Fluid News

Farmer Profile > "Hedt Farms"

Owned and operated by
Brian & Pam Hedt, Dan & Suzi Wouters

An SA Stock Journal article was the trigger for one farming family's conversion to using fluid fertilisers.

Brian Hedt and Dan Wouters, of the Wimmera region, became interested in liquid fertilisers after reading about Bob Holloway's work with fluid fertilisers at Minnipa. As they have highly alkaline soils, they knew about the almost immediate tie-up of P in granular form, but didn't know of an alternative until then.

In Brief

Crops	-Beans, wheat, lentils, barley
Hectares	-1480 arable
Soil type	-Calcareous grey clays
Rainfall	-410 mm
Location	-Dimboola, Wimmera
System	-Every tool in the tool box! No till- timely cultivation
App rate	-17 L /ha. Phos acid (7 kg (P)/ha)

They were sceptical of the push to increase the "fertiliser bank" as nobody was able to cite any real improvements in crop health or yield using this strategy. Then, a trip to the Fluid Fertiliser Forum 2003, Streaky Bay, whet their appetite and improved their knowledge of why liquid P worked.

From the editor

Jim Kelly

Most agricultural regions of South Australia have experienced significant rains this week, I hope that this rain hasn't caused any damage and is not to late to be of value as crops fill.

There is a lot of good information in this edition, with research results from some of this year's trials from South Australia and Victoria.

This edition of the Fluid News is quite special. It is the largest edition we have produced to date. As the development of the use of fluid ferilisers are in their infancy, there are new products being developed all the time. We have produced this edition to assist growers gain a greater understanding of the products available and where they can access new products.

You will notice in the Agrichem advertisement that they have made available their Broadacre Nutrition Manual, free of charge to the readers of the Fluid News. If you click on the email address it will create an email where you can send your details to receive the manual.

As always, we are looking for articles so please contact us about your experiences with the use of fluid fertilisers.

Contact: Jim Kelly
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High rates of liquid P dilution in water (100lt+/ha) to achieve a continuous flow of product was their main concern at first. Bob's Minnipa team deemed 100lt+/ha as a key to the spectacular results they observed, but Brian and Dan decided for practical reasons that this was too high and set about finding a way to get a continuous stream at 30 - 40lt/ha.

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SAGIT CSIRO GRDC Project UA CS0231 State Government Victoria Department of Primary Industries SARDI Government of South Australia THE UNIVERSITY OF ADELAIDE AUSTRALIA Fluid Fertilizer Foundation

Farmer Profile > "Hedt Farms"

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"We purchased and installed two 900lt, secondhand saddle tanks to our tractor, together with pumps, plumbing a Hardi controller. After this, a specialised low volume, high pressure system was developed and attached to our air seeder in time for planting in May 2003," Brian said.

They purchased a 9000lt SS milk tanker, pumping equipment and enough 200 litre drums of 82% phos acid to apply 8 units of P, plus 2% zinc in time for cropping. They also carry 400 litres of clean water for washing and flushing.

"Testing was done with water and, to our dismay, after loading the first load of P acid we only finished 1.4 ha before the Hardi regulator started to play up. The phos acid had dissolved its gizzards!" he said.

A quick trip to the Raven supplier and 3 years on 'everything is sweet'. From then on when making any changes they did an "acid test" first, to see that the components they intended to use were able to withstand the acidity.

"Of course all this know-how is now readily available to any new adopter of this really easy and effective way to apply clear liquid fertilisers," Brian said.

Brian and Dan said they wanted to distribute low rates accurately, and in a continuous high pressure stream, so they built their distribution system from the ground up. They didn't want expensive or complicated manifolds bolted to the frame of the cultivator with a 'myriad of spaghetti-like loose hoses' running across the machine. They thought this could cause problems in the field and make access to the topside of the cultivator awkward, as well as raising the possibility of accidental damage.

"We were also concerned about using orifice plates, as they mean that downstream of these plates to the furrow bottom was effectively at zero pressure. Thus, there is limited capacity to "drive" or "squirt" the product into the bottom of the furrow and below the seed. This aspect of applying P to crops was reinforced with one of the most interesting seminars Dan and I have ever attended when we heard Dr Mike McLaughlin speak at GIP Horsham on P availability and uptake," he said.

Another feature of the Hedt Farms system is that it is easy to check, clean or change the outlet orifice, which is in fact nothing more than an appropriately sized, short blunt hypodermic needle.

They attach the needle barb with super glue to soft flexible 4mm PVC drip tube, the needle tip is then glued into a short piece of polypropylene air line to protect it. This assembly is then slid into a piece of steel hydraulic tube with a slightly crushed lower end so that the needle sits in exactly the right position, and it is protected from soil contact.

The 4mm PVC tube is fed through an electrical gland nut on the top of the hydraulic tube and then tightening the thumb nut secures the tube in place.

The 4mm tube runs up the seeder down-tube, to a polypropylene DCV (Diaphragm Control Valve) which serves two functions, one to prevent dripping as per boom sprayers, and the other to be the point at which they quick change the 4mm tube and needle assembly to a bigger or smaller size if required.

"These DCV's are supplied by Wilger and are the only DCV that we know of that does not eventually dissolve in P Acid," Brian said.

continued page 12

New products target improved efficiency

With innovative ideas and a wealth of experience, CSBP is helping take you into the future of sustainable and professional farming

ADVERTORIAL

CSBP has always been at the forefront of researching and developing new fertiliser products, notably with the recent introduction of liquid fertilisers to the WA market. This year, CSBP has expanded its range of premium liquid fertilisers by launching two new ranges suitable for banding at seeding.

CSBP Business Manager Fertiliser Products, Wayne Crofts, said CSBP has a long history of developing new fertiliser products for the Western Australian market.

"CSBP has a huge amount of experience in the WA agricultural industry, and as a result we are attuned to the unique soils and conditions of the State," Wayne said.

"The new liquid product ranges reflect this. The uptake of liquid fertilisers since their introduction has been fantastic, and we want to support farmers by offering them a greater choice of liquid fertilisers."

The two new liquid fertiliser ranges allow growers to head down the full liquid nutrient path at seeding. For broadacre cropping, CSBP already has the premium NPKS range of solid fertilisers called MacroPro and has added a comparable range of liquid fertilisers called MacroStream. The new AgStream range of premium NPS liquid fertilisers now complements the Agras, Agstar and Agflow ranges of solid fertilisers for cropping.

As premium, clear liquid fertilisers which are stable in storage and easy to handle, these new ranges complement CSBP's Flexi range including Flexi-N, Flexi-NS and Flexi-NK.

