Dodder Control In Alfalfa Grown For Seed

Paul J. Torell
ASSOCIATE AGRONOMIST
PARMA BRANCH EXPERIMENT STATION

In southwestern Idaho, the second alfalfa crop is most commonly used for seed production. In this area, dodder will germinate and attach to alfalfa from mid-April to September.

Early germinating dodder remains attached on the alfalfa stubble after the first hay crop is removed. This is the so-called stubble-attached dodder, and it literally "grows up" with the seed crop of alfalfa. In addition more dodder continues to germinate and attach itself to this second alfalfa crop.

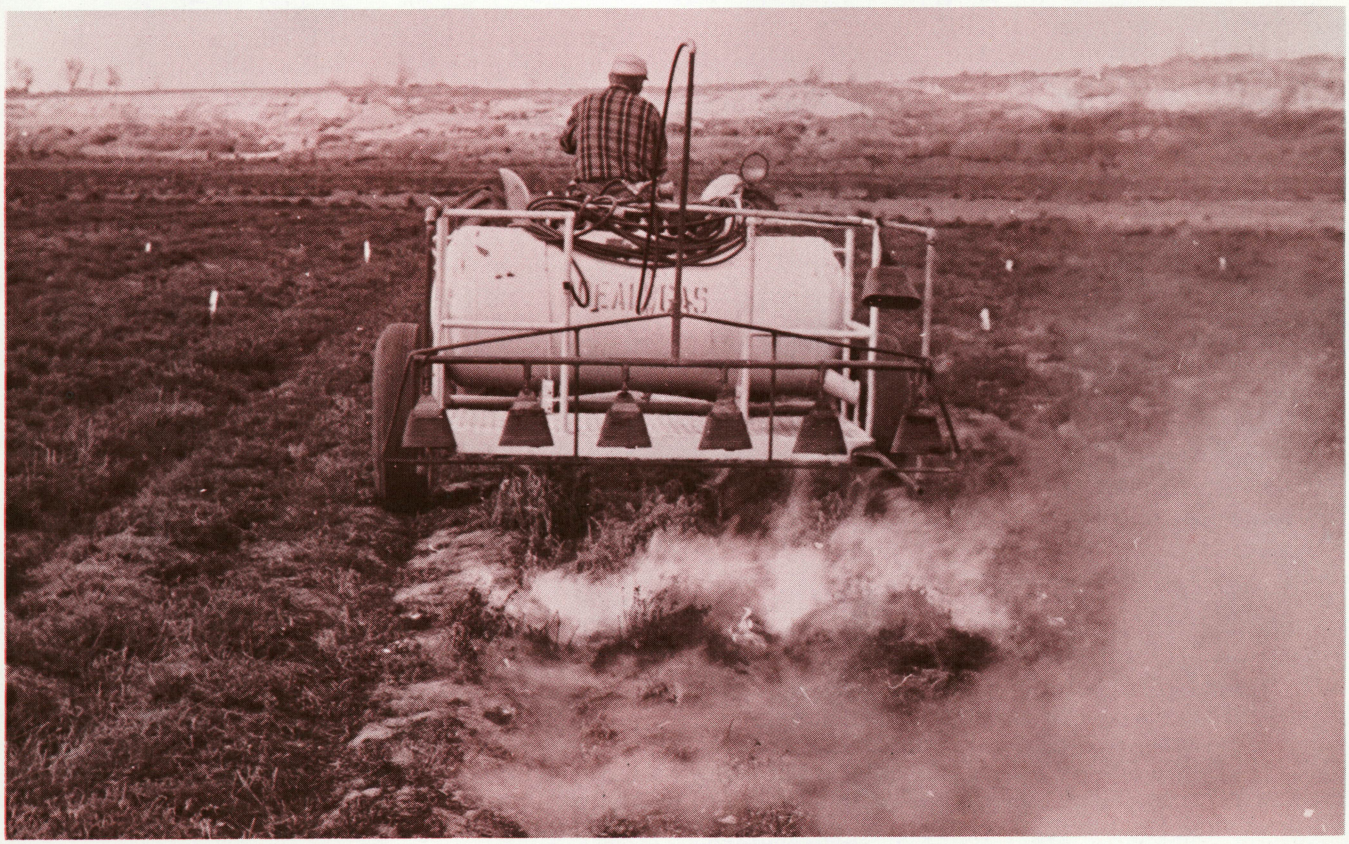
The combined effect of the two dodder "crops" is a drastic reduction in alfalfa seed yield.

To maintain high seed yields where dodder is a problem, two treatments are necessary: One to kill stubble-attached dodder; the other to kill the new dodder seedlings as they germinate in the second alfalfa crop grown for seed.

