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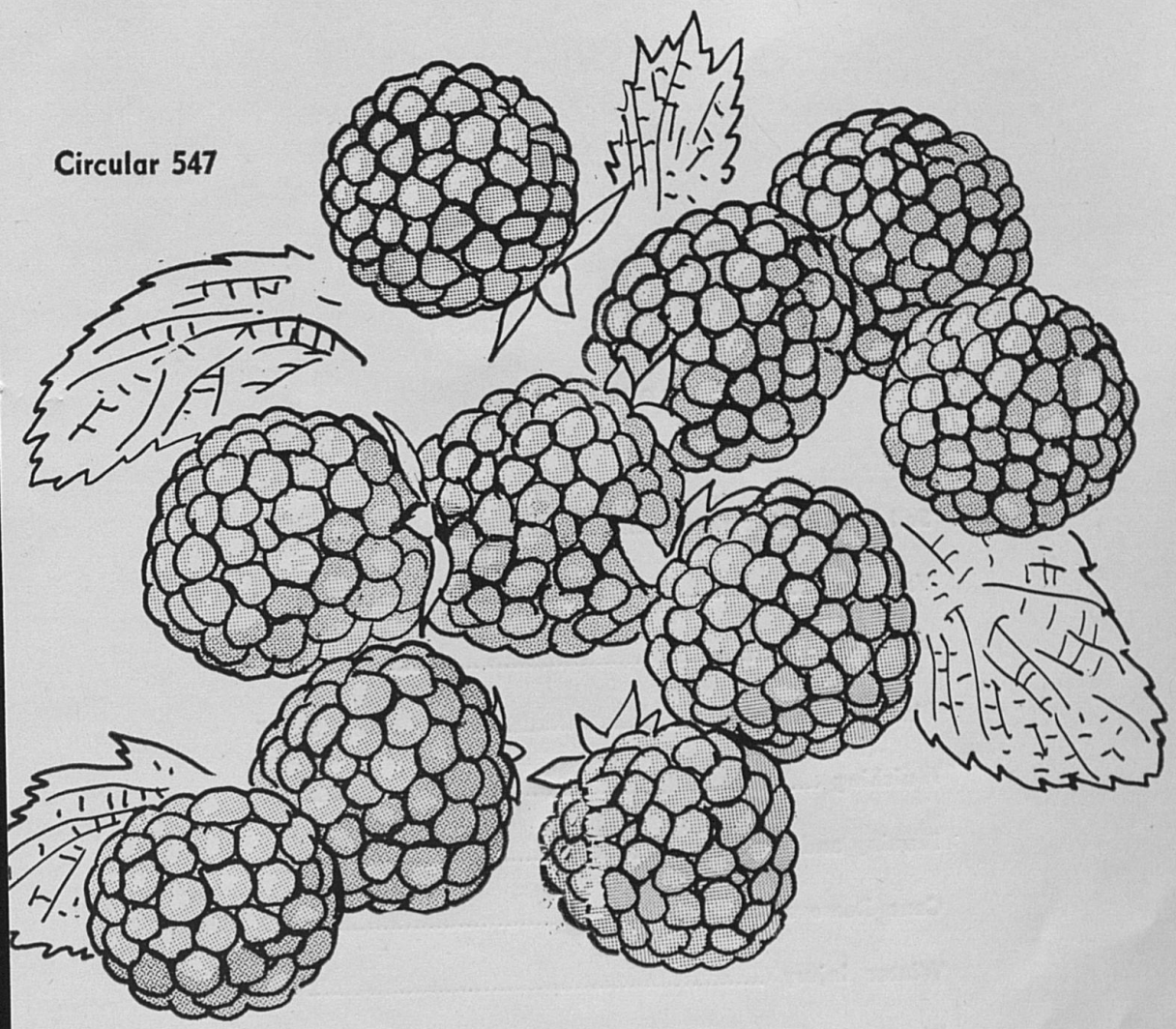
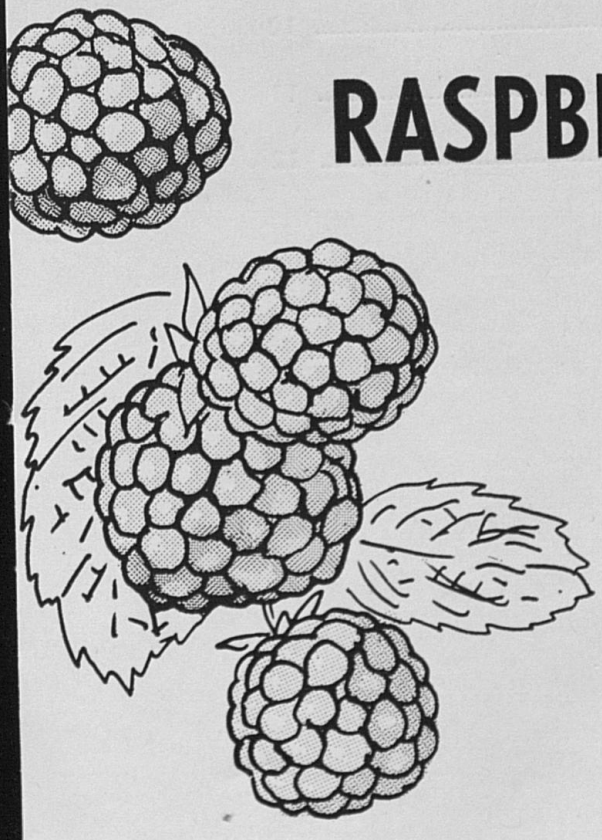


