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1973

### Control and Elimination of Field Bindweed

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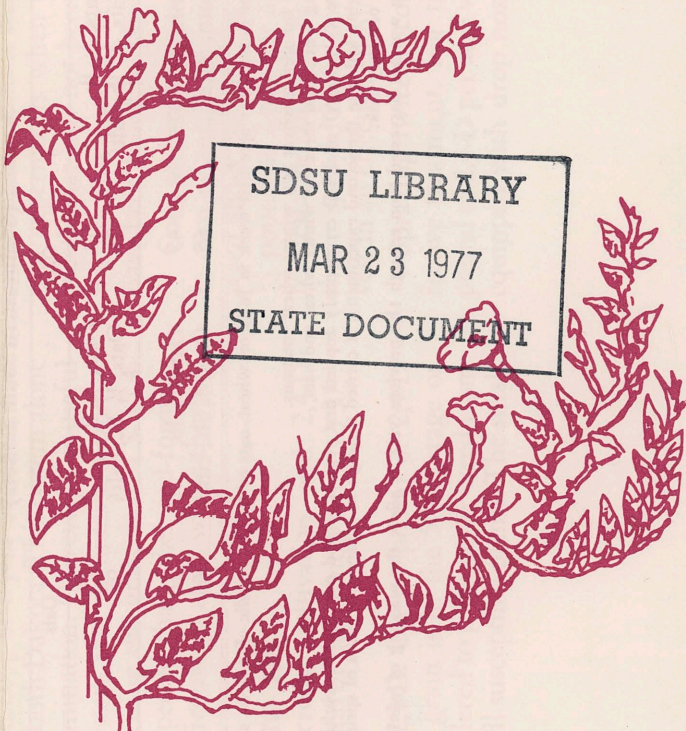
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FS 306  
rev. 1976

CONTROL AND ELIMINATION OF  
**Field Bindweed**



COOPERATIVE EXTENSION SERVICE  
SOUTH DAKOTA STATE UNIVERSITY  
U. S. DEPARTMENT OF AGRICULTURE

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# CONTROL AND ELIMINATION OF Field Bindweed

FS 306  
rev. 1976

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by Lyle A. Derscheid, Extension Agronomist

Field bindweed, sometimes called creeping jenny, is a deep-rooted perennial that spreads by underground parts and by seed.

One seedling, when not competing with other plants, is able to produce in one season a root system that penetrates 4 feet deep and spreads out about 2½ feet in each direction. In three growing seasons, the roots may go down 18 to 20 feet and spread out to form a circle 17 to 18 feet in diameter.

Field bindweed infests about 1,500,000 acres on 30 thousand farms in South Dakota.

The yield of crops is normally reduced 30 to 50% by a bindweed infestation. Yield was reduced an average of 42% in eight South Dakota wheat fields and 33% in 12 South Dakota oat fields. In Kansas, barley yield was reduced 65% and sorghum yield 48%.

Field bindweed emerges later in the spring than leafy spurge, Russian knapweed, or hoary cress and is less difficult to eliminate. It emerges about the same time as Canada thistle or perennial sowthistle. To control and eliminate field bindweed, use intensive cultivation, semiselective chemicals, certain competitive crops, selective herbicides, or combinations of these.

## REDUCE STANDS 75 TO 90%

Combinations of cultivation, cropping, and chemicals can reduce the stand of field bindweed 75% or more in 1 year.

**Intensive Cultivation.** Cultivate every 2 weeks during good growing conditions and every 3 weeks during dry, hot weather when plants are growing less rapidly. This generally means cultivating at 2-week intervals during June and July and at 3-week intervals during August, September and early October.

Cultivation, from spring until freeze-up, will kill a high percentage of bindweed plants. However, cultivation from immediately after harvest of small grain one year until freeze-up the next year is more effective.

## Follow the Label

Federal regulations make it unlawful for any person to use an herbicide in a manner inconsistent with its labeling. This includes the kind of crop and weed; rate, carrier and other application directions; storage, disposal and protective clothing; or other precautions stated.

