Integrated Irrigation
ABN 69 321 757 374
13 Riddoch St
Penola, SA 5277

Catch Can Test Results
Tim Powell
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Catch can test results for Pivot 1, 40ha

Property

Date: March 2025

Distribution Uniformity	**DU**	**58%**
Coeficient of Uniformity	**CU**	**69%**

Test Conditions

Catch can spacing:	2 m
Wind speed & dir:	SW 21 km/hr
Pivot direction:	SE
Pivot Age:	?
Rotation time	21.6 hrs
Pivot setting:	? 100%
% of circle to rotate:	100%
Pivot area:	40 ha
Regulators	15 psi
Sprinklers:	Nelson Rotator

Measured Depth Results (mm)

Expected depth from settings	8.0	(Guessed)
Average Irrigated depth	9.1	
Most Frequent Result	8.0	
Lowest 1/4 avge depth	5.3	
Lowest 1/4 weighted avge depth	7.2	

Water use Results

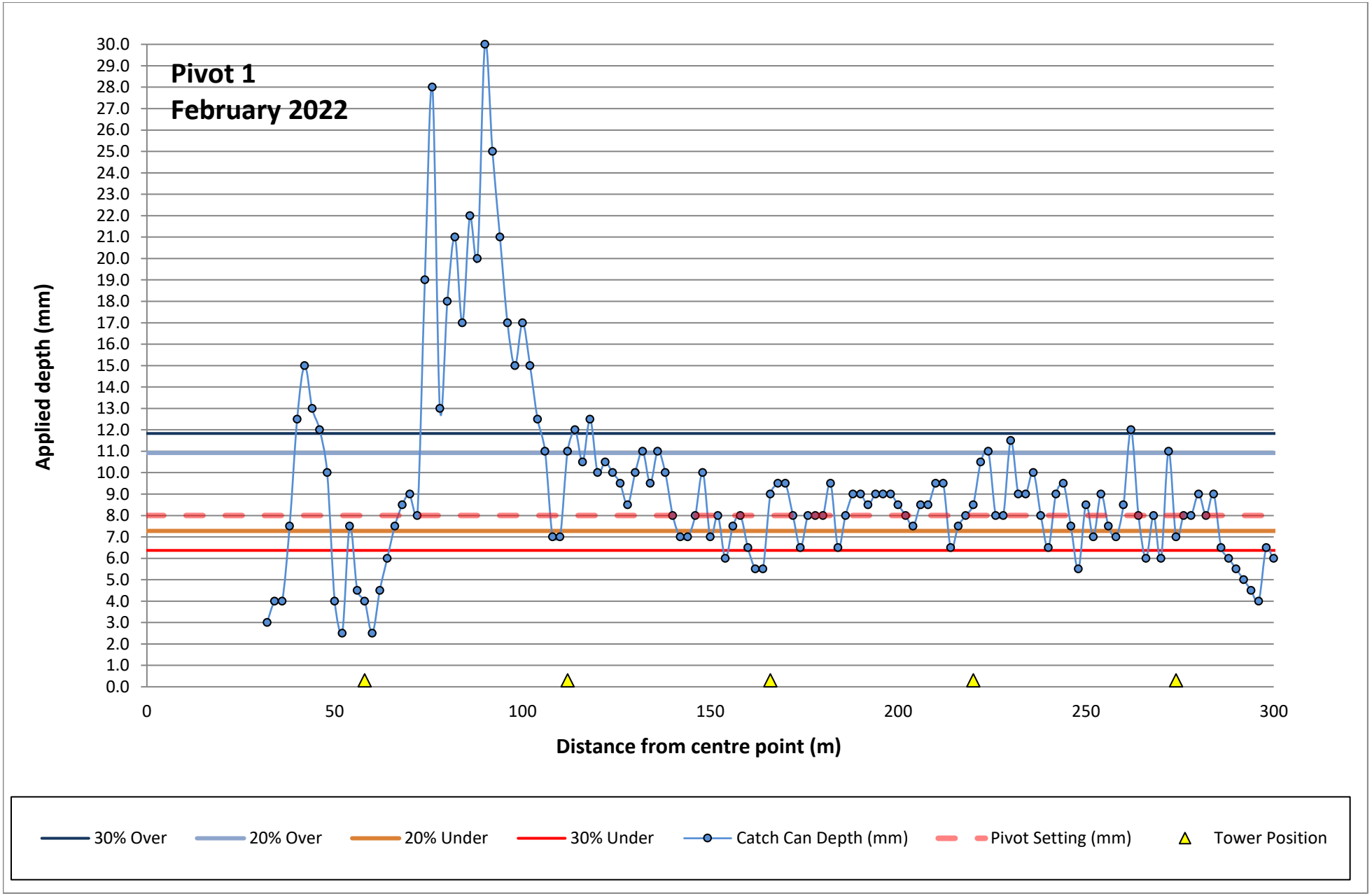
Avg depth x area wtr use per lap	3371.61	kL
Measured water use per catch can	3060.82	kL
Metered water from water meter	2416	kL
Metered Flow Rate:	192	kL/hr
Start Meter Read:	3414283	kL
End Meter Read:	3414612	kL
Measured area:	37.05	ha

Pump/Motor

RPM	?
Amps	?
Hertz	?

