



MFS soil test results 2013

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CSIRO Sustainable Agriculture Flagship

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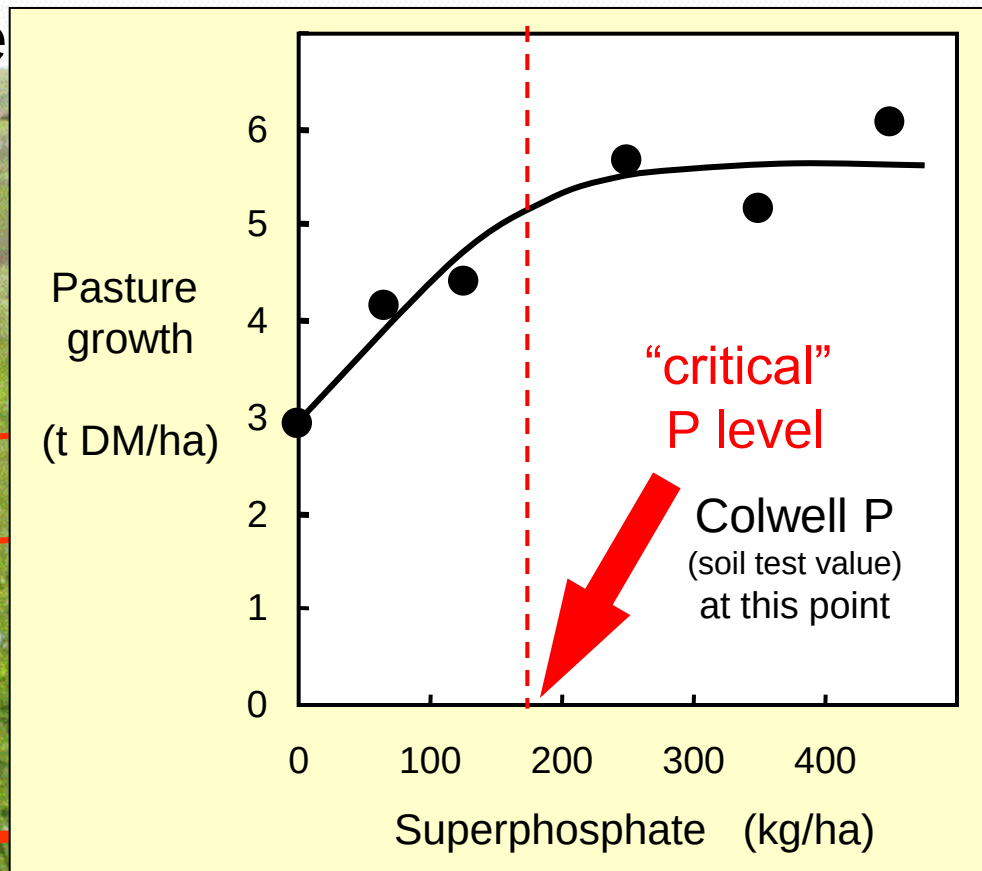
Nancy Spoljaric
MFS

MFS soils club - soil testing history

Year		2010	2011	2012	2013
Farm businesses		19	38	49	55
No. of 'unique' paddocks tested		96	247	479	680
SOIL FERTILITY MONITORING	Paddocks with repeat samples (4x)				18
	(3x)				23
	(2x)				105
TESTING	Paddocks sampled once only				534

Response to superphosphate

(Ginninderra Experiment Station, Canberra)

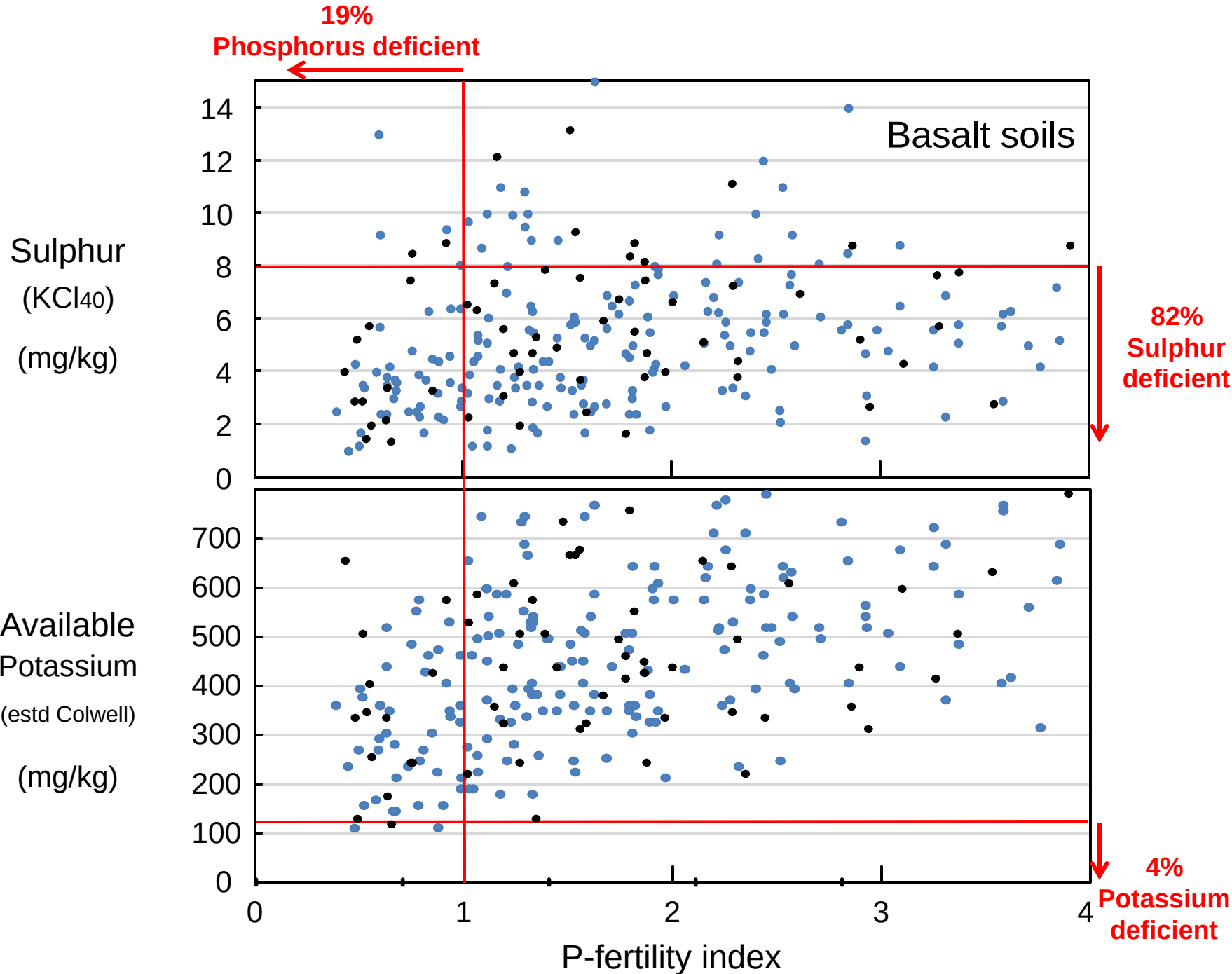


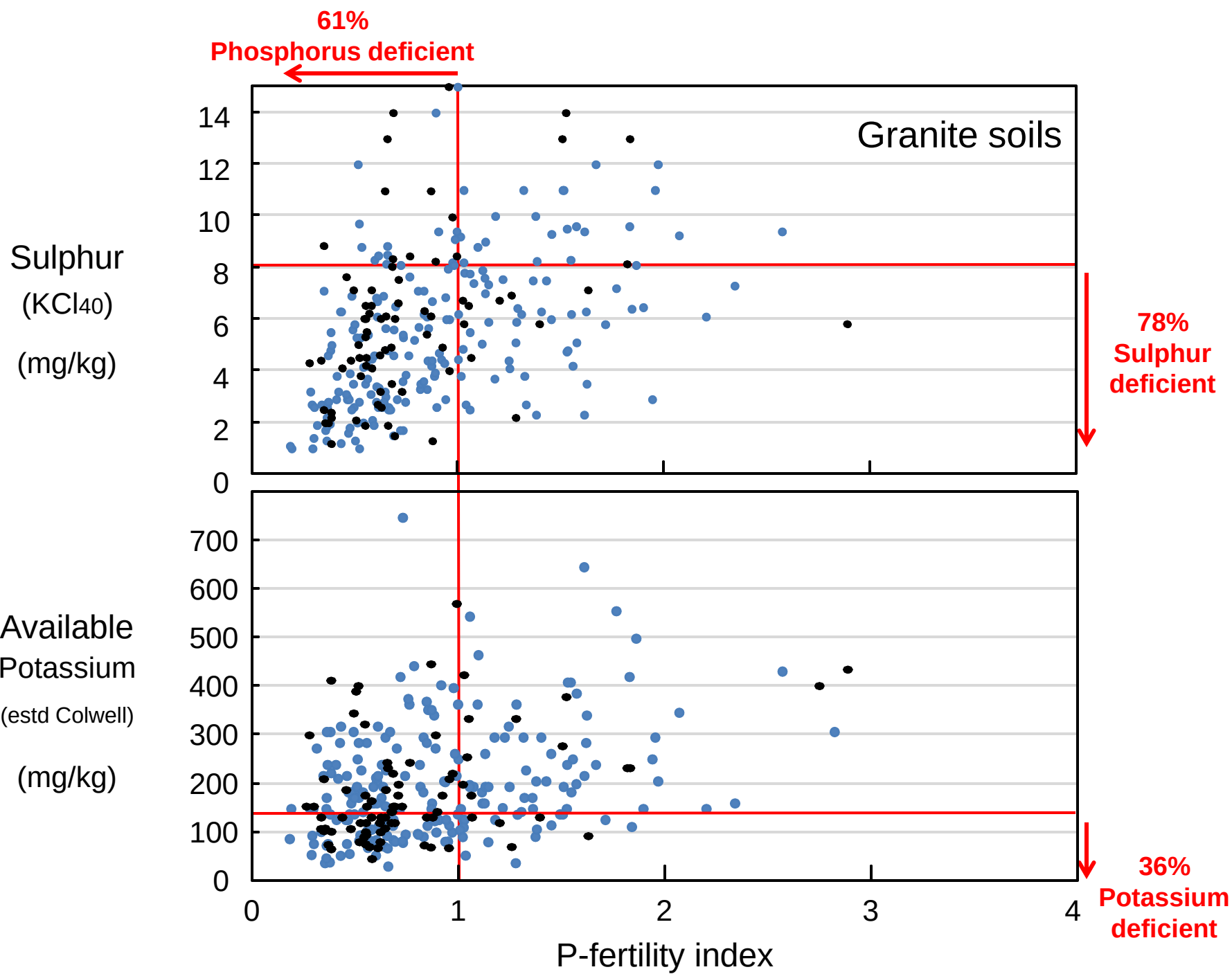
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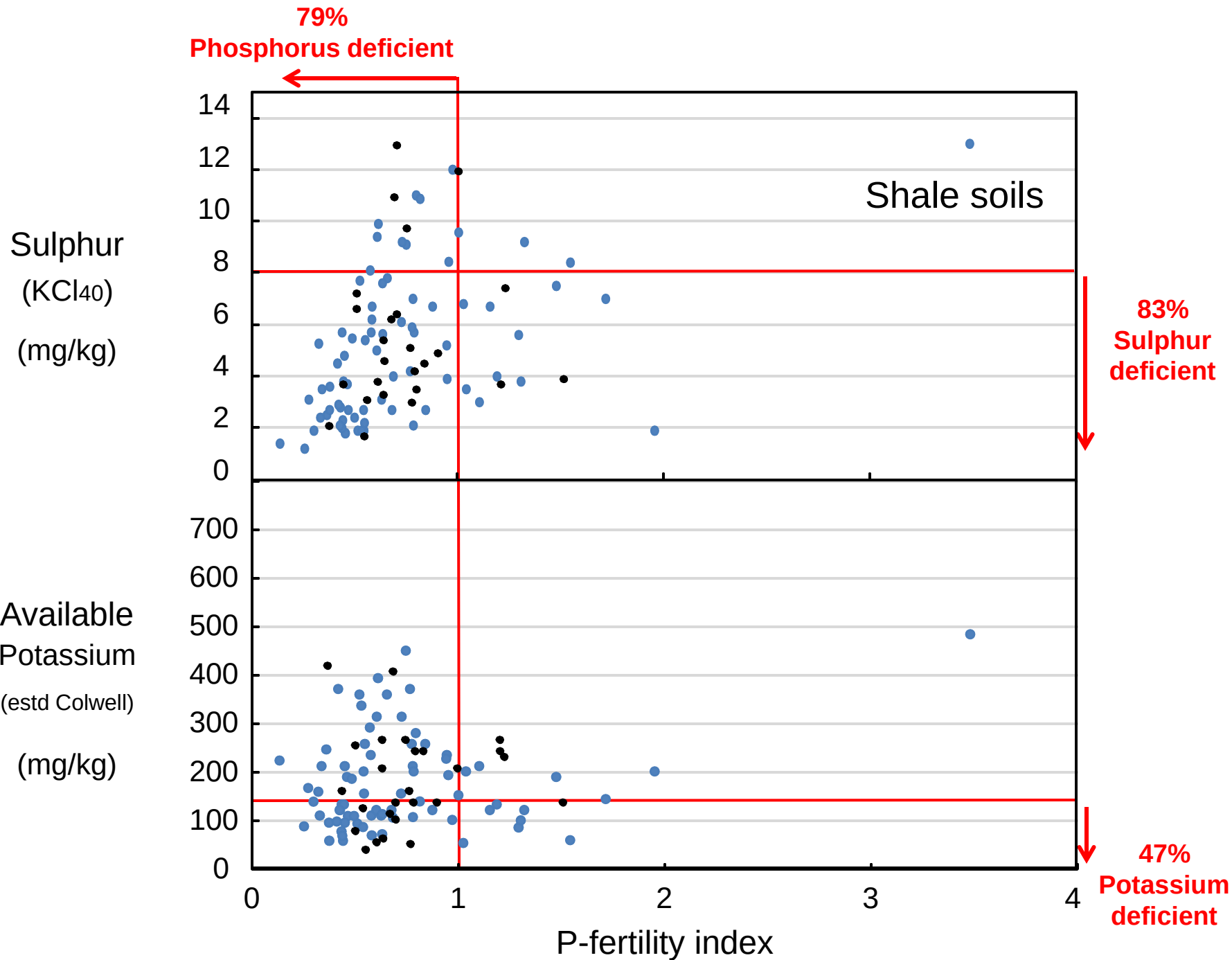
0

