

Marketing Options for Grapes and Grape Products



P.L. Brady, M. Thomsen, and J.R. Morris



UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

ARKANSAS AGRICULTURAL EXPERIMENT STATION

January 2010

Research Report 988

This publication is available on the Internet at <http://arkansasagnews.uark.edu/1353.htm>

Front and back cover photo credits: University of Arkansas Enology and Viticulture Program

Technical editing, layout, and cover design by Gail Halleck

Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Fayetteville.
Milo J. Shult, Vice President for Agriculture. Mark J. Cochran, AAES Director and Associate Vice President for
Agriculture–Research. PMC360InddCS3. The University of Arkansas Division of Agriculture follows a nondiscriminatory
policy in programs and employment.
ISSN:1539-5944 CODEN:AKABA7

Marketing Options for Grapes and Grape Products

Pamela Brady, Professor

Department of Food Science
and

Institute of Food Science and Engineering
University of Arkansas Division of Agriculture
2650 N. Young Ave.
Fayetteville, Arkansas 72703

Michael Thomsen, Professor

Department of Agricultural Economics and Agribusiness
and

Institute of Food Science and Engineering
University of Arkansas Division of Agriculture
2650 N. Young Ave.
Fayetteville, Arkansas 72703

Justin R. Morris, Distinguished Professor

Department of Food Science
and

Institute of Food Science and Engineering
University of Arkansas Division of Agriculture
2650 N. Young Ave.
Fayetteville, Arkansas 72703

University of Arkansas Division of Agriculture
Arkansas Agricultural Experiment Station
Fayetteville, Arkansas 72701

Acknowledgements

Appreciation is expressed to Mike Heilman, Dr. Steve Seideman and Dr. Jean-Francois Meullenet, University of Arkansas Division of Agriculture, Institute of Food Science and Engineering for their assistance in reviewing this manuscript.

Preparation of this text was supported by the National Research Initiative of the USDA Cooperative State Research, Education, and Extension Service, grant #2006-55618-17203 entitled “Enhancement of family farms through value-added grape products.”

CONTENTS

Impact Statement	4
Introduction	5
Finding a Market Niche	7
Direct Marketing Options for Grapes	8
Adding Grapes to a Produce Stand, Farmers Market or CSA Arrangement	9
Marketing Grapes through Custom Orders or Pick-Your Own Operations	15
Marketing Grapes through Commercial Channels	17
Marketing Grapes to Wineries and Processors	18
Selling Fresh Grapes through Mainstream Wholesale and Retail Markets	21
Making and Marketing Value-added Grape Products	24
Conclusions	30
References Cited	30

Appendices

Appendix A – Recommended Grape Varieties for Arkansas	32
Juice Grape Varieties	32
Seedless Table Grape Varieties	33
Wine Grape Varieties	33
Muscadine Grapes for Central and Southern Arkansas	35
Appendix B – Harvest Dates for Produce Crops	
Commonly Grown in Arkansas	37

Impact Statement

Many owners of small- and medium-size farms in Arkansas and across the U.S. have begun to explore the potential of juice and wine grapes as an alternative crop to increase the profitability and stability of their farming operations. Grapes are unique in that they are not only well-suited for marketing through traditional commercial channels but also are popular in direct marketing venues such as produce stands, farmers markets, community sponsored agricultural ventures, and pick-your-own operations. This publication provides an overview of the various types of market channels available for grape growers and explores their potential as outlets for regional grape producers. It is not intended as a “how-to” book but rather is designed to help identify some of the factors which might be involved in deciding to become a part of the grape and wine industry.

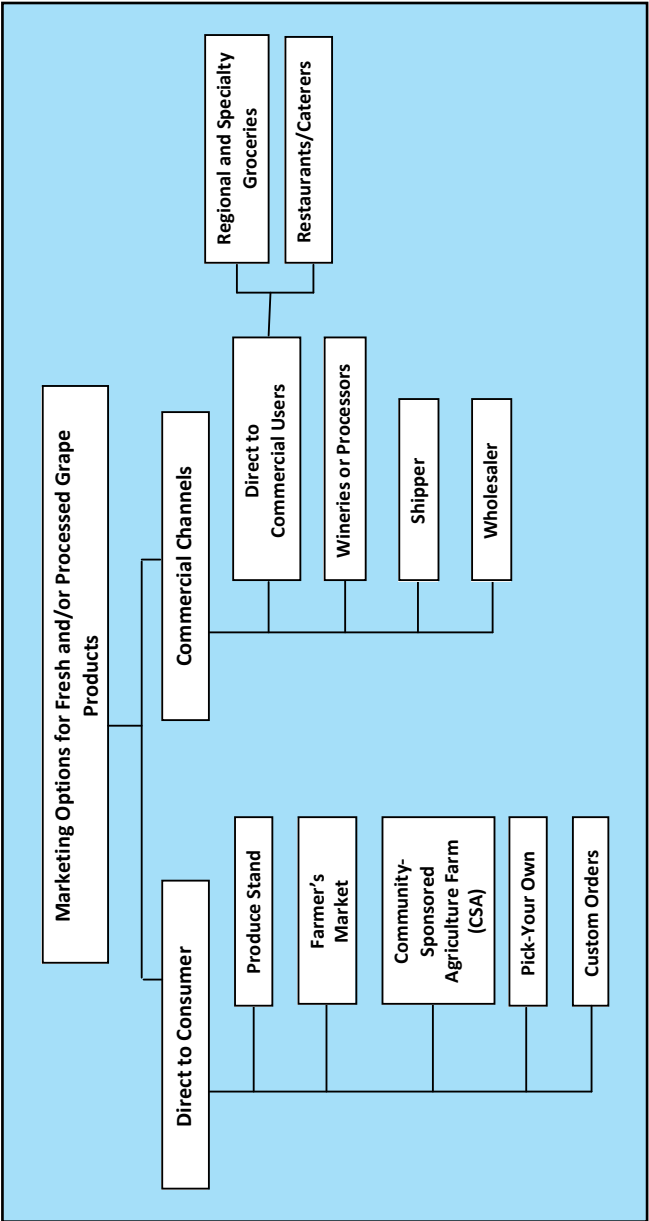
Introduction

Many farmers with small- and medium-size farms have found it very difficult to make a living and are looking for alternative agricultural activities to increase farm income. The USDA's National Research Initiative (NRI) funded a program at the University of Arkansas to provide research, information, and training to help these farmers explore the production of grapes as an alternative crop to increase profitability and add stability to the family farm.

Growers in Arkansas and elsewhere in the Southeast have the option of growing table grapes; juice or wine grapes for sale to processors or wineries; and/or grapes for the grower's own use in making wines, juices, or other value-added products. In addition, muscadines, which are unique to Arkansas and the Southeast United States, have tremendous undeveloped fresh and value-added market potential.

As shown in Figure 1, there are a wide variety of market channels available for grapes and products made from grapes. This publication provides an overview of these channels and their potential as outlets for regional grape producers. It is not intended as a "how-to" book but rather is designed to help identify some of the factors which might be involved in deciding to become a part of the grape and wine industry. After briefly addressing the importance and sources of market niches, this publication looks at key considerations for successfully selling grapes and products made from grapes through various direct marketing formats and through commercial channels. Appendices provide supplemental information about the grape industry. Appendix A contains a list of grape cultivars recommended for growing in Arkansas along with descriptions of their characteristics and recommended uses. Since grapes are often grown and marketed as part of a broader selection of fresh products, many growers find it desirable to identify a variety of crops that are available throughout the growing season when developing a marketing strategy. Appendix B summarizes harvest periods for grapes and other fruit and vegetable crops frequently grown in Arkansas.

