

New Weed Control Practices In Strawberries

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Row at left (not sprayed) required four hand hoeings.



Row at right had three sprays of 2, 4-D and one hand hoeing.

During the past few years certain practices have been developed which promise to decrease the amount of hand labor required in strawberry production. These are very important developments because labor cost is the most important item in strawberry production and amounts to \$100 to \$150 per acre. Perhaps more important yet is the fact that labor is difficult to secure.

Since 1945 numerous chemicals have been tested for selective weed killing in strawberries. It was very encouraging to find that strawberry plants were

somewhat resistant to 2,4-D, one of the most effective herbicides. Other chemicals used with some success in this crop are Dinitros, IPC (iso-propyl-N phenyl-carbamate), Experimental Herbicide 1 (2,4-dichlorophenoxy cellosolve sulfate) and Experimental Herbicide 2 (dichloral urea).

Use of Chemicals Appears Promising

These experimental tests indicate that 2,4-D is the most satisfactory chemical for use in Missouri and appears promising for pre-planting, summer and fall applications. Pre-planting sprays are applied after the ground is prepared for planting. Setting may be started immediately after the spray is applied.

Summer sprays in new fields are applied after several runner plants have formed, making hand labor necessary to control grass and weeds within the row. Applications can begin in late June and continue until the middle of August.

In old fields, applications immediately after renewal and again in July help in keeping fields free of grass and weeds. 2,4-D should not be used during late August, September and early October when the fruit buds for next year's crop are forming. Sprays applied during the fruiting season (bloom to harvest) may result in the production of large numbers of "buttons".

Fall applications can be used in late October and early November for weeds which germinate in the fall, live through the winter and begin growth again next spring. Chickweed and primrose (wild beet) are two weeds of this type which are serious pests in Missouri. Fall applications, in old fields or new, have an important place in strawberry production.

2,4-D is classified as a selective weed-killer because concentrations of this chemical which are sufficient to kill most broadleaf plants do not seriously damage grasses. It is used successfully to kill weeds in lawns without serious damage to the grass. When we speak of selectively killing annual grasses in strawberries it is that grass which is just breaking through the ground—less than $\frac{1}{4}$ inch in height.... Most grasses after they reach a height of 1 or more inches are as resistant to 2,4-D as strawberries. Apply the 2,4-D to a clean field. Have the toxic chemical in the surface layer of the soil ready to kill the grass and weeds as they germinate.

Suggestions for Using 2,4-D

The amine salt of 2,4-D appears to be the most satisfactory form of this weed killer. Following are suggestions for its use.

For pre-planting sprays:

Sandy soil—2 to 3 pounds acid per acre

Silt or clay loam—3 to 4 pounds acid per acre.

Soil with high organic matter content (new land) 4 to 6 pounds acid per acre.

For summer sprays in new fields:

1 to $1\frac{1}{2}$ pounds acid per acre. Apply after runner plants are

setting and weeds cannot be controlled by cultivation. Clean out all grass and weeds before spraying.

2,4-D at this rate is effective against grasses only in the germinating stage. Do not use 2,4-D during the period August 15 to October 15.

For summer sprays in old fields:

1½ to 2 pounds acid per acre. Apply immediately after harvest and renewal. Repeat application after 3 to 4 weeks. Do not spray during the period August 15 to October 15.

For fall applications—New and old fields:

1½ to 2 pounds acid per acre. Apply in late October or early November to rid field of overwintering weeds.

For pre-planting sprays the volume of water in which the 2,4-D is applied is not important from the standpoint of injury to the plants but for applications during the summer and fall a small volume of spray (10 to 15 gallons per acre) will result in less damage to the plants.

Several types of sprayers may be used. For small acreages a knapsack or other hand operated sprayer can be used, but for large acreages one of the least expensive and yet most satisfactory sprayers is the low volume weed sprayer that is operated by the power take-off of the tractor. Low volume fan nozzles should be used with all types of sprayers.

An important factor in the successful use of chemical weed killers in strawberries is the accurate application of the material. You must be able to regulate accurately the amount of 2,4-D applied.

To calculate the amount of commercial 2,4-D preparation to use, first determine the number of gallons of spray that will be applied per acre by the sprayer. One method of determining this is to fill the sprayer with water, spray an area 20 x 109 feet, and measure amount of water needed to refill sprayer. The gallons used on this area $\times 20 =$ gallons per acre. Most 2,4-D preparations appearing on the market at present contain 4 pounds of 2,4-D acid per gallon. To apply 2 pounds of 2,4-D acid per acre add 2 quarts of the commercial preparation to the volume of spray applied per acre.

Precautions

1. Strawberries are only somewhat resistant to 2,4-D and may be killed if excessive concentrations are used.
2. To use 2,4-D successfully, you must be able to regulate accurately the amount of 2,4-D applied per acre.
3. If 2,4-D is to have any effect on grasses, it must be applied not later than the germinating stage.
4. Both pre-planting and summer sprays may cause damage if there is a long drought period immediately after application.
5. 2,4-D applied during the period of fruit bud formation (differentiation)

may result in deformed fruits. In Missouri this period is from late August to late October.

6. 2,4-D should not be used during the fruiting season (bloom to harvest).
7. Most vegetable crops, flowering plants, grapes and certain legumes are extremely sensitive to 2,4-D.
8. A sprayer used for 2,4-D should not be used for applying fungicides or insecticides to 2,4-D susceptible plants.
9. Chemicals must be considered only as aids in weed control—not the sole means of control.

Geese Are Excellent for Crabgrass Control

The use of geese in the strawberry field, a practice employed by some growers for many years, has recently received considerable attention. Geese do an excellent job of keeping the field free of crabgrass. They also eat certain other grasses and many broadleaf weeds. However, we cannot expect geese to eliminate all hoeing. There are several weeds such as sorrel, smartweed, vetch, chickweed, oxalis, foxtail, ragweed, etc., which are not adequately controlled.

Usually four to six geese per acre are recommended. Give the geese a ration of cracked corn and water and shelter to provide shade and protection from rain. Moreover, protection from foxes and coyotes must be considered.

A feeding and watering place should be provided which is 15 to 20 feet removed from the edge of the strawberry field. The birds loiter here and no strawberry plants are able to survive within several feet of this point.

In the spring of the second year the geese may be allowed to pasture in the field until about 3 weeks before the fruit begin to ripen. After harvest and renewal of the field, geese will help measurably in the control of grass and weeds.

Geese and 2,4-D May be Good Combination

The use of 2,4-D to control broadleaf weeds and geese to control crabgrass could eliminate most of the hand labor in strawberries.

Summer Mulches Help in Weed Control

A mulch applied in July after a desirable stand of plants is obtained will help measurably in the control of weeds which germinate in the late summer and fall. A number of growers use this practice successfully.

Recent experiments indicate that certain mulching materials may be applied in June just as runner growth begins. A mulched strip 12 to 18 inches along the plant row decreases markedly the number of weeds, particularly grasses, which must be removed by hoeing or hand pulling. When sawdust and cotton hulls were used, runner plants were able to take root through these materials. Straw, cane pomace, and leaves should be run through a chopping or shredding machine to give best results.

In addition to controlling weeds in hot dry summers mulches conserve moisture and afford the plants considerable protection by keeping soil temperatures 10 to 15 degrees F. cooler than uncovered areas.