



Cooperative Extension Service

CIRCUL
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NORTH DAKOTA STATE UNIVERSITY - FARGO, NORTH DAKOTA 58102
UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING



WEED CONTROL

Cultural Control of Wild Oats

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Wild oats, showing seedhead, roots and seeds.

When a field becomes infested with wild oat seed, controlling the weed becomes a problem, and the task of eliminating it is very difficult. Research

workers in Canada have reported that in infested fields as many as 21 bushels of wild oat seed per acre have shattered prior to wheat harvest. The plow layer in certain fields has been found to contain as high as 71 bushels of wild oat seeds per acre. These figures emphasize the severity of the wild oat weed problem and the difficulty in contending with it. Wild oats is the most serious annual weed in North Dakota and causes a greater reduction in farm income than any other weed.

There is no quick or easy way to eradicate wild oats from a field. But the task is not hopeless. It is possible to eliminate the weed by following a combination of good rotation, timely tillage operations and applications of wild oat control chemicals. This procedure requires good judgment and persistence. The most reliable way for small grain growers to eliminate wild oats from their fields is to get the seeds to sprout and then destroy the plants before they produce seed.

Understanding wild oats will help in establishing satisfactory control measures.

* Wild oats mature ahead of most of North Dakota's field crops and shatter a considerable amount of seed to the ground before harvest—a serious source of infestation.

* A new wild oat seed crop has a high percentage of dormancy, resulting in delayed germination and an accumulation of live seeds in the soil. The degree of dormancy varies from year to year. In general, the germination per cent of fresh wild oat seed is:

Two weeks after maturity - 0 to 5 per cent germination;
Four weeks after maturity - 5 to 25 per cent germination;

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Two months after maturity - 5 to 50 per cent germination;

The following spring - up to 80 per cent germination;

The second spring - up to 97 per cent germination.

- * At the time wild oat seeds shatter they frequently contain as high as 32 per cent moisture. Until the seeds have dried and after-ripened, they will not germinate. The length of time required to after-ripen the current season's seed crop depends on the weather and soil moisture conditions.
- * Wild oat seeds lying on or near the surface of the soil in the fall are exposed to weathering. Such seeds have a shorter dormancy period than those plowed or cultivated into the soil immediately after harvest. Therefore, avoid fall tillage--or at the most, make a shallow, delayed fall tillage.
- * Wild oat seeds can remain in the soil for several years without rotting; they will germinate and grow when conditions become favorable.
- * Wild oat seeds germinate best at temperatures below 50°F. and rarely germinate during the warm summer months--mid June through August. Summerfallow, except for the early spring tillage to germinate and kill two or three crops of wild oats, is not very effective in controlling the weed.
- * Fall germination of wild oat seed usually is poor even though growing conditions may seem favorable.
- * Burning stubble is not an effective means of controlling wild oats. If stubble and straw are heavy, and the burning is slow such as would occur in a windrow, there may be some tendency for the dormancy to be broken in newly shattered seed or for the seeds to be destroyed.
- * Germination of wild oat seed lying on the soil surface is poor; the seeds must be covered lightly with soil to germinate well.
- * Making a very early and shallow spring tillage to cover the wild oat seeds and warm the soil encourages early germination. If early spring tillage is not possible, substitute a late fall tillage just before freeze-up.
- * Deep plowing in an attempt to bury seeds so deeply they are not likely to germinate is not

effective. The furrow slice is not completely turned over, consequently all surface seeds are not buried to the full plow depth. Thus, wild oat seeds are scattered throughout the normal plowing slice.

- * Harrowing a few days after the spring sown crop has sprouted and before it is up can reduce wild oat stands up to 50 per cent if the wild oats are ahead of the seeded crop. Also, when soil moisture is good but the soil surface is dry, small grains and most row crops can be harrowed after they are up. However, harrow before the small grain crop begins to stool. The wild oat seedlings should be small as many are killed by being covered with soil rather than by being harrowed out. After the seeded crop is up, wheat, sunflowers, soybeans, corn, potatoes and sugarbeets can be harrowed one to three times, but barley only once. Avoid harrowing soybeans while they are emerging and sunflowers while emerging and until they reach the four to six leaf stage. Do not harrow flax or sorghum.

Some farmers report good wild oat control by shallow disking or using a rod weeder shortly after the seeded crop has sprouted but well before it emerges.

- * In unseeded fields, cultivating is an excellent means of killing wild oat plants that are 3 to 4 inches high. If cultivated under favorable conditions, wild oat plants smaller than this may reroot.
- * Applying fertilizer with a grain drill attachment places it where the seeded crop will get the advantage, enabling the crop to get a head start on the wild oats growing between the rows.
- * Of the spring sown grain crops, barley is the most competitive with wild oats, followed by wheat and oats; flax is the poorest competitor with the weed.
- * Delayed seeding is one of the best methods of controlling wild oats. However, the choice of crops which can be planted late is limited to flax, silage corn and several forage crops and their yields generally will be lower than for such crops sown earlier. Cultivate to kill two to three crops of wild oats and delay seeding until about mid June. After this date, wild oats is less likely to germinate.

- * Winter rye seeded on summerfallow gives very effective wild oat control.
- * Some wild oat seeds can germinate 4 to 6 days after heading. Infested fields harvested for hay should be cut as soon as the wild oats begin to head.
- * Wild oat seeds can survive the digestion tract of animals. Whole grain or hay containing wild oat seed should not be fed unless the manure is piled and allowed to heat. Animals fed wild oats should not be allowed to roam over the farm.
- * Wild oat seeds are killed in well cured silage.
- * Selective wild oat control herbicides are available and are a valuable aid in controlling this weed. These chemicals should be used as a supplement to good cultural control practices.

