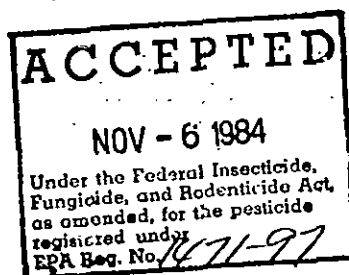


ELANCO ID 5955

SPIKE 80W



A preemergence and postemergence herbicide for control of brush and weeds in such areas as:

Airport runways	At the base of highway
Utility substations and	guardrails, signposts,
rights-of-way	and markers
Tank farms	At the base of transmission
Railway roadbeds and	towers and poles
and ballast	Around industrial buildings
Railroad rights-of-way	Lumberyards
Road shoulders where no	Railroad yards
vegetation is desired	Ditchbanks
Under asphalt and concrete	Firebreaks
pavements where no	Fence rows
future landscaping	
is planned	

The degree and duration of control may vary with the amount of chemical applied, soil texture, and other conditions.

Active ingredient:

tebuthiuron: N[5-(1,1-dimethylethyl)-

1,3,4-thiadiazol-2-yl]-N,N'-dimethylurea.....80.0%

Inert Ingredients:.....20.0%

Contains 3.2 pounds active ingredient per 4 pound bag.

SPIKE® - the registered trademark for Elanco Products tebuthiuron.

CAUTION: KEEP OUT OF REACH OF CHILDREN. See back panel for additional caution statements.

Net Weight 4 Pounds

EPA Reg. No. 1471-97

## Precautionary Statements

### Hazards to Humans and Domestic Animals

#### CAUTION

Harmful if swallowed. Avoid contact with skin, eyes or clothing. Avoid inhaling dust from product. In case of contact, flush with water.

#### Environmental Hazards

Do not contaminate any body of water, ponds or streams as death or injury may occur to vegetation irrigated by such. Do not contaminate water by cleaning of equipment or disposal of wastes.

#### STORAGE AND DISPOSAL

**Storage:** The herbicidal properties of Spike 20P require caution in handling, storage and transportation of this product. Store in original container only. In case of leak or spill, contain material and dispose as waste.

**Pesticide Disposal:** Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Disposal:** Completely empty container - do not reuse. Then dispose of empty container in a sanitary landfill, away from desirable plants, trees and water supply, or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

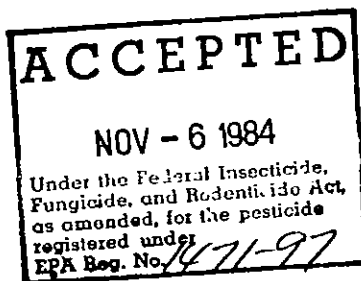
The manufacturer makes no warranties, express or implied, concerning this product or its use which extend beyond the description on the label. All statements made concerning this product apply only when used as directed. Spike 20P must be applied according to Elanco's written instructions, including, but not limited to, recommended rates. Failure to do so may result in poor weed control or plant injury. Elanco expressly disclaims any warranty, either express or implied, for the use of Spike 20P, alone or in combination with other products, when that use is not in strict compliance with Elanco's written recommendations.

**Elanco Products Company • A Division of Eli Lilly and Company**  
**Indianapolis, IN 46285, U.S.A.**

103\*\*\*\*/WP\*\*80/LABELS/US/\*\*\*\*/33

ELANCO ID 5955

SPIKE 80W



A preemergence and postemergence herbicide for control of brush and weeds in such areas as:

Airport runways	At the base of highway
Utility substations and rights-of-way	guardrails, signposts, and markers
Tank farms	At the base of transmission towers and poles
Railway roadbeds and ballast	Around industrial buildings
Railroad rights-of-way	Lumberyards
Road shoulders where no vegetation is desired	Railroad yards
Under asphalt and concrete pavements where no future landscaping is planned	Ditchbanks
	Firebreaks
	Fence rows

The degree and duration of control may vary with the amount of chemical applied, soil texture, and other conditions.

