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GRAPES

in the

HOME FRUIT GARDEN



By **STAFF MEMBERS**
of the
**DEPARTMENTS OF HORTICULTURE,
ENTOMOLOGY, and BOTANY AND
PLANT PATHOLOGY**

**MICHIGAN STATE COLLEGE
COOPERATIVE EXTENSION SERVICE**

EAST LANSING

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Grapes in the Home Fruit Garden

I. GRAPE CULTURE

(Prepared by Staff Members of the Department of Horticulture)

This folder contains essential information for successful culture of grapes in Michigan home vineyards. Detailed descriptions and information necessary for commercial culture are not included. Furthermore, several varieties discussed in this folder, while suited for the home garden, are not adapted for commercial culture.

Of all the deciduous fruit crops in Michigan, grapes are one of the easiest and most satisfactory to grow in the home fruit garden. Good crops of high-quality fruit are possible practically every year, and unlike most other woody fruit plants only two or three sprays are needed to keep the vines and fruit free of insect and disease pests.

Grapes are also fairly easy to prune and train and no special skills are required. Furthermore, the introduction during recent years of several new varieties, many with European "blood", has stimulated new interest. The home gardener now can grow several different varieties of various colors and flavors which ripen in sequence, providing fresh fruit over a period of several weeks.

Varieties for Home Vineyards

Most grape varieties need a growing season free of killing frosts for at least 160 successive days to mature a crop properly. Areas south of Saginaw and Muskegon, and a narrow strip along Lake Michigan north to Traverse City, meet this requirement during most years. Certain earlier varieties, however, do not need that many days. Those can be grown in more northerly counties if they are sufficiently cold hardy. Furthermore, Concord and other varieties sometimes are grown where the fruit matures sufficiently well for jelly and jam purposes, but not for fresh table use.

Many varieties of grapes are grown throughout the world, but relatively few of these are adapted to Michigan conditions. The European or *vinifera* grapes found in California and many of our American-type varieties are too cold-tender, or require too long a growing season, for Michigan conditions.

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The varieties below are suggested for Michigan home gardens. They are listed in approximate ripening sequence, from earliest to latest — however that may be slightly different in some areas and in some years. Letters in parentheses after variety names refer to color of the ripe fruit: (B) — blue or black; (W) — white, green or yellow; and (R) — red or pink.

EARLY

HIMROD (W) Seedless; four to five weeks ahead of Concord; large, loose clusters; sweet vinous flavor. For trial only.

SCHUYLER (B) About four weeks ahead of Concord; must be pruned heavily to prevent overbearing; wood may be injured by temperatures near -20°F ; susceptible to mildew.

VAN BUREN (B) Compact clusters of medium size; equal to Concord in quality, but berries slightly smaller.

SENECA (W) Clusters medium and fairly compact; berries oval; skin edible and tender; flesh firm, sweet, vinous and aromatic; has many *vinifera* qualities; susceptible to mildew.

PORTLAND (W) Vine vigorous, hardy and productive; luxuriant, persistent foliage; clusters and berries larger than other early green varieties; fairly foxy flavor.

ONTARIO (W) Vine moderately vigorous, hardy and productive; clusters medium to large, fairly loose; berries spherical, medium in size; flavor sweet, vinous, but quite foxy.

ATHENS (B) A month earlier than Concord; vine vigorous, hardy and productive; clusters fairly large and loose; berries slightly larger than Concord, slightly oval, with heavy bloom; skin tender; flesh of good quality, sweet, but tough and slightly foxy.

KENDAIA (B) Ripens with Athens; vine vigorous, hardy and productive; clusters fairly large and compact, often shouldered; berries size of Concord, fairly oval; skin fairly thick and tough; flesh juicy, sweet and aromatic.

BUFFALO (B) A few days later than Athens and Kendaia; vine vigorous, productive, but not as hardy as these two varieties; clusters medium and compact; berries medium and fairly oval; flesh juicy, melting, very sweet, but slightly foxy.

FREDONIA (B) Vine vigorous, hardy and productive; requires less pruning than Concord; clusters medium and

fairly compact; berries large and round; skin thick and tough; flesh juicy, firm but tender; flavor good but fairly foxy; susceptible to mildew.

