Chemigation with Micronized Sulfur Rapidly Reduces Soil pH in a New Planting of Northern Highbush Blueberry

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Abstract Northern highbush blueberry (Vaccinium corymbosum L.) is adapted to acidic soil conditions and often grows poorly when soil pH is greater than 5.5. When soil pH is high, growers will usually mix prilled elemental sulfur (So) into the soil before planting (converted to sulfuric acid by soil bacteria) and, if needed, inject acid into the irrigation water after planting. These practices are effective but often expensive, time consuming, and, in the case of acid, potentially hazardous. Here, we examined the potential of applying micronized So by chemigation through a drip system as an alternative to reduce soil pH in a new planting of 'Duke' blueberry. The planting was located in western Oregon and established on raised beds mulched with sawdust in Oct. 2010. The So product was mixed with water and injected weekly for a period of ≈2 months before planting and again for period of ≈2 months in late summer of the second year after planting (to assess its value for reducing soil pH once the field was established), at a total rate of 0, 50, 100, and 150 kg·ha−1 So on both occasions. Each treatment was compared with the conventional practice of incorporating prilled So into the soil before planting (two applications of 750 kg·ha−1 So each in July and Oct. 2010). Within a month of the first application of So, chemigation reduced soil pH (0–10 cm depth) from an average of 6.6 with no So to 6.1 with 50 kg·ha−1 So and 5.8 with 100 or 150 kg·ha−1 So. However, the reductions in pH were short term, and by May of the following year (2011), soil pH averaged 6.7, 6.5, 6.2, and 6.1 with each increasing rate of So chemigation, respectively. Soil pH in the conventional treatment, in comparison, averaged 6.6 a month after the first application and 6.3 by the following May. In July 2012, soil pH ranged from an average of 6.4 with no So to 6.2 with 150 kg·ha−1 So and 5.5 with prilled So. Soil pH declined to as low as 5.9 following postplanting So chemigation and, at lower depths (10–30 cm), was similar between the treatment chemigated with 150 kg·ha−1 So and the conventional treatment. None of the treatments had any effect on winter pruning weight in year 1 or on yield, berry weight, or total dry weight of the plants in year 2. Concentration of P, K, Ca, Mg, S, and Mn in the leaves, on the other hand, was lower with So chemigation than with prilled So during the first year after planting, whereas concentration of N, P, and S in the leaves were lower with So chemigation during the second year. The findings indicate that So chemigation can be used to quickly reduce soil pH after planting and therefore may be a useful practice to correct high pH problems in established northern highbush blueberry fields; however, it was less effective and more time consuming than applying prilled So before planting.