RASPBERRY CULTURE IN KENTUCKY



by C. S. WALTMAN

UNIVERSITY OF KENTUCKY
College of Agriculture and Home Economics
Agricultural Extension Service

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Raspberry Culture in Kentucky

By C. S. Waltman

Not enough raspberries are grown in most parts of Kentucky to supply the local demand, thus providing opportunity for farmers in such areas to grow raspberries for home use and local market. Raspberries grow and yield well in most parts of the state and begin to bear the second season after they are planted. Because their native home is in the cool climate of the north, however, special care is necessary to get best results in Kentucky. Raspberry culture in the state has declined during the past several years, chiefly because of an increase in certain diseases. Disease injury, however, can be prevented, or greatly reduced, by proper plant selection and timely treatment with a simple spray program.

New canes of raspberries grow one season, produce fruit the following season, and then die after harvest. The roots and crown live for several years and each spring produce a new crop of canes, while the fruit is maturing on the canes that grew the season before. Under favorable conditions, if given proper care, a raspberry planting may produce during a period of from 8 to 12 years. Plantings made on poor sites and receiving poor care often die out after 3 to 5 years. Highest yields generally are obtained by making a new planting on fresh soil every 4 or 5 years.

SOIL AND FERTILIZATION

A deep, fertile soil, high in humus, and well-drained, is best for raspberries. Choice tobacco land usually makes good raspberry land. The raspberry's natural habitat is near woodlots and old fence corners, and it grows best where there is a thick mulch of rotted leaves. In such places plants have large thrifty canes which produce heavy crops in spite of dry weather at harvest time. When possible, plant raspberries on soil with a northern slope, or where there is shade in the afternoon. Such soils are cooler, hold moisture better, and therefore are better for growing raspberries than where there is full afternoon sunlight. A liberal application of manure each year helps provide favorable conditions in the field. Plowing under clover sod or other green manure crops also improves the soil for raspberry growing. A spring side-dressing of 200 pounds per acre of nitrate of soda or sulfate of ammonia or its equivalent of ammonium nitrate each year is helpful on most soils.

VARIETIES

The three groups of raspberries are the black, the red, and the purple. The purple raspberry is a hybrid between the red and the black.

Black Raspberries

Cumberland is the best known black-cap variety in Kentucky. Its canes are vigorous and productive, and the fruit which ripens in mid-season is large and attractive. *Morrison,* a new variety from Ohio, has rapidly gained popularity. The fruit ripens somewhat later than Cumberland and is large and high in quality. The canes are vigorous and highly productive. *Logan* is an early variety that has done very well in Kentucky. The berries are large and attractive, and the plants yield well. Bristol has given excellent results at the Western Kentucky substation and other locations in Kentucky. It promises to become a leading variety in this state.

