

# Soil sampling for more informed decision making

Stephen Carr  
Precision SoilTech



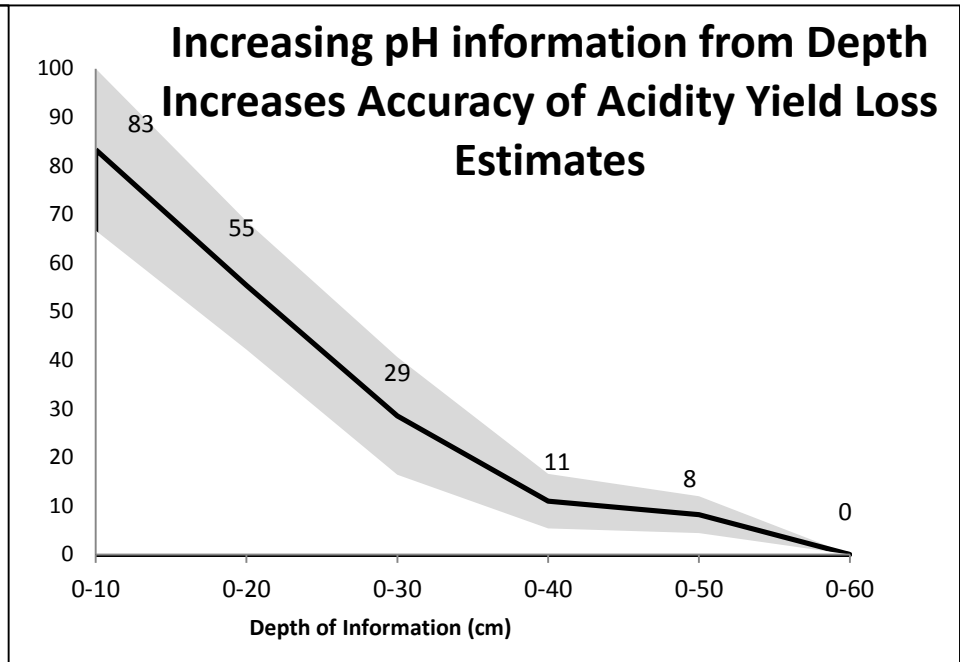
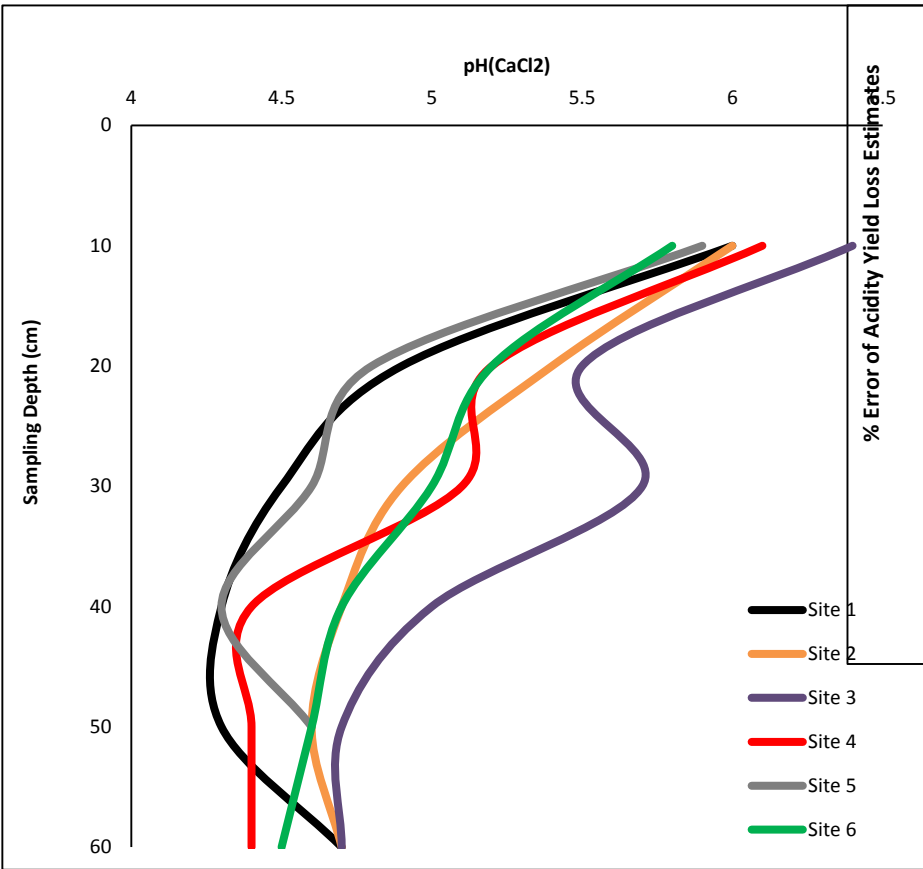
# Soil sampling -on farm decisions

