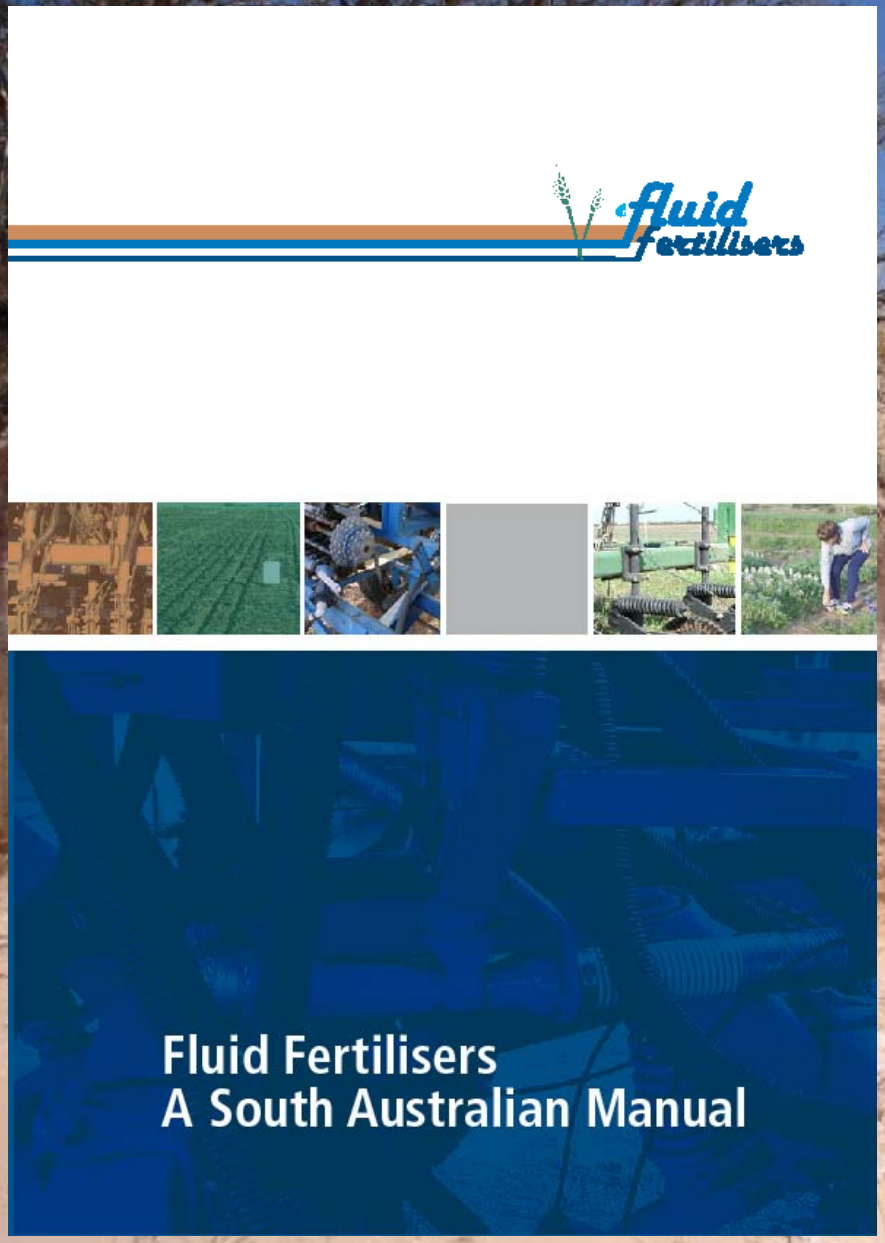

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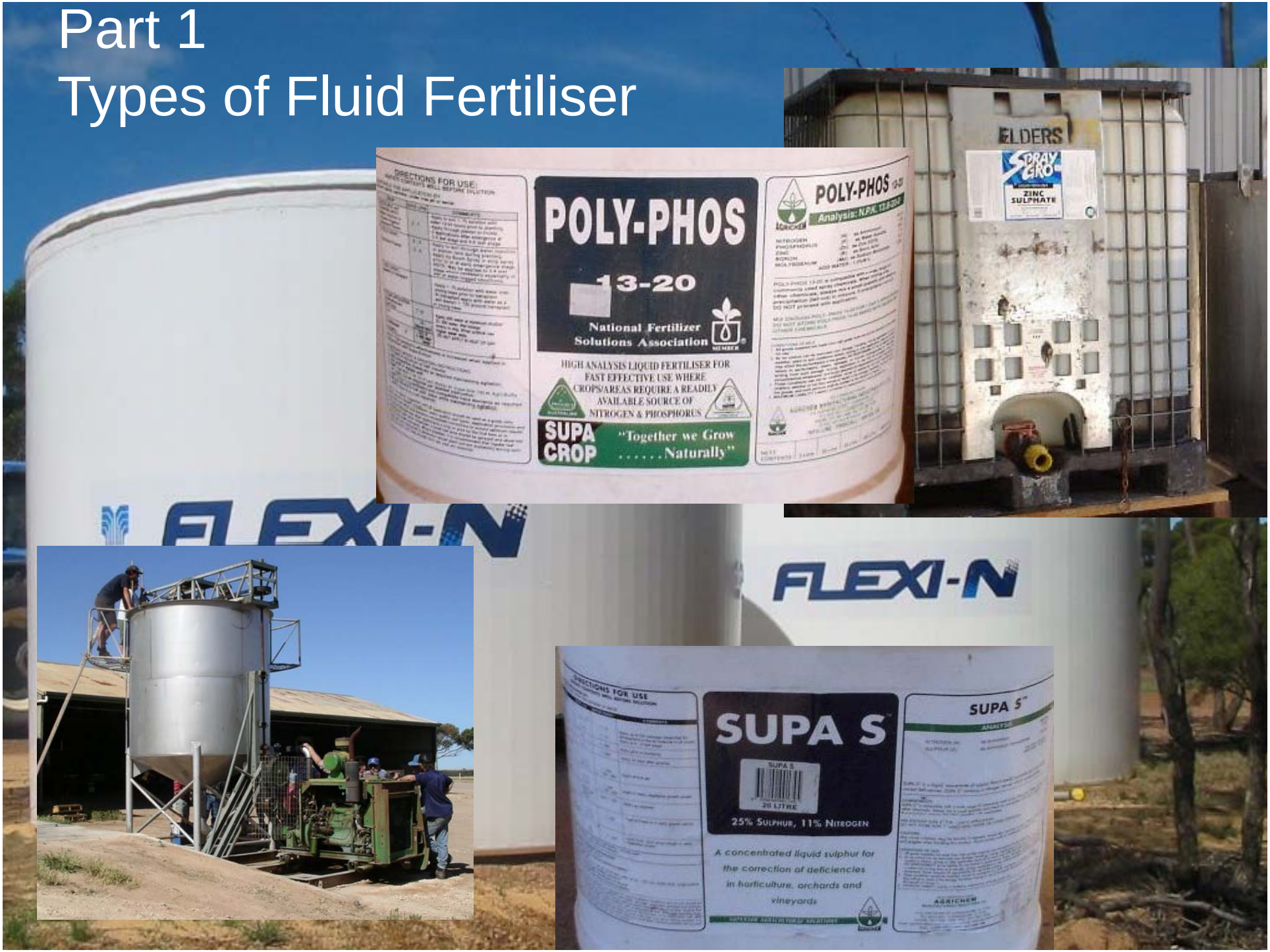
10 year research program 1997 -2006
Supported by:
Fluid Fertiliser Foundation
GRDC
SAGIT
Agrichem
IPL
CSBP

