Effects of Method and Level of Nitrogen Fertilizer Application on Soil pH, Electrical Conductivity, and Availability of Ammonium and Nitrate in Blueberry

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Abstract

Blueberries (*Vaccinium* spp.) require low soil pH and prefer N primarily as NH_4^+ for optimum production. Nitrogen fertilizer methods and rates were evaluated in a new field of 'Bluecrop' blueberry (*Vaccinium corymbosum* L.) to determine their effects on soil pH and availability of NH_4^+ and NO_3^- in soil solution. Treatments included four application methods (split fertigation, continuous fertigation, and two non-fertigated controls) and four rates of N application (0, 50, 100, and 150 kg·ha^{-1} N). Fertigation treatments were irrigated by drip and injected with liquid urea fertilizer; split fertigation was applied as a triple-split from April to June while continuous fertigation was applied weekly from leaf emergence to ≈2 months prior to the end of the growing season. Non-fertigated controls were fertilized with a triple-split of granular ammonium sulfate and irrigated by drip or microsprays. Soil pH was usually lower with microsprays than with drip, even when no N fertilizer was applied; however, soil pH was also reduced with higher N applications and, in fact, was similar between continuous fertigation and granular fertilizer (microspray) treatments when 150 kg·ha^{-1} N was added. Nitrogen application with granular fertilizer, whether irrigated by microspray or drip, maintained much higher NH_4^+ concentrations than continuous or split fertigation but often increased electrical conductivity (salinity) of the soil solution (EC_w) to >2 dS·m^{-1}. By comparison, EC_w was always <1.5 dS·m^{-1} with either fertigation method. Granular N application coupled with microsprays also resulted in higher NO_3^- concentrations than any other treatment, which may lead to more N leaching since the ability of blueberry to acquire NO_3^--N is limited.