

Developing nitrogen fertiliser guidelines for blueberry: research update

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- Managing the application of fertiliser to meet the nutrient needs of a crop is an efficient practice that assists in keeping nutrients on farm
- Additionally, this practice reduces the risk of excess nutrients being exported off farm affecting the water quality of creeks, rivers and the marine estate
- Currently, in northern NSW the Clean Coastal Catchments project is investigating the nitrogen (N) needs for Southern Highbush blueberry grown as an evergreen crop
- This article provides an update on the experiment being conducted at the Wollongbar Agricultural Institute (NSW Department of Primary Industries), in northern NSW, investigating the responses of a substrate blueberry crop to N supplied in fertigation

Experimental outline in brief

Fertigation treatments

Five rates of N (50% nitrate, 50% ammonium) supplied via drippers to pots in fertigation solution (14, 60, 80, 100, 120 mg /L), each made with the same concentration of total salts (electrical conductivity (EC) 0.92 dS/m) and pH of 5.7, and adjusted according to the weather conditions.

Plants and materials

Southern Highbush (*Vaccinium corymbosum* '11-11'), planted in May 2021 into 28 litre pots containing a commercial blend of coir, peat moss and perlite.

Key data collected

- Whole-plant dry weight and plant nitrogen concentration on 3 dates for all N rates (July 2022, January 2023, March 2023)
- Three plants per treatment
- Fruit production for 3 N rates (40, 60, 100 mg/L) during the 2023 season

Our findings to date

On average, whole plants (roots and shoots) contained 0.8g of N in July 2022, 3g in January 2023 and 5g in March 2023. From these results we calculated that between January and March 2023, the plants were taking up 0.5 g of N from the supplied fertigation, per week. This measured amount - 0.5g per week - is what the crop was using during summer, about 20 months after planting.

In general, the total dry weight (growth) of the plants and their N concentration was greater at the higher rates of N in fertigation, than at the lower rates. However, despite the total plant growth being greater at 100 mg N/L, compared with 40 mg N/L, their total fruit production, when we first measured it in 2023, was similar in count and total fresh weight (average of 1.4 kg per plant totalled from 12 harvests between mid-June to late October). The exception was that the average fresh weight of berries was greater for the 100 mg N/L treatment (2.41g), compared with the 40 mg N/L treatment (2.17g). Unfortunately, we were unable to take measurements of fruit production from all the treatments in 2023 but we are expanding our data collection to all 5 treatments for the current season.



Figure 1. A typical plant harvested in July 2022 (L) containing about a total of 0.8 grams of nitrogen and a plant prior to the harvest in January 2023 (R) containing a total of about 3 grams of nitrogen, and taking up about 0.5 grams of nitrogen per week during this time. Photo credit: NSW DPI

It is emerging from these data that the **fertigation rate of 120 mg N/L is excessive** and could be reduced to 100 mg N/L without reducing plant growth.

This is based on the finding that there was no difference in growth between these two treatments.

Again, we do not have production data for both treatments but will be looking forward to seeing if these treatments differ or not for the berry harvest this season.

Other information that we are investigating, and will be able to report on over the next year, includes:

- the role of plant canopy area and fruit number on fruit size
- the impact of pruning severity on plant demand for N
- the critical N concentrations in leaves associated with optimum growth for an establishing crop

Together, this experiment and our on-farm trials are gathering data on how N is taken up and lost from the growing system. This information will be used to develop new guidelines, such as the fertiliser N guidelines for blueberry as an establishing crop, to be released later this year.

Key Messages

- A blueberry plant in a substrate system about 1.5 years after planting takes up about 1.5g of N per week during summer
- In this study, the fertigation rate of 120 mg N/L was excessive and could be reduced to 100 mg N/L, without reducing plant growth
- The effect of fertigation N and plant N on berry production will be investigated for the 2024 season



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