

Blueberry Research Open Day, Wollongbar Agricultural Institute, NSW

Melinda Simpson, New South Wales Department of Primary Industries



Figure 1. The blueberry facility at Wollongbar Agriculture Institute, Wollongbar, NSW

Photo credit: Melinda Simpson, NSW DPI

On 11 April 2024, NSW Department of Primary Industries (NSW DPI) opened its doors for industry to explore the blueberry research being carried out at the Wollongbar Agricultural Institute, NSW.

This research is being conducted to develop better management practices for applying fertiliser and managing nutrient run-off.

The day started with Diana Unsworth (Technical Officer Clean Coastal Catchments) giving an overview of the fertigation control room and the experimental design that is being used to conduct the research.

The main research aims to find the optimum rate of nitrogen for blueberry growth and production. The experiment itself is looking at five rates of total Nitrogen (40ppm, 60ppm, 80ppm, 100ppm and 120ppm) and has been designed as a randomised block experiment to control differences that may occur due to spatial variation (Figure 2). The variety being used is the Southern Highbush cultivar 11-11.

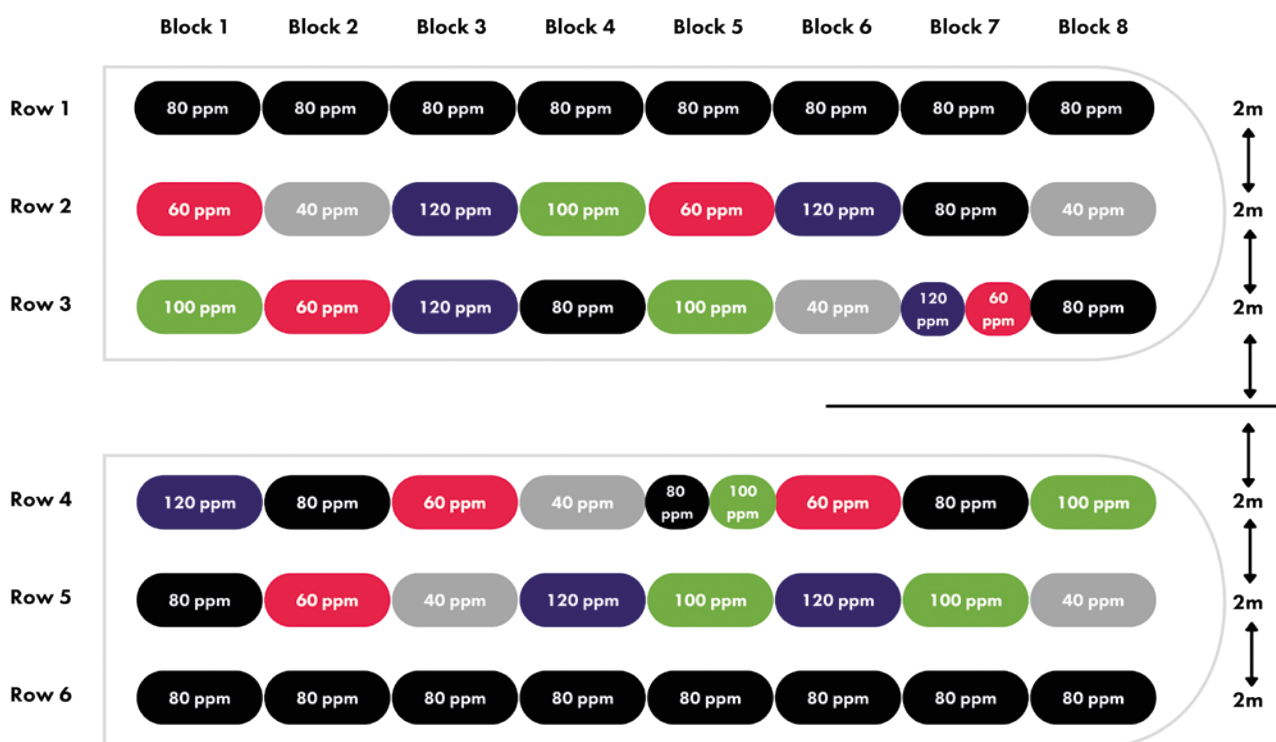


Figure 2. Blueberry experiment set up at the NSW DPI facility. There are five total nitrogen treatments 40ppm (grey), 60ppm (red), 80 ppm (black), 100ppm (green) and 120ppm (purple). Each block contains 6 plants with a total of 300 plants. The two outer (black) rows are the buffer rows which are receiving the 80ppm treatment.

