

Maize Trial, Ashcroft Farm 2014/2015

Introduction

This trial was designed to determine the effectiveness of 6 EM treatment variations, against a control on Maize, at Ashcroft Farm at Carew.

The yield as evaluated by picking all the cobs over a set distance (10 metres).

Method and Materials

- **History of paddock:** ex kale
- **Plot size and layout:** See table 1
- **Maize variety:** Pioneer...
- **Sowing date:** 25/10/14
- **Date of product applications;** All products, 2/12/14 and repeated on 3/2/15 (flowering)
- **Trial Design:** Treatments= 7, Replicates= 4 see Table 1
- **Plot Size :** 10 metres long by 0.5 metres wide (1 row) equalling, 5 m²,
- **Harvest Date:** 20/4/15
- **Harvest Method:** 5 metre row lengths were harvested per plot (just cobs). The plots were harvested as numbered plots, with no reference to treatments (blind approach).
- **Data Analysis:** Independent data analysis was carried out by Dr Tim Jenkins

Summary

The aim of this trial was to test EM on Maize yield, and in particular compare a number of variations of EM, including some combinations with Nitrogen.

- EM gave a significant and economic yield response when applied to a Maize Crop
- EM-RTU, our standard recommended product for this application, was the best performing treatment.
- The variation of EM, (EMN-RTU) which included some N in the manufacturing process, did not perform better than our standard product EM-RTU.
- EMN-RTU with a half rate of Nitrogen, performed better than a full rate of Nitrogen not containing EM.

Table1: Treatment details

Treatment	Table 2: Key	Amount per ha	Description
1	EM-RTU	20 l/ha	EM-Ready to Use (standard)
2	EM-RTU plus Molasses	20 litres/ha plus 20 litres/ha	Addition of molasses
3	EMN-RTU	20 litres/ha	EM-RTU manufactured with small amount of N
4	EMN-RTU plus Molasses	20 litres/ha plus 20 litres/ha	Addition of molasses
5	Liquid N plus EMN-RTU	23kgN/ha plus 20 litres/ha EM-RTU	Effect of N at half rate with EM
6	Liquid N	46kgN/ha	Comparing N alone at full rate
7	Control	0	No additional treatment

Basal Fertilisers applied to paddock

- Pre-plant= 300kg/ha Potash Super plus 10kg/ha Borate 45
- Drilling= 300kg/ha Cropmaster 15 plus 5/ha of Zinc Sulphate plus 5kg/ha Copper Sulphate
- N Post Emergence @ 15-20 cm ht = 150kg/ha, **note** (not applied to trial)
- N Post Emergence @ 30-40 cm ht = 150kg/ha, **note** (applied to trial)