The new NPS range includes AgStream, AgStream Plus and AgStream Max. They are suitable for application through liquid seeder systems and can be applied with other liquid fertilisers, such as Flexi-N or Flexi-NS, or separately with granular fertilisers.

The new premium NPKS range includes MacroStream and MacroStream Plus. They are also suitable for application through liquid seeders, but cannot be applied with other liquid fertilisers (this application requires a dual banding system).

Both the AgStream and MacroStream ranges are compatible with liquid zinc and Impact fungicide.

CSBP has also added a Flexi-NKS to its premium Flexi liquid range. Flexi-NKS is suitable for application to crops through boomsprayers and can be used as a foliar top-up on crops which require split applications, or boosting applications of nitrogen, potassium and sulfur after seeding.

As farming and technology advances, CSBP is committed to developing fertiliser and technical products that meet the needs of WA farmers and support high yielding, sustainable and profitable farming.

For more information, contact Wayne Crofts, CSBP Business Manager Fertiliser Products on 0429 116 701.

CSBP Premium Liquid Range

	N	P	K	S		N	P	K	S		N	P	K	S
Flexi-N	32.0				AgStream	9.9	6.0		12.9	MacroStream	5.3	8.0	7.7	6.4
Flexi-NS	28.0			5.0	AgStream Plus	10.6	10.2		8.2	MacroStream Plus	6.6	9.9	6.9	5.7
Flexi-NK	15.0		8.0		AgStream Max	10.4	11.6		5.8					
Flexi-NKS	10.2		11.4	9.4										

FLEXI-N® AGstream® macroSTREAM®

CSBP Grow to your full potential.

fluid fertilisers

New liquid fertilisers on offer from Incitec Pivot

ADVERTORIAL

By Roy Hildebrand, Incitec Pivot Limited's Product Manager – Liquids

Incitec Pivot's range of EASY Liquids® fertilisers has grown this year to include four new products.

Three of these fertilisers were developed specifically for use as starters – EASY NP™, EASY NP + Zn™ and EASY NPK 27™.

EASY NP contains nitrogen and phosphorus. Where zinc is required, EASY NP + Zn offers nitrogen and phosphorus plus zinc. EASY NPK 27 contains nitrogen, phosphorus, potassium and zinc.

The nutrients supplied in EASY Liquids Starters have been carefully chosen for maximum efficiency in crop. They contain 100% water soluble phosphorus, chelated zinc and ammonium nitrogen.

Growers can use EASY Liquids Starters for precise and accurate placement of small amounts of phosphorous and zinc with the seed at planting. EASY Liquids Starters can be used to apply low rates of nutrient much more evenly along the row than any granular fertiliser.

'Pop-up' applications of just 5 to 15 L/ha can give the crop ready access to nutrients during the early stages of germination and establishment, before plant roots could reach banded granular starter fertilisers.

As an alternative, EASY Liquids Starters can be injected into the soil with the seed or sprayed directly on to the soil at higher rates to supply the crop's entire starter fertiliser requirement. They can also be used through fertigation systems and in foliar sprays.

Where nitrogen and sulphur is needed in combination, farmers can now choose between two EASY Liquids, thanks to the introduction of EASY NS™.

The two nitrogen and sulphur liquids offer varying ratios of nutrient, with EASY ATS® containing more sulphur than nitrogen (16% N, 34% S w/v), while the new EASY NS contains more nitrogen than sulphur (37% N, 7% S w/v).

The extensive range of liquid fertilisers now available gives farmers a wide array of options when determining the right fertiliser program for their crops.

continued page 5

Incitec Pivot's EASY Liquids range of fertilisers

Fertiliser	pH	Specific gravity (kg/L)	Analysis (% w/v)				
			N	P	K	S	Trace elements
EASY N™	6 - 7	1.32	42.5				
EASY U Sol™	8 - 9	1.14	26				
EASY NPTM	6 - 6.5	1.3	11	16			
EASY NP + Zn™	6 - 6.5	1.29	10	15			0.7 Zn
EASY PK®	7 - 8	1.42	1	12	24		
EASY NPK 27™	6 - 6.5	1.33	8	14	5		0.7 Zn
Topfoliar®	3.5 - 4.5	1.2	9.1	4	6.2		0.01 Cu, 0.03 Zn, 0.03 Mn, 0.002 Mo, 0.005 B
EASY NS ™	7 - 7.5	1.32	37			7	
EASY ATS®	8.5 - 9.5	1.325	16			34	
EASY KS®	7 - 8	1.48			30	25	
EASY Cal®	5 - 7	1.5	12.6				18.1 Ca
Coppersol®	3 - 4	1.17				3.4	6.7 Cu
Zincsol®	2.5 - 3.5	1.38				8.4	16 Zn
Mangasol®	2.5 - 3.5	1.42				10.1	17.3 Mn

from page 4

Before choosing a product, farmers should consider all of the product's physical and analysis characteristics.

Ask whether the product is a true liquid or suspension requiring agitation. All of Incitec Pivot's EASY Liquids are true clear liquid fertilisers.

Always confirm whether the analysis is quoted in w/v or w/w. An incorrect assumption can make a substantial difference to the apparent value of the fertiliser.

The nutrient analysis for liquid fertilisers is typically quoted as weight of nutrient per volume of liquid (w/v).

For dry fertilisers, nutrient analysis is quoted on the weight of nutrient per weight of product (w/w). For example, the analysis of urea is 46% nitrogen. This means there is 46 kg of nitrogen for every 100 kg of urea.

But the weights and volumes of liquid fertilisers differ. For example, 1,000 litres of EASY N™ weighs 1,320 kg.

When EASY Liquids are sold in bulk, by the tonne, it is often necessary to compare a tonne of dry product with a tonne of liquid fertiliser. The calculation to convert w/v to w/w is:

> Analysis in w/v divided by Specific Gravity equals Analysis in w/w. Using EASY N as an example: 42.5 / 1.32 = 32% N w/w

For more information on choosing the right liquid fertiliser for your crop and application type, see your local Incitec Pivot Agent or Dealer.

