EAZE

NT FARMERS

FOX ROAD FIELD DAY

29 March 2023


Northern Hub
NT FARMERS
NETAFIM™
GROW MORE WITH LESS
Team Work
MAKES THE
Dream Work
ALPHA GROUP
CONSULTING
PACKED BY
FOXALICIOUS FRUIT
Territory
Natural Resource
Management

HOUSE KEEPING

SCHEDULE

- NT Farmers - VegNET Update
- Netafim – Irrigation scheduling
- James De Barro & Andrew Dalglish – Soil moisture probes
- **Lunch**
- NT Farmers – CEO Update on Water
- Netafim – Automation & product selection
- **Quick break**
- Netafim – Field Walk
- DEPWS – Soil Pit
- **Cold beverages, BBQ, social butterfly activity**

NT FARMERS

VegNET 3.0 Update

What is VegNET3.0?

- 5-year national extension program led by AUSVEG
- Aims to assist in boosting productivity and deliver the latest research and development on-farm
- Over the next 5 years, field trails, case studies, industry tours, workshops and one on one support will be delivered across Australia with a focus on local industry needs in each state.

NT Focus Areas

PROTECTED CROPPING

WATER EFFICIENCY

SOIL HEALTH

INTEGRATED PEST MANAGEMENT

BIOSECURITY

What's on in 2023?

- Hydroponics trial in Acacia Hill
- Thailand Industry Tour
- Case studies on composting, IPM and protected cropping
- Northern Food Futures Conference – Tickets paid for by VegNET3.0
- More industry tours!

Protected Cropping Australia Conference Industry Tour

Brisbane, 17th- 20th July 2023

What will the conference cover?	Major protected cropping developments in topics such as pollination, water use, emerging technology and pests and disease management.
What costs are covered?	Airfares, accommodation while in Brisbane and farm tour costs. Conference registration fees are not covered.
Who can apply?	Vegetable growers and industry service providers who service vegetable growers.

Food Incubator Industry Tour

Cairns, October 2023

What will the tour cover?

3-day workshop exploring options for value-add products sourced from produce that does not meet markets specifications.

What costs are covered?

Workshop cost, airfares and accommodation.

Who is eligible?

Vegetable growers and industry service providers who service vegetable growers.

FNQ FOOD INCUBATOR

CREATE | INNOVATE | ACCELERATE

All Things Irrigation + Water

NT Farmers Katherine 29th March

- Irrigation Scheduling
- Water budgets

Scheduling

Based in Murray Darling basin – Mildura

Scheduling

To develop a program the following info is required:

- **Irrigation system**
  - Application rate or litres per tree
  - How much of the soil surface is wet
- **Rootzone depth**
  - Depth of active roots
- **Soil Data**
  - RAW
    - Readily available Water
- **Plant water use**
  - Weather data ETo
  - Evaporation pan E_{pan}

Scheduling

Application rate

- Application rate mm/Hour
- = Sprinkler output / (Row sp. x Sprinkler sp.)
  - 35 / (6.6 x 3.8) = 1.4 mm/H

- Litres/tree
- 9.9 x 4.9 =206 trees/ hectare
  - 206 x 70 = 14,420 L/Hect.

- 14,1420 = 1.4 mm/H

Scheduling

- % of area wet by irrigation system
  - 35 L/H = 28.2 M²
    - 6 M diameter
    - Area occupied by sp. = 25.08
    - 100 % coverage
  - 70 L/H = 38.5 M²
    - 7 M diameter
    - Area occupied by sp. = 48.51
    - 80% coverage

Scheduling

- Rootzone depth
  - Usually, biggest influence on soil water holding capacity

Scheduling

RAW - readily available water

Table 1. Readily available water (mm/cm) stored between –8 and –1500 kPa

Texture grade	Soil water deficit (mm/cm) –8 to –20 (kPa)	–8 to –40 (kPa)	–8 to –60 (kPa)	–8 to –200 (kPa)	–8 to –1500 (kPa)
sand (S)	0.33	0.36	0.38	0.40	0.62
loamy sand (LS)	0.45	0.52	0.55	0.58	0.87
clayey sand (CS)*	–	0.55	0.60	0.64	1.00
sandy loam (SL)	0.46	0.59	0.65	0.70	1.15
light sandy clay loam (LSCL)	0.45	0.65	0.74	1.03	1.37
loam (L)	–	0.69	0.84	1.00	2.43
sandy clay loam (SCL)	0.39	0.61	0.71	1.01	1.44
clay loam (CL)	0.30	0.53	0.65	0.73	1.48
clays (SC, LC, LMC, MC)	0.27	0.46	0.57	0.66	1.49
heavy clay (HC)**	–	0.25	0.41	0.49	1.20

* Interpolated value ** Samples from Kununurra, WA

Source: K. G. Wetherby, soil survey and land use specialist. This table is the result of detailed field and laboratory studies on 360 samples from the Murray Mallee and Barossa Valley in South Australia.

Scheduling

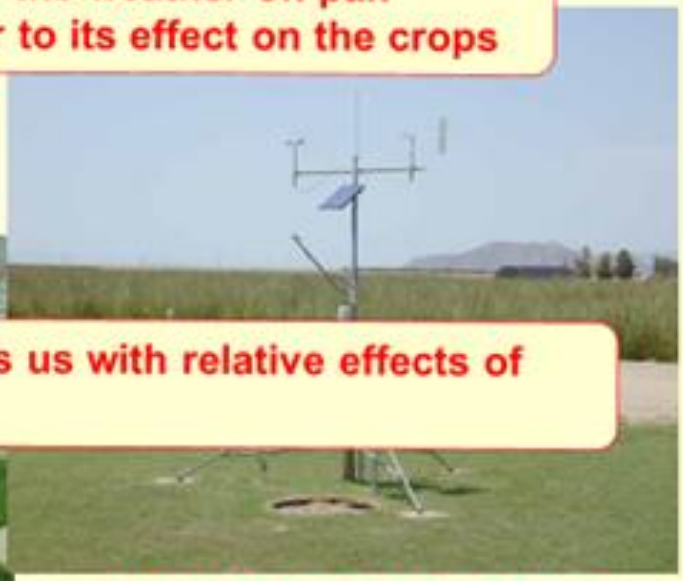
- **Plant water use**

- **Evaporation data**
  - E_{pan} x C_f

- **Weather station**
  - Eto x K_c

It is assumed that the effect of the weather on pan evaporation and ETp is similar to its effect on the crops

Evaporation pan



The ETp and Epan provides us with relative effects of the weather.

Weather station

We calculate the effect of the weather on evapotranspiration (ETp) of a reference crop

Scheduling

Plant water use – weather data - BOM

Tindal RAAF - March 2023 daily calculations

Date	Evapotrans-piration (mm) 0000-2400	Rain (mm) 0900-0900	Pan Evaporation (mm) 0900-0900	Max Temp	Min Temp	Max Rel Hum (%)	Min Rel Hum (%)	Average 10m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
01/03/2023	**4.2**	6.0		31.2	24.9	91	64	5.70	12.92
02/03/2023	**4.1**	8.0		30.1	24.5	96	71	5.02	16.82
03/03/2023	**3.8**	16.4		29.3	22.9	97	66	3.78	15.28
04/03/2023	**5.4**	0.4		32.4	22.7	91	52	3.59	21.02
05/03/2023	**7.0**	0.0		35.6	25.6	87	37	4.00	23.78
06/03/2023	**4.7**	2.2		32.8	24.1	97	58	3.08	18.48
07/03/2023	**6.0**	29.8		33.9	22.4	97	53	3.67	24.86
08/03/2023	**4.4**	0.0		33.4	23.9	94	60	4.09	14.68
09/03/2023	**4.7**	10.2		33.5	22.1	95	50	1.18	21.65
10/03/2023	**6.0**	0.0		34.1	21.0	96	25	1.63	27.15
11/03/2023	**5.3**	0.0		34.7	17.7	93	22	0.90	27.08
12/03/2023	**5.6**	0.0		35.5	19.5	92	34	1.16	26.86
13/03/2023	**6.1**	0.0		35.8	22.8	91	36	1.81	26.22
14/03/2023	**6.1**	0.0		35.2	25.8	87	48	3.06	23.39
15/03/2023	**6.5**	0.0		35.0	24.2	94	40	2.88	26.05
16/03/2023	**5.9**	0.0		35.8	23.5	91	40	1.56	26.02
17/03/2023	**5.8**	0.0		36.4	23.6	91	37	1.45	25.58
18/03/2023	**6.0**	0.0		36.1	23.6	91	41	1.93	25.29
19/03/2023	**6.4**	0.0		34.9	23.6	87	41	2.89	25.23
20/03/2023	**6.4**	0.0		34.6	22.4	93	44	3.60	25.31
21/03/2023	**6.3**	0.0		34.2	23.9	90	47	3.89	23.77
22/03/2023	**6.6**	0.0		35.7	24.0	89	39	3.36	24.81
23/03/2023	**5.7**	0.4		35.7	23.3	93	38	2.02	23.54
24/03/2023	**6.2**	0.0		35.7	23.3	93	41	2.72	24.73
25/03/2023	**6.7**	0.0		35.6	25.5	84	39	3.27	25.27
Totals:	**141.9**	73.4							

Scheduling

- Putting it all together

  - Moisture held in root zone
    - RAW -8 to – 40 kPa (Sandy clay loam)
      - 0.61 mm/cm
    - Rootzone depth
      - 50 cm
    - 0.61 x 50 = 30.5 mm
  - Wetted %
    - 35 L/H, 6.6 x 3.8 = full coverage
    - 70 L/H, 9.9 x 4.9 = 80 % coverage
  - RAW
    - 35 L/H = 30.5 mm
    - 70 L/H = 30.5 x 0.8 = 24.4 mm

Scheduling

- **Putting it all together**
  - **RAW -8 to -40 kPa**
    - **35 L/H = 30.5 mm**
    - **70 L/H = 24.4 mm**
  - **Irrigation run time**
    - **30.5 / 1.4 = 22 Hour**
    - **24.4 / 1.4 = 17.5 Hours**
  - **Days between irrigation**
    - **Assume Et_c = 6 mm/Day**
    - **Etc = Eto x K c = 6 x 0.7 = 4.2 mm / Day**
  - **35 L/H sprinkler**
    - **30.5 / 6 = 5 Days**
  - **70 L/H sprinkler**
    - **24.4 / 6 = 4 Days**

Developing a water budget

- Monthly climatic data
  - Average monthly Eto
    - BOM
    - Silo
    - IBM weather
  - Average monthly Rainfall
- Crop coefficient Kc

Developing a water budget

Sample water Budget

Sample Mango Water Budget												
	Jan	Feb	March	April	May	June	July	August	Sept.	October	Nov.	Dec.
Averge daily Eto mm	7.2	6.7	6.5	6.4	6.2	5.9	5.9	6.4	7.3	7.2	8.6	5.5
Average daily rainfall mm	5.5	4.8	1.8	0.7	0.3	0.0	0.0	0.0	0.2	0.7	2.8	10.2
Eto - rainfall mm	1.7	1.9	4.7	5.7	5.9	5.9	5.9	6.4	7.1	6.6	5.8	0.0
Kc*	0.39	0.39	0.39	0.39	0.80	0.80	0.80	0.80	0.60	0.60	0.60	0.60
Ave. Irrigation mm/Day	0.7	0.7	1.8	2.2	4.7	4.7	4.7	5.1	4.3	3.9	3.5	0.0

Note *** Ref- : Australian Mangos Irrigation based on evapotranspiration**

QUESTIONS?

SOIL MOISTURE MONITORING AND IRRIGATION SCHEDULING

OVERVIEW

- BACKGROUND
- CONTEXT
- WHAT IS SOIL MOISTURE MONITORING?
- WHAT IS IRRIGATION SCHEDULING?
- CASE STUDIES

BACKGROUND

- **JAMES DE BARRO**
  - **WHO AM I?**
  - **WHERE AM I BASED?**
  - **HOW AM I INVOLVED IN SOIL MOISTURE MONITORING?**
    - COMMERCIAL
    - RESEARCH
    - POLICY
  - **WHY AM I HERE?**

CONTEXT

- WA AND NT SINCE 2008
- RANGE OF CROPS/PLANTATIONS
- SERVICE AND SUPPORT
- NT FARMERS SOIL MOISTURE MONITORING PROJECT
  - PROBES AND WEATHER STATIONS
  - EDUCATION
  - SUPPORT

WHAT'S NEXT?