63

250 kg superphosphate/ha







Basalt soils

20% below optimum for P
80% below optimum for S
Adequate to high K levels

} ~20% P & S deficient

Granite soils

60% below optimum for P
80% below optimum for S
25% below optimum for K

} ~55% P & S deficient
} ~25% P, K & S deficient

Some soils may benefit from lime

Shale soils

80% below optimum for P
80% below optimum for S
50% below optimum for K

} ~70% P & S deficient
} ~35% P, K & S deficient

Some soils may benefit from lime

Bottom line: within these soil groups, paddocks can differ considerably

MFS soil test database tool

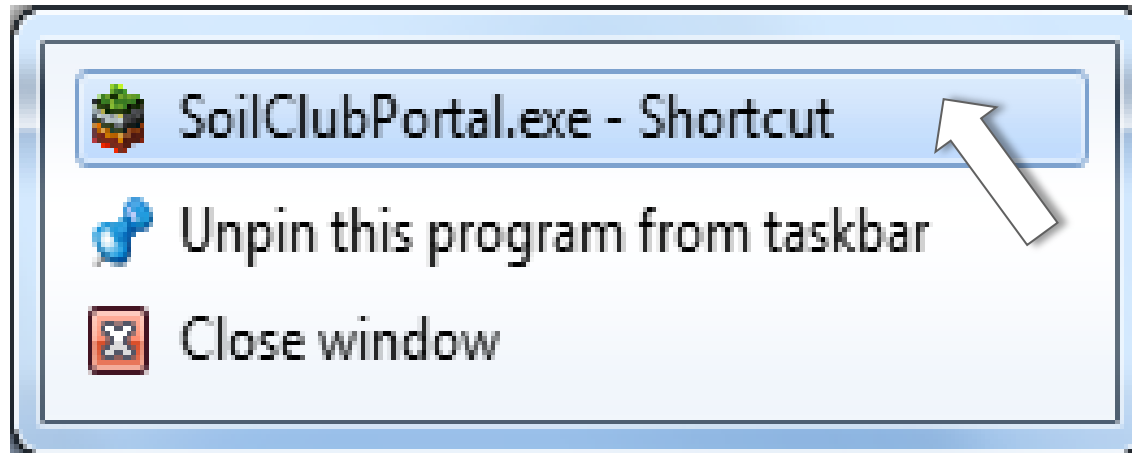
NEW

(i) Manageable way of collating and storing MFS soil test data

- 200-500 soil samples being tested each year
- each analysed for 21 different soil tests
- => 4,000 – 10,000 data values to be handled/stored annually

(ii) Rapid way of extracting soil test information & farm reports

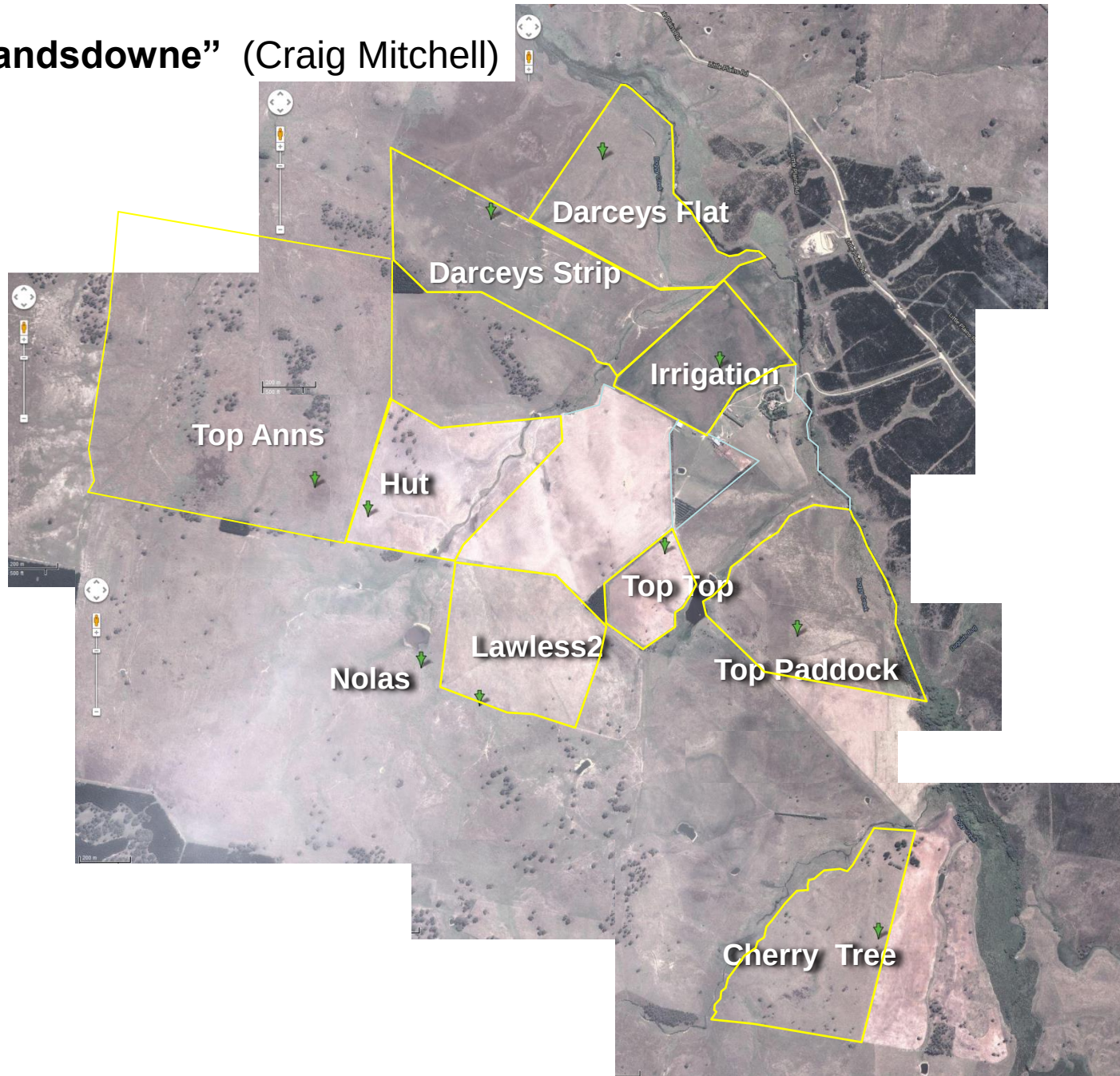
MFS soil test database tool



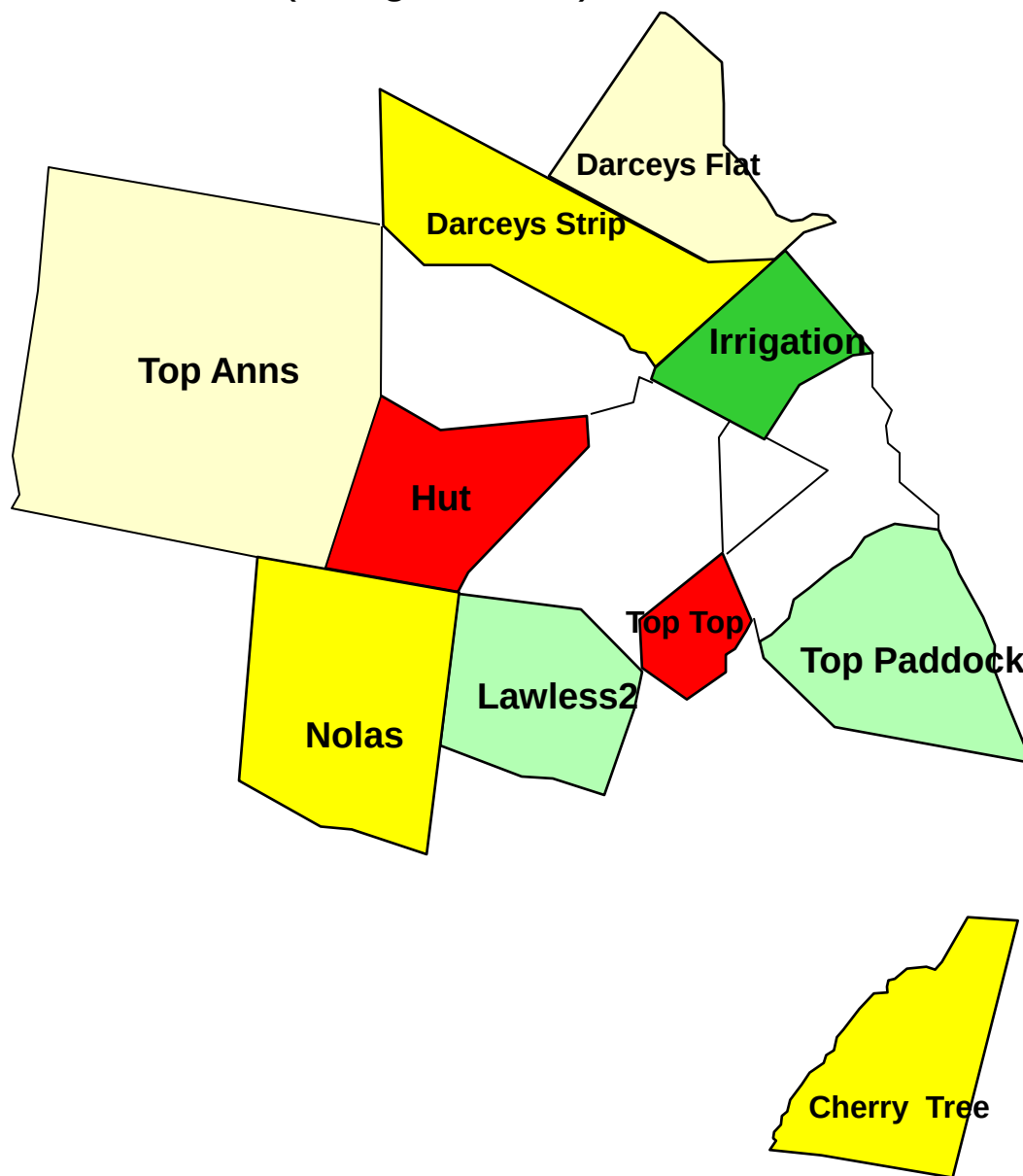
LIVE DEMONSTRATION **MFS Soils Club DATABASE**