Figure 1. Exploring Options for Marketing Grapes as an Alternative Crop.
(Note: Although juice and wine grapes were the crop chosen for this discussion, the concepts and considerations presented would be similar for other alternative crops)



Finding a Market Niche

Regardless of the market outlet being served, grape growers in Arkansas and elsewhere in the Southeast will almost certainly need to develop and pursue some form of niche marketing strategy. Niche marketing consists of identifying and serving a unique market segment or filling a unique market need that is not currently being served or met by larger or mainstream market participants. Niche marketing generally requires producing a specialty product or service for a limited segment of the market. These markets are often less price-sensitive than bulk commodity markets and reward farm product suppliers with a price premium for their ability to meet the stringent requirements of the buyers. Small- and mid-size suppliers that can meet the volume requirements and precise specifications of niche markets can often find a good fit for their limited production capacity. Niches can be found in any of three dimensions that are used to characterize the market. These dimensions consist of the product or service in question, the timeframe in which the product or service is available, and the geographic area where the product is delivered or the service is performed.

Product or service niches arise from the ability to assemble a product or service that contains characteristics valuable to customers but that is unique in some way from that which is being provided by mainstream market participants. For example, table grape varieties suitable for production in Arkansas have flavor profiles and physiological characteristics that make them distinct from ordinary varieties of table grapes normally found in supermarket produce departments. These differences can be the source of a market niche if consumers view them as a distinctive, exciting, or refreshing contrast to the commonplace fruit that is available year-round. Services tailored to home winemakers provide a good example of another market niche that can be exploited by smaller grape growers. Those making wine as a hobby want a sufficient supply of good quality fresh grapes to make their wine but generally do not want to purchase in bulk lot quantities. The flexibility and smaller production volume that characterizes small growing operations becomes a strength when serving this market.

Timeframe, the second dimension used in characterizing a market, also can form the basis of a niche marketing strategy. Niches based on market timing can arise if the growing conditions enable producers to place grapes on the market during a favorable window, often before, after, or between harvest periods in major producing regions. Growers may, in some cases, seek to develop niches

based on market timing by selecting early or late maturing varieties that hit the market during times when the price outlook is more favorable or that enables processors, wineries, or other downstream customers to better use their production or storage capacity.

Finally, market niches can be based on geographic location. These may result from the reputation of a given region or unique marketing advantages that result from proximity to customers. Perhaps the best example of a market niche based on geography lies in the trend among many consumers to seek foods that are produced near their homes. These consumers believe that food grown closer to their homes tastes better and is more nutritious because it does not have to travel long distances to get from the farm to the table. As a consequence, these consumers are willing to pay premium prices for locally-grown products. In addition, some consumers see consuming locally-produced foods as a way to strengthen the local economy and many believe that buying locally is better for the environment since less fuel and other resources are consumed getting the product to market. The interest in locally-produced foods provides an important and growing niche for small- and mid-sized growers.

Direct Marketing Options for Grapes

Direct markets (markets where sales are made directly to the customer or final user) are often preferred by growers with small- and medium-size farms. With relatively small acreage, it is sometimes difficult to meet the volume of production, or standards for size, color, and uniformity required by processors or wholesalers. Direct markets offer an alternative way of selling product. Even when other marketing options are viable, many growers with small- and medium-size farms have found that direct marketing offers a means of increasing cash flow and supplementing income. Direct marketing options include sales through outlets such as:

- produce stands
- farmers markets
- community sponsored agriculture (CSA)
- custom orders
- pick-your-own operations

Several advantages and disadvantages are common to all of these direct marketing formats (Rainey, Hipp, and Hauk, 2006). By selling directly to the

end user, growers receive retail prices for their grapes. Moreover, consumers buying directly from the grower are often willing to pay higher prices for product because they value the opportunity to get high-quality, fresh grapes directly from the grower. Another benefit of direct marketing is that the grower usually receives payment immediately and has some degree of control over price levels. However, direct marketing means that producers perform more services and assume added marketing costs (such as handling, labor, management, etc.). Although a grower can generally expect higher prices per unit in direct markets, these prices need to offset the added costs that come with assuming additional market functions and should compensate the grower for the additional effort and management that are involved. Other negative aspects of direct marketing include increased risk from liability exposure and the effect of unavoidable factors, such as weather, on sales. Growers selling directly to consumers should work with local authorities on issues such as licensing and zoning restrictions or for permission to use public spaces as sales locations.

Adding Grapes to a Produce Stand, Farmers Market, or CSA Arrangement

If a produce stand, farmers market, or CSA-type arrangement is chosen as the direct marketing method, grapes will generally be sold to many different customers in small quantities and will almost certainly be only one of many crops that are sold throughout the summer months. The key consideration, therefore, is whether the addition of grapes to the product mix enhances the income that the farm is capable of generating and makes economic sense given the resource constraints facing the operation. Before addressing this question it is useful to briefly outline the main features of these direct marketing arrangements.

Produce stands are the most straightforward approach to direct marketing (Figure 2). The key to a successful stand is location and advertising. If the produce stand is on a farm in a remote area, it may be necessary to use agricultural tourism activities and/or intensive advertising to draw customers to the stand. A roadside stand may take more planning and time to put into operation than a stand located on the farm, but roadside stands may have the advantage of being in a better location for drawing customers. A stand may be operated from a year-round permanent structure or from a truck, trailer, or tent during harvest periods.



Figure 2. Whether on the farm or operated as a roadside stand, produce stands provide consumers with the opportunity to purchase fresh fruits and vegetables directly from the grower. (Photo source: USDA)

Regardless of whether the stand is located on the farm or in some other location, it should be clean and orderly since few people will buy items they intend to eat from a place that looks unsanitary. Sales staff for produce stands is generally drawn from the farm family or other farm workers. Those chosen to work in the stand should be people who enjoy working with other people and are pleasant and friendly as well as knowledgeable about the products offered and their uses. Produce sold through a farm or roadside stand may be grown exclusively on the farm or may be purchased from outside sources. However, operators should be honest with consumers about the source of the produce since one of the reasons many consumers choose to patronize stands is because this allows them to know the source of the produce they are buying.

Farmers markets are defined as a common facility or area where multiple farmers/growers gather on a regular, recurring basis to sell a variety of fresh fruits, vegetables, and other farm products directly to customers (Figure 3). This form of farmer-to-consumer direct marketing provides unique experiences for both consumers and growers and, as a result, has experienced phenomenal growth in recent years (Figure 4). Consumers shopping at farmers markets are able to access a broad range of fresh produce directly from a number of different



Figure 3. Farmers markets are facilities or areas where multiple farmers/ growers gather on a regular, recurring basis to sell a variety of fresh fruits, vegetables, and other farm products directly to customers. (Photo: Scene at Springdale Farmers Market courtesy of Jim McGuire, Springdale, Ark.)

growers. This marketing arrangement makes it possible for consumers to meet and interact with the people who actually grew the produce. Because of this, farmers markets are more likely to be a planned destination for consumers and this reduces the difficulty of attracting potential buyers. Over time, growers often develop personal relationships with customers and can enjoy a great deal of customer loyalty. Farmers markets can also be a means of generating customer interest in alternative venues operated by a grower, such as a farm stand or a pick-your-own operation.

Although consumers often think of a farmers market as a setting where farmers congregate to sell product, most farmers markets are well-organized, structured venues. In most cases farmers markets are set up when growers form an organizational framework that is responsible for establishing and enforcing basic guidelines pertaining to participation in the market; collecting dues, fees, or commissions to cover expenses incurred by the market collectively; and representing the interests of the market in the local community. Organizations such as the Farmer's Market Coalition (www.farmersmarketcoalition.org) provide examples of organizational documents, guidelines, and other resources for those involved in organizing or governing farmers markets.

Number of Operating Farmers Markets

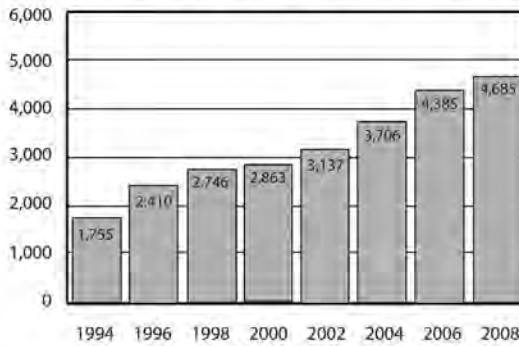


Figure 4. The number of farmers markets operating in the U.S. have increased dramatically during the past few years. (Source: USDA/AMS Marketing Service Division).

