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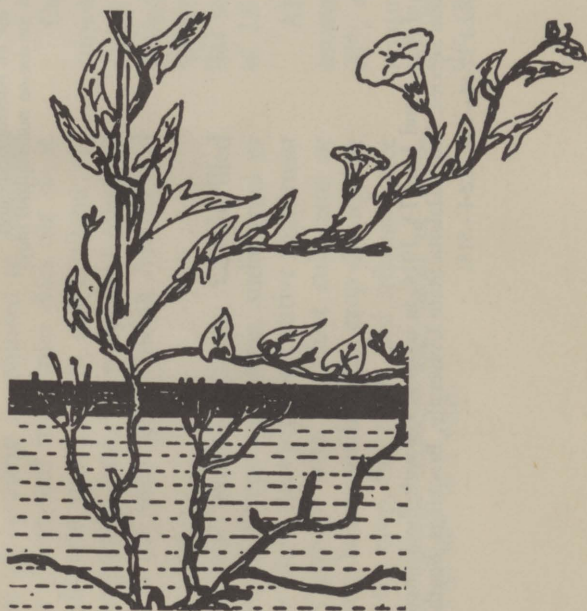
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Control & Elimination of

Field Bindweed



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

Field Bindweed

By Lyle A. Derscheid, extension agronomist

Field bindweed¹, 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 or 18 feet in diameter.

Field bindweed infests about 1,300,000 acres on 29 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, soil sterilant 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.

A duckfoot field cultivator or blade is the most satisfactory implement; a one-way disk is also fairly effective. 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. 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.

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. Here is a view of a duckfoot cultivator which is most effective in eliminating stands of field bindweed. Keep sweeps sharp and set to cut 4 inches below the soil surface with a three- to four-inch overlap between sweeps. A wider sweep or blade (30" up) is also effective in eliminating field bindweed. This implement may be more desirable on soil free from rocks where wind erosion may be a problem. It is important to leave a plentiful amount of weed and crop residue on the soil surface.

¹*Convolvulus arvensis* L.

Small Grain, 2,4-D and Cultivation. Use $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D per acre when spring grain is in the 5-leaf stage to prevent the weed from going to seed and to weaken some plants. Cultivate three or four times after harvest to kill some of the weakened plants.

An amine form of 2,4-D is generally more effective than an ester form in eastern South Dakota where bindweed grows more rapidly. The ester forms frequently kill the tops without killing the roots, though they are usually more effective under poor growing conditions.

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

In experimental tests, stands were reduced 75% by the application of $\frac{3}{4}$ pound of 2,4-D amine in wheat during the first week in June and four post harvest cultivations in mid-July, mid-August, September, and early October using a cultivator equipped with 30-inch sweeps. A treatment with 2,4-D and three post harvest cultivations before seeding winter wheat reduced the stand to 60%.

Fallow and 2,4-D. In areas where the land is fallowed for a year, satisfactory results have been obtained by combining the use of fallow and 2,4-D. One satisfactory method is to cultivate every 2 weeks until about August 1. Spray with $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D about 3 weeks later when the bindweed has emerged. Another satisfactory method is to spray when the bindweed is budding in June. Start cultivation when regrowth appears and continue for the remainder of the season. Complete elimination probably will not be achieved, but a high percentage of plants can generally be killed.

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.

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 reduces the stand of bindweed about 75 to 80% in 1 year.

Cultivation and Forage Crops. Cultivate with a duckfoot cultivator or blade every 2 weeks between May 15 and August 15. Seed bromegrass or intermediate wheatgrass at the rate of 12 pounds per acre, alfalfa at the rate of 8 pounds per acre, or a mixture of alfalfa and a perennial grass. The stand of bindweed is generally reduced 80 to 90% by this system.

Grain and Nonselective Chemicals. Spray grain with $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D when spring grain is in the 5-leaf stage. (This treatment did not injure MO-O-205 or Garry oats, or wheat in several experiments and probably will not damage barley.) In limited tests spraying two weeks after harvest with 4 pounds of 2, 3, 6-TBA (2 gallons of Trysben 200 or Benzac 1281) per acre or 4 pounds of dicamba (1 gallon Banvel D) or $\frac{1}{2}$ pound of picloram (1 quart Tordan 22K) per acre has reduced the stand of bindweed over 95 per cent in one year. The residual effect of the herbicides probably will injure a small grain crop seeded the next spring, but probably will not damage corn or sorghum seeded in late May. **Although these systems are effective in reducing the stand of field bindweed, the use of herbicides in this manner has not been approved by the Federal Pure Food and Drug Administration.**

REDUCE STANDS 10 TO 30%

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

Small Grain and 2,4-D. Use $\frac{1}{2}$ to $\frac{3}{4}$ pound of 2,4-D per acre when spring grain is in the 5-leaf stage to prevent the weed from going to seed and to weaken some plants. The small grain gets ahead of the weed and holds it in check until harvest. Spray after harvest with $\frac{3}{4}$ pound of 2,4-D per acre to kill some of the weakened plants. Stands were reduced 30 to 40 per cent in experiments that were sprayed about 2 weeks after harvest.