Part 1
Types of Fluid Fertiliser

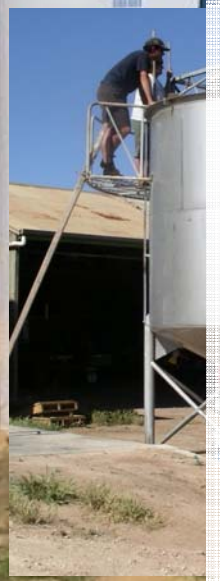


Part 1
Types of Fluid Fertiliser

Fluid fertilisers - small market share in Australian cereal cropping. Most farmers are unfamiliar with products available in Australia.

Many farmers have started with micronutrients alone.

SA farmers mainly use phosphoric acid plus urea and micronutrients mixed on farm. Transporting, storing and using phosphoric acid has specific issues e.g. acidified UAN.



Manual: Lists products available in Australia

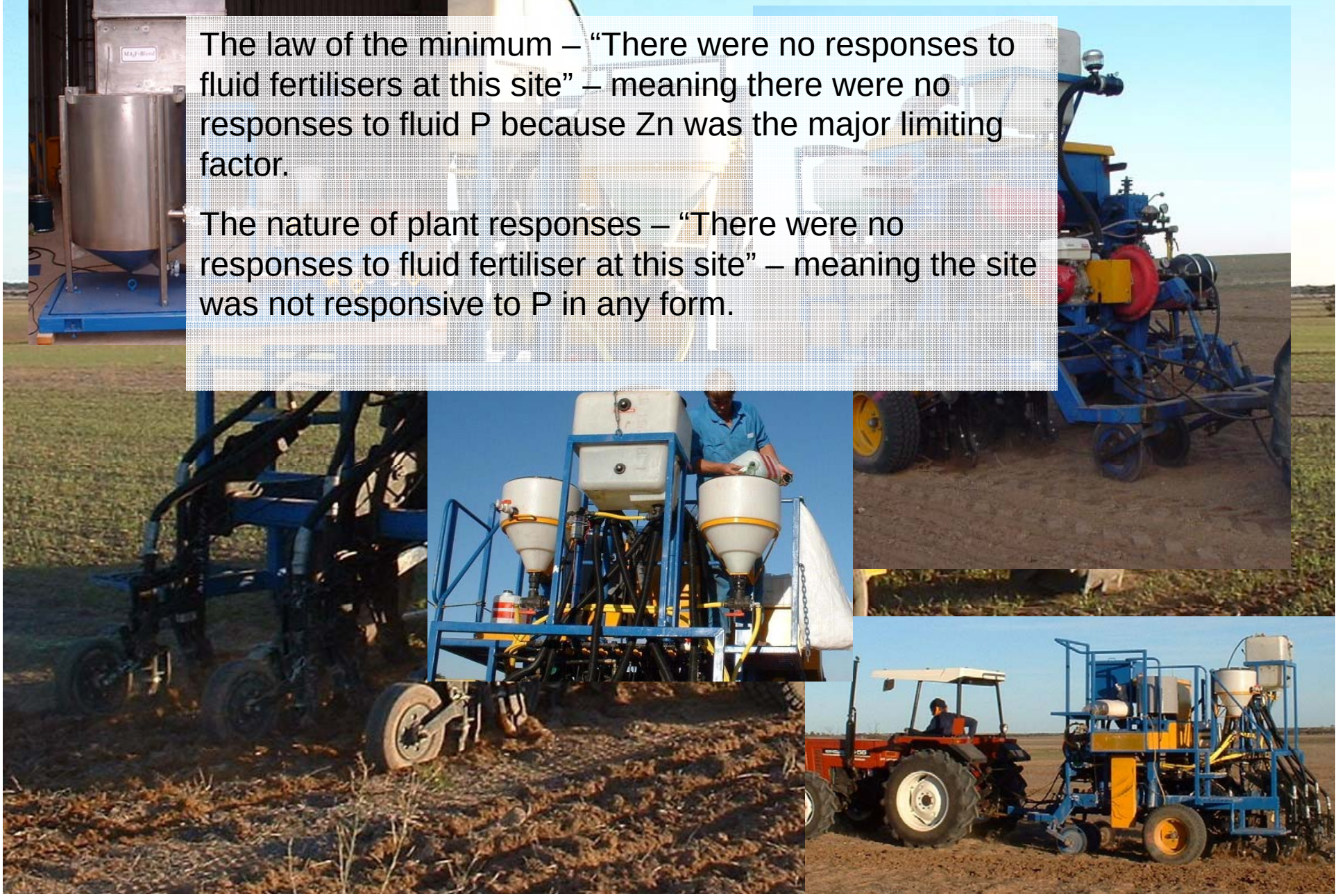
Legal requirements

OHSW issues

Part 2 Field Research with Fluid Fertilisers

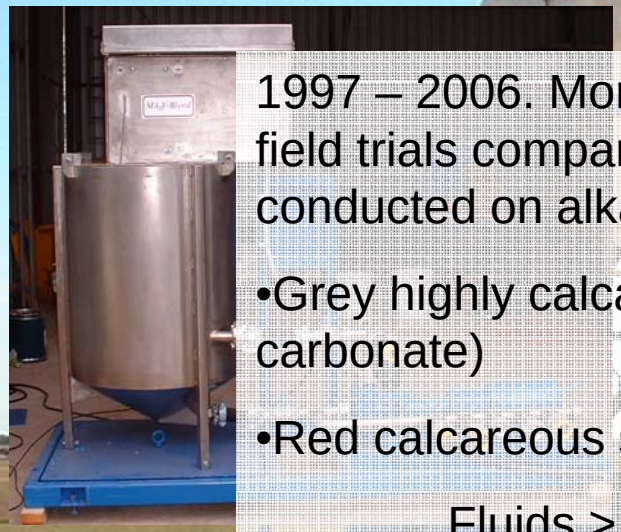
The law of the minimum – “There were no responses to fluid fertilisers at this site” – meaning there were no responses to fluid P because Zn was the major limiting factor.

The nature of plant responses – “There were no responses to fluid fertiliser at this site” – meaning the site was not responsive to P in any form.



Part 2 Field Research with Fluid Fertilisers

Part 2 Field Research with Fluid Fertilisers



1997 – 2006. More than 100 replicated randomised block field trials comparing fluid and granular fertilisers were conducted on alkaline, mainly calcareous soils in SA.