A Community Supported Agriculture (CSA) farm refers to a situation in which customers (called members) purchase shares of a farm's produce, usually in advance, and receive deliveries of fresh produce throughout the growing season. For this reason, CSA farms are sometimes called "subscription agriculture." Like farmers markets, CSA farms have experienced tremendous growth in recent years. Strohlic and Shelley (2004) reported that although CSA farms were non-existent in the U.S. in the 1970s, by 2004 there were more than 1,700 farms and CSA farms were in all 50 states and boasted several hundred thousand members.

A CSA arrangement provides some clear advantages over other direct marketing formats. While spoilage loss is a persistent problem in most direct marketing, the subscription feature of CSAs ensures a home for all produce and virtually eliminates this problem. In addition, the up-front commitment by customers that is typical of the CSA model means that customers/members are sharing in the production risks and are providing the working capital that is needed to finance the grower's costs. On the downside, the ability of a CSA to attract members is generally dependent on its ability to provide them with a diverse range of in-season crops throughout the growing season. The necessity for season-long crop diversity requires CSA growers to plan carefully in order to provide members with the variety they expect. Strohlic and Shelley (2004)

noted that some CSA farms are addressing this issue by entering into agreements with other CSA operations so that their combined production can provide members with a greater variety of produce than could feasibly be produced on an individual farm.

If a grower decides they want to market farm produce using direct marketing techniques, they must then decide if grapes will be one of the produce options offered. If grapes will be grown, a grower must then decide if these grapes will be table grapes, i.e. grapes that are eaten fresh, or grapes for processing. The type or types of grapes grown will significantly affect marketing strategies.

Table grape varieties recommended for Arkansas differ in appearance, flavor, and texture from those varieties that consumers normally encounter in supermarkets. In particular, many of these varieties have been bred from American cultivars and have retained the distinct flavor characteristics of juice grapes. In the past, table grapes grown in Arkansas were predominantly “slipskin” varieties, identified by a skin that is edible, thicker than that of European varieties, and separates easily from the flesh of the fruit. Newer table grape releases developed in the state are generally non-slipskin, hardy varieties with characteristics more like juice grapes (Appendix A). In this respect, fresh grapes produced regionally truly are unique local products and thereby are generally well received by direct market consumers. Direct marketing provides growers with the opportunity to educate customers about these unique physical characteristics and this can help develop customer relationships and may improve the customer’s overall shopping experience at a farmers market stall or produce stand. These unique attributes also make fresh table grapes an excellent item to enhance the blend of products in mid- to late-summer CSA deliveries.

The inclusion of grapes in the mix of products offered through a farmers market or produce stand may make sense from a merchandising standpoint because grapes are likely to generate a high level of unplanned purchases and thereby increase sales.¹ The potential for grapes to fill the role of an impulse item lies in the fact that they are very convenient to eat in the fresh form and this increases the likelihood that consumers will buy them as an extra treat or

¹ An unplanned purchase refers to those items that a consumer decides to buy only after arriving at the market venue. To qualify as an unplanned purchase, the consumer would need to have arrived at the venue with no specific intention to purchase the item. The purchase decision is made on site once the customer realizes that the item is available or in response to a marketing stimulus that creates a desire for the item.

snack item. Aside from increasing revenue, the ability to generate an unplanned purchase in a farmers market setting increases the likelihood that the customer buys the other items he or she planned to purchase from your stall as opposed to the stall of one of your competitors. This can be especially important in driving sales. For produce stands that cater to highway traffic, the convenience factor is particularly advantageous. It is difficult to think of a fruit more suitable than grapes for filling the role of a convenient and healthy snack that can be enjoyed on a long car ride.

Finally, grapes will likely be a good complement to other crops being sold through a direct marketing venture. Grapes mature in the latter part of the summer and can take the place of berry crops which generally ripen earlier in the growing season (Appendix B). Muscadine grapes can extend the season even further since they mature in the late summer to early fall after the season for most fruit crops has passed. In addition, grapes can be used in producing value-added products such as juices, spreads, leathers, and other processed products that can not only be marketed throughout the growing season but can also be sold during the winter months when locally-grown fresh products are not available.

Growers should carefully consider the production requirements of the grape varieties being selected. Grapes take several years to establish so, even if things go well, a marketable crop of any size will not be available until three years after the vines are planted. Even under ideal management conditions, the full yield potential of the vines will not be reached until the fourth or fifth year. The costs of establishing a vineyard are higher than those for simply planting the vines. In addition to the plants themselves, major establishment expenditures consist of constructing and maintaining trellises to support the vines, providing a means of supplying adequate irrigation water to the vines, and labor-hours required to train the young vines during the establishment period (Figure 5). Once established, labor will be required to prune the vines during the months of late winter and early spring. During the growing season, additional labor will be needed to manage the canopy and fruit load and to harvest the grapes. Potential growers should consider the labor requirements of other crops being produced before adding grapes to the crop mix to ensure that labor demands for the total operation can be met by the available labor pool and that demands are spread out over the growing season and not occurring all at one time. Depending on the size of the vineyard, additional equipment, such as specialized sprayers, also may need to be purchased.

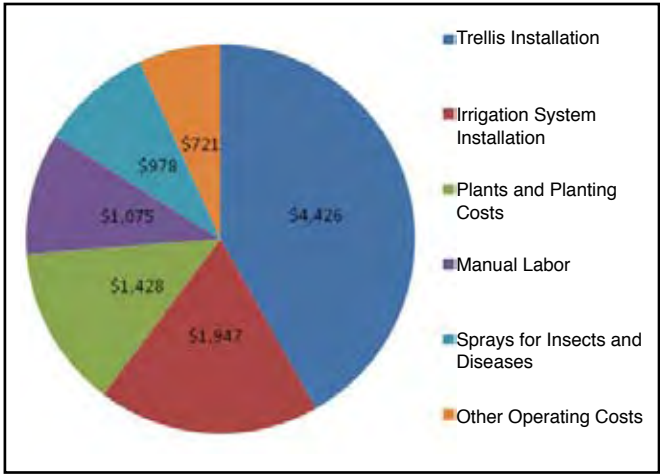


Figure 5. Costs (\$/acre) incurred during establishment of French-American or American hybrid wine grape vineyard on a high-wire single-curtain trellis system with 9 foot by 8 foot vine spacing. (Source: Thomsen, 2008).

In addition, consideration must be given to the grape varieties best adapted to a particular geographical region. A grower also would need to consider the fact that the harvest period for grapes is relatively short, which limits the time money can be made selling grapes through direct market outlets. In order to extend the period when income is being generated and to increase the potential customer base, growers generally find it is desirable to grow several different varieties of grapes with different harvest dates. Grape varieties recommended for production in Arkansas and suggestions for their use are summarized in Appendix A.

In considering whether production of grapes makes sense, the potential grower should also consider other objectives of his or her operation. As noted in Appendix A, many grape varieties are susceptible to fungal diseases and insect pests. Because of these problems, careful management is essential, and many grape varieties may not be suited to organic production practices. Therefore, it may not be feasible to add grapes to a direct marketing enterprise that bases its unique identity on the production of organic produce.

Marketing Grapes through Custom Orders or Pick-Your-Own Operations

Other direct marketing options for grapes include selling through custom orders or through a pick-your-own (PYO) operation (Figure 6). In



Figure 6. Consumers are often willing to pay close to retail price for produce at pick-your-own farms since they are assured of product freshness and value the experience of being on the farm. (Photo Source: UA Enology and Viticulture Program)

general these options will differ from produce stands, farmers markets, and CSA arrangements in two important ways. One is that the volumes involved in transactions with customers are likely to be much larger and customers are more likely to be interested in purchasing grapes for purposes of home processing or winemaking and not just for fresh consumption. Because transaction volumes are larger, it is more important to cultivate relationships with customers so they return to the operation year after year. The intended uses customers have for the grapes also will impact the varieties grown on your farm. Secondly, there is less of a need to produce as wide a variety of crops to stock a produce stand, market stall, or CSA basket with a broad selection of in-season crops. This means the grower can specialize in fewer crops or focus exclusively on grape production.

