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Chemical WEED CONTROL

in field crops

CHEMICAL weed control recommendations in this circular are based on information available from the North Dakota Experiment Station and the Research Committee of the North Central Weed Control Conference.

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.

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

When you apply 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 along with good cultural control should result in a large measure of weed control.

Timely application of weed control chemicals in growing crops is important. Weed competition will reduce crop yields severely, unless weeds are removed early.

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. Ideal temperatures are 65 to 85 degrees. Below 60 degrees kill will be very slow and above 90 degrees there is danger of crop injury.

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 hard to kill weeds, rates higher than suggested may be needed even though some spray injury to the crop may result. The lower rates are suggested only when growth is rapid or when you are treating very susceptible weeds.

Rates suggested here are in terms of acid equivalent per acre. For example, ½ pound of 2,4-D means 1 pint of material containing 4 pounds of 2,4-D acid per gallon. Dalapon – ¾ pound acid equals 1 pound of product.

Wheat, durum and barley

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

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 ¼ to ½ pound per acre of 2,4-D amine or ¼ to 1/3 pound of 2,4-D ester can generally be used to control broadleafed weeds without injury to the crops. These crops are likely to be injured if 2,4-D is applied before the 2 leaf stage, or from the early boot to the dough stage.

For buckwheat control ½ to 5/8 pound of 2,4-D ester applied as early as the crop is ready is suggested on wheat and durum. Two applications of 5 ounces each, 1 week apart, can also be applied and may control buckwheat even more effectively than a single heavy application.

Oats

Oats are more tolerant of MCPA than of 2,4-D. Apply after the 5 to 6-leaf stage up to the early boot stage. Even during this period 2,4-D can injure oats. Early jointing is the most sensitive stage during the spray period. Suggested rates per acre for oats are ¼ to ½ pound of MCPA, ¼ to 3/8 pound of 2,4-D amine and not over ¼ pound of 2,4-D ester.

Fall sown rye and wheat

Winter rye and winter wheat may be treated with 2,4-D at ¼ to ½ pound per acre of the ester or amine. Apply 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 yield 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 per cent 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, French weed, cocklebur, marsh elder and ragweed. Use 5 to 8 ounces in amine formulations for wild buckwheat, smartweed, redroot pigweed, Canada thistle or perennial sowthistle. Use 2,4-D ester at 4 to 5 ounces for Russian thistle. The higher rates, especially of ester formulations, may damage flax seriously.

Dalapon at ¾ pound per acre will kill green foxtail, yellow foxtail and barnyard grass in young flax. Flax should be at least 2 inches tall and the weeds less than 2 inches for best results. Dalapon can be applied in a mixture with MCPA or 2,4-D to kill susceptible broadleafed and grass weeds with one application. For mixtures, use slightly lower rates of each chemical than when using either chemical alone. Dalapon can be used on flax under-seeded to alfalfa, sweetclover, trefoil, red clover and alsike.

Spray with 5 to 10 gallons of solution per acre. The upper rate of water is preferred for esters or more than 4 ounces of amine. When spraying flax, avoid careless operations or poor equipment that may give uneven distribution of spray material which can result in overdosage of some flax.

Preharvest Weed Control

In small grain crops, treatment before harvest at the early dough stage should be an emergency measure used only when weeds threaten to interfere with harvest operations. One pound 2,4-D per acre is generally required to obtain satisfactory control at this late stage of weed growth.

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 but recovery is normally good. Severe stand losses may occur when a wind storm or careless cultivation occurs within a few days after treatment.

Apply ¼ to ½ 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. Use drop nozzles whenever possible to direct the spray away from top corn leaves. Stalk breakage increases with heavier rates and with applications at later stages of growth.

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.

Soybeans

Selective chemical weed control in growing soybeans is not recommended.

Pre-emergence herbicides

In North Dakota and other Great Plains states results with all pre-emergence applied chemicals have been erratic and undependable. Results seem to vary from year to year and field to field, depending on such factors as soil moisture, soil temperature, rainfall, soil type, etc. For this reason, pre-emergence chemicals are not reliable.

Pre-emergence chemicals being considered are: Randox on corn and soybeans at 4 to 5 pounds per acre; Randox T for both annual grasses

and broad leaf weeds in corn; Simazin on corn at 3 pounds or Atrazine at about 2 pounds per acre with considerable danger of residual effect on next year's crop; 2,4-D ester at 1 pound per acre on corn.

Grass Seedings

New seedings of perennial grass may be treated with up to ¾ pound of 2,4-D per acre 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 2,4-D applications.

Established stands of most perennial grasses are very tolerant of 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 ¼ pound or less per acre. Sweetclover and alfalfa usually will be injured. A complete canopy formed by the companion crop and from weeds will reduce injury to the legumes.

Seeding alfalfa and birdsfoot trefoil may be treated with ½ to 1 pound per acre of 4-(2,4-DB) ester or 1 pound per acre of the amine for control of certain broadleafed weeds. Best results are obtained when the weeds are small. Weeds controlled are kochia, Russian thistle, lambsquarters, pigweed and Frenchweed. Tops of Canada thistle, bindweed and curled dock are also killed. You can mix 4-(2,4-DB) with Dalapon to control both annual grass and broadleaf weeds.

Dinitro products may be used on established stands of legumes at 1 to 3 pounds per acre for broadleafed 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, sweetclover 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.

Dinitros, 4-(2,4-DB), TCA and Dalapon can be used on seedling stands or on seed crops. but do not have label clearance for use on hay and pasture crops.

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, 5 to 7 pounds of TCA per acre can be applied just before the emergence of the beets. If weather makes it impossible to apply TCA before emergence of the beets, delay the application 10 days. This delayed treatment should be for emergency 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 5 to 6 pounds of Dalapon per acre.

NEW WILD OATS CONTROL CHEMICALS

Two chemicals, Carbyne for post-emergence and Avadex for pre-planting use, are recommended for selective wild oats control in wheat, barley, flax, peas and sugar beets. See circular A-351 for information concerning their use.

CHECK PER ACRE OUTPUT OF YOUR SPRAYER

To do a good, economical job of spraying it is necessary to know the pre-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. Check each nozzle for even distribution.

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

This circular was prepared with the assistance of Dr. E. A. Helgeson, Botanist, Agricultural Experiment Station