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—Scientific Note—

Nitrate and Electrical Conductivity Monitoring for Blueberry Production with Five Nitrogen Rates

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Production of blueberry is rapidly expanding in Florida due to its profitability and nutritional value. Nitrogen is the most crucial nutrient element for blueberry production. The goal of this study was to monitor soil nitrogen changes with soil chemical analyses and soil sensors after nitrogen fertilizer application. Two southern highbush blueberry varieties were used in this study: 'Emerald' and 'Farthing.' The trial was carried out at the University of Florida, IFAS Plant Science Research and Education Unit in Citra, FL. Five nitrogen rates were used: 50, 87, 125, 200, and 300 lb/acre N. Nitrogen fertilizer as urea was applied in even applications on 15 Mar., 5 Apr., 26 Apr., 17 May, 7 June, 28 June, 19 July, 9 Aug. 9, and 20 Sept. 2021. Soil samples were collected from the five treatments four times, approximately 14 days after each split nitrogen application. The nitrate analysis was done by a commercial lab. The soil sensors were installed in two treatments: 125 and 300 lb/acre N at three depths: 6, 12, and 30 inches. Soil moisture and EC were monitored and recorded with dataloggers from March to July. The results show that: 1) soil nitrate content increased from 0.1 mg/kg in early growth stage to 8 mg/kg in late growth stages; 2) soil nitrate levels also increased significantly with N application rate; and 3) soil nitrate levels were relatively similar with soil depth for the first soil sampling, but decreased significantly with soil depth for the other soil samplings except 23 Apr. (Fig. 1). There was not much difference between the two varieties except for the first sampling, where 'Emerald' had significantly lower nitrate level than 'Farthing'. The soil sensor data was noisy but did show some dynamic changes in EC with 125 lb/acre N (Fig. 2). The top 6-inches of soil always had the greatest nitrate content. When N fertilizer was applied, there was an increase; however, there was no pronounced increase for the 19 July application because there was heavy rain (6.5 inchs) just two days after the N application. These data show that over fertilization of N results in significant leaching away from the root zones. The EC monitoring data suggest that growers need to check the weather report to minimize N loss through leaching before making any fertilizer applications.

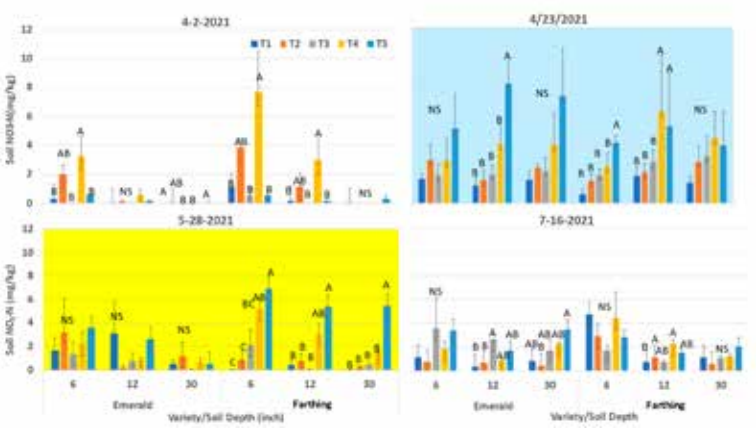

Fig. 1. Soil nitrate contents between 'Emerald' and 'Farthing' with five nitrogen rates (50, 87, 125, 200, and 300 lb/acre N) at three depths (6, 12, and 30 inches).

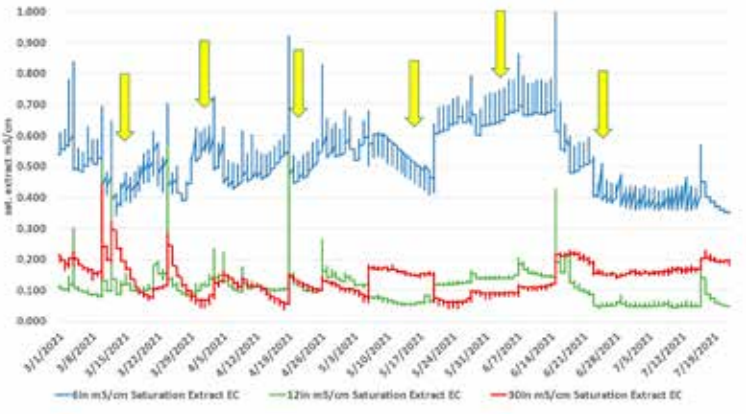

Fig. 2. Soil EC monitoring for 'Emerald' with a nitrogen rate of 125 lb/acre N at three depths (6, 12, and 30 inches). The arrows indicate the dates of N application.

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