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Net Weight 4 Pounds

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103\*\*\*\*/WP\*\*80/LABELS/US/\*\*\*\*/32

## Precautionary Statements

### Hazards to Humans and Domestic Animals

#### CAUTION

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**Container Disposal:** Completely empty container - do not reuse. Then dispose of empty container in a sanitary landfill, away from desirable plants, trees and water supply, or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

80W

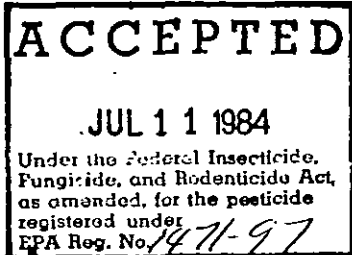
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103\*\*\*\*/WP\*\*80/LABELS/US/\*\*\*\*/33

ELANCO ID 5955

SPIKE 80W



A preemergence and postemergence herbicide for control of brush and weeds in such areas as:

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 Utility substations and  
     rights-of-way  
 Tank farms  
 Railway roadbeds and  
     and ballast  
 Railroad rights-of-way  
 Road shoulders where no  
     vegetation is desired  
 Under asphalt and concrete  
     pavements where no  
     future landscaping  
     is planned

At the base of highway  
     guardrails, signposts,  
     and markers  
 At the base of transmission  
     towers and poles  
 Around industrial buildings  
 Lumberyards  
 Railroad yards  
 Ditchbanks  
 Firebreaks  
 Fence rows

The degree and duration of control may vary with the amount of chemical applied, soil texture, and other conditions.

Active ingredient:

tebuthiuron: N[5-(1,1-dimethylethyl)

-1,3,4-thiadiazol-2-yl]-N,N'-dimethylurea.....80.0%

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Contains 3.2 pounds active ingredient per 4 pound bag. SPIKE® - the registered trademark for Elanco Products tebuthiuron.

CAUTION: KEEP OUT OF REACH OF CHILDREN. See back panel for additional caution statements.

Net Weight 4 Pounds

EPA Reg. No. 1471-97

DIRECTIONS FOR USE: Read All Directions Carefully Before Applying.

Human: Harmful if swallowed. Avoid contact with skin, eyes or clothing. Avoid inhaling dust from product. In case of contact, flush with water.

Environmental: Do not contaminate any body of water, ponds or streams as death or injury may occur to vegetation irrigated by such. Do not contaminate water by cleaning of equipment or disposal of wastes.

Storage and Disposal: The herbicidal properties of SPIKE 80W require caution in handling, storage and transportation of this product. Do not contaminate food or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container. Dispose in an incinerator or land fill approved for pesticide containers or bury in a noncropland area away from desirable plants, trees and water supply.

The manufacturer makes no warranties, express or implied, concerning this product or its use which extend beyond the description on the label. All statements made concerning this product apply only when used as directed. SPIKE 80W must be applied according to Elanco's written instructions, including, but not limited to, recommended rates. Failure to do so may result in poor weed control or plant injury. Elanco expressly disclaims any warranty, either express or implied, for the use of SPIKE 80W, alone or in combination with other products, when that use is not in strict compliance with Elanco's written recommendations.

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## PRECAUTIONS

SPIKE 80W IS INTENDED FOR NONCROPLAND VEGETATION CONTROL. IT IS AN EXTREMELY ACTIVE HERBICIDE WHICH WILL KILL TREES, SHRUBS AND OTHER FORMS OF DESIRABLE VEGETATION HAVING ROOTS EXTENDING INTO THE TREATED AREA. FEEDER ROOTS OF MANY SPECIES OF DESIRABLE VEGETATION EXTEND MANY FEET BEYOND THE DRIP LINE OF THE BRANCHES, AND A VERY SMALL AMOUNT OF SPIKE 80W IN CONTACT WITH ONE FEEDER ROOT OF A TREE, SHRUB OR OTHER DESIRABLE VEGETATION MAY CAUSE SERIOUS INJURY OR DEATH TO THE ENTIRE PLANT.

AN ARBORICULTURIST (TREE EXPERT) SHOULD BE CONSULTED TO HELP YOU TO DETERMINE IF THE AREA OF PROPOSED APPLICATION IS FREE OF ALL ROOTS OF DESIRABLE VEGETATION. THE EFFECT OF SPIKE 80W ON DESIRABLE VEGETATION MAY BE IRREVERSIBLE AND ITS PRESENCE IN THE SOIL MAY PREVENT GROWTH OF OTHER DESIRABLE VEGETATION FOR SOME YEARS AFTER APPLICATION.