- WHY USE A MOISTURE MONITORING TOOL?
- WHAT TOOLS ARE AVAILABLE?
- WHO SUPPORTS THE TOOLS?
- WHO SUPPORTS THE USER?
- WHICH TOOL TO USE?
- HOW ARE THEY INSTALLED?
- HOW ARE THE TOOLS USED?

WHY USE A MONITORING TOOL?

- IRRIGATION SCHEDULING
  - $/ML APPLIED
  - QUANTITY
  - QUALITY
- DRYLAND OR IRRIGATION
- OPTIMISE CAPITAL INVESTMENT
- NOT AN OPTIONAL EXTRA
- SO WHAT'S MOST IMPORTANT?
  - AMONGST LOTS OF OPTIONS AND CHOICES ITS U

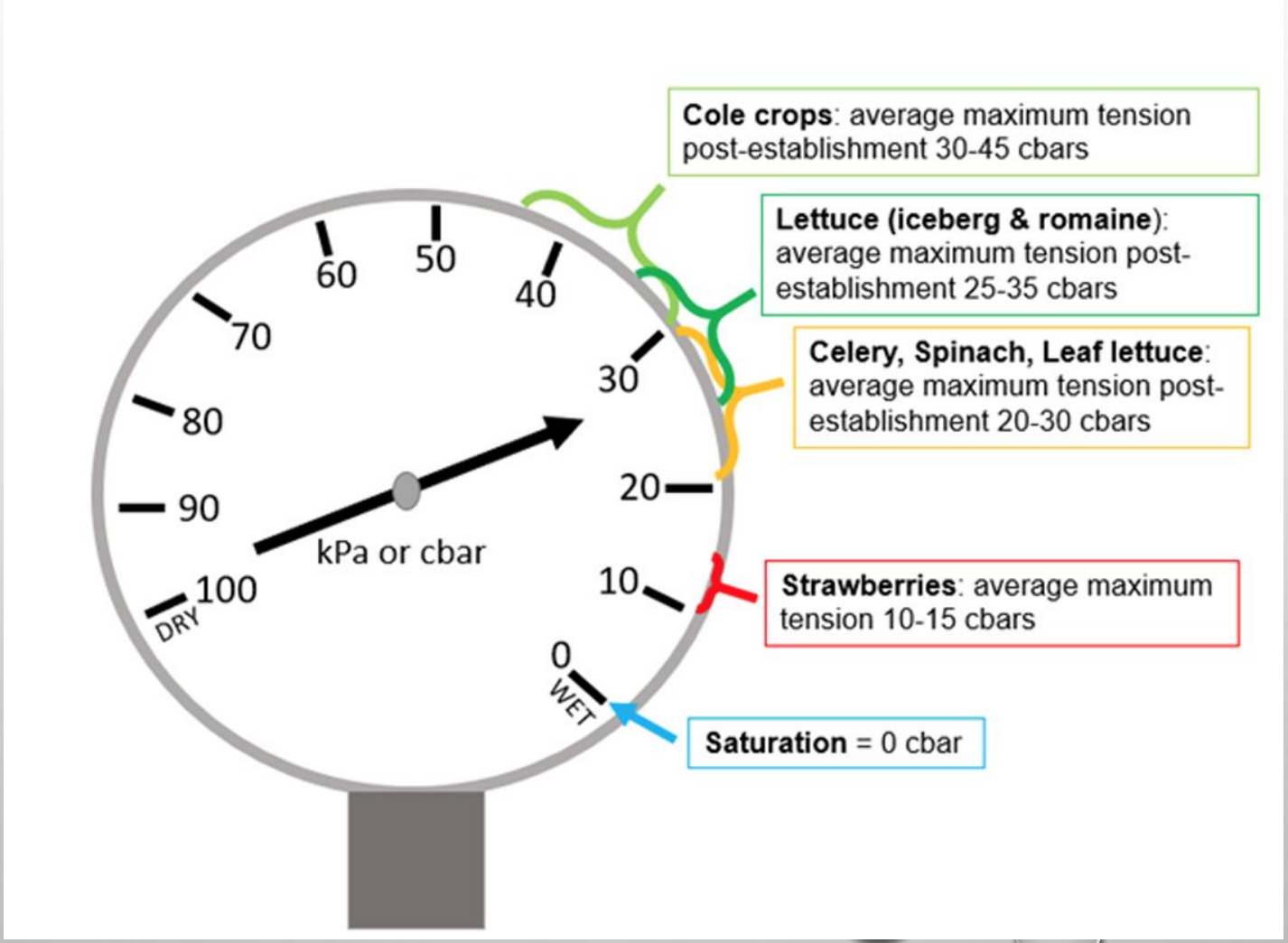
NEUTRON PROBE

WATER POTENTIAL – SUCTION PRESSURE

TENSIONMETER

GYPSUM BLOCK

TENSIONMETER



WATER CONTENT

CAPACITANCE PROBE

TDR

WHO SUPPORTS THE TOOLS?

WHO SUPPORTS THE USER?

WHICH TOOL TO USE?

- WHO BEFORE WHAT
  - WHAT DO I THINK I NEED?
  - MANUAL OR CONTINUOUS?
  - ME OR THEM INSTALLATION?
- CROP AND SOIL TYPE
  - BURIED OR ABOVE GROUND
- IRRIGATION SYSTEM
- LABOUR SOURCE – AM I HERE OR THERE?
- COMMUNICATION METHOD
  - CELLULAR, RADIO, WIFI, SATELLITE, PHYSICAL OR BLUETOOTH CONNECTION

METHOD OF INSTALLATION

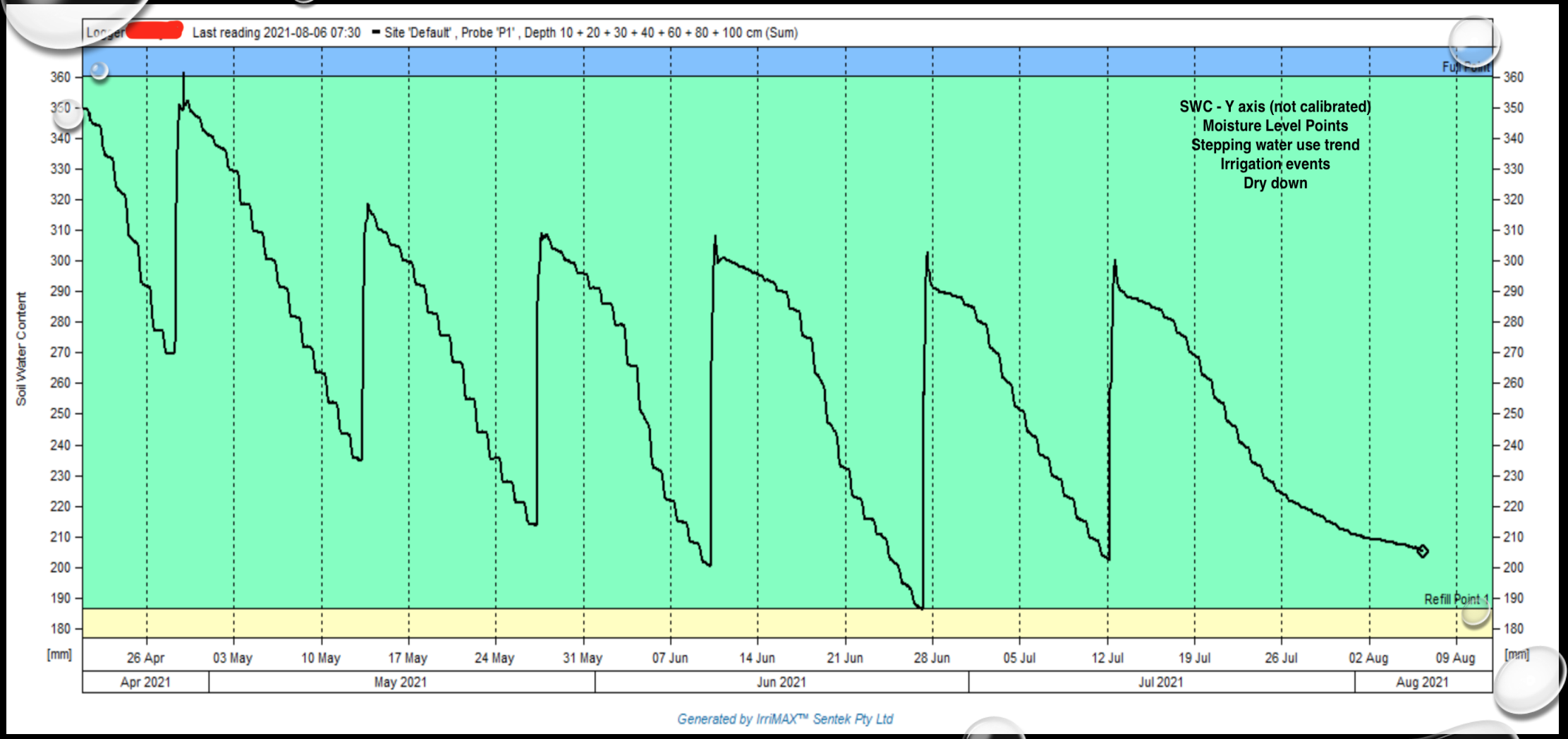
- IS IT IMPORTANT?
  - DOES IT IMPACT DATA?
- ANY TOOLS REQUIRED?
- ANY SKILL REQUIRED?
- DO I NEED TO ADD STUFF?
  - SLURRY?
- WHAT ABOUT CABLES/WIRING
  - VERMIN ISSUES?
  - WEATHER ISSUES?

