp.	P
Primrose	<i>Oenothera kunthiana</i>	P
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	P
Sowthistle	<i>Sonchus</i> spp.	A
Texas thistle	<i>Cirsium texanum</i>	P

<sup>1</sup> Use higher rate where heavy or well-established infestations occur.

<sup>2</sup> Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup> Use not permitted in California unless otherwise directed by supplemental labeling.

<sup>4</sup> For best results, early postemergence applications are required.

## Terrestrial Weeds Controlled *(continued)*

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Vines and Brambles</b>		
<b>Apply 1 pt/A</b>		
Field bindweed	<i>Convolvulus arvensis</i>	P
Hedge bindweed	<i>Calystegia sepium</i>	A
<b>Apply 2 to 3 pts/A<sup>1</sup></b>		
Wild buckwheat	<i>Polygonum convolvulus</i>	P
<b>Apply 3 to 4 pts/A<sup>1</sup></b>		
Greenbriar	<i>Smilax</i> spp.	P
Honeysuckle <sup>3</sup>	<i>Lonicera</i> spp.	P
Morningglory	<i>Ipomoea</i> spp.	A/P
Poison ivy	<i>Rhus radicans</i>	P
Redvine	<i>Brunnichia cirrhosa</i>	P
Wild rose <sup>3</sup>	<i>Rosa</i> spp.	P
including:		
Multiflora rose	<i>Rosa multiflora</i>	P
Macartney rose	<i>Rosa bracteata</i>	P
<b>Apply 4 to 6 pts/A<sup>1</sup></b>		
Trumpetcreeper	<i>Campsis radicans</i>	P
Virginia creeper	<i>Parthenocissus quinquefolia</i>	P
Wild grape	<i>Vitis</i> spp.	P

<sup>1</sup> Use higher rate where heavy or well-established infestations occur.

<sup>2</sup> Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup> Use higher labeled rates.

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Brush Species</b>		
<b>Apply 2 to 4 pts/A<sup>1</sup></b>		
Brazilian peppertree	<i>Schinus terebinthifolius</i>	P
Chinese tallow tree	<i>Sapium sebiferum</i>	P
Popcorn tree		
Russian olive	<i>Elaeagnus angustifolia</i>	P
Sumac	<i>Rhus</i> spp.	P
Willow	<i>Salix</i> spp.	P
<b>Apply 4 to 6 pts/A<sup>1</sup></b>		
Alder	<i>Alnus</i> spp.	P
American beech	<i>Fagus grandifolia</i>	P
Ash <sup>3</sup>	<i>Fraxinus</i> spp.	P
Aspen	<i>Populus</i> spp.	P
Autumn olive	<i>Elaeagnus umbellata</i>	P
Bald cypress	<i>Taxodium distichum</i>	P
Bigleaf maple	<i>Acer macrophyllum</i>	P
Birch <sup>3</sup>	<i>Betula</i> spp.	P
Black gum <sup>4</sup>	<i>Nyssa sylvatica</i>	P
Black oak	<i>Quercus kelloggii</i>	P
Boxelder	<i>Acer negundo</i>	P
Ceanothis	<i>Ceanothis</i> spp.	P
Cherry <sup>3,4</sup>	<i>Prunus</i> spp.	P