Crop type suitability and application method

Crop	Common application method by fertiliser			
	Soil injection	Sidedressing	Fertigation (with irrigation)	Foliar sprays
Horticulture	EASY N EASY NP EASY NP + Zn EASY NPK 27	EASY N EASY NS EASY Cal	EASY N EASY U Sol EASY NP EASY NP + Zn EASY PK EASY NPK 27 Topfoliar EASY NS EASY ATS EASY KS EASY Cal Zincsol Mangasol Coppersol	EASY N EASY U Sol EASY NP EASY NP + Zn EASY PK EASY NPK 27 Topfoliar EASY KS EASY Cal Zincsol Mangasol
Cotton	EASY N EASY NP EASY NP + Zn EASY NPK 27	EASY N EASY U Sol EASY NS	EASY N EASY U Sol EASY NS EASY KS	EASY N EASY U Sol EASY PK EASY KS EASY Cal Topfoliar
Cereals, Grains, Oilseeds and Pulses	EASY N EASY NP EASY NP + Zn EASY NPK 27	EASY N EASY U Sol EASY NS EASY ATS	EASY N EASY U Sol EASY NS EASY KS	EASY N EASY U Sol Zincsol Mangasol Coppersol
Sugar	EASY N EASY NP	EASY N EASY U Sol	EASY N EASY U Sol EASY NS EASY KS	EASY N EASY KS Zincsol Coppersol
Pasture	EASY NP	EASY NS EASY N EASY NS	EASY N EASY PK EASY NS EASY KS	EASY N EASY KS
Forestry	EASY NP	EASY N EASY NS	EASY N	EASY N Zincsol Mangasol Coppersol

the importance of broadacre nutrition

Using high quality nutrition on broadacre crops can significantly improve the health and yield of your crop. Scientific research has now proven this beyond doubt.

The key issue for growers is finding broadacre nutrition products with a proven scientific track record—products they can genuinely trust to improve the performance of their crop.

Agrichem's range of liquid nutrition products is driven by rigorous scientific research and for the last twenty years we have helped broadacre growers in Australia and around the world to enjoy greater plant health and yield.

Our range has been developed to provide essential trace elements and other nutrients to your crop via versatile liquid suspensions that can be delivered through seed dressing, furrow injection and foliar application. Recent trials have confirmed the powerful impact that trace elements have on broadacre yield especially when a combination of foliar and seed dressing applications are utilised.

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Trial 1: Zinc Seed Dressing & Foliar Zinc Spray[1]

Seed dressing 30 TIMES MORE EFFICIENT than soil spray

BENEFITS OF SEED DRESSING + FOLIAR

141% more yield than control
32% GREATER IMPACT on yield than seed dressing alone

Results: Zinc is shown to dramatically improve yield, with best results being achieved when seed dressing and foliar are combined.

1. Trial conducted on wheat GRDC Research Update Lameroo, Nov 1997.

For your FREE 60 page full comprehensive BROADACRE NUTRITION MANUAL which includes all the information you need in regards to liquid nutrition management please email justins@agrichem.com.au with the following information:

1 Name
2 Trading Name
3 Address
4 email
5 Area and type of crops grown

Please type " FREE BROADACRE MANUAL" in the subject field.

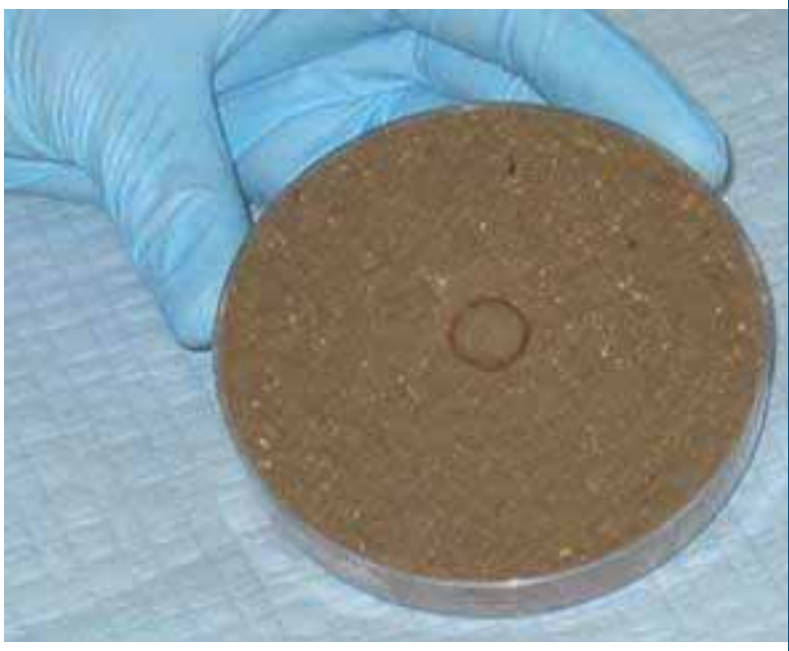
Are fluid Zn and Mn fertilisers more effective than granulars?

Experiments have been undertaken at the University of Adelaide and CSIRO Land and Water, by Drs Ganga Hettiarachchi, Enzo Lombi, Mike McLaughlin, David Chittleborough and Ms Caroline Johnston, to try to examine the mobility and potential availability of Mn and Zn from granular and fluid forms of Mn and Zn fertilisers.

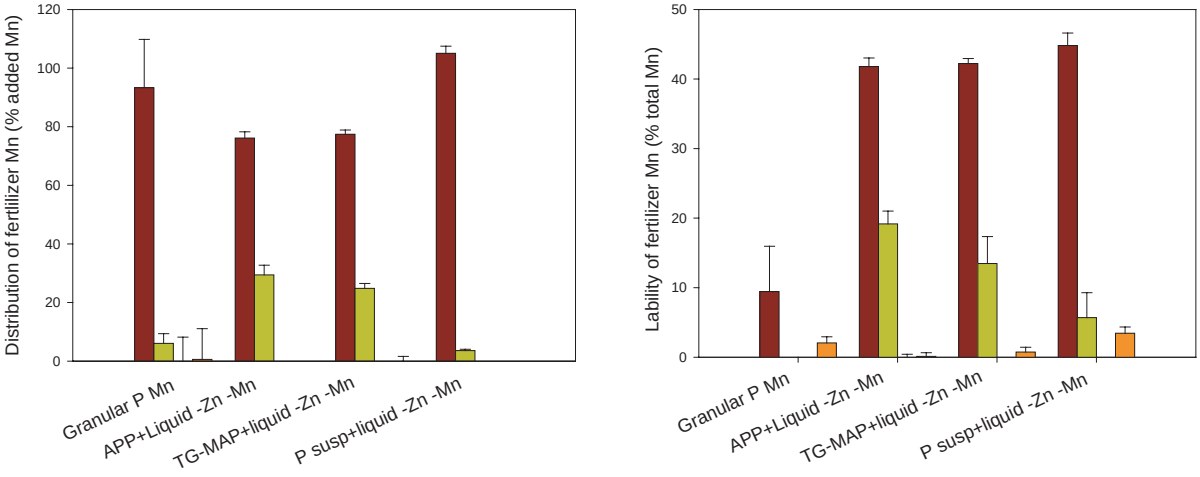
Soils were placed in petri dishes as shown to the right and fertilisers were placed in the centre of each dish. After 35 days, concentric rings of soils were collected outwards from the fertiliser placement point (0- to 7.5-, 7.5- to 13.5-, 13.5- to 25.5-, and 25.5- to 43- mm) and availability of Zn or Mn were determined by using 65Zn and 54Mn radioisotopes techniques.

