fertiliser. And remember that farming in many ways is a mining operation. Every tonne or kilogram of commodity taken to market is an export of nutrients. While new farming systems may cycle P more efficiently, those exported nutrients must still be replaced, if not tomorrow then certainly at some time in the future, if we hope to retain productive and sustainable systems.

Be very wary of new sources of P for crops and pastures being marketed as a cheaper option than our standard mineral P fertilisers. There are mountains of evidence and experience collected over the hundred years of superphosphate use in Australia that the most effective fertilisers for supplying P to crops and pastures are those which contain reasonable levels of water soluble P (DAP and MAP contain around 20% soluble P). There is very little evidence that anything which purports to enhance or promote P uptake or utilisation (to make up for low levels of actual P in the product) is a cost effective strategy for broadacre crops and pastures in southern Australia. The simple message is to work out how much soluble P you are buying in every tonne of your alternative product. If that is a higher cost per kg of P than in DAP or MAP then really question whether you are making a sound investment. I am not saying that some of these alternatives do not have a place, but review your strategy rigorously if the cost per unit of water soluble P is higher than in DAP or MAP.

Although some astute farmers managed to secure some very good deals with fluid P products for the current season (because they locked in orders before fluid P prices increased in line with granular prices) this is unlikely to be an opportunity in the future. I expect that fluid P is always going to be more expensive per unit of P than granulars, so fluid P products will have to perform better on the farm than their granular counterparts to be cost effective. While the relative gap between fluid and granular products appears to have closed over the last year, the situations where fluid P performs sufficiently better than granular are still restricted to the highly calcareous grey sands of the upper Eyre Peninsula.

A new soil test for P reserves

An additional soil test is now being offered commercially to assist interpretation of the Colwell P test. This is the phosphorus buffering index which estimates the P fixation capacity of soils or the capacity of the soil to convert applied P into forms which crops and pastures can not use. Values of PBI less than 100 are considered low (low fixation capacity) while values over 200 are considered high. Soils with a high PBI will require up to 5 kg P/ha more to raise Colwell P reserves more than one unit than soils with a very low PBI and desirable levels of Colwell P may be up to 10 units higher for these soils than for the low PBI soils. This additional test is a very useful addition to your monitoring programme but probably does not need to be done on every 0-10 cm soil test that you take – it is not likely to change much with time.

See the article by Sean Mason for an exciting new test for estimating soil P reserves. Although this test may be several years away from a commercial reality, it is showing great promise as a substantially better test than the current Colwell P.

For further information

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CWFS TWIN N PRODUCT TRIAL

Brad Davis
Central West Farming Systems

Key Messages

- N demand by crops in last year's trials results was low due to the very dry finish to the season.
- There was no benefit from applying Twin N to wheat in this season

What is Twin N?

Twin N is a product, containing free living nitrogen fixing bacteria, which claims that atmospheric nitrogen will be fixed inside the plant and in the soil. The theory is that these nitrogen fixing bacteria will provide the treated plant with a continuous supply of N throughout the season.

How was it done?

Four replicated and randomised small plot trials were sown at Euabalong, Tottenham, Weethalle and Wirrinya. The treatments compared a standard practice of an upfront MAP fertiliser only, to this same rate of MAP plus a Twin N foliar application.

Due to poor seasonal conditions, the trial at Wirrinya failed and was not harvested and is not reported further in this article.