Herbicide rates suggested in this publication are based on satisfactory performance in research tests. Higher rates of chemical required to control perennial weeds may result in crop damage under some conditions. Some herbicide product labels do not include these rates. Read the label first, not afterward.

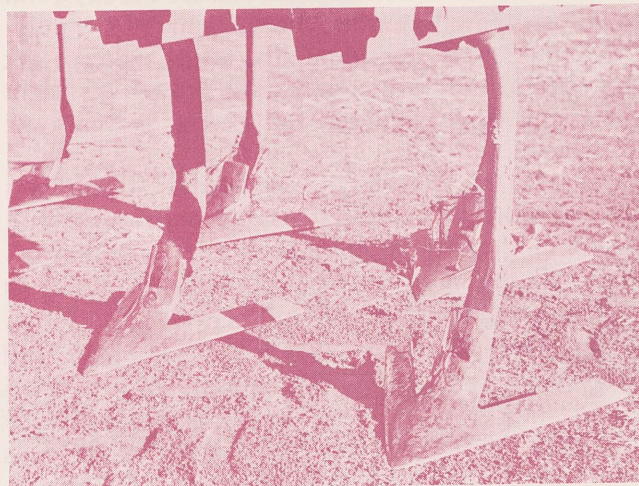
A duckfoot field cultivator (Figure 1) or blade is the most satisfactory implement; one-way disk is also fairly effective. Equip the cultivator with wide sweeps (12 to 60 inches) that overlap 3 to 4 inches. Keep them sharp; be sure they are kept flat when in the soil and operating at a depth of 4 to 5 inches. The same is true for the one-way disk. Keep the disks sharp and operate at a depth of 4 to 5 inches. It is essential that each bindweed root be cut by each cultivation.

If there is considerable plant residue on the area to be cultivated, it may be necessary to use the moldboard plow for the first operation especially if narrow sweeps are used on the cultivator. It is important to leave a plentiful amount of weed and crop residue on the soil surface where wind erosion may be a problem.

It takes 7 to 10 days for new shoots to emerge after the roots have been cut. Another 7 to 10 days elapse before there are enough leaves to produce more food than is needed for growth. Therefore, little plant food is stored in the roots and the root reserves are being used for plant growth for a period of 14 to 20 days. Each cultivation has a similar effect.

Combining intensive cultivation for part of the season with the production of a crop and chemical application is generally more practical than an entire season of cultivation. Income from the crop is obtained and erosion hazards, resulting from a full season of cultivating, are greatly reduced.

Figure 1. Field cultivator equipped with two rows of 12-inch sweeps that overlap. Three rows of similar sweeps or wider sweeps or blades (30" up) are effective for eliminating bindweed and also allow more trash to slip between the gangs.



**Small Grain, Spraying and Cultivation.** Use  $\frac{3}{4}$  pound of 2,4-D per acre when spring grain is in the 5-leaf stage of growth (early June) or when winter grain is fully tillered (mid- to late May) to kill susceptible plants, prevent seed production, and weaken resistant plants. Use an amine form of 2,4-D because an ester form frequently kills the tops of the plants without killing the roots. After harvest, use a treatment that will kill plants that are weakened but not killed by the spray. An application of 2,4-D may kill some weakened plants. Post-harvest cultivation will kill weakened plants and also get many of those that are resistant to 2,4-D.

There are two systems that can be used.

1. Spray in the grain with  $\frac{3}{4}$  pound of a 2,4-D amine. Spray again after harvest. In experimental tests, one application of  $\frac{3}{4}$  pound per acre reduced the stand 45 to 50% in spring grain and 35% in winter wheat (Table 1). A second application reduced stands 10 to 15% more. In one test, treatment 1 year with two sprayings reduced the stand 61% in spring wheat and 42% in winter wheat. Treatment for 2 years with two sprayings resulted in 87 and 73% elimination in spring and winter wheat, while 3 years gave 96 to 99% elimination. The bindweed in this test had not been sprayed for several years.

