

Demonstrating Effects of Lower Nitrogen Management of Blueberry Using On-Farm Trials in the Fraser Valley

Background: Nitrogen (N) application rates vary dramatically across blueberry cultivars and various soil types and regions of the Fraser Valley. Research in the Pacific Northwest has shown the potential to reduce N rates and improve plant performance. Extending this research from replicated plots of a few cultivars and soil types requires validation across a broader range of field conditions.

Objective: The objective of the current trials is to evaluate the effects of reduced N rates across a range of blueberry cultivars, soil types and regions in the Fraser Valley.

Trial Design: A network of 17 blueberry field trials was established to compare observational field blocks of the growers' "full" N rate with a "reduced" N rate. Seven 'Duke', five 'Bluecrop', two 'Elliott', two 'Draper' and one 'Reka' field were selected from across four regions: Abbotsford/Matsqui, Chilliwack, Delta/Richmond and Pitt Meadows/Maple Ridge. Application rates were not altered for the first year of this trial in 2017, which was treated as a baseline.

Trial Implementation: In 2018 and 2019, differential rates of N management were coordinated with growers. Reductions in N application ranged from 12-100% in 2018 and from 4-100% in 2019, depending on the cultivar and soil type. Reductions averaged 37 and 40% in 2018 and 2019, respectively. Leaf tissue and soil samples, as well as various measures of plant performance (e.g., bud counts, fruit per cluster, average fruit weight), were taken from "full" and "reduced" N rate blocks in each field. Data were analyzed across locations by treating sites as individual replications.

Interim findings from the end of 2019:

- Despite variation across years, "reduced" N rate blocks did not result in significantly lower leaf N, indicating the potential to reduce N application rates without causing deficiencies (**Fig. 1**).
- Soil post-harvest nitrate was significantly reduced by lower rates of N application on average, but the actual N rate used for any particular field was a poor predictor of post-harvest nitrate, meaning it should not be used to determine whether rates are adequate or excessive.
- No negative effects on any measure of plant performance were observed, while positive effects on fruit weight and the length of first-year whips may have only been short-term effects.

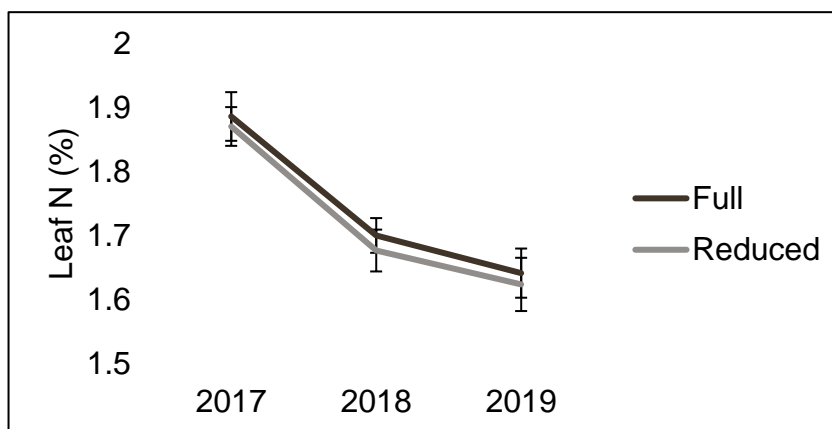


Fig. 1. Leaf nitrogen (N) content for "full" and "reduced" N application rate blocks in 17 blueberry fields in the Fraser Valley.

Summary: In the short-term, no negative effects of reduced N rates were observed across a range of blueberry cultivars, soil types and regions of the Fraser Valley. Lower post-harvest nitrate values did result from reduced application. Longer-term responses must be evaluated to rule out any negative effects of prolonged reductions in N application rates.

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