

2010 NC Vineyard Survey

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Introduction

In 2010, the Appalachian State University (ASU) Enology and Viticulture Program initiated a preliminary survey of North Carolina vineyards with the goal of collecting varietal and cultural information relevant to the NC industry. Interest in this information was voiced through a series of three open meetings held by the Enology and Viticulture program with grape growers and winemakers across North Carolina.

Survey data was collected in-person by ASU Enology and Viticulture research assistant Stephanie Smith. Participants responded to 67 questions covering the following topics: Acreage and Yield, Varieties Grown, Vineyard Management, Disease and Pest Pressure, Sustainable Practices, and Cost Benefit Analysis.

More than 30 vineyards were contacted for interviews from July 1 through August 30; fifteen vineyards were available for interviews. Of those interviewed, the Eastern, Mid/Yadkin Valley, and Western regions were each represented by five vineyards.

Results

I. Acreage and Yield

Acreage

The age, size, and stage of production varied greatly among the visited vineyards.

- Interviewed vineyards ranged in establishment year from 1972 to 2008.
- The average age of vineyards was 10 years; 33% were established in 2002-2003.
- Vineyard acreage spanned up to 35 acres in production.

Average Vineyard Age		Average Vineyard Acreage	
Region	Average Age (yrs)	Region	Average Acreage
West	5.6	West	1.2
Mid	10	Mid	19.5
East	14.4	East	11

Yield

Many vineyards did not have precise figures for annual production, primarily due to the young age of vines or lack of production records. For the older and more established vineyards, annual production ranged from 2-8 tons per acre. Growers of muscadine grapes generally maintained production in the upper range.

- Only 40% of surveyed vineyards could estimate yield.
- Of vineyards interviewed, 67% use only estate-grown grapes for wine production, and 27% reported buying additional grapes for their winery.
- 33% of vineyards reported selling their grapes.
- 67% of vineyards interviewed currently operate established wineries. An additional 13% are in the process of winery construction.

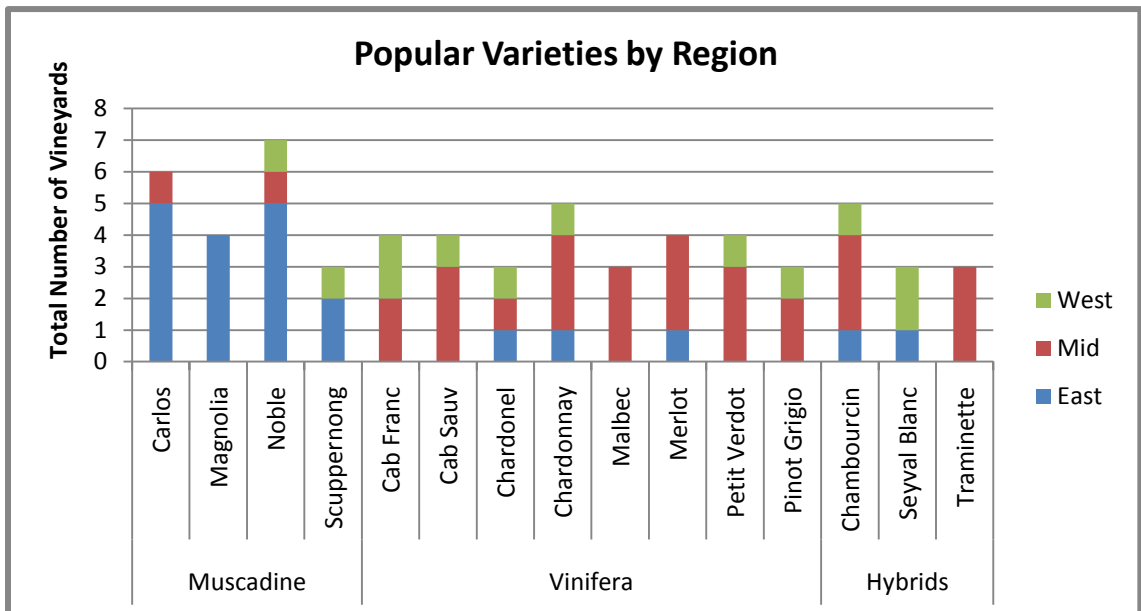
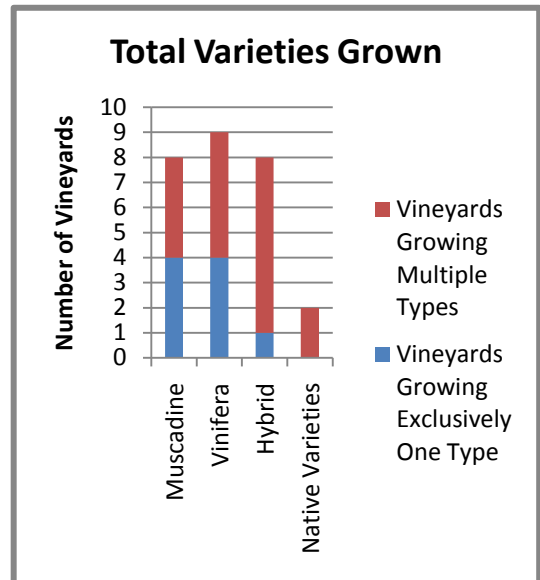
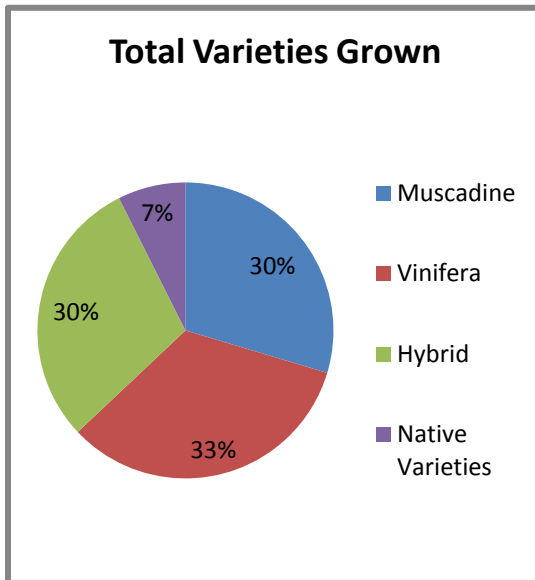
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II. Varieties Grown

