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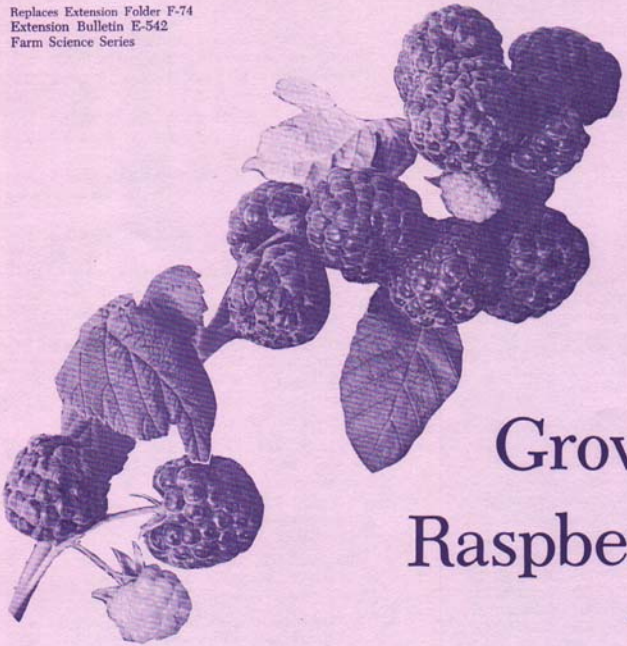

Growing Raspberries

in Michigan

By Jerome Hull, Jr., and James Moulton
Department of Horticulture

Raspberries are adapted to many areas in Michigan. With proper care, plantings can be expected to produce good crops of high-quality berries for a number of years. The first crop, a small one, is produced the second year after setting the plants. Production usually reaches its peak in the third year and falls off rather sharply after the fifth or sixth year, although profitable yields can be maintained for eight to ten years if plantings are kept free of insects, diseases, and weeds.

Raspberries are biennial plants. New shoots or canes arise from below ground each growing season and over-winter and bear fruit the following season.

New shoots, which will bear the following season's crop, develop during the harvest season. Old fruiting canes die shortly after harvest. With ever-bearing types, the new shoots bear a crop during late summer and a second crop the next year during the regular season.

Raspberries, like all horticultural crops, demand careful attention. Lack of disease control can limit the profitable life of most plantings more than any other factor.

Yields vary greatly among varieties. In general, purple varieties are the heaviest producers; black raspberries next, and red varieties produce the smallest crops.

The average yield of raspberries in Michigan is about 800 quarts per acre. The best fields of black raspberries, however, average 1,500 or more quarts; red raspberries about 1,300; and purple types about 2,000. In some years, under favorable conditions, certain plantings produce crops several times larger than these. Low yields are usually caused by diseases and insects, poor sites, low soil moisture, infertile soil and weed competition.

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CHOOSING THE SITE

A suitable site is necessary for successful raspberry culture. Select a site somewhat higher than nearby land. This reduces the danger of cold injury and loss of fruit buds in the spring from late frost, since cold air drains into low areas.

Raspberries grow well on a wide range of soil types. Well-drained loams, or clay loams, are usually most productive. Lighter textured soils, such as sandy soils are easiest to cultivate. They dry rapidly after wet periods, permitting prompt use of tillage tools and other equipment. The nutrient and moisture reserves of light textured soils, however, are lower than those with large amounts of clay.

Select a site at least 300 feet from other raspberry crops to minimize transfer of virus diseases. Also eliminate any wild bramble plants found within several hundred feet of the planting. Brambles are rough, prickly shrubs or vines, which include raspberries and blackberries.

Potatoes, tomatoes, eggplants, peppers, and brambles are all susceptible to Verticillium Wilt. Do not plant raspberries after these crops, because they increase the Verticillium Wilt in the soil. This soil-borne, fungus disease is most serious with black and purple varieties. Several years should elapse before raspberries are planted in soils where this disease organism may be present.

If possible, set raspberries on sites planted to cultivated crops the previous year. If sod fields must be used, turn-under the sod the season before setting raspberries. Eliminate weeds and grasses through frequent tillage or by treatment with herbicides the season prior to planting.

SELECTING NURSERY STOCK

Set only plants which have been inspected by the Bureau of Plant Industry of the Michigan Department of Agriculture. Each package of inspected plants carries a certificate stating that they have been examined by qualified personnel for destructive insects and diseases and that they are true to name.

