

Liquid trace elements on wheat, Rankins Springs, Merriwagga, Hillston

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No visual differences were observed between trace element treatments.

No significant differences were found in yield or grain quality compared to the control in the two trials harvested for grain.

2007

The trials

The aim was to observe and measure the impact across three trial sites that various liquid trace elements have on grain yield and quality when applied evenly into the seed furrow at sowing.

Site details: Merriwagga

Location: Merriwagga CWFS research site.

Soil type: red sandy loam overlying calcareous subsoil.

Rainfall: average annual 370 mm, growing season Apr-Oct 220 mm.

Management: Two portions of the paddock were chosen for the Merriwagga trials (2 separate trials).

One was a 30 month fallow (chemical fallow), with one cultivation in January 2005, and the other was following barley in 2006 (stubble).

The trials were sown on 7 May (40 kg/ha Ellison wheat seed plus 60 kg/ha Granulock 15) and 1.2 L/ha Trif urX® + 2 L/ha Roundup PowerMAX™ was incorporated by sowing (IBS). MCPA LVE (0.8 L/ha) was applied in June for broadleaf weed control.

The fallowed portion of this trial was harvested on 16 November, but the stubble portion failed and was not harvested.

Site details: Rankins Springs

Location: 'Hill End', Rankins Springs.

Soil type: red sandy loam.

Rainfall: average annual 400 mm, growing season Apr-Oct 270 mm

Management: The paddock was wheat in 2006 (no till). The trial was sown on 23 May (40 kg/ha Ellison wheat seed plus 60 kg/ha Granulock 15) following a knockdown application of 1 L/ha Roundup PowerMAX™. MCPA LVE (0.8 L/ha) was applied in June for broadleaf weed control.

This trial was not harvested!

Site details: Hillston

Location: 'Wilga Glen', Hillston (irrigated).

Soil type: brown clay loam.

Rainfall: average annual 370 mm, growing season Apr-Oct 220 mm

Management: this trial site was an irrigated field following corn in summer 2005/2006. The corn stubble was baled, disced and harrowed prior to sowing. The paddock had 150 kg urea pre-drilled, and was sown on 26 May (100 kg/ha Ellison wheat seed plus 120 kg/ha Granulock 15). A further 60 kg/ha N was water run on the first irrigation (19 August), 20 kg N/ha water run on the second irrigation (20th September), and a third irrigation on the 11 October (no fertiliser).

Weeds were controlled with 0.8 L/ha MCPA LVE applied in June.

The trial was harvested on 29th November.

Treatments

All trials were sown using the wheat variety Ellison.

Fertiliser treatments were applied as a liquid solution down a dropper tube into the seed furrow at sowing. This was applied in addition to granulated starter fertiliser.

The liquid injection was made possible by using an electric pump connected to each 2 mm dropper via a 19 mm hose. Each dropper was connected to a tyne and aimed at squirting the fertiliser solution to exactly where the seed was delivered into the



furrow. This setup delivered a total water rate of 233 L/ha, which is too high for practical scenarios, but was aimed at delivering very even amounts of liquid solution along the furrow in the trial situation.

Liquid fertiliser products used

| Nutrient | Fertiliser name | Analysis |
|------------|----------------------------|----------------------------|
| Copper | Coptrel 500 | 50% Cu, 6.5% N |
| Magnesium | Hydromag | 38% Mg |
| Boron | Bortrac | 15% Bo, 6.5% N |
| Zinc | Zinc sulphate heptahydrate | 800 g/kg ZnSO ₄ |
| Manganese | Manganese sulfate | 98% MnSO ₄ |
| Molybdenum | Sodium molybdate | 39.6% Mo |

Seasonal review

A good early start allowed timely sowing in all three trials. Unfortunately by August conditions became extremely dry. In total only 96 mm fell between April and October. The two dryland trials survived mostly on stored subsoil moisture, and the irrigated trial was grown mainly on irrigation water.