MID-SEASON

EDEN (B) Clusters medium and often loose; berries medium and slightly oval; flesh juicy, meaty but tender, sweet and vinous.

ROMULUS (W) Seedless; ripens 15 to 20 days before Concord; vine vigorous and productive; clusters large and compact; berries small, sweet, vinous, and of good quality. For trial only.

BETA (B) Vine vigorous, cold hardy and productive; clusters small to medium, single-shouldered, and fairly loose; berries black with blue bloom; small to medium and round; skin thin and tender; flesh fairly tender and juicy; flavor vinous, spicy, and aromatic; sugar and acid contents high, good for jelly and juice. Suggested for Northern Michigan areas where cold hardiness is a factor.

BRIGHTON (R) About Delaware season; blossoms largely self-sterile, thus cross-pollination from another variety must occur; vine fairly vigorous and productive; cold hardy; clusters large, shouldered and fairly loose; berries dark red, fairly large and slightly oval in shape; skin moderately thick, but tender; flesh fairly tender, sweet, aromatic and vinous; high dessert quality.

DELAWARE (R) Vine medium in vigor, hardy and productive; clusters fairly small, often shouldered, and very compact; berries fairly small; skin thin but tough; flesh tender, juicy, sweet and aromatic. A leading variety for high quality wine and champagne.

DUNKIRK (R) A few days later than Delaware; vine vigorous, hardy and productive; clusters medium and compact; berries medium and fairly oval; similar to Delaware but with larger clusters and berries; and the skin, while thin, is tougher.

NAPLES (R) Has Delaware parentage, but ripens about a week later; productive; cluster larger but less compact than Delaware; berries larger but have tougher skin than Delaware; flavor similar to Delaware. For trial only.

BATH (B) Few days earlier than Concord; vine vigorous and productive; cluster medium and compact; berry medium, slightly oval; flesh tender, juicy, sweet, non-foxy; needs heavier pruning than Concord. For trial only.

ALDEN (RB) Few days earlier than Concord; vine vigorous and productive; clusters large and loose; berries large, oval and reddish-black; flesh juicy, meaty, tender; flavor good, sweet and vinous; requires heavy pruning. For trial only.

NIAGARA (W) Vine vigorous and productive; clusters fairly large and compact; berries slightly oval; sweet, juicy but strongly foxy.

CONCORD (B) Vine vigorous, hardy and productive; clusters fairly large and compact; berries fairly large and round; skin thick and tough; flesh fairly tough and juicy; flavor aromatic, sweet and foxy. The standard American variety, and the only one suitable for unfermented juice.

STEUBEN (B) A day or two later than Concord. Vine vigorous, productive, and quite cold hardy; clusters long and compact, usually shouldered — often double; berries medium with very heavy bloom; skin tough; flesh sweet with distinctive spicy tang; no foxiness.

RUBY (R), YATES (R), HECTOR (R), GOLDEN MUSCAT (W), CATAWBA (R), URBANA (R) and SHERIDAN (B) are late varieties which do not mature properly in most locations in Michigan. They may, however, be worthy of trial in some Southern Michigan areas.

FRENCH-AMERICAN HYBRIDS

During recent years, considerable interest has developed in the so-called French-American hybrid grapes. They originated in France from European varieties (*Vitis vinifera*) crossed with selections from the wild of certain American species, mainly *V. rupestris* and *V. lincecum*. The French breeders avoided varieties and selections of *V. labrusca*, the so-called “fox” grape, such as Concord. Niagara and Ontario, since Europeans consider their “foxy” flavor as objectionable.

Since World War II, many of these hybrids have been imported for testing in America. Developed mainly for wine purposes, most are not suitable for fresh table use. The fruit is similar to European wine varieties while the vines possess the hardiness and disease resistance of the wild American selections.

Not enough is known about the French-American hybrids to suggest them for widespread planting in home vineyards. Tests in Canada, New York and other places

have demonstrated that some may be worthy of limited trial in Michigan:

SEIBEL 1000 (B). Ripens with Concord; vine is cold hardy, vigorous and fairly productive; clusters and berries medium in size; flavor sweet; juice nearly colorless; produces a white or sometimes faintly pink wine.