Red Raspberries

Latham is the most important variety grown in Kentucky. The berries are large and attractive, and stand shipment well, but are rated only fair to good in quality. Because the foliage is subject to leaf-spot diseases, summer spraying is necessary to maintain vigor. It is one of the most productive sorts and ripens in mid-season. *Sunrise* is a new, very early ripening variety developed by the U. S. Department of Agriculture. It has shown promise in tests in Kentucky and is suggested for trial for home and commercial plantings. *Indian Summer,* an everbearing variety that produces both a spring crop and a fall crop that ripens until frost, has done well at Lexington and in western Kentucky at Princeton. It is recommended for trial. *September* is a new everbearer which appears very promising.

In addition to the foregoing varieties, *Flaming Giant* (Ohta) has done well in experimental and commercial trials in western Kentucky. This variety is earlier than Latham but is of lower quality and lighter in color. It seems to do better without being sprayed than other varieties similarly treated.

Purple Raspberries

Sodus has been found in trials at the Kentucky Agricultural Experiment Station to be the most vigorous and productive of any purple varieties grown. However, the canes of this raspberry are subject to winter injury. *Potomac* and *Marion* are two new sorts also suggested for trial.

PROPAGATION

Black and purple raspberries are propagated by tip layering. In August or early September the tips of the new shoots should be bent to the ground and covered with soil. Roots will form during the fall, and in the spring the new plants may be cut from the parent for setting. The plants will be stronger if the young plant is left attached to the mother plant over winter.

Red raspberries are propagated from the sucker shoots which spring up from the roots of the old plant. Be *sure* to leave a piece of the parent root attached to each plant. Transplant only the most vigorous and healthy suckers. Under favorable conditions it is possible to transplant young suckers in the spring when they are 5 to 6 inches high.

PLANTING AND CULTIVATION

Although raspberries may be set in late fall, it is better, especially with blacks and purples, to plant them in early spring before growth starts. Red raspberries are often set 3 feet apart in rows 7 or 8 feet apart. When using the hill system, plants are usually set 5 or 6 feet apart each way. Black and purple raspberries generally need more space than reds, and for this reason are often set 4 feet apart in rows 8 feet apart or in 6′ x 6′ hills. A planting 6′ x 6′ requires 1,210 plants per acre. A planting 3′ x 8′ requires 1,815 plants per acre. Many prefer to set 2 plants per hill because this almost doubles the yield the first harvest season. It is always best to separate blacks and reds by several hundred feet to avoid the spread of disease.

Begin cultivating in April and continue through August. Two or three hoeings may be necessary to keep the patch free of weeds. In small gardens a heavy straw mulch may be used in place of cultivation.

MULCHING

In home gardens particularly, and on commercial areas if materials are available, brambles will generally respond very favorably to mulching. A heavy covering of straw, strawy manure, grass clippings, sawdust or leaves serves this purpose well. A suitable mulch saves moisture, keeps the berries clean, holds down weeds, keeps the ground from becoming hard, makes cultivation unnecessary, reduces erosion, and keeps the soil at a lower and more nearly uniform temperature during the summer. These benefits are partly offset, however, by the fact that plants on mulched areas need nitrogen fertilizer, because the rotting materials reduce the soil nitrate supply. In tests at the Kentucky Agricultural Experiment Station covering a period of years, the yields of red raspberries were doubled where a heavy

mulch of strawy manure was used. The heavy mulch should be applied at least every other year. In addition to the increased yields, berries from plants that were mulched were larger and better developed, and the new growth and fruits were less seriously affected by periods of dry weather. Best results were obtained when the mulching was done in the spring after pruning but before new canes had started to grow.

At the Western Kentucky Experiment Substation heavy mulching of the entire space between red raspberries set in hills, with waste hay and straw, greatly increased the yield and vigor of plants in comparison with clean-cultivated areas. In fact, plots that had a heavy mulch and no sprays were, in several seasons, more productive than cleanly cultivated sprayed plots.