- Measure-manage-monitor (save & make money)
- Why are you collecting a soil sample? Nutrients, pH  
compaction, disease, profile modification, farm trial
- How many sites do you need to sample? 1, 5, 10, 20, 30
- How deep do you need to sample? 0-10cm, 30cm, 50cm
- Importance of geo location >300,000 sites over 20 years
- Using other resources in conjunction? farmer knowledge  
EMI, yield maps, biomass, satellite imagery
- Tailor strategy- no one system applies

# Soil sampling for on farm decisions

- Low resolution soil sampling data provides very little information about actual soil properties, and results in inaccurate input prescription- **compromise!!**
- 30 sites in 50 ha required but most growers do 4 to 6
- Economic compromise? Costs based on 100 ha paddock

Assume 100 ha paddock	4 sites	6 sites	10 sites	20 sites	30 sites
Collection Cost at \$27/site	\$ 108.00	\$ 162.00	\$ 270.00	\$ 540.00	\$ 810.00
\$/ha	\$ 1.08	\$ 1.62	\$ 2.70	\$ 5.40	\$ 8.10
Analytical cost at \$47/site	\$ 188.00	\$ 282.00	\$ 470.00	\$ 940.00	\$ 1,410.00
\$/ha	\$ 1.88	\$ 2.82	\$ 4.70	\$ 9.40	\$ 14.10
Collect 10-20cm for pH \$13/site	\$ 52.00	\$ 78.00	\$ 130.00	\$ 260.00	\$ 390.00
Collect 20-30cm for pH \$13/site	\$ 52.00	\$ 78.00	\$ 130.00	\$ 260.00	\$ 390.00
	\$ 104.00	\$ 156.00	\$ 260.00	\$ 520.00	\$ 780.00
\$/ha	\$ 1.04	\$ 1.56	\$ 2.60	\$ 5.20	\$ 7.80
Total/ha based upon 100 ha	\$ 4.00	\$ 6.00	\$ 10.00	\$ 20.00	\$ 30.00
Average herbicide spend/ha	\$113				



**Deeper Soil Sampling leads to more efficient  
crop Input Decisions: Case Study**  
**Wes Lefroy, Precision SoilTech**  
**Wayne Pluske, Equi**

Fig 1: pH results from the 6 sites at West Mingeneew.