On farms where field bindweed has been sprayed annually, results might not be as good. Most of the susceptible plants have been killed and only plants that are resistant to 2,4-D remain.

2. A better system is to spray in the grain with  $\frac{3}{4}$  pound of a 2,4-D amine and cultivate three or four times after harvest. In experimental tests, spraying with  $\frac{3}{4}$  pound of 2,4-D amine per acre, reduced the stand 45 to 50% in spring grain and 35% in winter wheat. Post-harvest cultivations reduced the stand further (Table 1). Three cultivations after oats or winter wheat were harvested resulted in a 60% stand reduction for the year but four cultivations after spring wheat resulted in a 75% stand reduction in one year. Two years of spraying and post-harvest cultivation resulted in a stand reduction of 80 to 85%, and three years gave 98 to 99% elimination.

Winter grain has some advantage, it keeps the soil covered over winter and starts growth earlier in the spring. However, early fall seeding prevents late cultivation.

In one test with spring grain, oats stubble was plowed shortly after harvest and cultivated twice with a duckfoot cultivator equipped with 12-inch sweeps. This left the land bare over winter and subject to erosion. In another test with spring and winter wheat, all cultivations (4 with spring wheat and 3 with winter wheat) were performed with a field cultivator equipped with 30-inch sweeps, which left a stubble mulch on the land and protected it from erosion.

**Intensive cultivation and 2,4-D.** Cultivate five times between June 1 and August 1 with a duckfoot or sweep-type field cultivator. Apply  $\frac{3}{4}$  pound per acre of 2,4-D amine about 3 weeks later when bindweed has emerged. In tests in southeastern South Dakota, this system reduced the stand over 95%.

**Three-or-Four-Year Rotations.** Several rotations such as continuous small grain, wheat-fallow-wheat-fallow, wheat-sorghum-wheat-sorghum, oats-corn-oats, wheat-sorghum-fallow, continuous grass, grass-grass-fallow-wheat, or the use of a summer crop in one of these rotations can be used to eliminate field bindweed if modified with the use of 2,4-D and/or cultivation. The results from several of these are given in Tables 1 and 2.

**Grazing.** Grazing sheep will considerably reduce the stand of bindweed. Start grazing during early spring. Rotate cattle ahead of the sheep if the sheep do not keep the grass grazed. Heavy grazing will eliminate as much as 75 to 85% of the weed in 1 year. Intensive overgrazing is required to eliminate the remaining plants and sometimes does not do it.

Another effective system is to graze winter rye during May and early June. Plow rye and plant sudangrass. Graze the sudangrass during August and September.

#### **REDUCE STANDS 40 TO 50%**

Several combinations of crops, cultivation and 2,4-D spraying reduce the stand of field bindweed 40 to 50% in 1 year and more in 3 or 4 years.

**Cultivation and Summer Crops.** Close-drilled crops of soybeans, forage sorghums, sudangrass or buckwheat are more strongly competitive than most other crops. Cultivate with duckfoot cultivator or blade three times before seeding the crop during late June. Harvest the crop, fall plow, and cultivate once or twice. This system generally reduces the stand of bindweed about 40 to 50% in 1 year, 60 to 70% in 2 years, and 85 to 95% in 3 years.

**Cultivation and Forage Crops.** Cultivate with a duckfoot cultivator or blade every 2 weeks between May 15 and August 15. Seed a mixture of alfalfa and a sod-forming perennial grass. Seed alfalfa at the rate of 8 pounds per acre and brome grass or intermediate wheatgrass at the rate of 12 pounds per acre. The stand of bindweed was reduced 40% in 1 year of this system, and 95% in 4 years in southeastern South Dakota (Table 2). However, tests conducted in south central South Dakota indicated the use of alfalfa only eliminated 19% of the weeds in 1 year and 50% in 4 years.