SOIL MOISTURE DATA

- THE MOST IMPORTANT BIT
- EASE TO ATTAIN
- STRAIGHT FORWARD TO WORK WITH
- UNCOMPLICATED TO INTERPRET AND USE

SOIL MOISTURE DATA

- APP
  - PHONE OR TABLET
- ONLINE SOFTWARE
  - COMPUTER
- IMPORT INTO A PLATFORM
  - API


Logger [redacted] Last reading 2021-08-06 07:30 Site 'Default' , Probe 'P1' , Depth 10 + 20 + 30 + 40 + 60 + 80 + 100 cm (Sum)
Full Point
SWC - Y axis (not calibrated)
Moisture Level Points
Stepping water use trend
Irrigation events
Dry down
Refill Point 1
Soil Water Content
[mm]
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
26 Apr
03 May
10 May
17 May
24 May
31 May
07 Jun
14 Jun
21 Jun
28 Jun
05 Jul
12 Jul
19 Jul
26 Jul
02 Aug
09 Aug
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
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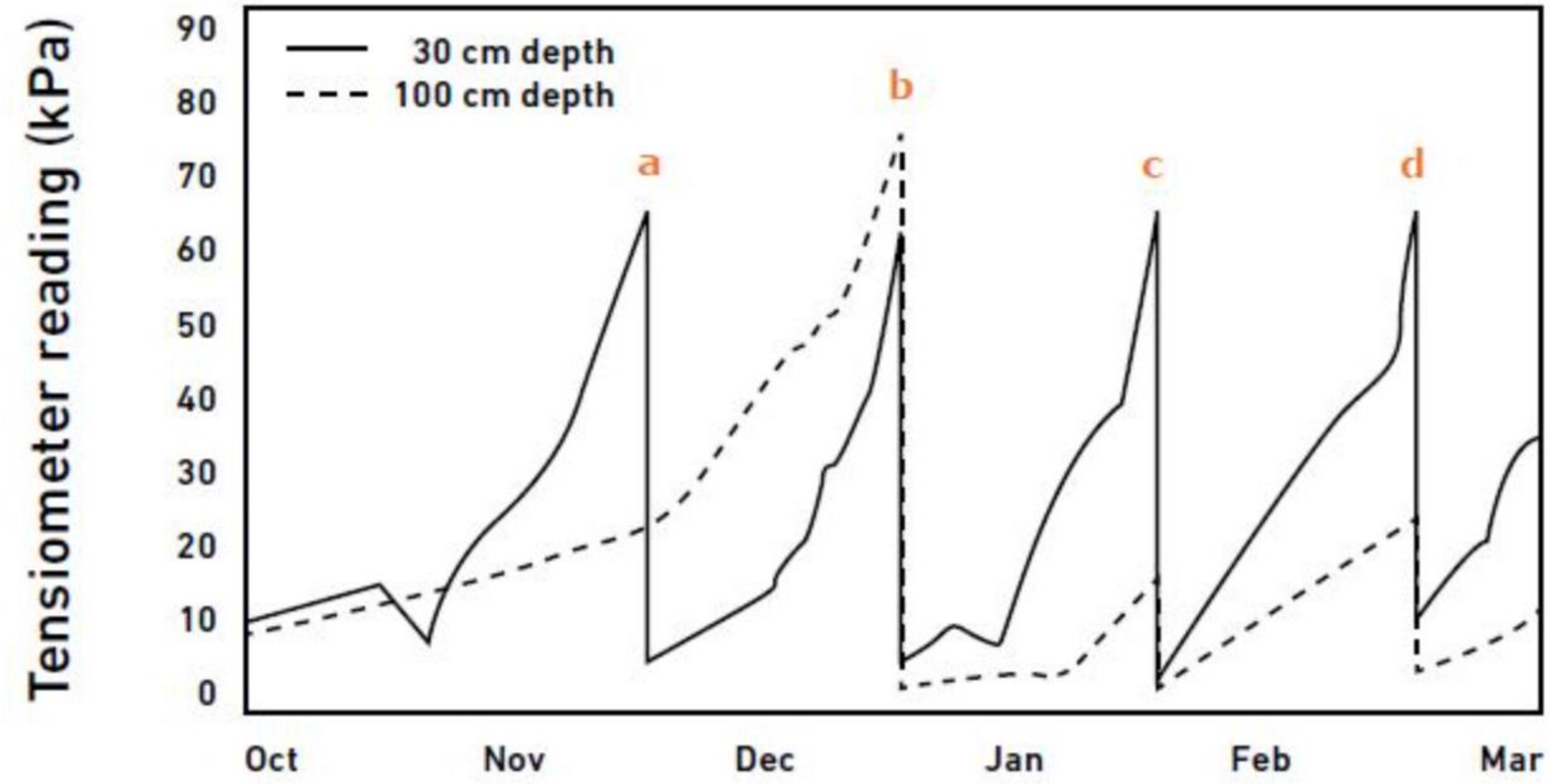
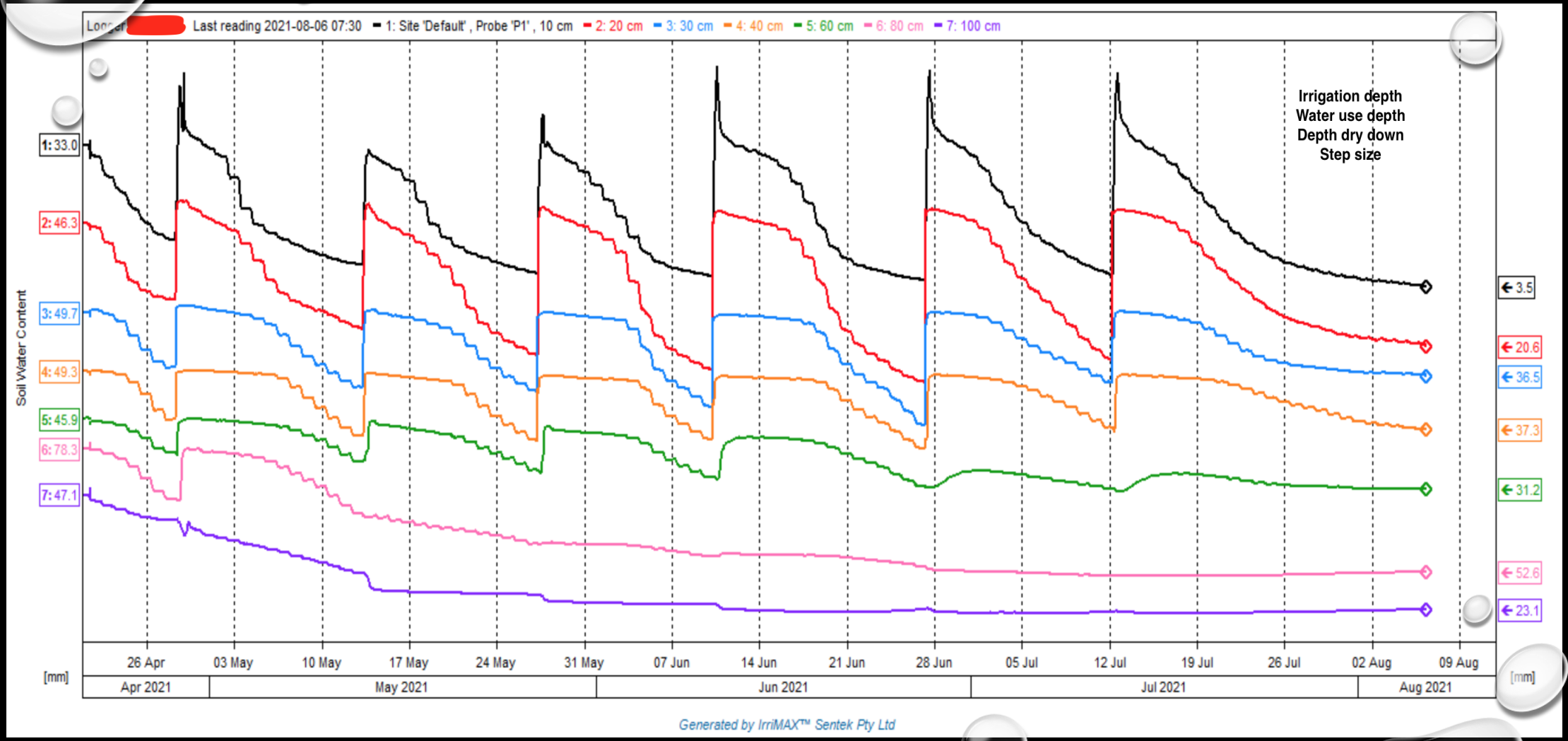

Tensiometer reading (kPa)
90
80
70
60
50
40
30
20
10
0
30 cm depth
100 cm depth
a
b
c
d
Oct
Nov
Dec
Jan
Feb
Mar