Manganese from fluid fertilisers moved more easily through the soil, away from the point of fertilisation, compared to a granular source of Mn. Furthermore, the availability of the Mn from the fertiliser was much greater with the fluid formulation.

In contrast, the movement of Zn away from the point of fertiliser application was restricted, regardless of the source of Zn. However, the availability of fluid Zn, applied with fluid P or suspension P, was significantly higher compared to the granular fertiliser, indicating fluid or suspension Zn does not get fixed in these soils.



Less fixation of fluid Zn provides an explanation for the better crop response to fluid Zn fertilisers observed in field trials conducted by Dr Bob Holloway's team. Their field studies have shown an increased response to fluid Zn (Zn concentration in grain) compared to granular fertilisers in calcareous sandy loam soils. Inclusion of Zn and/or Mn with P in granules does not seem to be an effective way of supplying these micronutrients to crops, especially in alkaline soils.



Update on fluid fertiliser trials from Victoria

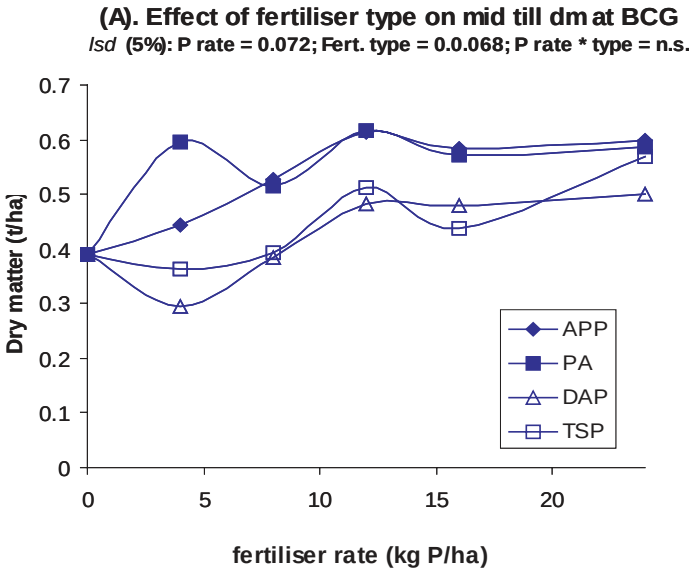
R Armstrong, J Nuttall and R Argall (DPI – Horsham)

The 2005 season has been 'varied', to say the least. Following crop failures due to drought and a late frost in 2004, and decile 1 rainfall from January to June 2005, rainfall of up to 60 mm was recorded in mid June throughout most of the Victorian Mallee and Wimmera regions. This rain allowed sowing of wheat (cv. Yanac) at three trial sites: Barbers; the Birchip Cropping Group Field day site at Birchip in the southern Mallee and Dooen in the Wimmera region, as part of the Victorian component of the GRDC Fluid Fertiliser project. Both Birchip sites were Calcarosols, whilst the Dooen site was sown on a grey cracking clay soil (Vertosol). At each site, the effectiveness of 4 different fertiliser types, comprising two fluid forms (Ammonium Polyphosphate: APP and Phosphoric Acid: PA) was compared to two granular types (Diammonium Phosphate: DAP and Triple Superphosphate: TSP) at 6 rates of applied P (0 to 24 kg P/ha). A basal application of zinc was applied to all plots and Nitrogen was adjusted so a constant amount (50 kg N/ha) was applied to all treatments.

Following sowing in late June, the dry conditions persisted where decile 1 – 3 rainfall was recorded at all sites between July and September. At crop mid-tillering, large dry matter responses to P fertiliser were recorded at all trial sites compared with the control: 54% at the BCG site, 85% at Barbers and 99% at Dooen (Figure 1). The effectiveness of fluid fertilisers varied significantly with each site. At Barbers, there was no effect of fertiliser type. In contrast, at both the BCG site and Dooen, both fluid fertiliser types were superior to the two granular forms, especially at low to medium rates of applied P (4 to 8 kg P/ha). The two fluid fertiliser forms produced, on average, 34 and 58% more dry matter than the two granular forms at 4 and 8 kg P/ha respectively at Dooen, whereas at the BCG site, the respective figures were 34 and 18%.

The 2005 trial sites at both Barbers and Dooen were conducted on areas directly adjacent to the 2003 trial sites (ie. with the same soil type). However, in contrast to 2005 the fluid fertilisers were more effective than granular types at both sites, especially at Barbers in 2003. This result indicates that there may be a strong seasonal interaction between the relative effectiveness of fluid and granular fertilisers, at least in the early growth stages of the crop. Bob Holloway has also recorded similar effects at Minnipa on the highly calcareous soils of the Eyre Peninsula. This aspect is currently being examined in glasshouse trials using intact cores collected from both Barbers and Dooen sites (see article on page 10).

Since mid-tillering, good rainfall (> 50 mm) was recorded in both the Mallee and Wimmera, giving hope for a good finish to the season. This will allow the ultimate assessment of the benefits of using fluid fertilisers: do they improve grain yield?



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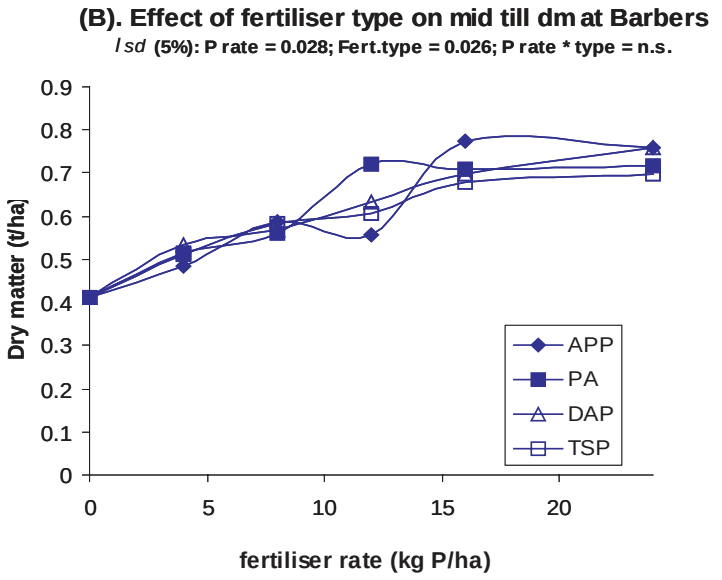