READ THE ENTIRE LABEL BEFORE USING SPIKE 80W TO DETERMINE IF THIS PRODUCT IS SUITABLE FOR THE DESIRED PURPOSE.

Do not use SPIKE 80W on areas such as walks, driveways, streets, lawns, patios, tennis courts, swimming pools, cemeteries, or other landscaped areas, or under asphalt or concrete pavement where future landscaping is planned. Do not apply on field crops. Do not apply on any area into which the roots of field crops or other desirable vegetation may extend. ROOTS OF TREES, SHRUBS, AND OTHER



DESIRABLE VEGETATION MAY EXTEND FAR BEYOND THE DRIP LINE OF THE PLANT'S BRANCHES.

AVOID NONTARGET DRIFT OR PRODUCT MOVEMENT. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT OR PRODUCT MOVEMENT. DO NOT APPLY TO AREAS WHERE SOIL MOVEMENT BY WATER EROSION AND/OR NATURAL OR MECHANICAL MEANS IS LIKELY. DO NOT APPLY TO AREAS WHERE WIND IS LIKELY TO CAUSE SOIL MOVEMENT UNLESS A SOIL SEALANT IS USED. DRIFT OR ANY FORM OF PRODUCT MOVEMENT FROM TREATED AREAS MAY CAUSE DAMAGE TO ANY VEGETATION TO WHICH TREATMENT IS NOT INTENDED.

Ditchbank Usage - Do not apply SPIKE 80W to any portion of the ditchbank that will come into direct contact with water as movement of SPIKE 80W in this water to non-target plant species may result in the injury or death of those plants. Do not apply on ditches used to transport irrigation or potable water. Keep from contact with other pesticides and seeds.

Thoroughly clean all traces of SPIKE 80W from application equipment after use. DO NOT EMPTY RESIDUES CLEANED FROM APPLICATION EQUIPMENT ON AREAS WHERE THEY MAY COME IN CONTACT WITH THE ROOTS OF DESIRABLE VEGETATION OR THE WATER SOURCE FOR SUCH VEGETATION.

Woody Plant Control - Grazing is allowed in areas receiving band or individual plant treatments with 5 pounds per acre

or less of SPIKE 80W. In areas receiving band or individual plant treatments with 5 pounds per acre or less of SPIKE 80W, grass may be cut for hay one year after application.

SPIKE 80W may injure or suppress certain herbaceous vegetation in the treated area. Therefore, do not apply where such injury cannot be tolerated. Do not apply broadcast applications of SPIKE 80W where forage or maintenance of a grass cover is desired.

Injury to most herbaceous perennials is reduced if SPIKE 80W is applied when this vegetation is dormant.

DIRECTIONS FOR USE: Read All Directions Carefully Before Applying.

#### TOTAL VEGETATION CONTROL

SPIKE 80W is a preemergence and postemergence herbicide for total control of vegetation in such noncropland areas as:  
airport runways, utility substations and rights-of-way, road shoulders where no vegetation is desired, under asphalt and concrete pavements where no future landscaping is planned, at the base of highway guardrails, sign posts and markers, at the base of transmission towers and poles, around industrial buildings, lumberyards, railroad yards, ditchbanks, firebreaks, and fence rows.

For total vegetation control in areas not treated the previous season with SPIKE 80W or other residual herbicides, apply SPIKE 80W prior to or just after emergence of plants as follows:

At 5 pounds per acre, SPIKE 80W will control the following:

Alfalfa	Hemlock, poison
Aster, heath	Henbit
Aster, white heath	Honeysuckle, Japanese
Barley, little	Horseweed
Bedstraw	Knapweed
Bluegrass, annual	Kochia
Bluegrass, Kentucky	Lambsquarters
Bouncingbet	Lupine
Bromegrass, downy	Medic, black
Bromegrass, ripgut	Morningglory
Bromegrass, smooth	Mullein, common
Broomsedge	Nightshade, silverleaf
Buffelgrass	Oat, wild
Burclover	Panicum, Texas
Buttercup, smallflower	Pepperweed, Virginia
Camphorweed	Pigweed
Carrot, wild	Plantain, buckhorn
Catsear, spotted	Puncturevine
Cheat	Ragweed, giant
Chickweed	Raspberry, red

