Year-end report to Virginia Wine Board
30 June 2007

TITLE: Wine grape cultivar evaluations

Principal Investigator: Tony K. Wolf
VA Tech FRS #: 447732

Award amount: $3,646
Amount remaining at year-end: $3,138

Objectives: To evaluate novel wine grape cultivars in the Eastern Piedmont of Virginia

Comment on funding: I regret that this project had such a high balance remaining at year-end. With delays in grant approval, I chose to forego hiring part-time wage help for harvest, as originally planned. Our wage help needs in the spring of 2007 were also lower than expected, because more of the work was done by staff at the Southern Piedmont AREC. I take responsibility for the unspent balance remaining with this award and will vow to more accurately assess my financial needs and to fully expend awards in the future.

Progress: Since July 2006, the vineyard at Southern Piedmont AREC (Blackstone, VA) has received regular maintenance and harvest of variety plots occurred between late-August and mid-October.

General observations to-date: Previous problems with raccoons and birds were largely avoided in 2006 by adding additional charged wires to the electric fence and by applying bird netting prior to veraison. Due to its very early ripening, we still lost most of the fruit of Aleatico to a combination of birds and rots. The most notable, negative feature of the vineyard in 2006 was the prevalence of Pierce's Disease (PD) symptoms. This bacterial disease is limited to areas with relatively warm winters, the frequency of which has been associated with a northern extension of the range of PD (http://www.ext.vt.edu/pubs/viticulture/463-020/463-020.html). A survey of the Blackstone vineyard revealed that approximately 18% of vines expressed apparent PD symptoms in 2006 (Figure 1). Symptoms were observed on as few as 2 shoots per vine, and in other cases the entire vine was affected. An additional 3% of the planting was dead in 2006, although vine death was not necessarily due to PD. Pierce's Disease was confirmed in a subset of symptomatic vines by using a commercial immunoassay kit. Vine pruning treatments and the use of soil-applied insecticide are proposed for 2007 to help manage PD incidence. It is too early at this point to state relative susceptibility of cultivars at Blackstone to PD.

Primary fruit chemistry at harvest in 2006 is shown in Table 1. Several varieties appear to be promising: Petit Manseng, the white-fruited variety from the Jurançon, retained its distinctive flavors and exhibited a good balance of sugar and acidity at harvest. Cabernet Sauvignon #337, Rousanne, Tinta cao, and Norton also tasted very good at harvest. Generally, the grapes at Blackstone have had higher pH values at harvest, for a corresponding sugar concentration, than what we have seen at the cooler Winchester site. This is likely due to the higher heat summations at Blackstone, compared to Winchester.

Viognier and Traminette, which are also grown at Winchester, have not expressed as intense flavors or aromas at harvest at Blackstone as they do at the Winchester site. Again, that may reflect the greater heat experienced at Blackstone.

We've lost several of the Tempranillo vines to vascular pathogens (e.g., crown gall) and/or winter injury. It's uncertain at this point whether we simply started with poor nursery stock or whether the vines are not adapted to the Blackstone environment. The fruit matures early and has had mediocre quality. NY73.0136.17 (Noiret) colors early, but does not acquire perceptible flavors or aromas or soluble solids levels greater than about 18° Brix. Aleatico and Muscat blanc also mature early. These are both aromatic varieties and (consequently) suffered significant depredation by raccoons and green June bugs in previous years. Both Aleatico and Muscat blanc continue to suffer losses to hornets and wasps. Interestingly, Muscat blanc was nearly devoid of flower clusters in 2006 – no other varieties expressed this problem and the Muscat blanc canopy was not overly shaded in 2005. Tannat and Norton looked reasonably good at harvest, although the Tannat was not as ripe as desired. Our chief problem with Tannat in 2006 was a significant underestimation of cluster weight, which led to excessive crop. We have been able to achieve much lower acid levels at Blackstone than at Winchester with Norton, a reflection of the lower vigor and more open canopies at the Blackstone site.

Selected components of crop yield for the 2006 season are presented in Table 2. We had arbitrarily targeted 5.0 tons/acre in 2006; however, we greatly exceeded that goal in many cases due to larger than expected cluster weights (bold font values in Table 2).

The wines being made from the Blackstone fruit will be subjected to chemistry and sensory evaluations and will help identify varieties that are relatively superior performers in the relatively warm part of the state.

Soil-applied insecticide (Admire-Pro) was applied to 3 of the 6 replicates of each variety in June 2007 (two applications). The insecticide is systemic and may offer some reduction in the leafhopper transmission of the Pierce's Disease bacterium. As of June, PD symptoms were not apparent with any vines. Those symptoms did start to appear in August and vines will be rated on 23 August for PD symptoms.

Project is on track.

Recent presentations:

Zoecklein, B.W., T.K. Wolf, L. Pelanne, and S. Birkenmaier. Evaluation of Viognier grapes and wines in response to VSP, Smart-Dyson, or Geneva Double Curtain training in northern Virginia, USA. Poster presentation at 2006 International Cool Climate Viticulture and Enology Symposium, Christchurch, NZ, February 2006.

Wolf, Tony K. Response of Traminette to rootstock and three different training systems. Grower presentation at the NC State University's Viticulture Workshop, 17 November 2006, Raleigh, NC.

Wolf T. K. and B. Zoecklein. 2005. Training system and rootstock effects on Traminette fruitfulness, fruit yields, and vegetative performance. American Journal of Enology and Viticulture. 56:4 (abstract). Presented at 2005 ASEV/ES annual meeting, St. Louis, MO.

Pelanne, L., B. Zoecklein and T.K. Wolf. 2005. Effect of training system and rootstock effects on Traminette free volatiles, glycosides, and wine sensory attributes. American Journal of Enology and Viticulture. 56:4 (abstract). Presented at 2005 ASEV/ES annual meeting, St. Louis, MO.

