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Strawberry Diseases

Obtaining a high yield of high quality berries is the objective of most strawberry growers. Perhaps you remember certain years when crop production seemed almost ideal. But for some reason or reasons, excellent crops are not produced every year.

Weather conditions that damage the crop are beyond your control in most cases. However, much of the loss is caused by diseases, insects, and weeds. And, to a great extent, these pests can be controlled. Only the diseases are discussed here. Nevertheless, a sound strawberry production program includes organized control of all pests and the use of good cultural practices. A total program replaces most of the "luck" factor in crop production.

FUNGICIDE APPLICATIONS FOR ESTABLISHED PLANTS

The production of the best possible crop from existing plantings is of immediate interest. Use chemicals to control diseases such as leaf spots and fruit rots on these plantings.

Bud stage, just before bloom, is the time for the most important chemical application of the season. Use the necessary insecticides and one of the following fungicides:

Spray Application

Fungicide*	Pounds per 100 gallons	Level tablespoons per gallon	Last application before harvest
benomyl	½ to 1	½ to 1	No time limitation
captan 50% W.P.	1½ to 2	1½	No time limitation
dodine 65% W.P.	¼ to ½	½	14 days
folpet 50% W.P.	2	2	No time limitation
thiram 75% W.P.	2	1½	Remove residues by washing if applied within 3 days of harvest
zineb 65% W.P.	1½ to 2	1	7 days

* These fungicides are sold under trade names such as:

benomyl - Benlate

captan - Orthocide 50 Wettable, Orthocide Garden Fungicide, Stauffer Captan 50-W, and Stauffer Captan Garden Fungicide.

dodine - Cyprex

folpet - Ortho Phaltan and Stauffer Phaltan

thiram - Thylate

zineb - Dithane Z-78, Parzate, and other brand names that contain the term "Zineb."

You can apply dusts of 5 to 10 percent concentration instead of sprays. For best results, apply dusts when plants are wet or damp.

Fungicides used without insecticides may be applied to strawberry plants during the blossom period. This treatment will reduce blossom infection by fungi, resulting in more fruit with fewer blemishes.

Make additional applications of the above fungicides at intervals of 7 to 10 days up to the limitation given. You may apply captan up to and during harvest. Generally, make harvest applications immediately following picking of ripe fruit. Harvest applications generally are unnecessary if several applications are made before harvest.

Powdery mildew occurs at times on strawberries. Sulfur may be used for control, however it may cause some burning of plants at high temperatures. Do not apply during periods of temperature of 80°F. or higher or if such temperatures are likely to occur during the following 2 days. Follow label directions.

You may apply the above fungicides to June-bearing varieties after harvest. The limitations given for "last application before harvest" must be followed for everbearing varieties.

PLANTING STOCK AND SOIL PROBLEMS

Some plant disease problems must be corrected before plantings are made. The plants or soil may be infected or infested with disease organisms that later would cause problems. Crop rotation is recommended. If you plan to make new plantings from your own stock, remove and destroy any weak or unusual plants during the growing season.

WINTER INJURY

Some growers have lost many plants in new plantings and surviving plants were often weak. Low

yields generally resulted. Plant damage is apparently caused by several factors, including winter injury to the plant beds from which new plantings were made. The injury is most likely to occur if plants are exposed to alternating warm and cold temperatures during the winter. Mulching with hay, straw, leaves, or other such material reduces the chance of winter injury.

VIRUS

Research work on strawberry diseases showed that most plantings are infected with viruses. In spite of this infection, many plantings that are well cared for produce good crops. The U.S. Department of Agriculture has produced new stocks of common varieties that are essentially free from viruses. Increases in yields were found in some tests where virus-free plants were compared with virus-infected plants of the same varieties. Virus-free stocks of many varieties are being made available to commercial nurseries.

Strawberry viruses are spread by aphids. Virus-free plants become infected after a few years unless aphids are carefully controlled. For commercial fruit growing or home gardens, it is perhaps better to obtain new plants every few years than to try to completely control the spread of viruses.

NEMATODES

Parasitic nematodes are small round worms that usually measure from about one sixty-fourth to one sixteenth of an inch long. Some species of nematodes cause serious strawberry diseases when they occur in high numbers. Root-knot nematodes cause characteristic knots or galls on roots.

Some symptoms of root-knot and other nematodes are: stunting, yellowing of leaves, reduced berry yields, reduced production of runner plants, wilting, and general vigor loss. Severe infestations of nematodes on strawberry plants were found in a few cases in Minnesota.

Nematode root diseases are almost impossible to diagnose from symptoms alone. To make an accurate diagnosis, nematodes must be recovered and identified from diseased plants and soil. Such a diagnosis can be made only in a specially equipped laboratory by trained personnel. Whenever you suspect a nematode problem, collect approximately 1 pint of soil together with roots of a few diseased

plants from the suspected field. Place samples in a plastic bag to prevent drying and mail them to:

Plant Disease Clinic
University of Minnesota
St. Paul, Minnesota 55101

The basic principle of nematode control in strawberries is planting only nematode-free strawberry plants in nematode-free soil. Few commercial suppliers attempt to supply nematode-free strawberries, but more nurseries are producing such plants each year.

Eliminating nematodes from the soil is at best a rather expensive and difficult task. The basic method of field-scale nematode control is soil fumigation (application of chemicals). Obtain information on soil fumigation by writing to the above address. Crop rotation is generally more economical than soil fumigation if land is available.

BLACK ROOT ROT

The term black root rot is used to describe a variety of symptoms in which roots are black, many plants die, and remaining plants are often weak. The cause often has been traced to several factors including winter injury, fungus root rot, virus infection, nematode infection, and poorly grown plants.

At present the best recommendations for control are: use sound healthy plants; sort plants at planting time to eliminate weak ones and those with discolored roots; use virus-free and nematode-free plants; plant on new ground that has not been used for strawberries for several years; and use a good program of soil fertility and insect and disease control. Destroy any weak plants during the season, before they form runners. You can use soil fumigation for the control of fungus diseases if it should become necessary.

The information given in the publication is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no indorsement by the Minnesota Agricultural Extension Service is implied.

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