SEIBEL 7053 (B). Ripens about with Concord; vine vigorous and productive; clusters large. Susceptible to mildew.

SEIBEL 9110 (W). Ripens about a week later than Fredonia; vine moderately vigorous; clusters medium and fairly loose; berries medium, oval, and of good quality. Has possibilities both for dessert and wine use.

SEIBEL 14664 (W). Vine is fairly vigorous; clusters and berries large; berries oval; flesh solid and skin edible. A good dessert variety.

Nursery Stock

Vigorous one-year-old plants with large root systems are preferred for grape planting stock, although two-year-old plants may be satisfactory but often cost more. They should be set as soon as possible after they have been received. If they arrive in a dry condition, they may be soaked in water for several hours and then planted at once. If immediate planting isn't possible, the plants should be heeled in a trench deep enough to accommodate the roots in well drained soil. A site protected from the sun during most of the day, such as a location near the north side of a building, is suitable. After taking the plants from the shipping bundle and distributing them upright along the trench, soil should be sifted among the roots so that large air spaces won't occur. After filling the trench and firmly packing the soil, the tops should be covered with loose soil. It is desirable, as a final precaution, to cover the tops with damp burlap, peat moss or similar material.

Propagation

Good grape planting stock is available from most fruit nurseries. Home gardeners, however, sometimes wish to propagate their own stock, and this is fairly easy to do if proper procedures are followed:

Cuttings — The usual method of propagating grapes is by means of cuttings from dormant canes of the past

year's growth. Sections from well matured canes about one-fourth to three-eighths of an inch in diameter and measuring 4 to 5 inches between joints (also called "nodes" or "buds") make the best cuttings. They may be selected at any time when the vines are fully dormant, but those made during late fall or early winter often root better than cuttings made later in the dormant season.

Cuttings should be about 8 to 10 inches in length. Each should contain three buds, with the bottom cut made just below the lowest bud and the upper cut about one inch above the top bud. Then about 25 cuttings should be arranged in a bundle and tied so that the bases are all together. The bundles then should be buried, with basal ends up, in a trench dug in a well drained, preferably sandy, soil. A 3-inch layer of soil should cover the bases of the cuttings. A layer of straw or strawy manure, about 6 inches deep, placed on top of the covered trenches will protect the cuttings during cold weather and aid in callusing the basal ends while the tops remain dormant. The mulch should be removed as the weather begins to warm in early spring.

The cuttings should be removed from the trenches and lined out in nursery rows as early in the spring as a plant bed on a site with deep fertile topsoil can be well prepared. They should be set, with the top bud just above the soil surface, about 5 or 6 inches apart in rows which are 3 to 4 feet apart. The soil should be firmed well around the cuttings and should be cultivated often during the growing season. With proper care, about half should produce good grape vines which will be ready to set permanently the following spring.

Layering — A few varieties do not root readily from cuttings and layering is an almost sure way to propagate these as well as other grapes. Where only a few vines of any one variety are desired, layering perhaps is the most satisfactory method of propagation, since it results in stronger vines earlier than those grown from cuttings.

When dormant, a vigorous cane from an established vine should be curved toward the ground. A bend made near its tip then should be placed at the bottom of a hole 3 or 4 inches deep. The hole should be filled with soil and firmly packed so that the tip of the cane extends vertically with two or three buds above the surface of the soil. This cane should not be permitted to bear fruit during the two or three years it takes to get the new vine established.

Grafting — Because most American-type grapes root relatively easily from cuttings, grafting is not used commonly to propagate them. Some varieties, however, often lack vigor when grown on their own roots but make vigorous growth and produce more fruit when grafted onto certain rootstocks.

In cases where a change of varieties is desired, it is possible to top-work established vines by cleft-grafting scions of desired varieties onto them. When properly performed, a full crop of fruit of the new variety often occurs in the third season after the graft has been made.

If detailed information on grafting grapes is desired, inquiries should be addressed to the Department of Horticulture, Michigan State College, East Lansing, Michigan.