Table 1. Harvest date and primary fruit chemistry of varieties/clones being evaluated at the Southern Piedmont Agricultural Research and Extension Center, Blackstone, Virginia, in 2006.

Variety (clone)	Harvest date	Brix	pH	TA (g/L)
Aleatico	- [z]			
Cabernet franc ("#313")	13 Oct-06	19.1	3.76	4.60
Cabernet franc (#1)	13 Oct-06	19.6	3.71	4.49
Cabernet Sauvignon (#337)	27 Sept-06	18.8	3.72	6.29
Chardonnay (#96)	30 Aug-06	20.5	3.74	5.58
Mourvedre	27 Sept-06	17.7	3.70	4.98
Muscat blanc	- [y]			
Norton	12 Oct-06	21.4	3.99	5.94
NY73.0136.17 (Noiret)	19 Sept-06	17.3	3.58	5.49
Petit Manseng	18 Sept-06	23.2	3.47	6.93
Petit Verdot	Not harvested	20.3	3.65	6.43
Rousanne	18 Sept-06	18.5	3.73	5.83
Tannat	21 Sept-06	21.1	3.56	6.56
Tempranillo	- [z]	18.3	3.82	5.62
Tinta cao	18 Sept-06	19.1	3.70	6.25
Touriga nacionale	20 Sept-06	18.6	3.73	5.39
Traminette	30 Aug-06	17.8	3.55	6.14
Vidal blanc	30 Aug-06	19.0	3.63	6.29
Viognier	30 Aug-06	21.6	3.89	4.84

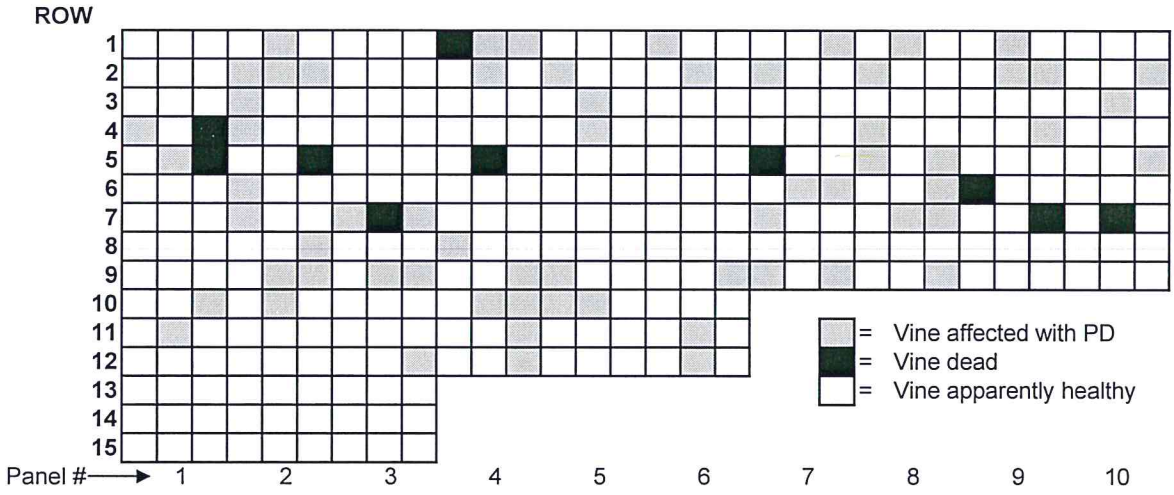
- [z] Not harvested due to early bird, insect, and/or fruit rots.
- [y] Muscat blanc was almost entirely devoid of flower clusters in 2006.

Table 2. Components of 2006 crop yield for varieties/clones being evaluated at the Southern Piedmont Agricultural Research and Extension Center, Blackstone, Virginia, 2006.

Variety (clone)	Berry wt. (g)[yz]	Cluster wt. (g)[x]	Crop per vine (lbs)	Tons per acre equivalent[w]
Aleatico	-[z]			
Cabernet franc ("#313")	1.88	152.7	17.8	4.84
Cabernet franc (#1)	2.02	195.5	22.9	**6.24**
Cabernet Sauvignon (#337)	1.77	195.1	31.4	**8.56**
Chardonnay (#96)	1.65	174.6	19.9	5.42
Mourvedre	2.25	375.4	31.2	**8.49**
Muscat blanc	-[y]	.	.	.
Norton (GDC training)	1.68	85.6	29.6	8.08
NY73.0136.17 (Noiret)	2.35	197.0	14.0	3.83
Petit Manseng	1.29	114.9	20.0	5.45
Petit Verdot	1.83	.	.	.
Rousanne	2.21	172.3	18.6	5.07
Tannat	2.15	371.0	33.0	**8.99**
Tempranillo	2.94	-[z]	.	.
Tinta cao	1.88	122.5	14.7	4.00
Touriga nacionale	2.13	56.4	9.4	2.56
Traminette	2.03	192.2	21.8	5.93
Vidal	2.34	318.0	38.3	**10.4**
Viognier	1.80	205.3	21.6	5.89

-[z] Not harvested due to early bird, insect, and/or fruit rots.
-[y] Muscat blanc was almost entirely devoid of flower clusters in 2006.

Figure 1. Occurrence of vines that showed any symptoms of Pierce's Disease (PD) in 2006. Affected vines ranged from having as few as 2 affected shoots to being completely affected. Dead or missing vines were not necessarily lost to PD.



351 total vines / 64 with some PD symptoms = 18%. Rows 13, 14, and 15 are Norton, which have not shown PD symptoms, but which may be asymptomatic carriers of the causal bacterium.