- Grey highly calcareous soils (15-70% calcium carbonate) Fluids >granular in 90% of trials
- Red calcareous soils (5-15% calcium carbonate)

  Fluids > granular in 58% of trials
- Red loamy sands (<5% calcium carbonate)

  Granular > fluid in 31% of trials

  Fluids >granular in 8%

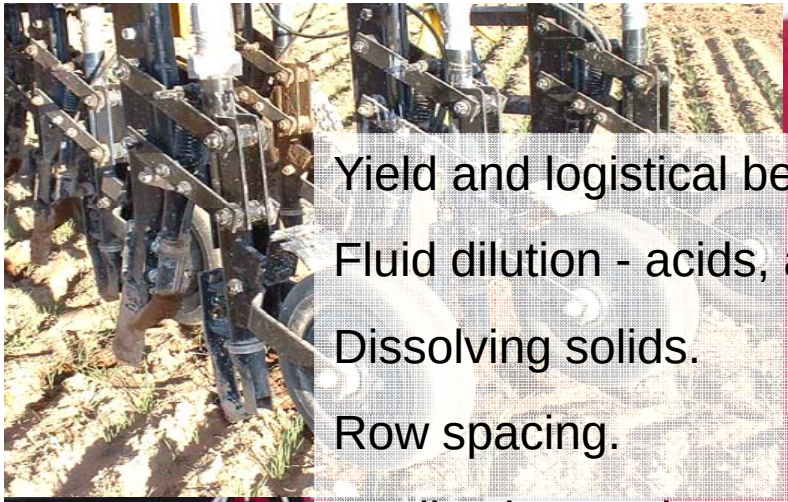
- Leaching of nitrate on sandy soil?
- Urease + nitrification inhibitors? – some evidence.

Part 2 Field Research with Fluid Fertilisers

Other issues investigated:

- Product and rate testing
- Fertilizer placement
- Application methods
- Timing of application
- Multi-nutrient formulations
- Varietal and species interactions with fertilizer type
- Disease x fertilizer interactions
- Residual effects
- Granular particle size

Part 3 Application Technology



Yield and logistical benefits.

Fluid dilution - acids, application rates, dilution volumes.

Dissolving solids.

Row spacing.

Application equipment.

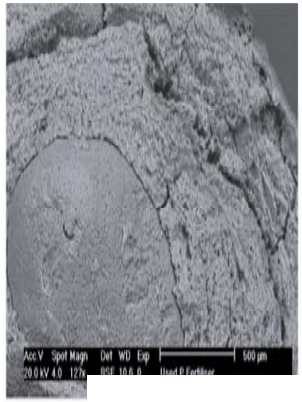
Converting granular equipment.

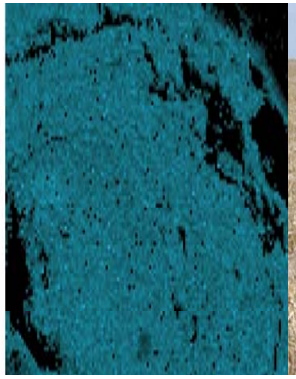
Conversion of units – P_2O_5, K_20, N

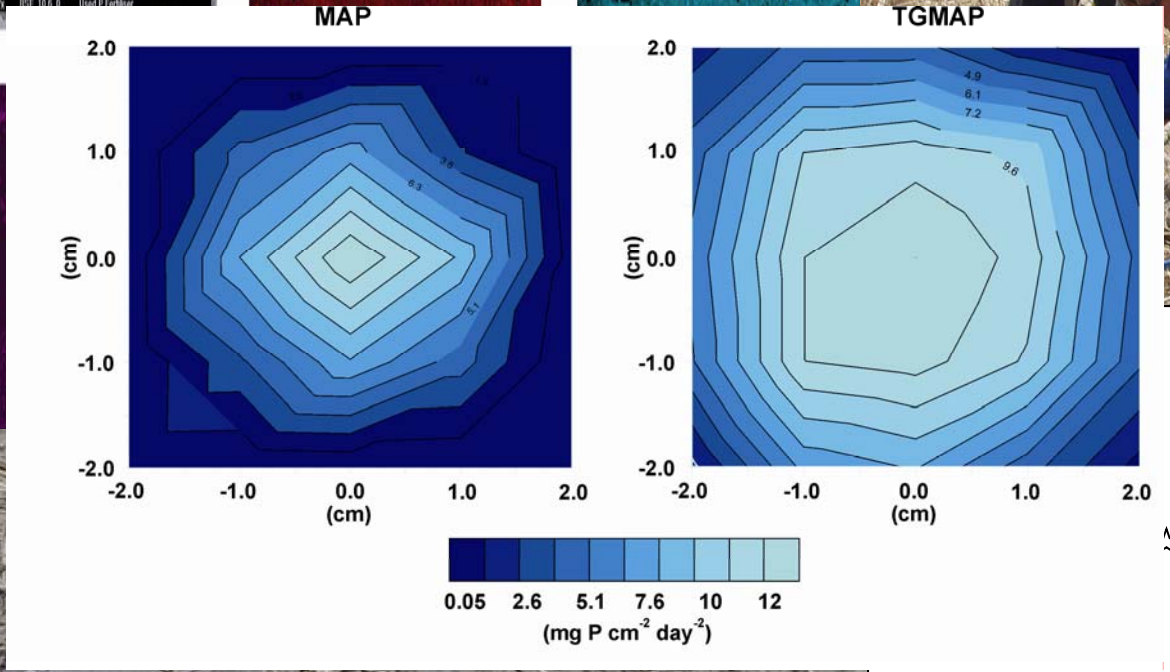
w/v% to w/w%

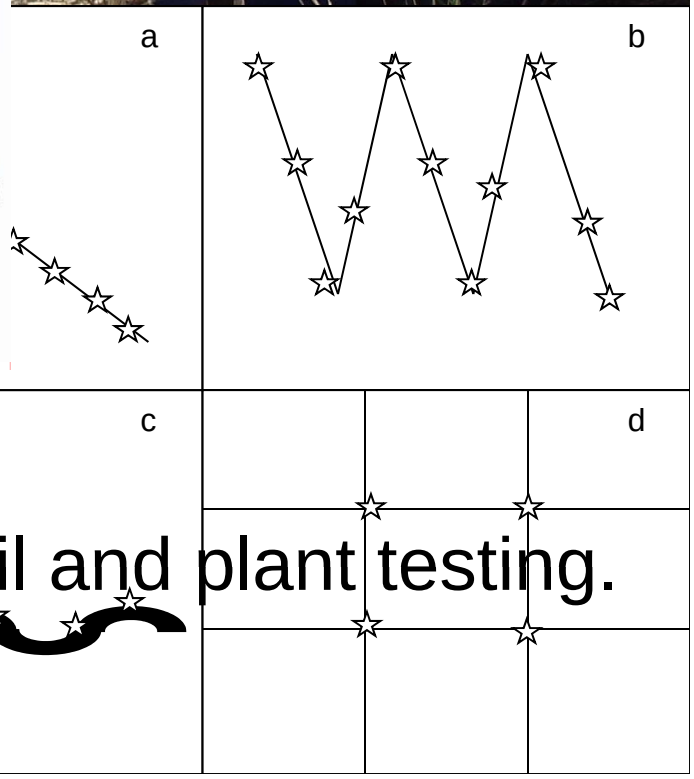
Metric to Imperial

Part 3 Application Technology









Part 4 Background chemistry and soil and plant testing.