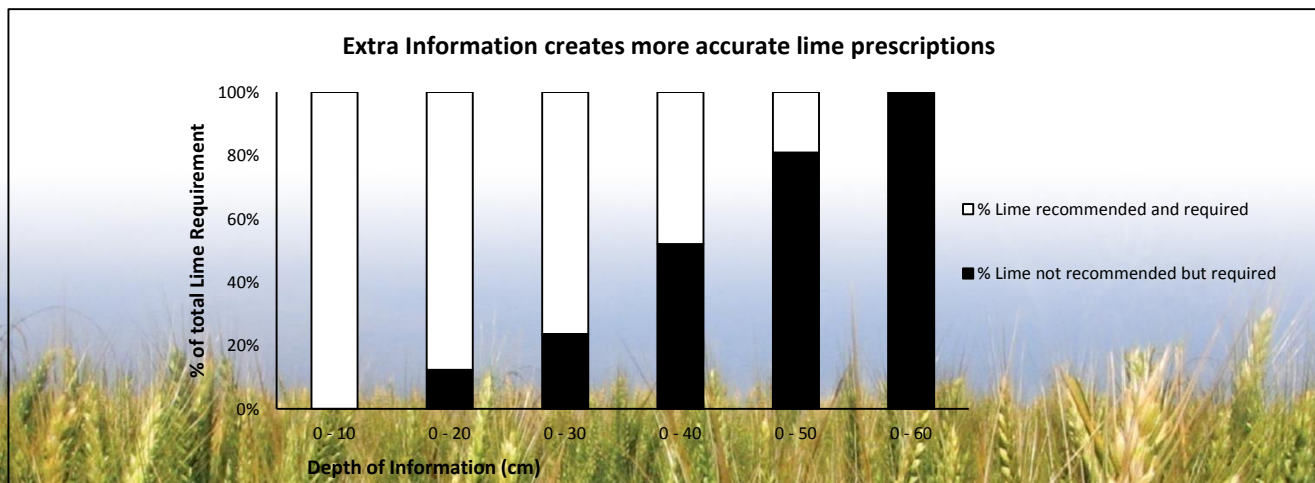


Fig 2: % of total lime required vs the amount recommended at each depth at a whole paddock scale.







Precision SoilTech

Neutral/Alkaline
Ideal
Slightly Acidic
Acidic
Very Acidic

Site	pH10
	pH20
	pH30







Neutral/Alkaline
Ideal
Slightly Acidic
Acidic
Very Acidic

Site	pH10
	pH20
	pH30

#1 5.3  
+ 4.8  
5.3

#2 5.6  
+ 5.3  
5.6

#3 5.7  
+ 5.2  
5.1

#4 5.9  
+ 5.2  
5.2

#5 5.5  
+ 4.7  
4.5

#6 5.7  
+ 5.4  
5.2

#7 5.6  
+ 5.1  
5.3

#9 5.8  
+ 5.2  
5.8

#10 5.7  
+ 5.4  
5.0

#11 5.6  
+ 5.2  
5.1

#12 5.8  
+ 5.7  
5.7

#13 5.5  
+ 5.1  
4.8

#14 5.8  
+ 5.0  
4.3

#15 5.4  
+ 5.1  
5.4

#17 5.7  
+ 5.1  
5.8

#18 5.7  
+ 4.8  
4.6

#19 5.6  
+ 4.9  
5.0

#20 5.5  
+ 5.5  
5.2

#21 5.3  
+ 5.2  
5.6

#22 5.6  
+ 5.0  
4.1

#23 5.4  
+ 5.0  
5.2

#24 5.7  
+ 4.6  
5.0

#25 5.8  
+ 4.6  
4.6

#26 5.7  
+ 4.6  
5.0

#27 5.6  
+ 4.7  
4.9

#28 5.6  
+ 5.4  
5.3

#29 5.4  
+ 5.3  
5.5

#30 5.6  
+ 5.1  
5.0

#31 5.7  
+ 4.4  
4.3

#32 5.0  
+ 4.6  
5.2

#33 5.6  
+ 5.2  
5.3

#34 5.6  
+ 4.8  
4.9

#35 5.7  
+ 5.2  
5.2

#36 5.7  
+ 5.1  
5.0

#37 5.8  
+ 5.5  
5.6

#38 5.7  
+ 4.7  
4.1

#39 5.5  
+ 4.5  
4.7

#40 5.1  
+ 4.4  
?

