Trial: Tradecorp Mn on Wombok (2 Trials: Drip & Foliar)

Crop:	**Wombok** var. Matilda
Product:	**Tradecorp Mn (EDTA)**
Location:	Lowood, Queensland
Aim:	Tissue Manganese
Control:	Existing total Micronutrient Program (Lignos & Sulfates)
Application:	Drip & Foliar (Boom sprayer)
Rate:	Drip: 3 kg /ha, Foliar: 100 g /100 L (250 - 300 L /ha)
Planting date:	23/04/18 (Drip Block), 30/04/18 (Foliar Block)
Timing:	**Trail 1:** 06/06/18 (Drip application) – 43 DAP
	Trial 2: 09/06/18 (Foliar application) – 40 DAP

Results – Tradecorp Mn (EDTA) by Drip

Drip Application						
	Control	T/C Mg	Units	%	Optimal Range	Comment
Nitrate	5,070	4250	ppm		2500-4500	Optimal
EC	10.5	9.8	mS/cm			
Phosphate -P	62	93	ppm	+ 50	50-100	Optimal
K	1941	1981	ppm		1200-2500	Optimal
Ca	632	594	ppm		300-500	Med-high
Mg	214	191	ppm		80-150	Med-high
Zn	0.47	1.93	ppm	+ 310	1-5	Optimal
Sulfate - S	107	151	ppm	+ 41	100-300	Optimal
Cu	0.3	0.54	ppm	+ 80	0.6-2	Med-Low
Mn	0.2	0.4	ppm	+ 100	1-5	Low
Fe	0.27	0.91	ppm	+ 235	0.8-5	Optimal
B	1.5	2.8	ppm	+ 87	1-5	Optimal
pH	6	6	ppm	=		
Brix	2.6	2.8	%	+ 8		
Cl	1350	1120	ppm	- 9		
Na	505	331	ppm	- 20		
Si	2	9	ppm	+ 350	1-5	Very high

Tradecorp Mn (EDTA)

Increasing;

- **Mn** by **100%**
- **P** by **50%**
- **Zn** by **310%**
- **S** by **41%**
- **Cu by 80%**
- **Fe** by **235%**
- **B** by **87%**
- **Si** by **350% and**

Lowered

- **Na** by **9%**
- **Cl** by **20%**

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Results – Tradecorp Mn (EDTA) by Foliar

Spray Boom Application 5						
	Control	T/C Mg	Units	%	Optimal Range	Comment
Nitrate	6,040	5,530	ppm		2500-4500	
EC	11.50	11	mS/cm		8-10	
Phosphate -P	95	97	ppm		50-100	
K	2,308	2,095	ppm		1200-2500	
Ca	564	528	ppm		300-500	
Mg	162	165	ppm		80-150	
Zn	0.37	0.59	ppm	+ 59	1-5	
Sulfate - S	134	150	ppm	+ 12	100-300	
Cu	0.22	0.33	ppm	+ 50	0.6-2	
Mn	0.25	0.29	ppm	+ 16	1-5	
Fe	0.23	0.54	ppm	+ 134	0.8-5	
B	1.70	1.60	ppm		1-5	
pH	6.1	6.2	ppm	=	5.5-6.2	
Brix	3.0	3.0	%	=	4-6	
Cl	1490	1,560	ppm		500-2000	
Na	764	692	ppm	- 9	250-1000	
Si	3	2	ppm		1-5	

Tradecorp Mn (EDTA)

Increasing;

- **Mn** by **16%**
- **Zn** by **59%**
- **S** by **12%**
- **Cu by 50%**
- **Fe** by **135%** and