*(continued)*

## Terrestrial Weeds Controlled *(continued)*

Common Name	Scientific Name	Growth Habit <sup>2</sup>
<b>Brush Species <i>(continued)</i></b>		
<b>Apply 4 to 6 pts/A<sup>1</sup></b>		
Chinaberry	<i>Melia azedarach</i>	P
Chinquapin	<i>Castanopsis chrysophylla</i>	P
Cottonwood	<i>Populus trichocarpa</i>	
	<i>P. deltoides</i>	P
Cypress	<i>Taxodium</i> spp.	P
Dogwood <sup>3</sup>	<i>Cornus</i> spp.	P
Elm <sup>5</sup>	<i>Ulmus</i> spp.	P
Eucalyptus	<i>Eucalyptus</i> spp.	P
Hawthorn	<i>Crataegus</i> spp.	P
Hickory <sup>3</sup>	<i>Carya</i> spp.	P
Huckleberry	<i>Gaylussacia</i> spp.	P
Lyonia spp.		
including:		
Fetterbush	<i>Lyonia lucida</i>	
Staggerbush	<i>Lyonia mariana</i>	P
Madrone	<i>Arbutus menziesii</i>	P
Maple	<i>Acer</i> spp.	P
Melaleuca	<i>Melaleuca quinquenervia</i>	P
Mulberry <sup>3,6</sup>	<i>Morus</i> spp.	P
Oak <sup>7</sup>	<i>Quercus</i> spp.	P
Persimmon <sup>4</sup>	<i>Diospyros virginiana</i>	P
Poison oak	<i>Rhus diversiloba</i>	P
Poplar	<i>Populus</i> spp.	P
Privet	<i>Ligustrum vulgare</i>	P
Red alder	<i>Alnus rubra</i>	P
Red maple	<i>Acer rubrum</i>	P
Saltcedar	<i>Tamarix pentandra</i>	P
Sassafras	<i>Sassafras albidum</i>	P
Sourwood <sup>4</sup>	<i>Oxydendrum arboreum</i>	P
Sweetgum	<i>Liquidambar styraciflua</i>	P
Sycamore	<i>Platanus occidentalis</i>	P
Tanoak <sup>3</sup>	<i>Lithocarpus densiflorus</i>	P
Titi <sup>8</sup>	<i>Cyrilla racemiflora</i>	P
Tree of heaven	<i>Ailanthus altissima</i>	P
Vaccinium spp.		
including:		
Blueberry	<i>Vaccinium</i> spp.	
Sparkleberry	<i>Vaccinium arboreum</i>	P
Water willow <sup>9</sup>	<i>Justicia americana</i>	P
Yellow poplar <sup>3</sup>	<i>Liriodendron tulipifera</i>	P

<sup>1</sup> Use higher rate where heavy or well-established infestations occur.

<sup>2</sup> Growth Habit: A = Annual, B = Biennial, P = Perennial

<sup>3</sup> Use higher labeled rates.

<sup>4</sup> Best control with applications before formation of fall leaf color

<sup>5</sup> Tank mix with glyphosate

<sup>6</sup> Degree of control may be species dependent.

<sup>7</sup> For water oak (*Quercus nigra*), laurel oak (*Q. lauriflora*), willow oak (*Q. phellos*), and live oak (*Q. virginiana*), use higher labeled rates.

<sup>8</sup> Suppression only

<sup>9</sup> Use not permitted in California unless otherwise directed by supplemental labeling.

## Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above.

**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.**

**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S EXCLUSIVE REMEDY AND BASF'S EXCLUSIVE LIABILITY, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE, SHALL BE LIMITED TO REPAYMENT OF THE PURCHASE PRICE OF THE PRODUCT.**

**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF AND THE SELLER DISCLAIM ANY LIABILITY FOR CONSEQUENTIAL, EXEMPLARY, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.**

BASF and the Seller offer this product, and the Buyer and User accept it, subject to the foregoing **Conditions of Sale and Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of BASF.

1108

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000241-00346.20120911b.**NVA 2012-04-104-0184**

Based on: NVA 2011-04-104-0062  
Supersedes: NVA 2011-04-104-0115

BASF Corporation  
26 Davis Drive  
Research Triangle Park, NC 27709

  
The Chemical Company



HVF15	72 fl oz Vastlan + 24 fl oz Tordon 22K + 3 fl oz Milestone <sup>34</sup> per 100 gallons water	Controls various brush species such as oak, pine, poplar, maple, cherry, elm, vines, and broadleaf weeds while maintaining most grasses. Recommended for most areas. Typical use rates are between 50 and 200 GPA.	Spray all leaves until thoroughly covered for best results. Use caution when treating brush along edges of ROW due to chance for off-target from root uptake. Do not use on areas with low organic matter such as, soils with a high composition of sand or areas with Karst topography.	S	S	C	234 gallons
HVF15+E	+ 1.5 oz Escort <sup>34</sup>	For use on sites with bush honeysuckle. Typical use rates are between 50 and 200 GPA.	Negative effect on grasses, herbs, and forbs.	C	S	C	234 gallons