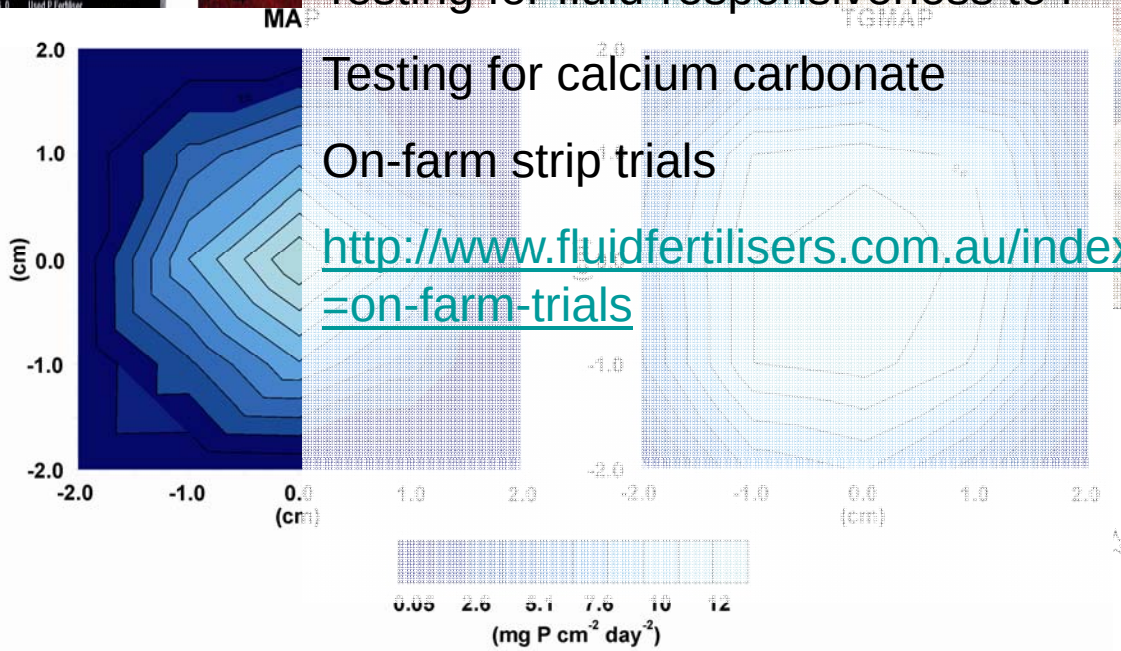
Soil and plant testing

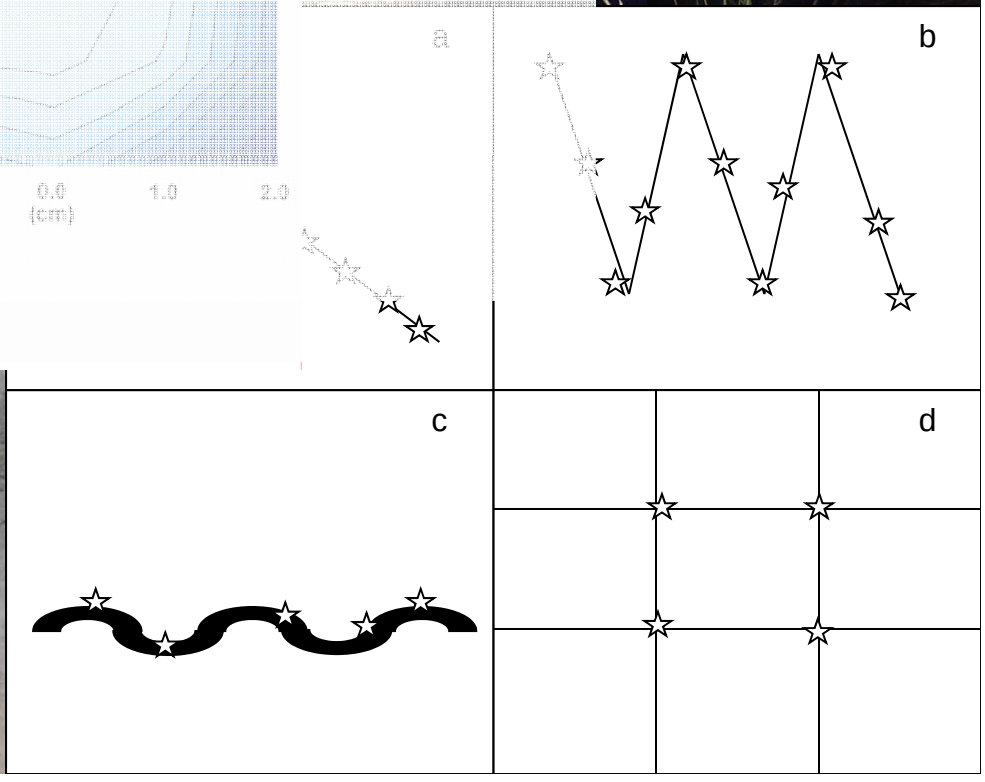
Testing for fluid-responsiveness to P

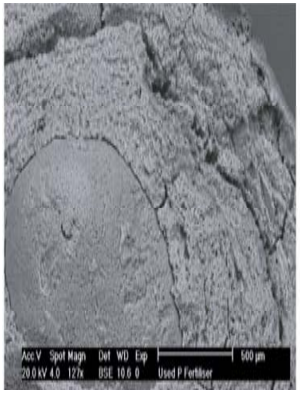
Testing for calcium carbonate

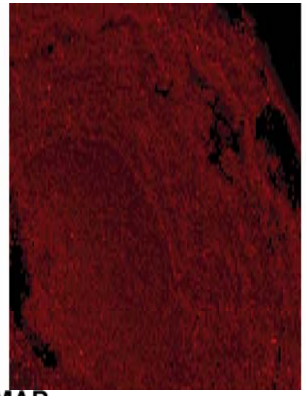
On-farm strip trials

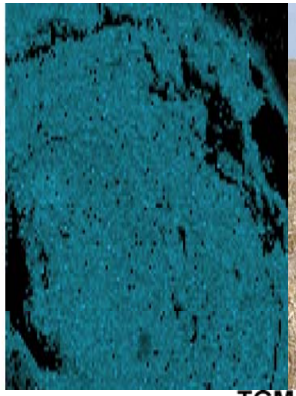
http://www.fluidfertilisers.com.au/index.php?page=on-farm-trials