Background

Euabalong Site

Hosts	Ian & John Kemp
Location	"Derrida"
Paddock history	Barley Stubble
Soil Type	Red Clay Loam
Soil fertility	pH (1:5 water) 5.9 Colwell P 35mg/kg Nitrate Nitrogen 25mg/kg Sulphate Sulphur 3.7mg/kg Zinc (DTPA) 0.35mg/kg
Sowing Date	11th June 2009
Harvest Date	13th November 2009
Plot Size	13m x 1.8m
Seeding rate	40 kg/ha of EGA_Gregory
Fertiliser rate	MAP at 66kg/ha
Foliar	Twin N 1 vial/5h before growth stage 30
Herbicide	Site treated with 2L/ha Roundup 450 2 weeks prior to sowing, 1.5L/ha Roundup 450 and 1.5L/ha Triflur Xcel at sowing.
Design	Block design with three replications and fully randomised within reps
Measurements	Establishment, vigour, yield, protein, screenings, test weight and moisture

Tottenham Site

Background

Host	David Fishpool
Location	"Curran Park"
Paddock history	Fallow
Soil Type	Red Clay Loam
Soil fertility	pH (1:5 water) 6.6 Colwell P 58 mg/kg Nitrate Nitrogen 31 mg/kg Sulphate Sulphur 7.6 mg/kg Zinc (DTPA) 0.8 mg/kg
Sowing Dates	7thth May 2009
Harvest Date	4th November 2009
Plot Size	13m x 1.8m
Seeding rate	40 kg/ha of EGA_Gregory Wheat
Fertiliser rate	MAP at 66kg/ha
Foliar	Twin N 1 vial/5h before growth stage 30
Herbicide	Site treated 2L/ha Roundup 450 at sowing, Axial and MCPA Lve in crop
Design	Block design with 3 replications and fully randomised
Measurements	Establishment, vigour, yield, protein, screenings, test weight and moisture

Weethalle Site

Hosts	Paul & Brenda McKinnon
Location	"Labertouche"
Paddock history	Long Fallow
Soil Type	Red Clay Loam
Soil fertility	pH (1:5 water) 6.1 Colwell P 25 mg/kg Nitrate Nitrogen 7.3 mg/kg Sulphate Sulphur 1.6 mg/kg Zinc (DTPA) 0.36 mg/kg
Sowing Date	12th June 2009
Harvest Date	16th November 2009
Plot Size	13m x 1.8m
Seeding rate	40 kg/ha

Fertiliser rate	MAP at 66kg/ha
Foliar	Twin N 1 vial/5h before growth stage 30
Herbicide	Site treated 2L/ha Roundup 450 and 1.5L/ha Triflur Xcel at sowing.
Design	Block design with three replications and fully randomised
Measurements	Establishment, vigour, yield, protein, screenings, test weight and moisture

What happened?

All the trials established well and at growth stage 30 showed good health and vigour. The Twin N foliar application was applied in the late evening or early mornings to reduce evaporation, allowing the bacteria time to enter into the plant. This process is said to take around three hours and the plant surface needs to remain moist for this duration.

At the spring field days there were obvious signs of moisture stress across all the trials. The trial displayed no signs of nutrient deficiencies.

The season ended quickly across all sites and all crops ran out of moisture severely penalising yields.

Results

Table 1. Twin N yield & grain quality

Euabalong			
	Yield (t/ha)	**Protein %**	**Screening %**
Nil	0.283	13.65	10.1
Twin N	0.319	13.58	9.17
Tottenham			
	Yield (t/ha)	**Protein %**	**Screening %**
Nil	1.039	14.02	6.2
Twin N	1.062	13.7	5.72
Weethalle			
	Yield (t/ha)	**Protein %**	**Screening %**
Nil	0.801	12.40	4.43
Twin N	0.834	12.57	4.37

What does this mean?

Twin N was of no benefit to crop performance at any of the three sites. However, with yields severely constrained by lack of moisture, extra N was most likely not required by the crops so any N product would have failed to produce a benefit.

Twin N is an additional input cost. The site at Wirrinya had Twin N applied to the crop when prospects were looking good. The crop failed due to the poor finish to the season. This is a risk all growers face which impacts on how much input to use.

Further research is required to fully assess the benefits of using Twin N. As the trials were suffering from severe moisture stress, nitrogen would not have been the limiting factor.