- Records held
- Records that could be held in future versions
- How soil data are imported
- Export of a farm soil test reports

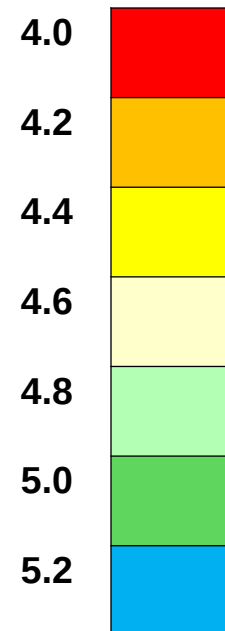
“Landsdowne” (Craig Mitchell)



“Landsdowne” (Craig Mitchell)

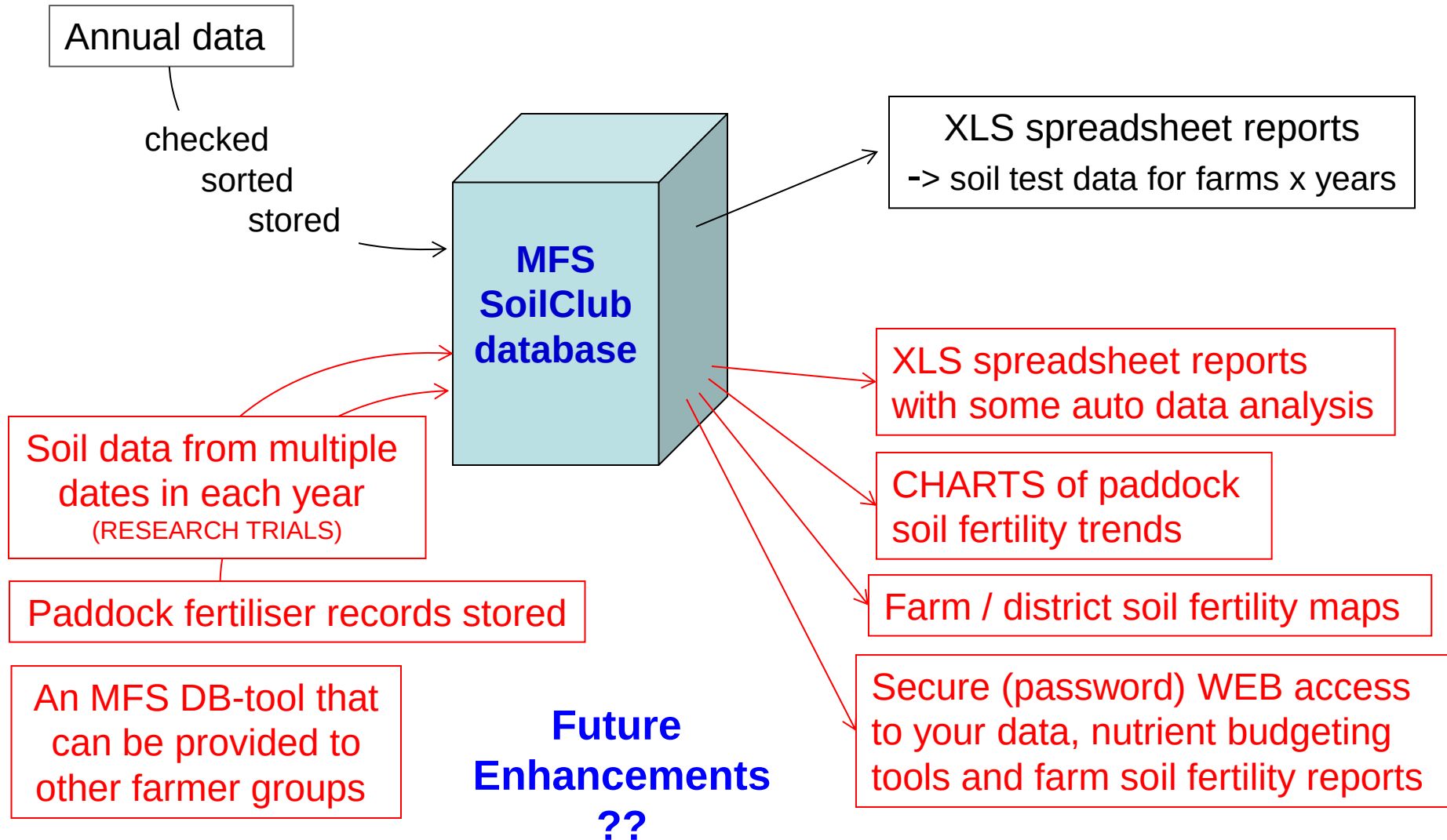


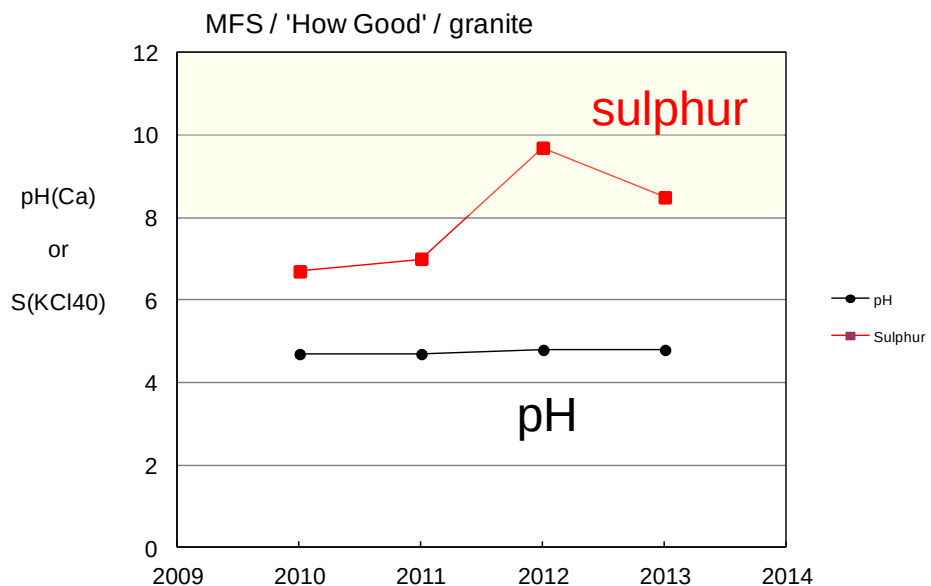
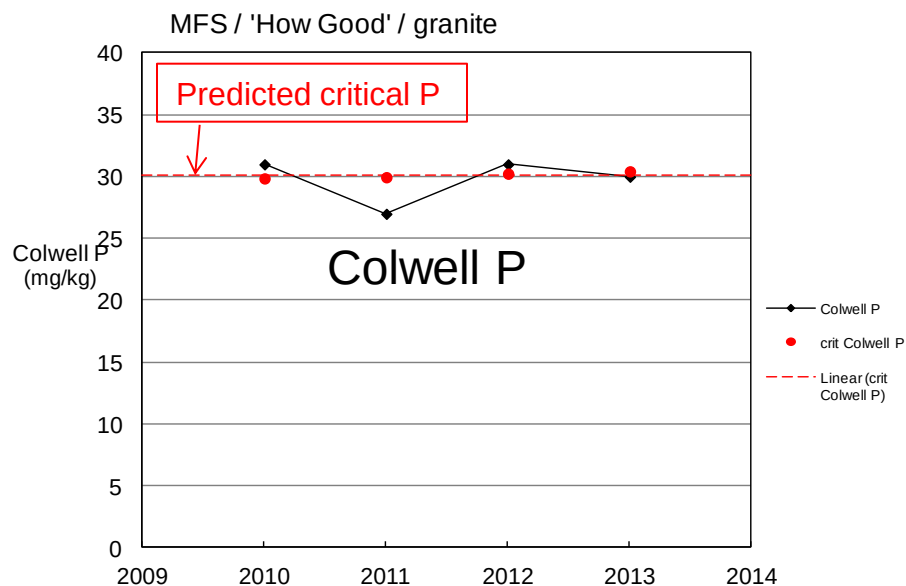
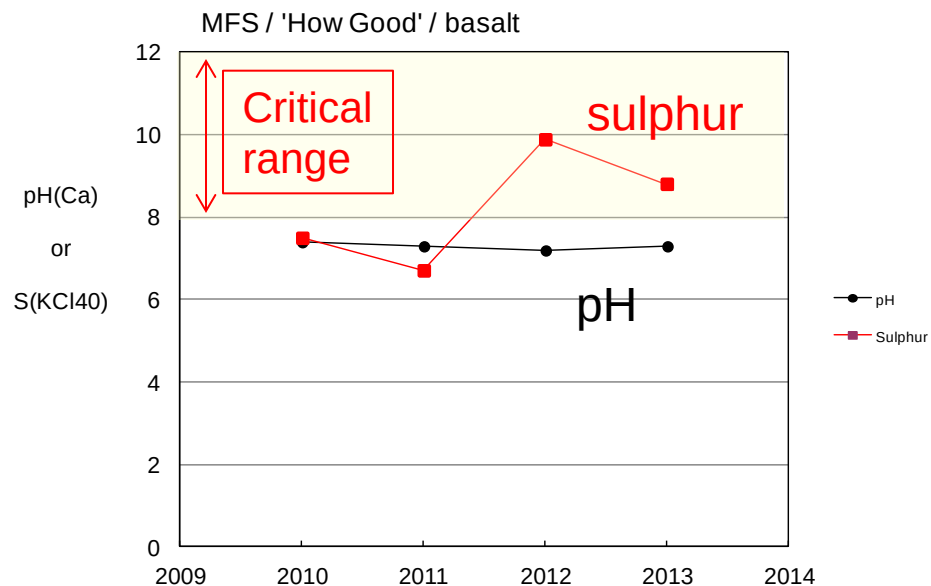
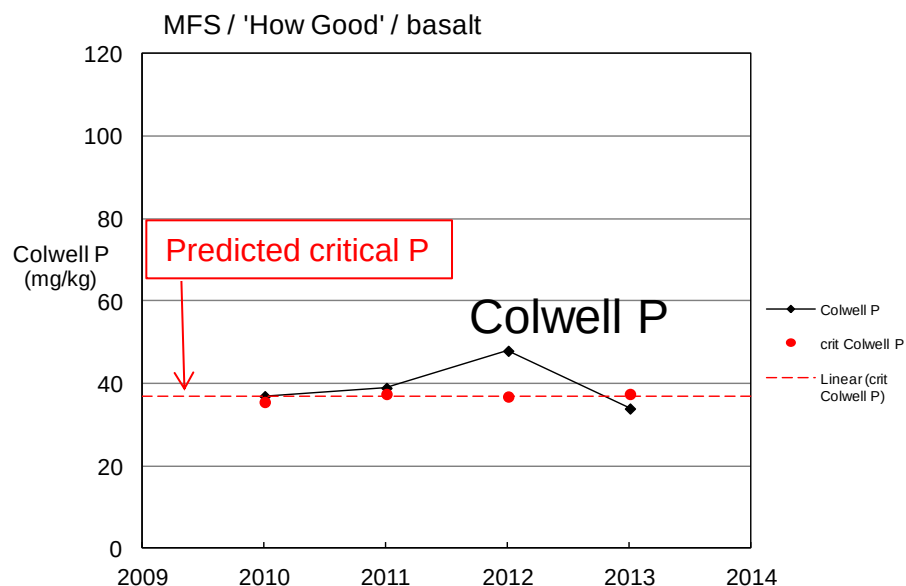
Soil pH(Ca)