Site and Soil

Warm southern exposures are desirable for home vineyards, especially in Northern Michigan areas. Gently sloping sites on slightly elevated land are desirable, so that air drainage is insured. Deep, well-drained sandy loam soils containing abundant organic matter are best for grapes. When grown on light-textured sandy soils, the fruit usually ripens earlier, the crop may be smaller, and the vines less vigorous than when grown on fertile loamy or clayey soils. The earlier ripening of the fruit on sandy soils, however, may be an advantage more important to gardeners than size of the crop where the growing seasons are relatively short.

Planting

The best time to set the vines is in early spring, as soon as the soil can be tilled satisfactorily. The soil should be cultivated thoroughly prior to planting. Where an area has been in sod, it is best to grow a row crop for a year prior to setting the vines.

Gardeners may use various spacings when setting plants, but in most cases no closer than 7 feet between plants in the rows and 8 feet between rows. On good fertile soils, however, the distance between plants in the rows of vigorous growing varieties should be increased.

Before each plant is set all but one of the most vigorous stems should be removed, and broken and long straggling roots should be trimmed so that they can be distributed well in the planting hole. The roots should be arranged so that they are not twisted or bunched to-

gether; soil then should be sifted and packed firmly around them to eliminate large air spaces. The final step is to cut the top back, leaving only two buds above the surface of the soil.

Care after Planting

Vines may be permitted to grow and lay along the ground during the first season, but it is better to train the most vigorous shoot of each plant to a stout stake, five or six feet high. If other shoots and suckers are removed as they appear, the main cane, which ultimately will be the trunk, then will be more vigorous.

It is necessary to cultivate and hoe the new planting several times to eliminate weed competition. Strawberries or vegetable crops may be grown between the grape rows during the first season.

The Trellis

The trellis or arbor should be established either in the fall or early spring after the first growing season. Two galvanized No. 10 or No. 11 wires, one about 2½ feet and the other about 5½ feet above the ground commonly are used for trellising grapes. The posts may be set 21 to 30 feet apart, depending upon the distance between vines in the rows, with three vines between posts. Durable wood, such as cedar, locust, white oak or osage orange may be used for posts. Metal posts, though their initial cost is comparatively high, often are more durable and are easier to handle and establish in the ground than wooden posts. Line posts (those within the rows) if wooden, should be at least 3 inches in diameter at the top and 8 feet long, so that they may be set about 2½ feet in the ground. Heavy wooden end posts, 5 to 8 inches in diameter at the top and about 9 feet long, so they can be set about 3 feet in the ground, are preferred. It will be necessary to brace end posts to prevent the wires from becoming loose.

Grapes may be trained satisfactorily on latticed arbors and porches and sometimes on garden fences. In such cases the ornamental and shade value of the vines may be more important than their fruit crop. No standard procedure can be furnished for growing and managing grapes under these conditions, since each case is an individual problem. Old wood on the vines, however, should be kept at a minimum and close to the trunks. It should

be noted, also, that arbors, fences and lattice work must be strong enough to support the weight of both the mature vines and a full crop of grapes. Provisions also must be made for tying the canes firmly to the supporting structure. Furthermore, the vines should be pruned annually to prevent the accumulation of old wood which results in low vigor.

Training the Vines

Performance of grape vines when trained in a certain way often is dependent upon the variety, climate and soil fertility. This perhaps accounts for the fact that several different systems of training are popular in various parts of the country.

The standard method of training grapes in Michigan is the "Single Trunk Four-cane Kniffin System". A mature vine trained to this system consists of a single permanent trunk reaching to the top wire of a two-wire trellis; extending from this trunk are four one-year old canes, one trained in each direction on each wire; and finally, two renewal spurs of two buds each, preferably coming from the trunk are left at a level near each wire. These are the basic components of the system, though in actual practice it may be desirable to have more than four canes, sometimes as many as eight or nine on very vigorous vines.

During dormancy following the first growing season, the vines should be pruned to a single cane which extends and then is tied to the top wire of the trellis. Where the vines are not vigorous enough for this, they should be trained so that a single cane will extend just above the lower wire. Extremely weak vines must again be cut back to two buds during dormancy following the first season and then be treated as new vines the following season. In all cases, the single canes selected for the trunks should be straightened and tied tightly to keep them taut, so that straight trunks will develop.

