Title: Determining optimum date for foliar sampling of primocane fruiting blackberry in the Mid-South

Progress Report:

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Research

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Objective:
The objective of this project is to begin progress toward the development of fertilizer recommendations for primocane-fruiting blackberry. To this end we propose to:
- Determine the sampling date with the least variation of elemental concentrations in the leaves of primocane-fruiting blackberries in North Carolina and Arkansas.

Justification:
The Northern hemisphere is the most important part of the world where blackberries are grown, and the amount and types of cultivars are diverse. Various kinds of blackberries with special characteristics have been developed by researchers and special programs in the U.S. During the last decade, the University of Arkansas has developed a new type of blackberry genotype: the primocane fruiting (PF) blackberry. This genotype has the potential to extend the fresh market season annually, which makes PF blackberries an attractive crop. However, there are some important plant nutritional parameters that need to be researched in order to optimize yield and financial returns. There is information on the optimum rate and time of application of nitrogen (N) fertilization for floricane-fruiting blackberries and raspberries, but nothing specific for PF blackberries. It is important to know the optimum stage of development for collecting foliar sample of blackberry leaves in order to make the necessary recommendations to improve the yield and fruit quality.

Methodology:
Foliar samples were collected from several locations in Arkansas and North Carolina (Table 1). The foliar sampling protocol was similar to that used for FF blackberry in Clark et al. (1988). Leaves were sampled on five dates throughout the season in each location for each genotype, in April, May, June, July, and August. Leaves were collected from the fifth node from the apical bud. Ouachita, a floricane-fruiting cultivar for added for comparison.

In Arkansas, plants were managed according to several cultural practices. In Fayetteville, Arkansas, three plantings of Prime-Ark 45 were sampled. One planting is located under a high tunnel where the canes are mown to ground level in May. The second planning is also under high tunnel conditions, but the canes are not mown. The third planning is outside under no cover and is mown. Mowing in combination with high tunnels is recommended in Arkansas to delay harvest until optimum fall temperatures for fruit development (four replications). In Clarksville, Arkansas, samples were collected from Prime-Ark® 45, from Prime-Jan®, and Ouachita (for the comparing between cultivars and between FF and PF types)(three replications). All three genotypes were in field conditions (not under any covering) and will not be mown in the spring. In North Carolina, Prime-Ark® 45 samples were collected from three locations, Owl's Den Farm and Toluca Blackberry Farm, and Faith Farms (four replications).

All samples were sent to the soil testing research laboratory of the University of Arkansas for nutrient analysis (N, P, K, Ca, Mg, S, Na, Fe, Mn, Zn, Cu and B).

State	Location	Treatment and cultivar
Arkansas	Fayetteville	Prime-Ark® 45, high tunnel, mown in May
		Prime-Ark® 45, high tunnel, not mown
		Prime-Ark® 45, field, mown
	Clarksville	Prime-Ark® 45, field, not mown
		Prime-Jan®, field, not mown
		Ouachita, field, not mown
North Carolina	Owl's Den Farm	Prime-Ark® 45
		Prime-Jan®
	Toluca Blackberry Farm	Prime-Ark® 45
		Prime-Jan®
	Location 3	Prime-Ark® 45
		Prime-Jan®

Results:
Preliminary data analysis indicates no significant mean element variation between collection times and locations. During the 2011 growing season, the weather conditions can be described as with extreme heat and lack of precipitation. Since plant growth and development is affected by numerous external factors including weather, a second year of data will be necessary to verify 2011 results. We have applied for second-year funding.

Impact Statement:
This project is part of a M.S. student thesis. When completed next fall, results will be used to generate fertilizer timing recommendations to the industry.

Literature Cited

Clark, J. R., J. B. Buckley III, and E. W. Hellman. 1988. Seasonal Variation in Elemental Concentration of Blackberry Leaves. Hortscience 23(6):1080.