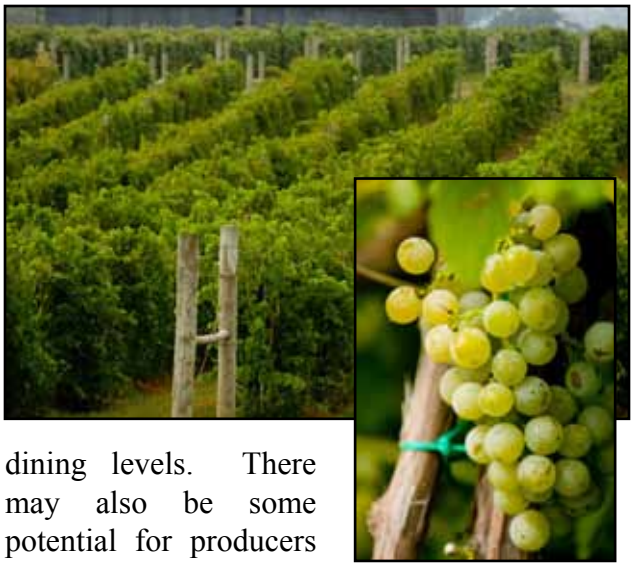
UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

Grapes

Introduction

Grapes (*Vitis* spp.) are suitable for either large-scale or small-scale commercial production. Typically three types of grapes are grown in Kentucky: Native American, hybrid, and European grapes. The climate in Kentucky is the limiting factor to grape production. Although American and hybrid varieties are better suited for production in Kentucky, European (*vinifera*) varieties are more desirable and potentially have the highest economic gain for grape growers and wine makers. However, *vinifera* varieties are more susceptible to winter injury and diseases resulting in a lower yield, reduced fruit quality, and often vine death. Growing grapes in Kentucky can be highly successful and rewarding if the varieties are matched to a specific site and proper production techniques are implemented.



Marketing and Market Outlook

It is critical that growers determine their marketing strategy *before* planting, since this is an essential consideration in selecting appropriate cultivars. Growers interested in commercial production should become associated with the Kentucky Vineyard Society, through which many education programs on grape and wine production are conducted.

A marketing system for Kentucky's table grapes does not exist. The volume of grapes that can be marketed in Kentucky through fresh market outlets is limited and currently concentrated at the farmers market and fine dining levels. There may also be some potential for producers wishing to explore and expand markets in more populated parts of the state, especially in the Louisville and Northern Kentucky areas.

Wine grapes do offer the opportunity to market larger volumes. Several wineries operating in the state are interested in purchasing certain cultivars of high-quality, Kentucky-grown grapes. Demand does differ by variety and close communication on variety selection with wineries is a critical part of long-term planning. More wineries are utilizing production contracts. Growers should also estimate their breakeven price per ton and compare their cost of production to recent prices paid by wineries.

Marketing and policy guidelines are dynamic for wine grapes and wineries. Careful attention should be paid to local and state laws governing the production and sale of wine. While wine grape production certainly can be profitable, there remains

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substantial policy uncertainty. That said, many new wineries are emerging onto the market in and around Kentucky, creating additional market opportunities for quality wine grapes.

Production Considerations

Cultivar and plant selection

There are many grape cultivars from which to choose. Each type of grape has its own characteristic and each cultivar within these types has its own advantages and disadvantages. While all species of grapes can be used to make wine, the quality of the finished product is influenced by cultivar, fruit quality, and vine management practices. Variety selection will be based on site suitability and the target market, whether that is a buyer contract or consumer demand. Select well-adapted cultivars that are cold tolerant and have increased disease and pest resistance for their locale.

Growers should purchase true-to-name nursery stock that is certified virus-free. Many feel that top-grade, 1-year-old plants are best.

Site selection and planting

Sites for grapes should have full sun exposure, good air circulation, and well-drained soil. The best sites are above the level of adjoining land, so that cold air drains away from the planting. Gently rolling hillsides with well-stabilized soil are fine; however, cultural operations are easier on level or gently sloping sites. Vines are normally planted in the spring after the risk of freezing temperatures has passed.

Trellis construction

Grapevines require a trellis, or training system, for vine support and the production of a high quality crop. The training system should be chosen prior to planting and be in place by the start of the second growing season. The training system should be strong, long-lived, and appropriate for grape variety and vineyard site. This is a major vineyard investment which should last 20 years or more.

Maintenance

Grapevines require regular maintenance including training, pruning, and canopy management. Weed control under trellises, maintaining row middles, and post-planting fertilization will also be required.

Training begins with young vines at the end of the first season and continues on mature vines. In Kentucky, many grape producers prefer to develop a vine that has two trunks of different ages to reduce losses in case of winter injury to one trunk.

Vineyards require regular pruning to aid in the production of large crops of high quality fruit and to keep the vines healthy. Vines are normally pruned from late winter to early spring after severe weather is past.

Canopy management commonly includes shoot thinning, shoot positioning, shoot hedging, cluster thinning, and leaf-pulling. The purpose of canopy management is to increase sunlight exposure to the grapevine canopy, provide better spray coverage, and to find the balance between vegetative and fruiting growth that will maximize grape production each year. Finding this balance will improve fruit quality, cold hardiness, and longevity of the vineyard.