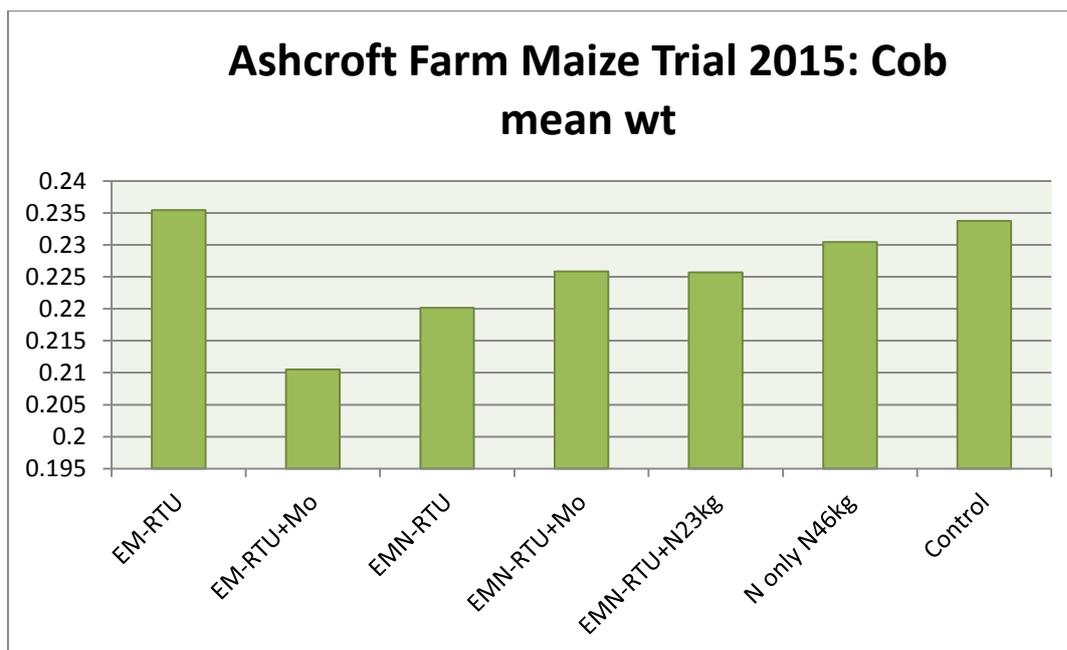
Aims

The aim of the trial was to test a few variations of EM on Maize growth and yield. Firstly what effect does adding molasses to the tank mix when applying EM-RTU. This is a technique I have seen before. Secondly, we wanted to compare a variation of EM-RTU which uses a little Nitrogen in the brewing process. This is a variation we saw in Poland and wanted to see if it in fact enhanced the EM.

Thirdly, we believe that by combining EM and Nitrogen we can enhance the activity of the Nitrogen. Consequently, can we get a similar result with a half rate of Nitrogen combined with EM, compared to a full rate of N without EM.

Results: Yields are expressed as fresh weight.

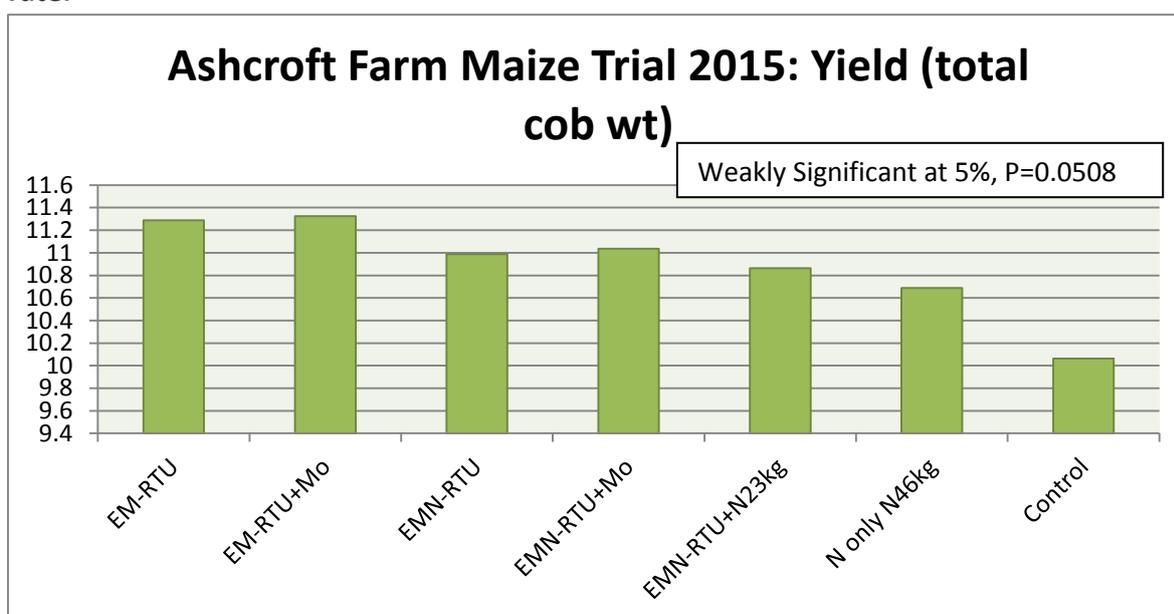
Table 2: Ashcroft Farm Maize Trial 2015: Mean cob wt. Effect of EM treatments with and without molasses plus the effect of EM with a half rate of N compared to a full rate.