In the second season, suckers and lateral shoots below the lower wire should be removed as they appear. This aids in developing more vigorous growth in the upper portion of the vines. At the end of the second season, a trunk extending to the upper wire and four short lateral canes may be available on the more vigorous vines. With weaker vines this may not be possible until the end of the third year. If the vines bloom heavily the second year, most of the flower clusters should be removed, since heavy

fruit production at this time will result in weak shoot growth. Most of the vines should produce a fair crop of fruit in the third year, after which they may be treated as mature vines.

Soil Culture

Home garden vineyards should be cultivated during the first two or three seasons until they become well established. Thereafter, mulches of straw, leaves, lawn clippings or similar materials may be used, and if applied heavily and often enough no cultivation will be necessary. Cultivation, when practiced, should be no more than three or four inches deep. It should begin in early spring and continue until early August after which an annual cover crop, such as oats, barley, millet or sudan grass may be sown between the rows and worked into the soil the following spring.

Fertilizer

Where available, a bushel of well-rotted stable or barnyard manure applied around each mature vine is one of the best fertilizers for grapes. Manure should be applied during late winter or early spring in a ring extending about three feet, but no closer than one foot, from the trunk. Five to ten pounds of fairly dry rabbit or poultry manure may be applied to each vine if other animal manures are not available.

Commercial fertilizers may not be needed if sufficient amounts of animal manures are applied annually. Complete fertilizers (those containing nitrogen, phosphate, and potash), such as a 12-12-12 grade may be used at the rate of one or two pounds to each mature vine as growth begins in the spring. Two or three ounces should be applied to each new vine, shortly after planting. In the second year, five or six ounces is sufficient and in the third year about 12 ounces should be applied. Where soil tests indicate that potassium and phosphorus supplies are high, nitrogen fertilizers alone are satisfactory. Where ammonium nitrate is used, apply one or two ounces around each vine shortly after planting. If either nitrate of soda or sulfate of ammonia is used, apply two to four ounces. In the second year, apply two or three ounces of ammonium nitrate or four to six ounces of one of the other materials. In the third year, these amounts should be doubled. Thereafter, apply about eight ounces of ammonium nitrate or one pound of either nitrate of soda or

sulfate of ammonia. These amounts of nitrogenous fertilizers may be adjusted according to the vigor of each vine. Commercial fertilizer should be distributed around the vines as described above for animal manures.

In cases where vines have made excessive growth, no fertilizer of any type should be applied to the vines for a few years. Later, when the vines make less vigorous growth, a fertilizer program can be resumed.

Use of urea sprays on grape foliage for supplementing nitrogen fertilization, is not at present a satisfactory practice for home vineyards.

Pruning

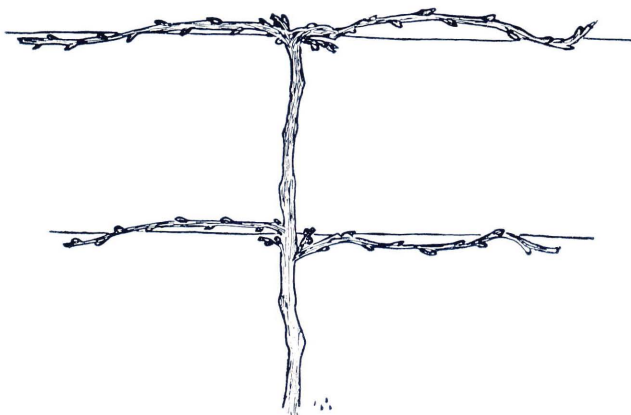
Grapes may be pruned at any time when the vines are fully dormant. It is best, however, to wait until February or March after most of the danger of winter injury to canes has passed. Pruning may be done as late as April, but should be completed before the buds begin to swell. "Bleeding" of sap may occur from canes pruned late in the season, but this generally is not harmful. Late pruning is better than no pruning at all. Summer pruning, other than removal of suckers and watersprouts from the bases of vines, should be avoided.

