

OCT 20 1994

Dr. Merlyn L. Jones  
DowElanco  
9330 Zionsville Rd.  
Indianapolis, IN 46268

Dear Dr. Jones:

Subject: Groundwater Advisory Statements  
Dow/Elanco Spike 80W  
EPA Reg. No. 62719-107  
Your submission dated Oct. 12, 1994

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable and a stamped copy is enclosed for your records.

Sincerely yours,

Robert J. Taylor  
Product Manager 25  
Fungicide-Herbicide Branch  
Registration Division (H7505C)

Enclosure

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7820

[Editor's note: Added text is underlined and deleted text is denoted by ~~strike-through~~.]

[Bag - Spike 80W]  
[Front of Bag]

(logo) DowElanco

# Spike\* 80W

A preemergence and postemergence herbicide for total control of brush and weeds.

(insert graphic of tree in circle with slash through it. Copy below the tree is: Spike\* 80W will kill trees and shrubs. Carefully read the precautions before using.)

**Active Ingredient:**

tebuthiuron: <i>N</i> -[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]- <i>N,N'</i> -dimethylurea .....	80.0%
Inert Ingredients .....	20.0%
<u>Total .....</u>	<u>100.0%</u>

Contains 20 pounds active ingredient per 25 pound bag.

**Keep Out of Reach of Children**

## CAUTION

Refer to back panel of bag for precautionary information and Directions for Use including Storage and Disposal.

**Notice:** Read the entire label. Use only according to label directions. Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" inside label booklet.

In case of emergency endangering health or the environment involving this product, call collect 517-636-4400.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-107

EPA Est. 477-TX-1

\*Trademark of DowElanco  
DowElanco • Indianapolis, IN 46268 U.S.A.

**Not For Residential Use**

**Specialty Herbicide**

**Net Weight 25 lb**

**ACCEPTED  
WITH COMMENTS  
By EPA Letter Dated**

OCT 20 1994

Handwritten notes and registration number:  
62719-107

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[Back of Bag]

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## Precautionary Statements

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### Hazards to Humans and Domestic Animals

#### CAUTION PRECAUCION

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.)

#### Causes Eye Irritation • Harmful If Swallowed, Inhaled Or Absorbed Through The Skin

~~Avoid breathing dust and contact with eyes, skin or clothing. Use eye protection and protective clothing such as coveralls, a long-sleeved shirt and impermeable gloves when handling this product.~~ Eye protection, long-sleeved shirt, long pants, shoes and socks, and waterproof gloves must be worn when handling or applying this product. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

#### First Aid

**If swallowed:** Call a physician or Poison Control Center. Drink one or two glasses of water and induce vomiting by touching back of throat with finger or, if available, by administering one to two teaspoons of syrup of ipecac. Do not induce vomiting or give anything by mouth to an unconscious person.

**If on skin:** Wash with plenty of soap and water. Get medical attention if irritation develops.

**If in eyes:** Flush eyes with plenty of water. Call a physician if irritation develops.

**If inhaled:** Remove individual to fresh air. If breathing difficulty occurs, get medical attention. If not breathing, provide cardiopulmonary resuscitation assistance (mouth-to-mouth) and get medical attention.

#### Environmental Hazards

**Precaution:** Do not use Spike® 80W herbicide in any area where desirable species are in the vicinity of the plants to be controlled. A small amount of Spike 80W in contact with the roots of desirable trees or other woody species may cause severe injury or death. The roots of such plants may extend far beyond their drip lines.

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 ~~by cleaning of equipment or when disposing of wastes or equipment washwaters when disposing of equipment washwaters or rinsate.~~

**Ground Water Advisory:** This product is known to leach through soil into ground water under certain conditions as a result of registered (rangeland and non-crop) uses. Use of this product in areas where soils have rapid to very rapid permeability, particularly where the water table is shallow, may result in ground water contamination.

#### Use Restrictions for Groundwater Protection

**Vulnerable Sites:** To minimize any movement of tebuthiuron to subsurface water, do not exceed the application rates specified below on treatment sites where soils have a sand or loamy sand texture throughout the soil profile and all of the following characteristics:

1. Rapid to very rapid permeability.
2. Absence of well-defined organic layers or a textural B-horizon (restricting layer of fine-textured soil).
3. The water table of an underlying aquifer<sup>†</sup> is shallow.