Last reading 2021-08-06 07:30
1: Site 'Default' , Probe 'P1' , 10 cm
2: 20 cm
3: 30 cm
4: 40 cm
5: 60 cm
6: 80 cm
7: 100 cm
Irrigation depth
Water use depth
Depth dry down
Step size
Soil Water Content
1: 33.0
2: 46.3
3: 49.7
4: 49.3
5: 45.9
6: 78.3
7: 47.1
3.5
20.6
36.5
37.3
31.2
52.6
23.1
[mm]
26 Apr
03 May
10 May
17 May
24 May
31 May
07 Jun
14 Jun
21 Jun
28 Jun
05 Jul
12 Jul
19 Jul
26 Jul
02 Aug
09 Aug
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
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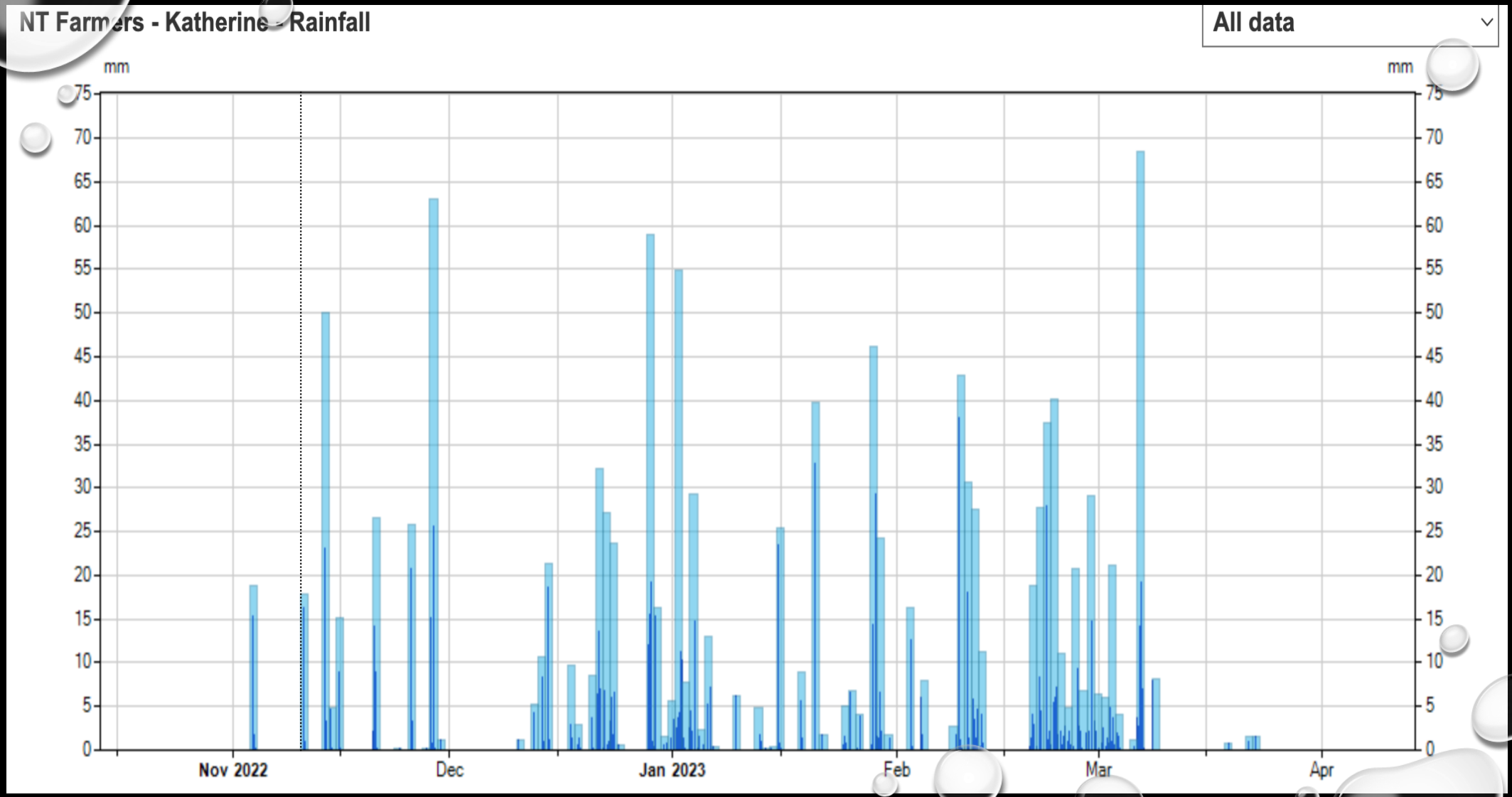
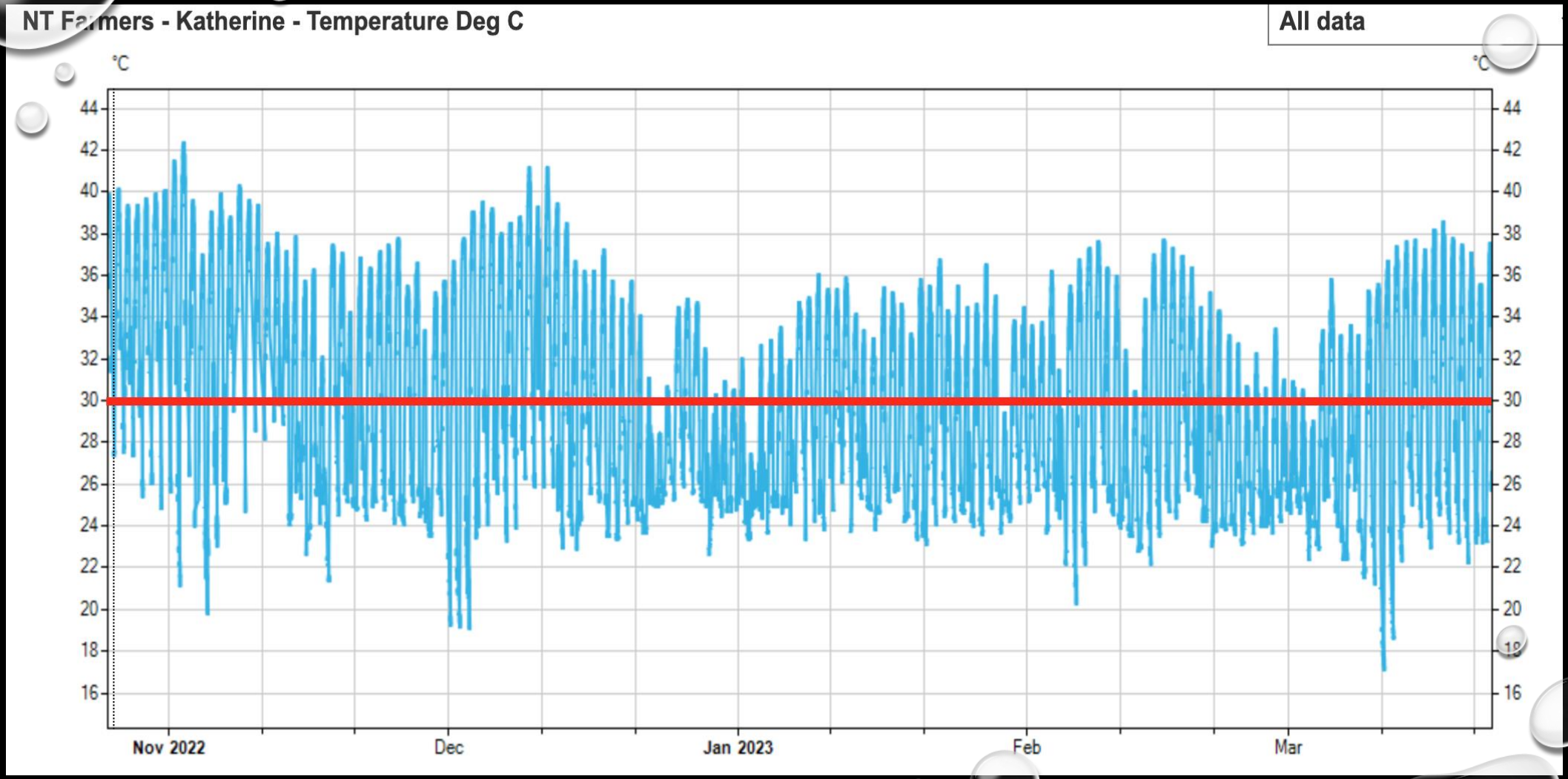
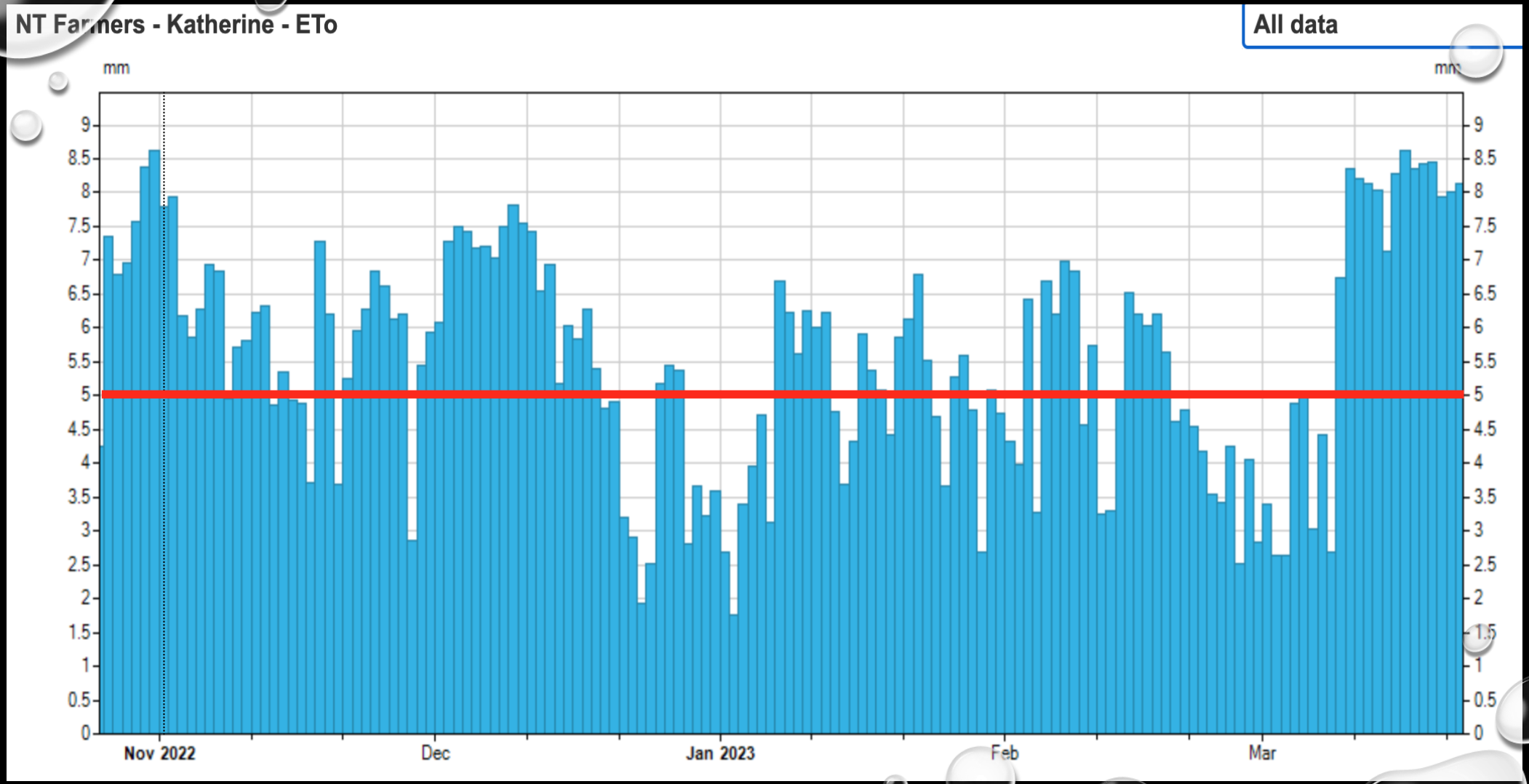
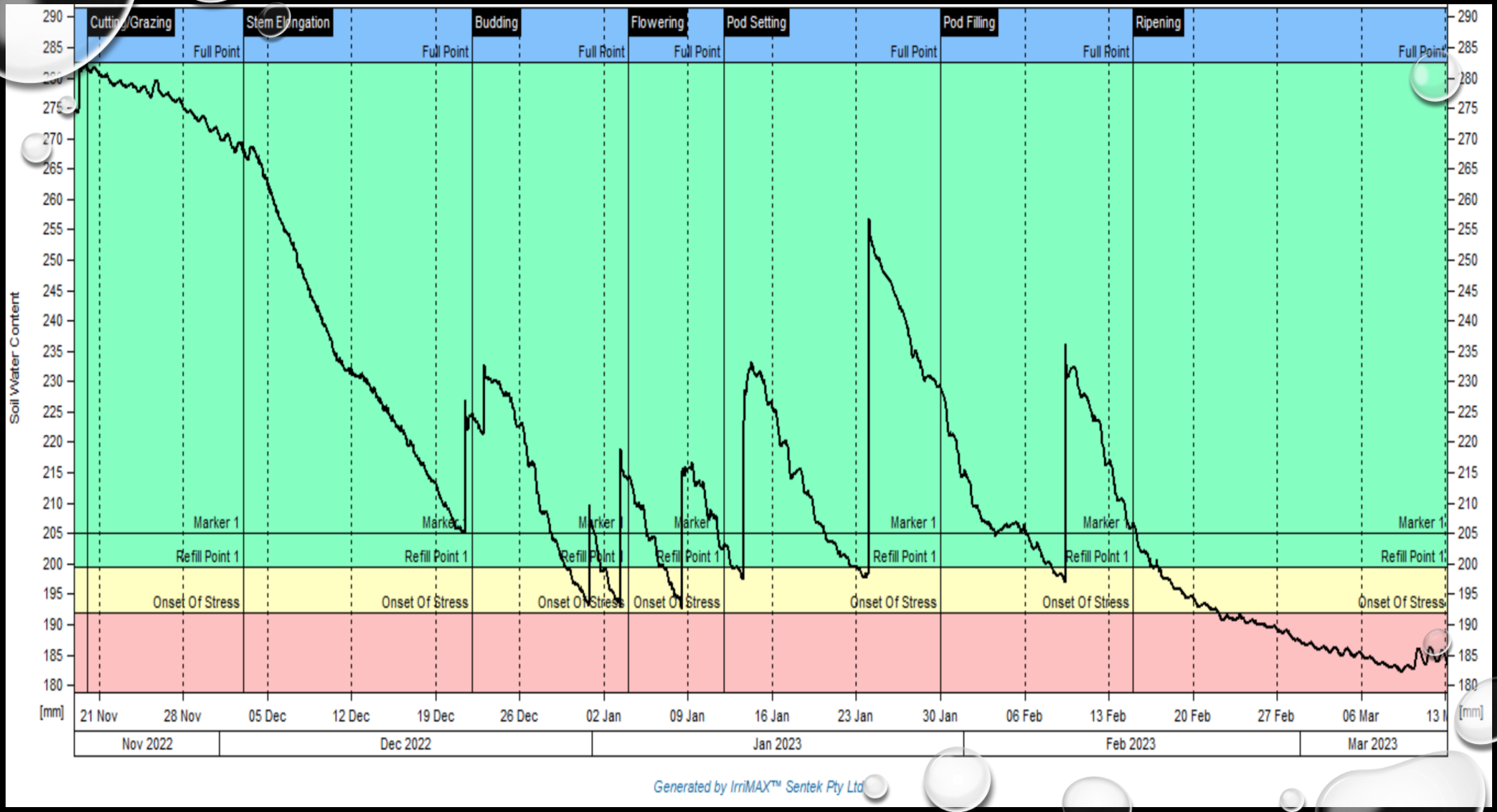

NT Farmers - Katherine - Rainfall
All data
mm
mm
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
Nov 2022
Dec
Jan 2023
Feb
Mar
Apr


NT Farmers - Katherine - Temperature Deg C
All data
°C
°C
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
Nov 2022
Dec
Jan 2023
Feb
Mar


NT Farmers - Katherine - ETo
All data
mm
mm
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Nov 2022
Dec
Jan 2023
Feb
Mar


