Precision Ag Trials

Plant Growth Regulants (PGR)

Marrabel

Although PA tools have been available to Australian grain growers for many years, and the benefits have been well documented, it is estimated that less than 1-% of grain growers utilise PA 'beyond guidance' in any form.

The objective of this GRDC / SPAA funded project is to increase the level of adoption of PA 'beyond guidance' by broadacre farmers. The project specifically aims to increase the level of adoption of variable rate (VR) by growers in the project to 30% by 2013. This goal will be achieved by demonstrating how to use PA tools to growers at a regional level and by increasing the skills of growers and industry in PA to a level where they can then use PA tools in their farming systems to achieve economic, environmental and social benefits.

Trials and demonstrations are conducted on growers' properties and are visited throughout the season using farm walks and workshops to discuss the advantages and disadvantages of PA techniques with the involvement of other regional growers.

This information sheet presents the outcomes of the SPAA trial **on the use of plant growth regulants in barley** from season 2011.

Aims:

- To assess the effects of plant growth regulants (PGR's) on crop growth and grain yield across variable soils in barley.

Background:

Canopy management is used to optimise crop growth for the yield potential at a given location. That is, to grow sufficient vegetative crop to realise yield potential, but not excessive bulk such that lodging or haying off occurs. Strategies that can be used in canopy management include fertiliser management, in particular nitrogen, seeding rates and sowing dates. Another tool for manipulating crop growth is with PGR's. These regulants act to shorten the stem of cereal crops and reduce their growth during stem elongation. This may be beneficial where crops are growing unrestrained on soils with high levels of nutrition and no subsoil constraints, but have a limited or negative effect where the crop is already restricted by some other constraint. These trials aim to identify in which zones a yield response is most likely from PGR's.

About the trial:

PGR's were trialled in a paddock at Marrabel sown to Commander barley. The paddock has variable soil types and production potential, with soil types ranging from red to black clay. Soil depth also varies according to depth of rock and slope, with some zones prone to waterlogging in wet conditions. The zones are

shown in Figure 1, however the treatment strips were predominantly in the middle zone. The trial strips were applied through a 32m boom spray. At the time of application there were high levels of stored soil moisture, however there was no significant rainfall from that time until September 27th.

There were two treatments applied. These were

1. Nil
2. Cycocel @ 1 L/ha + Moddus @ 200 mL/ha @ GS31

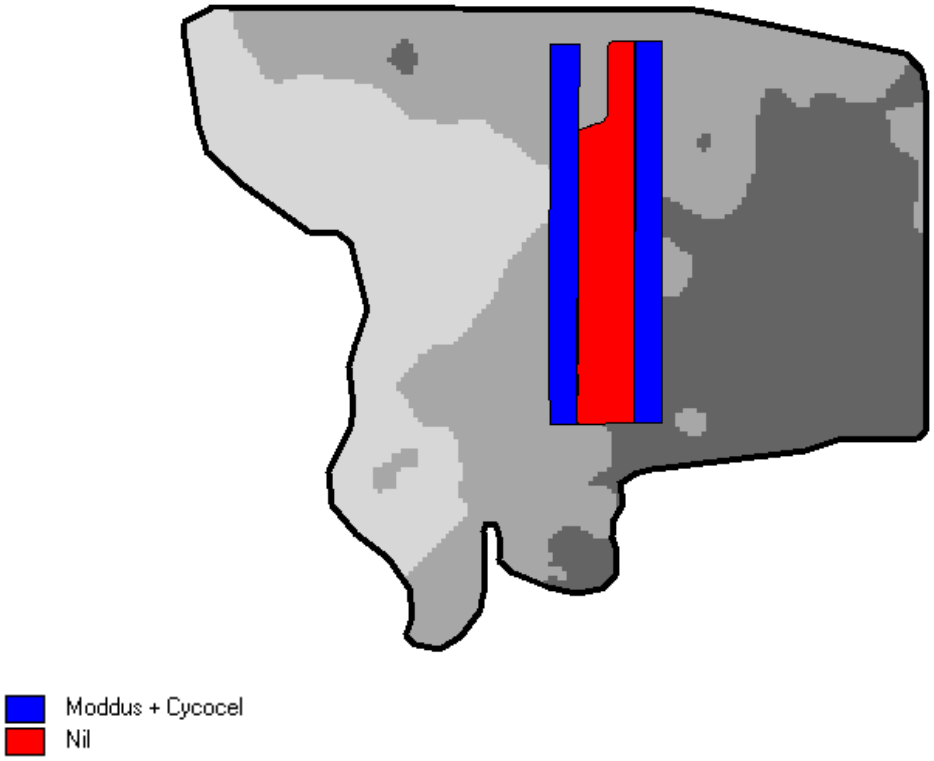

Figure 1: Layout of PGR treatments across production zones in a Commander barley paddock at Marrabel.

