Muscadine Grape Production Part II
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(Editor's Note): This is the second part of an article begun in our January issue of FRUIT SOUTH. The following section deals with training, pruning, fertilizing, controlling weeds, harvesting and handling. We hope that these two articles have been helpful to those of you involved in muscadine production or considering growing muscadines.

TRAINING
The purpose of training is to establish the framework of the vine as soon as possible. This is accomplished by pruning during the growing season for the first two years. The summer pruning consists of the removal of all lateral growth on the trellis arms to three or four joints at about 30-day intervals during the growing season.

When training young muscadine grapevines, follow as closely as possible the step by step procedure listed below:

After planting, prune the vine to a single stem and cut the vine back to leave at least two buds. This step is important because it balances the root system with the top, limits the number of growing points, and forces new, strong wood that will rapidly develop into a permanent trunk.

Tie a durable string, such as nylon or new binder's twine from the stub of the new plant to the trellis wire. A soft, small diameter wire may be used instead of the string, or a small stake or cane can be used. (See Fig. 1).

An alternative method, if the vine is planted near the post, is to place a 3 to 4-inch nail at the bottom and top of the post and attach the string or wire tightly between these nails. Train the vine up the wire or string.

As the new trunk grows, tie loosely to the training cord or stake and pinch or clip out sideshoots that develop in the leaf axils. Do not remove the leaves that are growing on the main trunk and do not pinch the terminal growth of the main trunk until it reaches the trellis wire. (See Fig. 2).

This training process must be repeated once every two or three weeks throughout the summer.

When the new trunk reaches the trellis wire, pinch it back to four inches below the wire. Tie a string from the top-of the vine to the wire and place enough tension on the string to straighten the trunk. This encourages branching. Train the new branch to the trellis wire to form the permanent fruiting arm. (See Fig. 3).

Train the fruiting arm along the wire by tying it loosely to the wire as it grows. Do not prune back side shoots on the permanent fruiting arm until the dormant season.

Allow the fruiting arm to meet halfway between the vines. (See Fig. 4). Retain these fruiting arms at this length permanently, or until they become diseased, injured, or unproductive. If the need arises, allow a new fruiting arm to grow from a new shoot arising near the original trunk.

Dormant season pruning the first two years consists of cutting back all current season’s lateral shoots on the arms to two or three buds and the removing of side-growth on the trunk. If no summer pruning has been done, it will require the removal of much growth during the dormant season that should have been forced into forming the framework.

After the framework has been established, prune each year during the dormant season. Cutting back shoot growth is the principal pruning needed during the first few years. Remove all shoots not needed for spurs and fruiting arms. Cut other shoots back to short spurs, each with two or three buds.

As the vines get older, they develop clusters or spurs or spur systems. Eventually, overcrowding will result unless some of the spurs, or entire clusters of spurs, are removed. Overcrowding causes weak shoot growth, reduced fruit-bud formation, and poor fruit set after flowering. Removing some of the spurs will induce the growth of strong new shoots from the arm. These can then be developed into new spurs to replace older ones.

Too many vigorous spurs frequently are left at the top of the trunk. Prevent this condition by removing most of the spur systems at the top of the trunk.

To prevent death by girdling, remove all tendrils that encircle the trunk or arms. Tendrils will also girdle and kill spurs, but the loss of a spur is comparatively unimportant.

Vines may be pruned at any time during the dormant season, but if they are pruned soon after leaf fall, less bleeding will occur. Late pruning may cause the vine to bleed heavily in mild weather, but there is no evidence that the bleeding injures the vine. The possibility of bleeding should not keep one from pruning.

FERTILIZATION
A soil test should be made for mature vineyards. Young plants should receive a complete fertilizer such as 12-12-12 (NPK), or some other commonly available mixture, in early spring of the first growing season. This mixture should be used at the rate of one-half pound per vine. About mid-June, side dress with one fourth pound of nitrate of soda, or its equivalent of other nitrogen sources, per vine in a similar manner.

