

Introduction

The production of alternative or nontraditional crops is being explored by many small farmers as a way of increasing the value of their farming operations. Although these crops are usually in fairly low demand, they are especially suited for growing on farms with limited acreage and for use in niche markets.

Muscadines (*Vitis rotundifolia* Michx.) are grapes native to Arkansas that have tremendous undeveloped market potential as fresh fruit, in processed products, and for the production of nutraceuticals. Muscadines have the advantage of not being as seriously affected by disease or insects as other grape species grown in the South; therefore they can be produced with approximately one-half the sprays required by French-American Hybrid or *Vitis labruscana* grapes. There has been interest from Arkansas wineries in expanding commercial plantings of muscadine grapes in central and southern Arkansas regions where these grapes can be successfully produced.



Figure 2. Muscadines are native to Arkansas and have tremendous undeveloped market potential.

For a number of years, the Grape and Wine Research Program in the Division of Agriculture, University of Arkansas, has been involved in work to identify the muscadine cultivars most suitable to commercial production in Arkansas, appropriate handling of these grapes, formulation and production of products from them, and markets for both fresh fruit and processed products. Because approximately 40% of the muscadine fruit is skin and seed, typically considered waste products, efforts are currently underway by some to develop seedless muscadines. Another alternative to reducing the percentage of the fruit that is lost as waste has been to identify uses for the press fraction from muscadine processing. In recent years it has been found that muscadine seeds and skins contain a number of components--nutraceuticals--which benefit human health. Research to further identify the nutraceutical materials present in mus-

cadine seeds and skins and ways to use and market these waste products is on-going.

The Muscadine Grape

Few individuals outside of the southern United States are familiar with muscadine grapes (*Vitis rotundifolia*) since they are native to the southeast United States and not marketed widely in other parts of the country. The grapes have thick skins, large seeds, and a unique, soft, musky-flavored pulp. Cultivars vary in color from almost white, referred to as bronze, to pink, red, blue, purple, and nearly black. Common names for dark-fruited muscadines include bullace, bull grape, and bullet grape (Olien, 2001). The term “scuppernong,” often used to refer to all bronze-fruited varieties, is actually the name of a specific muscadine cultivar.

North Carolina claims credit as the place where muscadines were first discovered, citing a 1524 log book of French navigator Giovanni de Verrazano, who was exploring the Cape Fear River Valley, as the first recorded account of the grapes (Anon, 2000). A popular legend credits Sir Walter Raleigh’s colony with discovering the Scuppernong “mother-vine” on Roanoke Island in 1584 and spreading cuttings from it widely, including to the area of the Scuppernong River where, in 1811, it was identified in a newspaper report as the “Scuppernong grape.” Other authorities believe the first discovery of muscadines occurred in the mid-18th century along the Scuppernong River and that cuttings from this planting were eventually carried to Roanoke Island, where they became known as the “mother-vine” (Olien, 2001). Although the grape’s history is somewhat unclear, it is known that there is a vine on Roanoke Island that has been in continuous cultivation for nearly 200 years, and today this historic vine has a trunk over two feet thick and covers half an acre.

Figure 3.
Muscadine cultivars vary in color from almost white or bronze to nearly black.



Muscadine grapes need a long growing season since they usually require 100 days on the vine to mature the fruit (Olien, 2002). They grow best on fertile, sandy loams and alluvial soils and grow poorly on wet or heavy soils.

Muscadines are native to the region from Virginia to East Texas and south (Figure 4).

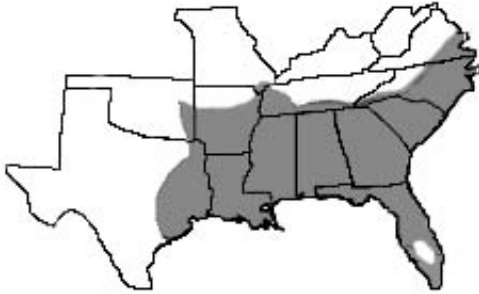


Figure 4.
Areas in gray represent regions of natural muscadine distribution (Modified from Olien, 2002).