#41 5.2  
+ 4.8  
5.1

#42 5.8  
+ 4.9  
5.2

#43 5.7  
+ 4.8  
5.2

#44 5.6  
+ 4.8  
4.8

#45 5.5  
+ 4.9  
4.5

#46 5.4  
+ 5.1  
5.2

#48 5.9  
+ 4.7  
5.1

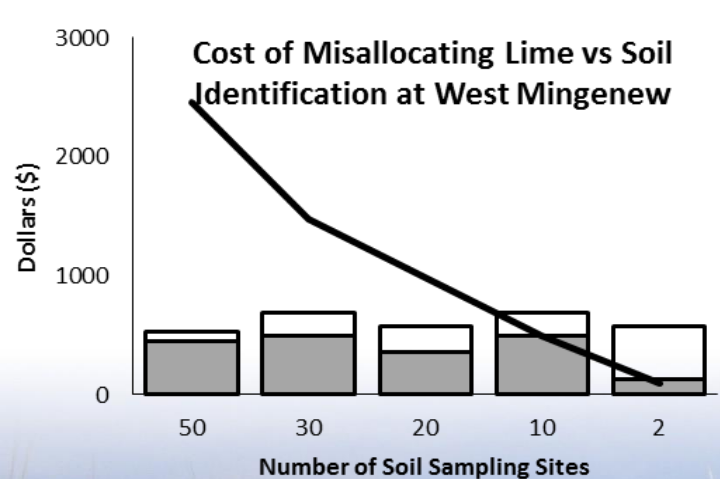
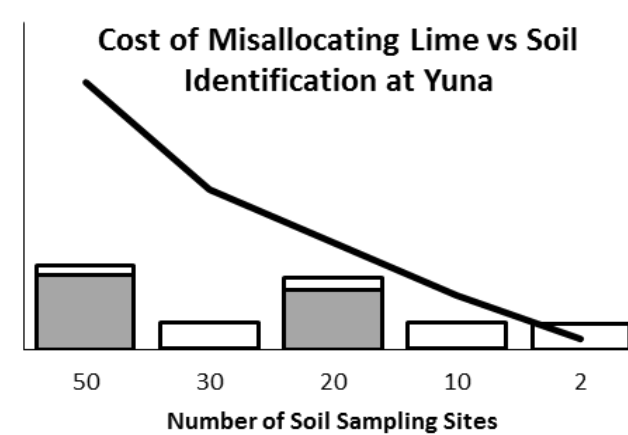
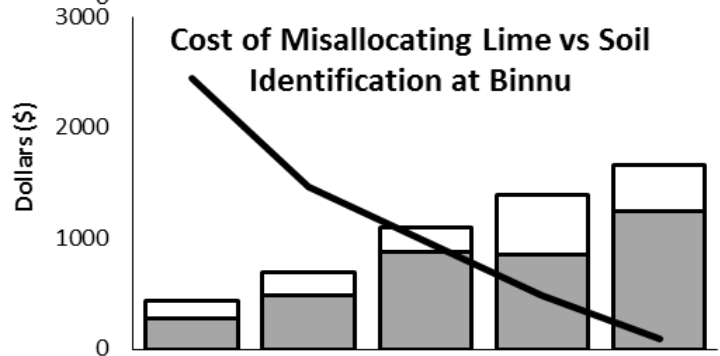
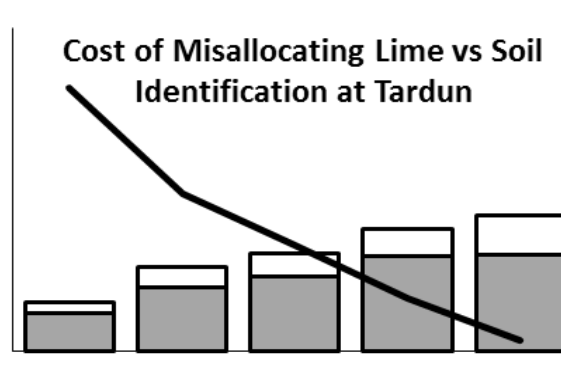
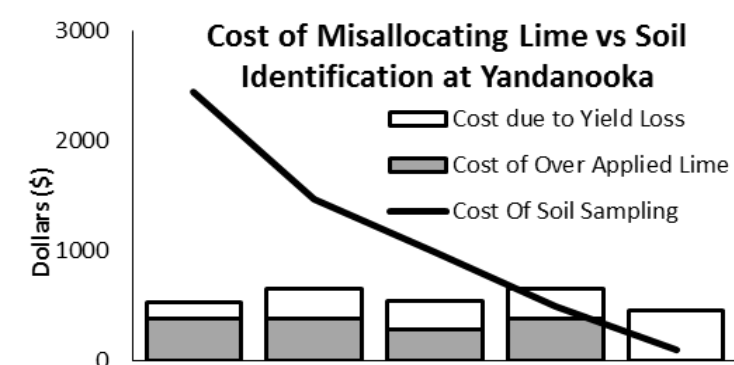
#49 5.5  
+ 5.2  
5.5

