

Title: **Methods of Soil Acidification in Blueberries**
Progress Report

Grant Code: SRSFC 2007-18

Extension Proposal

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Objectives:

To demonstrate the effectiveness of applying acidifying agents to the soil surface in blueberry plantings via trickle irrigation versus traditional techniques to the surface of the soil or mulch.

Justification:

Growth and fruiting of blueberry is optimal in soils having a pH of 4.8 to 5.2. Although soils in most areas of the Southeast are acidic, their normal pH levels are well above this desired range. Preplant pH adjustment and postplant amendment of pH levels are crucial to the successful establishment and maintenance of blueberry plantings.

Following planting, routine soil testing is suggested to ascertain that soil pH levels remain in the desired range. In the event that the pH is elevated, recommended steps to reestablish the desired soil acidity level includes utilizing an acid-forming nitrogen source such as ammonium sulfate. If additional pH adjustment is needed, ferrous sulfate is suggested to further acidify the soil.

In some soils, maintaining soil pH in the desired range of 4.8 to 5.2 can be very difficult. Soil pH levels can rise very quickly and testing may not be frequent enough to achieve and maintain the desired response. In addition, the use of mulches which are strongly recommended in many

areas can interfere with amending soil pH.

Since low volume irrigation (trickle) is utilized in most blueberry plantings, the possibility exists that irrigation water could be acidified and delivered to the root zone of the blueberry plant in a much more efficient manner than can be achieved through surface application of materials. Through close monitoring of the soil in the root zone of plants, frequent, minute adjustments could be made to keep the soil pH in the optimum range throughout the growing season.

This proposal involves investigating the use of acid-forming nitrogen fertilizers or other acidifying agents via trickle irrigation systems versus traditional surface application of these materials on plant growth and fruiting. Ammonium sulfate is being recommended as the nitrogen source in established plantings where the soil pH needs to be lowered. Ammonium sulfate is readily soluble in water and is the most acid-forming of the commonly available nitrogen sources. Therefore, it is a good candidate for delivery through irrigation systems.

Methodologies:

Mature blueberry plantings with Tifblue as the primary rabbiteye cultivar and Bluecrop as the primary highbush cultivar exist on the Middle Tennessee Research and Education Center in Spring Hill, TN, the Highland Rim Research and Education Center in Springfield, TN and the Plateau Research and Education Center in Crossville, TN. All three of these plantings are current sites of mulching trials. Each of them contains four replications of the cultivar/mulching combinations and could readily be modified to accommodate soil acidification treatments which would include maintaining soil pH through the traditional practices of routine soil testing and the addition of surface amendments to achieve pH adjustments and through increased monitoring of soil pH plus acidifying irrigation water.

Budget:

Equipment and supplies:	
injection equipment - three locations	\$2,100
modification of existing irrigation systems	800
pH meter	600
fertilizing and acidifying agents	300
Travel	<u>1,200</u>
Total	\$5,000

Results:

Results of this work would be presented to growers through field day presentations, annual grower meetings, newsletters and the SRSFC website. The duration of this work should extend over a three year period to allow for implementation of the proper equipment and adequate time to monitor soil pH levels and to measure responses in growth and fruiting.

Due to severe advective freeze damage on the nights of April 4 - 8, 2007, the blueberry crop was

destroyed. A “no-cost” extension on this grant was requested and approved to allow the work to be conducted on blueberry plantings carrying a full crop of fruit. Equipment and supplies needed to modify irrigation systems and to inject fertilizers and acidifying agents into the system have been purchased and will be installed in anticipation of a crop in 2008