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- **Na** by **9%**

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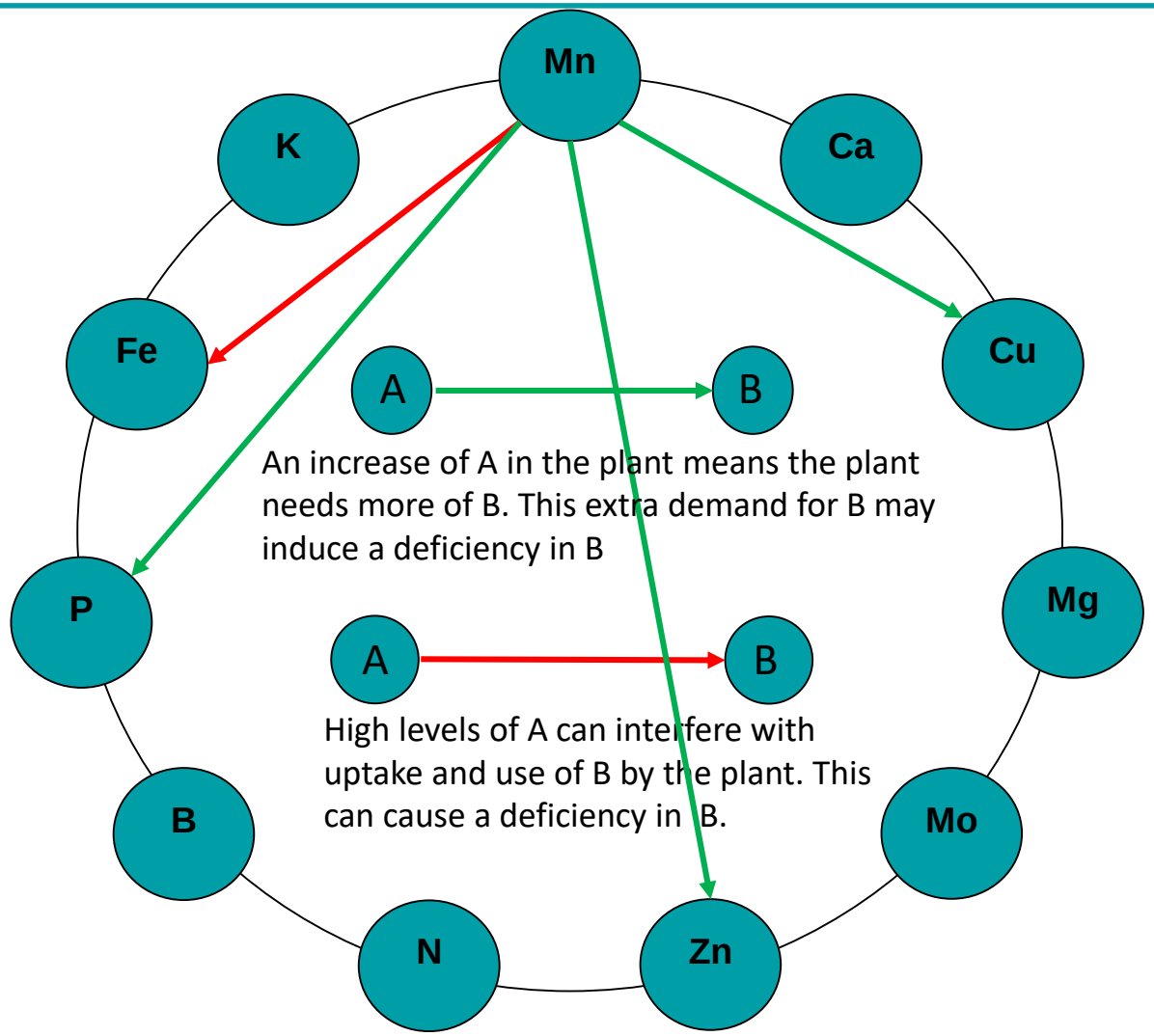
How can Tradecorp Mn increase the tissue content of other nutrients?



- There are over 118 studies interactions between different nutrients and the number is rising
- Manganese is known to enhance scavenging and uptake of Zinc[1,2] & Copper[3] & Phosphorus
  - This was confirmed in the trials where Zinc was increased by +310 (Drip) and +59% (Foliar)
  - This was confirmed in the trials where Copper was increased by +80% (Drip) and +50% (Foliar)
  - This was confirmed in the trials where Phosphorus was increased by +50% (Drip)
- Manganese is not expected to increase Iron[4,5]
  - In this Trial Iron was increased by +235 (Drip) and +135% (Foliar)
  - This is likely due to the critically low micronutrient levels of Iron and other nutrients

1. Asian Journal of Plant Sciences (2014) 13 (1): 26-33
2. Journal of Plant Nutrition (2010) 22 (5) 752-769
3. Journal of Plant Nutrition 25 (8):1701–07
4. Communications in Soil Science and Plant Analysis 36 (13–14):1717–25
5. Journal of Plant Nutrition 31 (5):839–48

Conclusions

- In the Control the micronutrients were either at or below critical levels indicating the previous micronutrient program was not effective
- The Drip Program was more effective than the Foliar program at increasing micronutrient content
  - This is excepted as the dose was higher
- The Tradecorp Mn drip Manganese EDTA program will need to be implemented over a number of cycles to bring Mn levels back to “Normal”
- The Tradecorp Mn foliar Manganese EDTA program should also be continued until drip irrigation brings level more towards normal
  - Adding extra foliar applications will likely be beneficial in the near term
- When Tissue levels are this low the micronutrient program should begin earlier in the crop

Conclusion

- Tradecorp Mn increased Tissue **Mn +100%** (Drip) and **+16%** (Foliar)
  - This was expected as foliar application was a lower dose

- Increasing Mn levels consequently increased the levels in **Zn, S, Cu, Fe** in both methods of application and decreased **Na** levels

- This is because of the role Mn play in Chlorophyll synthesis and enzyme activation

- University of Colorado & Autonomous University of Madrid in independent studies have concluded that EDTA micronutrients are the most effective delivery method in soil, particularly when compared to Lignosulfonates and Sulfates[1,2,3]

1. Journal of Agricultural & Food Chemistry (2009) 57, 226-231
2. Journal of Plant Nutrition (2002): 25, 259-273
3. Communications in Soil Science and Plant Analysis (2006): 37, 199-209

Conclusion

Tradecorp Mn @ 3kg /ha (Drip) or Foliar 100g /100 L (300L) increased
Sap Tissue Mn by +100% and +16%

Manganese is fixed when in contact with organic matter in soil

Tradecorp Mn EDTA is not affected by organic matter levels and available for plant uptake