Some varieties of virus-free raspberry nursery stock are now available. Virus-free plants transplant more successfully, and are more vigorous and productive. Virus-free red raspberries produce more sucker plants, have been exceptionally more fruitful than regular nursery stock, and should result in longer-lived plantings. Whenever possible, utilize virus-free planting stock.

Propagation

Red (and yellow) raspberries are propagated by suckers from underground stems. They are dug during the domant season and usually called one-year-old plants. Some nurseries dig these sucker plants and transplant them to nursery rows. After being kept in the nursery for another year, they are dug the following fall and sold as one-year-old transplants.

The extra cost charged for these year-old plants is not worthwhile to commercial growers. Home gardeners sometimes prefer them since they do not require pruning at planting time, and thus bear some fruit the first year.

Black and purple raspberries are propagated by "tip-layering." This is usually done in late August by burying the tips of the current season's cane 2 to 4 inches in the soil. The buried tips develop roots and form new plants before dormancy the same year. Before digging, they are cut from the original plant. About 6 inches of the old cane (called the "handle") is left attached to the rooted tip. Plants are shipped with these handles attached.

TRANSPLANTING METHODS

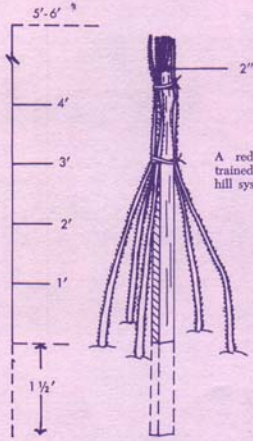
Keep the plants cool and moist when they arrive from the nursery. If planting is delayed for several days, open the bundles, place the plants in a newly-dug trench, six inches deep, and cover them with soil. Or, the plants can be kept for several days in cold storage at about 35°F.

Plant raspberries early in the spring (April) as soon as the soil can be worked. But, it is better to delay planting than to attempt to work wet soil.

Spacing of plants in the row and distance between rows depend upon the training system and type of tillage equipment used. Michigan growers use either the hedgerow, hill, or linear system. All three can be used with red and yellow varieties, while black and purple varieties should usually be trained to the linear system.

Virus-free red raspberry plants (background) are more vigorous, productive and produce more sucker plants than plants which are not virus-free. Compare to virus-infected plants (foreground).

Left — red raspberry plant propagated from sucker plants. Right — black raspberry plant propagated by tip-layering.



A red raspberry plant trained and pruned to the hill system.

Hedgerow

This is most popular training system in Michigan for red raspberries. Set the plants at about 2½ to 3 feet apart in the row and 6 to 10 feet between rows. Sucker plants from underground stems will form a solid and continuous row in one or two years.

Hill

The Hill system is sometimes used for red raspberries. Set the plants 5 or 6 feet apart, both in the row and between rows to permit cultivation in two directions. Drive a stout stake next to each hill of canes after planting for supporting canes. The stake should extend about 5 feet above the ground.

Linear

This system differs from the hedgerow in that all sucker plants are removed from the planting. Fruiting canes come from the crown of the original plant. For red raspberries, set plants at the same distance as in the hedgerow system.

Black and purple raspberries are usually trained to the linear system. Set plants 2 to 4 feet apart in the row and 7 to 10 feet between rows. For mechanical harvesting, close spacing in the row is preferred.

Setting the Plants

Set red varieties about an inch deeper than they grew in the nursery. Make holes or furrows large enough so that roots can be spread out. Set black and purple varieties in the bottom of the hole or furrow and cover the roots with about 2 inches of soil. If covered deeper, the new sprouts may be smothered. Pack soil firmly around the roots. Push soil around the base of the plants by cultivating after the new shoots grow above ground.

After planting black raspberries, remove old cane (handle) attached to the rooted, layered plant. This will reduce the danger of disease.

Keep plants protected from sunlight and wind during planting. When setting large plantings of raspberries, some growers use forest tree mechanical transplanters.

Immediately after setting, cut back the tops of red raspberry canes (except transplants) to about 6 inches. On black and purple varieties, remove the old cane (handle) at the ground line to eliminate a possible source of anthracnose infection. Burn all removed parts.

