



# CHEMICAL WEED CONTROL

in  
FIELD CROPS

NORTH DAKOTA  
AGRIC. COLLEGE  
JAN 21 1958  
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**R**ecommendations for chemical weed control contained in this circular are based on recommendations of the Research Committee of the North Central Weed Control Conference and the North Dakota Experiment Station.

The use of chemicals suggested here is contingent upon registration of such chemicals by the Food and Drug Administration in regard to tolerances when applied to crops raised for food or feed purposes. Use chemicals only as recommended on the label of the container.

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**NDAC Extension Service, Fargo**  
NORTH DAKOTA AGRICULTURAL COLLEGE

Use of chemical herbicides can add materially to a good cultural weed control program. In small grain production timely chemical applications can be used effectively for control of annual weeds. Chemicals are also useful in growing crops for control of perennial weeds such as creeping jenny, leafy spurge, Canada thistle and perennial sowthistle.

When applying herbicides to growing crops, follow closely the instructions on the container. In determining rates to use, consider both the crop tolerance and kind of weeds present. The proper use of herbicides should result in a large measure of weed control. But if the chemicals are not used along with recognized cultural control practices they are not likely to solve your weed problems.

Timely weed control in growing crops is important. Weeds must be sprayed before small grains reach the shot blade stage or grain yields will already have been seriously reduced by the weed competition.

Do not spray when there is danger of drift or when winds are blowing toward a neighboring crop or planting more susceptible than the crop being sprayed.

Weeds more susceptible to 2,4-D than MCPA (the amine formulation of MCP) include Russian thistle, false flax, wild buckwheat, smartweed, redroot pigweed, ball mustard, tansy mustard and sowthistle.

For mixed weeds use the upper rates suggested. For harder to kill weeds higher rates may be needed even though some spraying injury to crop may result. The lower rates are suggested only when growth is rapid or when treating very susceptible weeds.

Rates suggested herein are in terms of acid equivalent per acre. For example,  $\frac{1}{2}$  pound of 2,4-D means 1 pint of material containing 4 pounds of 2,4-D acid per gallon.

## **Wheat, durum and barley**

Wheat, durum and barley are more tolerant to 2,4-D than other crops with wheat and durum somewhat more tolerant than barley.

These crops are likely to be injured by 2,4-D if applied before the 2 leaf stage or during the boot and shot blade stage. The best time to spray wheat, durum and barley is from the time that 5 full leaves appear until the early boot stage. During this period  $\frac{1}{4}$  to  $\frac{1}{2}$  pound per acre of 2,4-D amine or  $\frac{1}{4}$  to  $\frac{1}{3}$  pound of 2,4-D ester can generally be used to control broadleaved weeds without injury to the crops.



## Oats

Oats are more tolerant of MCPA than of 2,4-D. Application should be made after the 5 to 6 leaf stage up to the early boot stage. During this period 2,4-D can injure oats at any stage of growth, with early jointing the most sensitive stage. Suggested rates per acre for oats are  $\frac{1}{4}$  to  $\frac{1}{2}$  pound of MCPA,  $\frac{1}{4}$  to  $\frac{3}{8}$  pound of 2,4-D amine and not over  $\frac{1}{4}$  pound of 2,4-D ester.

## Winter rye

Winter rye may be treated with 2,4-D at  $\frac{1}{4}$  to  $\frac{1}{2}$  pound per acre of the ester or amine to control susceptible broadleaved weeds with little injury to the crop. Applications should be made in the spring from the full tillered stage through early jointing but before the boot stage. Fall applications generally result in crop damage and should not be used.

## Flax

Spray flax with MCPA or 2,4-D as soon as enough susceptible weeds emerge to make spraying practical. This is usually when flax is 2 to 6 inches tall. Spraying may reduce yields somewhat, but weed competition usually reduces yields more than the injury from spraying. Do not spray flax during the stage between bud and until 90% of the bolls have formed.

MCPA is less likely to injure flax than 2,4-D and is the preferred material. Use 2 to 3 ounces per acre of MCPA or 2,4-D in amine formulations for susceptible weeds like wild mustard. Use 4 ounces for weeds such as lambsquarters, Frenchweed, cocklebur, marsh elder and ragweed. Use 5 to 8 ounces in amine formulations or 5 to 6 ounces of MCP ester for wild buckwheat, smartweed, red root pigweed, Canada thistle or perennial sowthistle. Use 2,4-D ester at 4 to 5 ounces, or MCP ester at 6 ounces for Russian pigweed and Russian thistle. The higher rates, especially of ester formulations, may damage flax seriously.

TCA at 5 pounds per acre or Dalapon at 1 pound per acre will kill green foxtail, yellow foxtail and barnyard grass in young flax. The flax should be at least 2 inches tall and the weeds less than 2 inches for best results. TCA or Dalapon can be applied in mixture with MCPA or 2,4-D to kill susceptible broad leaf and grass weeds with one application.

Dalapon may require more optimum weather and growth conditions for best results.

TCA can be used on flax under-seeded to alfalfa, sweetclover, and trefoil. Dalapon can be used on flax under seeded to alfalfa, sweetclover, trefoil, red clover, and alsike.

Flax should be sprayed with at least 12 gallons of spray solution per acre when using TCA, Dalapon, esters or more than 4 ounces of amine.

## **Preharvest Weed Control**

In small grain crops, treatment before harvest at the early dough stage should be considered an emergency measure to be used only when weeds threaten to interfere with harvest operations. One pound per acre of 2,4-D is generally required even though it may result in some crop injury.

