Growing Raspberries in Michigan
Michigan State University
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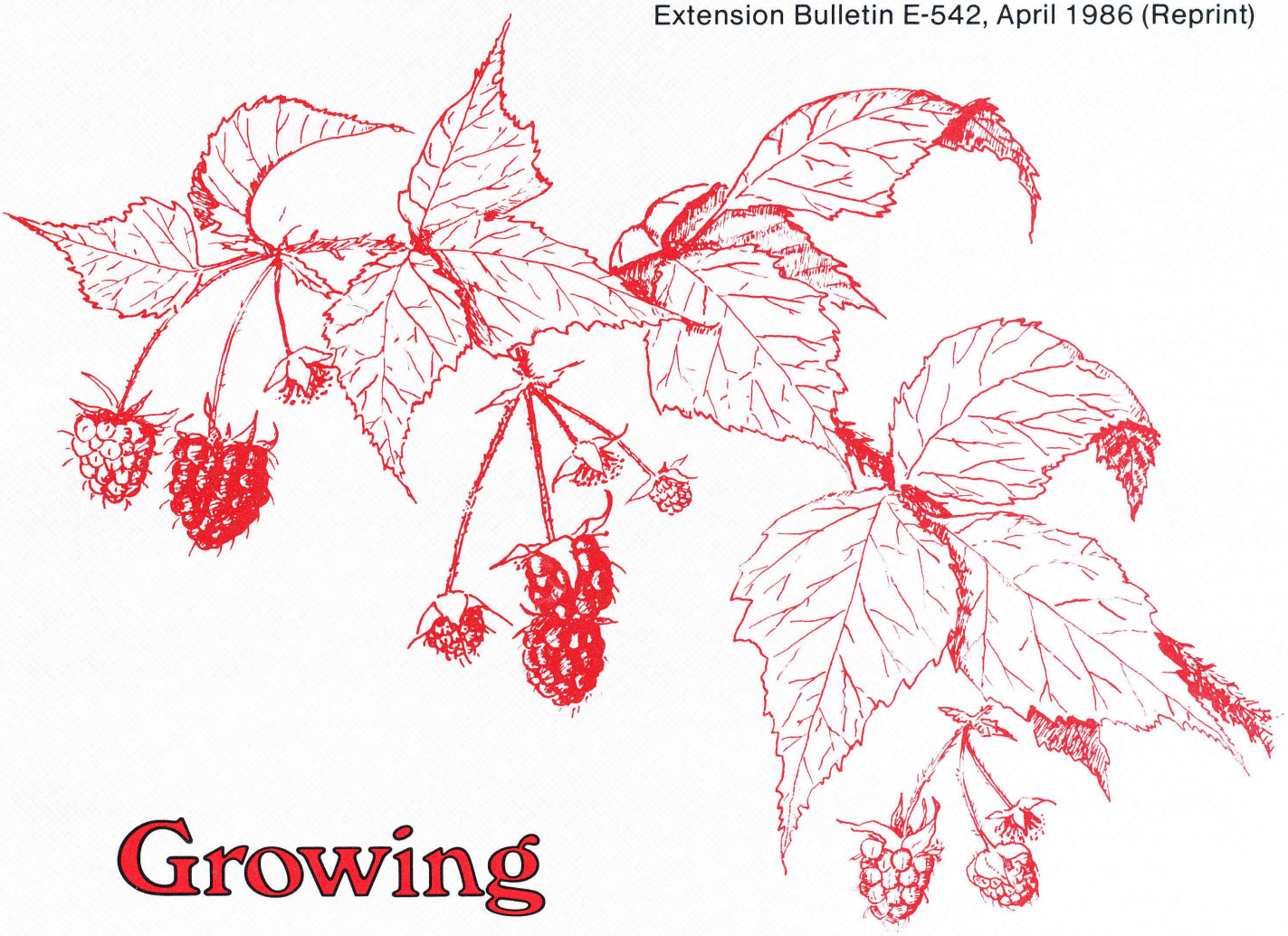

Growing Raspberries in Michigan

By Jerome Hull, Jr., James Moulton and Jim Hancock
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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, which will bear the following season's crop, develop during the harvest season while old fruiting canes die shortly after harvest. With everbearing types, the new shoots bear a crop the first season during late summer and a second crop the next year during the regular season.

Like all horticultural crops, raspberries 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, followed by black raspberries, then red raspberries.

The average yield of raspberries in Michigan is about 800 quarts per acre. The best fields, however, average 1,500 or more quarts of black raspberries, about 1,300 of red raspberries and about 2,000 of purple types. 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.