Sophie Parks (Plant Physiologist) presented on the results of this experiment to date, and these indicate that the fertigation rate of 120 mg N/L is excessive and could be reduced to 100 mg N/L, without reducing plant growth. Further to this, it has been determined that a blueberry plant in a substrate system about 1.5 years after planting takes up approximately 0.5 g of N per week during summer. This information will help to develop new fertiliser guidelines for blueberries. You can read the full article from Sophie Parks on this work on PAGE 102.

In other research that the team is conducting, Sophie Parks discussed how lightly pruned and heavily pruned plants had similar nitrogen demands for a period of 12 weeks following pruning. Further, that by 9 weeks after pruning, plants in both pruning treatments had similar demands for fertigation volume as their canopies had reached similar size by that stage.

From this work, the day then moved to Mark Bayley (Mark Bayley Consulting), who talked about on-farm solutions to reduce nitrogen leaving farms. Mark has been working with the DPI to design, construct and monitor the effectiveness of bioreactors and reedbeds to remove nitrogen from irrigation run-off water.

You can read further updates about this aspect of the CCC project in previous articles from this journal which can all be found on the website Resource Library at berries.net.au/resource-library by selecting 'Mark Bayley' from the Document Author dropdown list



Figure 4. Mark Bayley talking about the trial looking at nitrogen removal from irrigation run-off water by using bioreactors and reed beds. Photo credit: Meg Strang, NSW DPI

Some key points from Mark's talk were that both bioreactors and reedbeds work best if you can capture and direct the irrigation water directly to bioreactors and reedbeds. You need to have a good understanding of how much water flow will be passed through the treatment system as more water will require a bigger system. Bioreactors work quicker than wetlands for removing nitrate, but a wetland may be preferable if phosphorus, ammonia and/or pesticides are an issue in addition to nitrate.

Monitoring of the bioreactor showed that once the flow rates stabilised, nitrate removal across all three bioreactors was extremely high, with removal efficiencies exceeding 95% across this time series.

The day then wrapped up with a presentation from Harriet Brickhill, Local Land Services (LLS) who spoke about the Clean Coastal Catchments grant program. Harriet highlighted how a previous grant recipient made significant nutrient savings by capturing their greenhouse cucumber drain water for re-use.

The day showcased a holistic approach to nutrient management. Starting with fertigation system design, moving to plant irrigation and nutrient requirements and finishing with treatment options for irrigation run-off water, it demonstrated how growers can make changes to all of these practices to minimise nutrient run-off to the environment.



Figure 5. L-R: Melinda Simpson (NSW DPI), Wendy Morris (Qld Berry IDO), Jen Rowling (Berries Australia Project Manager)
Photo credit: Wendy Morris, Berries Australia



**Department of
Primary Industries**

Acknowledgements

This research is part of the Clean Coastal Catchments project which is being delivered by the NSW DPI and funded by the NSW Government under the Marine Estate Management Strategy.

The Clean Coastal Catchments (CCC) Research project works with growers to keep sediment and nutrients on farm and out of coastal waterways while supporting profitable and sustainable agriculture.

The CCC Research project is funded through the NSW Government's Marine Estate Management Strategy to improve water quality for our ocean, estuaries, and coastal wetlands.

CCC are working with agricultural industries in key coastal areas to actively manage issues associated with production and land management that can damage the marine estate.

Better management of fertiliser and water on farm will assist industry to be more productive, profitable and environmentally sustainable, while reducing negative impacts on coastal creeks and rivers and sensitive marine areas.



To stay informed about the Clean Coastal Catchments (CCC) project, visit bit.ly/News-CCC or scan this QR code