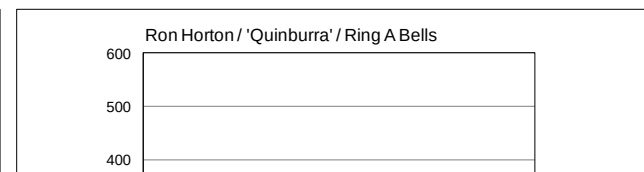
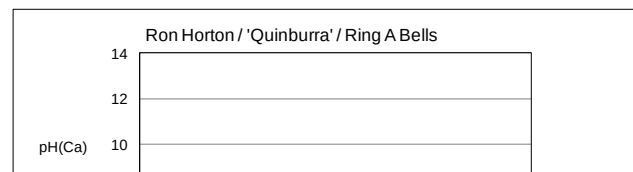
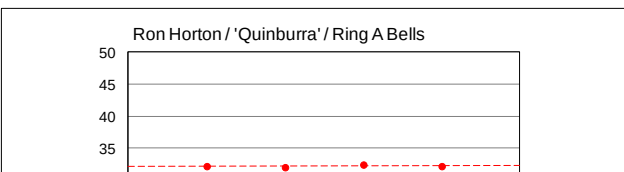
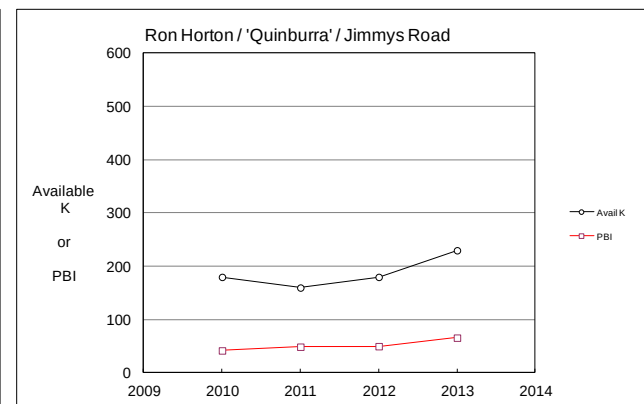
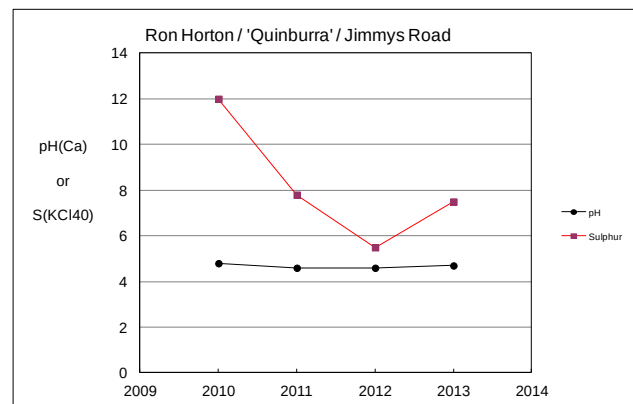
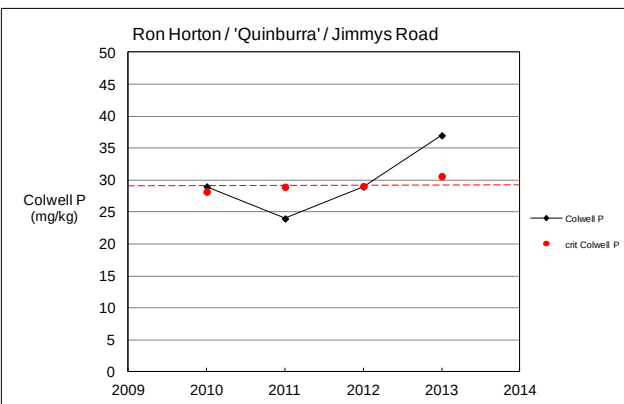
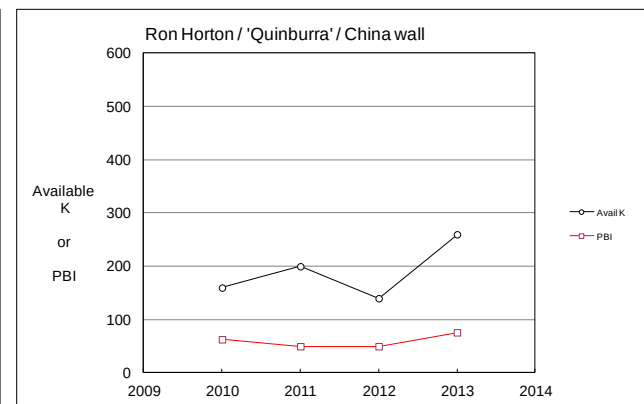
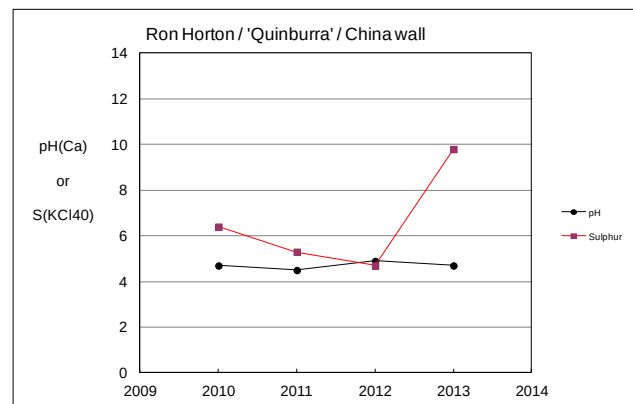
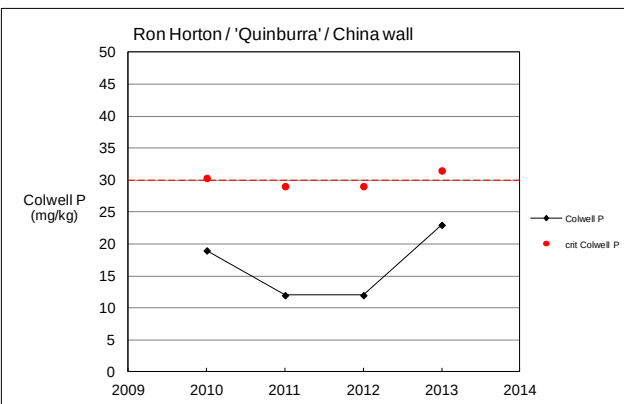
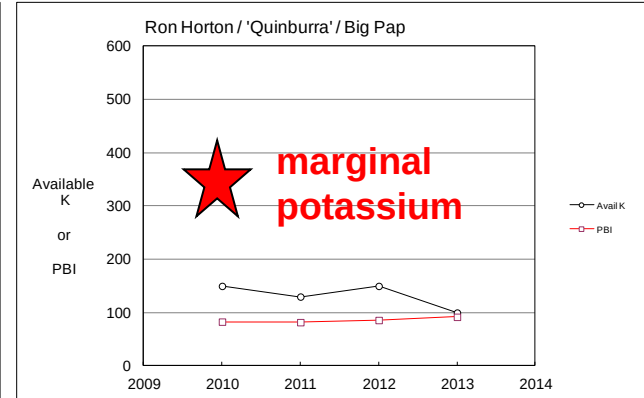
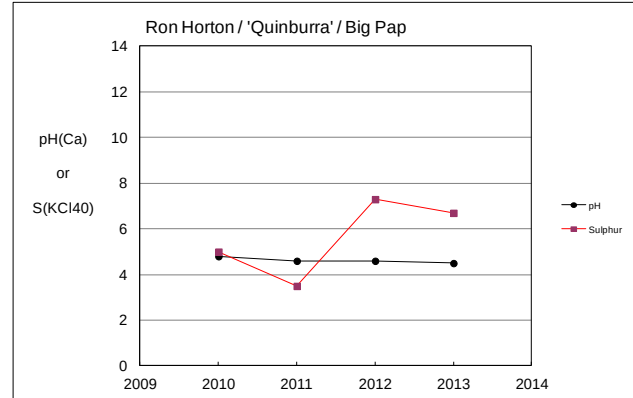
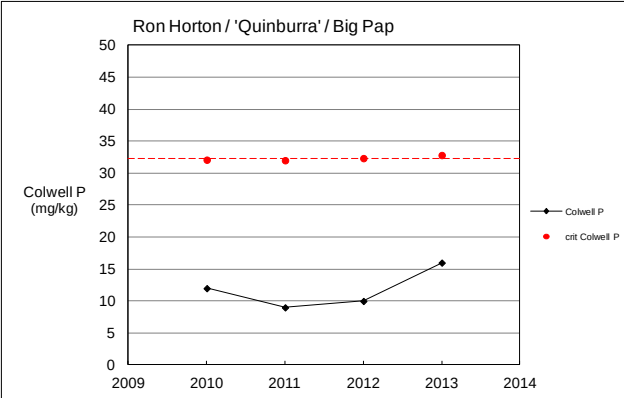