If you plan on marketing your grapes through custom orders, you will generally line-up orders and work out arrangements for the delivery of the grapes well in advance of harvest. Thus time, effort, and advertising expenditures are required to develop an adequate base of customers. Once you attract customers, it is important that they have a good experience using the grapes so that they continue to place orders in the future. It is probably good practice to maintain a customer database so that orders can be solicited early in the growing season. Such a database also enables you to maintain contact with customers

through periodic communications covering topics such as new developments at your farm, winemaking tips, or recipes for home processing. Many growers have found that the internet offers a quick, inexpensive method of communicating with customers and soliciting custom orders.

There are several considerations if grapes are marketed through a PYO operation. First, costs can be lower since the consumers provide the labor for picking and also transport the product away from the vineyard. Consumers are often willing to pay prices close to the retail price for the grapes since picking their own fruit allows them to get the freshest possible grapes while experiencing the surroundings of a working vineyard. Because the picking season is relatively short, the farmer's time commitment to operate this type of sale is short but so is the period of income generation. Some PYO operators generate traffic and repeat customers by making their farm a tourist attraction. They not only provide consumers an opportunity to gather fresh produce but also make the farm a fun family destination with activities such as festivals, craft fairs, petting zoos, and hayrides. A farm store may offer produce to those who do not want to pick for themselves along with value-added products such as pies, cakes, jams, jellies, juices, etc. made from the farm's produce.

Establishing a PYO requires a grower consider planting techniques. The grower may want to select several grape varieties that ripen at different times so that the season is extended. Spacing of vineyard trellises may need to be adjusted to allow pickers room to move about between rows without damaging the vines. In addition, space on the farm must be set aside for traffic control and parking. This may decrease the amount of land that can be planted. The advantages and disadvantages of a PYO operation must be carefully weighed before entering into this type of operation (Table 1).

Marketing Grapes through Commercial Channels

The main weakness of direct marketing venues is that often only a limited volume of fruit can be moved through these markets and this restricts the growth and income potential of the farming operation. Moreover, the grower must assume many additional roles in marketing the grapes and these add costs, complexity, and risk to the operation. Commercial channels can absorb much higher volumes of product and provide the grower with the opportunity

Table 1. Advantages and disadvantages of pick your own operations (Adapted from a list developed by the University of Delaware as cited by Whatley, 1987).

Advantages	Disadvantages
<ul style="list-style-type: none"> • Need for seasonal labor is reduced. • Grading, packing, and storage costs are eliminated. • Container costs are lower. • The grower is paid when the crop leaves the farm. • Grower has more control over prices. • No labor camps or housing for seasonal laborers. • Since crops are picked fully ripe, yields are often increased 10-15 percent. • Usually no packing house is needed; however, some sales area is required. 	<ul style="list-style-type: none"> • Accident liability increases since public is on your land picking product. • Managing sales requires long hours of work, especially on weekends. • Bad weather, or even the threat of it, scares away pickers leaving the grower with a crop and no harvesters. • Customers may be hard to control and sometimes are disagreeable. • Inexperienced pickers in the vineyard increase the possibility of damage to vines and trellis system.

to specialize and operate an efficient vineyard. Commercial channels include selling fresh grapes to processors or wineries or selling grapes or grape products into wholesale and retail channels. This section briefly addresses considerations involved in marketing through these channels.

Marketing Grapes to Wineries and Processors

Entering the grape growing business on a commercial scale involves a substantial capital investment and represents a long-term commitment. Estimates of the cost of establishing a vineyard depend on the grape variety being grown but, as shown in Figure 5, amount to thousands of dollars per acre. Once these investment dollars are committed to the vineyard, it will generally be difficult to recoup them if profit outlook diminishes.

From a marketing standpoint, the overarching concern is that, once a vineyard is established, a buyer may be able to extract substantial price concessions from the grower. To illustrate, consider the example in Table 2. Table 2 reflects the following assumptions:

- The vineyard yields 6 tons per acre.
- Fixed costs per acre are estimated as the total establishment costs of \$10,575 (the total of items shown in Figure 5), amortized at 8.25% over 30 years, capital recovery for machinery, and an allowance for taxes and insurance.

- Operating costs presented reflect those yearly costs associated with operating an established vineyard. These include the costs of manual labor operations, machinery operations, maintenance on the trellis and irrigation systems, and harvest costs.

At the break-even price of \$510 per ton, the revenue generated is just equal to the sum of the operating costs and fixed costs. The break-even price is computed as:

$$\frac{\text{Fixed Cost per Acre} + \text{Operating Cost per Acre}}{\text{Yield per Acre}} = \frac{\$1,950 + \$1,110}{6 \text{ Tons}} = \$510 \text{ Per Ton}$$

Let us consider a grower who establishes a vineyard under the expectation that prices will be \$700 per ton, well in excess of the break-even price. As shown in Table 2, the expected net return at the \$700 price is \$1,140 per acre. What would this grower do if, after establishing the vineyard, the price situation worsened considerably? Suppose, for instance, that prices fell to \$400 per ton, well below the break-even price. Would the grower cease production? To answer this question, let us compute net returns under the assumption that the grower ceases production. In this case, revenue is zero because no grapes are produced, operating costs are also zero, but fixed costs remain at \$1,110 per acre. In other words, if the grower ceases production when the price is \$400 per ton, he or she realizes a loss of \$1,110 per acre. As shown in Table 2, when production continues at \$400 per ton the loss is only \$660 per acre in comparison. In this example, the grower will continue production as long as the price exceeds the shutdown point. The shutdown price is the price that equates revenue with operating costs and is computed as:

$$\frac{\text{Operating Cost per Acre}}{\text{Yield per Acre}} = \frac{\$1,950}{6 \text{ Tons}} = \$325 \text{ Per Ton}$$

Table 2. Returns to an example vineyard at different price levels (cost estimates based on Thomsen, 2008).

Price (\$/ton)	700	400
Revenue (\$/acre)	4,200	2,400
Operating Costs (\$/acre)	1,950	1,950
Fixed Costs (\$/acre)	1,110	1,110
Net Return (\$/acre)	1,140	(660)
Break-even price(\$ ton)	510	
Shutdown price (\$/ton)	325	

At this juncture, it is important to distinguish between an “economic loss” and an “accounting loss”. At prices below the break-even point, the producer incurs an economic loss because money tied up in the vineyard operation is earning less than it could have in an alternative investment opportunity. Depending on how the vineyard is financed and the accounting conventions used in computing net income, there could easily be situations where the vineyard generates a cash flow sufficient to cover ongoing obligations and/or shows a positive return on accounting statements or income tax forms, even when prices are below the break-even point.

The main point of the above example is that once a vineyard is established, a buyer could substantially lower the price and still keep a grower in business and providing a steady supply of grapes. This concern is less important if there are a large number of alternative market outlets for grapes. However, grapes are perishable and timing of harvest is important to quality and yield. The number of buyers that can be found on short notice will, in most cases, be small so the potential for opportunistic behavior on the part of a buyer remains a concern. Fortunately, most buyers recognize that such behavior generally does not make long-term business sense and compromises their ability to secure the needed quantity and quality of grapes in the future. However, vineyards are productive for many years and the same type of problem can occur if the winery or juice processor to whom the grower usually sells goes out of business. An alternative buyer may be unwilling or unable to provide the same price level, and the grower could be placed in a situation of economic loss.

Because of these pricing concerns, a contractual relationship with a buyer is advisable. A contract with a winery or processor should be in writing and should specify the amount and type of grapes to be delivered, what constitutes acceptable quality, and a price, or at least a means of determining a price, at harvest time. Ideally, a grower would have a contracted price for the first few years of vineyard establishment with later years being tied to market conditions. Such an arrangement would help guarantee a return during establishment years when cash flow is likely to be tightest but would allow flexibility in that later years would follow market trends. Another recommendation is to choose varieties with traits desirable to multiple wineries, juice processors, or other market outlets in the region, thereby reducing reliance on a single buyer. In selecting varieties, adaptability to different market outlets may be more important to the long-term success of the operation than profit potential forecasted prior to vineyard establishment.