### **Corn**

The use of 2,4-D in growing corn is suggested to control susceptible weeds especially in the row and to reduce the number of cultivations. Some degree of injury to corn in the form of brittleness and bending or breakage of stalks can be expected for several days after treating with 2,4-D. Severe stand losses may occur when treatment is followed in the next few days by a wind storm or careless cultivation.

Apply  $\frac{1}{4}$  to  $\frac{1}{2}$  pound of 2,4-D per acre after the corn is 2 to 4 inches tall up to the tasseling stage. Determine the dosage by the kind of weeds being treated. The esters must be used at lower rates. If the corn is over 30 inches tall, drop nozzles should be used unless the weeds are too tall. Stalk breakage increases with heavier rates and with later applications.

Do not apply 2,4-D during the tasseling stage or when the temperature is over 90 degrees. MCP has not proved to be less injurious to corn than 2,4-D.

Annual grass weeds (except wild oats) can be controlled by CDAA (Randox) applied pre-emergence at the rate of 4 pounds per acre. Band application can be used to reduce per acre cost. Control is effective for 4 to 6 weeks.

Covering slightly by pulling a loop of logchain over the sprayed area increases effectiveness in dry years.

### **Soybeans**

Selective chemical weed control in growing soybeans is not recommended.

To control annual grasses (except wild oats) CDAA (Randox) at 4 to 6 pounds per acre applied before bean emergence has proven effective.



As with all pre-emergence herbicides, results will vary with weather conditions. Band treatment can be used to lower cost per acre. Covering treated area - See corn (page 4).

## Grass Seedings

Perennial grass seedlings may be treated with up to  $\frac{3}{4}$  pound per acre of 2,4-D after the grass seedlings have reached the 2 to 4-leaf stage. When grass seedlings become well stooled and have 12 or more leaves they are about as tolerant as established stands. Young grass seedlings may be injured by treating at or soon after emergence. Legumes in grass-legume mixtures are likely to be seriously injured by a 2,4-D application.

Established stands of most perennial grasses are very tolerant to any recommended rate of 2,4-D.

## Forage legumes

Avoid using herbicides on seedling legumes unless the nurse crop is seriously threatened by weeds. Red, ladino and alsike clover may be sprayed with 2,4-D or MCP amine at  $\frac{1}{4}$  pound or less per acre. Sweet-clover and alfalfa usually will be injured. A complete canopy formed by the companion crop and from weeds will reduce injury to the legumes.

Seedling alfalfa and birdsfoot trefoil may be treated with  $\frac{1}{2}$  to 1 pound per acre of 4-(2,4-DB) ester or 1 pound per acre of the amine for control of certain broad-leaved weeds. Best results are obtained when the weeds are small. Weeds controlled are Kochia, Russian thistle, lambsquarters, pigweed and Frenchweed. Tops of Canada thistle, bin-weed and curled dock are also killed. 4-(2,4-DB) can be mixed with Dalapon to control both annual grass and broad leaf weeds.

In established stands, 2,4-D or MCPA may be applied in the dormant stage of the legume in late fall after killing frost, or in early spring. Dinitro products may be used on established stands of legumes at 1 to 3 pounds per acre for broadleaved weed control.

TCA at 5 to 7 pounds per acre can be used to control many annual grassy weeds in both seedling and established stands of alfalfa, sweet-clover and birdsfoot trefoil without permanent injury. For best results, apply the TCA before the grass seedlings are 2 inches tall. Alsike, red and ladino clover are injured or killed by TCA treatments.

Dalapon may be applied at the rate of 2 to 3 pounds per acre in seedling stands of alfalfa and birdsfoot trefoil to control annual grasses. Apply Dalapon in 5 to 10 gallons of water per acre soon after emergence of the grass seedlings--often 1 or 2 weeks after emergence of the legume. Dalapon may be used later in the season if necessary.

TCA and Dalapon cannot be used if small grains are being grown as a nurse crop.

## Sugar beets

Crop rotation and cultivation are the principal means of weed control in sugar beets. Where annual grasses (except wild oats) are a problem the application of 5 to 7 pounds of TCA per acre, just before the emergence of the beets can be used. If weather makes it impossible to apply TCA before emergence of the beets, delay the application 10 days. This delayed treatment should be an emergency treatment only as it will stunt some beets.

Dalapon at 2 to 4 pounds per acre to control annual grasses, except wild oats, can be used. It must be applied after emergence of the weeds, either before or after beet emergence. Where wild oats are a problem apply 4 to 6 pounds of Dalapon per acre.

### CHECK PER ACRE OUTPUT OF YOUR SPRAYER

To do a good, economical job of spraying it is necessary to know the per-acre output of your sprayer and to make adjustments as necessary. Too much chemical will injure your crop and too little chemical may not do a good weed killing job.

1. Start with the spray tank completely full.
2. Make one round.
3. Measure carefully the water it takes to refill the tank.
4. Determine the number of acres covered from table below.
5. Divide the exact gallons used in one round by the acres covered. This gives rate of application per acre. Mix your chemical and water accordingly.

#### Boom Width

16 ft. = 1.9 A/mile	30 ft. = 3.63 A/mile
18 ft. = 2.18 A/mile	32 ft. = 3.87 A/mile
20 ft. = 2.42 A/mile	33 ft. = 4.00 A/mile
22 ft. = 2.66 A/mile	34 ft. = 4.12 A/mile
24 ft. = 2.9 A/mile	36 ft. = 4.36 A/mile
25 ft. = 3.03 A/mile	38 ft. = 4.60 A/mile
26 ft. = 3.15 A/mile	40 ft. = 4.84 A/mile
28 ft. = 3.39 A/mile	

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