EM –RTU had the highest weight per cob, and EM-RTU plus molasses, had the lowest weight per cob (Table 2).

EM-RTU was superior to EMN-RTU, the variation of EM made with some N. These results were not significant, so is indicative only.

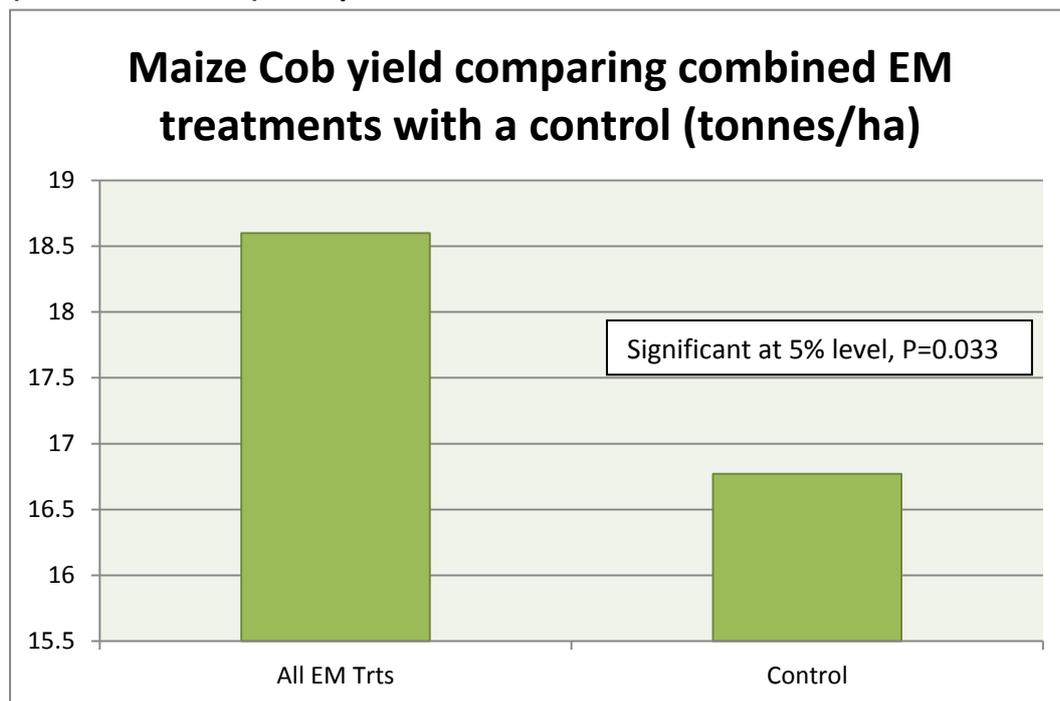
Table 3: Ashcroft Farm Maize Trial 2015: Total cob wt per plot. Effect of EM treatments with and without molasses plus the effect of EM with a half rate of N compared to a full rate.



EM-RTU and EM-RTU plus molasses were similar and both significantly better for yield than the control (5%). The inclusion of molasses gave a slight lift when it was added to EM-RTU and EMN-RTU (not significant).

Combining EM with a half rate of Nitrogen appeared to be very successful and in fact was better than a full rate of Nitrogen. When comparing these treatments...??