The maximum use rates for Spike 80W in areas described above are:

- Less than 20 inches annual precipitation: Do not apply more than 25 lb/acre Spike 80W.

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- Greater than 20 Inches annual precipitation: Do not apply more than 2.5 lb/acre Spike 80W.

Refer to the "Woody Plants Controlled" section of this label for plant species controlled at these application rates.

‡An aquifer is defined as "an underground saturated, permeable, geologic formation capable of producing significant quantities of water to a well or spring. It is the ability of the saturated zone, or portion of that zone, to yield water which makes it an aquifer (American Chemical Society, 1983). Local agricultural agencies can provide further information on the type of soil in your area and the location of shallow ground water aquifers.

~~The maximum use rates for Spike 80W in areas described above are:~~

~~Less than 20 inches annual precipitation: Do not apply more than 1.25 lb/acre Spike 80W.~~

~~Greater than 20 inches annual precipitation: Do not apply more than 2.5 lb/acre Spike 80W.~~

Refer to the "Woody Plants Controlled" section of this label for plant species controlled at these application rates.

Do not apply Spike 80W in areas where the water table is predominately shallow (5 feet or less), such as marshy or sub irrigated areas, or areas immediately adjacent to streams or lakes which are periodically flooded, unless such use is allowed under a state-approved pesticide management program. Note: Also on such areas, woody plants rooted directly in a shallow water table are minimally affected by applications of tebuthiuron and poor woody plant control will result.

Do not apply Spike 80W where bedrock is continuously exposed or in areas of bedrock overlain by soils that are shallow or discontinuous.

Do not apply Spike 80W in areas adjacent to sinkholes or depressions lacking external drainage which occur within areas of karst topography.

Do not apply Spike 80W to high shrink/swell soils (vertisols) which develop deep cracks upon drying.

Do not apply Spike 80W within areas identified by state or local authorities as protected groundwater recharge zones.

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### Directions for Use

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

Read all Directions for Use carefully before applying.

Do not apply Spike 80W through any type of irrigation system.

### Storage and Disposal

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

**Storage:** The herbicidal properties of Spike 80W 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:** 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 bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Refer to label booklet in pocket of bag for additional precautionary information and Directions for Use.

Directions Enclosed [EDITOR NOTE: Turned at a 20° angle inside a box which has all 4 sides as bold dotted lines.]

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[Right Gusset of Bag]

(logo) **DowElanco**

**Spike\* 80W**

[Left Gusset of Bag]

(logo) **DowElanco**

**Spike\* 80W**

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[Literature Booklet -- Spike 80W]  
[Front Cover of Booklet]

(logo) **DowElanco**

# **Spike 80W**

## **Vegetation Management**

**A preemergence and postemergence herbicide for total control of brush and weeds.**

**Not for Residential Use**

EPA Reg. No. 62719-107

(insert graphic of tree in circle with slash through it. Copy below the tree is: Spike\* 80W will kill trees and shrubs. Carefully read the precautions before using.)

\*Trademark of DowElanco  
DowElanco • Indianapolis, IN 46268 U.S.A.

### **Specialty Herbicide**

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T1H WPS0 LABELS US

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[Page 2 of Booklet]

Active Ingredient:

tebuthiuron: N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-N,N'-dimethylurea

tebuthiuron: N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-N,N'-dimethylurea .....	80.0%
Inert Ingredients .....	20.0%
Total .....	100.0%

Contains 20 pounds active ingredient per 25 pound bag.

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**Environmental Hazards**

**Precaution:** Do not use Spike® 80W herbicide in any area where desirable species are in the vicinity of the plants to be controlled. A small amount of Spike 80W in contact with the roots of desirable trees or other woody species may cause severe injury or death. The roots of such plants may extend far beyond their drip lines.

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

**Ground Water Advisory:** This product is known to leach through soil into ground water under certain conditions as a result of registered (rangeland and non-crop) uses. Use of this product in areas where soils have rapid to very rapid permeability, particularly where the water table is shallow, may result in ground water contamination.

