

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

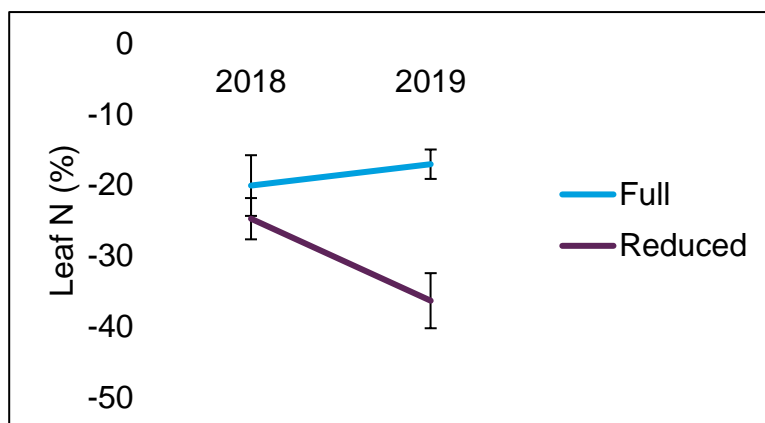
**Background:** Raspberry nitrogen (N) application rates vary by grower, cultivar and soil type in the Fraser Valley. Experimental research has indicated the potential to reduce N rates and mitigate loss of nitrate to groundwater sources without negative effects on plant performance. However, extension of this research to growers requires comparisons across a broader range of field conditions, which was the objective of the current on-farm demonstration trials.

**Trial Design:** A network of 5 raspberry field trials was established to compare observational field blocks of the growers' "full" N rate with a "reduced" N rate across three fields of 'Meeker' and one of each of 'Chemainus' and Wake™ Field. Rates of N were not altered in the baseline year in 2017.

**Trial Implementation:** In 2018 and 2019, differential N application rates were coordinated with growers. Rate reductions averaged 28%, ranging from 18-36% in 2018 and 15-37% in 2019, depending on the field. Leaf tissue and soil samples were taken from "full" and "reduced" N rate blocks in each field. As well, various measures of plant performance were taken in each year of the trial, including cane length, winter damage, fruit laterals per cane, fruit per lateral and average fruit weight. Data were analyzed across locations by treating sites as individual replications.

### Interim findings from the end of 2019:

- Variation in leaf N was observed across years, and there was a significantly greater percent change in leaf N for the "reduced" blocks compared with the "full" rate blocks after two years of the current trial (**Fig. 1**). However, these relative reductions in leaf N did not result in any actual plant deficiencies compared with established sufficiency standards. This indicates the potential to reduce N rates without adverse effects on leaf N status.
- Soil post-harvest nitrate also varied considerably across years. Percent change from the baseline year indicated a significantly lower average for the "reduced" blocks compared with the "full" rate blocks in 2018 but not in 2019. In addition to large fluctuations in post-harvest nitrate across years and fields, 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.



**Fig. 1.** Percent change in leaf nitrogen (N) content compared to a baseline year for "full" and "reduced" N application rate blocks in 5 raspberry fields in the Fraser Valley.

- No significant effects on any measure of plant performance were observed in two years of implementing differential N rates.

**Summary:** In the short-term, no negative effects of reduced N rates were observed across a range of raspberry fields in Abbotsford. Reductions in post-harvest nitrate were not consistent, and longer-term evaluations are necessary to rule out any negative effects of prolonged reductions in N application rates

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