Fertilizer applications the first year should be made broadcast in a circle three or four feet in diameter. Roots will grow two to three feet long in all directions the first year. On mature vineyards, never apply fertilizer directly under the
trellis. This encourages weed growth under the trellis. The roots on a four-year-old vineyard will have crossed the next row, so fertilizer applied under the trellis would not be important for vine growth or fruit production. The second year these amounts should be increased to one pound of the complete fertilizer and one-half pound nitrate with the area of application increased to five feet.

The third year, two pounds of the complete fertilizer should be applied broadcast over entire area except for an 18-inch band under the trellis. For succeeding years two to four pounds should be sufficient, depending on the vigor of the vine and soil test results. This application should be broadcast along each side of the row before vine growth starts in the spring. Do not let fertilizer come in direct contact with the roots or within 12 inches of the trunk of the vines. Vine growth on a mature vineyard should average 30 to 36 inches per year. If more growth than this occurs, cut down on the nitrogen; if less, increase nitrogen.

**TOP** Fig. 1
A small cane stake was used to start the training process for this young muscadine plant.

**MIDDLE** Fig. 2
When the terminal growth has reached the top wire, pinch it back to 4 or 5 inches below the wire. This encourages branching. Train a new branch to each of the trellis wires.

**BOTTOM** Fig. 3
When the new branches reach the trellis wires, pinch back the terminals again and form two permanent fruiting arms on each trellis wire. Do not prune back side shoots on the permanent fruiting arm until the dormant season.
Fig. 4. During the second and third growing season the fruiting arms are allowed to meet one-half way between the vines.

Fig. 5. This catching frame was constructed on a trailer. Doors can be lifted to remove the muscadines when bin is full. The hydraulic hand operated shaker is operated from the tractor. This type of equipment can be used to harvest small commercial plantings.

Fig. 6. Large plantings are harvested with mechanical harvesters. This harvester is operating in a commercial muscadine planting of Mr. Louis Jones, Madison, Arkansas.
WEED CONTROL

Frequent, shallow, clean cultivation is necessary the first two years. Keep all grass and weeds from around the plants. Never cultivate deep at any time. Three inches should be the maximum depth, or the shallow root system will be damaged.

After the second year, mowing the middles of the rows and using herbicides are recommended instead of cultivation. Additional information on weed control may be obtained from your local County Extension Agent.

Harvesting and Handling

Harvesting by shaking requires two 10 x 20 foot sheets, which may be made from burlap bags or canvas. Place a sheet along each side of the trellis, or use a picking frame. Shake each arm of the vine with quick jerks. Separate leaves, twigs and other trash from the fruit either by hand, while rolling the fruit back and forth on the sheet, or by running the fruit through a fanning mill or some similar apparatus. By using this shaking method, a two-man team can harvest two tons of fruit in 10 hours. The efficiency of this operation can be improved using the equipment similar to that shown in Fig. 5.

Those varieties having large, compact clusters may be sold as fresh produce. Cut clusters with grape shears or knives and pack in market baskets or lugs. Harvesting one ton by this method.

This catching frame was constructed on a trailer. Doors can be lifted to remove the muscadines when the bin is full. The hydraulic hand operated shaker is operated from the tractor. This type of equipment can be used to harvest small commercial plantings requires about 150 man hours of work. Hand-picked fruit remains in good condition for several days after harvest. Keep in a cool place or under refrigeration. Some bruising and injury occurs when fruit is harvested by shaking. If such fruit is not used or sent to the processor quickly, decay is likely to develop. Handle the fruit carefully and rapidly.

If large commercial plantings are made, the mechanical harvesters that are used to harvest Concord and other large commercial grape plantings could be adjusted and adapted to harvest muscadine grapes. (See Fig. 6).

YIELDS

The yield of muscadine grapes varies with variety, season, spacing, soil, fertilizer, and cultural practices. States that have commercial production report yields ranging from four to six tons per acre. Higher yielding varieties average about five tons per acre.