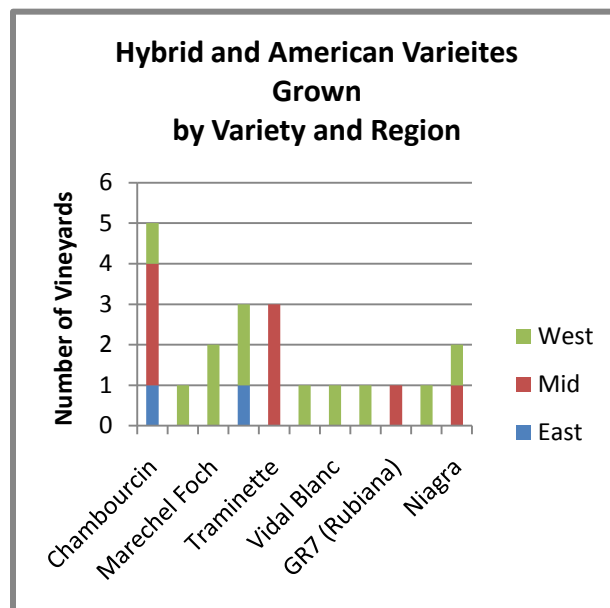
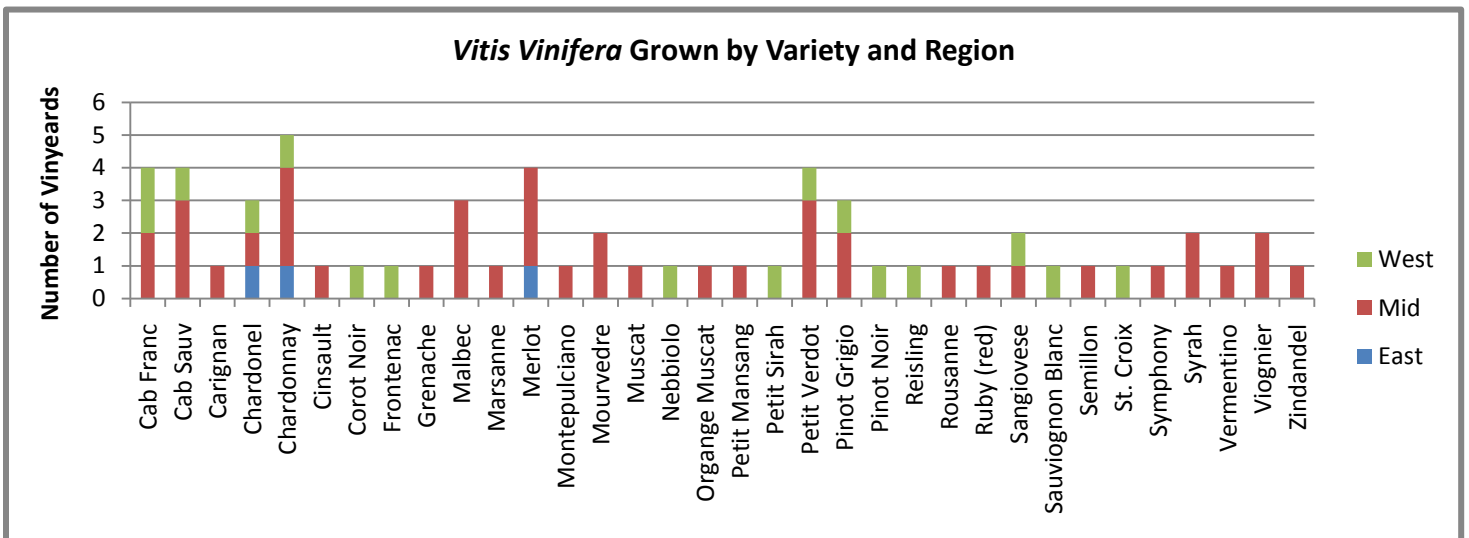
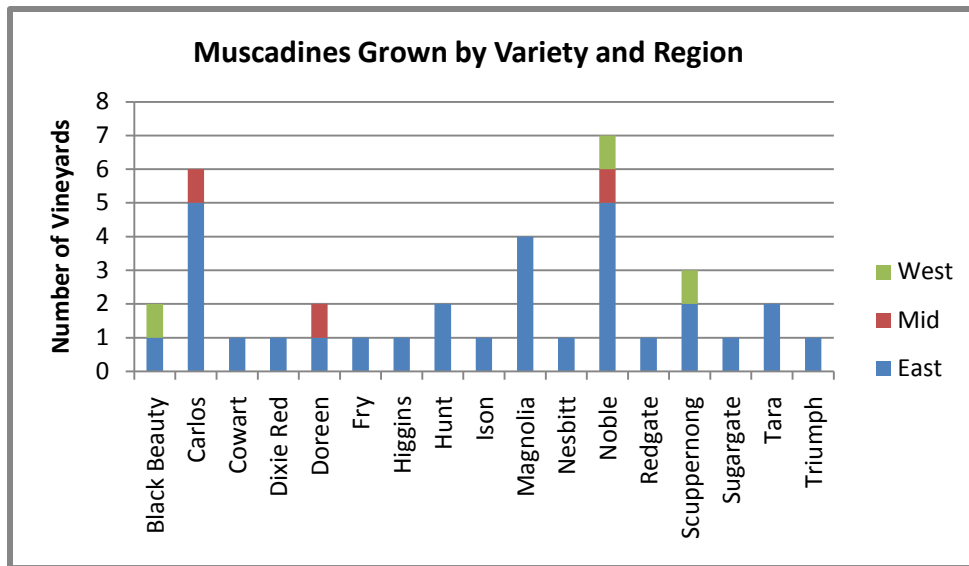
Vineyards reported growing 62 species of grapes collectively, including those of *Vitis rotundifolia*, *Vitis vinifera*, the North American or *Vitis labrusca* and *Vitis aestivalis* group, and French-American Hybrids. No vineyards surveyed sell fruit wines, but 4 make various fruit wines in-house.

