

Detailed soil testing and tissue testing delivers results

A rigorous approach to soil testing using Soil Test Pro and fortnightly tissue sampling resulted in a corn yield of 17.2t per hectare achieved with 6.7 megalitres; 2.5t/megalitre.

Commencing in 2016, the paddock has been sampled twice using Soil Test Pro on two-hectare grids to check soil nutrient status for macros and micros. The results from the first round of sampling were used to determine variable rate lime requirements and to identify any other issues that needed to be addressed. The second round of sampling, 18 months later, was used to check that the changes made were achieving the desired outcome. With no further soil amendments required the paddock was planted to Pioneer 1756 on 23rd October and germination commenced 31st October.

Once you have soil test data, you can begin to manage most things. The soil test results were used to identify tissue sampling sites and plants were sampled approximately every two weeks throughout the growing season. Tissue sampling is the “report card” for the crop. You fertilise a crop, but did that fertiliser get into the plant? Tissue sampling commenced 14/11/17 (approximately V3-V5).

Standard N:P:S was applied as per the agronomist’s recommendation. A foliar application of Microfusion (water soluble liquid containing 10 micro elements) at 5L/ha was applied with herbicides at V3-V5. Microfusion was targeted at V3 to maximise the concentration of trace elements in the plant for tassel and ear initiation; all leaves and ear shoots the plant will ever produce form inside the stalk from V3 to about V5.

		#2 NES	#2 NEN	#2 NES	#2 NEN	#2 NES	#2 NEN	#2 NES	#2 NEN	#2 NES	#2 NEN	#2 NES	#2 NEN
		14/11/2017	14/11/2017	30/11/2017	30/11/2017	14/12/2017	14/12/2017	28/12/2017	28/12/2017	19/01/2018	19/01/2018	5/02/2018	5/02/2018
%	N	5.5	5.54	4.89	4.54	3.75	3.96	3.6	3.72	2.41	2.45	2.5	3.17
%	P	0.6	0.79	0.32	0.31	0.29	0.37	0.28	0.25	0.25	0.27	0.22	0.29
%	K	4.78	5.63	4.07	3.89	3.85	3.34	3.21	3.35	2.24	2.48	2.44	1.79
%	Mg	0.2	0.19	0.21	0.24	0.2	0.2	0.23	0.22	0.23	0.17	0.25	0.35
%	Ca	0.6	0.54	0.44	0.69	0.36	0.37	0.52	0.39	0.6	0.57	0.65	0.58
%	S	0.39	0.44	0.28	0.31	0.27	0.31	0.23	0.23	0.2	0.21	0.2	0.22
ppm	B	23.6	24.5	21	25.2	16.5	21.7	28.4	32.8	19.8	13.7	24.7	21.3
ppm	Zn	43.4	37	24.3	26.8	34	30.7	22.9	20.6	28	20.9	28.8	32
ppm	Mn	138	248	281	169	101	321	130	129	193	195	474	100
ppm	Fe	538	343	473	388	204	160	149	127	171	164	183	198
ppm	Cu	10.4	9.9	8.7	11.5	12.8	11.2	10.2	8.3	8.4	10	11.5	14.7
	Na	12.2	2.58										

Tissue sample results- NES highest yielding area, NEN was the lowest yielding area of the paddock.



The potential of kernels per row is determined by at least V15 and maybe as early as V12. Moisture or nutrient deficiencies from V10 to V15 significantly reduce kernel numbers, ear size and grain yield. The plant begins to accumulate nutrients just prior to tasselling (28/12/17) and then levels decline as the kernels develop.

Ezyflow Calbud (Ca:Mg:Zn:N:B) was applied 14th December at 2L/ha for this accumulation of nutrients. Corn Mix (nitrogen + trace elements) was applied through the lateral on the 5/2/18 as a top up nitrogen application.

Grain in the bin reflects the benefit of soil and tissue testing to tailor crop nutritional needs

Previous seasons yields, and yields achieved in other paddocks this season where the same attention to detail from soil and plant tissue testing was not applied highlight significant gains can be made. Even though the same nutritional program was followed, without testing, the program was “best guess” rather than targeted. The yield of 12.9t/ha suggests the fertiliser program was not reflective of what the crop needed. This paddock did suffer moisture stress at one point and a strong wind just prior to harvest knocking cobs on the ground.

Yield map- Field Boundary Yield Surface kg/Ha			
Range (kg)		Ha	Per cent
Low	High		
1400	6300	1.06	1.3%
6300	11200	3.75	4.6%
11200	16100	17.31	21.2%
16100	21000	56.89	69.6%
21000	25900	2.68	3.3%
Total hectares		81.69	
Average yield		17.2t	

The major contributor to improved yields in the tested paddock was the increased focus on soil and tissue testing to better manage soil amelioration and nutrition. An

improvement in irrigation management at the north end (see yield map) would have also been beneficial.

Soil sampling using Soil Test Pro twice in 18 months was an investment of \$66.98/ha (includes GST, testing, sampling fee, postage and interpretation). Investment in tissue sampling for the crop was \$23.71/ha giving a combined total of \$90.69/ha.

A corn price of \$260/t in April 2018 equates to \$1118/ha difference; this makes a \$91/ha investment in detailed soil testing since 2016 using Soil Test Pro, in conjunction with frequent tissue testing throughout the season, a worthwhile investment.



Since the first soil samples were collected in March 2016 the paddock has produced canola (2016), grazing oats (2017) and corn (2017/18). The paddock is currently fallow and will have corn planted in 2018.

Additional considerations for the 2018/19 corn crop include:

- Application of K-Fusion prior to tasselling
- Addition of Nutrifusion Boron with the Ezyflow Calbud application
- Use of SupaWET, applied through the lateral, to improve water infiltration

I must thank Tocal College for its assistance in preparing the yield maps through its Precision Agronomy course.

Soil Test Pro: The more you test, the more you know.

Form more information please contact

Mark Coupland
0437 666 886
mark@yarrawa.com.au
www.yarrawa.com