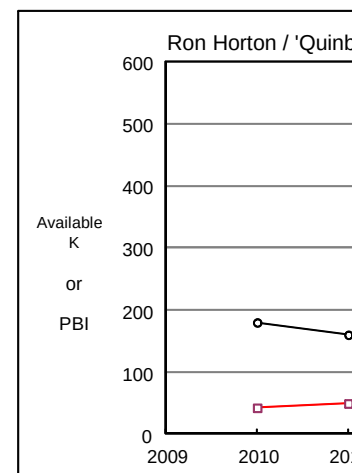
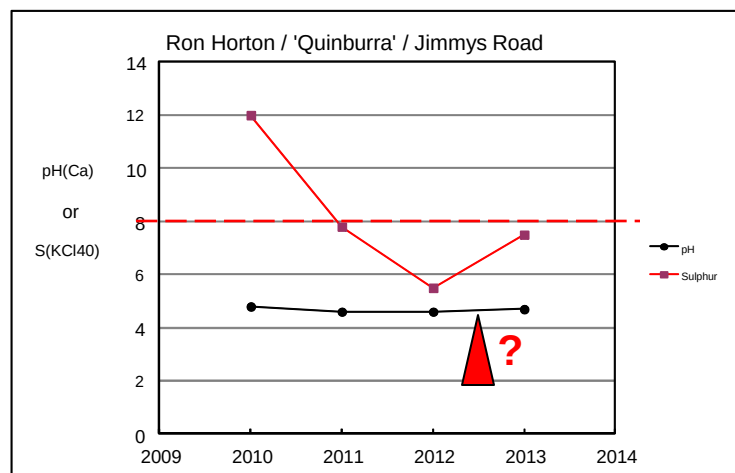
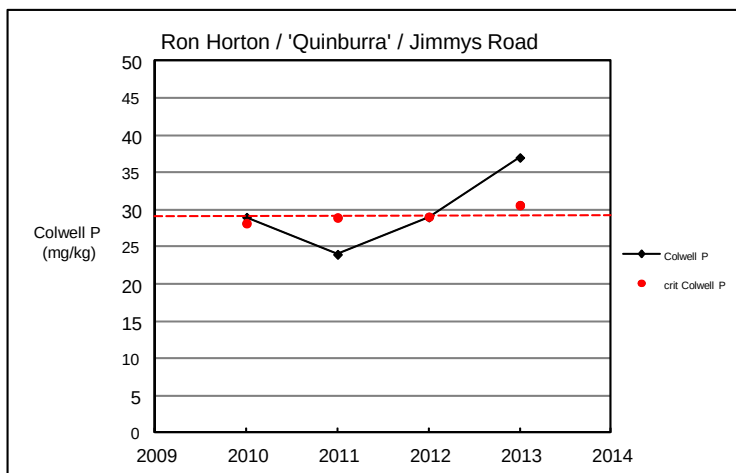
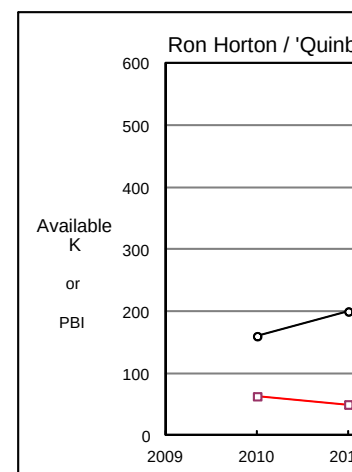
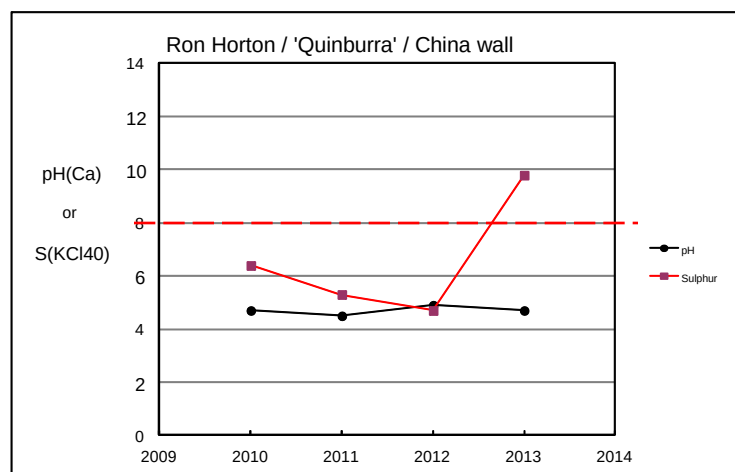
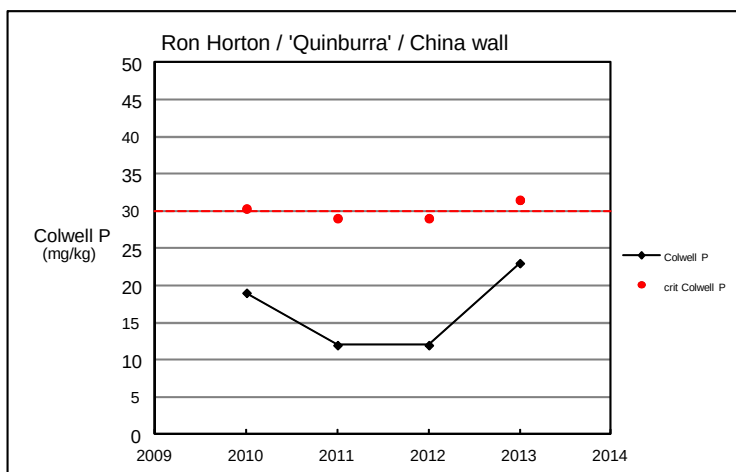
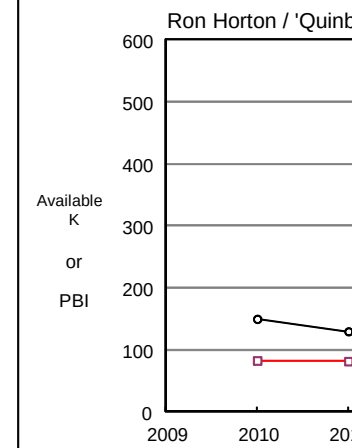
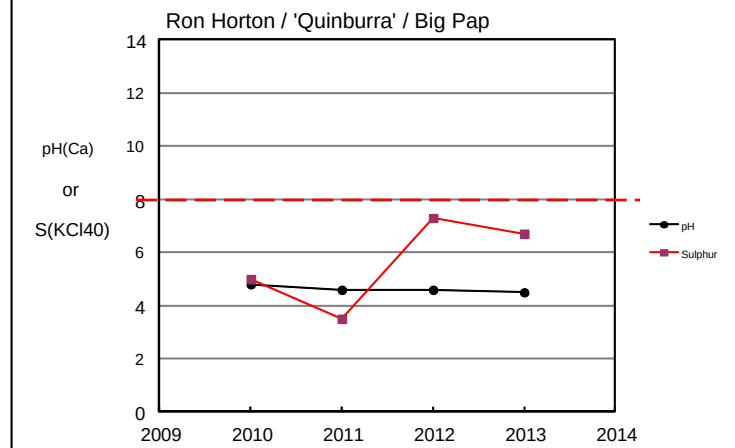
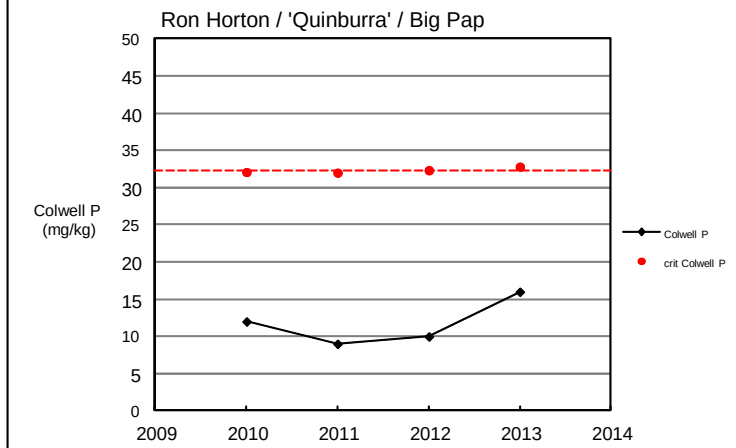
2012

MFS soil test database tool

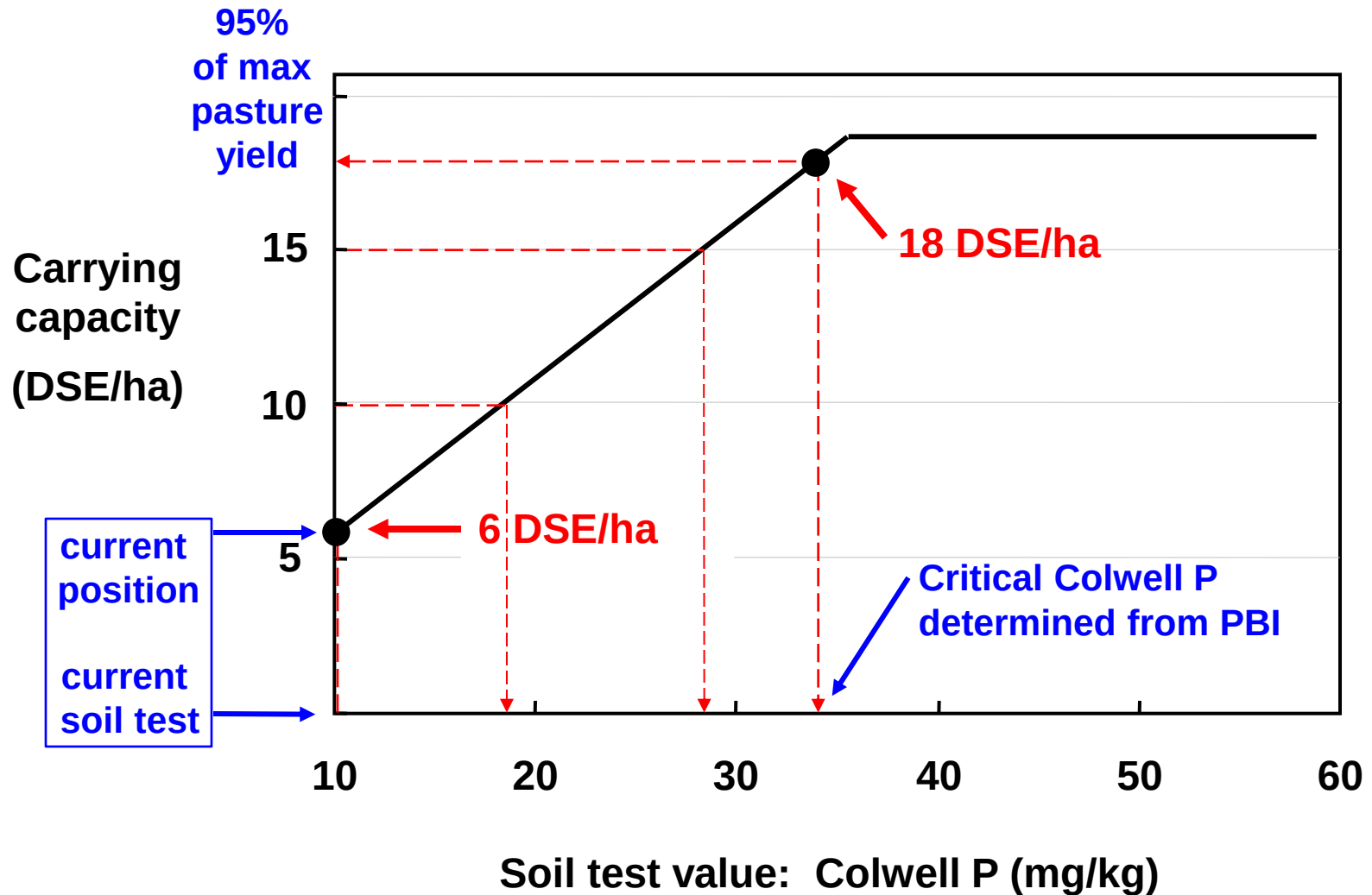








Planning next year's fertiliser investment - the “5 Easy Steps” approach



How much P to apply?

(i) enough P to move
from where you are
now to your next
soil test target

+

(ii) enough P to hold
the target soil test
for the coming year

=

**Amount of P
to apply**

capital P or build-up P

~2.5-2.7 kg P/ha *per* 'Colwell unit' incr.

OR

~9 kg P/ha *per* 'Olsen unit' incr.

mainly depends on PBI of soil

maintenance P

~1 kg P *per* DSE

OR

~11 kg P *per* ha
(125 kg super/ha or 1 cwt/acre)

PBI of soil, P export, other losses

*These are "ball park" calculations
... follow fertiliser use with soil testing*

Planning next year's fertiliser investment using the “5 Easy Steps” approach and the “HLN P-budgeting” tool



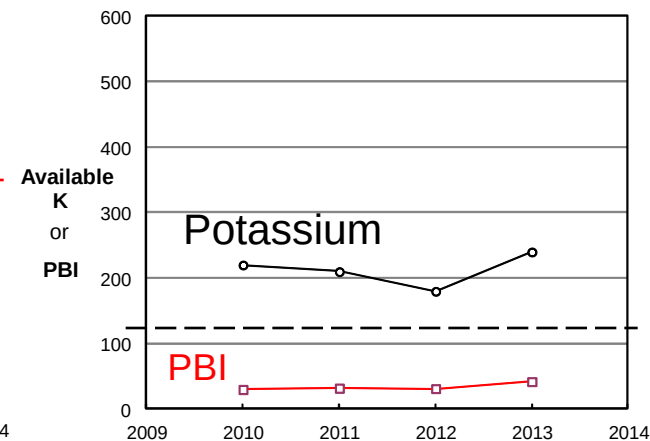
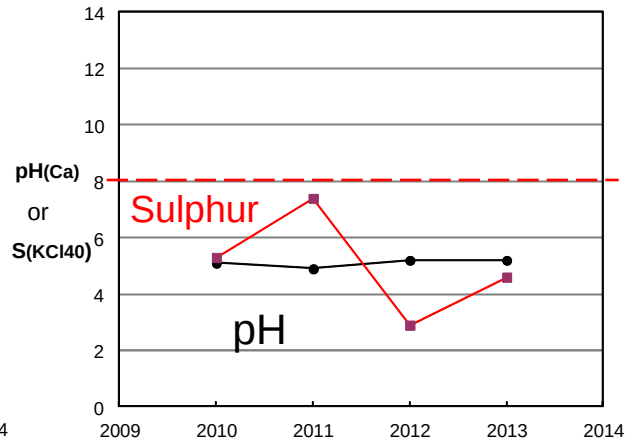
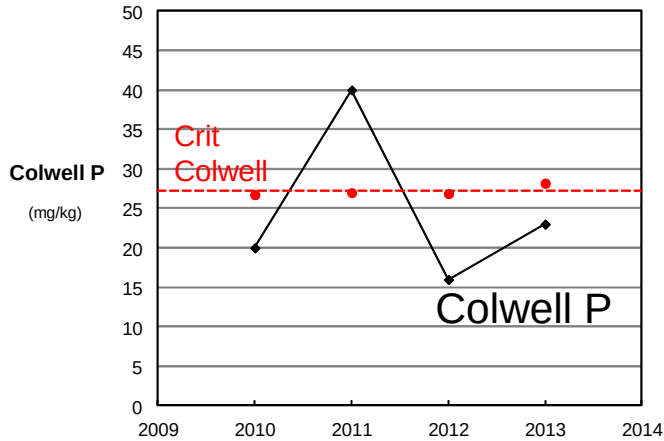
“*Five Easy Steps*” booklet and computer tool
available for download from: www.mla.com.au