Clover, red	Ryegrass, Italian
Cocklebur	Sedge, annual
Creeper, Virginia	Shepherdspurse
Crowfootgrass	Sida, prickly
Dock, curly	Sowthistle, annual
Dogfennel	Spikeweed
Fescue	Spurge
Fescue, rattail	Spurge, spotted
Fiddleneck, coast	Starthistle, yellow
Filaree	Strawberry
Filaree, redstem	Sunflower, common
Fleabane, annual	Telegraphplant
Foxtail	Timothy
Gaillardia, rosering	Trumpetcreeper
Geranium, Carolina	Velvetgrass
Goldenrod	Vetch
Grape	Witchgrass
Gumweed	

At 7.5 pounds per acre, SPIKE 80W will control the following:

Awngrass, triple	Ivy, poison
Barley, foxtail	Reed, common
Bromegrass, Japanese	Sandbur, field

Canarygrass, reed  
 Carpetweed  
 Chicory  
 Cinquefoil, common

Smartweed, swamp  
 Sowthistle, perennial  
 Spurge, prostrate  
 Sumac, staghorn  
 Sweetclover, white

At 10 pounds per acre, SPIKE 80W will control the following:

Barnyardgrass

Oxtongue, bristly

Crabgrass

Poorjoe

Itchgrass

Purslane, common

Johnsongrass, seedling

Ragweed, common

Lovegrass

Saltbush

Orchardgrass

Sedge, bull

At 20 pounds per acre, SPIKE 80W will control the following:

Bermudagrass

Lookingglass, Venus

Cudweed

Vaseygrass

Dallisgrass

For the maintenance of total vegetation control in noncropland areas east of the Rocky Mountains which were treated the previous season with SPIKE 80W or other residual herbicides, apply SPIKE 80W prior to or just after emergence of plants as follows: (Some of the species listed may show erratic control depending on the time between application and weed germination.)

At 2 pounds per acre, SPIKE 80W will control the following:

Bluegrass, annual	Parsnip, wild
Bluegrass, Kentucky	Pepperweed
Carrot, wild	Pigweed
Chickweed, common	Ragweed, common
Croton	Smartweed, Pennsylvania
Fleabane, annual	Sweetclover
Horseweed	Thistle, Canada
Mullein	Woodsorrel, yellow
Panicum, fall	

At 3 pounds per acre, SPIKE 80W will control the following:

Goldenrod	Spurge
-----------	--------

In areas of rainfall greater than 25 inches per year, the 3 pounds per acre maintenance rate should be used for all weed species listed above.

For the maintenance of total vegetation control in noncropland areas west of the Rocky Mountains which were treated the previous season with SPIKE 80W or other residual herbicides, apply SPIKE 80W prior to or just after emergence of plants as follows: (Some

of the species listed may show erratic control depending on the time between application and weed germination.)

At. 1.5 pounds per acre, SPIKE 80W will control the following:

Bassia, fivehook	Pigweed
Cheat	Plantain
Cudweed	Ryegrass, annual
Foxtail	Saltbush
Lettuce, prickly	Shepherdspurse
Oat, wild	Witchgrass
Oxtongue, bristly	

At 2 pounds per acre SPIKE 80W will control the following:

Buttercup	Mustard
Canarygrass, reed	Ragweed, western
Knapweed, Russian	Starthistle, yellow
Knotweed	Telegraphplant
Mallow	

At 3 pounds per acre, SPIKE 80W will control the following:

Barley	Sida, alkali
Gumweed	Smartweed, swamp
Puncturevine	

In areas of rainfall greater than 25 inches per year, the 3 pounds per acre maintenance rate should be used for all weed species listed above.

#### Application Directions

Apply SPIKE 80W in 15 to 150 gallons of water per acre before or during the period of active growth of plants to be controlled. Initial control is enhanced by rainfall.

In areas of low annual rainfall (less than 15 inches per year) SPIKE 80W should be applied prior to the time of year when the predominant portion of that rainfall occurs. A minimum of 1 to 1 1/2 inches of rainfall is required to activate SPIKE 80W and place it in the primary weed seed germination zone.