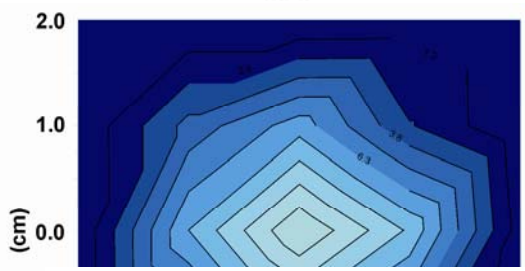


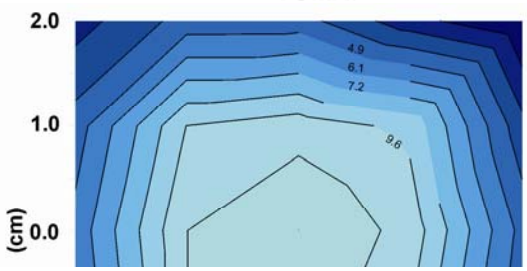










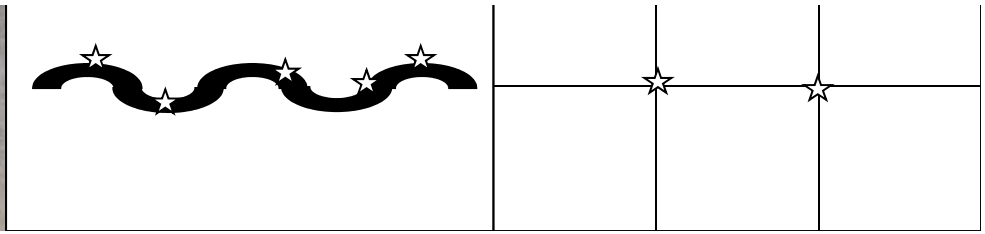


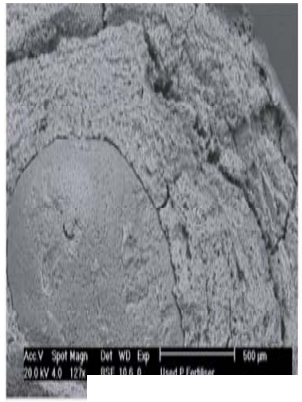
The attached document, "Testing fluid fertilisers with strip trials on farm", will assist farmers in the design, management and analysis of on-farm trials.

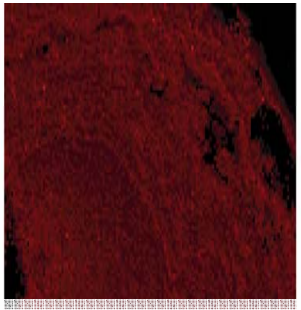
Statistical analysis of the results is a crucial part of any trial. To assist with this process an appropriate trial design has been included in "Testing fluid fertilisers with strip trials on farm", accompanied by a package which they can use to analyse their results. If growers, adhere to the designs and suggestions they can be confident of the results and their interpretation of them.

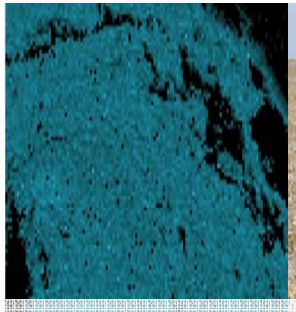
www.fluidfertilisers.com.au/index.php?page=on-farm-trials

Trial result analysis tool









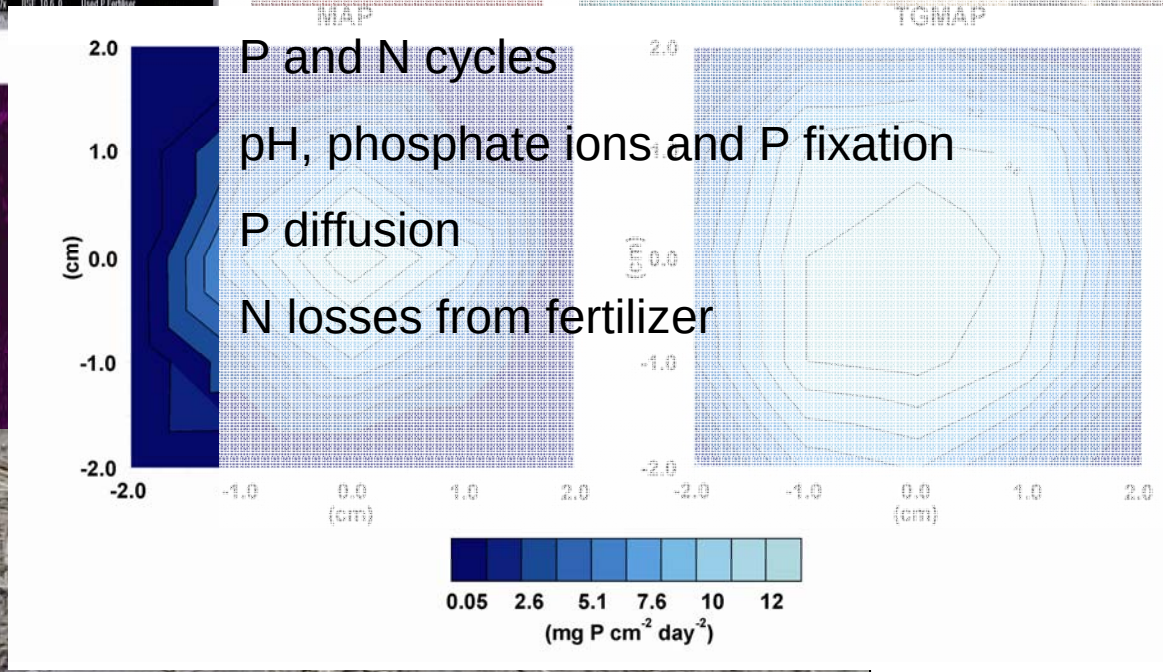
Factors controlling reaction products in soil