#50 5.8  
+ 5.2  
5.6

#51 5.3  
+ 4.8  
5.0

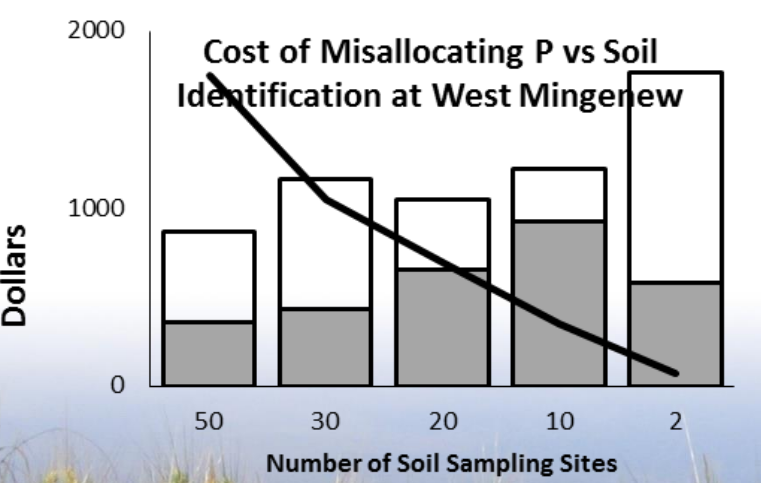
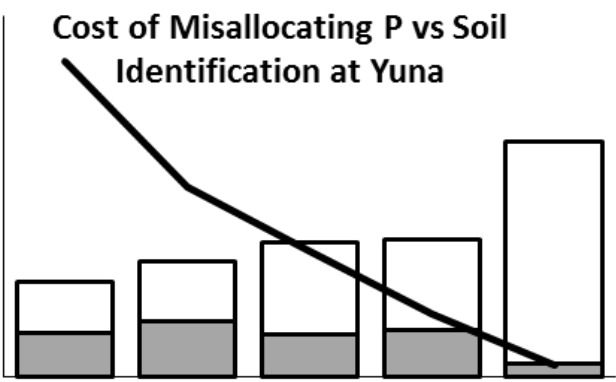
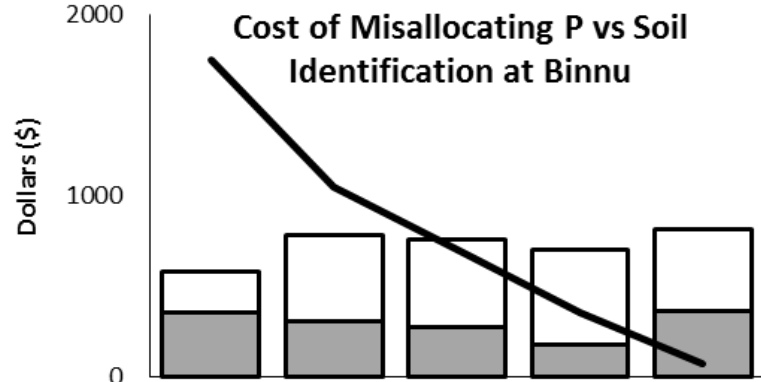
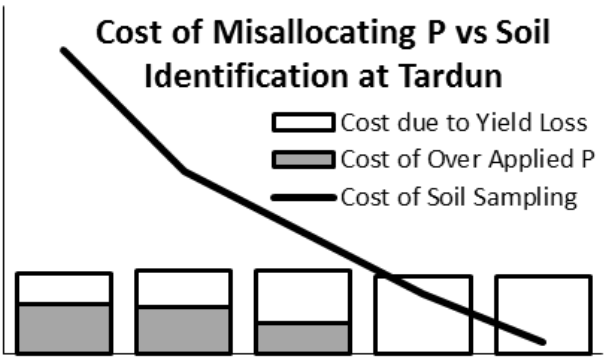
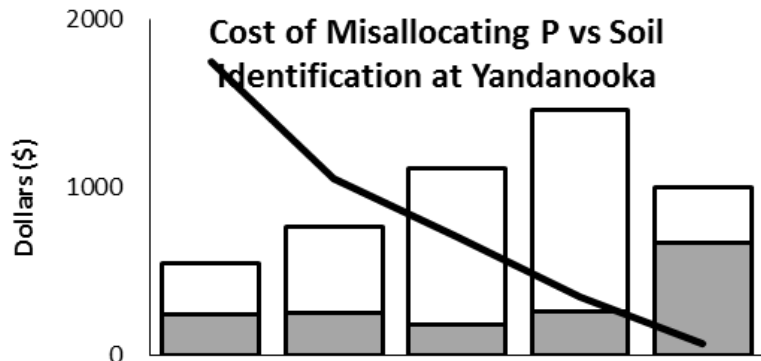
#52 5.8  
+ 5.2  
5.2