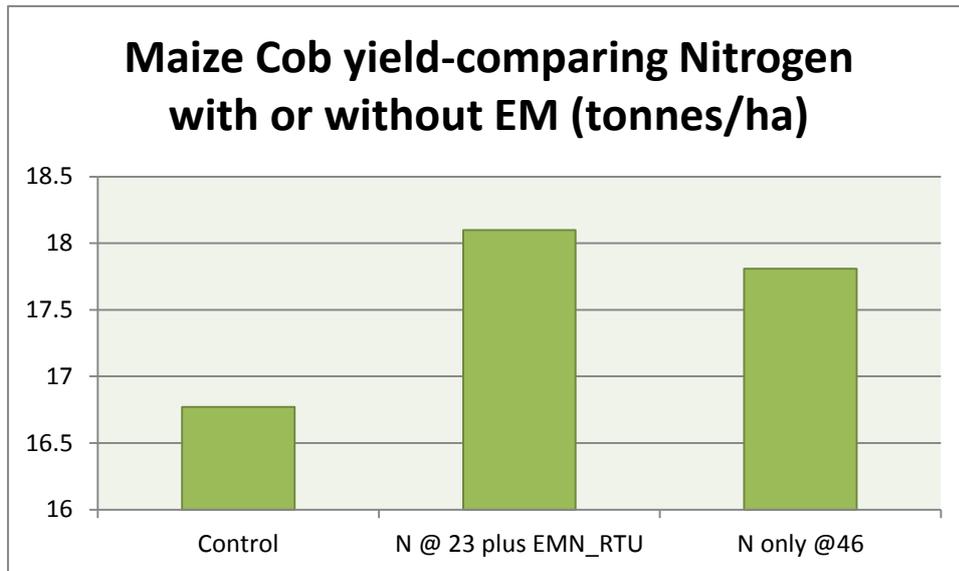
Table 4: Ashcroft Farm Maize Trial 2015: Total cob wt. Effect of combined EM treatments (not N treatments) compared to untreated control



When we combine the EM treatments (excluding the Nitrogen treatments) and compare these to the control we find we get a significant increase in yield over control.

Overall a very positive result, demonstrating that EM can significantly increase the yield of Maize.

Table 5: Ashcroft Farm Maize Trial 2015: Total cob wt. Effect of Nitrogen with, or without EM compared to untreated control (tonnes/ha)



By looking at the Nitrogen treatments in isolation we can see some trends more clearly (Table 5).

Nitrogen did give a slight increase in yield over the untreated control. EM combined with Nitrogen at half rate (23kgN/ha cp 46 kgN/ha) was as good as or slightly better than the high rate of N (46). We can't draw conclusions in this particular comparison as; we did not compare all combinations of the N with EM. This comparison needs to be repeated in more detail.

Economics

The cost of 2 applications of EM was about \$100.

The extra yield of Cobs amounted to 1.8 tonnes/ha (cob portion only)

The value of maize is 20 cents/kg. EM increased Cob yield by an extra 1800kg/ha. The value of this extra yield is \$360/ha, less cost of input (\$100), leaving a profit of \$260 per ha.

We can assume this yield increase is actually greater than this, as this yield, does not take into account the non-cob parts of the plant, which were not measured in this trial.

Therefore the use of EM-RTU on Maize has shown to be a very positive input, with a high margin of economic return

Acknowledgement

We thank Barry Daly, for the allowing us to use his crop for the trial.

Appendix 1: Dr Tim Jenkins analysis.

EM Maize Trial

The treatments pooled resulted in higher yields (cob weight per hectare) than the control comparison ($p=0.019$, mixed model analysis with plant number per plot as a random variable). This may have been at least partly due to the effect of liquid N fertiliser applied. A half rate of liquid N with EM RTU performed similarly to a full rate of liquid N (46 kg N/ha) but because the N rates differed as well as the inclusion of N, it cannot be determined what the effect of EM was in combination with the Liquid N. Considering each treatment individually, there was only a weakly statistically significant difference detected between treatments ($p=0.058$).

Figure 1 shows that the EM treatments all tended to have higher yields than the control comparison. When just the treatments without Liquid N were considered, there was no statistically significant difference detected between treatments ($p=0.223$). When the EM treatments were pooled and compared with control (again excluding the Liquid N treatments), the EM effect was estimated at 1.22 tonne per hectare and this was statistically significant ($p=0.033$).

Figure 1. Boxplot of treatment effects with means represented by crosses and medians by bold horizontal lines.