Selling Fresh Grapes through Mainstream Wholesale and Retail Markets

Produce sold in the fresh market is not “processed,” but it must still be prepared for marketing. Such preparations are important if one wishes to move product through conventional channels and include operations such as cooling, washing, sorting, grading, and packaging. As a group, these operations are referred to as “packing.” Packing operations are often performed by the grower, but the cost of the equipment required for packing some fruits and vegetables may lead growers to seek alternative methods of packing their product. Growers who are unable or do not wish to do their own packing may turn to companies, called packers, for help in preparing produce for market. Growers generally have two options when working with packers. They can sell their produce to a packer or they can hire a packer. When a grower sells product to a packer, the grower is usually quoted a flat price for a given quantity of product. The price offered is generally based on product quality and reflects the fact that it is the packer who will be affected by price changes that occur before the product reaches the market. Growers who do not want to sell their product to a packer can still benefit from the services of a packer by using a packer who will pack the product for a fee. After the product is packed it must be shipped to the next stage in the marketing chain. This involves assembling and selling loads of produce. The people who do this are called shippers. Shippers are usually located where the product is grown. Most packers are also shippers, but many growers who handle their own packing may still rely on a shipper to handle the assembling and selling functions. Of course some growers perform all three functions (grow, pack, and ship) themselves.

Wholesalers acquire grapes and other produce from shippers or grower-shippers and sell them to retailing businesses. Some wholesalers handle a broad range of grocery products, including, fresh produce. Others specialize only in fresh produce items. Figure 7 provides a breakdown of sales of fresh fruits and vegetables by different types of participants in the wholesale market. It is clear from Figure 7 that wholesalers specializing in fresh fruits and vegetables account for the largest portion of sales. Brokers and agents also play a significant role in wholesaling fresh fruits and vegetables (see box, page 25). In addition, wholesalers often specialize according to the type of retail customer being served. Some wholesalers cater specifically to supermarkets or convenience stores while others specialize in supplying restaurants and foodservice retailers. In many cases, large

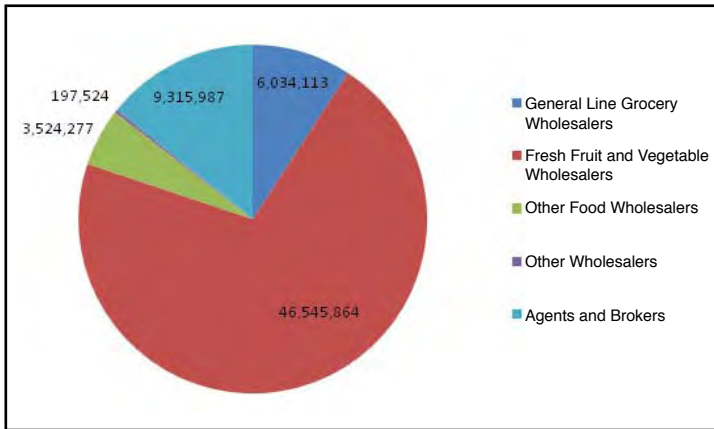


Figure 7. Sales of fruits and vegetables at the wholesale level by type of market participant (\$1,000s of dollars). (Source: U.S. Department of Commerce 2002 Economic Census)

retailers provide their own wholesaling functions through distribution centers that receive, warehouse, and ship a broad range of grocery items including fresh produce. Additional information about the structure, trends, and practices of fresh produce wholesale and retail markets is available in a report by the USDA's Economic Research Service (Dimitri, Tegene, and Kaufman, 2003).

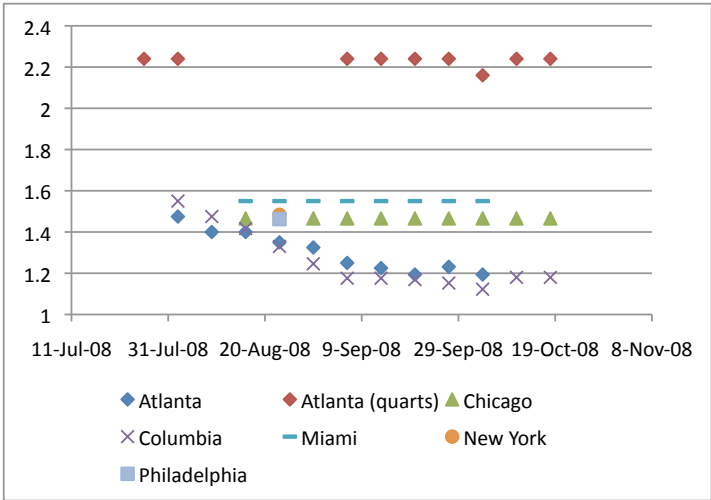
Marketing to regional wholesalers or large chain store distribution centers requires consistent quality, often requires significant volumes, and in some cases, year-round supplies. These buyers may have specific and demanding requirements for product uniformity, types of containers, cooling, transportation, and delivery of fresh produce. Retailers and wholesalers obtain products from a variety of sources around the country. Frequently, new growers will have to prove to potential buyers that they are serious about the business and are able to provide product that has been grown, packed, and in some cases, graded to meet specifications set by the buyer. Conforming to these requirements can be a difficult barrier for small-scale producers. One trend that favors smaller growers, however, is the growing interest in locally produced foods and especially locally-produced fruits and vegetables. As discussed previously, an increasing number of consumers are becoming more interested in buying fresh, high quality, locally-grown fruits and vegetables. This trend has led some large supermarket chains to feature locally-grown produce and to even build marketing campaigns around the fact that they offer locally-grown produce.

Obtaining information to support marketing through mainstream wholesale and retail channels also can be difficult. Many transactions between

shippers and wholesaling or retailing businesses involve private contracts and so market volume and price information is not in the public domain. However, the USDA's Agricultural Marketing Service (AMS) monitors transactions at terminal produce markets in large U.S. cities and maintains a database of prices. This makes it possible to observe prices being received at the wholesale level at different points in the growing season. For example, Figure 8 shows the presence and price of muscadine grapes in U.S. markets during the 2008 growing season and is based on data obtained from AMS. Muscadine prices presented in Figure 8 were for grapes originating in Georgia, South Carolina, or North Carolina. The AMS also gathers information about the volume of fresh fruits and vegetables being sent from major shipping point markets. This is a good source of information on volumes originating in major production regions, but the reporting of shipping volumes depends upon the number and participation of shippers so not all fruit shipments are represented in these data. AMS data on terminal market prices and shipping point volumes is available at <http://www.marketnews.usda.gov/portal/fv>.

Directories containing information on packers, shippers, processors, brokers, wholesalers, and others that participate in commercial fruit and vegetable market channels are also available. The Produce Reporter Company's Blue Book is one example and is available online at <http://www.bluebookprco.com> (registration required). The reference desk at major research libraries, especially

Figure 8. Weekly prices (\$/lb) and presence of muscadine grapes at U.S. terminal markets during the 2008 growing season. Unless otherwise specified, prices reflect bulk 20 to 25 lb containers. (Source: USDA, Agricultural Marketing Service).



those at universities with strong agricultural programs, will likely have a copy of the Blue Book that is available on request.

Making and Marketing Value-added Grape Products

Value-added food products are commodities whose value has been increased through the addition of ingredients, processes, or other enhancements that make them more attractive to the buyer and/or more readily usable by the consumer. Value-added products can open new markets, create recognition and appreciation for the farm, and extend the marketing season. Value-added products also complement tourism by giving visitors a tangible “piece” of their visit to take home.

It should be noted, however, that value-added agricultural activities do not increase commodity prices; rather they add value to products by performing activities usually done by others (Ellerman et al., 2001). The added value is reflected in higher market costs. The benefit to the farmer comes because the added value of the product is received at the farm level, not by someone else.



Figure 9. Value-added products made from muscadines and other grapes include juice, wine, jellies, jams and other sweet spreads, raisins, fruit rolls and other dried products, and extracts like seed oil, flavors, colors, and nutraceuticals.
(Photo: UA Enology and Viticulture Program)

The Role of Brokers in Marketing Fresh and Value-added Products

Many food producers and processors need help learning to function within the somewhat complicated food marketing and distribution system. A food broker can provide this help. A food broker is an independent agent who negotiates sales for food producers. These brokers are contracted by producers to sell their goods to independent wholesalers, chain wholesalers, and retail stores. Brokers or reps do not purchase product from the shipper or manufacturer, but make sales for them in their chosen market territory. They earn a commission based on the volume of goods that they are able to sell.