To maximize performance under a variety of conditions, SPIKE 80W is recommended for use in tank-mix combination with any of the following products: amitrole, Atraton® 80W, Banvel® 720, Banvel® W.S., Karmex® 80W, MSMA, paraquat, Princep® 80W, Roundup®, SURFLAN® 75W, 2,4-D or ~~Oust®~~. Where applications are made to existing vegetation, the contact or burning properties of paraquat or MSMA provide the rapid top kill while SPIKE 80W gives the residual long-term control desired. Applications to areas which are infested with certain difficult to control perennial weeds (such as johnsongrass, bermudagrass, quackgrass, horsetail,



bindweed, dandelion or nutsedge) will benefit from tank-mixing SPIKE 80W with Roundup, amitrole, Banvel, Banvel 720, or 2,4-D. The addition of SURFLAN, Oust, Karmex, Atratul or Princep will improve SPIKE's performance on certain annual broadleaf and grass weeds such as foxtail, kochia, Russian thistle, or seedling johnsongrass.

Read the SPIKE 80W label and labels of products to be tank-mixed carefully before using. Note all warnings, cautions, precautions, and limitations of warranty on all labels.

SURFLAN® - oryzalin, Elanco Products Company

Atratul® - atrazine and prometon, Ciba-Geigy

Banvel® - dicamba, Velsicol Chemical Corporation

Karmex® - diuron, E.I. DuPont De Nemours & Company

Princep® - simazine, Ciba-Geigy

Roundup® - glyphosate, Monsanto Company

Oust® - Sulfometuron-methyl, E.I. DuPont De Nemours & Company

Apply with any sprayer that will apply the spray uniformly. Check the sprayer before and during use to insure proper calibration and uniform application.

To mix, fill spray tank half full of water. Start agitation and continue during the entire mixing process. Add required amount of SPIKE 80W and allow to mix when tank mixing. If additional product is a wettable powder, add to tank and allow to mix thoroughly. If additional product is a liquid, add slowly while filling remainder of tank with water. Continuous agitation in the spray tank is required to keep the materials in suspension throughout application. Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming.

For treating small areas, a tank type hand sprayer or sprinkling can may be used. Before application determine the amount of water and chemical necessary to cover uniformly the area to be treated. Shake or stir frequently.

#### WOODY PLANT CONTROL

SPIKE 80W is an effective herbicide for the control of brush and vines. SPIKE 80W can be applied either as a broadcast spray,

banded application or as an individual plant treatment depending upon the size, density and location of brush to be controlled.

SPIKE is to be applied to the soil (Not the Foliage!) where it is absorbed by the roots of plants. Effects are slow to appear and will not become apparent until sufficient moisture has carried SPIKE 80W into the root zone. The time required to achieve control is dependent on soil type, amount of rainfall and depth of species rooting. Some species may go through several defoliations and refoliations over a period of approximately two to three years prior to dying.

SPIKE 80W can be applied anytime except when the ground is frozen or the soil is saturated with moisture. For optimum results, applications should be made just prior to the resumption of active seasonal growth in the spring and/or periods of rainfall. For applications made in the late summer or early fall in areas of average annual rainfall of greater than 25 inches, higher rates should be used and inconsistent control may result on densely infested brush areas and hard to control species.

SPIKE 80W may be used on cut brush but for optimum results time should be allowed for the brush to resprout to a height of approximately 5 feet prior to application. SPIKE requires an actively growing plant to be effective. The larger the resprouts the more SPIKE that will be taken up by the plant and the more effective and consistent the control will be.

For the control of woody plants and vines, the following rates of SPIKE 80W are recommended. These rates can vary depending upon soil type, rainfall, time of application and size/density of the woody plants.

SPIKE 80W applied at the rate of 1.25 pounds per acre will control the following species.

Haplopappus tenuisectus	(Burroweed)
Larrea tridentata	(Creosotebush)
Mimosa biuncitera	(Wait-a-minute-bush)

SPIKE 80W applied at the rate of 2.5 pounds per acre will control the following species.