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. However, the nutrient and moisture reserve of light-textured soils 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 soilborne fungus disease is most serious with black and purple varieties. Several years should elapse before raspberries are planted in soils where this disease organism might be present.

Raspberries are also subject to nematode damage. To help eliminate this pest problem and Verticillium Wilt, fumigate the soil before planting (information can be found in the Fruit Pesticide Handbook E-154).

If possible, set raspberries on sites where cultivated crops were planted 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

Only set 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 it has been examined for destructive insects and diseases and plants 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, are exceptionally more fruitful than regular nursery stock, and should result in longer-lived plantings. Whenever possible, use virus-free planting stock.

Propagation

Red (and yellow) raspberries are propagated by suckers from underground stems. They are dug during the dormant season and are 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 of these one-year-old transplants is not worthwhile to commercial growers. Home gardeners sometimes prefer them, since they do not require pruning at planting time and bear some fruit the first year.

Black and purple raspberries are propagated in late August by "tip-layering." The tips of the current season's cane are buried 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," are left attached to the rooted tip. Plants are shipped with these handles.

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. The plants can also 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 not when soil is wet.

Planting Systems

The hedgerow system is the most popular in Michigan. In this system, plants are set from 1½ to 4 feet apart in the row, with 6 to 12 feet between each row. Exact spacing distances should be determined by plant costs, equipment size, the suckering ability of the variety, and the amount of time the grower is willing to wait for the rows to fill out. Black raspberries sucker very little and should be planted close together. Reds sucker profusely and purples are intermediate in suckering

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

ability. Maintain hedgerow widths at 1½ feet and thin plants during the dormant season to 8 inches apart.

A few growers still employ the hill system. Yields per acre are often lower with this system, but cultivation is easier since equipment can be moved across and between rows. The most common procedure is to set plants 5 or 6 inches apart and thin each year to the healthiest 6 to 10 canes. A 5-foot stake may be necessary for support.

Setting the Plant

Set red varieties about one 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 two 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.

Keep plants protected from sunlight and wind during planting. When setting large plantings of raspberries, some growers use mechanical tree 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 that dies during the winter, such as oats or Sudan grass.

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 154 for herbicides suggested for raspberry plantings.

Irrigation

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

Lack of water can seriously reduce yield of bramble fruits, particularly just prior to or during the harvest season. Ample soil moisture is essential from the time the fruit begins to show color until harvest is completed. Overhead irrigation with sprinklers can be used effectively, but it is necessary to spray for diseases, especially anthracnose, immediately after irrigation. Trickle irrigation, using emitters or perforated bi-wall pipes, has proven to be a very effective method for moisture control in raspberries. Plant nutrition can also be adjusted quickly by injecting fertilizers through a trickle irrigation system.

Fertilization

Farmyard manure is one of the best raspberry fertilizers. 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. About 200 pounds of a 14-14-14 fertilizer will be needed in the second year and about 400 pounds in succeeding years. For small plantings, about ½ pound should be applied to each 100 square feet

in the second year and about one pound in succeeding years. Virus-free plants have greater growth potential and require about one-third more fertilizer.

Exact fertilization rates will depend on the site and vigor of the plants. Generally, too little nitrogen has been used if new red raspberry canes do not grow to 5 feet and if new purple and black canes do not reach the top of bearing bushes.

PRUNING

Pinch back the ends of black raspberry shoots in the summer when they are 2 to 2½ feet tall. This will have to be done several times during the season as the new shoots will grow at different rates. In the early spring of the following year, shorten the side branches to 8 to 10 inches.

June-bearing raspberry plants should be left alone in the summer. In the early spring, shorten the main canes to 4 to 5½ feet and prune the laterals back to 10 inches. Canes should be thinned to 6 or 8 large canes per row foot.

Purple raspberries, hybrids of red and black raspberries, can be pinched at 3 feet or left alone, depending on grower preferences. Side branches should be cut to 8-10 inches in the spring.

Everbearing raspberries may be single or double cropped. If a single crop is desired, mow the canes at ground level each dormant season. This eliminates the summer crop, but new shoots will develop the following spring and produce a fall crop. Twenty-five to fifty percent of the total yield is lost by this procedure, but pruning costs are greatly reduced. If both the summer and fall crops are to be harvested, treat the everbearers as you would other red raspberries except for picking the fall crop.

Removal of Fruited Canes

Immediately after the last harvest, cut and burn old canes which have borne fruit on all raspberry types except the fall crop of everbearing types. Remove all suckers growing outside of the hills or rows and thin excess new shoots.