Code	Application Method and Custom Blend Mixture	Unique Characteristics	Limitations/Restrictions	Notable Species			Max. Allowed Volume Per Acre
				BH	JK	TOH	
	<b>Low Volume (LVF) Follar (best suited for sites with low-medium density brush less than 8 feet tall)</b>						
<b>LVF10</b>	<b>64 oz Arsenal + 64 oz Method 240 SL + 6 oz Escort XP + 126 oz Liberate per 100 gal</b>	Controls various brush species such as, oak, pine, poplar, maple, cherry, elm, honeysuckle, birch, olive, vines, and maintaining most grasses. Typical use rates between 10 and 20 GPA.	Selective low volume mixture. Limited injury to grasses. Preferred LVF Mix where olive and birch are present.	C	C	C	28 gallons



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### **Executive Profile**

CEO, President of private Technical Agriculture Specialty Chemical Industry Business Consulting. Technical & Business Development/ Sales & Strategic Marketing/ Business Plan Development / Six Sigma / Supply Chain Management / Economic & Process Analysis/ National Accounts Management / HR Leadership/ Financial Business Analysis/ Educational Training / Personnel development / Organizational Structure /Extensive Public speaking & communication

Creative decisive and technical analytical with interpersonal executive business acumen skill set consistently successful in business Agriculture Chemical Technical expertise, ROE value, market share ROI balance, operating budget efficiency, & improving bottom line profitability through innovation & strategic goal oriented organizational leadership. Expert in Agricultural Specialty Technical Chemical industry, developing sales & marketing business plans, market brand/company image, mission vision value proposition through team building facilitation, operational excellence, & Six Sigma processes aligned to corporate goals.

- Strategic Market Business Planning & Development
  - IVM Information Technology Implementation & Management
  - Agriculture Chemical Technical Specifications
  - Regulatory Compliance & Molecule Registration
  - Herbicide Environmental Fate, Chemical Mode of action
  - Competitive Market Analysis & Price Matrix Strategy
  - Organizational Business Structure Analysis & Change Facilitation
  - Product & Concept Market launches & Ramp-up
  - Financial Planning, Analysis, Accountability Reporting
  - Human Resources Management/Leadership
- 

### **Qualifying Experience**

#### **EnviroSolutions Group, 2012 to Present**

##### **President**

Executive founder of this privately held Agriculture Chemical Consulting firm serving the Public Utility, Rural Electric Cooperative, Turf & Ornamental, Specialty Agricultural, Federal/State Government agencies, and industry commercial stakeholders. Our people provide technical chemical, regulatory, & business strategy expertise from the board room to field operations focused on science & best management practices. Proven results oriented performance for 35 years in the Agricultural Chemical Specialty industry assures our clients of leading edge technical expertise built on research & development science. Field operational economic efficiency, regulatory compliance balanced with environmental stewardship is our client foundational business principles. Our clients benefit by an independent technical view centered on their project scope with clearly defined expected results with accountability.

### **Selected Goal Results**

- Developed comprehensive Integrated Vegetation Management (IVM) plan system, processes, operational execution and performance assessment accountability matrix
- Initiated 48 YTD Public Utility & State Federal Agencies IVM & Technical Chemical project contract agreements
- Published 76 YTD technical articles, journals, educational manuals & specialty chemical business practices within Industry & business community
- Developed key strategic business alliances with R & D based chemical manufacturers such as Dow Chemical, DuPont, & Bayer etc.
- Developed key university strategic affiliations for R & D chemical protocols & field operation demonstration trials research
- Developed over 34 industry educational training programs, workshops & certification programs
- Initiated & developed an Economic & Performance analysis system resulting in constant improvement processes for client contractor, vendor, bid agreements.
- Environmental impact assessment of IVM, T & O, & technical chemical programs for industry: Mitigation, detectable residue soil/plant analysis assessment, technical specification recommendation
- Regulatory compliance expertise with technical knowledge resources within industry for Federal ERA, State Departments of Agriculture, NERC/FERC, DNR, & other government agencies
- Extensive Field Agronomy, plant taxonomy, woody/herbaceous plant species ecological expertise & management systems customized to site use; Public utility distribution/transmission, pipe lines, DOT'S roadside, DOD, oil/gas drill site, & large private land reclamation projects.