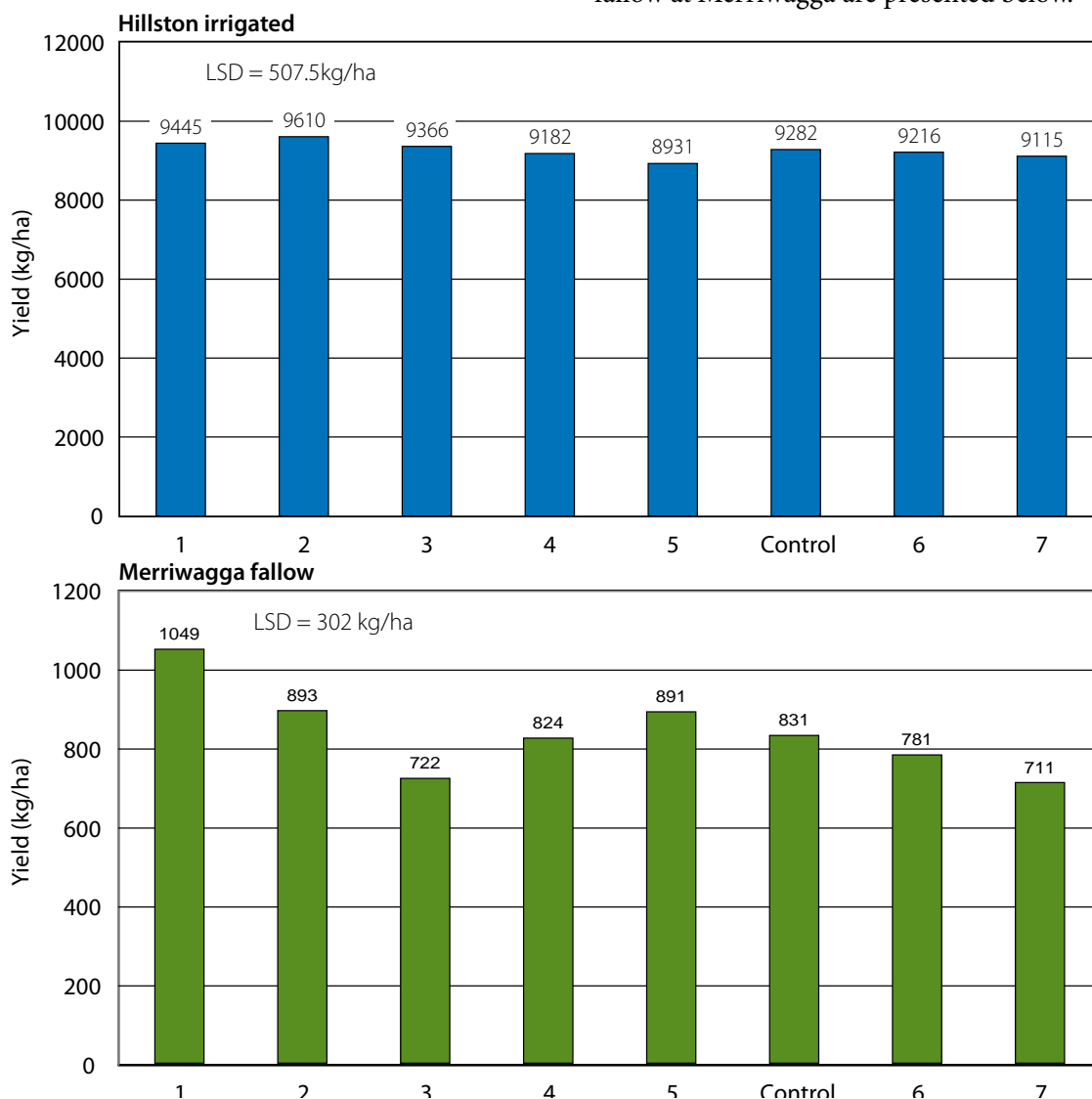
Treatments

| Treatment (rate per ha) | | Cost per ha |
|-------------------------|--|-------------|
| Control | Water only | \$0.00 |
| 1 | 200 ml Coptrel | \$3.47 |
| 2 | 500 ml Coptrel | \$8.66 |
| 3 | 200 ml Coptrel + 1.5 kg Hydromag | \$17.95 |
| 4 | 200 ml Coptrel + 1.5 kg Hydromag + 350 ml Bortrac | \$21.83 |
| 5 | 200 ml Coptrel + 1.5 kg Hydromag + 800 g ZnSO ₄ | \$19.34 |
| 6 | 200 ml Coptrel + 800 g ZnSO ₄ + 1.25 kg MnSO ₄ + 5 g Sodium molybdate | \$6.82 |
| 7 | 200 ml Coptrel + 1.5 kg Hydromag + 350 ml Bortrac + 800 g ZnSO ₄ + 1.25 kg MnSO ₄ + 5 g Sodium molybdate | \$25.18 |

Rankins Springs trial was severely drought affected by mid September, as was the stubble portion of the Merriwagga trial.

Results

The yield results of the Hillston trial and the trial on fallow at Merriwagga are presented below.



Interpretation of results

Hillston

There was no variation between applied treatments and the control at Hillston. This paddock was managed for maximum yield (bulk paddock yield 8 t/ha), and at no time was water severely limiting. Leaf tissue tests taken at mid-tillering showed no nutrient deficiencies existed and it was therefore unlikely to find a treatment response.

Merriwagga fallow

The Merriwagga trial on 30 month fallow performed exceptionally well given the low in-crop rainfall. From August on, this trial was solely dependant on stored moisture in the soil profile. Leaf tissue tests taken at mid-tillering showed slightly low phosphorus and molybdenum, however no significant differences were evident from the nutrient treatments applied.

This trial was damaged by emus prior to harvest, and up to 30% of the yield may have been lost as a result. The damage was uniform across the trial, and the impact on the results was minimal.

Merriwagga stubble

The Merriwagga trial on stubble was just about completely dead from drought by the end of September. There was no visual difference between nutrient treatments. Leaf tissue tests taken at mid-tillering indicated low magnesium and molybdenum levels.

Rankins Springs

The Rankins Springs trial was virtually dead from drought by early October. There was no visual difference between nutrient treatments. Leaf tissue tests taken at mid-tillering showed low magnesium and molybdenum levels.



Seeder liquid injection setup at used to apply liquid micro-nutrient treatments at sowing.

Photo Barry Haskins.

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Further information: available from the project team agronomists at NSW DPI Wagga Wagga, Condobolin, Parkes, Hillston, Temora, Cowra and Moulamein.



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