Of surveyed vineyards:

- 53% grow muscadines, 27% exclusively.
- 60% grow *vinifera*, 27% exclusively.
- 53% grow hybrid grapes, 7% exclusively.
- 13% grow American native varieties, none exclusively.
- 60% vineyards grow one genus group exclusively, while 40% grow a combination.



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Growers were surveyed on their opinions based on experience with each variety. There was no discernable agreement among growers regarding:

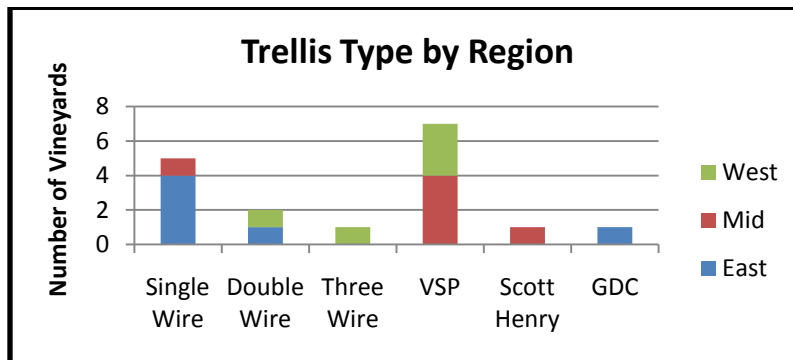
- which varieties sell the most wines
- which varieties make the best wines
- which varieties are least challenging to grow by region
- which varieties are most challenging to grow by region

The only exception is slight consensus that muscadine varieties pose fewest challenges in general.