CULTURAL PRACTICES

The following suggestions for obtaining the best possible wild oat control by cultural practices are based on the facts just discussed, plus grower experience.

FIELD TO BE SUMMERFALLOWED

1. Do not cultivate in the fall or, at most, make only a very shallow, late cultivation, leaving the stubble upright to hold snow. This permits the new crop of wild oat seeds to lay on or near the soil surface where weathering will help to break dormancy. If fall cultivation is necessary to control other weeds, delay the operation until late September. Early mowing or spraying with 2-4,D will prevent seed production of other weeds.
2. Early the next spring cultivate the field shallowly, to cover the wild oat seeds and prepare a seedbed favoring their germination.
3. The second cultivation should be the deepest of the season. Make it as soon as the first wild oat crop is 3 to 4 inches high. At the same time, leave a firm seedbed favorable for germination of the next wild oat crop.
4. Repeat the shallow cultivations as often as the wild oats gets 3 to 4 inches high, always leaving a firm seedbed favorable for germination of the next crop.

5. If using the system just described, do not plow or cultivate the summerfallow deeply later in the season. To do so would bring deeply buried wild oat seeds up near the soil surface. Such seeds are not likely to germinate until next spring when a crop is sown.
6. Use only shallow tillage the following spring in preparing a seedbed for sowing the crop.

FIELD TO BE SOWN EARLY TO SMALL GRAIN CROPS

1. Early seeding of small grain crops will not eliminate wild oats. Limit early sowing of small grains to fields that are relatively free of wild oats. Continuous early seeding of a field favors a build up of wild oat seeds in the soil.
2. In areas of the state where early seeding is possible, the simplest and probably the best method is to plow in the spring and sow the crop immediately.
3. Where fall plowing is necessary in areas having heavy soils, delay plowing until September 15 if wild oats are somewhat of a problem.
 - (a) The next spring, give the field a shallow cultivation and plant the crop immediately.
 - (b) As soon as the crop has sprouted, harrow the field to help reduce wild oat population.
4. When applying fertilizer, use a grain drill attachment to place the fertilizer in the crop row. A fertilized crop is likely to give stronger competition to wild oats than a crop which has not been fertilized.
5. Barley is the best competitive crop with wild oats and is the preferred crop for seeding in badly infested fields.

DELAYED SEEDING - FIELD TO BE PLANTED TO LATE CROPS

1. In delayed seeding, use crops such as flax, corn millet, sudangrass, sorghums and buckwheat.
2. The simplest method of delayed seeding is merely to plow and plant the field immediately, about the middle of June. This procedure usually produces a wild oat-free crop, but it does not tend to reduce the wild oat population.

3. A delayed seeding program permits the killing of several crops of wild oats before the crop is planted.
 - (a) Plow the infested field early in the spring, or in the late fall in areas where fall plowing is necessary.
 - (b) If plowing is done in the spring, harrow or otherwise prepare a firm seedbed favorable to germination of the wild oats. On fall plowed fields, an early spring tillage operation and harrowing will help promote early growth of the wild oats.
 - (c) Make the second cultivation the deepest; it should kill the first wild oat crop. Each succeeding cultivation, before seeding the crop, should be a little shallower than the last. Cultivate whenever wild oats are 3 to 4 inches tall.
 - (d) Keep cultivating the field as late as possible in order to kill as many wild oat crops as possible. Plant the crop immediately after the last cultivation.

SOWING THE FIELD TO GRASS OR ALFALFA

Sowing a wild oat-infested field to perennial grass or alfalfa, and leaving it for several years, usually is only partially successful in eliminating wild oats. Some seeds rot, but there is no assurance that all seeds will be destroyed in this manner. Usually, moisture conditions under a sod are not favorable for rotting the seeds. Instead, they may be preserved for an indefinite period and germinate when the sod is broken. It may be advisable to follow a sod crop with the delayed seeding practice.

CROPPING CHANGES CAN BE HELPFUL

The combination of tillage practices and herbicide application are cropping changes of benefit to the producer. Wheat, barley and oats can be treated with

various herbicides for broadleaf weed control. Flax can be treated with MCPA for broadleaf control and dalapon for foxtail (pigeongrass) control. Pre- and/or postemergence herbicides can be used in corn, soybeans, sugarbeets, sunflowers and other crops. Selective wild oat herbicides control wild oats in many crops.

One of the most commonly used wild oats control practices has been delayed seeding, which has proven to be an effective method for controlling the weed. However, experiments and farmer experience have demonstrated that delayed seeding, on the average, reduces the crop yield. The wild oat control herbicides, triallate (Far-go), diallate (Avadex) and barban (Carbyne), make it possible to plant early and control the wild oats with chemicals. While herbicides are relatively expensive, many growers use them rather than suffer a reduction in yields due to delayed seeding.

At least three successive years of effective wild oat control are necessary to control the weed in a heavily infested wild oat field. This can be accomplished by planning a rotation based on tillage practices in some years and chemical wild oat control in others. For example: first year, late sown flax (delayed seeding practice); second year, summerfallow; and third year, wheat or barley with herbicide, if needed. Many other combinations can be used.

When all other practices fail, sacrifice the wild oat infested crop and cut it early for hay or silage.

For details on chemical control of wild oats, see Circular A-351, "Chemical Wild Oat Control in Field Crops."

Assistance in preparing this circular was provided by Lars A. Jensen, extension agronomist, retired, and Dr. John D. Nalewaja, professor, Agricultural Experiment Station.