Cutting/Grazing
Stem Elongation
Budding
Flowering
Pod Setting
Pod Filling
Ripening
Full Point
Marker 1
Refill Point 1
Onset Of Stress
Soil Water Content
[mm]
290
285
280
275
270
265
260
255
250
245
240
235
230
225
220
215
210
205
200
195
190
185
180
21 Nov
28 Nov
05 Dec
12 Dec
19 Dec
26 Dec
02 Jan
09 Jan
16 Jan
23 Jan
30 Jan
06 Feb
13 Feb
20 Feb
27 Feb
06 Mar
Nov 2022
Dec 2022
Jan 2023
Feb 2023
Mar 2023
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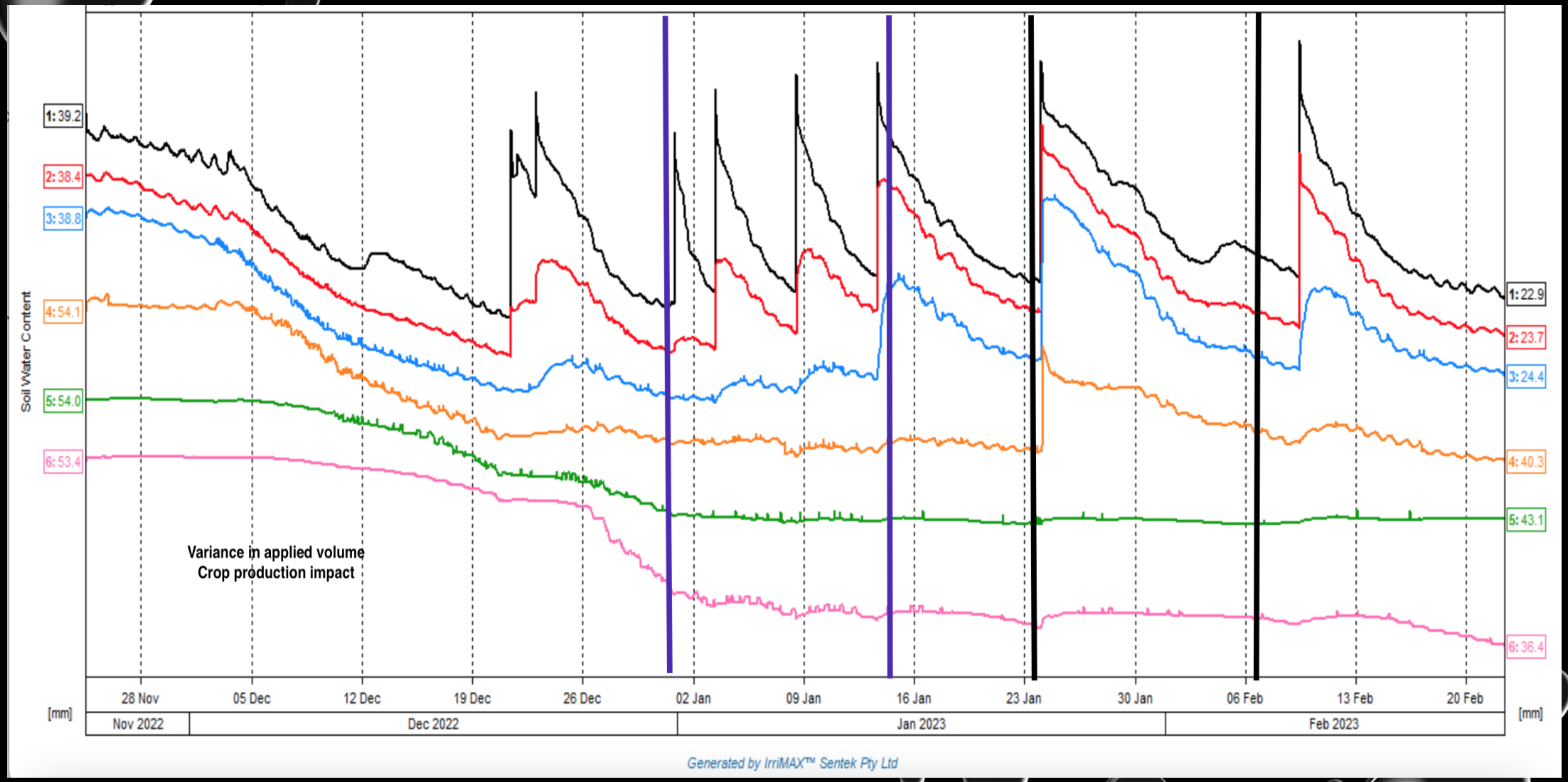
Soil Water Content
1: 39.2
2: 38.4
3: 38.8
4: 54.1
5: 54.0
6: 53.4
Variance in applied volume
Crop production impact
1: 22.9
2: 23.7
3: 24.4
4: 40.3
5: 43.1
6: 36.4
[mm]
28 Nov
05 Dec
12 Dec
19 Dec
26 Dec
02 Jan
09 Jan
16 Jan
23 Jan
30 Jan
06 Feb
13 Feb
20 Feb
[mm]
Nov 2022
Dec 2022
Jan 2023
Feb 2023
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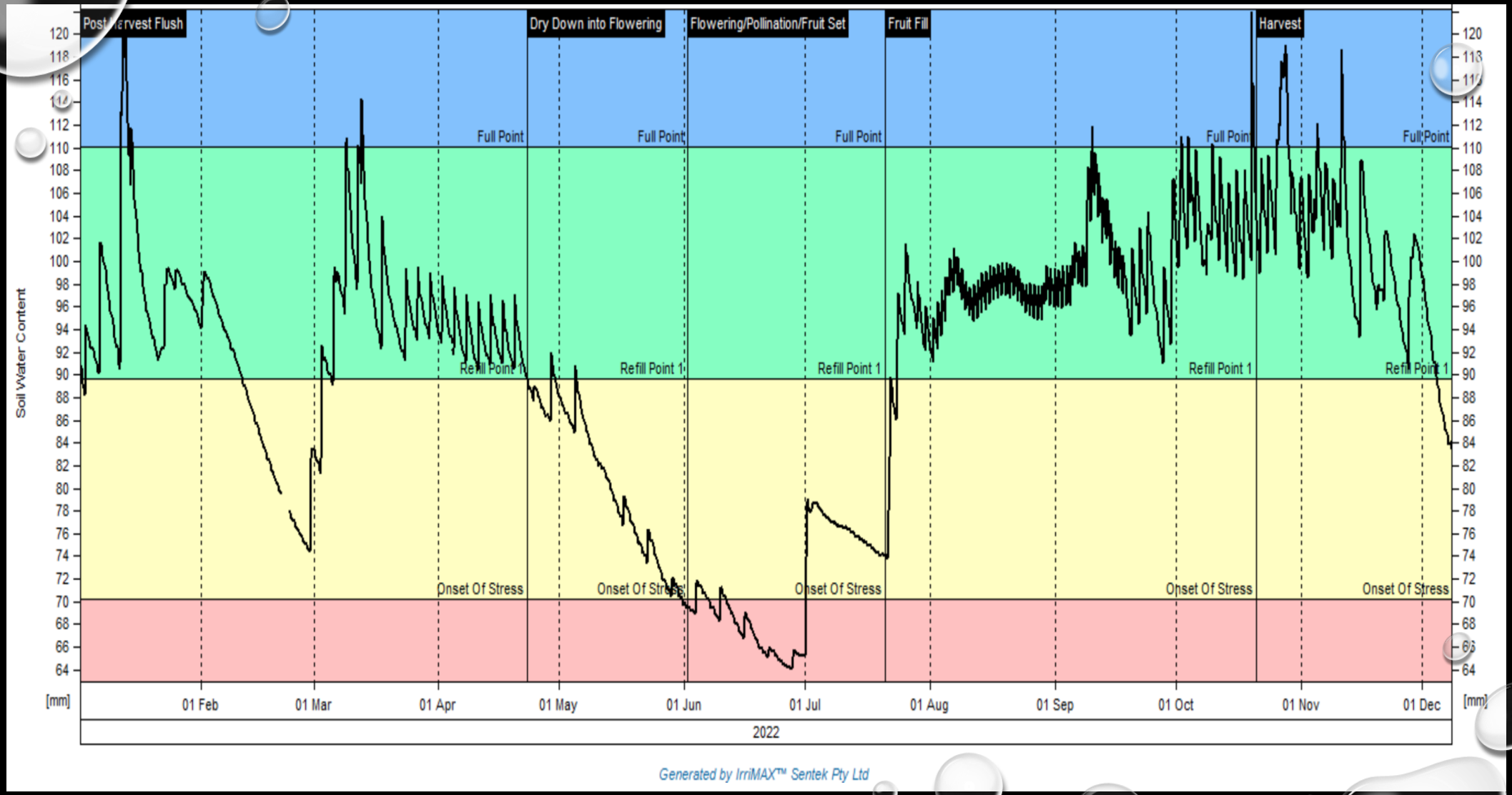
Post Harvest Flush
Dry Down into Flowering
Flowering/Pollination/Fruit Set
Fruit Fill
Harvest
Full Point
Refill Point 1
Onset Of Stress
Soil Water Content
[mm]
01 Feb
01 Mar
01 Apr
01 May
01 Jun
01 Jul
01 Aug
01 Sep
01 Oct
01 Nov
01 Dec
2022
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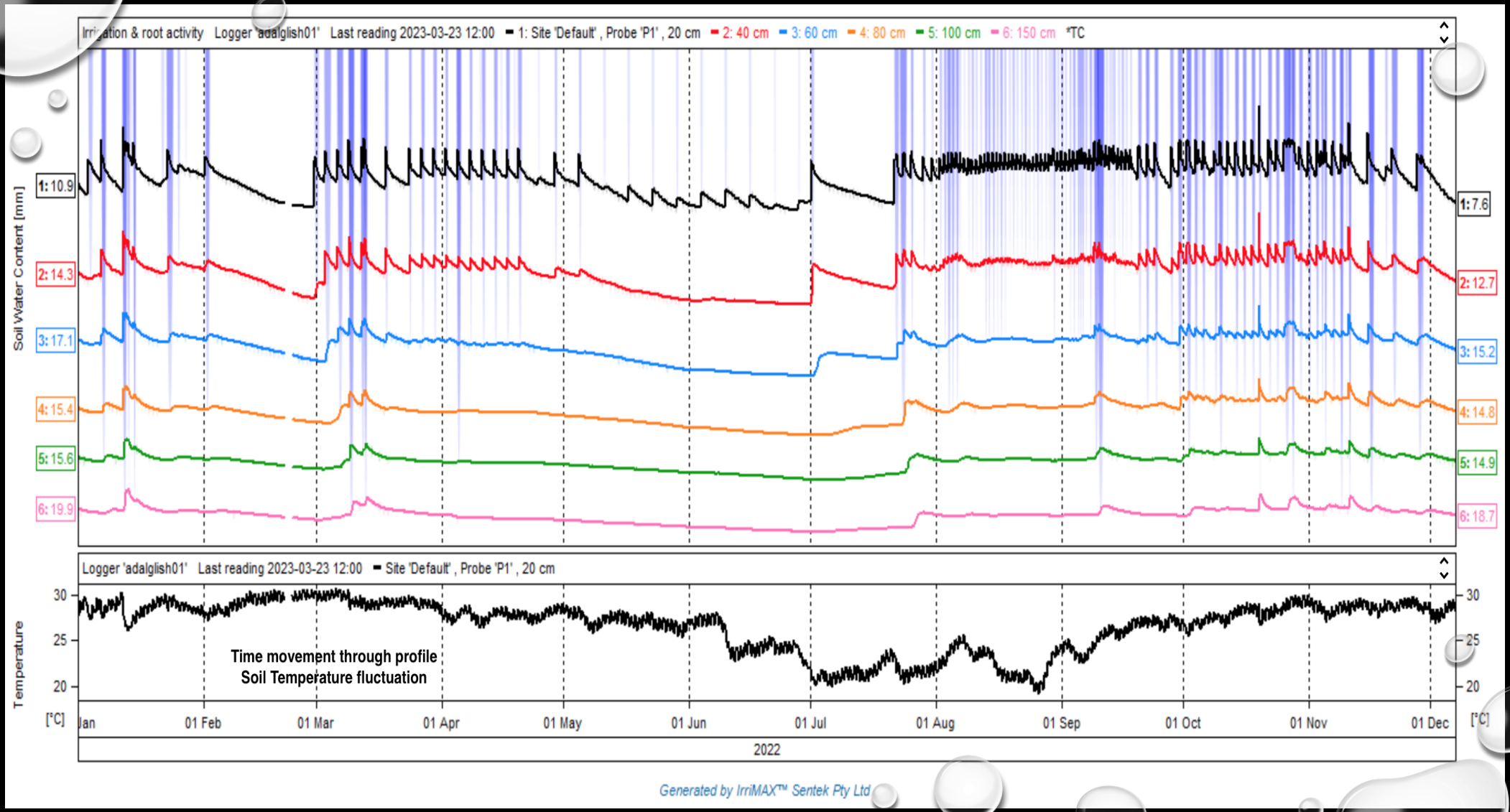
Irrigation & root activity Logger 'adalglish01' Last reading 2023-03-23 12:00 1: Site 'Default', Probe 'P1', 20 cm 2: 40 cm 3: 60 cm 4: 80 cm 5: 100 cm 6: 150 cm *TC
Soil Water Content [mm]
1: 10.9
2: 14.3
3: 17.1
4: 15.4
5: 15.6
6: 19.9
1: 7.6
2: 12.7
3: 15.2
4: 14.8
5: 14.9
6: 18.7
Logger 'adalglish01' Last reading 2023-03-23 12:00 Site 'Default', Probe 'P1', 20 cm
Temperature
30
25
20
[°C]
Time movement through profile
Soil Temperature fluctuation
Jan
01 Feb
01 Mar
01 Apr
01 May
01 Jun
01 Jul
01 Aug
01 Sep
01 Oct
01 Nov
01 Dec
2022
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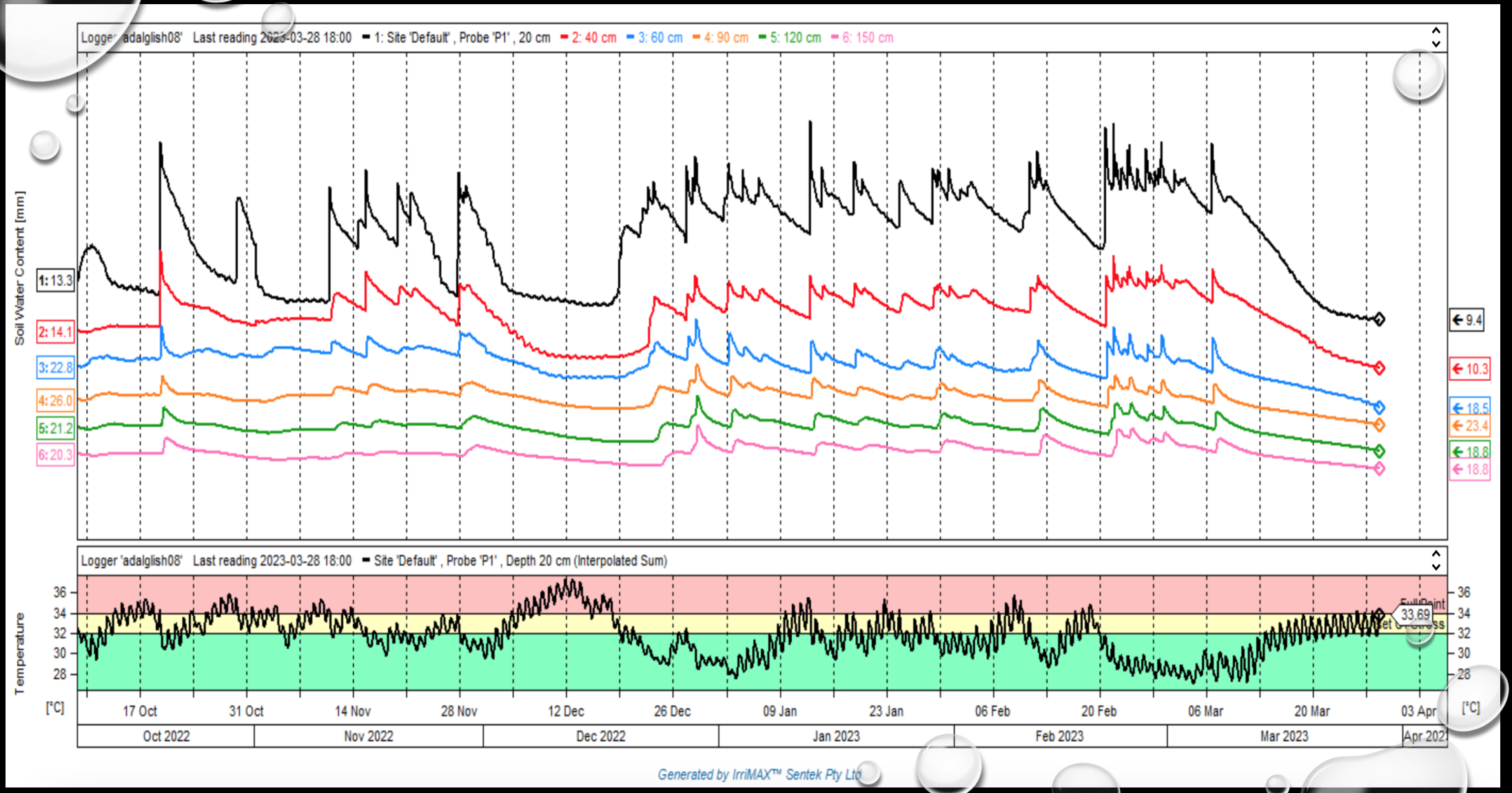
Logger 'adalglish08' Last reading 2023-03-28 18:00 1: Site 'Default' , Probe 'P1' , 20 cm 2: 40 cm 3: 60 cm 4: 90 cm 5: 120 cm 6: 150 cm
Soil Water Content [mm]
1: 13.3
2: 14.1
3: 22.8
4: 26.0
5: 21.2
6: 20.3
9.4
10.3
18.5
23.4
18.8
18.8
Logger 'adalglish08' Last reading 2023-03-28 18:00 Site 'Default' , Probe 'P1' , Depth 20 cm (Interpolated Sum)
Temperature
[°C]
36
34
32
30
28
33.69
17 Oct
31 Oct
14 Nov
28 Nov
12 Dec
26 Dec
09 Jan
23 Jan
06 Feb
20 Feb
06 Mar
20 Mar
03 Apr
Oct 2022
Nov 2022
Dec 2022
Jan 2023
Feb 2023
Mar 2023
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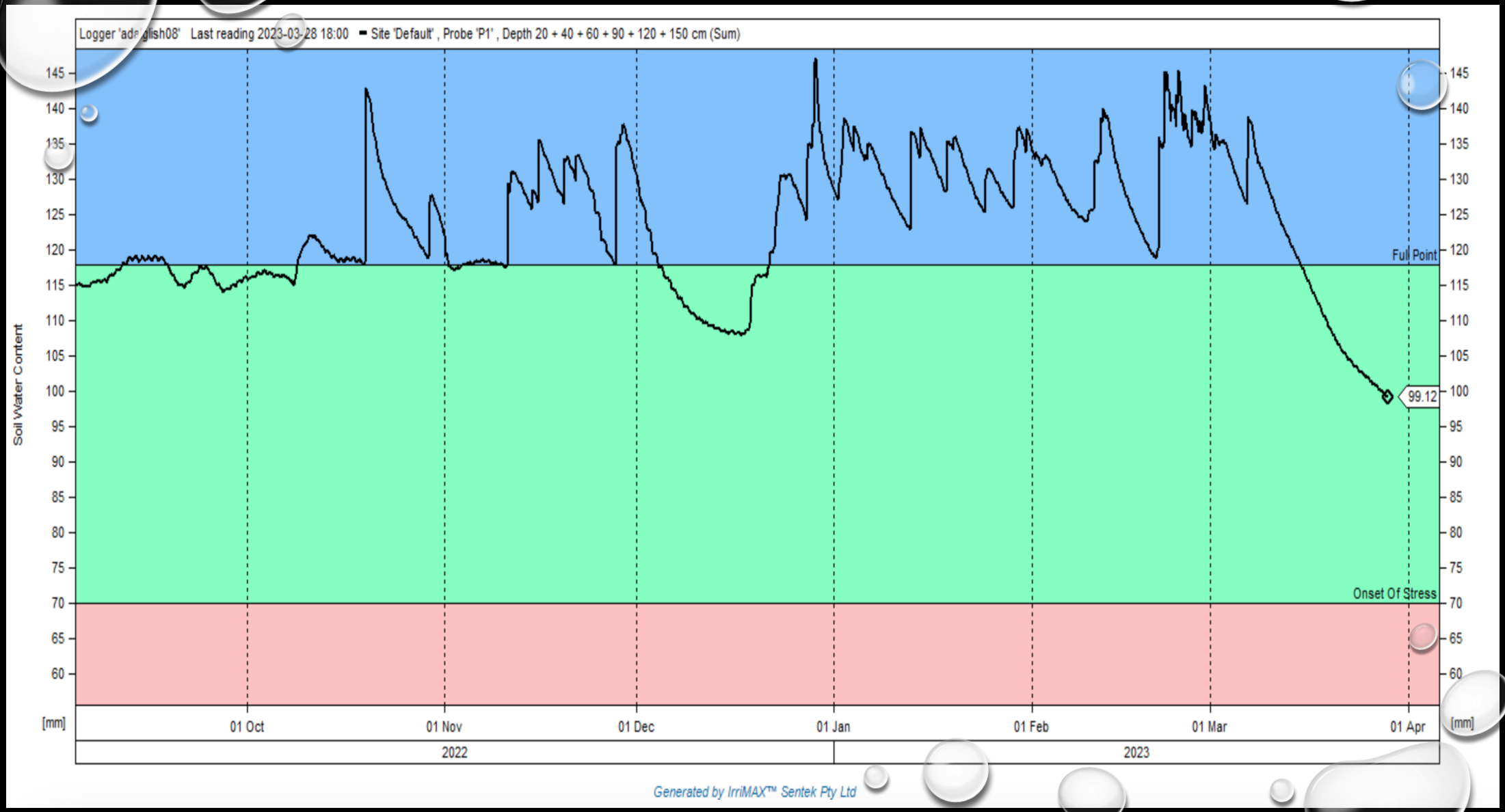
Logger 'adelaide08' Last reading 2023-03-28 18:00 Site 'Default', Probe 'P1', Depth 20 + 40 + 60 + 90 + 120 + 150 cm (Sum)
Soil Water Content
[mm]
Full Point
Onset Of Stress
99.12
01 Oct
01 Nov
01 Dec
01 Jan
01 Feb
01 Mar
01 Apr
2022
2023
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FINAL THOUGHTS