Ailanthus altissima	(Tree-of-heaven)
Aloysia lycioides	(Whitebrush)
Artemisia tridentata	(Big sagebrush)
Carya glabra	(Pignut hickory)
Celtis occidentalis	(Western hackberry)
Datura discolor	(Desert thornapple)
Lycium berlandieri	(Berlandier wolfberry)
Morus rubra	(Red mulberry)
Pinus monticola	(Western white pine)
Pinus spp.	(Pine)
Prunus emarginata	(Bitter cherry)

<i>Rhus glabra</i>	(Smooth sumac)
<i>Robinia pseudoacacia</i>	(Black locust)
<i>Rosa multiflora</i>	(Multiflora rose)
<i>Salvia leucophylla</i>	(Black sage)
<i>Symphoricarpos orbiculatus</i>	(Buckbrush)
<i>Ulmus americana</i>	(American elm)
<i>Vaccinium spp.</i>	(Blueberry)
<i>Gaylussacia spp.</i>	(Huckleberry)

SPIKE 80W applied at the rate of 3.75 pounds per acre will control the following species.

<i>Abies balsamea</i>	(Balsam fir)
<i>Acacia farnesiana</i>	(Huisache)
<i>Acer saccharum</i>	(Sugar maple)
<i>Alnus rugosa</i>	(Speckled alder)
<i>Betula populifolia</i>	(Gray birch)
<i>Carya texana</i>	(Black hickory)
<i>Celtis pallida</i>	(Granjeno)
<i>Condalia obtusifolia</i>	(Lotebush condalia)
<i>Ilex vomitoria</i>	(Yaupon)
<i>Larix laricina</i>	(Tamarack)
<i>Picea glauca</i>	(White spruce)
<i>Populus balsamifera</i>	(Balsam poplar)
<i>Populus deltoides</i>	(Eastern cottonwood)
<i>Quercus douglasii</i>	(Blue Oak)

<i>Quercus marilandica</i>	(Blackjack oak)
<i>Quercus stellata</i>	(Post oak)
<i>Salix</i> spp.	(Willow)
<i>Schaefferia cuneifolia</i>	(Desert yaupon)
<i>Spiraea tomentosa</i>	(Hardhack)
<i>Ulmus alata</i>	(Winged elm)

SPIKE 80W applied at the rate of 5 pounds per acre will control the following species.

<i>Acacia berlandieri</i>	(Guajillo)
<i>Acacia greggii</i>	(Catclaw acacia)
<i>Acacia rigidula</i>	(Blackbrush acacia)
<i>Acacia tortuosa</i>	(Twisted acacia)
<i>Acer negundo</i>	(Boxelder)
<i>Adenostoma fasciculatum</i>	(Chamise)
<i>Alnus rubra</i>	(Red alder)
<i>Campsis radicans</i>	(Trumpet creeper)
<i>Carya ovata</i>	(Shagbark hickory)
<i>Cercocarpus betuloides</i>	(Birchleaf mountain-mahogany)
<i>Colubrina texensis</i>	(Texas colubrina)
<i>Condalia obovata</i>	(Bluewood condalia)
<i>Cornus drummondii</i>	(Roughleaf dogwood)
<i>Crataegus</i> spp.	(Hawthorn)
<i>Eysenhardtia texana</i>	(Texas kidneywood)

<i>Fagus grandifolia</i>	(American beech)
<i>Jatropha dioica</i>	(Leatherstem)
<i>Leucophyllum frutescens</i>	(Cenizo [Texas silverleaf])
<i>Liquidambar styraciflua</i>	(Sweetgum)
<i>Parthenocissus quinquefolia</i>	(Virginia creeper)
<i>Populus grandidentata</i>	(Bigtooth aspen)
<i>Porlieria angustifolia</i>	(Guayacan)
<i>Prunus virginiana</i>	(Common chokecherry)
<i>Pseudotsuga menziesii</i>	(Douglas fir)
<i>Pueraria lobata</i>	(Kudzu)
<i>Quercus dumosa</i>	(California scrub oak)
<i>Quercus palustris</i>	(Pin oak)
<i>Quercus rubra</i>	(Red oak)
<i>Quercus virginiana</i>	(Live oak)
<i>Rhus typhina</i>	(Staghorn sumac)
<i>Rubus allegheniensis</i>	(Allegheny blackberry)
<i>Salvia ballotaeflora</i>	(Shrubby blue salvia)

SPIKE 80W applied at the rate of 6.25 pounds per acre will control the following species:

<i>Acer macrophyllum</i>	(Bigleaf maple)
<i>Acer platanoides</i>	(Norway maple)
<i>Acer saccharinum</i>	(Silver maple)
<i>Baccharis</i> spp.	(Groundsel tree)

