

Chemical control of **WILD OATS** in field crops

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Suggestions outlined in this circular for chemical control of wild oats are based on information from the North Dakota Agricultural Experiment Station, the Research Committee of the North Central Weed Control Conference, industrial research and farm experience.

Use of chemicals is advised only when the chemicals are registered by the Food and Drug Administration as to tolerances for application on crops raised for human food and livestock feed. Use each chemical only as recommended on the label of the container.

Wild oats are the most serious statewide weed problem in North Dakota. Nearly all farmers share in the estimated 30 to 40 million dollar annual crop loss caused by wild oats.

The chemicals, DATC (Avadex), DATC-BW (Fargo) and barban (Carbyne), are useful for selective wild oat control in many commonly grown crops. These chemicals have been tested on many farms in the U. S. and Canada. When used properly, they can: (1) Prevent a serious reduction in crop yield from wild oat competition, and (2) limit production and shattering of a heavy wild oat seed crop.

Usually these chemicals do not result in complete elimination of wild oats in the crop to which they are applied. From 85 to 95 per cent control is more common. This, however, is satisfactory control in many crops.

Wild oat chemicals do not injure legumes and some grasses when they are underseeded in crops which have been sprayed.

On fields seriously infested with wild oats, a cultural control program should precede the use of chemicals. When the stand of wild oats is too thick and the crop too poor, the use of chemicals is not practical.

To determine the effect of the chemical, leave an untreated check strip in the sprayed field. Comparisons made with another field are not reliable.

Sprayers Need Checking

Careful and accurate application is essential with wild oat chemicals. Sprayers must be in good working order to assure uniform chemical application. Check nozzles and screens individually for uniform output and carefully calibrate the sprayer. Uneven chemical application can result in poor wild oat control or crop injury, or both.

Full-length boom type sprayers are required for even application. (Do not use end nozzles set at an angle designed to eliminate skips.) Boomless sprayers should not be used. Constant ground speed of the sprayer is important for even application.

Understand Limitations

Before spraying, be sure to understand the proper use of either chemical. Check with your County Extension Agent, your local dealer, attend educational meetings, and study the label so you will know how and when to use the chemical and what to expect. Both chemicals require more exacting use than 2,4-D and other commonly used weed control sprays.

Under dry surface soil conditions such as occurred in 1961, wild oat control with the Avadex compounds was not consistent.

The wet, cloudy weather and succulent crop growth that occurred in 1962 resulted in Carbyne injury to some crops.

Table 1. BARBAN (CARBYNE)
(1 pound active ingredient per gallon)

Recommended rate per acre:

4 to 6 ounces active ingredient (2 to 3 pints of product)

Hard red spring wheat	Barley
Durum	Safflower
Peas	Flax - the lower rate preferred

12 to 16 ounces active ingredient (3/4 to 1 gallon of product)

Sugarbeets

Cannot be used in tame oats.

Timing Carbyne Application



WHEN MOST OF THE WILD OATS LOOK LIKE THIS - SPRAY. If, due to abnormal conditions, most of the wild oats have not reached the 2-leaf stage within 9 days after emergence, spray before the 14th day.

How to Use Carbyne:

- Encourage uniform spring germination and emergence of wild oats in order to have as high a percentage of plants as possible between the 1 and 2-leaf stage for spraying. This can be accomplished by shallow tillage in seedbed preparation and a firm seedbed.

- Accurate application is essential. The sprayer must be in top working order and be calibrated to insure even and accurate application. Overlaps or skips in field application must be avoided. Winds up to 15 miles per hour have not affected results. Spray pressure must be at least 45 pounds. The ordinary 5-gallon fan or cone type spray nozzle used for other weed spraying is satisfactory.

If the nozzles can be tilted forward at a 45 degree angle and the boom lowered correspondingly, the chance of success is improved. This is probably because the most effective and most rapid results are obtained when the chemical is applied to the base rather than the tip of the wild oat seedling.