WEED CONTROL

Mechanical

Cultivate soon after setting the plants and then often enough to control weeds and loosen the soil. Do not cultivate deeper than 3 to 4 inches. In fruiting fields, cultivate until harvest begins, and once or twice after harvest to loosen the soil.

After the last cultivation each year, seed an annual cover crop between the rows. Use a cover crop (such as oats or sudan grass) that dies during the winter.

Chemical

Certain herbicides are safe for controlling weeds in raspberry plantings if proper precautions are taken. Do not use any herbicide the year the planting is made. Consult MSU Extension Bulletin 433 for herbicides suggested for raspberry plantings.

Irrigation

Raspberries use more soil moisture than most fruit plants. During the growing season they require about 1 inch of water per week. When rainfall does not supply this amount, supplemental irrigation may be advantageous. Extremely warm and windy conditions make greater amounts of water necessary.

Lack of water can seriously reduce yields of bramble fruits, particularly when it occurs just prior to, or during the harvest season. Under such conditions, brambles will respond favorably to irrigation. Ample soil moisture is essential from the time the fruit begins to show color until harvest is completed.

Fertilization

Farmyard manure is one of the best fertilizers for raspberries. If animal manure is available, apply about 10 to 20 tons per acre in the spring before growth starts. If manure is not available, apply a 1-1-1 ratio of commercial-type fertilizer (such as 12-12-12 or 14-14-14). On newly-set plants, sprinkle about 2 ounces of fertilizer around each plant, 10 to 14 days after planting. Keep the fertilizer 3 to 4 inches from new shoots and canes. In the second year, apply enough fertilizer to furnish 25 to 30 pounds of actual nitrogen per acre. In following years, increase the amount to supply 50 to 60 pounds of actual nitrogen per acre.

This requires about 200 pounds of a 14-14-14 fertilizer in the second year and about 400 pounds in succeeding years. For small plantings, this is about ½ pound to each 100 square feet in the second year and about one pound in succeeding years.

PRUNING

Summer Pinching

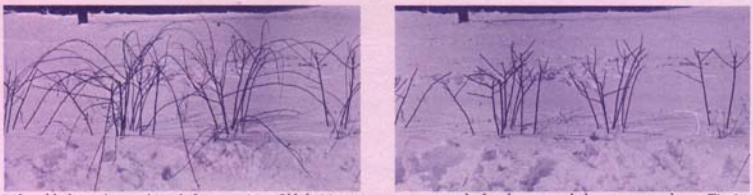
Pinch back the ends of new shoots of black and purple raspberries during early summer. Pinch shoots of black raspberry varieties when they become about 2 feet high, and purple varieties at about 2½ feet. Pinch closely spaced plants at 4' to produce high fruiting laterals to facilitate mechanical harvesting. Removing the top 2 to 4 inches of the new shoots promotes the development of strong, fruitful laterals (side branches). This allows the canes to grow stronger and be better able to support a crop the following year. If canes are not pinched back so that laterals develop, a long, arching cane is produced that fruits primarily in the terminal region. This is less productive and if trellis support is not provided, fruit will lie on the ground.

Do not pinch back the shoots of red raspberry plants.

Removal of Fruited Canes

Immediately after the last harvest, cut out and burn all old canes which have borne fruit. Do this

Left — red raspberry canes before pruning. Old fruit canes were removed after harvest and do not appear here. These raspberries have been trained to the hedgerow system. Right — the same canes after pruning. Weak or thin, short canes were removed and some vigorous canes thinned out. Canes along sides of row were removed to confine row width. Tall canes were headed back. *(Courtesy Hort. Research Inst. of Ontario, Vineland Station.)*



Left — black raspberry plants before pruning. Old fruiting canes were removed after harvest and do not appear here. Tipping in mid summer resulted in development of lateral branches. Right — the same plants after pruning. Laterals were headed back and small, weak canes removed. These raspberries have been trained to the linear system. *(Courtesy Hort. Research Inst. of Ontario, Vineland Station.)*

on all types of raspberries, except on the fall crop of everbearing types. Remove all suckers growing outside of the hills or rows.

Early-spring

During March or April, before growth starts, remove weak canes and those which are diseased or have insect damage. In red raspberries trained to the linear or hill system, thin the canes to 6 or 8 of the strongest at each crown or hill. In the hedgerow system, thin the canes so that they are no closer together than 8 inches.

