Summary of year-1 progress

Improved grape and wine quality in a challenging environment: An eastern US model for sustainability and economic vitality

Objective 1. Develop applied means of defining and achieving vine balance under variable eastern US conditions

Progress: Field experiments were initiated in (a) the Finger Lakes of New York, (b) the Yadkin Valley of North Carolina, and (c) continued at Winchester, Virginia to research vineyard floor management practices and other techniques that could be used to more favorably affect vegetative growth of vigorous grapevines. All three experiments have common data collection measures of crop yield components, vine vegetative growth measures, and fruit chemistry, but also include data collection designed to address local concerns or considerations, including soil moisture leachate, vine ecophysiology, and resulting wine quality attributes. The specific treatments are generally applicable to the range of conditions that exist throughout the eastern United States, but are tailored to local conditions. For example, annual cover crops are used instead of perennial cover crops in the Finger Lakes, due to the need to hill and de-hill grapevine graft unions for winter protection. The Finger Lakes experiment used Cabernet franc grapevines and was equipped in late 2010 with subsoil catchment basins to collect soil moisture to analyze for leaching nutrients and pesticides as a function of varied vineyard floor management practices. The North Carolina study, also using Cabernet franc grapevines, has varied herbicide widths under the trellis to generate a response curve of vine response to weed-free area. The Virginia experiment was in its sixth year in 2011 and explores several rootstocks, root restriction, as well as use of under-trellis cover crops to regulate vine growth. All three experiments consider the vineyard system in testing practical methods of altering vine balance – vine balance being the general vegetative performance of the vine relative to crop level, crop exposure, and ultimate wine quality. A fourth experiment was begun at Glen Manor Vineyards near Front Royal, Virginia in early 2011 to evaluate several rates and timing of two different forms of nitrogen fertilizer to Sauvignon blanc grapevines that have been grown with under-trellis cover crops for more than 5 years. This research is a linear extension of the under-trellis cover cropping work, which necessitates a more efficient means of supplying grapevines’ need for fertilizer nitrogen under the competitive system of vine size suppression. An additional area of research under Objective 1 explores improved methods of assessing and quantifying canopy architecture, and putting these tools in growers’ hands.

Objective 2. Develop research-based recommendations for optimally matching grape cultivars with site-specific environmental conditions

Progress: Grape variety evaluations as part of the multi-state research project, “NE-1020” were continued in 2011 in North Carolina, Maryland, Pennsylvania, New York, Ohio and Connecticut. The individual states’ results and reports on these trials will form the basis of one component of a proposed Geographical Information System (GIS) designed to help users evaluate potential vineyard sites and to suggest suitable species and grape varieties that might be grown at those sites. A sub-objective of Objective 2 is the development of a sophisticated, on-line GIS application for vineyard site analysis. A prototype, eastern United States GIS was developed in 2011, and incorporates PRISM climate data, Natural Resource Conservation Service’s Soil Survey Geographic (SSURGO) data, and digital topography data on a high-speed server on the Virginia Tech campus. The eastern US vineyard site evaluation tool,
itself is based in part on a Virginia vineyard site evaluation tool (http://vmdev.cgit.vt.edu/Vineyards/) initiated in an earlier project, but further refined under the umbrella of this USDA/NIFA project.

**Objective 3.** Understand and capitalize on consumer attitudes towards eastern US wines through market exploration of consumer perception/demand, willingness to pay, and assessment of product quality-assurance programs

**Progress:** Activity within this objective was proposed for year 2 and beyond; however, principal investigators Rickard (Cornell) and Safley (North Carolina State University) both initiated consumer purchasing preference studies or surveys in 2011.

**Objective 4.** Implement a broad range of innovative learning resources to improve grape and wine quality, inform vineyard site evaluation, decrease production costs, train trainers and workforce labor, and ultimately improve the competitive basis of the eastern US wine industry

**Progress:** A range of activities were proposed under objective 4 and many were started or completed during the first year. Project Director Wolf convened the first annual meeting of project investigators and Project Advisory Council members in July 2011, the output of which was a review of preliminary progress and needs assessment. A baseline knowledge survey was conducted during 2011 by principal investigator Jayaratne (NCSU). The survey was circulated among 1094 industry members, 25% of whom responded. The response data will be integrated into a more detailed planning document being used by the principal investigators going into year 2 and beyond. Educational events were conducted in several of the participating states and several of the project principal investigators have also been involved with eViticulture, eXtension’s national grape Community of Practice.