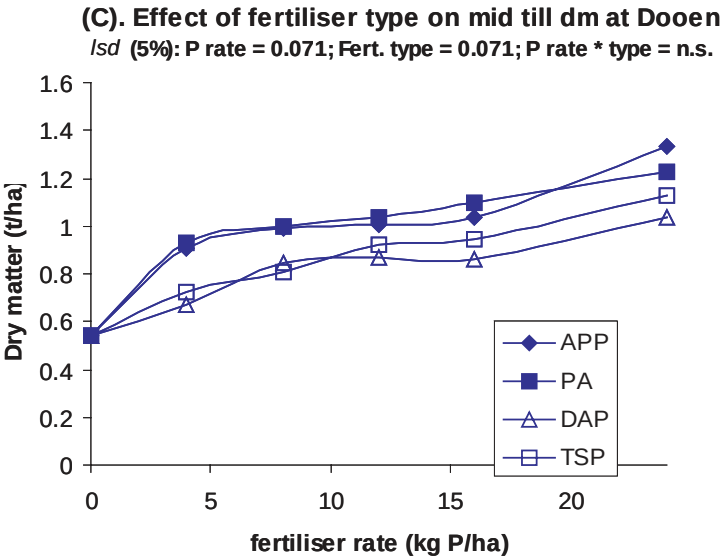


Figure 1: Effect of fluid (Ammonium polyphosphate: APP; Phosphoric Acid: PA) and granular (Diammonium phosphate: DAP; and Triple Superphosphate: TSP) on the growth of Yanac wheat (mid tillering) at (A). BCG Main Field site (Birchip) (B). Barbers (Birchip) and (C). Dooen in 2005.

In Brief

Fluid Fertiliser Manual now in preparation

The GRDC Fluid Fertiliser Manual, due for release at the end of March next year, is now being put together by Bob Holloway (MAC), Jim Kelly (Arris) Ian Richter (MAC) and Dot Brace (MAC). The manual will collate current knowledge on fluid fertilisers for use by farmers, agronomists and the fertiliser industry. As the degree of interest in fluid fertilisers increases and the possibilities they offer in terms of improved efficiency of use and handling become more widely known, there will be a need for information on the whole spectrum of fluid fertiliser usage, from products, mixing on-farm, application, equipment, storage, economics, research results and safe handling. The aim is to make the manual as comprehensive as possible so that it will be a “must have” item for farmers looking to use fluid fertilisers or those who want to make a balanced decision on whether or not fluid fertilisers will work for them.

The manual will provide a series of fact sheets for ready reference, either in printed form or available on the Fluid Fertiliser website at:

www.fluidfertilisers.com.au

Does soil water influence the effectiveness of different types of phosphorus fertiliser?

James Nuttall, Roger Armstrong & Russell Argall

There is growing evidence that relative efficiency of fluid and granular forms of phosphorus (P) fertiliser is influenced by seasonal (rainfall) conditions as well as soil type (see article on page 8). To test this idea, a glasshouse experiment using intact cores of soil collected from our current field trial sites at Birchip (in the southern Mallee) and Dooen (in the Wimmera region) was undertaken (Figure 1). For wheat (cv. Yipti) the impact of water availability (either pre or post-flowering water stress imposed compared to no water stress) on efficacy of phosphoric acid compared with triple superphosphate on growth and yield was tested.

At flowering, spike numbers of wheat grown in a Birchip soil was greater where phosphorus (P) (8 kgP/ha) was applied, compared with when no P was applied. However, no difference existed between phosphoric acid or triple super phosphate (Table 1). This trend existed irrespective of having low or high water availability in the pre-flowering phase. In contrast, spike numbers of wheat on a Dooen soil differed with pre-flowering water availability. Where high water was applied, no difference in tillering existed irrespective of P application or P type. Interestingly, where wheat was grown under low water availability, higher spike numbers existed where phosphoric acid was applied, compared with where no P or triple superphosphate was applied. It is expected these higher spike numbers will translate to higher yield, provided there is sufficient water for grain fill.

At crop maturity, the effect of water availability in the post-flowering phase will be determined, and the analysis of grain yield will provide clarification of the impact of water supply on P nutrition and yield of wheat.

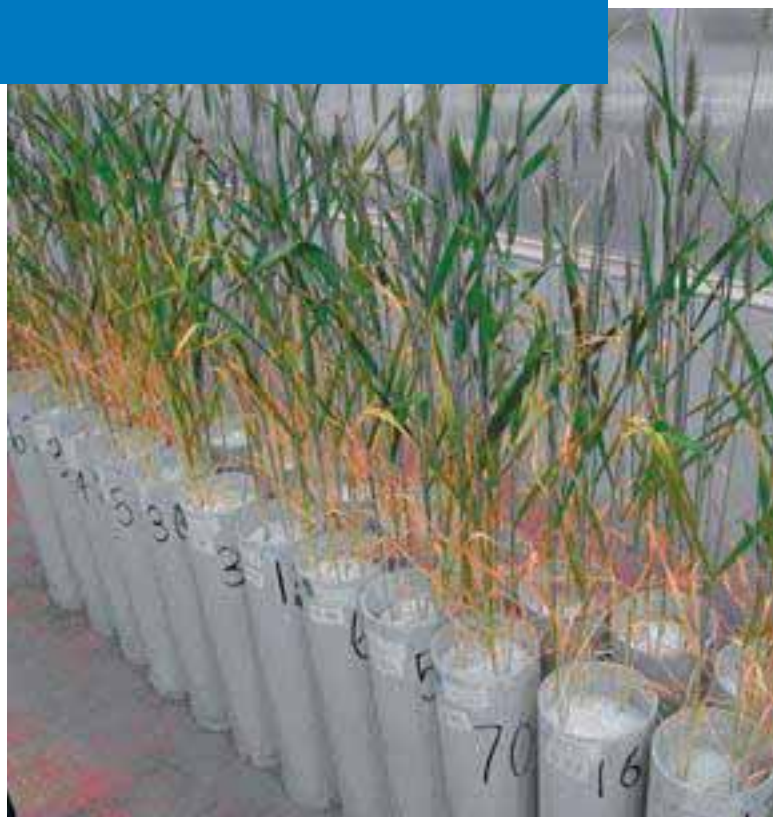


Figure 1. Small intact core trial, where wheat is at flowering

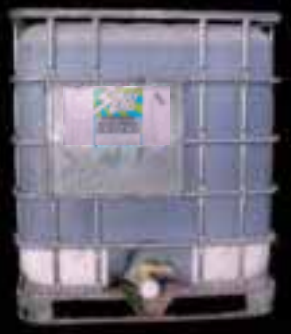
		Spikes/plant	
		Pre-flowering water availability	
Soil	P Fertiliser	High water	Low water
Birchip	None	2.50 (0.1)	1.67 (0.02)
	PA	2.94 (0.02)	2.22 (0.03)
	TS	3.00 (0.07)	2.28 (0.05)
Dooen	None	2.89 (0.69)	1.77 (0.03)
	PA	2.78 (0.03)	2.11 (0.05)
	TS	2.78 (0.12)	1.89 (0.01)

Table 1. Spike number of wheat plants at flowering given application of Phosphoric Acid (PA) and Triple Superphosphate (TS) at 8 kgP/ha and two pre-flowering water regimes for a Birchip (Calcarosol) and Dooen (Vertosol) soil. Standard error is in brackets.