Assessments:

Crop sensor growth measurements
Grain Yield

Results:

Yield differences between treatments were highly significant (Figure 3b). Differences observed between the growth regulant treatments and nil were up to 0.5t/ha along the trial strip. The yield differences were not significant at the northern end of the trial strips, this is where localised waterlogging was observed in the trial and crop growth was reduced before the growth regulants were applied, as observed in the crop spec data (Figure 2a).

Given the high cost of these treatments (approx $45/ha for Moddus + Cycocel), at $200/t a 0.45t yield increase is required to give a 2:1 return on the input costs. This was achieved in most zones, except where the crop was poorer due to waterlogging. The Crop Spec sensor was able to detect these areas of poorer crop. This Crop Spec sensor information could be used in future years to target PGR's site specifically only to crop where a significant response is likely.

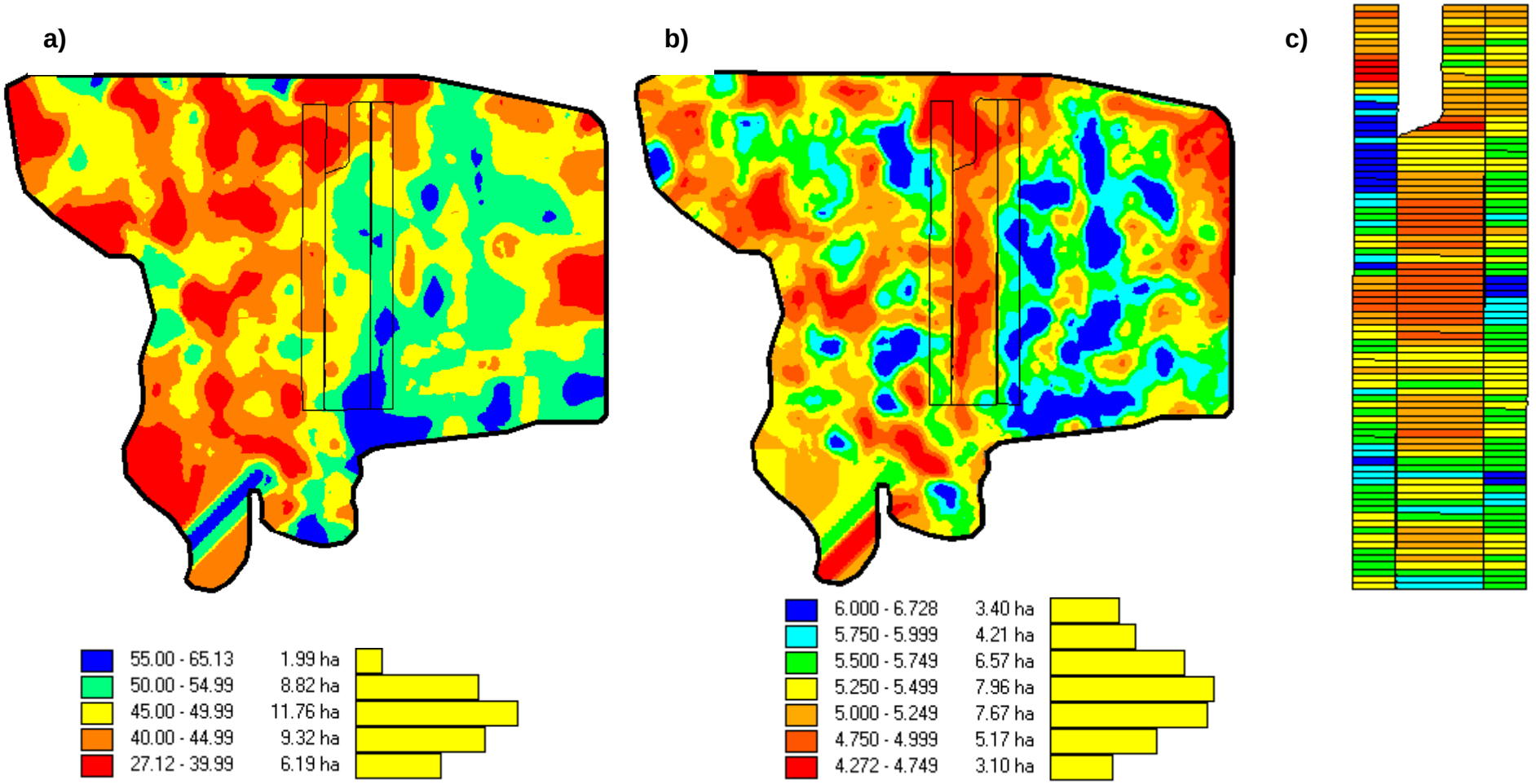

Figure 2 a) Crop Spec sensor image collected on 1/9/2011, b) barley yield (t/ha) map, c) yield of individual trial strips