- Timing of the application is very important. Application must be made when the wild oats are between the 1 and 2-leaf stage of growth. This is from the time the second leaf appears until the third leaf starts. Leaves damaged by wind or frost must still be counted. Very careful field checking by actual count is required so that application is made when most (1/2 to 2/3 or more) of the wild oat seedlings are between the 1 and 2 leaf stage. Normally, this will be 4 to 9 days after emergence. In dry, cold springs or on low fertility fields this period may

be prolonged somewhat, but SPRAY NO LATER THAN THE 13TH DAY AFTER EMERGENCE OF WHEAT, DURUM AND BARLEY. Observations indicate that fields of small grains are often sprayed too late. Do not spray after most of the wheat or barley plants begin their 4th leaf, flax the 12th leaf, peas the 6th leaf, safflower the 8th leaf stage of growth and sugarbeets not later than 1 month after emergence. Spraying later than suggested can result in serious crop injury and unsatisfactory wild oat control.

Ideally, wild oats should be sprayed when most of the plants have about 1½ leaves and small grains no later than 3 full leaves but in no event should a field be sprayed later than 2 weeks after emergence even though the wild oats have not reached 1½ leaves.

- Rate per acre: The lower rate suggested is for use on fields of good fertility and moisture levels which have a good crop stand, favorable growing temperatures and a high percentage of the wild oats between 1 and 2-leaf stages within 10 days after emergence. Rates below 4 ounces per acre have generally resulted in unsatisfactory wild oat control. (Table 1.)

The higher rate suggested is for use when growing conditions, including low fertility, drouth, frost, wind damage or heavy wild oat stands, result in slow wild oat seedling growth.

- Results are slow. One to two weeks after treatment, wild oat plants turn a bluish green, the leaves become brittle and the plants become swollen at the base. Some early chemical effect also may be noted, especially on wheat and barley. This effect usually disappears as the season progresses.

- Good crop competition is important. A healthy, vigorous, fast growing crop usually will overcome wild oats that emerge after spraying or sprayed plants that develop new tillers.

- Surviving wild oat plants usually are stunted, mature later than normal and produce only a few seeds. Many survivors may mature late enough to prevent shattering their seed before harvest.

- Carbyne must be applied on a dry plant surface but rain a short time after treatment does not seem to affect results.

- If broadleaf weed control is desired at this early spraying, MCPA at rates not to exceed 1/4 pound per acre can be added to the Carbyne. 2,4-D cannot be used because crop injury will result from early application of this chemical.

- Usually, Carbyne is effective on wild oats only. At times, there may be some setback to buckwheat, curled dock, lady's thumb and smartweed.

- Band spraying over the row reduces the cost per acre on sugarbeets.

- Livestock should not be allowed to graze on Carbyne treated fields until after harvest of the crop. Flax straw or pea stubble should not be fed to livestock.

- To mix the spray solution (1) fill the spray tank 3/4 full of water, (2) slowly add the proper amount of Carbyne, (3) finish filling the spray tank with water and (4) keep mixed while spraying.

Table 2. DATC (AVADEX)
(4 pounds active ingredient per gallon)

Recommended rates per acre:

1½ pounds active ingredient (1½ quarts of product)	
Flax	Sugarbeets
Safflower	Corn
Potatoes	
Peas (both dry and canning)	

Table 3. DATC-BW (FAR-GO)
(4 pounds active ingredient per gallon)

Recommended rates per acre:

1 pound active ingredient (1 quart of product)	
Hard red spring wheat and durum	
1¼ pounds active ingredient (1¼ quarts of product)	
Barley	
Far-go tends to be somewhat less injurious to small grains than Avadex.	

How to use Avadex and Far-go:

- These chemicals must be mixed thoroughly with the top soil by shallow tillage to incorporate the chemical. Success for wild oat control depends to a large extent on how well the chemical is incorporated into the top 1 or 2 inches of soil.