LIQUID
CROP NUTRITION

42N

- NPK 42 - 0 - 0
- High analysis UAN liquid



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SPRAY GRO LIQUID FERTILIZERS

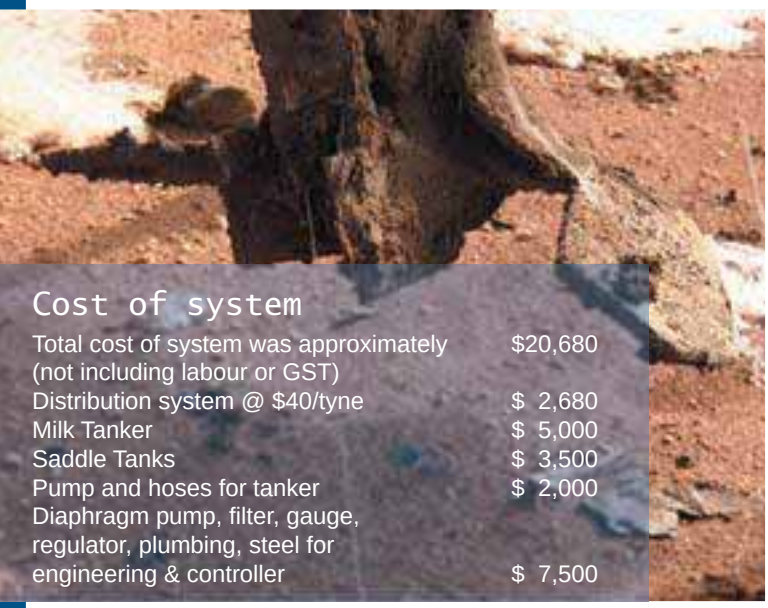
WHEN IT COMES TO FERTILIZERS, TURN OVER A NEW LEAF

Farmer Profile > "Hedt Farms"

from page 2

The distribution head is mounted under the air seeder head and is simply a 5cm Banjo socket with SS .3cm barbs fitted around its waistline; according to the number of outlets required to feed down to the seeder boots.

The whole thing is very compact and located out of harms way under the seeder head.



Cost of system

Total cost of system was approximately (not including labour or GST)	$20,680
Distribution system @ $40/tyne	$ 2,680
Milk Tanker	$ 5,000
Saddle Tanks	$ 3,500
Pump and hoses for tanker	$ 2,000
Diaphragm pump, filter, gauge, regulator, plumbing, steel for engineering & controller	$ 7,500

One end of the socket is plugged and the other is fitted to a reducer and a 1 inch barb, to which the supply line is attached.

"Our supply line is a Hardi sprayer hose, as it is very flexible and will not kink even when cold and frosty. We run the system at between 2 to 3 bar (30 to 45 PSI) and have tested it at 6 bar without failure."

This year we completed 1480ha at 40 litres/ha without a single blockage on a 67 tyne Horwood Bagshaw cultivator," Brian said.

Hedt Farms have now sold their seed and fertiliser gruper as the chaser bin and SS tanker provide them with enough capacity to crop 150 - 200ha's per trip, depending on the crop type. It also means one less piece of equipment on the farm, while making better use of others.

They use the SS tanker as a fire unit in summer and the chaser bin is part of the harvest operation. At the finish of each of the 3 seasons they have used this system on, they have queried if they should return to granular fertiliser, but on each occasion they have come up with a resounding no, 'as once set up properly, liquids are so easy to manage'.

The future

During the first 2 seasons there were some problems as they developed their own system. Now they are looking to entrain Bayleton and other fungicides with the fertiliser, to eliminate seed treatment with the resulting possible silo contamination and wasted seed.

"We feel the efficiencies that this system gives us adds to the timeliness of our cropping operation, in a way that granular fertiliser never could. We can also add or delete liquid trace elements as required, eliminating the need to pre-order and store particular specification dry fertiliser."

"We see the need for fertiliser companies to come on board and provide a cost competitive line of products that will allow farmers who farm extremely high or low pH soils the benefits of these very efficient and versatile clear liquid products," Brian said.

Alternative products

"We have also looked hard at flowable or suspension fertiliser, but from a practical point of view see no merit in these products, only problems for us in the field. Because of the stop/start nature of farmer's cropping programs the chances of having these products settle in delivery lines and filters is too risky, even incomplete flushing will be a trap. Clear liquids on the other hand have proved to be trouble free and very safe to use."

The Hedt Farms 2cm RTK Autofarm Autosteer system has proved a boon for on-farm trial work and they have done numerous trials with liquid fertilisers. Unfortunately, the seasons in their part of the Wimmera region have been very unkind and trials have not resulted in meaningful yield differences. In early spring 2004 they observed definite visible differences in their trials, but an extremely dry finish combined with frost rendered the trials meaningless. They will continue to trial different rates and combinations of liquid fertilisers and fungicides in the future, and one day hope to combine this with yield mapping to help to more accurately interpret their results.

"Remember - history shows that the strong do not necessarily survive, rather it is those that adapt that prosper."

Simplot liquid life
FLUID FERTILISERS

How Do You Get It?

With the use of fluid fertilisers now established as a viable alternative to granular in Australian agriculture - the question is where and how do I source these products?

It is now simple with the assistance of Simplot's strategic partners Australian Agricultural Chemicals and Grow Force Fertilisers. Consignments of fluid fertilisers in bulk, 13000 litre bladders and 1000 litre shuttles can be delivered to most major ports in Australia.