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**Use Restrictions for Groundwater Protection**

**Vulnerable Sites:** To minimize any movement of tebuthiuron to subsurface water, do not exceed the application rates specified below on treatment sites where soils have a sand or loamy sand texture throughout the soil profile and all of the following characteristics:

1. Rapid to very rapid permeability.
2. Absence of well-defined organic layers or a textural B-horizon (restricting layer of fine-textured soil).
3. The water table of an underlying aquifer<sup>‡</sup> is shallow.

The maximum use rates for Spike 80W in areas described above are:

- Less than 20 inches annual precipitation: Do not apply more than 1.25 lb/acre Spike 80W.
- Greater than 20 inches annual precipitation: Do not apply more than 2.5 lb/acre Spike 80W.

Refer to the "Woody Plants Controlled" section of this label for plant species controlled at these application rates.

<sup>‡</sup>An aquifer is defined as "an underground saturated, permeable, geologic formation capable of producing significant quantities of water to a well or spring. It is the ability of the saturated zone, or portion of that zone, to yield water which makes it an aquifer (American Chemical Society, 1983). Local agricultural agencies can provide further information on the type of soil in your area and the location of shallow ground water aquifers.

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~~Refer to the "Woody Plants Controlled" section of this label for plant species controlled at these application rates.~~

Do not apply Spike 80W in areas where the water table is predominately shallow (5 feet or less), such as marshy or sub irrigated areas, or areas immediately adjacent to streams or lakes which are periodically flooded, unless such use is allowed under a state-approved pesticide management program. Note: Also on such areas, woody plants rooted directly in a shallow water table are minimally affected by applications of tebuthiuron and poor woody plant control will result.

Do not apply Spike 80W where bedrock is continuously exposed or in areas of bedrock overlain by soils that are shallow or discontinuous.

Do not apply Spike 80W in areas adjacent to sinkholes or depressions lacking external drainage which occur within areas of karst topography.

Do not apply Spike 80W to high shrink/swell soils (vertisols) which develop deep cracks upon drying.

Do not apply Spike 80W within areas identified by state or local authorities as protected groundwater recharge zones.

**Directions for Use**

It is a violation of federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying. Do not apply Spike 80W through any type of irrigation system.

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### **Storage and Disposal**

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

**Storage:** The herbicidal properties of Spike 80W 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:** 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 bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

### **General Information**

#### **General Use Precautions**

Read the entire label before using Spike 80W to determine if this product is suitable for the desired purpose.

Spike 80W herbicide is intended for non-cropland 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.~~ (Ed. note: Text moved to beginning of section)

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 non-target 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 where wind erosion may cause movement of soil containing Spike 80W from the treated area unless the soil surface has been stabilized with a gravel mulch or some other means. Drift or any form of product movement from treated areas may cause damage to any vegetation to which treatment is not intended.

Do not apply Spike 80W to interior ditchbanks (areas which slope toward the drainage). Do not apply to ditches used to transport irrigation or potable water.

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.

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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.

**Weedy Plant Control Grazing Haying Restrictions**

If treated area is to be used for haying or grazing, do not apply more than 5 pounds per acre of Spike 80W, and do not apply the product more than once a year. 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.~~

(Editor's note: This paragraph moved forward in sequence; See above)

**Frequency of Application and Maximum Use Rates**

**Vegetation Control by Ground Broadcast or Banded Application:**

- The maximum use rate and frequency of application is 1 to 2 lb a.i./acre once every three years for vulnerable sites where soils are sandy and depth to water table is shallow. (Refer to Environmental Hazards section under "Use Restrictions for Ground Water Protection".)
- For all other areas, the maximum use rate and frequency of application is up to 4 lb a.i./acre once every three years; and no more than two treatments totaling 6 lb a.i./acre in any 6 year period.

Total Vegetation Control and Maintenance of Bare Ground by Ground Broadcast Only: The maximum use rate and frequency of application is up to 4 lb a.i./acre applied only once per year; however, no more than 6 lb a.i./acre may be applied in any 3 year period.