Stubble-attached dodder causes the greatest difficulty. It can be killed only by destroying the alfalfa tissue to which it is attached, since the dodder isn't vulnerable to selective herbicides.

Propane flaming and DNBP[1] spray for killing stubble-attached dodder were studied for three years at the Parma station. With proper application, both are extremely effective, giving nearly 100 per cent kill of stubble-attached dodder. This high degree of control is important. Otherwise with its long growing season, any escaping dodder will spread widely in the alfalfa seed crop and reduce yields.

DNBP is a common name referring to the general contact dinitro herbicides sold under the tradenames of Dow General or Sinox General. Tradenames are used only to identify the chemicals as they are known in the marketplace. No endorsement by the University is implied.



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As an example of how insidious dodder is, on research plots at Parma seedlings that attached to alfalfa in May covered an average of 20 square feet of alfalfa at harvest time. These plots yielded an equivalent of 200 to 400 pounds of dodder seed per acre. However, the alfalfa seed yield was reduced to practically nothing.

The effectiveness of flaming and DNBP spraying is shown in Table 1. Note that flaming is slightly more effective than is DNBP spraying. This advantage occurs mainly in weedy, trashy fields where the broad leaves of such weeds as curled dock and dandelions shield some of the dodder attachments from the chemical spray.

Table 1. Average per cent kill of stubble-attached dodder by propane flaming and Dinitro sprays.

Year	Per cent dodder kill by flaming	Per cent dodder kill by Dinitro
1964	99.2	93.9
1965	98.3	98.2
1966	99.5	99.8
3 yr. avg.	99.0	97.3

EFFECT ON ALFALFA BLOOM

Contrary to some beliefs, flaming and DNBP sprays are not detrimental to alfalfa bloom development. Three years' field experimentation at Parma proved this conclusively. Paired plots comparing flaming and DNBP sprays versus no treatment consistently showed that the delay in date-of-flowering is related to the height of alfalfa regrowth at the time treatments were applied.

The comparison plots graphically illustrated that when regrowth was one inch or less at time of treatment, there was no delay in reaching 50 per cent bloom when compared with the untreated plots. When there was two to four inches regrowth at time of treatment, the delay was from zero to three days. But when there was from six to eight inches of regrowth, the delay in reaching 50 per cent bloom ranged between five and ten days.

Thus the influence of either treatment on the date of alfalfa flowering is roughly the same as mowing at any given time.

TIMING

Timing is critical, both with flaming and DNBP sprays. Whether flaming or spraying, you must treat before alfalfa regrowth exceeds four to six inches. Above these heights, fuel cost for flaming becomes excessive, and the DNBP sprays don't reach the dodder attachments in the alfalfa crowns because of the excessive foliage.

Don't treat with either flame or spray before May 10 for two reasons: (1) peak dodder germination comes after May 10 and early treatment will miss the main dodder crop, and (2) air temperatures before May 10 are generally too low to get maximum efficiency from flaming or DNBP spraying.

A more optimum period is between May 15 and May 20.

An ineffective job at this time places an undue burden on the layby herbicide application and a considerable amount of dodder escapes into the alfalfa seed crop. This is illustrated in Table 2.

Table 2. Average per cent control of dodder at harvest time as influenced by date of stubble flaming and layby treatment[1] of DCPA.

Date of flaming	10 lb/A DCPA applied after flaming for a layby treatment	Per cent control of dodder
April 22	yes	68.0
" "	no	17.4
April 28	yes	57.3
" "	no	32.6
May 13	yes	95.6
" "	no	19.7
May 28	yes	96.0
" "	no	19.3

[1]Parallel results have been obtained with CIPC. DCPA and CIPC are the common names for the herbicides trademarked as, respectively, Dacthal and Chloro-IPC.

Incidentally, Table 2 also illustrates the importance of the layby herbicide treatment. A herbicide must be applied to kill the dodder that germinates in the second alfalfa crop that is grown for seed.

WEATHER CONDITIONS

Air temperature, wind, and humidity have a pronounced influence on the effectiveness of flaming and DNBP sprays. Flame or spray when temperatures are 65°F to 75°F or higher, when there is no wind or only a slight breeze, and when the humidity is low.

FLAMING INTENSITY

The dodder kill is highest and the propane fuel requirement is lowest when two flamings are used. The first flaming is used to kill the alfalfa foliage; the second is used to ignite the dried foliage.

Apply the first flaming at an intensity that will cause an immediate water-soaked appearance on the alfalfa leaves, followed by wilting in a few minutes. The fuel pressure and ground speed to be used will be determined by the particular flaming machine used and must be determined by operating experience. In any case the fuel consumption should not exceed 35 to 40 gallons of propane per acre.