### **Noxious Vegetation Control, Inc./Helicopter Minit-Men, Inc. 2012 to 2013**

#### **Partner/Owner Director of Sales, Marketing, Strategic Business Operations & Technical Services**

Board of Director Officer with this privately held leading aviation services, ground operations & Integrated vegetation management (IVM) program marketer. Technical Chemistry specifications, technical analytics, application methods, contract management, Sales Marketing, P & L, HR, Training responsibility with national product sourcing, logistics, strategy, & operational implementation with public utility, Federal/State government agencies, REC, & private land owner contract oversight. Human resource accountability of 100+ employees in 14 States. Intimately involved in national customer account profile, CRM, contract development, market offer, financial oversight, technical training & operational IVM program implementation.

### **Selected Goal Results**

- Sales Increase of 35% In one-year while sustaining aerial application gross margin at 32% & 24% ground operations. \$6.5 ml.
  - Engaged top 5 U.S. Public utilities developing business relationship with new & expanding contracts.
  - Developed Key Strategic Business Alliances with Basic Chemical manufactures: Dow & DuPont.
  - Initiated 9 Key Strategic Business Partners agreements with large national/regional Tree contractors
  - Initiated comprehensive companywide business governance & HR policies.
  - Developed & established Strategic Marketing plan, Sales segmentation analysis, Sales plan, forecast & competitive business analysis.
  - Reduced inventory carrying cost by 70% with sustainable process system management
  - Established ROI, ROE, EBITD, & financial ratio management triggers to ensure 100% fiduciary accountability & responsibility.
  - Established Sales, marketing, & safety training tools foundation for "best in class" model
  - Initiated and developed a business culture model for mission/vision company integration, industry stewardship, business decision ethics, & people diversity working environment for all employees & customers.
  - Introduced new supply chain molecule management systems through Continuum@ & returnable refillable container management systems.
  - Reduced financial liability & risk of customer contract performance specification standards by implementing balanced applicator/manufacture agreements with Industry best management practices I VM practices. 80% customer complaint reduction. 20% increased employee field operations efficiency. & increased customer satisfaction rating.
  - Initiated formalized business timeline cycle processes: strategic planning, sales & marketing, stage

- logistics, operational implementation.
- Initiated a comprehensive internal & external sales & market strategy process with IVM training presentation integrated IT software (Power Point etc.),
- Initiated a market communication strategy aligned with corporate business plan objectives via website, national trade show exposure, & social media conduits.
- Initiated a comprehensive IT systems overhaul from servers, cellular phones, computers, iPads, & all software systems. ArcView@AgNav
- Launched Technical Services group to business structure adding greater customer market value & competitive differentiation to company offer
- Currently critiquing annual business cycle goals to results performance targets while modifying company business plan & individual customer contract offers for future & subsequent multi-year offered agreements.
- Currently implementing all operational customer contracts, assessing performance specifications & over all company to processes structure to exceed established expectation objectives.