Pest management

Black rot is the most important disease of grapes in Kentucky. Other common diseases include anthracnose, Botrytis gray mold, crown gall, downy mildew, Phomopsis cane and leaf spot, and powdery mildew. Fungicide applications, along with good cultural practices, are critical for the management of these diseases.

Insect pests such as flea beetle, grape berry moth, grape cane gall maker, green June beetle, Japanese beetle, leafhopper, and phylloxera can all attack grapes. Regular scouting is necessary to monitor diseases and insect populations. Grapes usually require 12 to 15 pesticide sprays per season.

Weeds are managed with herbicides and/or mechanical cultivation. Since few herbicides can be used on young vines, many growers use black plastic mulch beneath vines for the first three years of growth. Most grape varieties are easily damaged by the vapor or drift of either 2,4-D or Dicamba.

Birds can cause serious crop losses during some years, often depending on the availability of other wild food sources and water. Netting and noisemakers are the two most commonly used methods of bird control.

Harvest and storage

Harvesting is the busiest and most labor intensive part of grape production. Table grapes can be packed into 1-, 2-, or 4-quart containers or vented plastic bags, depending on the buyer's preference.

Labor requirements

Labor needs per acre during the first and second years include planting (30 hours), training (30 hours), and maintenance (24 hours). A fruiting vineyard will require vine and trellis maintenance (80 hours) along with spraying and mowing operations (48 hours). Harvest will require approximately 48 hours per acre.

Economic Considerations

Producers should carefully examine their own costs and production situation before beginning production. Kentucky's climate and developing grape market can lend considerable risk for producers who do not pay the utmost attention to marketing and management. Initial investments include land preparation, purchase of planting material, and trellis installation. The following estimates are based on University of Kentucky 2008 grape production budgets that have been updated to 2010. Refer to *Grape Cost and Return Estimates: Summary and Assumptions* for information on the variables taken into consideration when formulating these budget figures.

TABLE GRAPES

Establishment costs for table grapes are estimated at about $9,000 per acre over a four- to five-year period. These establishment costs are recouped through year six. Most vines should produce a fair crop the third year and reach full bearing potential in four years.

Since returns vary depending on actual yields and market prices, the following per acre returns to land and management estimates are based on three different economic scenarios. Conservative estimates represent the University of Kentucky's statewide average cost and return estimates.

Pessimistic	*Conservative*	*Optimistic*
$(879) *	$2,970	$5,070

WINE GRAPES

Wine grapes will be economically feasible only in areas of the state where climatic risk for production is minimized and market prices approaching $1,000 per ton are assured. Returns per acre vary considerably depending on the varieties grown and the price paid per ton. A mature planting of European-American hybrids with a yield of 6 tons per acre and gross returns of $5,700, could return $1,750 per acre to land and management.

**Parentheses indicate a negative number, i.e. a net loss*

Selected Resources

- Crop Estimates in Vineyards (University of Kentucky, 2007) http://www.ca.uky.edu/agc/pubs/ho/ho86/ho86.pdf
- Grape Cost and Return Estimates: Summary and Assumptions (University of Kentucky, 2010) http://www.uky.edu/Ag/cdbrec/grapebudget10.pdf
- Grape Production Budgets – French-American Hybrid and American Wine Grape Varieties (University of Kentucky, 2008) http://www.uky.edu/Ag/cdbrec/european08.pdf

- Grape Production Budgets – Table Grape Varieties (University of Kentucky, 2008) http://www.uky.edu/Ag/cdbrec/tablegrapes08.pdf
- Grape Production Budgets – Vinifera Wine Grape Varieties (University of Kentucky, 2008) http://www.uky.edu/Ag/cdbrec/vinifera08.pdf
- Growing Grapes in Kentucky, ID-126 (University of Kentucky, 1997) http://www.ca.uky.edu/agc/pubs/id/id126/id126.htm
- Midwest Small Fruit and Grape Spray Guide, ID-94 (University of Kentucky et al., 2010) http://www.hort.purdue.edu/hort/ext/sfg/
- Midwest Small Fruit Pest Management Handbook, B-861 (University of Kentucky et al., 2004) http://ohioline.osu.edu/b861/index.html
- Commercial Grape Production in Kansas, MF-2370 (Kansas State University, 2004) http://www.ksre.ksu.edu/library/hort2/mf2370.pdf
- Midwest Grape Production Guide, B-919-05 (Ohio State University) http://ohioline.osu.edu/b919/index.html
- Organic Grape Production (ATTRA, 2006) http://www.attra.org/attra-pub/grapes.html
- Production Guide for Organic Grapes (Cornell University, 2010) http://nysipm.cornell.edu/organic_guide/grapes.pdf
- Southern Region Small Fruit Consortium (Clemson University, North Carolina State University, Virginia Tech, University of Arkansas, University of Georgia, University of Tennessee) http://www.smallfruits.org/
- Winery and Vineyard Feasibility Workbooks (Agricultural Marketing Resource Center, 2010) http://www.agmrc.org/commodities__products/fruits/wine/winery_and_vineyard_feasibility_workbooks.cfm

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