The second flaming should follow in two to three days. Use an intensity sufficient to char

the alfalfa stubble to the soil line. This will give the highest percentage kill of the attached dodder. The fuel consumption should be about 15 to 20 gallons of propane per acre.

Total fuel costs for the two flamings should be between $10.00 and $12.00 per acre.

AMOUNT OF DNBP TO USE

Under favorable weather conditions and moderate dodder infestation, a single DNBP spray will give adequate kills of stubble-attached dodder. Otherwise two sprays are needed. Average cost of materials for two sprays will be approximately $9.00 per acre.

The second spray should follow the first in two to three days. Both sprays should consist of the following: 3 pints of DNBP in 10 gallons of diesel oil + 50 gallons of water + ½ pint of a commercial spreader-sticker. Spray at a volume of 60 to 80 gallons per acre with mechanical or strong by-pass agitation. This rather high spray volume is needed to penetrate the alfalfa foliage and reach the dodder attachments at the crown area.

LAYBY HERBICIDE TREATMENT

The layby herbicide treatment is most important for maximum control of dodder through to harvest time (see Table 2).

Use either of the following for satisfactory results: 30 lb./A of 20 per cent CIPC granules or 10 lb/A DCPA as the 75 per cent wettable powder.

The CIPC granules can be applied by ground rig just before the first irrigation of alfalfa seed crop or by aerial broadcasting immediately following this irrigation.

The DCPA should be applied in a water spray of at least 40 gallons volume per acre just before the first irrigation of the seed crop.

SPOT TREATMENT

Spot treatment is an important part of controlling dodder in alfalfa grown for seed. For one thing, complete control throughout a generally infested field is seldom impossible. So it's necessary to go through the field with spot treatment equipment to knock down "hot spots."

And in fields with only a trace of dodder, the expense of full-field treatment is not justified.

EARLY SEASON SPOT TREATMENT

Spot treatment of dodder early in the season is sometimes feasible in alfalfa seed fields that are seeded in rows. About two to three weeks following the first irrigation of the seed crop, but before the alfalfa foliage covers over the crown area, patrol and treat small fields on foot with a knapsack sprayer. Treat larger fields with a tractor-mounted sprayer equipped with a platform for a spray operator.

For knapsack spraying, use ½ cup of DNBP in five gallons of diesel oil. Spray the dodder attachments and the surrounding alfalfa foliage until they just become "shiny" with oil. When the dodder attachments and the alfalfa are small, a single treatment is adequate. However, care should be taken that no dodder stems are missed with the spray.

For power spraying, use 2 quarts of DNBP in 20 gallons of diesel oil + 80 gallons of water + 1 pint of a commercial spreader-sticker. Spray the dodder attachments once with a drenching cover. Be sure the spray rig has a mechanical or strong by-pass agitation device.

LATE SEASON SPOT TREATMENT

When dodder stems reach the top of the alfalfa in late July and early August, spot treatment is especially useful to reduce the spread of dodder and to prevent it from producing seed. At this time a large amount of alfalfa growth is present and much of it is entwined with dodder stems and numerous attachments.

A thorough kill of this dodder almost always requires two treatments.

The best method is to spray the dodder patches first, then flame them.

Use 2 quarts of DNBP in 20 gallons of diesel oil + 80 gallons of water + 1 pint of a commercial spreader-sticker. In three to five days, or as soon as the alfalfa is dry enough to burn, burn the treated spots by propane flaming. In this case the dried alfalfa serves as part of the fuel making the propane consumption relatively low. Two flamings will do the same job, but the cost is higher.

Two DNBP sprays are less effective, primarily because it's difficult to get complete coverage throughout the dense mass of alfalfa and dodder stems.

PRECAUTIONS

1. Alfalfa stands should be at least one-year old before they are treated with any of the flaming or DNBP treatments herein suggested.
2. Do not flame dodder patches after a field has been defoliated, swathed, or is otherwise mature enough that a fire might spread with a sudden wind storm.
3. All of the DNBP herbicides are deadly poison to humans and livestock. Carefully observe the instructions for safe handling that are on the herbicide containers.

4. Although DCPA is approved for use on alfalfa grown for seed, the chemical is *not* approved for use on alfalfa hay.
5. The grower is responsible for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

RESIDUES

The suggestions for use are based on the best information currently available for each chemical that was enumerated. If the instructions are followed carefully, residues should not exceed the tolerance established for any particular chemical.

Controlling dodder will help you produce healthy, vigorous alfalfa for seed such as seen in these research plots.

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James E. Kraus

JAMES E. KRAUS, *Director*

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