On red raspberries trained to the hill or linear system, shorten the main canes to 5½ feet. If trained to the hedgerow system, cut them to 4 feet. If canes fail to reach the desired heights, cut off only winter-injured tips. Shorten side branches to about 10 inches.

For black and purple raspberries, leave all canes which are thicker than ½ inch. Shorten the side branches of black raspberries to 6-8 inches. Shorten side branches of purple raspberries to 8-10 inches. On both black and purple raspberries, cut straight, unbranched canes to about 2½ to 3 feet high.

VARIETIES

Red Raspberries

Latham — the most popular and dependable red raspberry in Michigan. Canes are vigorous, productive, and quite cold-hardy. Berries are large and tend to darken as they become over-mature. Quality is fair-to-good. Latham is a late-season variety with a fairly long harvest period.

Taylor — ripens slightly before Latham. Berries are large, attractive, and of good quality. Plants are vigorous, spreading, but not as hardy as Latham.

Canby — plants are vigorous, moderately hardy, rather productive, and produce fewer canes per hill than other varieties. Canes are nearly thornless. Berries are light-red in color and of good quality.

Hilton — a new variety from New York reported to be vigorous, productive, usually winter-hardy, with semi-erect canes. Berries are large, conic, medium red in color, but darker when over-ripe, and difficult to pick, unless fully ripe.

Sentry — a new variety from Maryland that is reported to have good size, excellent quality, and productivity.

September (ever-bearing) — probably the best fall-fruiting variety available. Fruit begins to ripen in late August. It continues to produce fruit until frost. Berries are medium size, bright red, and cling to the cane until fully ripe. The spring crop ripens early and is fair in quality.

Yellow Raspberries

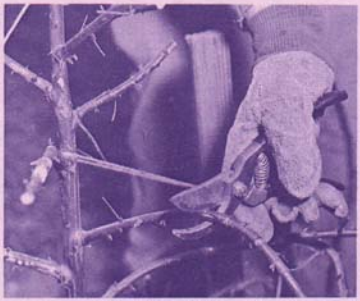
Yellow raspberries have evolved from red raspberries and are the same in all respects except for color. The fruit is of good quality and flavor. Yellow raspberries have little market demand and are grown only as a novelty.

Amber (late) and **Golden Queen** (late) are the two most common yellow varieties. Both have performed fairly well in Michigan.

Black Raspberries

Logan (New Logan) (early) — the leading processing variety in Michigan because of its early harvest season. It has a short season with most of the fruit harvested in three pickings. The first picking usually follows the last strawberry harvest, and the last picking is finished before the peak of cherry harvest. Berries are firm and of good quality. Plants are productive and vigorous.

Cumberland (mid-season) — formerly the leading variety in Michigan and still preferred by some growers. Canes are vigorous, productive, and cold-hardy. Berries are large, jet-black, firm, and high in quality. Plants are very susceptible to Anthracnose and do not produce exceptional yields.



Black and purple raspberry shoots arise from the crown early in the growing season. Pinch off 3 to 4 inches of shoot tips in early summer (left) when they reach the proper height (see text). This causes side branches to develop, increasing the amount of fruiting area. (When pruning in March or April, leave side branches 6 to 8 inches long on black raspberries and 8 to 10 inches long on purple varieties.) Laterals of black and purple raspberries should be headed back during pruning (right). Leave 8 to 10 buds on each lateral.

Allen (mid-season) — plants are reported to be productive, vigorous and hardy. Fruit is large and attractive, and approximately half of the total crop may be harvested in one picking.

Bristol (mid-season) — plants are vigorous and productive, but not especially hardy. Berries are attractive, firm, and of good quality, although sometimes difficult to pick unless fully mature.

Huron — a new variety from New York reportedly producing large, firm, glossy-black fruit of good quality. Plants are vigorous, productive, hardy and less susceptible to Anthracnose than some varieties.

Purple Raspberries

Purple raspberries are hybrids between black and red varieties, and usually propagated by tip-layering. Sometimes, a few suckers are produced. Plants are very vigorous and productive with sturdy, up-right canes. Fruit is used primarily for jam and culinary purposes.

Sodus (late) — berries are large, round, firm, and tart. Plants are vigorous, hardy, and productive.

Clyde (late) — ripens about one week later than Sodus. Plants are more vigorous and productive, and berries are firm, dark purple, tart, and of good quality.

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