<i>Cornus florida</i>	(Flowering dogwood)
<i>Fraxinus pennsylvanica</i>	(Green ash)
<i>Gaultheria shallon</i>	(Salal)
<i>Juniperus virginiana</i>	(Eastern redcedar)
<i>Lantana camara</i>	(Lantana)
<i>Liriodendron tulipifera</i>	(Tuliptree)
<i>Melaleuca quinquenervia</i>	(Melaleuca)
<i>Pinus banksiana</i>	(Jack pine)
<i>Pinus echinata</i>	(Shortleaf pine)
<i>Pinus resinosa</i>	(Red pine)
<i>Pinus virginiana</i>	(Virginia pine)
<i>Platanus occidentalis</i>	(American sycamore)
<i>Prunus serotina</i>	(Black Cherry)
<i>Quercus alba</i>	(White oak)
<i>Rubus laciniatus</i>	(Evergreen blackberry)
<i>Rubus occidentalis</i>	(Black raspberry)
<i>Schinus terebinthifolius</i>	(Brazilian peppertree)

SPIKE 80W applied at the rate of 7.5 pounds per acre will control the following species.

<i>Acer circinatum</i>	(Vine maple)
<i>Arctostaphylos patula</i>	(Greenleaf manzanita)
<i>Ceanothus cuneatus</i>	(Wedgeleaf ceanothus)
<i>Ceanothus leucodermis</i>	(Whitethorn chaparral)
<i>Crataegus crus-galli</i>	(Cockspur hawthorn)



<i>Elaeagnus angustifolia</i>	(Russianolive)
<i>Fraxinus americana</i>	(White ash)
<i>Ligustrum spp.</i>	(Privet)
<i>Rhus laurina</i>	(Laurel sumac)
<i>Sapium sebiferum</i>	(Tallowtree)
<i>Smilax rotundifolia</i>	(Common greenbrier)
<i>Ulmus parvifolia</i>	(Chinese elm)
<i>Ulmus rubra</i>	(Slippery elm)

### Broadcast Application

Apply SPIKE 80W in 15 to 150 gallons of water per acre with any properly calibrated herbicide sprayer. Check the sprayer before and during use to insure proper calibration and uniform application. Add the recommended amount of SPIKE 80W to clean water in the spray tank during the filling operation. Material must be kept in suspension at all times by constant agitation. Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming.

For treating small areas, a tank type hand sprayer may be used. Before application, determine the amount of water and chemical necessary to cover uniformly the area to be treated. Shake or stir frequently.

Do not apply broadcast applications of SPIKE 80W where forage or maintenance of a grass cover is desired.

#### Banded Application

SPIKE 80W is recommended for the control of woody plant species in noncropland areas (such as utility, railroad, and pipeline rights-of-way, ditchbanks and fence rows) by application of a series of parallel bands to the soil surface. Individual bands should be spaced at intervals from 4 to 10 feet and at the currently labeled rate range of 2.5 to 7.5 pounds per acre depending on the woody species to be controlled. Actual herbicide bands should be kept as narrow as possible during application to achieve minimal injury or control of herbaceous vegetation. Apply SPIKE 80W to the soil surface in 5 to 75 gallons of water per acre in a series of parallel bands with spacing between bands ranging from 4 to 10 feet. In areas such as brush infested fence rows on utility rights-of-way, a single band may be applied. Control is dependent upon root systems intercepting bands. Therefore larger stems should be treated individually when using single bands.

Band spacing should be selected based on the size of the woody plants in the area to be treated and the amount of injury or control of herbaceous vegetation that can be tolerated.

Where control of young or seedling woody plants is desired, bands should be spaced closer together. This will achieve maximum

exposure to their limited root systems. Where larger more mature woody species are to be controlled, bands should be spaced at the wider end of the recommended spacing range.

In addition to allowing adequate exposure of the more extensive root systems of these larger woody species for control, use of the wider spacings will further reduce injury or control of herbaceous vegetation in the area of treatment.

Within the treated band nearly all vegetation, woody and herbaceous, will be killed. Some herbaceous vegetation close to the treated band with roots extending into it may be severely injured or killed. However, since herbaceous species tend to have restricted root systems, most species outside the treated band will not be affected. Banded applications in areas of steep terrain should be applied across existing slopes in order to prevent soil erosion.