PRUNING AND TRAINING

Black and Purple Raspberries

These raspberries give best results when trained to a hill system, and they are easily maintained in this way because they do not spread beyond the point at which they were originally set. For support, tie the canes to a stake in each hill, or use a 2-wire trellis made on posts

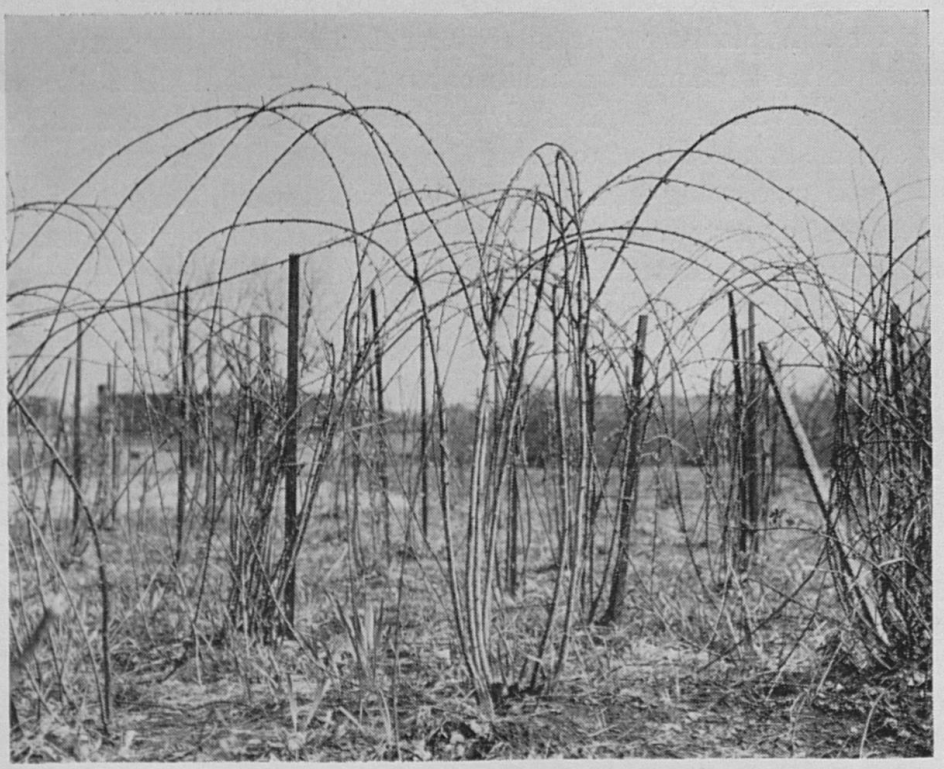

Fig. 1.— Black raspberry canes before being pruned.