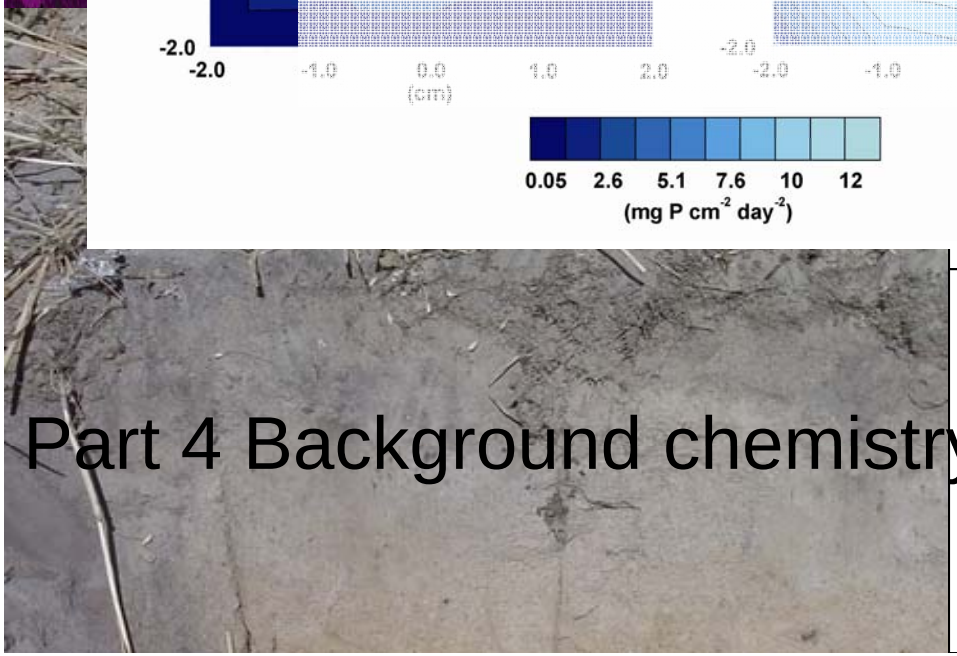
P and N cycles

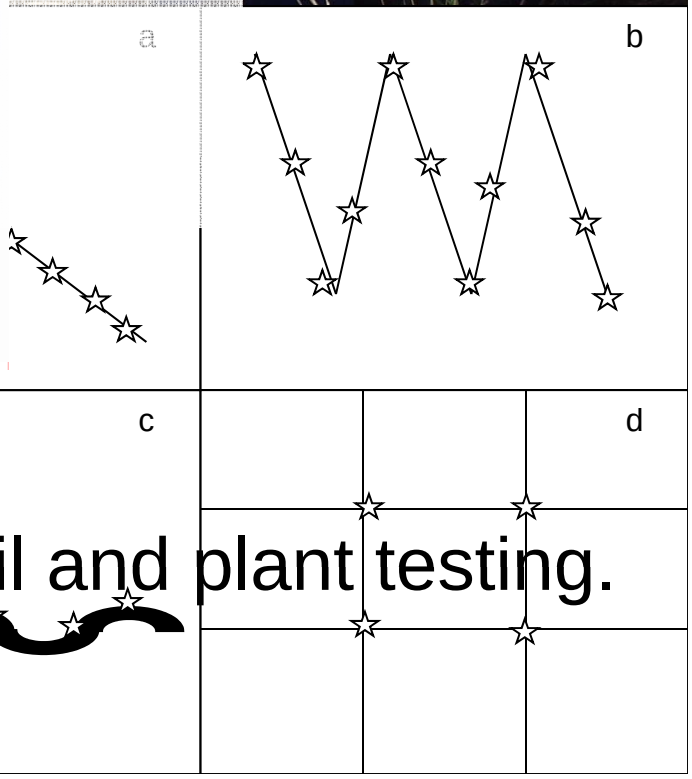
pH, phosphate ions and P fixation

P diffusion

N losses from fertilizer