**Perennial Grass and 2,4-D.** Spray in smooth brome grass or wheatgrass with  $\frac{3}{4}$  pound of 2,4-D during early June and again in August. This system reduced the stand of field bindweed in experimental

Table 1. Percentage of field bindweed killed with four 4-year rotations including spring wheat or winter wheat in South Central South Dakota and two 3-year rotations including oats in Southeastern South Dakota.

First year			Second year			Third year			Fourth year		
Treatment*	% Kill†		Treatment*	% Kill†		Treatment*	% Kill†		Treatment*	% Kill†	
	S. Wht.	W. Wht.		S. Wht.	W. Wht.		S. Wht.	W. Wht.		S. Wht.	W. Wht.
Presho (South Central South Dakota)											
Wheat	3	-22	Wheat	-9	-13	Wheat	-5	-38	Wheat	-47	-55
Wheat, 3/4 lb.	48§	35	Wheat, 3/4 lb.	74	80	Wheat, 3/4 lb.	70	81	Wheat, 3/4 lb.	90	84
Wheat, 3/4 lb., twice	61	42	Wheat, 3/4 lb., twice	87	73	Wheat, 3/4 lb., twice	99	96	Wheat, 3/4 lb., twice	97	91
Wheat, 3/4 lb., cult‡	74	65	Wheat, 3/4 lb., cult‡	81	85	Wheat, 3/4 lb., cult‡	99	98	Wheat, 3/4 lb., cult‡	97	97
S. Wheat, 3/4 lb., 4 lb. TBA	99	---	Wheat cult‡	99	---	Wheat, 3/4 lb., cult	99	---	Wheat, 3/4 lb., cult‡	97	---
Winter Wheat cult‡	---	21	W. Wheat, cult (1)	---	64	W. Wheat, cult‡	---	97	W. Wheat	---	---
Wheat	3	-22	Fallow (oneway)	-17	-51	Wheat	-23	-7	Fallow (oneway)	-23	11
Wheat, 3/4 lb.	48§	35§	Oneway, 3/4 lb.¶	47§	58	Wheat, 3/4 lb.	85§	85	Oneway 3/4 lb.¶	93	79
Wheat, 3/4 lb., twice	61	42	Oneway, 3/4 lb.¶	62	71	Wheat, 3/4 lb., twice	92	91	Oneway, 3/4 lb.¶	92	89
Wheat, 3/4 lb., cult‡	74	65	Oneway, 3/4 lb.¶	63	60	Wheat, 3/4 lb., cult‡	94	96	Oneway, 3/4 lb.¶	95	96
Wheat, 3/4 lb.	48	35	3/4 lb. oneway¶	40§	57	Wheat, 3/4 lb.	86§	87	3/4 lb. oneway¶	89	87
Wheat, 3/4 lb., twice	61	42	3/4 lb. oneway¶	71	75	Wheat, 3/4 lb., twice	93	95	3/4 lb. oneway¶	93	92
Wheat, 3/4 lb., cult‡	74	65	3/4 lb. oneway¶	85	76	Wheat, 3/4 lb., cult‡	93	94	3/4 lb. oneway¶	90	91
Wheat	3	-22	Sorghum	-16	-78	Wheat	-53	24	Sorghum	-32	-4
Wheat, 3/4 lb.	48§	35§	Sorghum, 1/2 lb.	76§	66	Wheat, 3/4 lb.	98§	98	Sorghum, 1/2 lb.	89	79
Wheat, 3/4 lb., twice	61	42	Sorghum, 1/2 lb.	90	74	Wheat, 3/4 lb., twice	99	95	Sorghum, 1/2 lb.	97	88
Wheat, 3/4 lb., cult‡	74	65	Sorghum, 1/2 lb.	86	87	Wheat, 3/4 lb., cult‡	98	97	Sorghum, 1/2 lb.	97	94
Wheat	3	-22	Sorghum	-6	-78	Fallow (oneway)	-37	34	Wheat	---	43
Wheat, 3/4 lb.	48§	35§	Sorghum, 1/2 lb.	76§	66	Oneway 3/4 lb.¶	89§	89	Wheat, 3/4 lb.	94	89
Wheat, 3/4 lb., twice	61	42	Sorghum, 1/2 lb.	90	74	Oneway 3/4 lb.¶	89	90	Wheat, 3/4 lb., twice	97	91
Wheat, 3/4 lb., cult‡	74	65	Sorghum, 1/2 lb.	86	87	Oneway 3/4 lb.¶	90	89	Wheat, 3/4 lb., cult‡	94	92
Scotland (Southeastern South Dakota)											
Oats			Oats			Oats					
Oats, 3/4 lb.	35	---	Oats, 3/4 lb.	60	---	Oats, 3/4 lb.	75	---			
Oats, 3/4 lb., cult§	60	---	Oats, 3/4 lb., cult§	75	---	Oats, 3/4 lb., cult§	95	---			
Oats, 3/4 lb.	35	---	Corn, 1/2 lb.	45	---	Oats, 3/4 lb.	60	---			
Oats, 3/4 lb., cult§	60	---	Corn, 1/2 lb.	65	---	Oats, 3/4 lb., cult§	65	---			