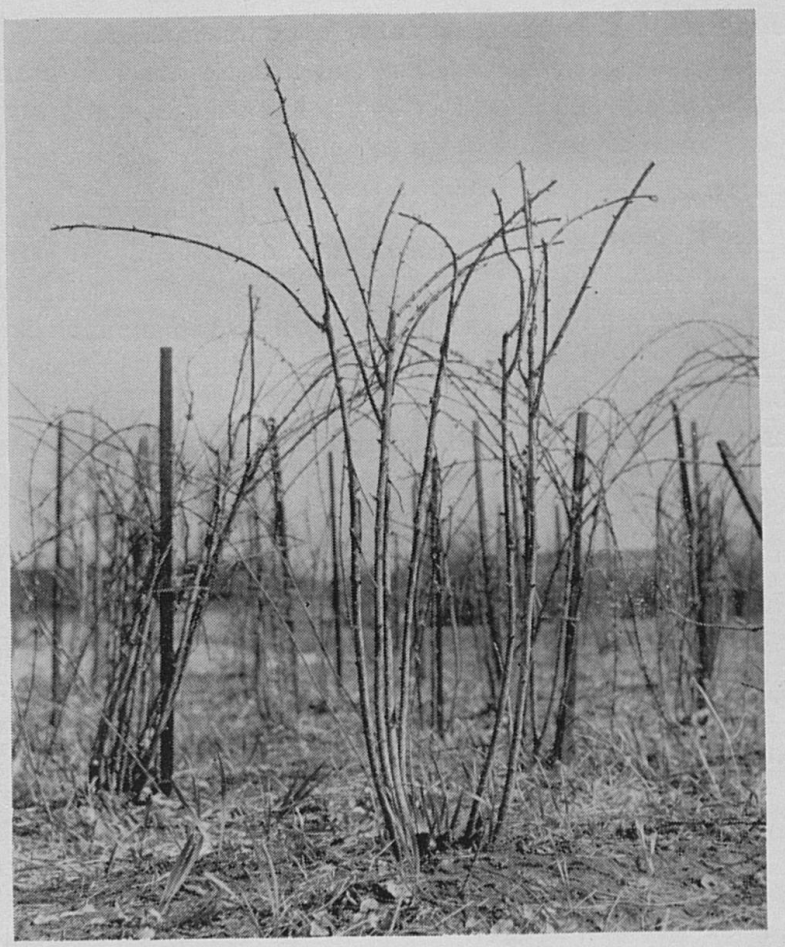

Fig. 2.— Same plant as shown in Fig. 1, after being pruned. Five or six vigorous canes per hill should be left for fruiting, and the laterals shortened to a length of 10 to 12 inches.

set to stand about 2½ feet above the ground. Fasten cross arms of 2″ x 4″ pieces, 2 feet long, to the posts and run a wire through or fasten it to each end of the cross arms. Then pull the canes and fruiting shoots between the two wires, which will support them. Some growers have been very successful in growing these raspberries without supports, by cutting the canes back to about 2 feet.

Early each summer when the new shoots are about 2 feet tall, pinch off the growing tip. This makes the canes stocky, and at the same time causes side branches to grow, greatly increasing the bearing surface of the plants. The following spring, prune the side branches to about 10 or 12 inches. Determine the number of canes to leave by the vigor of the plants and the richness of the soil. Ordinarily leave from 4 to 6 canes per hill. In general, pruning decreases

the number of berries and increases the individual size. A common mistake in pruning black raspberries is leaving the side branches too long. By so doing, more fruit buds are left on the plants than can be grown into well-developed berries.

Red Raspberries

The hill system—Red raspberries are not so easily grown in a hill system as black raspberries because they form new canes from their roots. However, if one removes the new plants when they appear outside the hill area, red raspberries can be trained in this way without too much additional attention. Plant 6′ x 6′. Leave 8 to 10 vigorous canes per hill in the spring and tie to a stake. Remove all the rest. Top the vigorous canes in the spring at a height of 5 or 5½ feet. Heading them back more than this removes some of the most productive area of the canes.

The hedgerow.—The most common method of training red raspberries is the hedgerow system. Narrow the row to 18 to 24 inches and thin the canes until those left for fruiting average about 10 canes for each 4 feet of row. Leave only the vigorous canes, and prune them back to about 5 feet.