Spot Treatments (Hand-held Equipment): May be applied at rates up to 6 lb a.i./acre when needed.

**Use Restrictions In the State of Florida**

In Broward, Collier, Dade, Hendry, Lee, Monroe and Palm Beach Counties of Florida, Spike 80W may be applied only in accordance with supplemental labeling.

**Approved Uses**

**Total Vegetation Control**

Spike 80W is a preemergence and postemergence herbicide for total control of vegetation in such non-cropland 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, 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:

Note: Refer to General Information section for limitations on maximum use rates, frequency of application and total application rates allowed during a given period of time. Refer to Environmental Hazards section under "Use Restrictions for Ground Water Protection" for other rate limitations on "vulnerable" sites.

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

- |                     |                    |
|---------------------|--------------------|
| alfalfa             | hemlock, poison    |
| aster, heath        | henbit             |
| aster, white heath  | honeysuckle,       |
| barley, little      | Japanese           |
| bedstraw            | horseweed          |
| bluegrass, annual   | knapweed           |
| bluegrass, Kentucky | kochia             |
| bouncingbet         | lambsquarters      |
| bromegrass, downy   | lupine             |
| bromegrass, riggut  | medic, black       |
| bromegrass, smooth  | morningglory       |
| broomsedge          | mullein, common    |
| buffelgrass         | nightshade,        |
| burclover           | silverleaf         |
| buttercup,          | oat, wild          |
| smallflower         | panicum, Texas     |
| camphorweed         | pepperweed,        |
| carrot, wild        | Virginia           |
| catsear, spotted    | pigweed            |
| cheat               | plantain, buckhorn |
| chickweed           | puncturevine       |
| clover, red         | ragweed, giant     |
| cocklebur           | raspberry, red     |
| creeper, Virginia   | ryegrass, Italian  |
| crowfootgrass       | sedge, annual      |
| dock, curly         | shepherdspurse     |
| dogfennel           | sida, prickly      |
| fescue              | sowthistle, annual |
| fescue, rattail     | spikeweed          |
| fiddleneck, coast   | spurge             |
| filaree             | spurge, spotted    |
| filaree, redstem    | starthistle,       |
| fleabane, annual    | yellow             |
| foxtail             | strawberry         |
| gailardia,          | sunflower, common  |
| rosering            | telegraphplant     |
| geranium,           | Timothy            |
| Carolina            | trumpetcreeper     |
| goldenrod           | velvetgrass        |
| grape               | vetch              |
| gumweed             | witchgrass         |

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

- |                                 |                               |
|---------------------------------|-------------------------------|
| <del>awngrass, triple</del>     | <del>ivy, poison</del>        |
| <del>barley, foxtail</del>      | <del>reed, common</del>       |
| <del>bromegrass, japanese</del> | <del>sandbur, field</del>     |
| <del>canarygrass,</del>         | <del>smartweed, swamp</del>   |
| <del>    reed</del>             | <del>sowthistle,</del>        |
| <del>carpetweed</del>           | <del>    perennial</del>      |
| <del>chicory</del>              | <del>spurge, prostrate</del>  |
| <del>cinquefoil, common</del>   | <del>sumac, staghorn</del>    |
|                                 | <del>sweetclover, white</del> |

For the maintenance of total vegetation control in non-cropland 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,
ileabane, annual	Pennsylvania
horsetweed	sweetclover
mullein	thistle, Canada
panicum, fall	woodsorrel, yellow

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

goldenrod	spurge
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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 non-cropland 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
knotweed	yellow
mallow	telegraphplant

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.

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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, Atritol 80W, Banvel 720, Banvel W.S., Karmex 80W, MSMA, Gramoxone, Princep 80W, Roundup, Surtlan 4AS, 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 Surtlan, Oust, Karmex, Atritol 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 label for Spike 80W and labels of products to be tank mixed carefully before using. Note all warnings, cautions, precautions, and limitations of warranty on all labels.

Other products registered for use on the site to be treated may be applied in tank mix combination with Spike 20P to provide broader spectrum weed control or provide initial top kill of existing vegetation. Consult the manufacturer's label for additional weeds controlled, directions for use, cautions and limitations before use. See detailed information for tank mixing in the General Information section of this label.