Machine Run Results

Centre Pressure	145 (21)	kPa	(psi)
End Pressure	69 (10)	kPa	(psi)
Pivot Panel Pressure	N/A	kPa	(N/A psi)
Starting Position	N/A	Degrees	
Ending Position	N/A	Degrees	
Last Tower Speed	1.58	m per minute	


Pivot 1
February 2022
Applied depth (mm)
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
50
100
150
200
250
300
Distance from centre point (m)
30% Over
20% Over
20% Under
30% Under
Catch Can Depth (mm)
Pivot Setting (mm)
Tower Position

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Notes:

DU (Average lowest 1/4 depth / Average Depth) should be above 90%.
CU is an area weighted analysis of deviation from average depth as per Christiansen (1942)

Water meter is ARAD IRT150 SNxx-xxxx? (Hard to read SN)
Soils under spans 2 and 3 are impossibly wet and untrafficable with very little pasture
Span 2 is appllying up to 3x the water depth applied by outer spans
Water meter appears to be under reading

Impossible to manage soil moisture and pasture growth

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Potential losses / cost Calculations

Discalimer:
These calculations are presented in good faith, based on actual catch can test results and previous industry research, and are presented as an information source to aid your making decisions about the cost Vs benefit of pivot works that may be required. In no way are these calculations presented as absolute or correct. It is the sole responsibility of the user of these calculations to make their own desicions and judgements as to the use of these calculations or not.

These dollar value calculations are based on a threshold of 30% over, and under watering. A potential yield (tonage) loss of 42% is associated with a 30% under watering of a ryegrrass pasture (Ward & Burch, DRNE Warnambool). A lesser amount of under watering (e.g. 20%) is likely to reduce yield to a lesser extent than an under watering of 30%. Under watering of less than 30% is considered in these calculations and a yield loss of only 25% is presented so these calculations of yield loss due to under watering should be considered rather conservative. The irrigation year of 2015-2016 is used as a fairly long, high irrigation requirement season as a point of reference. No loss of feed quality has been presented which is known to occur prior to yield loss when pastures are water stressed.

CALCULATIONS BASED ON MEASURED AVGE DEPTH

Information used in these calculations

Feed value ($/t)	$350
Assumed daily growth rate of pasture (kg/ha/day)	75
Days in irrigation season (2015-2016, approx. Oct to Apr)	212
ETo Irr water required 2015-2016, approx, Oct to Apr (mm)	752.1
Irrigation events required at pivot settings 2015-2016	82.6

	Over watered	Under watered
Area affected (>30%)	2.68	7.80
Area affected (20-30%)	1.54	6.61
KL of water >30% different to measured result (per irrigation event)	213.61	298.02
KL of water 20-30% different to Measured result (per irrigation event)	30.73	160.75
KL Total of water different to pivot settings (per season)	**20,194 Wasted**	**37,916 Needed**
% water wasted or needed compared to themeasured result (per season)	7.98%	14.99%
Likely production loss due to over or under watering (conservative)	25%	25%
Tons lost prdn Oct – Apr	16.794	57.254
Lost prdn if feed valued at $200/ton	**$5,878**	**$20,039**

Total per-season (based on 2015-16 year) economic losses due to watering pattern: **$25,917**

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CALCULATIONS BASED ON PIVOT SETTINGS

Information used in these calculations

Feed value ($/t)	$350
Assumed daily growth rate of pasture (kg/ha/day)	75
Days in irrigation season (2015-2016, approx. Oct to Apr)	212
ETo Irr water required 2015-2016, approx, Oct to Apr (mm)	752.1
Irrigation events required at pivot settings 2015-2016	94.0

	Over watered		Under watered	
Area affected (>30%)	**4.81**		**5.26**	
Area affected (20-30%)	**1.20**		**2.53**	
KL of water >30% different to pivot settings (per irrigation event)	190.00		35.28	
KL of water 20-30% different to pivot settings (per irrigation event)	24.08		50.67	
KL Total of water different to pivot settings (per season)	**20,126**	**Wasted**	**8,081**	**Needed**
% water wasted or needed compared to the pivot settings (per season)	**7%**		**3%**	
Likely production loss due to over or under watering (conservative)	**25%**		**25%**	
Tons lost prdn Oct – Apr	**23.91**		**30.99**	
Lost prdn if feed valued at $200/ton	**$**	**8,367**	**$**	**10,846**

Total per-season (based on 2015-16 year) economic losses due to watering pattern: $ 19,214

Comments, interpretations and observations

A nominal spec for our climate and soil depths is a rotation time of 15 hours and application depth of 10mm. This allows catching up under peak water use requirements when required.

Impossible to manage soil moisture with the application depth distribution as measured. The chart shows the end few spans as relatively consistent application depth however when the size of the y-axis required to show results from the 2nd span is considered the results are not as consistent as they appeaer.

No significant leaks from pipework noted

Water meter is likely under reading by around 10%

Soils are so wet under spans 2 and 3 they are largely impassable by 4WD the whole way round the circle at the time of this test. Soils under the outer spans are clearly patchy damp and dry where the test was performed. Pasture growth visually follows this observation

The production cost calculations above (while intended to be a guide only and not designed to be an accurate assessment) are very excessive and indicative of inability to manage soil moisture with this pivot

Immediate Solutions:

Fit regulators and new sprinkler pack. Replace water meter

Medium & long term Solutions:

Fill in deep pivot ruts with crushed limestone or similar

Costs:

An irrigation infrastructure company must be approached to project costs for required sprinklers