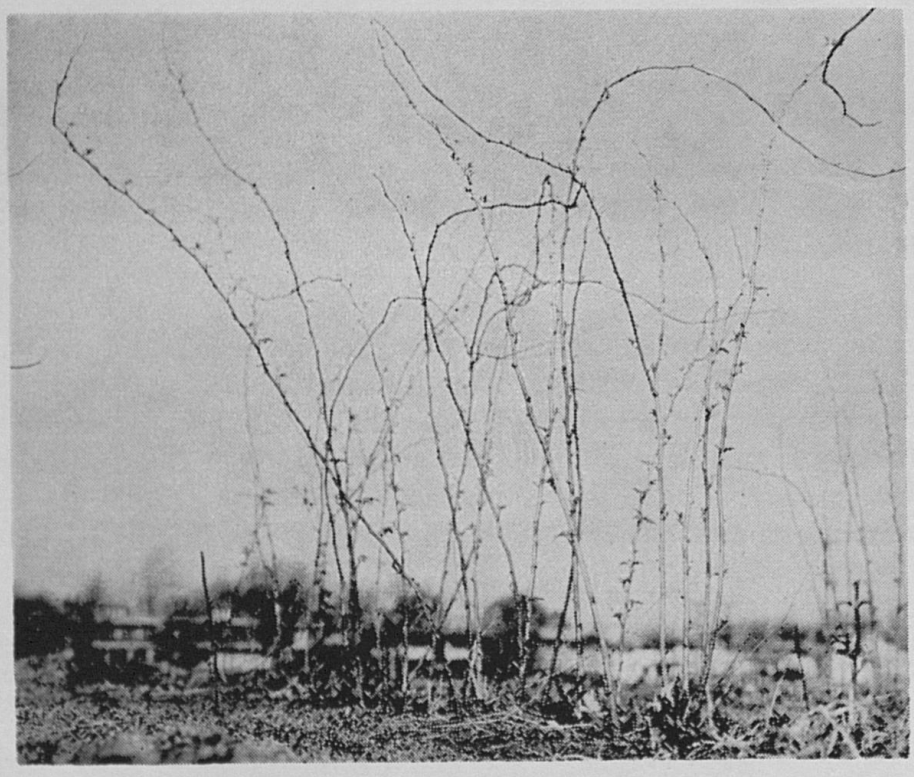

Fig. 3.— Red raspberry canes before being pruned, in hedgerow system of training.

Fig. 4.— Same canes as in Fig. 3, after being pruned. The most vigorous canes were shortened to a height of about 5½ feet, and thinned to about 10 canes per 4 feet of row.

Don't pinch off the tips of the red raspberries in summer, because they have little tendency to form side branches, and they don't respond well to this practice. In addition, pinching causes more suckers.

In the spring take out the weak and dead canes, and prune the vigorous ones to a height of about 5 feet.

CANE REMOVAL

Since the fruiting canes of all kinds of raspberries normally die after harvest, it is best to remove and burn these canes as soon as harvest is over. This is important because if not removed, the old canes often spread diseases to the young canes. Bits of old canes left on the ground may be a source of cane-blight infection. If anthracnose was not controlled earlier, remove severely affected new canes when removing the old canes.

WINTER INJURY

Kentucky raspberry plantings often have heavy loss of canes during winter. The reason for this is not completely understood, but it is thought to be a combination of disease, insect, and winter injury. Dur-

ing warm spells in late winter, canes and buds lose much of their resistance to cold. If these mild spells are followed by near zero weather in February or March, much injury results. Also, injury not caused by any one cold spell often occurs. Vigorous canes, free of insect and disease injury, have the best possibility of coming through the winter in good condition.

DISEASES[1]

Anthracnose

This disease, which is especially troublesome on black raspberries, causes oval or circular, grayish-white scabby spots on the canes. It often girdles the canes before the crop matures causing the berries to dry up. It is especially important, therefore, to plant only stock that is free from this disease. Before taking new black or purple plants to the field for setting, cut off the stubs of the old canes attached to the young plants below the ground level, and burn them. This keeps them from infecting the new shoots with anthracnose and cane blight. Apply delayed dormant spray (see page 12) when the leaves are showing green, or when they are about 1/8 inch long. Red raspberries are less likely to be seriously damaged by anthracnose than black and purple varieties, but sprays should be applied if there has been much anthracnose on the plants.

Crown Gall

This disease causes galls to form on the roots and lower part of the cane. It is especially common on red raspberries, but also injures black and purple varieties. Cut out and burn affected plants found in the patch.

Cane Blight

This disease may cause extensive damage to black rasberry canes during the fall and winter. Remove and burn all old canes and cane parts immediately after harvest, and also any plants already made unproductive by the disease. Remove canes and burn them whenever the disease shows up. After the disease has become established on a plant there is no means of control.