Brokers can act as a virtual sales staff by disseminating product literature, samples, and point of purchase materials, and by taking orders. Few producers have the time to perform these tasks themselves. If the producer chooses to hire a salesperson, they must pay that person a salary on a regular basis regardless of whether or not the product is moving into the marketplace. Since a broker works on commission, they are only paid when sales actually occur. Because food brokers are constantly working with retailers, they can keep the food producer up-to-date on market conditions. They also may perform such functions as rearranging product displays, moving products, and replacing food that has spoiled.

Using brokers can be the most cost-effective method for expanding access to markets. Since brokers often represent many different food lines, some retailers prefer to deal with them rather than with individual growers or manufacturers because one appointment with a broker can provide the retailer with exposure to a variety of products.

Some brokers specialize in facilitating fresh market transactions to grocery or foodservice channels. Others specialize in shelf-stable food products. Depending on the nature of your product, you may need to consider a "specialty" broker. These brokers specialize in representing products that fall into the specialty categories (relatively low-volume products). Examples of specialty goods include gourmet foods, products produced by small processors, or new products that do not suit the volume requirements of mass merchandisers. A broker specializing in products similar to the ones the producer is introducing will already have contacts with the most appropriate retail outlets and this may assist in launching the new product. There are fewer specialty brokers than "general" food brokers (who usually represent large national firms having well-known brand products). To locate the specialty broker nearest you, contact:

National Association for the Specialty Food Trade
120 Wall Street
New York, NY 10005
<http://www.specialtyfood.com/>

Adding value to grape products may be as simple as changing the way grapes are packaged for market. For example, packing bunches of grapes individually in plastic clamshell boxes for gourmet markets rather than selling fruit by the box or crate adds value to the fruit. Value is added when grapes are sold in gift baskets along with other locally-produced products such as bottles of locally-made wines or artisan breads from a local bakery. Still other approaches to adding value might be to simply add a bow to a box or basket of grapes or to sell boxes containing two or three different colored grape varieties.

Production of some value-added products may go beyond the simple steps of washing the fruit or creative packaging and may require processing the grapes into new, very different products. Processed grape products include:

- **Grape juice.** One of the simplest processed products made from grapes, juice is the liquid separated from the pulp by pressing the grapes. The composition of grape juice is similar to that of whole grapes, except that crude fiber and oils, which are primarily present in the seed, are removed. Quality characteristics of grape juice can be extremely variable since, to a large extent, the quality of the juice depends on the sugar level, acid content, and flavor constituents of the grapes, all of which develop as the grapes grow and mature. Cultivars vary dramatically in the levels of these constituents. In addition, since the composition of the grapes is affected by soil, climatic conditions, and vineyard management practices, the composition of a specific cultivar will vary within a vineyard and from one vineyard to another. Grape juice is well-recognized as a beverage and, in recent years, white grape juice has become popular as a healthy alternative to sugar syrup for use when canning fruits.
- **Juice concentrate.** Concentration of grape juice is a significant part of the grape processing industry (Siler and Morris, 1996). By removing some of the water from the juice, the sugar level is increased while shipping and storage costs are reduced. The aim in concentrating grape juice is to produce a form of the juice that is stable and easy to handle and store but that can be reconstituted to a high quality product as much like the original juice as possible. In addition to providing material for reconstitution, grape juice concentrate is mixed with other juices for the preparation of multi-fruit beverages, is used as a sweetener, and can provide a base for the production of sweet spreads.

- **Sweet spreads, like jelly, jam, preserves, and butter.** The process of making grape sweet spreads involves cooking the grapes and/or juice in and combination with sugar and pectin to a solids level appropriate for the desired spread. Jams, preserves and butter are made from whole or crushed fruit and differ mainly in the consistency of the cooked fruit. Jelly is made from juice and, ideally, is clear and free of fruit pieces.
- **Wine.** Wine is produced by fermenting grape juice. During fermentation, yeasts act on the sugars in the juice to convert them to alcohol and carbon dioxide. The character and quality of the wine is determined by the composition of the juice (see juice above), the fermentation style and method, and changes that occur naturally or are made to occur after fermentation. Arkansas Agricultural Experiment Station Research Report #983, "Considerations for Starting a Winery," available on-line at <http://arkansasagnews.uark.edu/983.pdf>, was prepared to serve as a starting point to investigate the many aspects of owning and operating a winery.
- **Vinegar.** The manufacture of vinegar involves two fermentation steps. The first is the winemaking process in which yeasts convert the sugars in the juice to alcohol and carbon dioxide. In the second, bacteria convert the alcohol to acetic acid. The two steps must occur separately since the acetic acid formed by the action of the bacteria retards yeast growth and activity. Because the alcohol level of the fermented wine must be low enough that it does not inhibit the action of the bacteria, wine should be diluted to about 10% alcohol content before beginning the vinegar-making process.
- **Miscellaneous processed products.** The popularity and versatility of grapes makes them desirable ingredients for a variety of products on the market. For example, fruit fillings for pies and cookies are often made from whole grapes while fruit rolls, a popular snack, are made by drying pureed grape pulp, alone or mixed with other fruit purees, flavorings and/or sweetener. Drying the whole grape yields raisins which are favorites alone, in combination with other dried fruits and nuts, and as ingredients in a variety of products.

In recent years there has been a great deal of interest in less-traditional products made from grapes. The discovery that not only the edible flesh of the grape but also by-products, like seeds and skins, contain components that are beneficial in promoting health (called nutraceuticals), has led to rapidly expand-

ing markets for grapes and their by-products. Grape seed extracts have been used as nutritional supplements in fruit-flavored beverages, cereals, snack bars, and dairy desserts such as yogurt. Grape seed oil is low in saturated fat and high in unsaturated fat, and contains significant levels of Vitamin E, yet is virtually tasteless. These characteristics have led to its increasing popularity as a cooking oil and as a food ingredient. Pigments extracted from grape skins are food ingredients that add both color and increased nutritional value to products.

The publication “The Muscadine Experience – Adding Value to Enhance Profits” (Arkansas Agricultural Experiment Station Research Report #974) discusses research conducted at the University of Arkansas to develop value-added products from muscadines. Also in this publication are some guidelines for development of various types of grape products. Although focused on muscadines, this discussion is applicable to all grape species making this publication a good reference for anyone planning to prepare and market value-added grape products. The publication is available online at <http://arkansasagnews.uark.edu/974.pdf>.

Unfortunately, generating income from value-added products made from grapes or any other commodity involves a lot more than simply deciding to make a product and then putting it on the market. In fact, developing and marketing value-added products can be a lengthy process, requiring substantial inputs of time and money, with no guarantee of success. Experts report that the average time spent developing a new food product is about two years, yet as many as 90 percent of these fail and are removed from the market within one to two years. This means a producer wanting to develop and market value-added grape products will find that one of the most profitable steps in getting the product to market is the time they spend researching the prospective product and its marketing prior to committing resources to product production.

Time also will be needed to develop the processes and procedures for making large enough amounts of the product for profitable sales. What seemed like an excellent idea in the home kitchen may become a problem as the recipe and preparation steps are expanded to make it into commercial-size batches. While some recipe variability is acceptable for home preparation, consistency is a requirement for commercialization. Achieving consistent, satisfactory results without sacrificing the uniqueness of the home-prepared product can be difficult, and, with some products, may prove impossible. Appendix B in “The

Muscadine Experience: Adding Value to Enhance Profits” provides an example of the steps involved in converting a home recipe to a commercial formula.