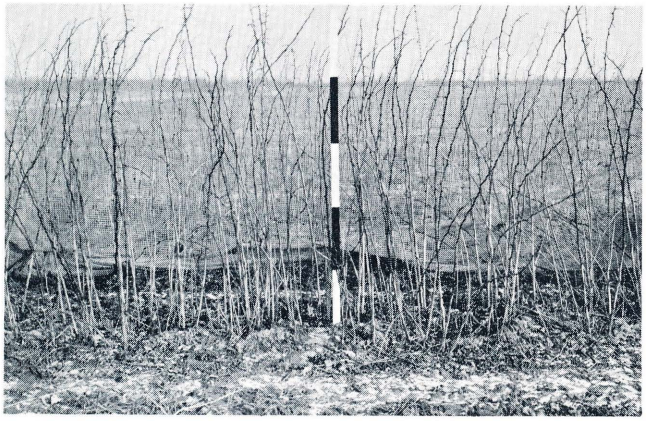
Primocane Burning

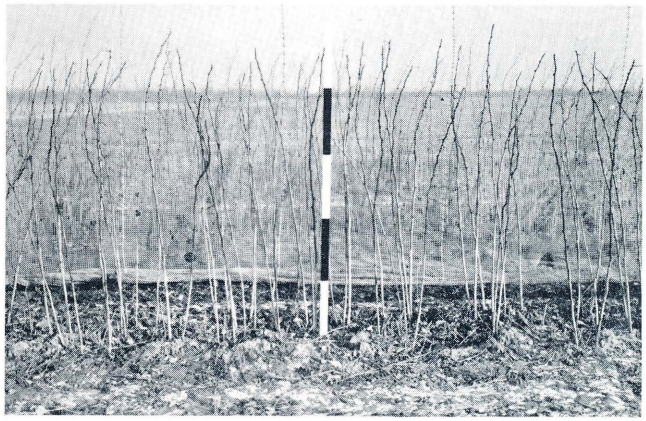
In several states, such as Washington and Oregon, new raspberry shoots are burned off in the spring with dinoseb oil. This procedure is *not* recommended for Michigan, where plantings are less vigorous than those in the Northwest.

HARVESTING

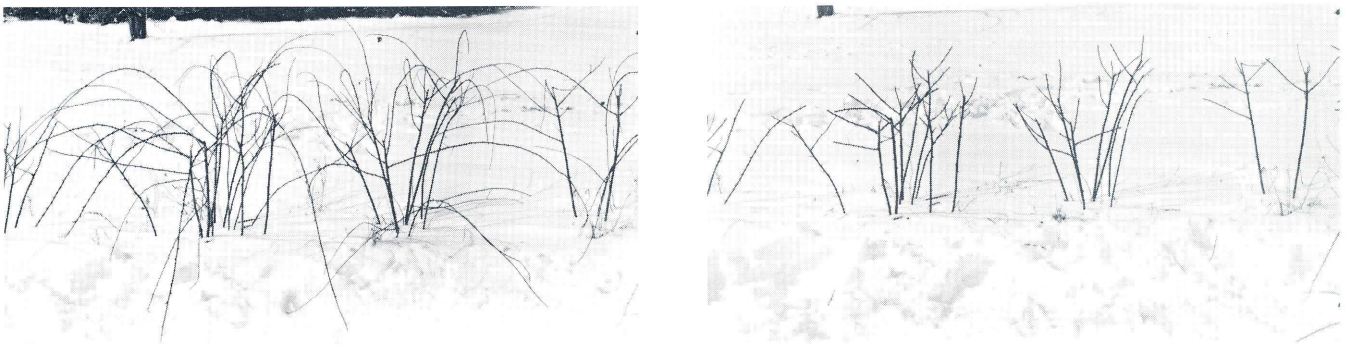
Five or six pickers are needed to adequately harvest one acre of raspberries for fresh market or processing. Raspberries should be harvested when the berry separates easily from the calyx cup. Most varieties do not carry well on the plant and should be harvested every two or three days. A major problem in fresh raspberry sales is rapid mold development on overripe fruit, which can spoil the whole container in a few days even when refrigerated. Growers should constantly supervise harvesters to be sure that they thoroughly harvest all of the ripe fruit from the centers and bottoms of the plants.

Several kinds of mechanical harvesters are being used on raspberries in Michigan, Washington, Oregon and British Columbia. The machines are reasonably efficient and the quality of mechanically harvested berries is adequate for processing. The hedgerow system is used for mechanical harvesting in Michigan. A trellis does not seem to be necessary.





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 the 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. (Courtesy Hort. Research Inst. of Ontario, Vineland Station)

DISEASE CONTROL

Virus disease is the major problem confronting Michigan raspberry cultivators. Several new resistant cultivars have been released in various parts of the United States and Canada, but have not been sufficiently tested in Michigan to be recommended. Our current cultivars remain productive for 6-10 years, if several important procedures are practiced: 1) disease-free stock is planted 2) neighboring brambles are destroyed 3) weak and diseased plants are removed 4) canes are removed after fruiting 5) weeds are controlled 6) pruning is done according to recommendations and 7) spray schedules are followed (E-154). These measures increase costs but also increase the longevity and productivity of the planting.