Points to be remembered in pruning a mature vine trained to the single trunk four-cane Kniffin system are as follows:

1. Select at least four straight unbranched one-year-old canes about one-fourth to three-eighths of an inch in diameter. They preferably should originate from the trunk; but when this is not feasible, as near to it as is possible. At least one cane should be trained each way on both wires. If excessively vigorous, two or three canes may be trained each way on the wires.
2. Select also two other canes near the level of each wire and prune each of these to two buds. These are called "renewal spurs", from which new canes for next year may originate near the trunk.
3. Remove all other wood from the vine, being careful not to break or injure canes selected for fruiting.
4. Shorten the selected canes, leaving 6 to 12 buds on each. A minimum number of buds (60 to 100) should be left on vines which grew vigorously the previous year, and a minimum number (25 to 35) on very weak vines.
5. Canes then should be twisted around the trellis wires, and each tied snugly near the tip. Jute twine,

binder twine, fine wire, or rubber ties may be used. If properly twisted on the trellis wires, usually only one tie will be needed for each cane. Tying operations are best performed after extremely cold weather has passed, but before buds begin to swell. The canes then are in a fairly pliable condition and can be handled and twisted with less danger of breakage.

6. Grapes may be pruned with hand shears, preferably of the "roll cut" or "snap" type.



PRUNING NEGLECTED VINES

Young, vigorous vines which have not been pruned for one or more seasons may have several stems or canes arising from their roots. One of the most vigorous and straightest of these on each vine should be chosen for the trunk and the other stems then should be cut off at the ground. Other pruning operations then should conform as closely as possible to the directions given above.

Old vines, not pruned or improperly pruned for several years, generally have too much old wood with most of the new wood originating far from the trunk. In some cases, several trunks may be present, all of which should be removed except the best one. As much old wood as possible should be cut from the top to encourage new growth near the trunk. Each of the remaining branches or arms then should be headed to a new cane originating as close as possible to the trunk.

Where an old trunk has become very crooked, injured badly by tillage equipment, weakened by disease, or injured by other causes, it may be desirable to replace it with a new trunk. This may be accomplished by selecting a strong stem or cane arising from the roots and developing it into a new trunk. Where an old vine has become

so weak that no stems arise from the roots, a new plant should be established from an adjacent vine, using the layering procedure described earlier.

II. PEST CONTROL

(Prepared by staff members of the Department of Entomology and the Department of Botany and Plant Pathology)

Insects and diseases which are most likely to cause serious damage are the berry moth, rose chafer, leaf hoppers, black rot and downy mildew. These may be kept in check by using the following spray schedule:

Time to Apply	Materials	Amount* to Use in:			Diseases and Insects to be Controlled	Remarks
		1 gal.	5 gal.	50 gal.		
1. Just as blossom buds open	Zineb.....	2 T.	½ C.	¾ lb.	Black rot, berry moth, downy mildew, rose chafer† leaf-hoppers	This spray must be applied if you expect to benefit from a spray program.
	or Low-soluble copper.....	5 T.	1 ¼ C.	2 lb.		
	Lead arsenate.....	3 T.	½ C.	1 ½ lb.		
	DDT 50% wettable powder ...	1 T.	½ C.	1 ½ lb.		
2. About time berries begin to touch each other	Zineb.....	2 T.	½ C.	¾ lb.	Same as above	
	or Low-Soluble copper.....	5 T.	1 ¼ C.	2 lb.		
	DDT 50% wettable powder.....	1 T.	½ C.	1 ½ lb.		

*Abbreviations in table:

T. — Tablespoon; C. — Cup.

†Repeat in 5-7 days if rose chafers persist.

A dust containing 7 parts copper, 10 parts arsenate of lead, 3-5 parts DDT, and enough flowing agent such as pyrex or talc to make 100 parts, may be used as a substitute for sprays on grapes.

Dust materials should be applied when the plant is wet from dew or following a rain and when there is little or no breeze. A thorough, even dust coverage is necessary to be effective.

Mixed dusts may be purchased ready for application or they may be prepared at home. A hand-blended dust requires careful mixing in order that each controlling material in the dust will be spread evenly throughout the entire mixture.

Wettable DDT powder may be added to an already prepared dust when one containing DDT is not available.