Pilot plant production provides an intermediate step between small scale, kitchen-level preparation and commercial production. Pilot plants are facilities where smaller batches of product can be manufactured using commercial-style equipment. This not only provides an entrepreneur with the opportunity to test their formulations and procedures on commercial equipment but also allows them to produce product to evaluate before committing to large batch production. The Food Processing Center in the Institute of Food Science and Engineering (IFSE) and the Department of Food Science, University of Arkansas, Fayetteville, provides such a facility. For information on using this Center, contact:

IFSE/UA Food Science Department
2650 N. Young Ave.
Fayetteville, AR 72704
Phone: 479-575-4040

An alternative to working in a pilot plant would be to have a test batch of the product manufactured by an approved food-processing facility (co-packer). Co-packing, also known as contract packaging, is when a company contracts with another company to manufacture and package foods that the original company will sell. The use of co-packers has become extremely popular with entrepreneurs who have a product idea but are not willing or are not able to invest in setting up a manufacturing facility to produce the product. Working closely with a co-packer experienced in product development and food processing can be invaluable to getting a recipe converted to a marketable product. The Arkansas Agricultural Experiment Station publication “Choosing and Using a Co-packer” (Research Report #985, available online at <http://arkansasagnews.uark.edu/985.pdf>) provides information on the pros and cons of using co-packers, locating co-packers in your area, and working effectively with a co-packer.

Once the product has been developed and production has begun, marketing becomes an issue. Most of the marketing options discussed previously for fresh grapes can be used with value-added products as well. However, producers of value-added products may want to expand their sales opportunities by placing their product in more traditional retail markets.

Conclusion

Ultimately, the potential for grapes as an alternative crop for small- and medium-sized farms is dependent on the existence of adequate market outlets to absorb the fruit produced at a price that can justify the costs of establishing and operating vineyards. If such markets can be developed, vineyards have the potential to command per-acre returns that greatly exceed returns from conventional crops.

References Cited

The references listed below were used as resources in the preparation of this manuscript. Many of these materials contain a great deal of additional information on growing and marketing alternative crops, especially grapes and grape products, which could be very useful to those considering growing these crops.

Bates R.P., L. Howard, and P.L. Brady. 2000. Adding Value to Arkansas Agriculture: Getting Started. Institute of Food Science and Engineering, Fayetteville, Ark. Contact IFSE, 2650 N. Young Ave, Fayetteville, Ark. 72704, phone 479-575-4040 for information on obtaining this publication.

Dimitri C., A. Tegene, and P. R. Kaufman. 2003. U.S. Fresh Produce Markets: Marketing Channels, Trade Practices, and Retail Pricing Behavior. United States Department of Agriculture, Economic Research Service, Agricultural Economic Report 825.

Ellerman, J., D. McFeeters and J. Fox. 2001. Direct marketing as a value-added opportunity for agriculture. Ohio State University Fact Sheet AE-8-01. Available on-line at <http://ohioline.osu.edu/ae-fact/0008.html>

Morris, J.R. and P.L. Brady. 2007. The Muscadine Experience – Adding Value to Enhance Profits. Arkansas Agricultural Experiment Station Research Report #974.

Morris, J.R. 2008. Considerations for Starting a Winery. Arkansas Agricultural Experiment Station Research Report #983.

Rainey, R.L., J. Hipp, and H. Hauk. 2006. Marketing your products directly. Arkansas Cooperative Extension Service Factsheet #FSA31-PD-6-06N. Available on-line at http://www.uaex.edu/Other_Areas/publications/PDF/FSA-31.pdf

Seideman, S.C., P. Brady, M. Heilman, and J. Morris. 2003. Starting a Food Business. University of Arkansas Cooperative Extension Service Publication MP388. Available on-line at http://www.uaex.edu/Other_Areas/publications/PDF/MP388.pdf

Siler, C.E. and J.R. Morris. 1996. High alcohol fermentation of grape juice concentrate. Proceedings 4th International Symp Cool Climate Vitic. And Enol. pp. 97-99

Strochlic, R. and C. Shelley. 2004. Community supported agriculture in California, Oregon, and Washington: Challenges and opportunities. California Institute for Rural Studies Report. Available on-line at <http://www.cirsinc.org/Documents/Pub0504.1.pdf>

Thomsen, M. R. 2008. “Vineyard Economics.” Presentation to the Mid-America Fruit Growers Conference, Nebraska City, Neb., January 17, 2008.

Whatley, B.T. 1987. How to Make \$100,000 Farming 25 Acres. Regenerative Agriculture Association, Emmaus, Pa.

Appendix A

Recommended Grape Varieties for Arkansas

Recommended Bunch Grapes for Central and Northern Arkansas

(Adapted from material prepared by: University of Arkansas, Division of Agriculture, Cooperative Extension Service)

Juice Grape Varieties

Niagara - A floral, strongly labrusca-flavored white grape. It ranks below Concord in cold hardiness. Requires soil of optimum fertility where it can have yields equal to or surpassing those of Concord. Suitable also as a table grape. Ripens about 1 week earlier than Concord. Used to produce white juice. Harvest date in Northwest Arkansas is typically August 20.

Sunbelt - Even-ripening juice grape for southern areas where Concord is not adapted. Patented by the University of Arkansas in 1993. It is an open pollinated selection of Concord. Berries are blue, large, seeded, and round. Clusters are small. The primary difference between Sunbelt and Concord is the ability of Sunbelt to ripen evenly in high-temperature climates like those found in Arkansas. The vine is productive, vigorous, moderately resistant to black rot and anthracnose, and highly resistant to powdery mildew and downy mildew. Harvest date in Northwest Arkansas is typically August 24.

Concord - Produces medium-sized clusters bearing large blue-black berries. Vigorous, productive, and hardy, Concord can be grown on a great variety of soils and under a wide variety of climatic conditions. Typical of labruscana vines, the fruit is classified as 'slipskin' due to the tough skin that separates readily from the pulpy flesh. Used to produce grape juice, jelly, sweet-finished wines, and eaten fresh. Has susceptibility to skin cracking and post-harvest shelling. Does not do well in especially warm areas since displays uneven ripening in excessively hot growing seasons, therefore should not be grown outside of Northwest Arkansas. Harvest date in Northwest Arkansas is typically September 1.

Catawba - This historically important variety is reportedly a chance seedling, selected in 1802, which originated in the Piedmont region of North Carolina and was named after the nearby Catawba River. It is a deep pink-skinned grape commonly used to produce sweet white, red, and pink juices. Suitable also as a table grape. Harvest date in Northwest Arkansas is typically September 10.

Seedless Table Grape Varieties

Venus - Blue seedless table grape with labruscana and muscat flavors. Slipskin. Moderate hardiness and medium vigor. Moderate resistance to fungal diseases but does require sprays for successful production. Early maturity (July 19 at Clarksville, Ark.).

Jupiter - Reddish-blue to blue seedless table grape with mild muscat flavor (exceeded only by Reliance in flavor appeal ratings). Large, non-slipskin berries and medium to large clusters. Hardy and medium vigor. Resistant to fruit cracking. Moderate resistance to fungal diseases but does require sprays for successful production. Early maturity (July 24 at Clarksville, Ark.).

Reliance - Pink seedless table grape with slight labrusca flavors. Medium-large clusters with medium-small berries. Slipskin. Very hardy and medium vigor. Highest rated flavor of all Arkansas varieties. Moderate resistance to fungal diseases but does require sprays for successful production. Skin cracking near maturity is a limiting characteristic in Arkansas. Early to mid-season maturity (July 29 at Clarksville, Ark.).

Mars - Blue seedless table grape with labrusca flavors similar to Concord. Very hardy and high vigor. Medium clusters with medium-sized berries. Slipskin. Highest resistance to fungal diseases among Arkansas varieties but does require sprays for successful production. Mid-season maturity (August 5 at Clarksville, Ark.).

Neptune - Yellow-green seedless table grape. Hardy and medium-low vigor. Large clusters with medium size berries. Non-slipskin. Moderate resistance to fungal diseases but does require sprays for successful production. Mid-season maturity (August 4 at Clarksville, Ark.).

Wine Grape Varieties

Red varieties:

Chambourcin - Blue-black cultivar with large clusters of medium-size berries. Moderately vigorous, but requires cluster thinning. Only red French-American

hybrid recommended for Arkansas. Good fruit intensity with spicy and sometimes earth characters. A complex hybrid variety with a vigorous spreading growth habit. Bunches are medium, well-filled and cylindrical, usually winged, medium-round berries with heavy, waxy bloom. Shows good resistance to downy mildew, powdery mildew, and phylloxera. Large clusters can lead to over-cropping.