Virus Diseases

Black and purple raspberries should not be planted closer than 300 feet to red raspberries, because mosaic diseases are spread by plant lice from the reds to blacks and purples. Red raspberries are not seriously injured by the various mosaics, but black raspberries are. Make new raspberry plantings only from plants known to be free of

[1] This section is by W. D. Valleau, Plant Pathologist of the Kentucky Agricultural Experiment Station.

mosaic or similar virus diseases. If mosaic or other virus diseases are found in a planting, thoroughly flame the affected plants with a torch to destroy all insects, and then dig the plants out and burn them. Mosaic can be recognized by its mottling of the leaves. Other virus diseases may cause dwarfing, leaf curl, or die-back. What appears to be a virus disease of black raspberries often cause very vigorous plants but nearly complete failure to set fruit. Remove these sterile plants, using the precautions recommended for removal of mosaic plants.

INSECTS AND MITES[1]

Mites

Light colored, speckled and slightly curled foliage on raspberries, especially in dry seasons, is caused by very small, yellowish or reddish mites often called "red spiders." To control these pests, make 2 applications a week apart, of aramite, 1½ lb. per 100 gallons, directing the spray at the undersides of the leaves where the mites are most numerous. If preharvest applications are used, at least 14 days must elapse between the last application and harvest. Never use sulfur sprays to control mites on raspberries, because even the mildest sulfurs applied in summer cause severe loss of leaves.

Red-Necked Cane Borer

The larva of this small red-and-black beetle is long and flat-headed. It bores within raspberry canes and causes swellings from 1 to 3 inches in length. Infested canes die or are severely weakened. The best method of control is to cut out and burn all affected canes before May, as the adults emerge in May and June. As this insect also breeds in blackberries and dewberries, destroying nearby wild brambles will aid in control.

Adults can be killed, just before blooming or immediately after harvest, by spraying with 4 pounds of lead arsenate plus 4 pounds of hydrated lime, or 2 pounds of 50 percent DDT wettable powder in 100 gallons of water per acre.

Raspberry Cane Borer

Numerous freshly wilted tips on young raspberry shoots are a sign of cane borer. The adult, a yellow and black long-horn beetle, causes the tips to die by making two rows of punctures around each shoot about ½ inch apart and laying a single egg in the shoot between the two girdles. Removing freshly wilted tips below the lower girdle gets rid of the eggs before the borers hatch and thus

[1] This section has been prepared and revised by the Department of Entomology and Botany, Kentucky Agricultural Experiment Station.

saves many canes. The borer hatching from each egg burrows downward in the cane and remains there for two seasons before it changes to the adult. Because of the long life cycle of the borer, removal of weakened canes and of all old canes after fruiting is a good control measure.

Where pruning does not prevent serious injury, apply a spray containing 2 pounds of 50 percent DDT wettable powder, or 4 pounds of arsenate of lead plus 4 pounds of hydrated lime in 100 gallons of water per acre. This spray should be applied just before the blossoms open. If it is necessary to spray after the fruit has begun to form, use 5 pounds of derris (5 percent rotenone) plus 0.5 pound of skimmilk powder in 100 gallons of water. This should be applied when the last petals are falling.

RASPBERRY SPRAY SCHEDULE

No.	Application	Materials (100 Gallons)	To Control
1	*Delayed Dormant*—In early spring when buds are beginning to open.	Liquid lime-sulfur—12 gallons	Anthracnose Scale
2	*Prebloom*—Apply at 10-day intervals from time new growth is 4-5 inches long until well after bloom.	Captan or Ferbam with sticker, 2 lb; Lead arsenate, 2 lb in full leaf	Anthracnose Saw flies
3	*Post Bloom*—Apply 7 days after leaves are fully expanded.	Captan, 2 lb; Lead arsenate, 2 lb	Anthracnose Saw flies
4	*Post Harvest*—Apply 3 sprays at 2 to 3 week intervals as soon as old canes are removed.	Captan, 2 lb; Aramite, W.P. 1½ lb	Anthracnose Mites

Precaution: Never use sulfur sprays of any kind on raspberries in the summer.

Note: If mites occur during fruiting apply aramite for control; a minimum of 14 days between last spray application and harvest should be observed.

Lexington, Kentucky May, 1957

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