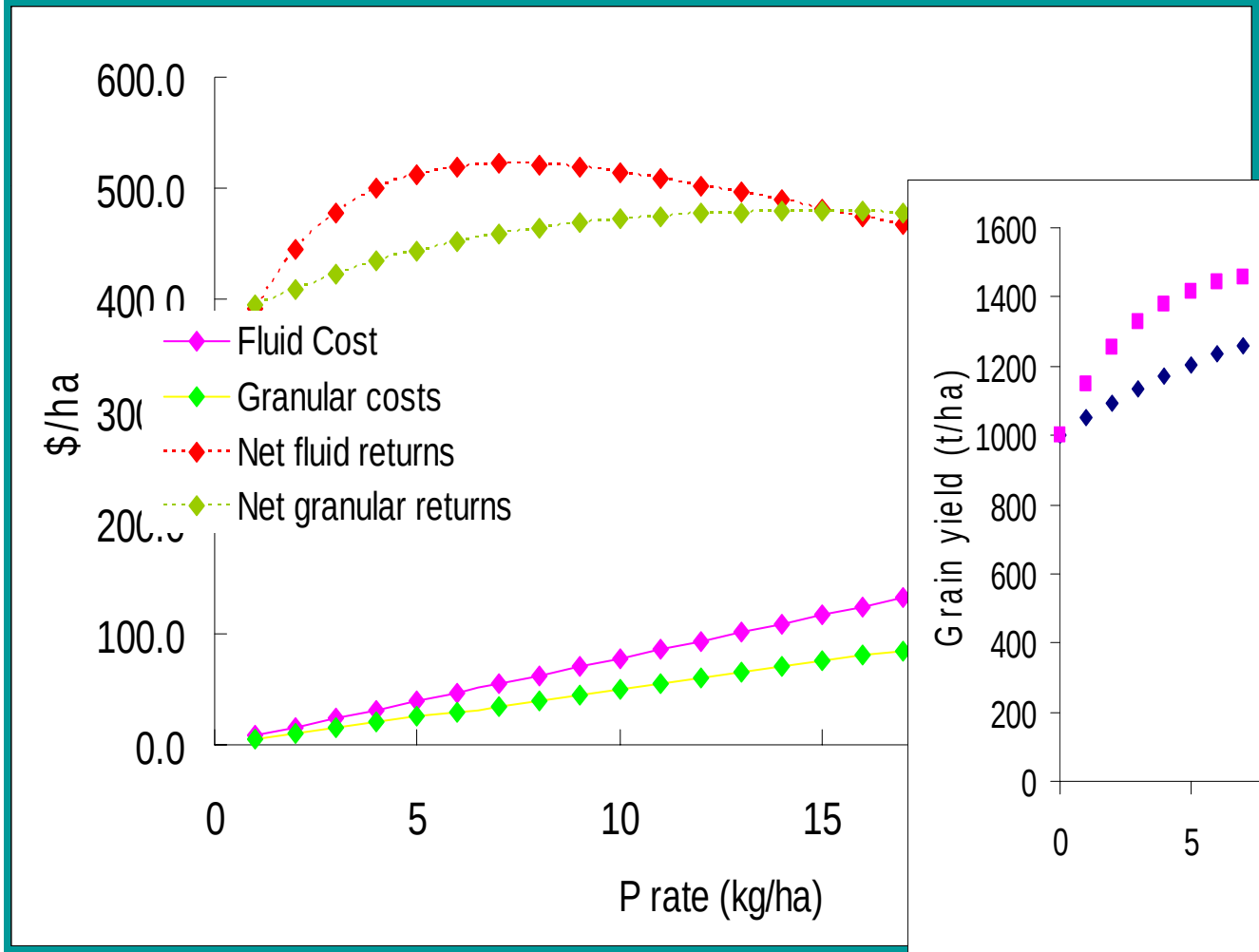


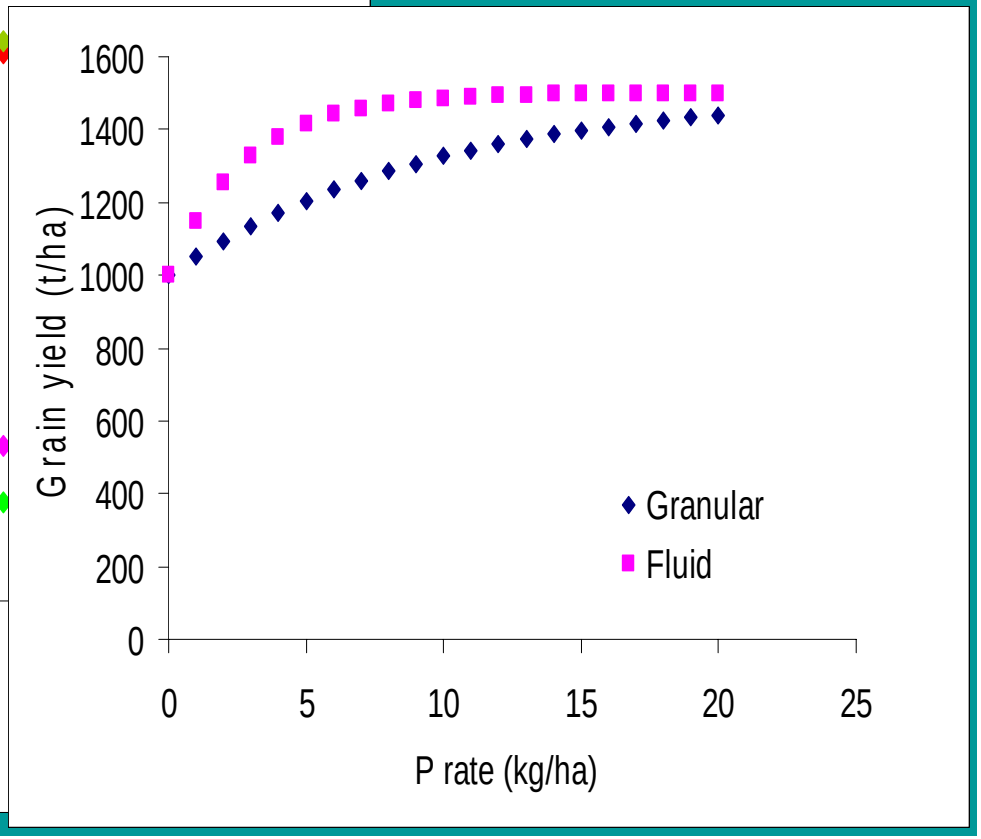




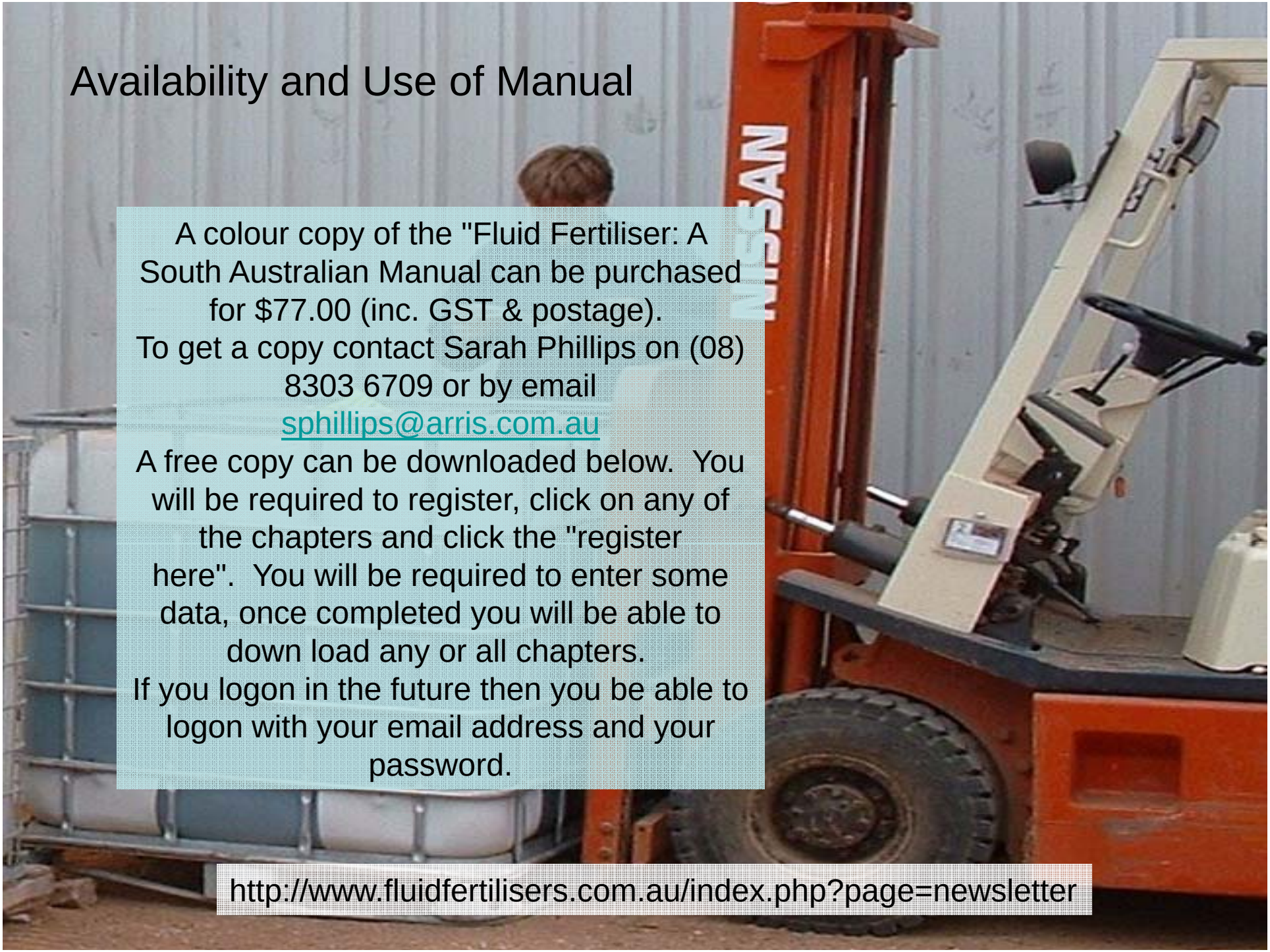
Part 4 Background chemistry and soil and plant testing.