Holbrook Landcare Network
“*P-budgeting tool*” available for download
from: www.holbrooklandcare.org.au

NEW

Ron Horton / 'Quinburra' / Sunny side



Ltd fert history
to this point;
lime 2004

P: 9 9 9 9 kg/ha
S: 11 11 16 11
pasture

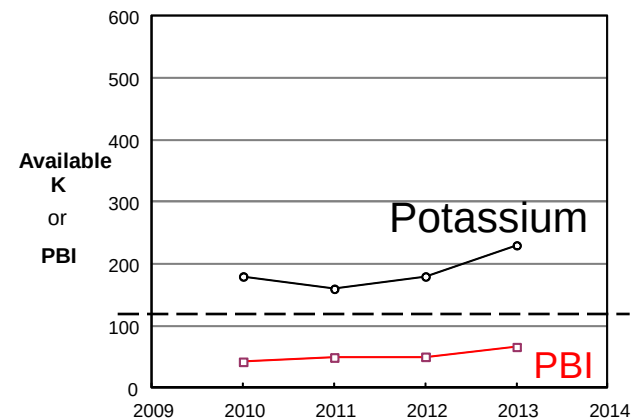
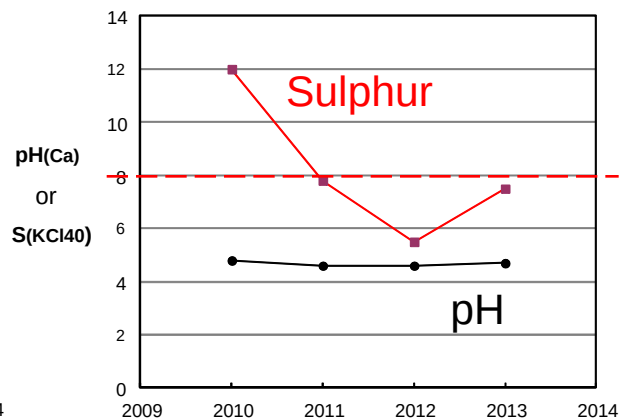
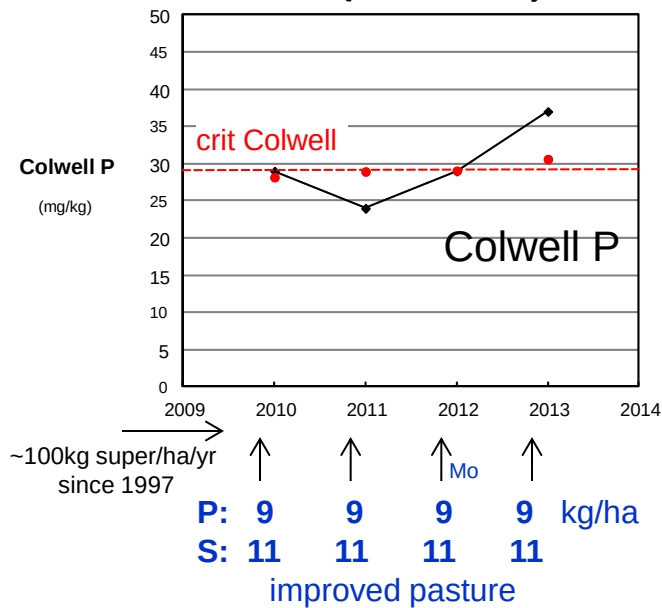
1. what are the P, S and K level “trends” ?
2. what is the current P level; where do you want to take it ?
3. what is current annual carrying capacity ?
4. what will it be at the target P level for next year?
5. do you need to adjust fertiliser / strategy based on S, K, pH results ?

LIVE DEMONSTRATION

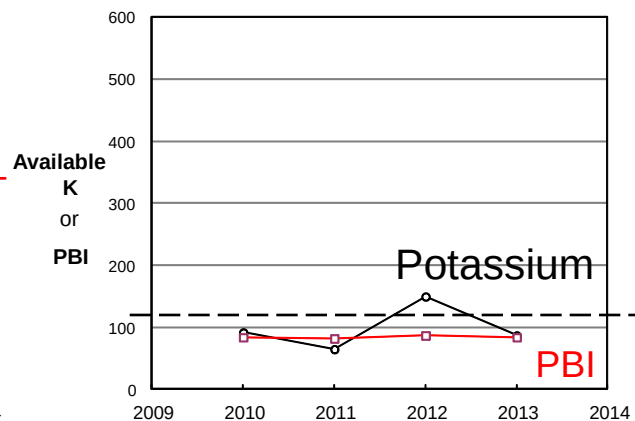
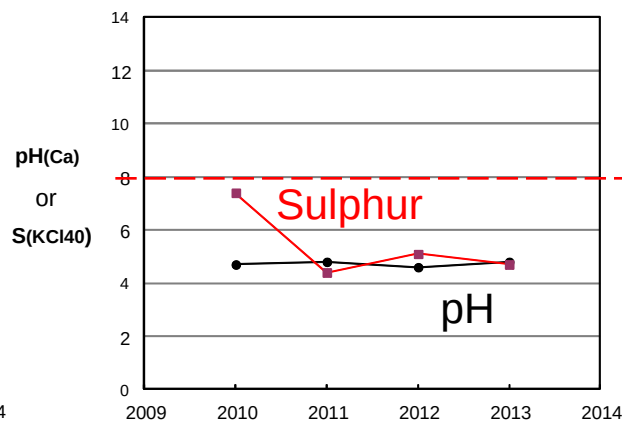
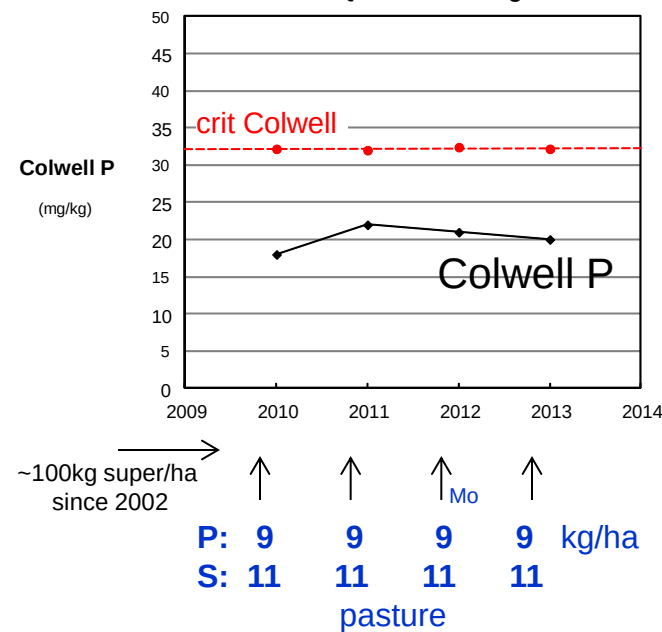
HLN phosphorus budget tool

- How to determine this year's fertiliser amounts
- Planning where you want to take soil paddock fertility
- How the tool calculate amounts to be spread
- How the tool totals your fertiliser budget for the year

Ron Horton / 'Quinburra' / Jimmys Road



Ron Horton / 'Quinburra' / Ring A Bells



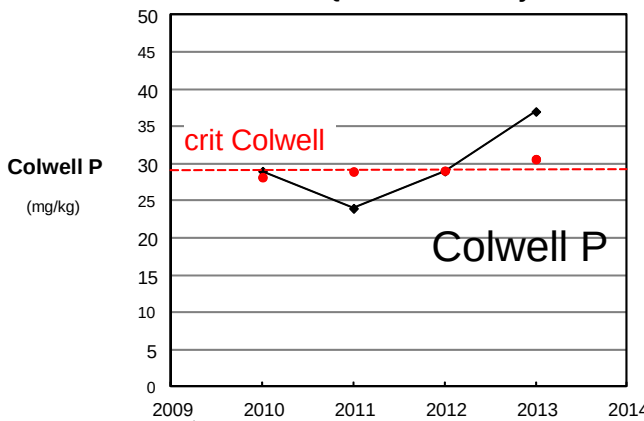
Planning a possible fertiliser investment

Fertiliser Budget

Paddock Name	Ha	Stocking Rate (dse/ha)	Maintenance (kg P/ha)	+ Capital						Total (kg P/ha)	Bud (kg)
				Current P Level	Target P Level	Capital (kg P/ha)	No	M only	M+C		
Jimmy's Road	50	14	11.2	28	28	0.0	☐	☒	Single super	11.2	
RingABells (maintain)	50	11	8.8	20	20	0.0	☐	☒	Single super	8.8	
RingABells (incr. quickly)	50	15	12.0	20	32	30.0	☐	☒	Single super	42.0	
RingABells (steady incr.)	50	13	10.4	20	23	7.5	☐	☒	Single super	17.9	
E	0	0	0.0			0.0	☒	☐	Single super	0.0	
F	0	0	0.0			0.0	☒	☐	Single super	0.0	
G	0	0	0.0			0.0	☒	☐	Single super	0.0	
H	0	0	0.0			0.0	☒	☐	Single super	0.0	
I	0	0	0.0			0.0	☒	☐	Single super	0.0	
J	0	0	0.0			0.0	☒	☐	Single super	0.0	
K	0	0	0.0			0.0	☒	☐	Single super	0.0	
L	0	0	0.0			0.0	☒	☐	Single super	0.0	
M	0	0	0.0			0.0	☒	☐	Single super	0.0	
N	0	0	0.0			0.0	☒	☐	Single super	0.0	
O	0	0	0.0			0.0	☒	☐	Single super	0.0	
P	0	0	0.0			0.0	☒	☐	Single super	0.0	
Q	0	0	0.0			0.0	☒	☐	Single super	0.0	
R	0	0	0.0			0.0	☒	☐	Single super	0.0	
S	0	0	0.0			0.0	☒	☐	Single super	0.0	
T	0	0	0.0			0.0	☒	☐	Single super	0.0	
200		Maintenance rate kg P/dse		Capital rate kg P/unit		2.5	Change all Single super				



Ron Horton / 'Quinburra' / Jimmys Road



~100kg super/ha/yr since 1997

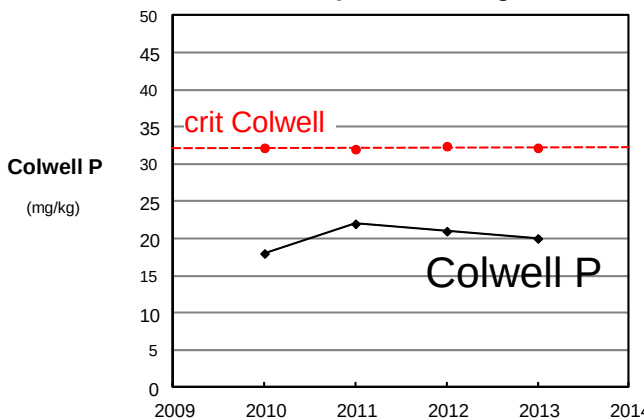
↑ ↑ ↑ ↑

P: 9 9 9 9 kg/ha

S: 11 11 11 11

improved pasture

Ron Horton / 'Quinburra' / Ring A Bells



~100kg super/ha since 2002

↑ ↑ ↑ ↑

P: 9 9 9 9 kg/ha

S: 11 11 11 11

pasture

Planning a possible fertiliser investment

Fertiliser Budget

Maintenance			+ Capital			= Fertiliser rate			Budget				
Paddock Name	Ha	Stocking Rate (dse/ha)	Maintenance (kg P/ha)	Current P Level	Target P Level	Capital (kg P/ha)	No ☐ M only ☐ M+C	Fertiliser Product	Total (kg P/ha)	Budget Rate (kg fert/ha)	Spread Rate (kg fert /ha)	Total (tonnes)	Total Cost (\$)
Jimmy's Road	50	14	11.2	28	28	0.0	☐ ☒ ☐	Single super	11.2	127	125	6.25	\$ 2,625.00
RingABells (maintain)	50	11	8.8	20	20	0.0	☐ ☒ ☐	Single super	8.8	100	100	5.00	\$ 2,100.00
RingABells (incr. quickly)	50	15	12.0	20	32	30.0	☐ ☐ ☒	Single super	42.0	477	475	23.75	\$ 9,975.00
RingABells (steady incr.)	50	13	10.4	20	23	7.5	☐ ☐ ☒	Single super	17.9	203	200	10.00	\$ 4,200.00
E	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
F	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
G	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
H	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
I	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
J	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
K	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
L	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
M	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
N	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
O	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
P	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
Q	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
R	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
S	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
T	0	0	0.0			0.0	☒ ☐ ☐	Single super	0.0	0	0	0.00	\$ -
200		Maintenance rate kg P/dse	0.8	Capital rate kg P/unit		2.5	Change all ☐ Single super		Single super			46.0	\$ 18,900.00
									MAP			0.0	
									DAP			0.0	
									Other 1			0.0	
									Other 2			0.0	
									Other 3			0.0	