III. Vineyard Management

Trellis Type

- 70% of Mid and Western vineyards use VSP.
- 80% of Eastern vineyards use a single wire trellis system.



Pruning Methods

Sixty percent of vineyards reported using spur-pruning methods, while 20% use cane pruning. An additional 20% use both spur and cane methods. Many vineyard managers voiced the concern that cane pruning involves too much labor. However, those that use cane pruning reported that the benefits justify the input.

Soil Nutrition

Of surveyed vineyards, 67% reported monitoring soil nutrition. Of these, all but one use NC State University for their analysis. Further, most refer to soil analysis to determine the degree and method of fertilization to be applied to the vineyard.

- 60% reported monitoring soil nutrient levels
- 87% fertilize the vineyard
- 67% of vineyards use chemical fertilizer, while 20% use mulch or compost exclusively
- 40% use a combination of mulch or compost and chemical fertilizers
- 27% reported using cover crops in vineyard

Irrigation

Fifty-three percent of vineyards have irrigation systems, all of which are drip systems. Further, all irrigated vineyards are located in the Eastern and Yadkin Valley regions. Most vineyard owners reported installing these systems because of long periods of drought, but also use them for fertigation. None of the Western vineyards surveyed utilize irrigation due to the amount of rainfall in the mountains. Additionally, only 20% of surveyed vineyards monitor soil moisture, all of which are in the Mid-state region.

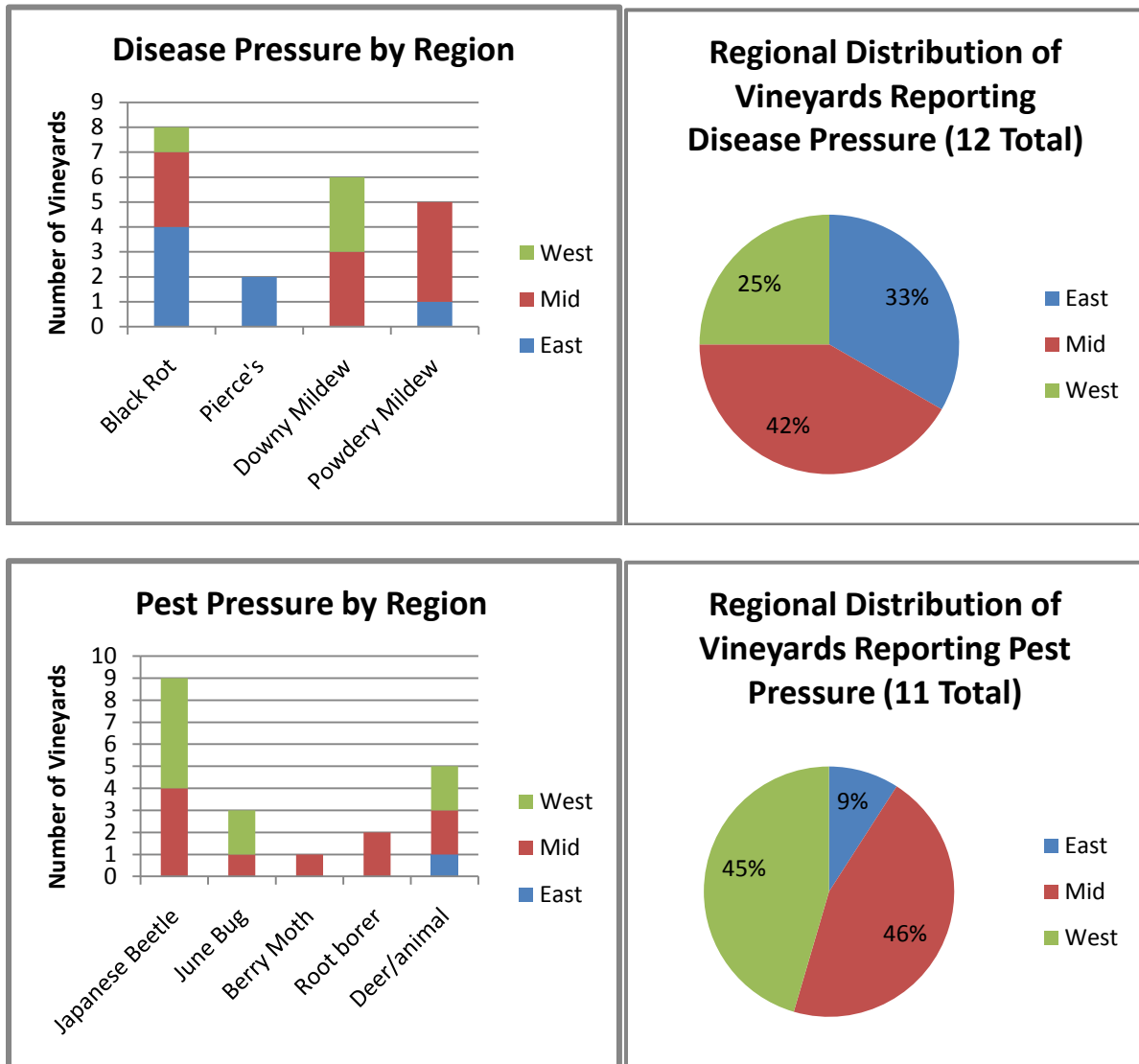
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Vineyard Floor