Apply with equipment designed to deliver the spray uniformly in the bands. To maintain the integrity of the individual herbicide bands, straight stream nozzles fitted with internal stabilizing vanes or their equivalent are recommended. Operating pressures should also be kept as low as will provide uniform delivery of the spray solution. Pressures in the range of 10 to 40 psi should be adequate. Pressures in excess of 40 psi will tend to cause the individual bands to break up.

When applications are made in an area where nozzles are elevated above the soil surface more than 5 feet, breakup of the individual spray streams may occur. If conditions do not permit delivery of intact spray streams to the soil surface, this method of application should not be used.

Fill the spray tank half-full of water. Start agitation and continue during entire mixing and spraying operation. Add the required amount of SPIKE 80W and allow it to mix thoroughly while completing the spray tank filling. If hand held or back pack type sprayers are used, shake vigorously after filling and periodically during application to maintain product suspension. A master shut-off switch for the entire spraying system and nozzle check valves are recommended on commercial spray equipment.

Material must be kept in suspension at all times by continuous agitation. Agitate by mechanical or bypass (hydraulic) means in the spray tank. If bypass or return agitation is used, it should terminate at the bottom of the tank to minimize foaming. Check the sprayer frequently before and during use to insure proper calibration and uniform application.

#### Individual (Spot) Application

SPIKE 80W may be applied in high or low volumes of water to selectively control individual woody plants. Recommended rates will vary depending upon site conditions with the higher rates

needed for difficult to control species, large plants, heavier soils, fall applications and cut brush. Consult your local Elanco SPIKE distributor to determine the best rates for your location.

For high volume applications, mix 1 pound of SPIKE 80W in enough water to make 10 gallons of solution. Apply 10 ounces of material to the soil per every 2 to 4 inches of stem diameter.

For low volume applications, mix 1 pound of SPIKE 80W in enough water to make 1 gallon of solution. Apply 1 ounce of material to the soil per every 2 to 4 inches of stem diameter.

When treating large stems, apply the multiple treatments in even spacing around the stem.

For applying SPIKE 80W in banded or individual plant treatment, two pieces of equipment are suggested; the Solo Model 425 back pack sprayer for both banding and individual plant treatment and the Spot Gun for individual plant treatment.

The Solo sprayer is prepared for spraying by adding the pre-slurried contents of a 4 pound bag of SPIKE 80W and water to the tank. Fill to capacity with additional water and shake vigorously. Equip the Solo sprayer with a 0003-SS straight stream nozzle and the Solo pressure regulator with the green (10 psi) pressure limiting spring. To band SPIKE 80W at 5 pounds per acre, walk at 3 mph (264 feet per minute) with the Solo on continuously

and space the bands 5 feet apart. Adjust the rate and walking speed according to the brush species and conditions encountered. For individual plant treatment with the Solo, apply a 1.5 second shot for every 1 to 2 inches of stem diameter at the base of unwanted woody plants.

The Spot Gun is prepared for individual plant treatment by mixing 2 pounds of SPIKE 80W in sufficient water to obtain 1 gallon of spray solution. Set the Spot Gun to deliver 8 milliliters of this solution for every 1 to 2 inches of stem diameter at the base of the unwanted woody plants. For application on steep slopes or other sensitive areas, the Spot Gun can be equipped with a soil probe to allow injection of the SPIKE 80W solution beneath the soil surface. Placement at a soil depth of 2 to 4 inches will eliminate any surface movement and reduce injury to herbaceous vegetation.

At the prescribed rates, a 4 pound bag of SPIKE 80W will treat approximately 950 stems 1 to 2 inches in diameter. Because of its non-volatile nature and low potential for drift this SPIKE application technique can be used for treating unwanted woody plants growing on non-cropland areas adjacent to sensitive crops. (See label precautions.) A white spot should be visible at the base of each treated stem which should aid in inspection of the completed work.

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Figure 1 consists of 16 small diagrams arranged in a 4x4 grid. The diagrams are organized into two columns of eight. The left column shows the initial state of a 2D lattice of particles, with particles represented by small circles at the corners of a square lattice. The right column shows the state after a time step, with particles having moved to new positions, indicated by arrows. The diagrams illustrate the movement of particles in a 2D lattice over time.