Chris Mirams
Agricultural Consultant

Department of
Environment and
State Government
Victoria



Chris Mirams
Agricultural Consultant

Department of
Environment and
Primary Industries



Single super
MAP
DAP
Other 1
Other 2
Other 3

Fertiliser decisions for different parts of a farm landscape



seasonal progression →

Annual rainfall:

..... 700 mm

Critical Colwell P:

30 mg/kg

30 mg/kg

Growing season length:

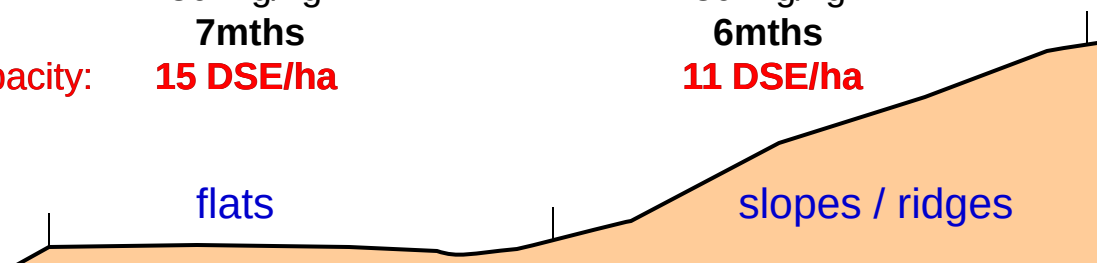
7mths

6mths

Sustainable carrying capacity:

15 DSE/ha

11 DSE/ha

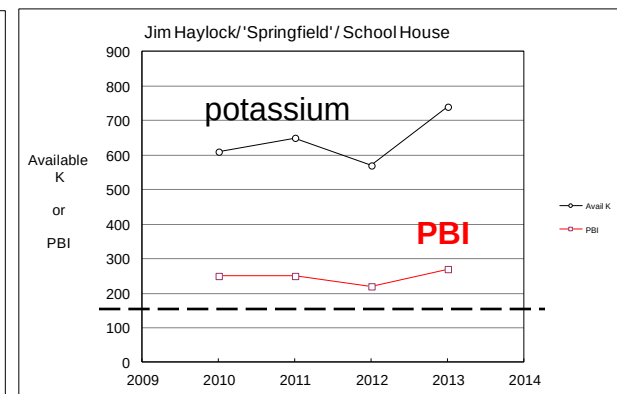
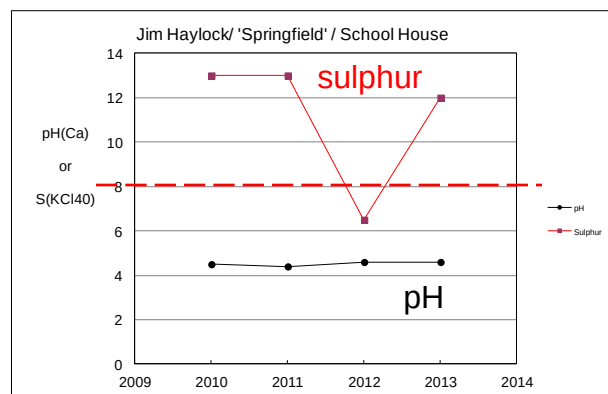
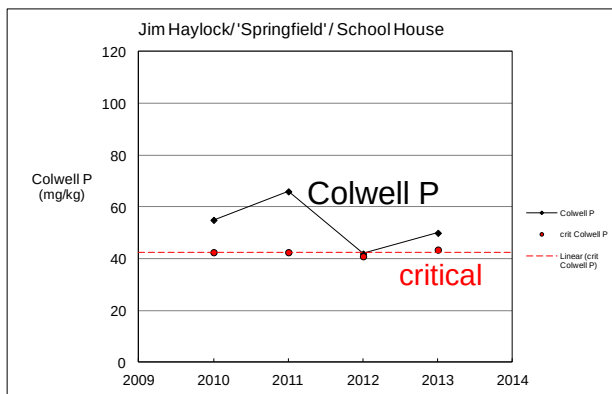
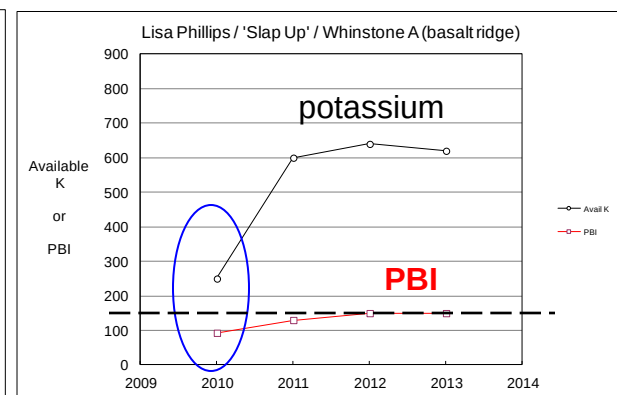
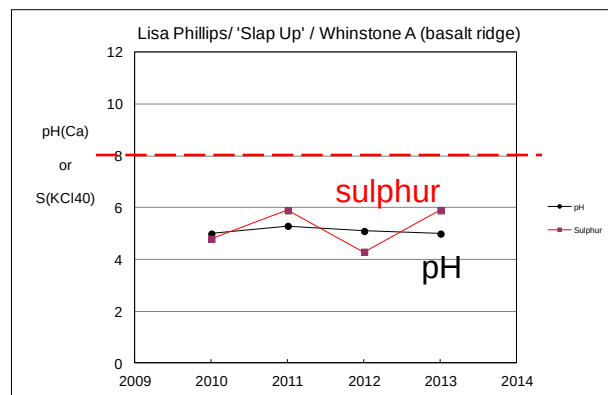
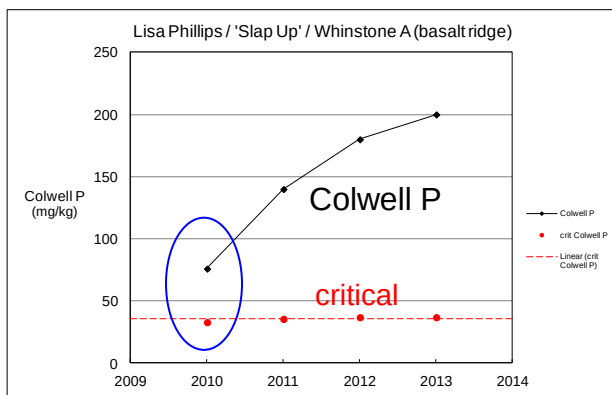
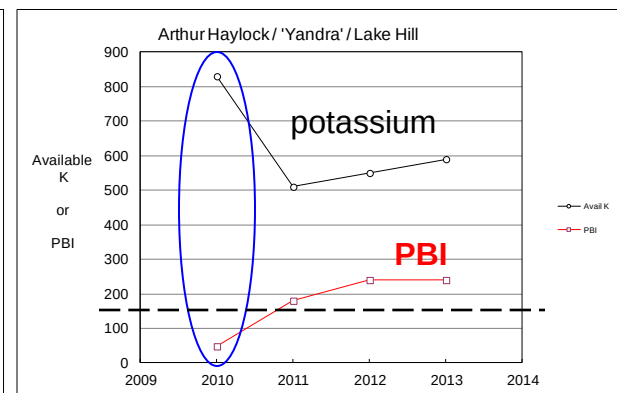
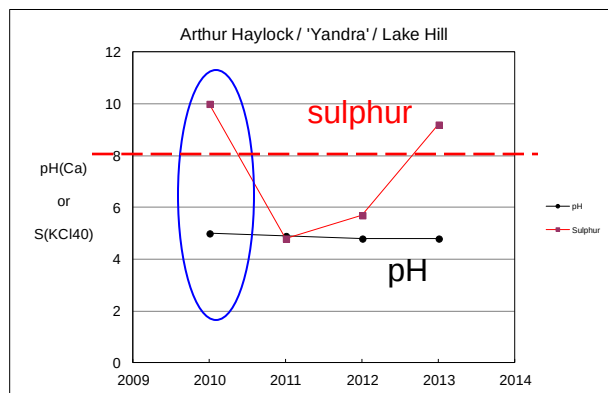
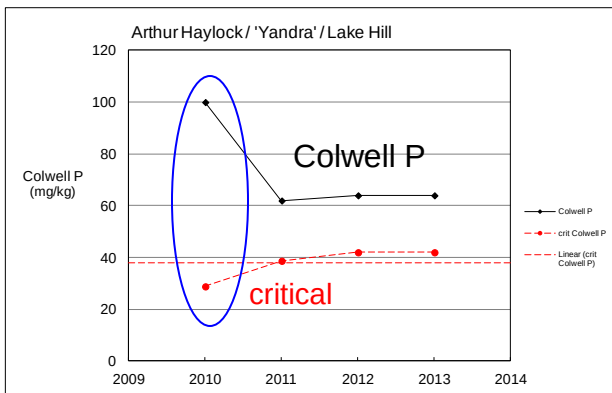


Assume both paddocks are at optimum P level (Colwell = 30) & set stocked at *their* opt SR.

Amount of P to be applied = maintenance application

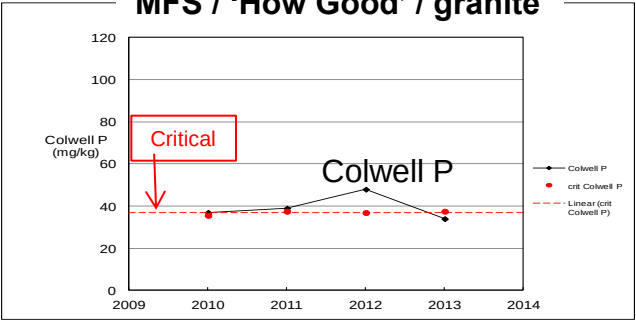
	<u>Soil type</u>	<u>Soil loss factor</u>	<u>Animal loss factor</u>	<u>Maintenance rate (kg P/DSE)</u>	<u>P applicatn rate (kg P/ha)</u>
FLATS:	sandy-loam	low	low	0.8	15 x 0.8 = 12 kg P/ha
SLOPE:	sandy-loam	low	high	0.9	11 x 0.9 = 9.9 kg P/ha

Soil test variability can kill your ability to make sensible decisions

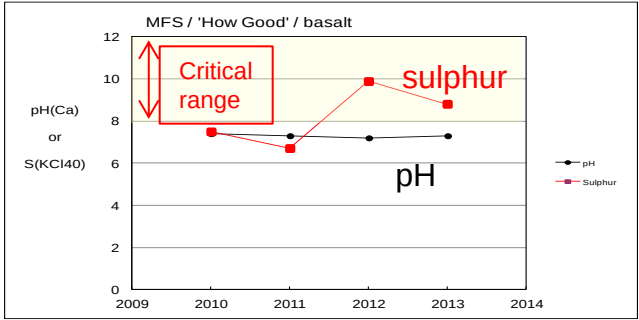


Is it the soil testing lab?