Part 5 Economic performance of fluid fertilisers





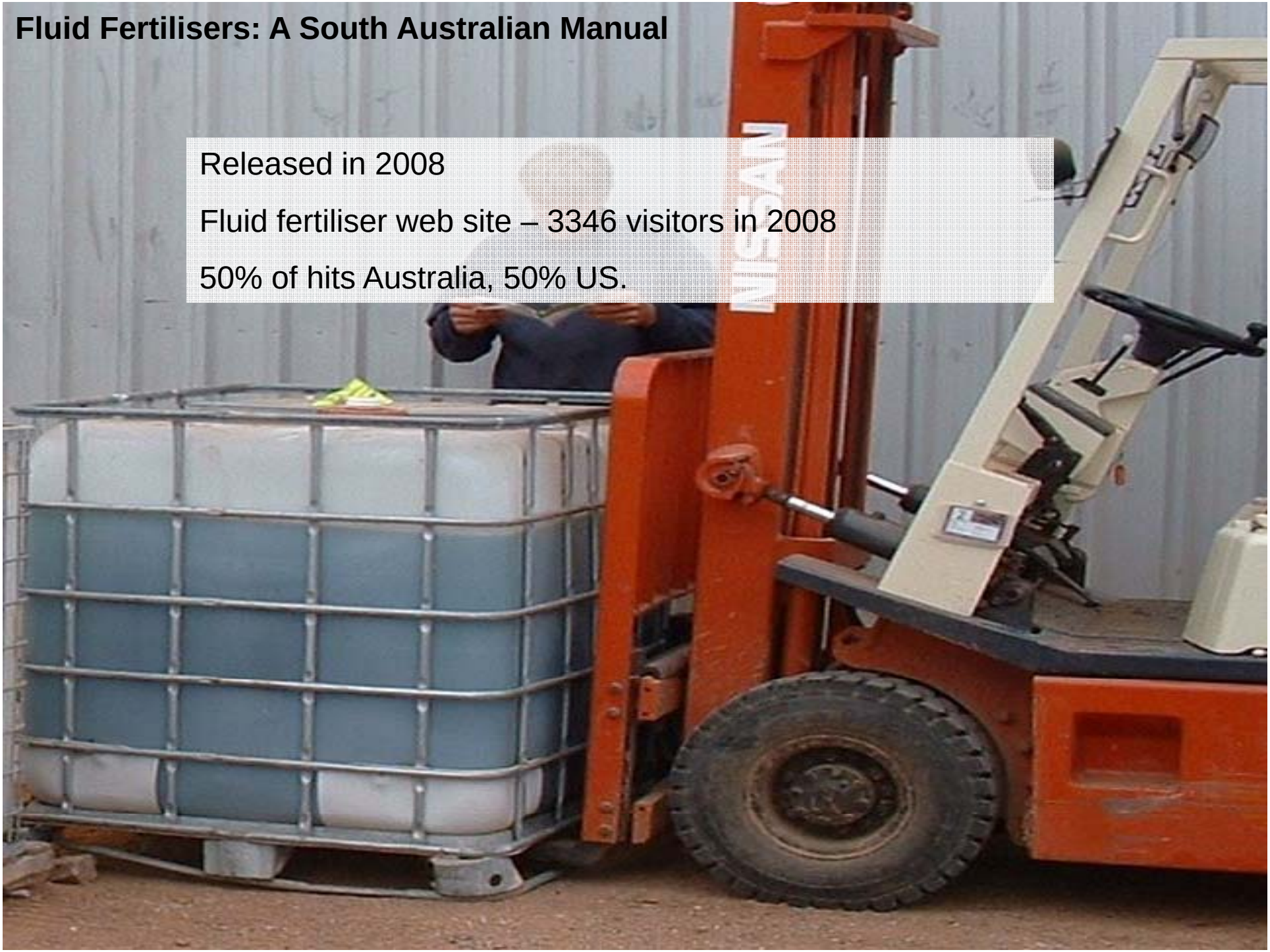
Availability and Use of Manual



A colour copy of the "Fluid Fertiliser: A South Australian Manual can be purchased for $77.00 (inc. GST & postage).
To get a copy contact Sarah Phillips on (08) 8303 6709 or by email sphillips@arris.com.au
A free copy can be downloaded below. You will be required to register, click on any of the chapters and click the "register here". You will be required to enter some data, once completed you will be able to down load any or all chapters.
If you logon in the future then you be able to logon with your email address and your password.

http://www.fluidfertilisers.com.au/index.php?page=newsletter

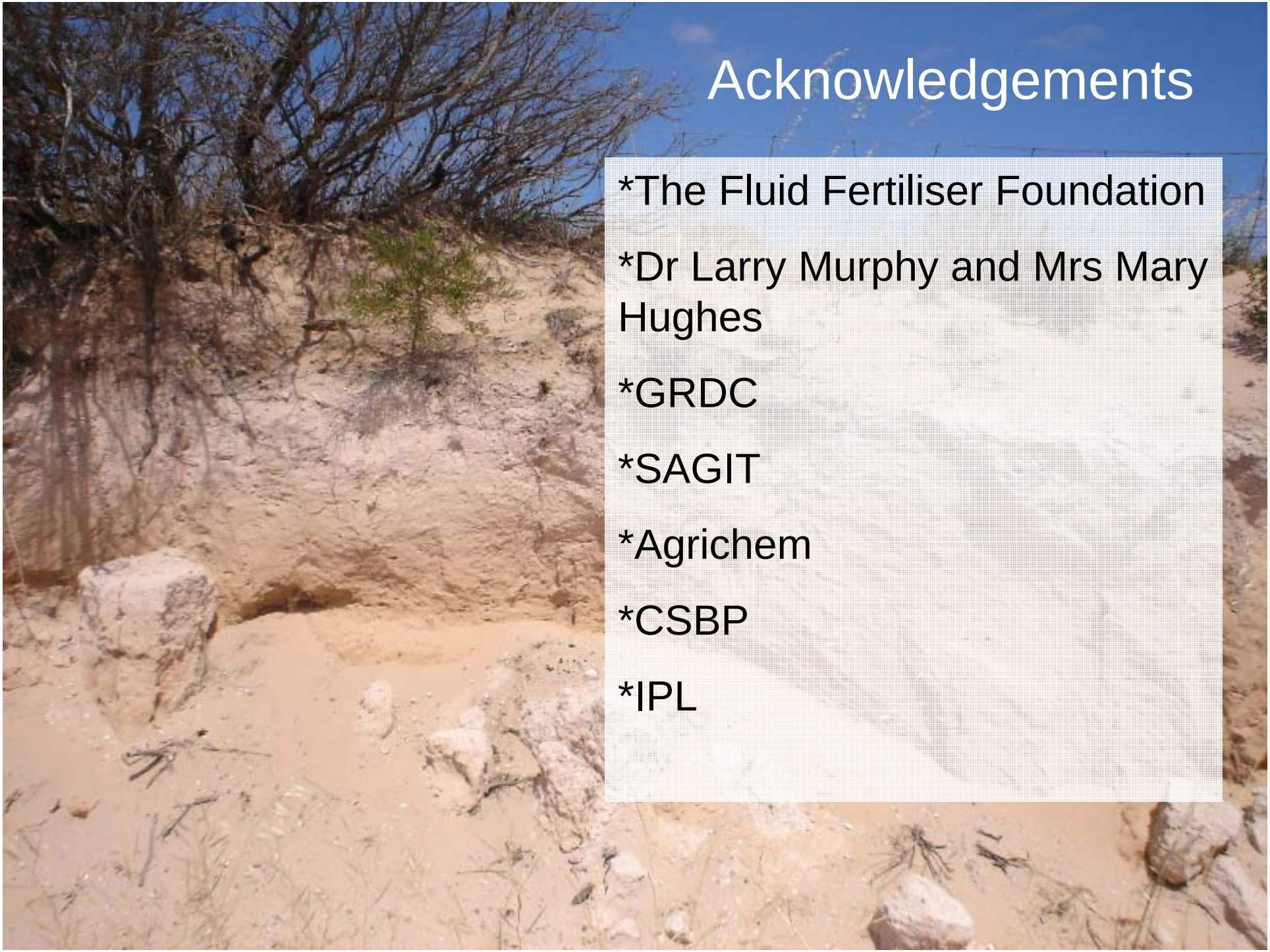
Fluid Fertilisers: A South Australian Manual



Released in 2008

Fluid fertiliser web site – 3346 visitors in 2008

50% of hits Australia, 50% US.



Acknowledgements

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*Dr Larry Murphy and Mrs Mary Hughes

*GRDC

*SAGIT

*Agrichem

*CSBP

*IPL