\*Refers to pounds of 2,4-D dimethylamine applied per acre first week in June on wheat, oats or fallow, middle of July on sorghum or corn and middle of August on wheat stubble or fallow.

†Percent of plants killed given separately for spring wheat and winter wheat rotations.

‡Four post-harvest cultivations with spring wheat and three for winter wheat and oats.

§Data from first experiment—double rate (1 1/2 lb/A) of 2,4-D erroneously applied first year of second experiment resulting in 12% (winter wheat) and 24% (spring wheat) more plants being killed in the second experiment. It carried through in subsequent years of spring wheat treatments.

¶Three fallow operations each year with one-way disk.

||Spring wheat was used because sorghum was not harvested soon enough the previous year to allow the planting of winter wheat.

Table 2. Percentage of field bindweed eliminated by use of forage crops, fallow and small grain, special cultivation and 2,4-D at two locations.

First Year		Second Year		Third Year		Fourth Year	
Treatment*	% kill	Treatment*	% kill	Treatment*	% kill	Treatment*	% kill
<b>Presho (South Central South Dakota)</b>							
Cult, alfalfa	19	Harvest hay	-5	Harvest hay	31	Harvest hay	48
Cult, brome	19	Harvest hay	-20	Harvest hay	0	Harvest hay	6
Cult, brome	19	Hay, 3/4 lb. S	61	Hay, 3/4 lb. S	94	Hay, 3/4 lb. S	95
Cult, brome	19	Hay, 3/4 lb. S & F	97	Hay, 3/4 lb. S & F	97	Hay, 3/4 lb. S & F	99
Cult, crested	19	Harvest hay	-48	Harvest hay	-34	Harvest hay	-55
Cult, crested	19	Hay, 3/4 lb. S	96	Hay, 3/4 lb. S	98	Hay, 3/4 lb. S	95
Cult, crested	19	Hay, 3/4 lb. S & F	92	Hay, 3/4 lb. S & F	97	Hay, 3/4 lb. S & F	94
Cult, intermediate	19	Harvest hay	-19	Harvest hay	14	Harvest hay	7
Cult, intermediate	19	Hay, 3/4 lb. S	97	Hay, 3/4 lb. S	94	Hay, 3/4 lb. S	90
Cult, intermediate	19	Hay, 3/4 lb. S & F	98	Hay, 3/4 lb. S & F	99	Hay, 3/4 lb. S & F	98
Cult, alfalfa	19	Harvest hay, plow F	35	Fallow W. wheat	44	Wheat, 3/4 lb., cult	35
Cult, crested	19	3/4 lb. S & F, plow	96	Fallow, W. wheat	91	Wheat, 3/4 lb., cult	97
Cult, intermediate	19	3/4 lb. S & F, plow	96	Fallow, W. wheat	80	Wheat, 3/4 lb., cult	89
Crested, 3/4 lb. S	10	Hay, 3/4 lb. S & F, plow	93	Fallow	81	Wheat, 3/4 lb., cult	93
Crested, 3/4 lb. S & F	54	Hay, 3/4 lb. S & F, plow	93	Oneway, 3/4 lb. F	88	Wheat, 3/4 lb., cult	93
Intermed., 3/4 lb. S	53	Hay, 3/4 lb. S & F, plow	90	Fallow	75	Wheat, 3/4 lb., cult	95
Intermed., 3/4 lb. S & F	43	Hay, 3/4 lb. S & F, plow	92	Oneway, 3/4 lb. F	90	Wheat, 3/4 lb., cult	93
Wheat, 3/4 lb. S, cult	72	Cult, sudan	80	Oneway, 3/4 lb. F	81	Wheat, 3/4 lb., cult	88
Cult, sudan, cult	1	Wheat, 3/4 lb., cult	75	Oneway, 3/4 lb. F	81	Wheat, 3/4 lb., cult	88
Cult, sudan, w. wht.	1	Wheat, 3/4 lb., cult	75	Oneway, 3/4 lb. F	81	Wheat, 3/4 lb., cult	88
<b>Scotland (Southeastern South Dakota)</b>							
Cult, alfalfa	40	Harvest Hay	75	Harvest Hay	90	Harvest Hay	95
Cult, Alfalfa-grass	40	Harvest Hay	80	Harvest Hay	85	Harvest Hay	95
Cult, Brome	40	Harvest Hay	60	Harvest Hay	65	Harvest Hay	70
Cult, Brome	40	Hay, 3/4 lb., S	70	Hay, 3/4 lb., S	98	-----	---
Brome, 1/2 lb., S	70	Hay, 3/4 lb., S	85	Hay, 3/4 lb., S	95	-----	---