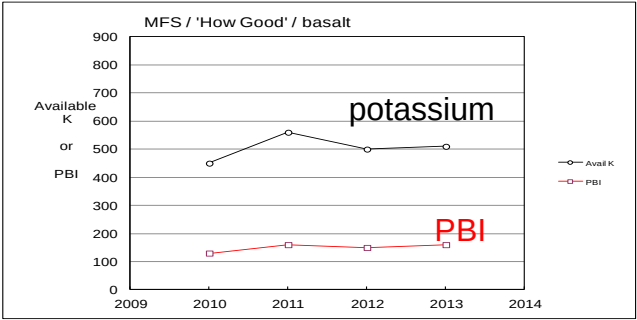
MFS / 'How Good' / granite



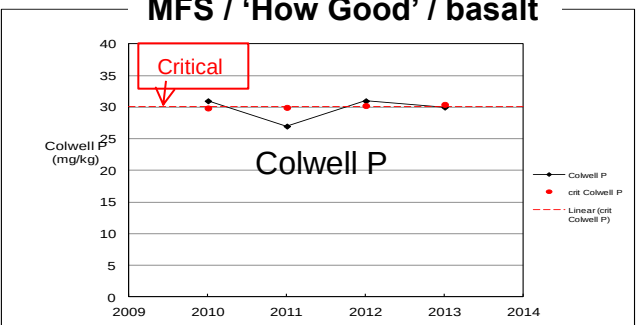
MFS / 'How Good' / basalt



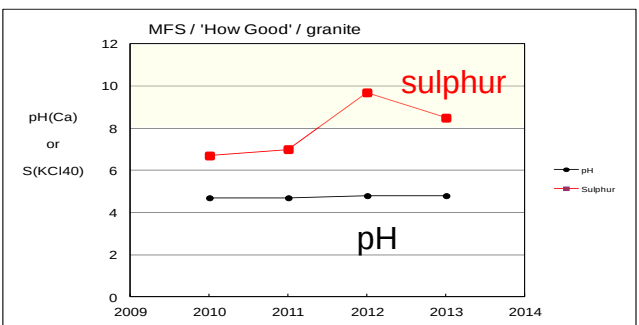
MFS / 'How Good' / basalt



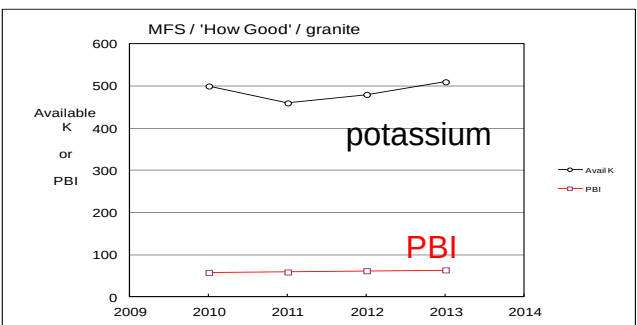
MFS / 'How Good' / basalt



MFS / 'How Good' / granite

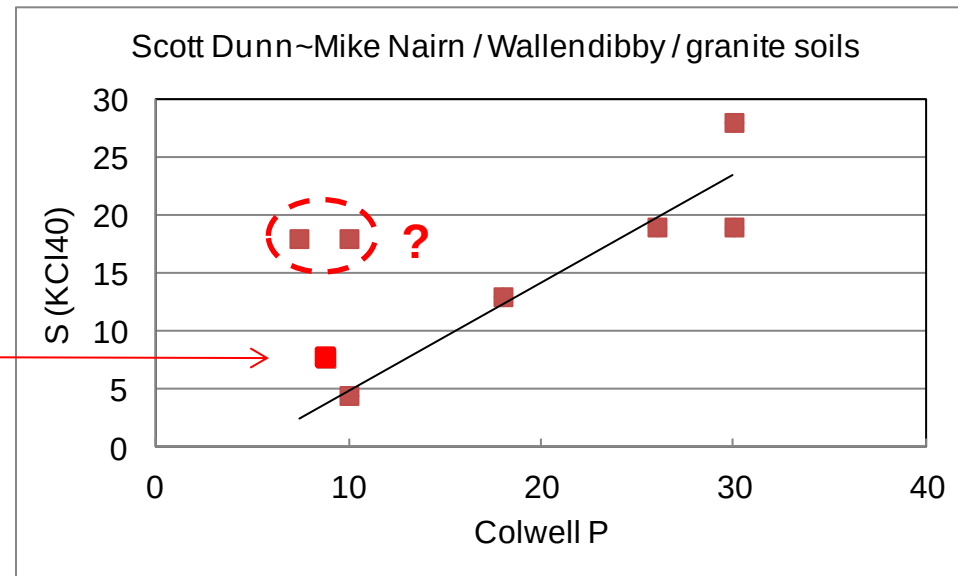
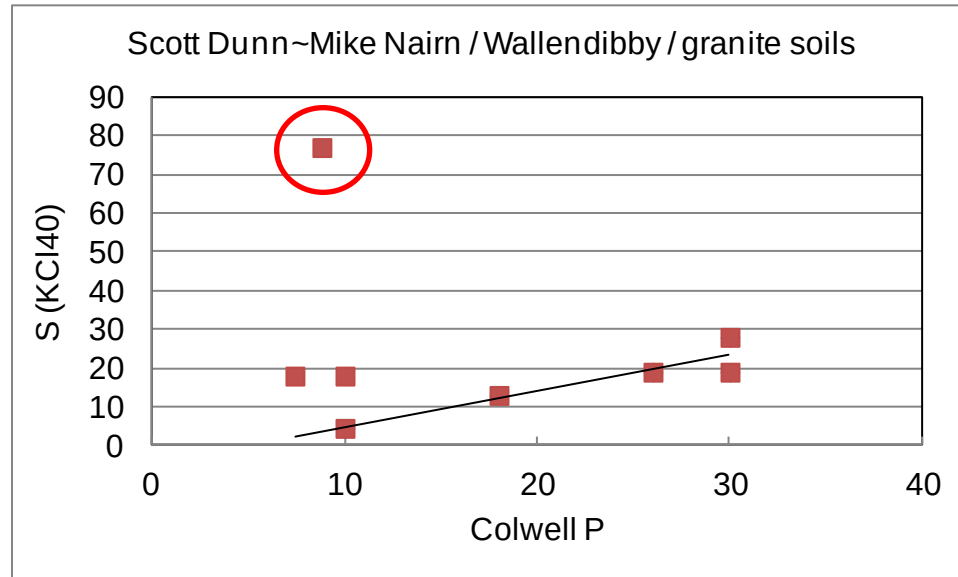


MFS / 'How Good' / granite



Sulphur deposit at “Wallendibby” ?

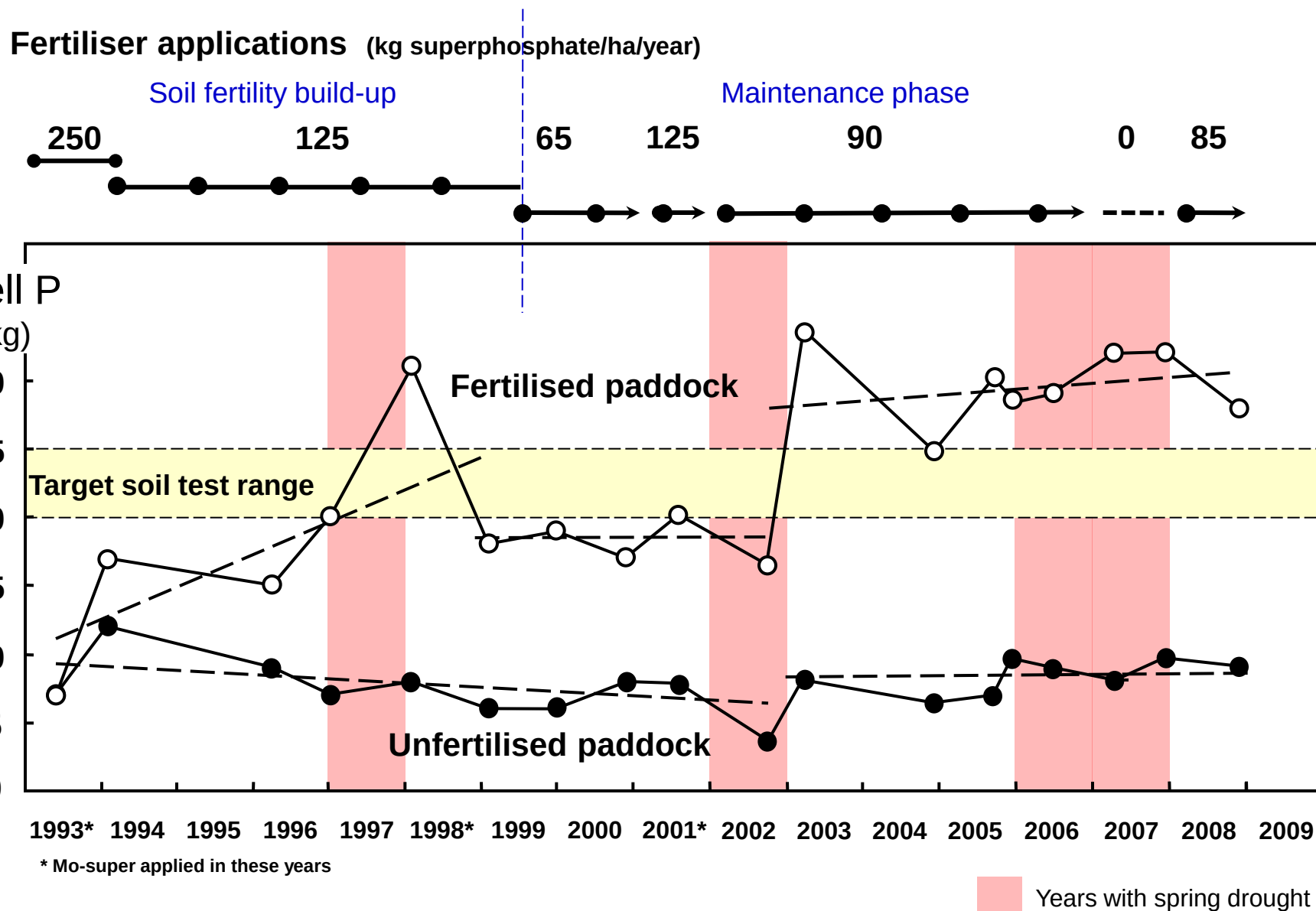
(High Range pdk)



This might just
be a typo:
77 vs 7.7 ??

Variability can just be reflecting the “real world”

– careful soil sampling & building a soil test history, ultimately reveals all.



How to take soil tests properly

and easily. Moist soil holds together in the corer

Soil tests that are not taken correctly will not give you an accurate result.

See page 6 of the “Five easy Steps..” booklet

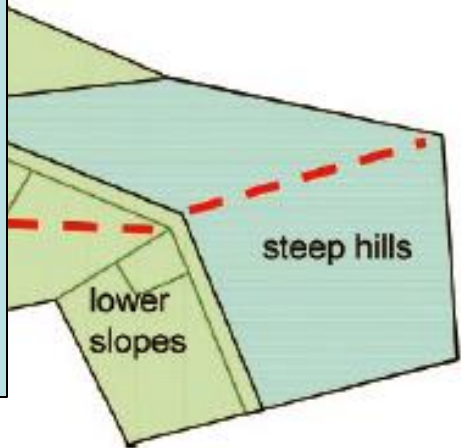
Soil test variables we can monitor:

- the lab’s testing precision ✓
- seasonal variability (soil test history) ✓ ?

Soil test variables we can “manage”:

- sample soil at same time of year ✓
- resample from the same “monitor” area/transect ✓ ?
- try to avoid sample across two soil types / zones
- collect the right number of soil cores
- if soil must be sub sampled; thorough mixing is essential
- collect soil cores to the correct depth (10cm) ✓ ?
- keep soil sample cool/dry ✓
- send to the lab ASAP ✓
- only soil sample >2 mths after spreading fertiliser

establish monitor paddocks or transects that represent the major classes of land, or management units of the farm. The objective is to represent the differing areas of land that are to be fertilised whilst ensuring a manageable soil testing load. Retest the monitor paddocks regularly. Over time you will be able to make decisions on the basis of the soil fertility trends that the results will reveal.



THANKYOU !