NOT AN OPTIONAL EXTRA

INFORMED DECISION MAKING

IMPROVE $/ML AND CAPITAL INVESTMENT RETURN

NETAFIM™

FERTIGATION and AUTOMATION

John Witherspoon March 2023

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Agenda

- FERTIGATION
- IMPACT OF HYDRAULIC DESIGN
- DOSING METHODS
- DOSING SYSTEMS
- AUTOMATION

What do plants need?

NETAFIM™
GROW MORE WITH LESS

Water

Food

Health

We can supply plant's needs through:

Irrigation

Fertilizers

Plant protection

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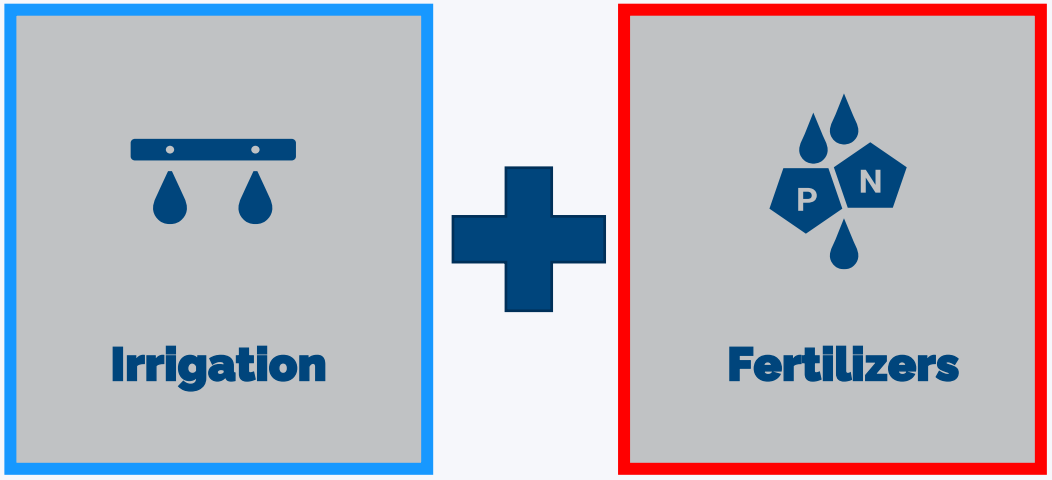
Fertigation

Fertigation = Irrigation + Fertilization

Fertigation is a field technique, which precisely delivers the plant nutrients via irrigation system to the crop root zone. The level of nutrition according to the crop demand during crop growing season.



