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A College of Agriculture Publication

# 2,4-D For Weed Control In Cereal Crops

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IDAHO Agricultural  
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BULLETIN 205  
MARCH 1954

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**G**OOD farming is the basis of all weed control. Good farming includes the use of clean seed, proper seedbed preparation, adapted varieties, good crop rotations, and proper fertilization. These practices will prevent many weed problems and will control others. However, the best farming methods will occasionally fail to control weeds because of unforeseen sources of infestation, unfavorable weather, diseases and insects. Under these circumstances chemical weed control can be used to advantage. **To obtain the greatest benefits from chemical weed control methods, use them as a supplement to good farming practices.**

## Chemicals for Weed Control

Several new chemicals for controlling weeds in cereal crops have appeared on the market in the past few years. Among these are MCP, 2,4,5-T, and the low-volatile esters of both 2,4-D and 2,4,5-T. None of these materials is superior to the amine type of 2,4-D for controlling our common weeds in grain fields when applied in spray form. All esters whether of low or high volatility will vaporize, and, therefore, are not recommended where there is danger of injury to susceptible crops. Dust materials of 2,4-D, MCP, or 2,4,5-T are not recommended for use in any diversified crop area. They may drift long distances and are less effective than sprays. **For selective weed control in cereal crops, the amine form of 2,4-D is safer than the esters and when properly applied is just as effective.**

## Recommended Rates of 2,4-D Amine

One pound (1 quart of 40 percent amine) of 2,4-D per acre is suggested for easy to kill annual weeds such as tumbling or "Jim Hill" mustard, fanweed, prickly or "China" lettuce, annual peppergrass, common mustard, pigweed, and lambsquarter. Tarweed, bachelor's button and Russian thistle can be controlled at the 1 pound per acre rate only when they are very small. Two pounds of 2,4-D are suggested to prevent seed formation on such weeds as morning glory, Canada thistle, perennial sow thistle and blue flowering lettuce.

## Time to Spray

Timely application of 2,4-D is more important than the kind of chemical or the rates used. Most annual weeds are easier to kill while young and actively growing than when they are older. You can control "easy to kill" annuals any time before their flowering stage. Spray them as early as possible in order to eliminate the competition for moisture and plant nutrients. Grain yields are seldom increased if you delay spraying until weeds are in the bloom stage.

## **Spring Grain**

The best time to spray spring grain with 2,4-D is between stooling and the boot stage. Spring grain normally stools about a month after it comes up and will usually measure approximately 6 inches to the tips of the tallest leaves. Don't spray grain from the time it is in the boot stage to the end of the flowering period. This is about 2 weeks. You can spray it after the flowering period. Spraying before stooling usually prevents stooling and frequently produces abnormal and sterile heads which reduce yields. Under certain conditions, spraying before stooling may kill the small grain plants. Spraying during the flowering stage occasionally produces sterile heads and may reduce yields.

## **Fall Grain**

Spray fall seeded grains early in the spring but not before stooling is completed. When such grains show winter damage, do not apply sprays until the plants have outgrown this damage. Under favorable conditions of growth, fall grains complete most of their stooling before winter sets in. However, when such grains are seeded late or when weather conditions are not favorable, most of the stooling will take place in spring. If it is necessary to reseed portions of fields to spring grain, delay the spraying and follow recommendations for spraying spring grain.

## **Method of Application**

Water is the safest carrier for applying 2,4-D. It gives the greatest selectivity in permitting the 2,4-D to do the greatest damage to weeds and the least damage to the grain. There is no advantage in using oil carriers except to reduce weight in airplane applications of ester types of 2,4-D in dryland areas. Oil carriers may cause serious damage to crop plants.

The more water per acre that you use in the spray, the better your weed kill will be. This will also give you the least grain damage. If you have plenty of water, use 20 to 50 gallons per acre. You can use small volumes of water or oils, but greater damage to the crop may result. The possibility of damage to the grain crop and poorer weed control resulting from small volumes per acre should be compared with the relative cost of applying greater volumes per acre.

## **Irrigated Grains**

Use 1 pound of 2,4-D in 20 to 50 gallons of water per acre for the control of annual weeds in irrigated fields. You will get 1 pound of 2,4-D in a quart of 40 percent amine. Apply this with ground equipment if possible. Airplane application is not generally recommended under irrigated conditions.

## Dryland Grains

Use the same rate of application as for irrigated grains if you have readily available water. If water is scarce and hauling costs great, use 1 pound in at least 5 to 10 gallons of water.

## Airplane Application

If you spray with aerial equipment, you may use 2½ pints (1 pound) of 2,4-D **ester** in 1 gallon of oil per acre. The use of esters of 2,4-D, 2,4,5-T and MCP is restricted by law in some areas. See your county agent before purchasing these materials. Use **esters** only where there is no danger of the material drifting to and damaging nearby crops. If you use water as a carrier apply 1 quart 2,4-D **amine** in 3 gallons of water per acre.