- 67% of vineyards use chemical herbicides, leaving on average a weed-free strip of 3.5 feet under vines.
- 50% of Mid and West region vineyards are concerned with erosion.
- 20% of Mid and West region vineyards are concerned with compaction.
- No vineyards in the Eastern region expressed concern with erosion or compaction issues.
- 27% of vineyards reported using cover crops between or under rows.

IV. Disease and Pest Pressure

Vineyards in the Mid-NC region reported the most disease and pest pressure in the state. It is probable that as Western vineyards continue to expand they will encounter an increase of disease and pest pressures related to higher relative humidity and rainfall.



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V. Sustainable Practices

Through the course of this study, only one vineyard was identified that currently maintains USDA Organic Certification. Although the number of certified vineyards is limited throughout North Carolina, several reported that they do practice organic, biodynamic, and/or integrated pest management techniques.

- 40% of growers surveyed used some sustainable techniques in the vineyard.
- Within that 40%, the average length of experience per vineyard with sustainable techniques is approximately 5 years.
- One vineyard is currently USDA certified; a second vineyard surveyed had been certified in the past and continues sustainable practices.
- 9 of 10 conventional vineyards expressed interest in sustainable techniques.

Comments from vineyard managers with experience in sustainable viticulture:

- Marketing value of certified grapes depends on the values of your consumers
- Benefits: Can be a cheaper growing system especially for muscadine grapes; Healthier for vineyard employees
- Challenges: Vineyard manager must keep up with prevention and not get behind; lower productivity; keeping up with certifiers and paperwork

Additionally, 14 of 15 (93%) vineyard managers reported being members of relevant organizations such as the NC Winegrowers Association, the NC Wine and Grape Council, the NC Muscadine Grape Association, the High Country Winegrowers Association, and the Carolina Farm Stewardship Association. Keeping connected to continued education and information in the field through such memberships is a commonly accepted practice in sustainability.

VI. Cost Benefit Analysis

Most vineyards did not have clear estimates for average costs of vineyard production, or chose not to disclose that information. Vineyards that could not provide cost estimates were excluded from this section. With available information, production costs ranged from \$350 to \$12,050 per acre. Of those vineyards that reported or estimated the cost, those practicing some sustainable techniques reported the lowest cost per acre.

Summary

The outcome of this survey has been to lay the groundwork for more comprehensive studies. These results have highlighted areas where very little consensus exists among North Carolina grape growers concerning vineyard issues. The topics for continued focus include determining the most amenable varieties for each region, in-depth information on the intensity of disease and pest pressures, and comparative production costs. Future research should be inclusive of more vineyards in order to achieve a comprehensive overview of the state of wine-grape production in North Carolina. Increased participation by winegrowers in future studies will directly contribute to the creation of more valuable, useful, and practical vineyard knowledge.

In addition, and with grower support through the submission of grape samples for chemical analysis, the Enology Services Lab at Appalachian State University will create a bank of annual data on grape development. The combination of this concurrent lab work with field research methodologies will prospectively generate a wealth of information for the enhancement of wine-grape production in North Carolina.