Major Essential Nutrients

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GROW MORE WITH LESS

Essential nutrients – mineral nutrients that are crucial for plant growth

- **Macro elements: Nitrogen, Phosphorus, Potassium (K).**
- **Secondary elements: Calcium, Magnesium (Mg), Sulphur.**
- **Microelements: Fe, Mn, B, Zn, Cu, Mo, Cl**
- **Carbon, Hydrogen, Oxygen – Carbon and Oxygen from atmospheric fixation in the photosynthetic reaction and respiration. Hydrogen and Oxygen from water hydrolysis.**

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NPK role in the plants

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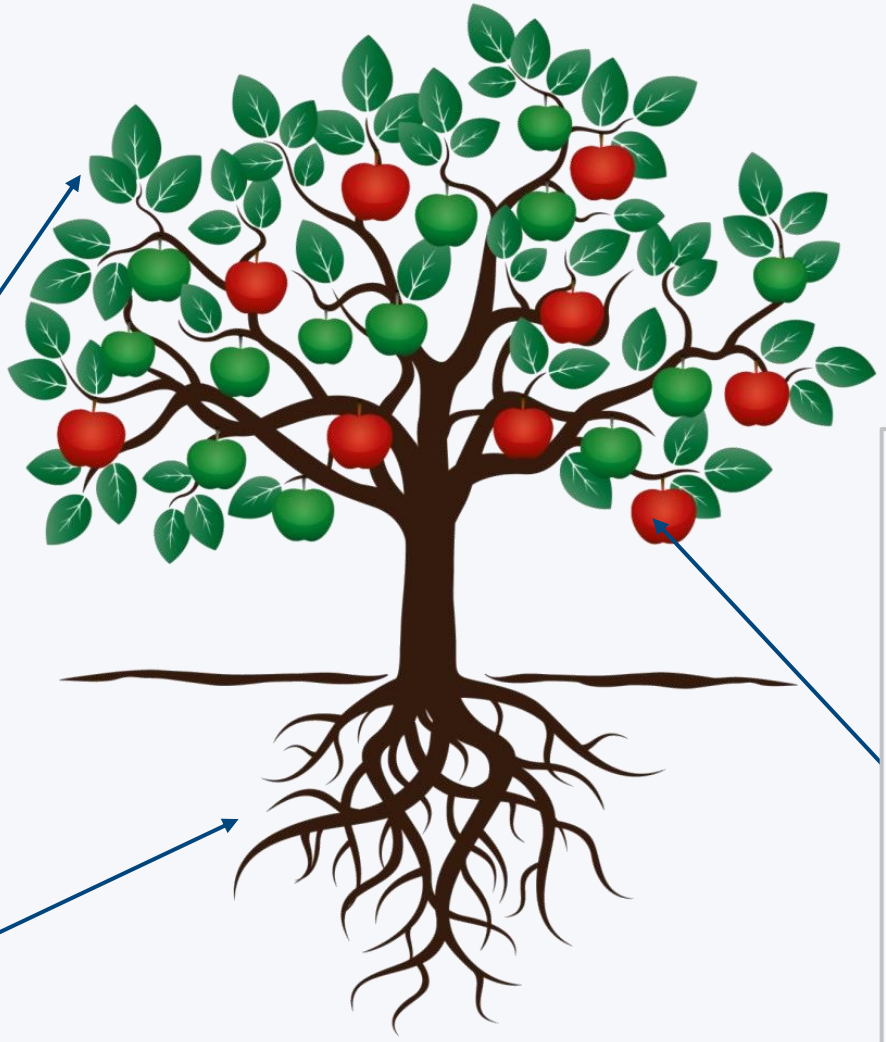
Nitrogen (NO_3, NH_4) – Vegetative growth



Phosphorus (P or P_2O_5) – Root growth and flowering

Potassium (K or K_2O) – Fruit growth (water and sugars)

Nutrients

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GROW MORE WITH LESS

What form can the products take?

- Granular
- Soluble
- Liquid

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Fertilization Process

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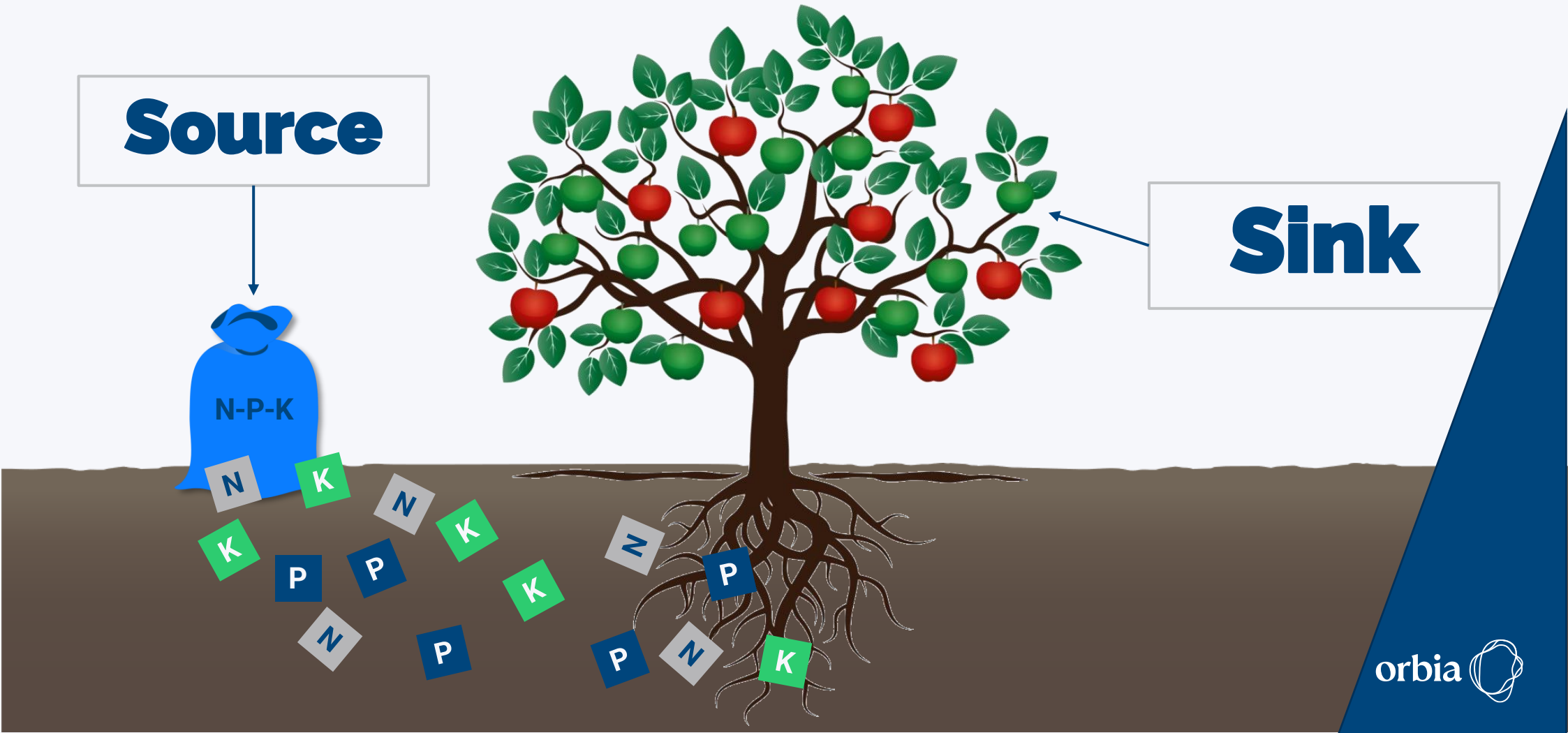