\*"lb" refers to pounds of 2,4-D dimethylamine applied per acre first week in June on wheat or grass, and mid-August on wheat, stubble or fallow.

tests, 50% in 1 year and 90% in 2 years in south central South Dakota, and 60% in 1 year and 95% in 3 years in southeastern South Dakota. This system alone seldom gives 100% elimination. However, it is useful as a follow-up to a system that includes a season of cultivation prior to seeding the grass or in a 3- to 4-year rotation. It is expected that other sod-forming grasses would be as effective in areas where they are adapted.

#### REDUCES STANDS 10 TO 30%

Combination of crops, cultivation and 2,4-D spraying reduce the stand of field bindweed 10 to 30% in 1 year.

**Small Grain and 2,4-D.** Use 3/4 pound of 2,4-D per acre when spring grain is in the 5-leaf stage or winter grain is fully tillered to prevent the weed from going to seed and to kill susceptible plants. The small

grain gets ahead of the weed and holds it in check until harvest. Stands were reduced 35 to 50% in several experiments when the chemical was applied to weeds that had not been previously sprayed. Results are not this good in fields where susceptible plants have been killed by previous sprayings.

**Corn or Sorghum and 2,4-D.** Spraying with 2,4-D in corn or sorghum reduces the stand of field bindweed about 30% in 1 year. Spray in either crop with 1/2 pound of 2,4-D per acre. This treatment prevents reinfestation and can be alternated with small grain that is sprayed in the spring and cultivated after harvest in an effective elimination program.

Spraying twice in corn or sorghum is a more effective treatment. For the second treatment use 3/4 pound of 2,4-D per acre with a high-clearance sprayer equipped with drop nozzles after the corn silks are

brown or sorghum has headed. In some cases sorghum may be somewhat difficult to spray at this stage.

**Fallow and 2,4-D.** In areas where the land is fallowed for a year, bindweed can be held in check by combining the use of 2,4-D with the fallow. One method is to fallow three times before August 1 then spray  $\frac{3}{4}$  pound of 2,4-D about 3 weeks later when the bindweed has emerged. Another system is to spray in June and start fallowing about July 1 and continue for the remainder of the season. In experimental tests, 10 to 20% of plants were generally killed in 1 year. Spraying in fallow prevents reinfestation and a fallow-2,4-D combination can be alternated with wheat the same as a row crop for an effective elimination program.