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 80W 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 rooting depth of target species. 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 re-sprout to a height of approximately 5 feet prior to application. Spike requires an actively growing plant to be effective. The larger the re-sprouts, the more Spike that will be taken up by the plant and the more effective and consistent the control will be.

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Effect of Shallow Groundwater on Woody Plant Control: Do not apply Spike 80W to areas where the water table is predominately shallow (5 feet or less), such as marshy or sub irrigated areas, or areas immediately adjacent to streams or lakes which are periodically flooded. On such sites, where roots extend directly to a shallow water table, woody plants are minimally affected by applications of tebuthiuron and poor control will result.

Note: Refer to General Information section for limitations on maximum use rates, frequency of application and total application rates allowed during a given period of time. Refer to Environmental Hazards section under "Use Restrictions for Ground Water Protection" for other rate limitations on "vulnerable" sites.

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†:

burweed	<i>Haplopappus tenuisectus</i>
creosotebush	<i>Larrea tridentata</i>
wait-a-minute-bush	<i>Mimosa biuncifera</i>

Spike 80W applied at the rate of 2.5 pounds per acre will control the following species†:

blueberry	<i>Vaccinium</i> spp.
buckbrush	<i>Symphoricarpos</i> <i>orbicalatus</i>
ceniza	<i>Leucophyllum</i> <i>frutescens</i>
(Texas silverleaf)	<i>Prunus emarginata</i>
cherry, bitter	<i>Ulmus americana</i>
elm, American	<i>Celtis occidentalis</i>
hackberry, western	<i>Gaylussacia</i> spp.
huckleberry	<i>Robinia pseudoacacia</i>
locust, black	<i>Morus rubra</i>
mulberry, red	<i>Pinus</i> spp.
pine	<i>Pinus monticola</i>
pine, western white	<i>Rosa multiflora</i>
rose, multiflora	<i>Salvia leucophylla</i>
sage, black	<i>Artemisia tridentata</i>
sagebrush, big	<i>Rhus glabra</i>
sumac, smooth	<i>Datura discolor</i>
tomapple, desert	<i>Ailanthus altissima</i>
tree-of-heaven	<i>Aloysia lycioides</i>
whitebrush	<i>Lycium berlandieri</i>
wolfberry,	
berlandier	

Spike 80W applied at the rate of 3.75 pounds per acre will control the following species†:

alder, speckled	<i>Alnus rugosa</i>
birch, gray	<i>Betula populifolia</i>
cottonwood, eastern	<i>Populus deltoides</i>
elm, winged	<i>Ulmus alata</i>
fir, balsam	<i>Abies balsamea</i>
granjeno	<i>Celtis pallid</i>
hardhack	<i>Spiraea tomentosa</i>
huisache	<i>Acacia farnesiana</i>
condalia, lotebush	<i>Condalia obtusifolia</i>
maple, sugar	<i>Acer saccharum</i>
oak, blackjack	<i>Quercus manilandica</i>
oak, blue	<i>Quercus douglasii</i>
oak, post	<i>Quercus stellat</i>
poplar, balsam	<i>Populus balsamifera</i>

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spruce, white  
 tamarack  
 willow  
 yaupon  
 yaupon, desert

*Picea glauca*  
*Larix laricina*  
*Salix* spp.  
*Ilex vomitoria*  
*Schaefferia cuneifolia*

Spike 80W applied at the rate of 5 pounds per acre will control the following species†:

acacia, blackbrush  
 acacia, catclaw  
 acacia, twisted  
 alder, red  
 aspen, bigtooth  
 beech, American  
 blackberry,  
     allegheny  
 boxelder  
 chamise  
 chokecherry, common  
 colubrina, Texas  
 condalia, bluewood  
 creeper, Virginia  
 dogwood, roughleaf  
 douglasfir  
 guajillo  
 guayacan  
 hawthorn  
 hickory, black  
 hickory, pignut  
 hickory, shagbark  
 kidneywood, Texas  
 kudzu  
 leatherstem  
 maples  
 mountain-mahogany,  
     birchleaf  
 oak, California  
     scrub  
 oak, live  
 oak, pin  
 oak, red  
oak, white  
pine, Australian  
pin  
 salvia, shrubby blue  
 sumac, staghorn  
 sweetgum  
 trumpetcreeper