Products Available

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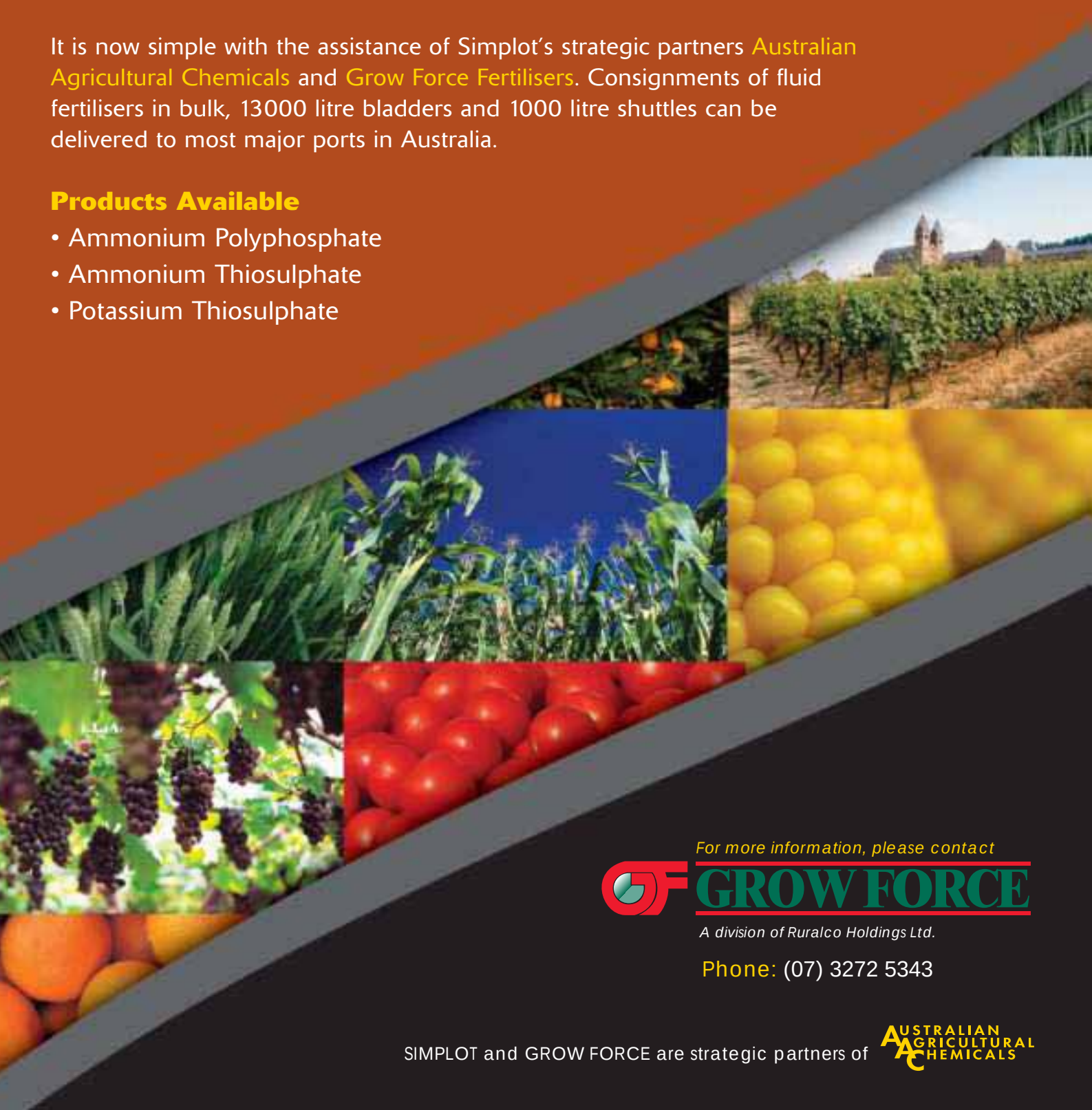
- Ammonium Thiosulphate
- Potassium Thiosulphate



For more information, please contact

GROW FORCE

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SIMPLOT and GROW FORCE are strategic partners of AUSTRALIAN AGRICULTURAL CHEMICALS

Eyre Peninsula fluid fertiliser nutrition trials

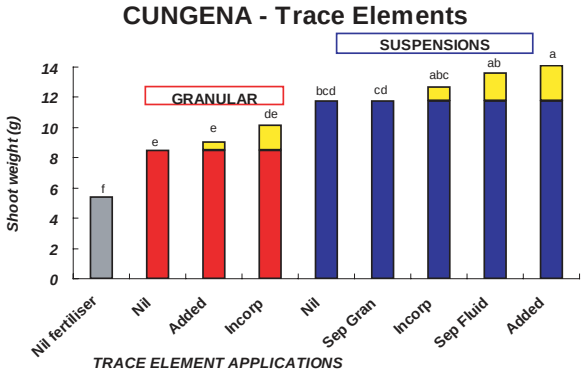
MAC Nutrition Group
Dot Brace, Dr Bob Holloway
& Ian Richter

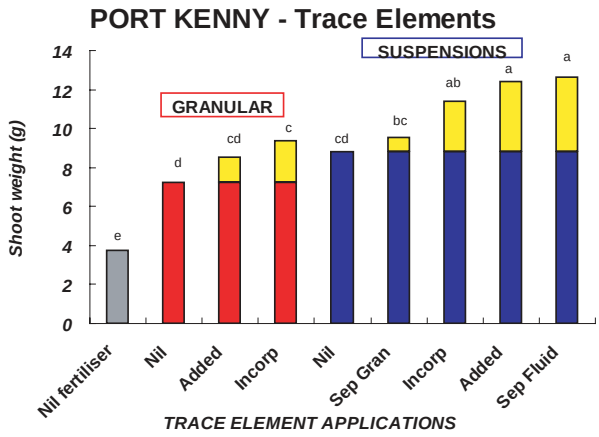
Micronutrient trial

This season we have set up a trial to help clarify how micronutrients perform in both granular and suspension mixes. The trial was sown on grey, highly calcareous soil at Cungena and Port Kenny. The micronutrients were either added to the mix or incorporated with the granules. In the case of the suspension added and incorporated treatments, these were the granular blends converted to suspension with the use of water, sulphuric acid and clay.

At early plant growth, whole plants were sampled from each plot, dried and weighed to measure shoot production. At both sites, the suspension mixes performed significantly better than the granular mixes. The micronutrients in the granular mixes performed best when they were incorporated on the granule. The use of dry blend micronutrient granules was an ineffective way of application. On the other hand, when the same dry blend was converted to a suspension there was a positive micronutrient response.

It appears that the even distribution of micronutrients with N and P in fluid form is the best way to enable plants access to macro and micronutrients in these calcareous soils.