- The sprayer must be calibrated and in top working order to insure even and accurate application. Avoid overlaps or skips. Field markers, such as chains attached to each end of the sprayer boom, are useful.

Ordinary 5-gallon fan type nozzles used for other weed spraying are satisfactory. Ten-gallon nozzles, if available, usually will result in more uniform application and less evaporation. Spray pressures not to exceed 30 pounds are suggested. Wind should not exceed 15 miles per hour.

- Apply and incorporate Avadex into the soil before planting flax, sugarbeets, safflower and potatoes.

To avoid injury to wheat, durum and barley, plant them first then apply Far-go and incorporate immediately with 2 harrowings. Crop seed must be below the treated soil area. This can be achieved either by deep seeding or shallow chemical incorporation.

Avadex can be applied either before or after planting corn or peas.

- The chemical must be applied on a smooth seedbed to permit uniform incorporation. Usually it will be best to work up a smooth seedbed before application. The chemical should then be incorporated shallowly (2 inches) by a disk, harrow or cultivator, followed by harrowing. Avoid applying on wet, lumpy, rough or ridged fields, such as occurs after using a field cultivator, because it will be impossible to incorporate Avadex uniformly into the surface soil. Deep furrow or hoe drills may not be satisfactory for use either before or after application because they tend to ridge the field, making uniform application difficult. If such drills are used, apply Avadex before planting the crop.

- Kill all wild oat seedlings present in the field by cultivation before applying the chemical. Wild oats which have emerged before the chemical is applied will not be killed by the chemical.

- Incorporate the chemical as soon as possible (within a few hours) after application in order to prevent loss by evaporation.

- Fields with much surface trash require extra surface tillage operations for good incorporation. A disk is the most satisfactory implement.

- On light, sandy soils where there is danger of severe wind erosion after application, Avadex or Far-go probably should not be used. The treated soil may blow from the field.

- Heavy rain following soil treatment does not seem to affect results materially. Chemical leaching is very slight unless rains are excessive and continued. Water erosion, however, can wash treated soil away from slopes and result in poor kill.

- Unsprouted wild oat seeds are not killed by Avadex or Far-go. Dormant and/or unsprouted seeds live over and may sprout next year or later.

- Avadex and Far-go remain active about 6 weeks, during which time they kill wild oats as they sprout. If rain delays seeding of post-planted crops after chemical application, the seedbed can be reworked shallow and seeded later.

● Wild oat plants may emerge on treated fields but usually die. Any plants surviving past the early seedling stage will usually develop normally.

● To mix (1) fill spray tank $\frac{3}{4}$ full of water, (2) carefully add the proper amount of chemical, (3) finish filling the tank with water, (4) allow the by-pass to mix before and during spraying. Solution remaining in the tank for some time should be mixed thoroughly before using.

● Avoid seeding tame oats on fields treated for wild oats the previous year, especially if more than $1\frac{1}{2}$ pounds of Avadex or Far-go were used per acre.

● Aerial applications are as effective as ground applications when the plane is equipped to apply a uniform spray pattern. Five gallons or more of spray material per acre are recommended. The pilot must be exacting in his operation.

Plan Your Wild Oat Control Program

Use of Carbyne, Avadex or Far-go should be part of a planned cropping program in controlling wild oats. A 3-year program on a badly infested field usually is necessary for control. Such a program, especially in the summerfallow area, may include 1 year of early fallow and 2 years of chemical or other wild oat control practices.

Cultural practices are a part of any good wild oat control program. Chemicals alone cannot do the job on fields severely infested with wild oats.

For additional information on wild oats, ask your County Extension Agent for a copy of "Wild Oats Facts and Tillage Control" (Circular A-276) and "Wild Oats, Can They Be Controlled?" (N. D. Agricultural Experiment Station Reprint No. 360).