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FarmLink Research Report 2015

FarmLink/St Anne's Agricultural Class

Project Partners

Trial Site Location

Temora Agricultural Innovation Centre

Report Authors

Kylie Dunstan, Kellie Jones (FarmLink)

Introduction

FarmLink partnered with St Anne's Central School Temora to offer a program of theory and practical hands-on lessons at Temora Agricultural Innovation Centre. FarmLink embraced the opportunity to link with potential farmers of the future and expose them to some of the research and other activities centred on improving the productivity and sustainability of farms in southern New South Wales. As a part of the school's Year 9 and 10 Agriculture elective, students visited TAIC throughout the school year and were taken through a variety of mixed farming operations including setting up and running a simple field experiment looking at the different surface application rates of nitrogen on the growth and productivity of wheat.

Outline

FarmLink developed a comprehensive program in conjunction with St Anne's Central School ensuring subjects aligned with the curriculum requirements for the Year 9 and 10 Agricultural Elective.

Learning areas throughout the course of the project	
Soils 1	Soil sampling & testing and farming practice
Soils 2	Impact of land use on soil structure and type
Farm Safety 1	Safe Machinery and Chemical usage on farm
Soils 3	Using soil test results to improve crop production
Livestock 1	Sheep identification and handling
Crops 1	Crop Identification – seeds, plants and end products
Soils 4a	Evaluation of impact of soil conditions on crop growth
Crops 2	Plant identification in the field
Crops 3	Identification of fertiliser, seed, and plants quiz
Livestock 3	Sheep husbandry II
Livestock 4	Sheep husbandry III
Soils 4b	Evaluation of impact of soil conditions on crop growth

Table 1. Course outline

As well as learning different topics during their 13 visits to TAIC, the class also designed, executed and reported on their own simple field experiment, which was an ongoing trial spanning 2015 and culminated in students making presentations during FarmLink's Annual Open Day on September 11. This was an opportunity for students to share what they had learned during the year, as well as explaining the process of their simple field experiment.

Teaching the students in different aspects of the learning areas, were Tony Pratt of FarmLink Research, Murray Long of Clear View Consulting, Landmark Agronomist Andrew Lockley and St Anne's teacher Wendy Sutherland.

Image 2. Andrew Lockley (Landmark) & Tony Pratt (FarmLink) demonstrating how to extract an intact soil core.

Impact of Various Nitrogen Application Rates

St Anne's Central School students conducted a field trial designed to determine the impact of nitrogen on crop growth and yield. This experiment was selected due to the importance of nitrogen management in broadacre crop production. The trial was designed to allow students to observe the impact of high, medium and low nitrogen levels on wheat when sown at Temora in May 2015. Students collected plant count, tiller number, final dry matter and grain production data.

Treatment outline

Treatment 1: 0kg/ha of Urea.

Treatment 2: 50kg/ha of Urea.

Treatment 3: 150kg/ha of Urea.

Plot Area = 10x3m = 30m2

Convert to hectares = 30m2 / 10,000m2 = 0.0030 ha

Treatment 2 (50kg/ha) = 0.0030 x 50 = 0.150kg

= 150g

Treatment 3 (150kg/ha) = 0.0030 x150 = 0.450kg

= 450g

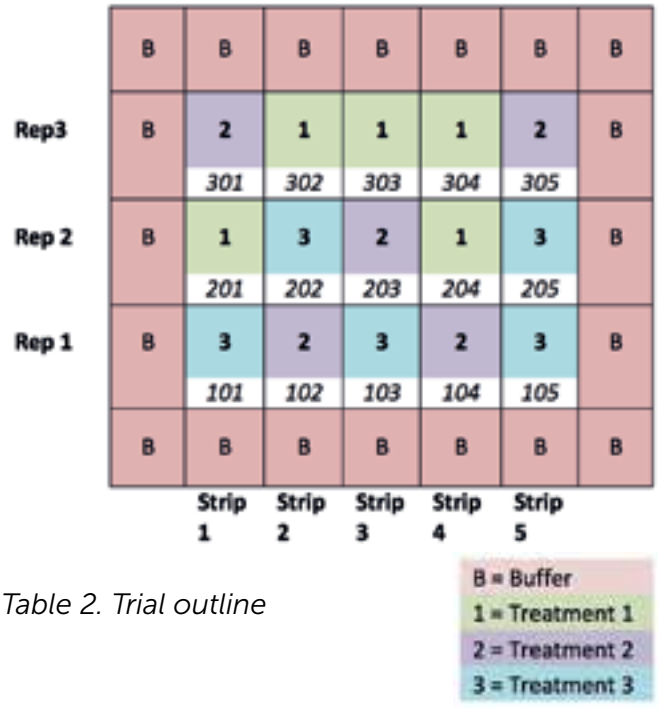

Table 2. Trial outline

Urea Rate	Establishment	Tiller Count	Dry Matter	Grain Avg
	Plants/m2	tiller/ m2	g/m2	Grain/ head
0 kg/ha	58.3	348.7	708.4	53.2
50 kg/ha	59.0	406.7	670.5	55.8
150 kg/ ha	70.0	464.7	711.5	55.1

Table 3. Average emergence rate, tiller counts, dry matter weights and grain numbers per head for each treatment.

Conclusions

From these results the students drew the conclusion that nitrogen can be used to improve plant growth and yield. However, there are boundaries and limitations, such as the timing of the nitrogen application and crop access to water and other nutrients.

The timing of the nitrogen application is crucial if you want to increase the yield and not just the biomass of the crop. The results in table 3 show the plots with 150kg/ha of urea applied to the surface prior to sowing had the highest plant counts, tiller counts and dry matter weight. But had a similar number of grains per head to the other two urea treatments of 0 and 50kg/t.

The average dry matter weights for treatment 1 (0kg/ha of urea) was higher than expected, relative to its tiller and plant emergence counts. There may have been an error that occurred during data collection that caused this. There were also visual differences that go against these results in table 3.

Applying nitrogen too early in the season may cause vigorous crop growth, draining the soil profile of moisture before the important flowering and grain filling stages. On top of this, the region experienced a short Spring, meaning there was little rainfall in September and October. In the future the class could think about adding an extra treatment of split application into their trial to observe the effects on the yield. If the soil profile seems to be fairly full and it's going to be a good spring, then the decision to top dress can be made.

Overall, the trial was successful in demonstrating to the students the effects of varying urea rates on plant growth throughout the season.