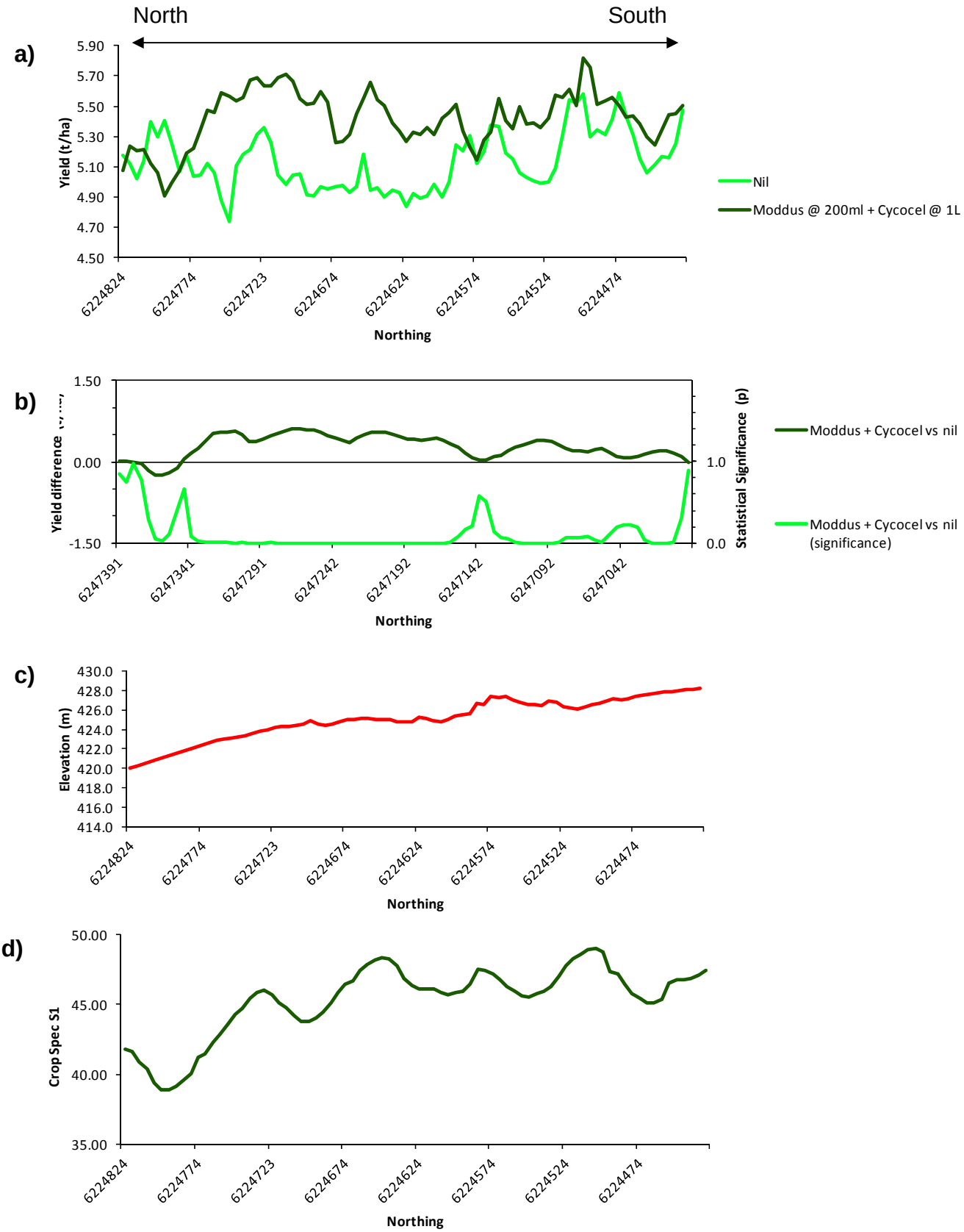

Figure 3 a) The yields of individual trial strips, relative to Northing, b) the difference in grain yield between Moddus + Cycocel treatment strips and the nil treatment and the statistical significance of that difference. $P < 0.05$ indicates a statistically significant yield difference, c) elevation along the trial strip, d) Crop Spec S1 value along the trial strip measured at the time of treatment application.

Who was involved?

Kym and Katie I'Anson hosted the trial
Sam Trengove conducted data collection and trial analysis

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