#53 5.1  
+ 4.3  
4.7



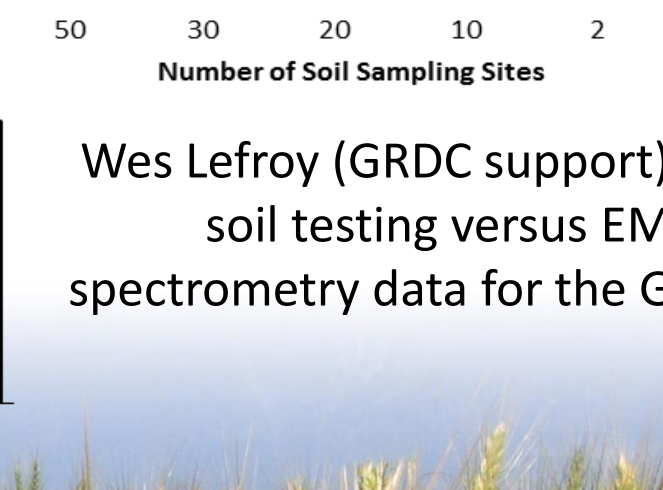
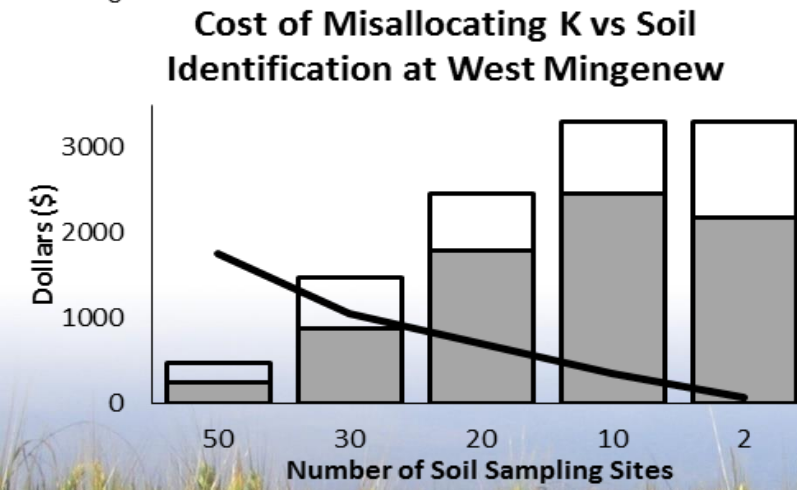
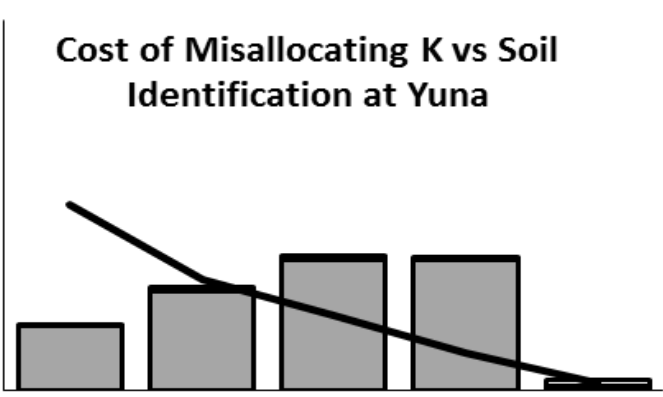
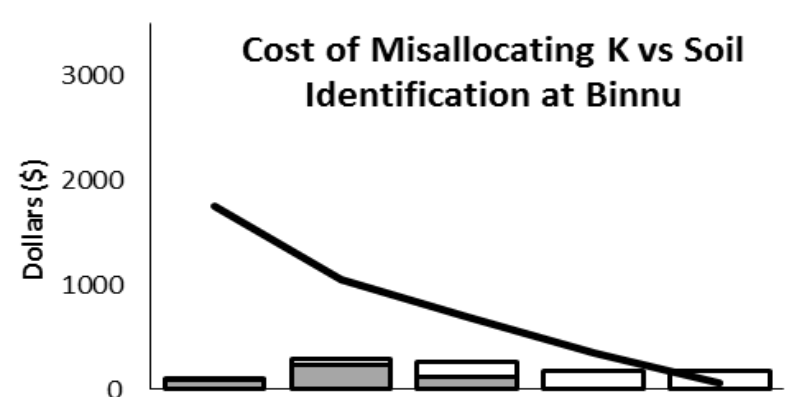
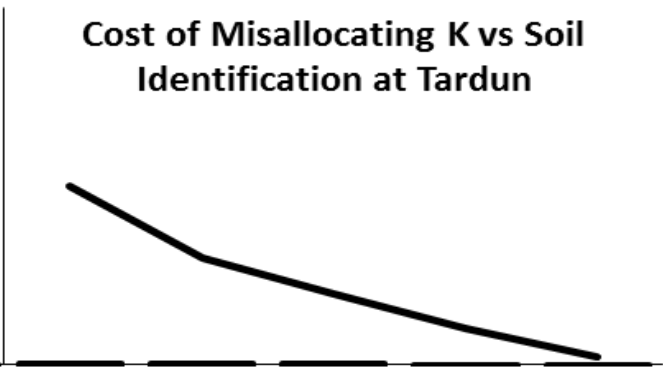
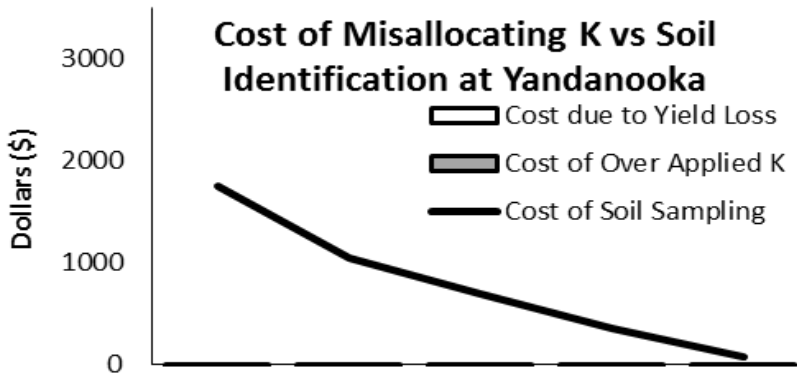
Wes Lefroy (GRDC support)- Quantification of soil testing versus EM38 and  $\gamma$ -ray spectrometry data for the Geraldton port zone





Wes Lefroy (GRDC support)- Quantification of soil testing versus EM38 and  $\gamma$ -ray spectrometry data for the Geraldton port zone





Wes Lefroy (GRDC support)- Quantification of soil testing versus EM38 and  $\gamma$ -ray spectrometry data for the Geraldton port zone