**Business Experience Agricultural Chemical Industry Experience of 38 years;**

- **Dow Chemical- Eastern U.S, Industrial Vegetation Management Business & National Account Business Management 1993 to 2012.** Responsible for Key Accounts & Business management of Eastern U.S. \$23ml. gross sales. Gross margin 44%. Expense Budget \$1.2 ml. Simultaneously grew volume at record 14% + annually & grew gross margin from 21% to 47% contribution EBDIT. 9 Herbicides molecule product market management
  - Strategic Business unit market planning
  - Business Action Planning, Budgeting, Financial market analysis & contribution margin accountable to company
  - Production volume forecasting
  - Contract management negotiation, pricing structure, discount administrative oversight & facilitation
  - Distributor Representative management leadership
  - Product portfolio field performance settlement process. Legal review.
  - Communication program planning
  - Publish written technical white papers through universities
  - Financial: pricing, contribution margin, EBDIT
  - Regulatory product labeling strategy
- **DowElanco •Technical Chemical Formulations Account Management Eastern & Mid-West U.S. -1990 -1994.** Accountable/Responsible for \$19.80ml. sales. Budget management \$90,000. Key National Technical Molecule formulator accounts management for Specialty business unit. Eastern & Mid - West U.S. Region. Herbicides, fungicide, insecticide active ingredient molecule management.
  - Account Management market strategy planning, sale/financial forecasting
  - Internal molecule production volume component forecasting
  - Sales volume forecasting & accountability to established annual plan
  - Contract negotiation, pricing, terms, discounts & financial accountability
  - Technical active ingredient quality assurance oversight
  - Registration & Sub-Registration molecule recommendation & administrative facilitation oversight
  - R & D technical active formulation quality assurance
- **DowElanco - Turf & Ornamental in Mid-Atlantic U.S. -1989 to 1990**
- **Elanco Products/EH Lilly - Agriculture Chemical Business unite 1986 to 1989.** Business unite product segment responsibilities roles
  - Communications Manager:** advertising planning, budgeting, vendor management, market research data analysis, Accountable/responsible for \$7ml annual sales. Budget \$35,000.00
  - Marketing product portfolio manager:** Molecule production planning, Strategic product Planning & program development. Financial contribution accountability. \$44mL annual sales. Budget. \$60,000.00
  - Market Research Manager:** Market Data analysis: soybean, cotton, special crops national
  - Financial Analysis Credit Manager:** Financial direct purchase distributor account review, D & B, balance sheet, P & L analysis, & credit recommendations.
- **Elanco - Agriculture Row Crop Regional Account Management-MN-1983 to 1986** Field technical senior agronomic representative with regional national account responsibility. Upper mid-west region, Responsible/accountable for\$4.2ml annual sales. Budget \$20,000
  - Territory sales action planning
  - Budgeting
  - Goal settings sales forecasting
  - Territory account routing
  - Field product performance management review & financial settlements
  - Major grower technical field sales

- **Elanco Agriculture Row Crop in AR. 1981 to 1983.** Field technical specialist for Mid-south district. Norther AR. Responsible/accountable for &1.7ml. annual sales. Budget> \$14,000
  - Territory sales action planning
  - Budgeting

#### **Related Skills**

Conducted 1,400+ Technical/marketing & multiple business unite pesticide molecule presentation Seminars. U.S., Canada & South America.,  
Published in Ag. professional journals, IVM articles and technical manuals  
Sales Marketing Leadership  
Strategic Market Planning, development & research  
Computer I.T. Systems: Word, PowerPoint®, Excel®, Outlook®, Quicken® Books,  
GIS/GPS Arcview®, SAP, 6 Sigma  
Budget Management & Forecasting  
Financial Analysis & business forecast

#### **Industry Leadership**

Past President of Mountain Lake Vegetation Management Association (MLVMC),  
Past President West Virginia Vegetation Management Association (WVMA),  
R.I.S.E. Representative. Current  
Current Board of Director Member: MLVMC, WVMA.  
Environmental Stewardship Technical Advisor, Public Utility Industry  
UAA Committee Chair & member  
ISA Member & Technical Chemical Advisor

#### **Education**

Bachelor of Science in Agriculture business & Agriculture Economics-  
University of Tennessee-1981  
MS. MBA work - University of Arkansas & University of Minnesota

#### **Certifications**

Certified Trainer: Seven Habits of Highly Effective People, Dale Carnegie Trainer,  
Strategic Marketing, Business Planning, Organization Structure,  
Consultative Sales, Organizational Sales & Marketing Management,  
Behavioral Sales, Strategic Marketing Systems & Processes, Art of Negotiation, Six Sigma Black Belt  
Certified Pesticide Applicator; State(s) Departments of Agriculture  
Certified Pesticide Instructor, R & O Product Demonstration

#### **Civic Involvement**

Christian School of Southern York Board of Director,  
York Christian Alliance Church Board of Director,  
York Lacrosse Treasure & Board of Director, Dallastown HS Scholarship Board of Directors.