**Alfalfa.** A good stand of alfalfa or alfalfa-grass mixture also reduces the stand of bindweed 10 to 20% each year. Two years of alfalfa or alfalfa-grass mixture is useful as a follow-up of the system that includes a season of cultivation and a fall seeding of the crop.

### SMALL PATCH CONTROL

#### Semi-selective Herbicides in Pasture and Range

The following treatments are intended to give 90 to 100% elimination of field bindweed in grass pasture and range. The treatments are most useful for small infestations. Refer to the table listing the

amount of product required for one square rod. Control seedlings and stragglers emerging in following season with an annual 2,4-D application.

1. Dicamba (Banvel) at 8 lb/A acid equivalent. Follow label restrictions for grazing or haying.
2. Picloram (Tordon 22K) at  $1\frac{1}{2}$  lb/A acid equivalent. This rate is usually satisfactory; however, in a few situations, some regrowth has been noted the following season. Follow application directions, precautions and limitations on the label.

#### Semi-selective Herbicides in Non-cropland

Numerous chemicals can be used to eliminate patches (weed nurseries) with one treatment. Apply the chemical to a band 6 or 8 feet wide around the outside of the patch to kill roots that extend beyond the patch. Seedling growth may appear after 2 or 3 years. These young plants can be eliminated with a 2,4-D application. Many new semiselective chemicals do not permanently injure perennial grasses, but will prevent crop growth for 2 or more years.

The chemicals listed in Table 3 generally give 95 to 100% elimination when applied at the rates designated. Rates are given in pounds, pints, or fluid ounces of commercial product for each square rod or acre and pounds active ingredient for each acre.

Table 3. Amount of several semi-selective herbicides required to kill field bindweed.

Chemical	Amount per Square Rod	Cost per Square Rod*	Amount per Acre	Cost per Acre
2,3,6-TBA (1)	$\frac{3}{4}$ cup	\$0.57	15 lb ( $7\frac{1}{2}$ gal)	\$ 91.20
Fenac (2)	$\frac{1}{2}$ pint	0.66	15 lb (10 gal)	105.60
Dicamba (3)	1.6 fl oz	0.44	8 lb (2 gal)	71.00
Picloram (4)	0.6 fl oz	0.26	$1\frac{1}{2}$ lb ( $\frac{3}{4}$ gal)	41.60
Picloram-2,4-D mix (5)†	1.2 fl oz	0.31	( $1\frac{1}{2}$ gal)	49.60
Borate-Picloram mix (6)	$\frac{3}{4}$ lb	0.68		

\*Approximate retail cost of chemical for 1 square rod. (1 fl oz=6 tsp.)

†Generally the most effective treatment for this weed.

(1) Brand name "TRYSDEN 200." (Approved for use on non-cropland only.)

(2) Brand name "FENAC." (Approved for use on non-cropland only.)

(3) Brand name "BANVEL." (Approved for use on non-cropland, pastures and rangeland—do not graze meat animals within 30 days before slaughter; do not graze dairy animals for 60 days after treatment; do not harvest for feed for dairy animals for 90 days after treatment is applied.)

(4) Brand name "TORDON 22K." (Follow label restrictions and precautions when using in pasture and range.)

(5) Brand name "TORDON 212." (Approved for use on non-cropland only.)

(6) Brand name "TORDON BEADS." (Approved for use on non-cropland only.)

#### REDUCE STANDS IN SHELTERBELTS

To reduce stand 10 to 25% in 1 year, use 1 pound of 2,4-D acid equivalent per acre twice each season (early June and late August). Use very low volatile formulations of 2,4-D, such as an emulsifiable acid formulation (brand name "Weedone 638"), an

oil soluble amine formulation (brand names "Emulsamine 3E" or "Dacamine"), or the lithium salt of 2,4-D (brand name "Lithate DSP"). Do not allow spray drift to contact leaves of trees; it will cause injury.



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