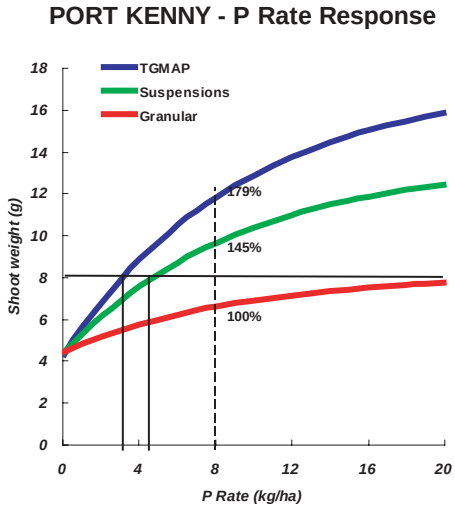


Phosphorus rate response trial

Also this season at Port Kenny we have a phosphorus rate response trial to compare the ability of a suspension, a clear liquid (technical grade MAP/phosphoric acid) and a granular to supply P to wheat at increasing rates of application. All treatments received zinc, manganese and copper. The granular was a commercial blend with micronutrients on the granules. The two liquid forms had the micronutrients incorporated in the complete mixes.

At early plant growth, whole plants were once again sampled from each plot, dried and weighed to measure shoot production.

As the graph indicates, at 8 kg/ha of P, the suspension mix had a dry shoot weight increase of 45% and the clear liquid 79% over the granular. Alternatively, the phosphorus application rate of the two liquids is much less than the highest production of granular P.



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12:16:0 analysis

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UAN N40% & 4% Humic
UAN N32% & 3% Humic

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Testing for phosphorus on calcareous soils – a bit of a lottery?

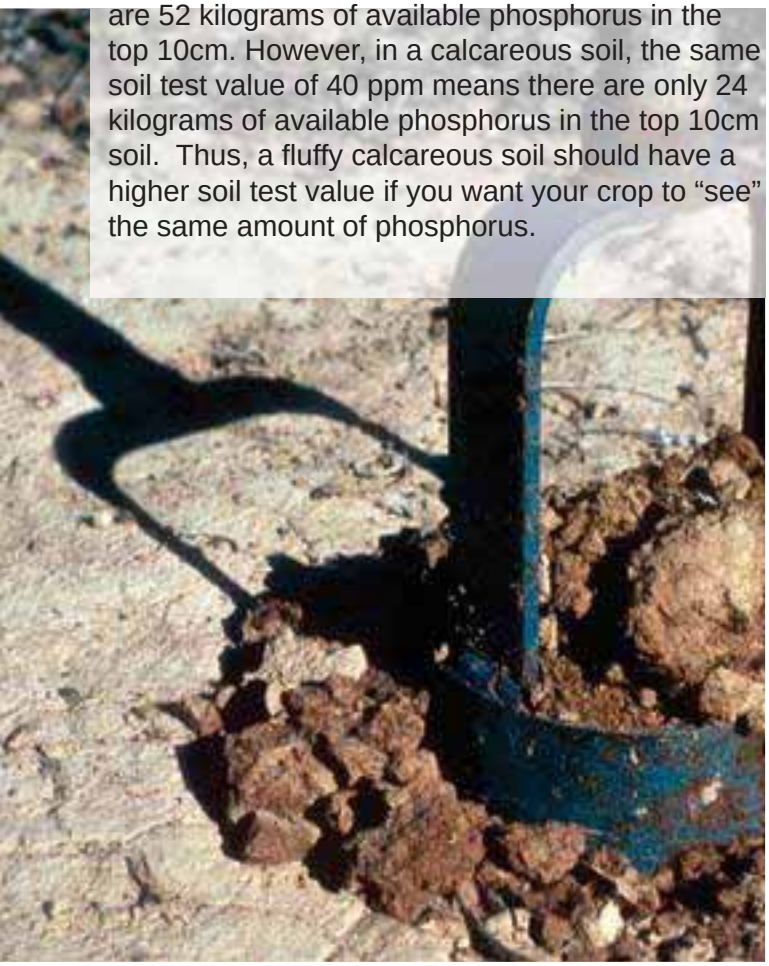
Prof. Mike McLaughlin,
CSIRO Land and Water/University of Adelaide,
Waite Campus, Adelaide

Over many years on the calcareous alkaline soils of South Australia and Victoria (Eyre Peninsula, Yorke Peninsula and the Mallee), many farmers may have noticed that soil test results for availablephosphorus (P) have been high, yet the crops could appear P deficient. Why is this?

There are probably two reasons that soil test results might be misleading on calcareous soils. One is related to the soil physical condition, and one to the chemistry.

If we look first at the physical explanation, calcareous soils have a low density due to the lime in the soil, that is they are inherently “fluffy” and “light”. When the laboratory analyses the soil sample for available P, it is expressed as “ppm” or milligrams of phosphorus per kilogram of soil. In a normal soil there is usually 1300 tons of soil in the top 10 centimetres (cm) of the soil profile for every hectare of land. However, the difference between calcareous and other soils is that in the top 10cm of the calcareous soil, there may be as little as 600 tons of soil. How does this affect available P testing?

If your soil test value is 40 ppm (a high value indicating no P deficiency), in a normal soil there are 52 kilograms of available phosphorus in the top 10cm. However, in a calcareous soil, the same soil test value of 40 ppm means there are only 24 kilograms of available phosphorus in the top 10cm soil. Thus, a fluffy calcareous soil should have a higher soil test value if you want your crop to “see” the same amount of phosphorus.



Soil chemistry also plays a role in confusing soil testing for phosphorus on calcareous soils. Most measures of available phosphorus in southern Australia are based on shaking the soil sample with a solution of sodium bicarbonate (called the “Olsen” or “Colwell” soil test). Phosphorus is present in soil as solid particles (precipitated after fertiliser is added), and also sitting on the surface of clay minerals in the soil. The bicarbonate extracting solution extracts the phosphorus from soil in two ways:

1) by knocking phosphorus off the surface of the mineral particles; and

2) by helping to dissolve up some of the solid phosphorus particles.

CSIRO research suggests that the bicarbonate extraction used (Olsen and Colwell) may be too good at dissolving up phosphorus, and the procedure may be dissolving up solid forms of phosphorus that the plant cannot access.

So what does this mean? Critical values for phosphorus on highly calcareous soils are likely to be much higher than on other soils when the Olsen and Colwell tests are used.

These tests are also probably not the best methods to measure available phosphorus in highly calcareous soils. CSIRO research again suggests that a technique using small strips of a resin might be a much better method on these soils, and research is needed to see if this works across a wide range of calcareous soils in southern Australia.

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