Acknowledgements

Thanks to all the co-operators, hosts, district agronomists, seed and product suppliers and CWFS staff for assistance with our trials throughout the year.

CWFS ZINC PRODUCT TRIALS

Brad Davis
Central West Farming Systems

Key Messages

- Zinc seed dressings and/or zinc foliar sprays did not benefit treated crops in the 2009 season

What products were used?

In conjunction with Agrichem (Silver Sponsors of CWFS), CWFS conducted a number of trace element response trials through the use of seed dressings and foliar sprays. These products included :

- Activist Zinc (30% Zn)
- Zip (18% P, 2% K, 14% Zn) and
- Kelpak (100% seaweed concentrate).

Why was it done?

Soil tests across a number of CWFS regional sites recorded low levels of zinc. Our regional trial sites at Condobolin, Euabalong, Rankins Springs and Weethalle recoded levels below 0.4 mg/kg of Zinc (DTPA). For this reason, these trials were set up to see if zinc was limiting yield potential.

How was it done?

Three replicated and randomised small plot trials were sown at Euabalong, Tottenham and Wirrinya. Due to poor seasonal conditions, the trial at Wirrinya failed and was not harvested.

At Euabalong the trial compared three control rates of MAP fertiliser, 0, 30 and 50 kg/ha. Treatments of a Zip/Kelpak seed dressing were applied to these fertiliser rates, and then later half were treated with Zip/Kelpak foliar spray for comparison.

Similarly at Tottenham, two control rates on MAP fertiliser of 0 and 50 kg/ha compared treatments of fertiliser with a Activist Zinc/Kelpak seed dressing, half of these were later treated with Activist Zinc/ Kelpak foliar spray or left untreated for comparison.

Background

Euabalong Site

Hosts	Ian & John Kemp
Location	“Derrida”
Paddock history	Barley Stubble
Soil Type	Red Clay Loam
Soil fertility	pH (1:5 water) 5.9 Colwell P 35 mg/kg Nitrate Nitrogen 25 mg/kg Sulphate Sulphur 3.7 mg/kg Zinc (DTPA) 0.35 mg/kg
Sowing Date	11th June 2009
Harvest Date	13th November 2009
Plot Size	13m x 1.8m
Seeding rate	40 kg/ha EGA_Gregory Wheat
Fertiliser rate	MAP at 0, 30 & 50 kg/ha
Seed Dressing	Zip/Kelpak
Foliar Spray	Zip at 2L/ha & Kelpak at 1L/ha in 50L/ha of water
Herbicide	Site treated with 2L/ha Roundup 450 2 weeks prior to sowing, 1.5L/ha Roundup 450 and 1.5L/ha Triflur Xcel at sowing.
Design	Block design with three replications and fully randomised
Measurements	Establishment, vigour, yield, protein, screenings, test weight and moisture

Tottenham Site

Background

Host	David Fishpool
Location	“Curran Park”
Paddock history	Fallow
Soil Type	Red Clay Loam
Soil fertility	pH (1:5 water) 6.6 Colwell P 58 mg/kg Nitrate Nitrogen 31 mg/kg Sulphate Sulphur 7.6 mg/kg Zinc (DTPA) 0.8 mg/kg
Sowing Dates	29thth May 2009
Harvest Date	4th November 2009
Plot Size	13m x 1.8m
Seeding rate	40 kg/ha of Gregory wheat
Fertiliser rate	MAP at 0, 50kg/ha
Seed Dressing	Activist /Kelpak
Foliar Spray	Activist at 0.5L/ha & Kelpak at 1L/ha in 50L/ha of water
Herbicide	Site treated with 2L/ha Roundup 450 at sowing, Axial and MCPA Lve in crop

During the season the trial was given a single spray with MCPA LVE, Verdict and Axial to control weeds.

Design	Block design with three replications and fully randomised
Measurements	Establishment, vigour, yield, protein, screenings, test weight and moisture