## Adjusting Equipment for Weed Control

A pressure of 30 to 40 pounds is suggested. There is usually no need for higher pressure for annual weed control. Somewhat higher pressure may be better for spraying dense stands of perennial weeds in order to get better penetration and coverage. For complete coverage and least drift, use relatively low pressure and set the spray booms not more than 20 inches above the weed growth.

## Perennial Weeds in Fall or Spring Sown Grains

The primary purpose of using 2,4-D to control perennial weeds in cereal crops is to reduce the spread of noxious weeds by preventing the weeds from forming viable seed. To prevent noxious weeds from producing seed, spray them before they reach the bud stage. Spray the weeds either at their early bud stage or just prior to the time the grain is in the boot, whichever comes first.

Oats and barley are more susceptible to 2,4-D injury than wheat. Use greater care when spraying these crops.

For irrigated cereals use 2 pounds of 2,4-D (2 quarts of 40 percent amine) in 50 gallons of water per acre.

For dryland cereals use 2 pounds of 2,4-D in 20 gallons of water per acre.

For badly infested spots in a field, double the rate of application. Do this by reducing the speed of the spray machine to half the speed used when applying 2 pounds per acre. The double rate of 2,4-D application will probably cause some injury to the grain, but it will be more effective on the perennial weeds, and actual yield reduction on these spots will be small. Spray perennial weeds in the fall if there is regrowth. Make your fall application at the rate of 3 to 4 quarts of 40 percent amine 2,4-D per acre.

Do not expect that one spraying a year with 2,4-D will eradicate your noxious weeds. For eradication it is necessary to spray at least twice a year for a number of years. Use chemicals in combination with suitable crops and cultivation.



Fig. 1—A field of wheat heavily infested with Canada thistle.

Fig. 2—The same field after 1 year of clean cultivation for weed control. Similar results can be obtained by timely spraying with 2,4-D.

## Weed Seedlings

Tests show that in old established stands of perennial weeds there may be hundreds of weed seeds per cubic foot of soil. Sodium chlorate, carbon bisulphide and 2,4-D have almost no ability to kill these seeds in the soil. **Therefore, the control of seedling plants is extremely important in any weed program.** We can easily kill these seedlings if we use control measures when the plants are small. Any seedling noxious weed dies quickly if we cut off its roots within a month after it emerges. At this early stage 2 pounds of 2,4-D will also kill seedlings.

## Cultivating After Harvest

Most annual and perennial weeds in the grain field will set seed after the crop is harvested. Prevent this by plowing, disking, or spraying the grain stubble immediately after harvest. Plowing or disking will prevent all weeds from producing seeds. A spray application of 2,4-D will prevent seed production of only those weeds which are highly sensitive to this chemical. It will not prevent seed production of grass weeds or resistant broad-leaved weeds.

— PERSISTENCE IS THE KEY TO WEED CONTROL —

## Precautions in Using Herbicides

Herbicides are plant killers, and any chemical powerful enough to kill weeds will kill crops or other valuable plants. We can use them safely only under certain circumstances. Follow these precautions to reduce the danger from these powerful chemicals:

1. Do not spray under windy conditions. Even if light breezes are blowing, be sure they are blowing away from sensitive crops.
2. Do not use esters of 2,4-D, 2,4,5-T or MCP near any susceptible crops **even if the air is quiet.**
3. Do not use dust forms of 2,4-D, 2,4,5-T or MCP in any diversified crop area.
4. Operate spray booms as close to plants as possible.
5. To reduce drift, use as much water as possible and pressures not greater than 30 to 40 pounds.
6. Do not use the same equipment for applying herbicides, insecticides and fungicides as 2,4-D-type materials are difficult to wash from sprayers.
7. Avoid spilling herbicides. Keep containers tightly closed.
8. Do not store 2,4-D-type materials in the same building with seeds, insecticides, fungicides, or fertilizers.
9. Promptly destroy empty herbicide containers but do not burn or use as incinerators. Some may be returned to the manufacturers; bury all others.
10. Wash weed sprayers after you use them and do not let the wash water enter irrigation ditches or drain onto soil occupied by valuable plants.
11. Be sure you have the right chemical. Use herbicides for weed control, insecticides for insect control, and fungicides for fungus control. **Read the label to be sure you have the right one.**

Cooperative Extension Work in Agriculture and Home Economics, D. R. Theophilus,  
Director, University of Idaho College of Agriculture and United States  
Department of Agriculture Cooperating.

Issued in furtherance of the acts of May 8 and June 30, 1914.