Cynthiana/Norton - Blue-black to deep purple cultivar with small berries and very small clusters. Moderately vigorous. Both have been shown to be identical members of the *Vitis aestivalis* species. Good fruit intensity with distinctive aroma and flavor characters. Requires soils with good drainage for optimal growth and productivity. Crops are best enhanced with high training, such as Geneva Double Curtain, or Hudson River Umbrella. Birds find the small fruit very attractive. Fruit can display high pH and high titratable acidity.

White varieties:

Cayuga White - A hybrid cross between Schuyler and Seyval Blanc made in 1947 and released in 1972 by the Geneva (N.Y.) Research Station. Usually is used to make a fruity, white wine of mild intensity somewhat similar to Riesling. Noted for hardiness and bunch rot disease resistance, Cayuga should be picked at low sugars (below 21% soluble solids) to avoid over-ripe, sometimes labrusca-like, flavors. Young shoots reportedly fragile in strong winds. Fruit somewhat susceptible to splitting if rainfall occurs during harvest period.

Chardonnay - French-American hybrid cross released in 1990 from Geneva, N.Y. A hybrid of Seyval Blanc and Chardonnay. Noted for good cold-hardiness. Requires good locations (low tolerance of poorly drained soils) with long growing season. Can make high quality dry white wine.

Seyval Blanc - Yellow-white cultivar with large compact clusters of medium berries. Can have serious bunch rot problems due to the tight clusters. Medium to low vigor and medium hardiness. Moderate susceptibility to downy and powdery mildews. Makes excellent white wine. Requires cluster thinning. This variety is decreasing in importance.

Traminette - Released in 1996, variety derived from a Joannes Seyve 23.416 x 'Gewürztraminer' cross by H.C. Barrett, then of the University of Illinois, and evaluated by Cornell viticulturists. Vine has high vigor, requires no spraying against powdery mildew, but may need a couple of sprays for protection against downy mildew if season is unusually wet. This white wine variety is claimed to be superior in its balance of sugar, acid, and pH levels to that of the parent ('Gewürztraminer') and also has less bitter phenols. Very vigorous on rootstocks.

Vidal Blanc - White-yellow cultivar with large clusters. Moderately hardy and ripens late. Resistant to bunch rot but susceptible to tomato and tobacco ring-spot viruses. Makes semi-sweet, Riesling-like wines with fruity, floral flavors and good balance. Parents are Ugni Blanc of France, (a.k.a. Trebbiano of Italy) and Rayon d'Or, it usually needs cluster thinning to achieve superior results.

Vignoles - White-yellow, extremely fruity cultivar with small, compact clusters of small berries. Tends to have bunch rot problems due to compactness. Medium vigor and good hardiness. Ripens two weeks before Concord. Slightly susceptible to downy and powdery mildews. May make the best late-harvest wine of any French Hybrid. Currently very popular as a high-quality dessert wine because of its retained fruitiness, high acid and good balance.

Muscadine Grapes for Central and Southern Arkansas

Characteristics of muscadine cultivars found feasible for production in Arkansas are shown in the table on the following page. Performance can vary substantially in response to site, climate, and other environmental and biological factors. Cultivars marked with an asterisk (*) are recommended for growers in the southwestern part of the state and areas with similar climates. This table was taken from the Arkansas Agricultural Experiment Station publication "The Muscadine Experience, Adding Value to Enhance Profits, Newly Revised" (Arkansas Agricultural Experiment Station Publication #982, <http://arkansasagnews.uark.edu/982.pdf>). Also contained in that publication is a discussion of cultivar selection and production considerations for muscadines.

Cultivar	Flower Type ^a	Berry Wt. ^b	% Dry Stem Scar ^c	Yield ^d	Disease Resist. ^e	Cold Hardiness ^e	Flavor ^e	Sugar Content ^f	Uses ^g
Black Cultivars									
Black Beauty*	P	VL	W	H	F	G-VG	E	M	F,P
Cowart	S	M	W	M-H	F	F-G	G	M	F,P
Ison	S	L	W	H	E	G	G	M	F,P
Jumbo	P	VL	W	M	G	F	G	L	F,P
NC67A015-17*	S	S	VD	H	No data	No data	E	M	F,P
NC67A015-26*	S	VS	VD	H	No data	No data	E	H	F,P
Nesbitt*	S	L	D	M	VG	F	VG	M	F,P
Southern Home*	S	M	D	L	E	F	G	H	P
Sugargate	P	VL	W	VL	F-G	P	E	VH	F
Supreme*	P	VL	W	VH	VG	G	E	M	F,P
Bronze Cultivars									
Carlos*	S	S	VD	H	G	E	G	L	P
Doreen	S	S	W	H	G	G	G	VH	P
Early Fry	P	L	W	VH	G	G	G	H	F
Fry	P	VL	VW	M	F	P-F	E	M	F
Granny Val*	S	L	D	VH	F-G	P-F	G	VL	F,P
Late Fry	S	L	VD	H	E	E	G	VH	F
Scarlet	P	L	D	H	VG	G	VG	H	F,P
Sterling	S	S	W	M	VG	E	E	M	P
Summit*	P	L	D	H	G-VG	F	G-F	H	F,P
Tara	S	VL	VD	M	G	F	G	H	F,P
Triumph	S	M	VD	M	F-G	P	G	H	F,P

^a Flower type: S= self-fruitlet or perfect flowered; P = pistillate or female-flowered. If pistillate cultivars are planted, one or more self-fruited cultivars must also be planted to provide pollen.

^b Berry size (g/berry): VS = 2.8-4.0; S = 4.1-6.0; M = 6.1-7.9; L = 8.0-9.4; VL > 9.4

^c % Dry Stem Scar: VD > 85; D = 71-85; W = 51-70; VW < 50

^d Yield (lbs/vine): VH > 80; H = 61-80; M = 46-60; L = 31-45; VL < 30

^e Disease Resistance, Cold Hardiness, and Flavor: P = poor; F = fair; G = good; VG = very good; E = excellent

^f Sugar Content (%): VH > 18.5; H = 17.4-18.5; M = 16.1-17.3; L = 14.6-16.0; VL < 14.6

^g Uses: F = fresh market; P = processing

Appendix B

Harvest Dates for Produce Crops Commonly Grown in Arkansas

(Source: Arkansas Farm Bureau, Best Pick Farm Markets website:
www.arfb.com/commodity_marketing/best_pick)

When developing a direct marketing strategy, it is often desirable to select a variety of crops that are available throughout the growing season. This provides consumers a reason to return to the sales location multiple times and helps the grower assure a longer period for generating income. The chart below indicates the approximate harvest seasons for produce commonly grown in Arkansas. The ranges in dates result from a variety of factors including differences in geographical regions, varieties, etc.

Commodity	Harvest Season in Arkansas*
Apples	Aug. 30 – Oct. 31
Asparagus	March 15 – May 5
Beans	June 1 – July 15; Oct. 1 – Oct. 31
Blackberries	June 15 – July 31
Blueberries: Highbush	June-July
Rabbiteye	July - August
Cabbage	May1 – June 15; Nov. 1 – Dec. 5
Cantaloupes	June 25 – Aug. 20
Corn – Sweet	June 10 – July 15; Oct. 1 – Oct. 20
Cucumbers	May 15 – Oct. 20
Eggplant	July 5 – Sept. 5
Grapes: Bunch	July 10 – Aug. 15
Muscadines	Sept. 1 – Oct. 15
Nectarines	June 15 – Aug. 30
Okra	June 25 – Oct. 15
Peaches	June 15 – Aug. 30
Southern Peas	July 1 – Oct. 5
Peppers	July 5 – Oct. 31
Plums	June – July
Potatoes: Irish (White)	May 15 – June 15
Sweet	Aug. 15 – Oct. 31
Pumpkins	Sept. 15 – Oct. 31
Raspberries	June 25 - July 25
Squash: Summer	May 15 – July 15; Aug. 1 – Oct. 15
Winter	June 15 – Oct. 31
Strawberries	May 15 – June 15
Tomatoes	June 15 – July 31; Oct. 1 – Oct. 31
Watermelons	July 5 – Sept. 15



UofA
UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE