Roscoe Taggart – Precision Agriculture
December 2022 Field Day
N-sensor FAQs

- **How does the N-sensor work?**

The N-sensor is fitted to the roof of Roscoe's tractor and allows him to measure the precise amount of nitrogen required for each area of crops in a paddock. As the fertiliser spreader moves through the paddock it varies the fertiliser application rate according to the data that the N-sensor receives. The amount of nitrogen is determined by measuring the crop's light reflectance. Measurements are taken every two seconds at specific wave bands which reflect the crop's biomass and chlorophyll content. The system then calculates the crop's nitrogen uptake which enables the correct amount of fertiliser to be applied directly to the plant.
The N-sensor should be used during the growth stage of a plant.

- **Which operating modes does the sensor use and what is the difference between the modes?**

Absolute mode – the sensor is completely in control of spreading nitrogen and it does so via the process described above.
Target mode – you enter the number of units of N obtained from the handheld N sensor into a tablet fixed inside the tractor. This process involves taking 30 leaf samples from the paddock and then the sensor provides a reading of how many units of N you need to apply to the crops.

- **What's the range of operation of the sensor?**

It measures 3.6 metres from each side of the tractor.

- **What information do you need to provide to the N-sensor?**

The upper and lower parameters of the N you want to apply.
The growth stage of the crop
The expected yield of the crop
This information is entered into a tablet fixed inside the tractor which then feeds the information to
the N sensor.

- **What is the range of N that you can use for the upper and lower limits?**

N is measured in kilograms. Roscoe has the lower limit set at 0kgs and the upper limit set at 120kgs as he prefers to be cautious regarding the amount of N he uses on farm.

- **How many different algorithms are you running?**
  Every crop has its own algorithm, and these are all pre-loaded into the tablet.

- **What is the handheld N sensor used for?**

The handheld N sensor provides you with your target rate which you need to know before operating the N-sensor in the target mode.
The handheld N sensor is also used to check that you have applied the correct amount of N to the crops. It is recommended to check the N levels once per week. This process involves taking 30 leaf samples from the paddock and then checking the reading to ensure that the levels of N are correct.

- **Do you need a particular type of tractor to fit the N-sensor?**

No, Roscoe uses a basic model of tractor and says that you don't need the latest model of tractor. The sensors and tablet can be removed from the tractor for storage when not in use.

- **How many farmers are using N sensors in New Zealand?**

In 2021, there were just two farmers in New Zealand using N-sensors (Roscoe and one other farmer located in mid-Canterbury). This year there are around 20 farmers using the N-sensors throughout New Zealand.

- **Is it easy to operate?**

It is quite easy. There are only six settings to adjust. You turn it on and then enter your paddock details, put in your upper and lower N limits, your growth stage, and the crop type (i.e. – wheat or barley) into the tablet and then you're ready to go.

- **Could you use the N-sensor for dairy pasture?**

The patches of cow urine in the paddock would distort the readings so it wouldn't work well in this setting.

- **Have you noticed a lot of variability since you have started using the sensor?**

More than I would have thought when it comes to pH, K, and S. Roscoe says the biggest difference is that he is putting on less fertiliser on everything which provides savings.

For more information on N-sensors please refer to the Yara website link below:
[Yara N-Sensor - to variably apply nitrogen | Yara New Zealand](#)