

# USING CLIMATE FORECASTING FOR NUTRIENT MANAGEMENT

SIX EASY STEPS®

## The Australian sugarcane industry continues to improve its understanding of nutrient management through a range of research projects.

This includes research to fine tune the SIX EASY STEPS nitrogen (N) guidelines for specific soils, farming systems, harvest times and climatic conditions.

A recent project funded by SRA and the Department of Environment and Science, led by researchers at James Cook University, investigated how climate forecasting might be used to refine N management in the Wet Tropics, specifically at Tully.

This work was conducted by Associate Professor Yvette Everingham (JCU) with the research team of Professor Bernard Schroeder (USQ), Dr Danielle Skocaj (SRA), Dr Peter Thorburn (CSIRO), Mr Jody Biggs (CSIRO) and Mr Justin Sexton (JCU).

The project was titled: *How much N does that crop need? Incorporating climate forecasting to improve nitrogen management in the Wet Tropics.*

Justin Sexton from the project team said that Tully was chosen because this allowed the project team to build on existing research into the impact of seasonal climatic conditions on N requirements completed by Dr Danielle Skocaj through her PhD for a specific soil type and harvest time.

Nitrogen management is important in the Tully region because of the extreme climate variability experienced. Climate variability, especially rainfall and radiation, influences crop responsiveness to applied N and makes the task of applying the right amount of N to maintain productivity and profitability whilst minimising N losses challenging.

"This project looked at the potential to use steps 5 and 6 of the SIX EASY STEPS program to refine N inputs," Justin said. "There is scope within these steps to adjust nutrient management guidelines for specific situations, but we also know that farmers need more information to support these decisions."

Justin said that, importantly, the project incorporated the potential risk to growers of under fertilising, if using climate forecasting to inform N management.

He said in this regard, a key element of the project was close engagement with the Tully sugar industry, in particular through a local consultative group.

At multiple meetings, this group was able to identify tasks to be performed to improve their understanding and trust in the project methodology. Interactions with the consultative group also provided the project team with valuable feedback to refine research activities.

### THE KEY FINDINGS OF THIS PROJECT INCLUDE:

- There are two distinct climatic subregions in Tully (e.g. wetter northern zone and drier southern zone).
- N guidelines vary with many different combinations of soil x location x climate x harvest date.
- Crop modelling can be used to help improve the understanding of these complex interactions.
- N guidelines are likely to differ between wet and dry years and climate models can provide knowledge if the year is likely to be wetter or drier.

- It is advisable to assess different forecasts from multiple leading, international climate forecasting models.

### FOR TULLY, THIS INVESTIGATION REVEALED THAT:

- For most soils, more N may be needed in wet years for blocks cut early (e.g. July). This is especially the case for blocks in the drier southern Tully climate zone where radiation tends to be higher and rainfall less than the northern wetter region.
- For most soils, less N may be needed in wet years for blocks cut late (e.g. November).
- For some poorly drained soils, less N may be needed in wet years for blocks cut midseason (e.g. September).

The project developed a prototype 'app' to present modelled N requirements for different soil x harvest time x location x climate (wet/dry years) combinations. Field validation of the modelled N requirements, as per steps 5 and 6 of the SIX EASY STEPS program, is required.

Similar investigations are currently being conducted in the Herbert district. ■

You can read the report from this project in the SRA eLibrary, available via [sugarresearch.com.au](http://sugarresearch.com.au)