*Acacia rigidula*  
*Acacia greggii*  
*Acacia tortuosa*  
*Alnus rubra*  
*Populus grandidentata*  
*Fagus grandifolia*  
*Rubus allegheniensis*  
  
*Acer negundo*  
*Adenostoma fasciculatum*  
*Prunus virginiana*  
*Colubrina texensis*  
*Condalia obovata*  
*Parthenocissus quinquefolia*  
*Cornus drummondii*  
*Pseudotsuga menziesii*  
*Acacia berlandieri*  
*Portieria angustifolia*  
*Crataegus* spp.  
*Carya texana*  
*Carya glabra*  
*Carya ovata*  
*Eysenhardtia texana*  
*Pueraria lobata*  
*Jatropha dioica*  
*Acer* spp.  
*Cercocarpus*  
     *betuloides*  
*Quercus dumosa*  
  
*Quercus virginiana*  
*Quercus palustris*  
*Quercus rubra*  
*Quercus alba*  
*Casuarina* spp.  
*Pinus* spp.  
*Salvia ballotaeiflora*  
*Rhus typhina*  
*Liquidambar styraciflua*  
*Campsis radicans*

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

ash, green	<i>Fraxinus pennsylvanica</i>
blackberry, evergreen	<i>Rubus laciniatus</i>
cherry, black	<i>Prunus serotina</i>
dogwood, flowering	<i>Cornus florida</i>
groundsel tree	<i>Baccharis</i> spp.
lantana	<i>Lantana camara</i>
maple, bigleaf	<i>A. macrophyllum</i>
maple, Norway	<i>Acer platanoides</i>
maple, silver	<i>Acer saccharum</i>

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melaleuca	<i>Maleuca quinquenervia</i>
oak, white	<i>Quercus alba</i>
peppertree,	<i>Schinus</i>
Brazilian	<i>terebinthifolius</i>
pine, Australian	<i>Casuarina spp.</i>
pine, jack	<i>Pinus banksiana</i>
pir.a., red	<i>Pinus resinosa</i>
pine, shortleaf	<i>Pinus echinata</i>
pine, Virginia	<i>Pinus virginiana</i>
raspberry, black	<i>Rubus occidentalis</i>
redcedar, eastern	<i>Juniperus virginiana</i>
salal	<i>Gaultheria shallon</i>
sycamore, American	<i>Platanus occidentalis</i>
tuliptree	<i>Liriodendron, tulipifera</i>

— Spike 80W applied at the rate of 7.5 pounds per acre will control the following species:

ash, white	<i>Fraxinus americana</i>
ceanothus, wedgeleaf	<i>Ceanothus cuneatus</i>
chaparral,	<i>Ceanothus leucodermis</i>
whitethorn	
elm, Chinese	<i>Ulmus parvifolia</i>
elm, slippery	<i>Ulmus rubra</i>
greenbrier, common	<i>Smilax rotundifolia</i>
hawthorn, cockspur	<i>Crataegus crus-galli</i>
manzanita, greenleaf	<i>Arctostaphylos patula</i>
maple, vine	<i>Acer circinatum</i>
privet	<i>Ligustrum spp.</i>
Russianolive	<i>Elaeagnus angustifolia</i>
sumac, laurel	<i>Rhus laurina</i>
tallow tree	<i>Sapium sebiferum</i>

[Editor' note: Plant species in the following table under Individual (Spot) Application were previously listed for broadcast application under 6.25 and 7.5 pound per acre application rates above.]