Although muscadines grow wild throughout Arkansas (except in the northern counties), they were not produced commercially in the state until 1972 (Moore, 1972). Figures are not available regarding the total acreage of muscadine production in Arkansas; however, it is known that muscadine processing is occurring in Altus, in the Arkansas River Valley (Clark, 2001), and that there are commercial plantings for fresh market sales in several counties, most notably White County.

The flavor and aroma of muscadine grapes are completely different from that of other grapes. The thick skins and seediness of the fruit along with their unique sensory characteristics are sometimes considered unappealing to consumers unfamiliar with these grapes (Leong, 2001). However, consumers who are accustomed to muscadines, or who have developed a taste for them, report that their unique characteristics make them a welcome alternative to the better known “California types” of grapes, giving them a unique niche in the grape market.

Those thinking about starting a muscadine vineyard should be aware that they will face a number of marketing challenges unique to these grapes (Leong, 2001). These include:

- lack of consumer familiarity with muscadines and muscadine products, requiring consumer education and market development;
- a restricted market for fresh fruit due to perishability issues and low demand in nontraditional marketing areas;
- inadequate formal market standards to associate price and quality.

Processing muscadines offers marketing alternatives for the fruit, but the production of muscadine grape products is small compared to that of Concord grapes. Wine continues to be a major market for muscadine grapes in the South. In recent years there has been an increase in interest, especially

among small processors, for the establishment of a market for jam, jelly, and juice from muscadine grapes. However, because processors have not been able to find a reliable supply of a high quality processing muscadine cultivar, jam and jelly production generally has been limited to small specialty packs which do not require large quantities of grapes.

Cultivar Selection and Production Considerations

Developing a sound plan for marketing crops is critical to the success of any farming operation. Marketing decisions should drive the production decisions, not vice versa. It is recommended that producers identify and research marketing opportunities prior to producing a crop (Rainey, 2002).

Arkansas is the home of two of the foremost commercial processors of muscadine products, Post Familie Vineyards and Winery and Wiederkehr Wine Cellars, Inc. Other wineries such as Mount Bethel Winery and Cowie Winery also produce muscadine wines. These processors may be willing to purchase muscadines from independent growers, provided the grapes are the appropriate varieties and are produced and handled to meet company specifications. If marketing product in this way is a desirable option, then it is important to contact the processor(s) prior to planting to ensure that the varieties and production procedures will be acceptable.

Muscadine grapes are adapted to almost any well-drained, moderately fertile soil with a pH of 5.5 to 6.5. The minimum temperature the vines can withstand depends on their vine condition, as well as weather conditions prior to low temperature exposure. Fluctuations of temperatures from high to low can be as damaging as an absolute low temperature because grape vines tend to deacclimate (lose their winter hardiness). It is best to plant muscadines in regions where the temperatures rarely go lower than 0°F.

Unlike other grape species and cultivars produced in Arkansas, the width between rows in muscadine vineyards may vary from 9 to 12 feet but is usually 12 feet (Noguera et al., 2004). The minimum spacing between vines in the row is 20 feet. This 9 x 20 foot spacing only requires 242 vines per acre, significantly fewer than the 544 to 623 plants per acre (depending on species and cultivar) required for *Vitis vinifera*, *Vitis labruscana*, and French-American Hybrid cultivars. In addition to information about the number of plants needed, Noguera et al. (2004) discuss other financial considerations for establishing a grape vineyard.

There are two types of muscadine grape cultivars planted in Arkansas: pistillate, or female flowering types; and self-fertile, or perfect flowering types (Noguera et al., 2004). The pistillate vines have flowers that produce only ovaries (fruit) and contain no anthers or pollen. Pollen for these female flowering vines must be provided by interplanting these types with self-fertile plants.