VARIETIES

June-bearing red raspberries

Latham (late)—the most popular and dependable June-bearing 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 has a fairly long harvest period.

Taylor (mid-season)—berries are large, attractive, and good quality. Plants are vigorous, spreading, but not as hardy as Latham.

Canby (late mid-season)—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 good quality. Canby has a higher level of virus resistance than the other raspberries grown in Michigan.

Others—Hilton (late), Sentry (mid-season), Boyne (mid-season), Comet (mid-season) and Newburg (mid-season) are acceptable, but have not performed as well as Latham in most areas.

Everbearing red raspberries

Heritage—the most widely planted everbearing red variety and the most popular red raspberry grown in Michigan. Its fall crop ripens late and can be caught by frosts and a lack of pickers, but its overall quality is good. Fruits are medium-sized, deep red and very firm. It can also be mechanically harvested and may be pruned by mowing at ground level. Its fall crop begins ripening 3 weeks earlier than the September variety in the fall and a little later in the spring.

September—berries are medium-sized, bright red, and cling to the cane until fully ripe. The spring crop ripens early and is fair in quality.

Yellow raspberries

Yellow raspberries were developed 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.

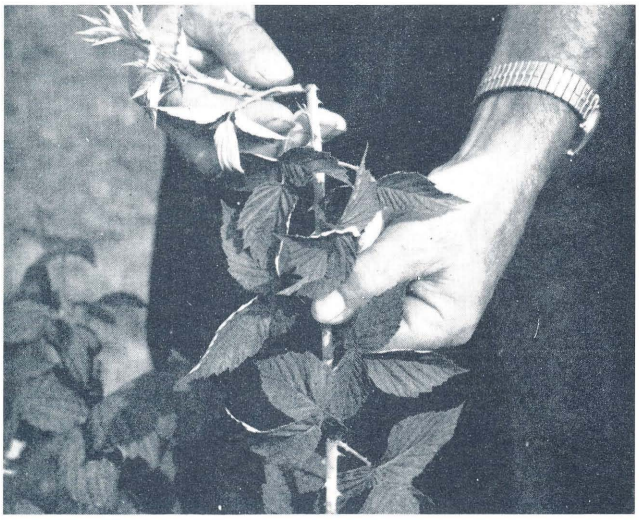
Amber (late) and Golden Queen (late) are the two most common yellow varieties. Both have performed fairly well in Michigan.

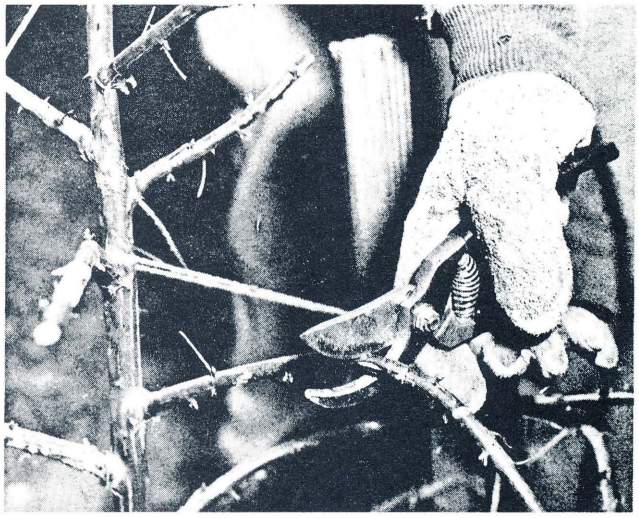
Black raspberries

There are not many black raspberries planted in Michigan due to disease problems, but the demand is great.

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 cherry harvest. Berries are firm and of good quality. Plants are productive and vigorous, but very susceptible to virus.

Cumberland (mid-season)—formerly the leading variety in Michigan and still preferred by some growers. Canes are vigorous, productive, and





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.

cold-hardy. Berries are large, jetblack, firm, and high in quality. Plants are very susceptible to Anthracnose and do not produce exceptional yields.

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.

Others—Black Hawk (late), Bristol (mid-season), Huron (mid-season), Jewel (mid-season) and Morrison (late) are planted to some extent in Michigan and do reasonably well.

Purple raspberries

Brandywine (late)—has largely replaced Sodus and Clyde. Plants are very vigorous and sufficiently hardy but may need a trellis because of the heavy crop. The large, tart berries make excellent jam.

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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