Spike 80W may be applied to the following species by Individual (Spot) Application only:

ash green	<i>Fraxinus pennsylvanica</i>
ash white	<i>Fraxinus americana</i>
blackberry, evergreen	<i>Rubus laciniatus</i>
ceanothus, wedgeleaf	<i>Ceanothus cuneatus</i>
chaparral	<i>Ceanothus leucodermis</i>
whitethorn	
cherry, black	<i>Prunus serotina</i>
dogwood, flowering	<i>Cornus florida</i>
elm, Chinese	<i>Ulmus parvifolia</i>
elm, slippery	<i>Ulmus rubra</i>
greenbrier, common	<i>Smilax rotundifolia</i>
groundsel tree	<i>Baccharis spp.</i>
hawthorn, cockspur	<i>Crataegus crus-galli</i>
lantana	<i>Lantana camara</i>
manzanita, greenleaf	<i>Arctostaphylos patula</i>
maple, bigleaf	<i>Acer macrophyllum</i>
maple, Norway	<i>Acer platanoides</i>
maple, silver	<i>Acer saccharum</i>
maple, vine	<i>Acer circinatum</i>
melaleuca	<i>Maleuca quinquenervia</i>



<u>oak white</u>	<u>Quercus alba</u>
<u>paperbark</u>	<u>Schinus</u>
<u>Brazilian</u>	<u>terebinthifolius</u>
<u>pine Australian</u>	<u>Casuarina spp.</u>
<u>pine jack</u>	<u>Pinus banksiana</u>
<u>pine red</u>	<u>Pinus resinosa</u>
<u>pine shortleaf</u>	<u>Pinus echinata</u>
<u>pine Virginia</u>	<u>Pinus virginiana</u>
<u>privet</u>	<u>Ligustrum spp.</u>
<u>raspberry black</u>	<u>Rubus occidentalis</u>
<u>redcedar eastern</u>	<u>Juniperus virginiana</u>
<u>Russianolive</u>	<u>Elaeagnus angustifolia</u>
<u>satal</u>	<u>Gautheria shallon</u>
<u>syrac laurel</u>	<u>Rhus laurina</u>
<u>sycamore American</u>	<u>Platanus occidentalis</u>
<u>talow tree</u>	<u>Sapium sebiferum</u>
<u>tulotree</u>	<u>Liriodendron tulipifera</u>

**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 non-cropland areas (such as utility, railroad, and pipeline rights-of-way 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 5.0 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 close 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.

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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

**Attention Caution:** Do not use Spike 80W in this manner in any area where desirable species are in the vicinity of the plants to be eliminated. A small amount of Spike 80W in contact with the roots of desirable trees or other woody species may cause severe injury or death. The roots of such plants may extend far beyond their drip lines.

Spike 80W will injure or control other herbaceous vegetation in the treated area. Therefore, do not apply where such injury cannot be tolerated. See the list of herbaceous vegetation controlled by Spike 80W under the Total Vegetation Control section of this booklet.

[Editor's note: Preceding 2 paragraphs moved to this location from end of this section of label.]

Note: Refer to General Information section for limitations on maximum use rates, frequency of application and total application rates allowed during a given period of time. Refer to Environmental Hazards section under "Use Restrictions for Ground Water Protection" for other rate limitations on "vulnerable" sites.

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 DowElanco Spike distributor to determine the best rates for your location.

For high volume applications, mix 1 one 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 one 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.

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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 all 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 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.

~~Caution: Do not use Spike 80W in this manner in any area where desirable species are in the vicinity of the plants to be eliminated. A small amount of Spike 80W in contact with the roots of desirable trees or other woody species may cause severe injury or death. The roots of such plants may extend far beyond their drip lines.~~

~~Spike 80W will injure or control other herbaceous vegetation in the treated area. Therefore, do not apply where such injury cannot be tolerated. See the list of herbaceous vegetation controlled by Spike 80W under the Total Vegetation Control section of this booklet.~~

[Editor's note: Text in preceding 2 paragraphs moved to beginning of section.]

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### Warranty Disclaimer

DowElanco warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. DowElanco MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

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### Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of DowElanco or the seller. All such risks shall be assumed by buyer.

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### Limitation of Remedies

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The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at DowElanco's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used

DowElanco shall not be liable for losses or damages resulting from handling or use of this product unless DowElanco is promptly notified of such loss or damage in writing. In no case shall DowElanco be liable for consequential or incidental damages or losses.

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