Corn and 2,4-D. Two sprayings with 2,4-D in corn or sorghum reduces the stand of field bindweed about 30% in 1 year. Spray in either crop with $\frac{1}{2}$ pound of 2,4-D per acre. Spray with a high-clearance sprayer equipped with drop nozzles after the corn has tasseled or sorghum has headed. Use $\frac{3}{4}$ pound of 2,4-D per acre.

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.

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 10 to 25% each year. This system alone requires considerable time to reduce the stand of field bindweed materially and 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. It is expected that other sod forming grasses would be as effective in areas where they are adapted.

PREVENT SPREADING

Spraying once a year with 2,4-D in small grain, corn, or sorghum reduces the stand of field bindweed slightly and keeps it from spreading to any great degree. Spray either crop with $\frac{1}{2}$ pound of 2,4-D per acre.

NONSELECTIVE HERBICIDES

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 nonselective chemicals do not permanently injure perennial grasses, but will prevent crop growth for 2 or more years.

The chemicals listed in table 1 generally give 95 to 100 per cent elimination when applied at the rates designated. Rates are given in pounds, pints, or fluid ounces of commercial product for each square rod. Use the higher rates for summer application for those chemicals indicating a range of treatment rate.

REDUCE STANDS IN SHELTERBELTS

Use AMS as suggested in table 1 as a soil sterilant.

To reduce stand 10 to 25 per cent in 1 year, use $1\frac{1}{2}$ pounds 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.**

Table 1. Amount of Nonselective Herbicide Required to Kill Field Bindweed

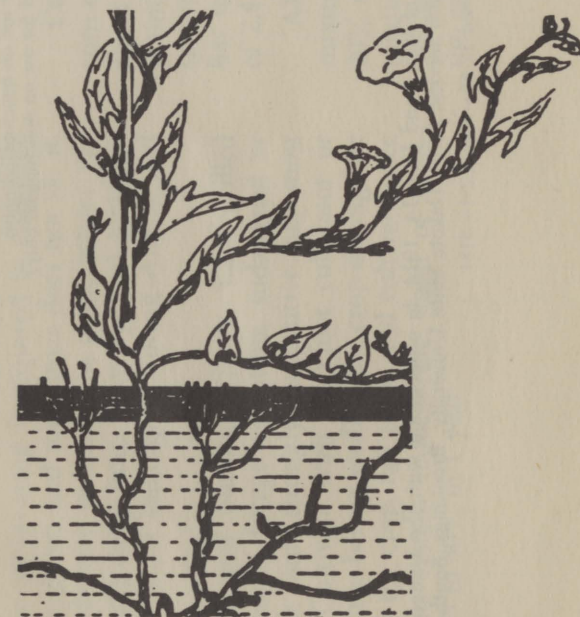
Chemical	Amount per Square Rod	Cost per Square Rod*	Amount per Acre	Cost per Acre
AMS (1)	4-6 lb.	\$1.44—2.52	-----	-----
Sodium chlorate	5 lb.	0.87	-----	-----
2,3,6-TBA (2)	$\frac{3}{4}$ cup	0.47	15 lbs. (7 $\frac{1}{2}$ gal.)	\$75.00
Fenac (3)	$\frac{1}{2}$ pint	0.52	15 lbs. (10 gal.)	\$82.50
Borate-TBA mixture (4)	1 lbs.	0.35	-----	-----
Dicamba (5)	2 fl. oz.	0.47	10 lbs. (2 $\frac{1}{2}$ gal.)	\$75.00
Picloram (6)	$\frac{4}{5}$ fl. oz.	0.25	2 lbs. (1 gal.)	\$40.00

*Approximate retail cost of chemical for 1 square rod at lower rates for areas 10 to 15 square rods in size. Cost decreases for large areas and varies somewhat with local situations.

- (1) Brand name "Ammate X" (use only in trees)
- (2) Brand names ((Benzac 1281," "Trysben 200" (approved for use on noncropland; do not graze within one year)
- (3) Brand name "Fenac" (do not use treated forage for feed)
- (4) Brand names "Benzabor," "Amoco Noxious Weed Killer," and "Coop-TBA Granules"
- (5) Brand name "Banvel D" (approved for use on noncropland only)
- (6) Brand name "Tordon 22K" (approved for use on noncropland only)

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