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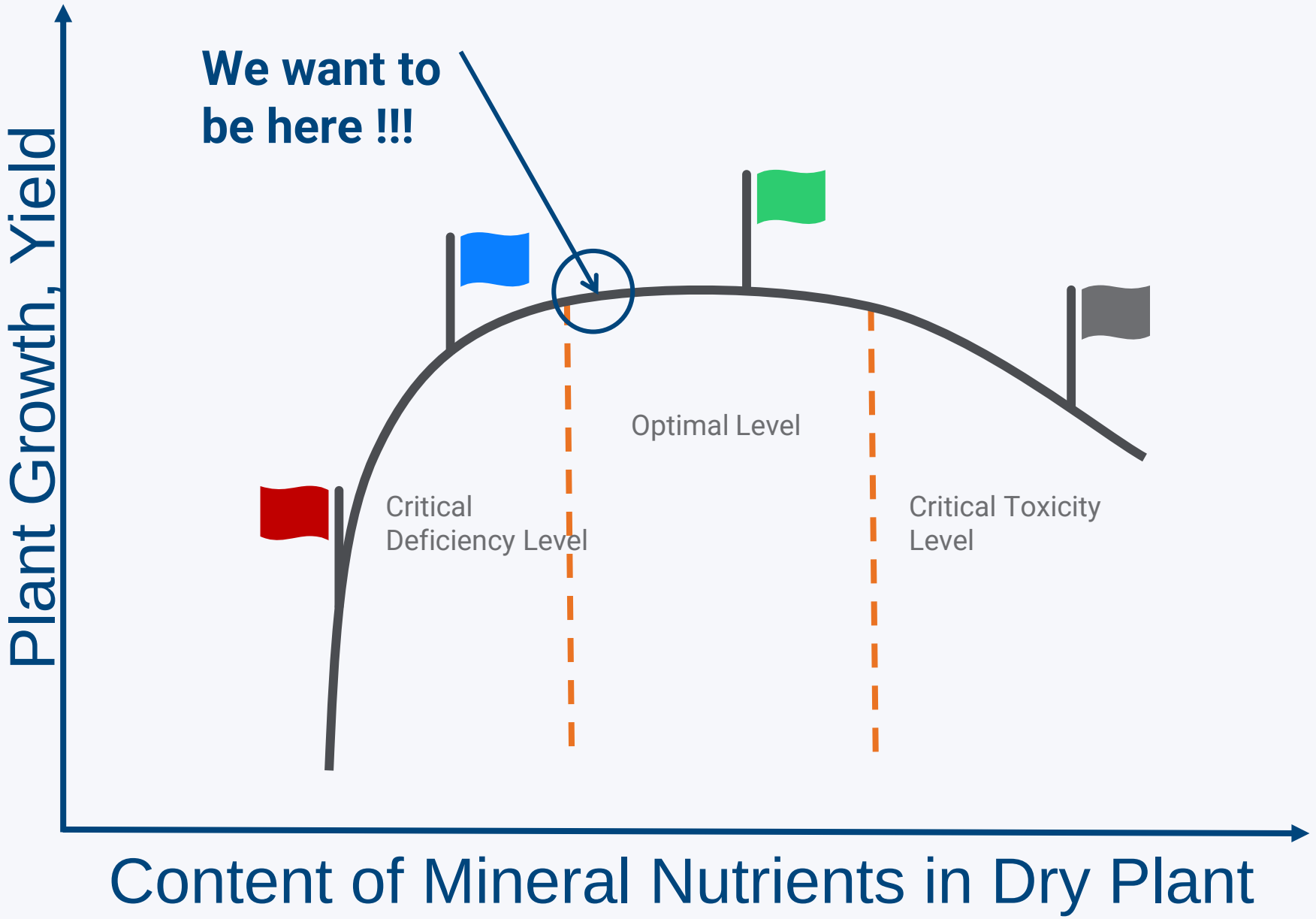
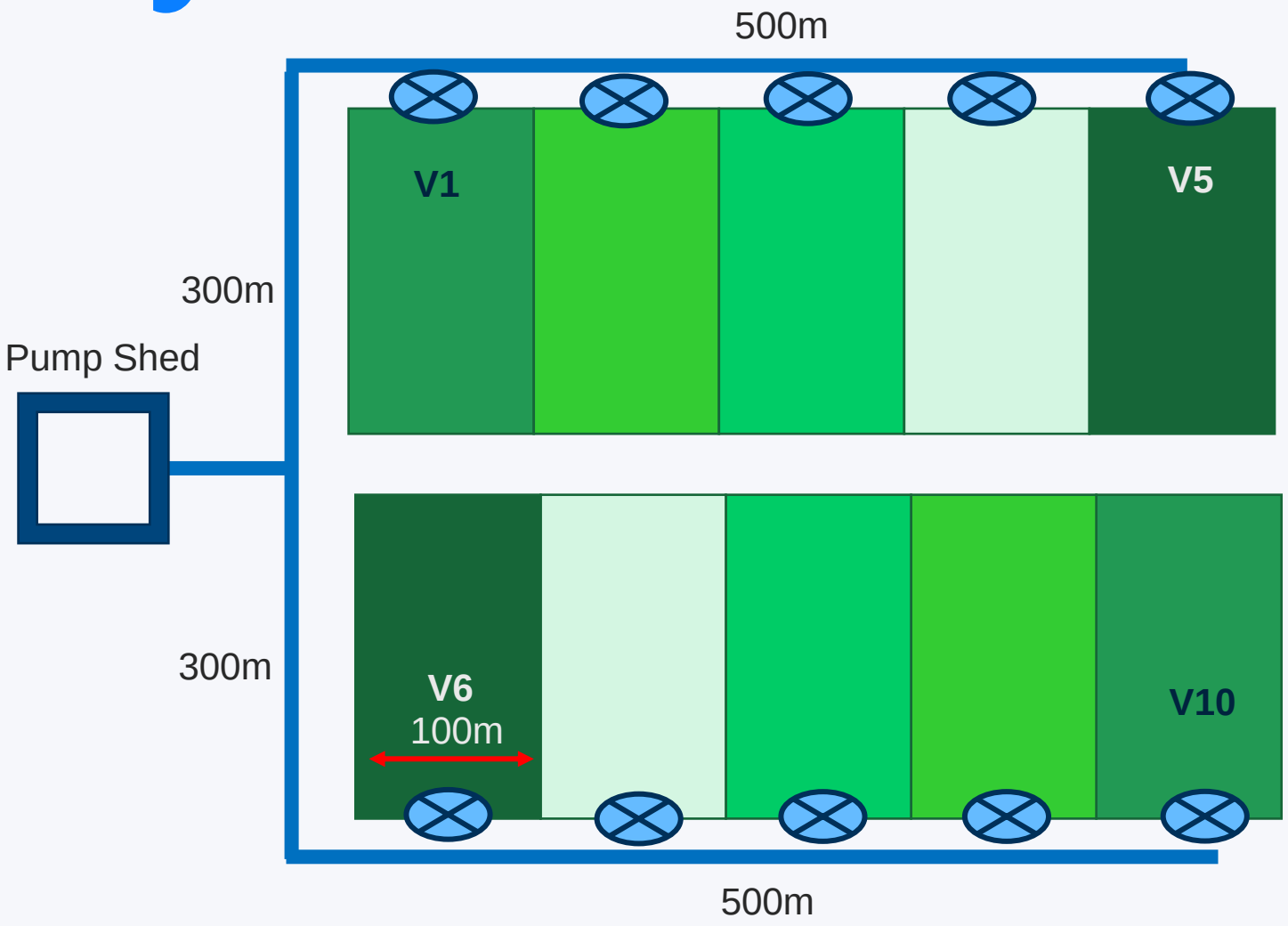
Nutrient / Growth Ratio



Fertigation Dosing Methods

- Bulk
  - By Time or Quantity
- Spread [Bulk]
  - By Time or Quantity
- Proportional [Ratio]
  - Usually Liters per Cubic Meter _ x/1000

Farm Irrigation Hydraulic Layout



Velocity in single mainline

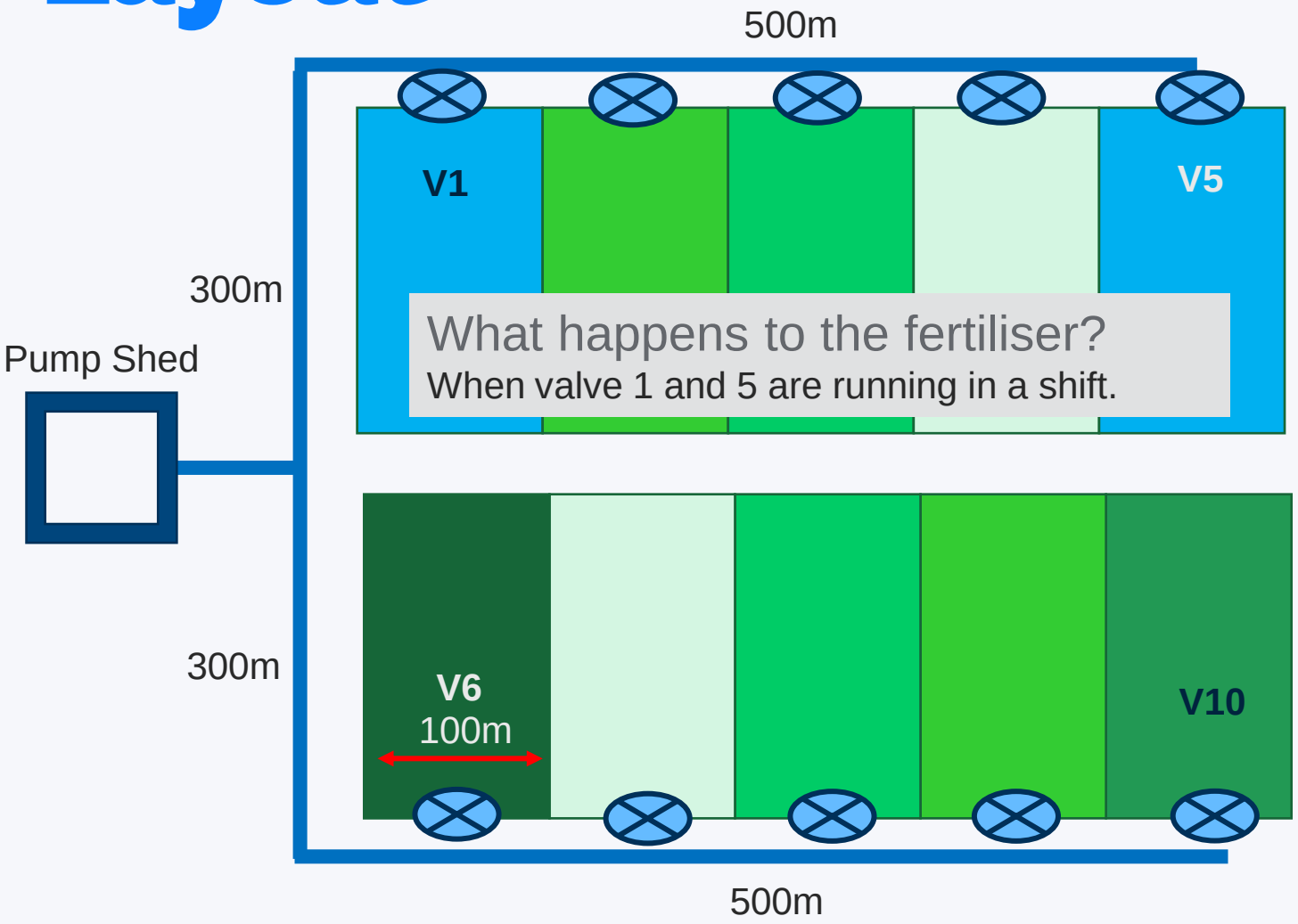
- **1m/sec**

Travel time to V1?
Total Main length 400m
Therefore 400sec
7 Min

Travel time to V5?
Total Main length 800m
Therefore 800sec
14mins

***Assuming all pipes are the same size**

Farm Irrigation Hydraulic Layout

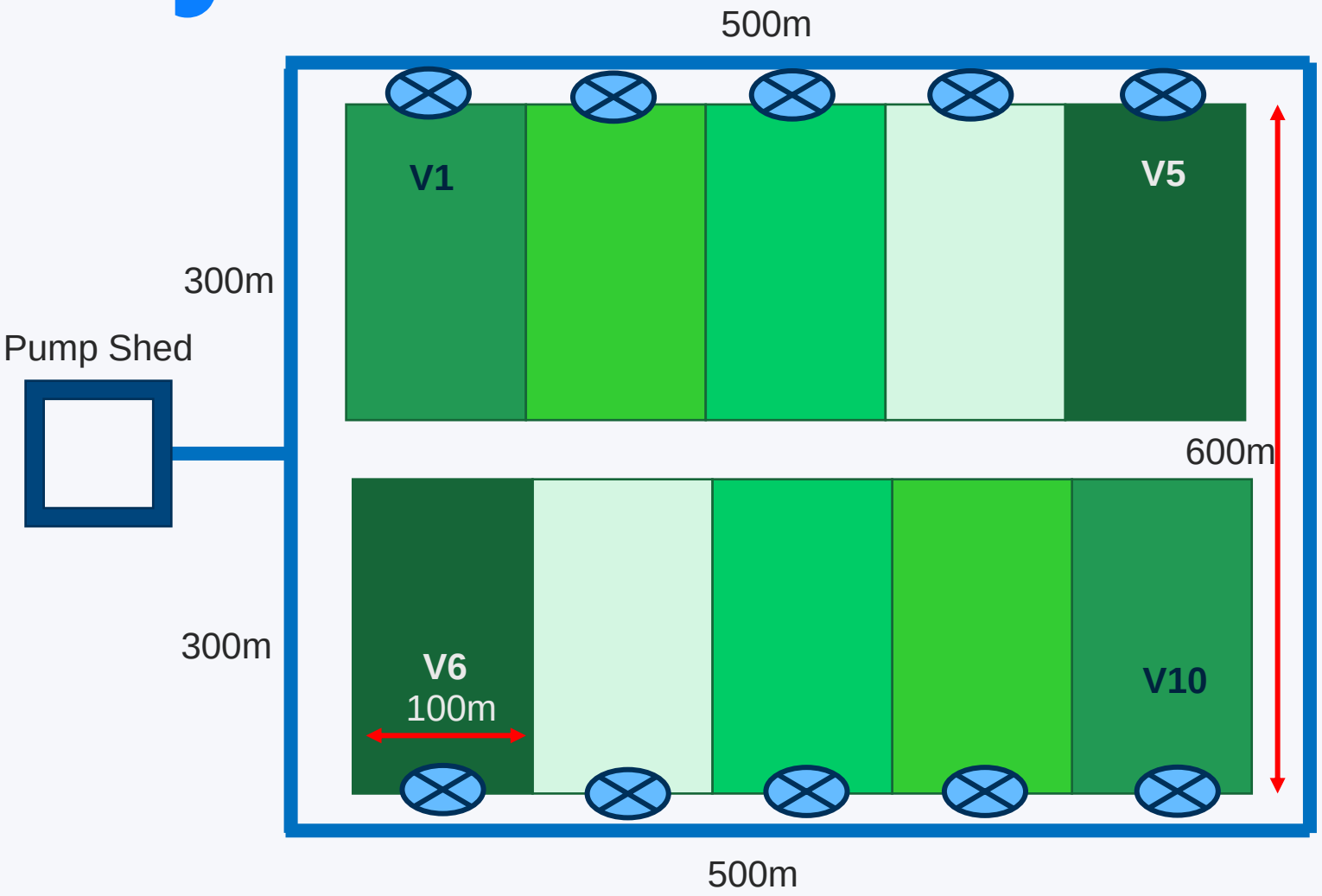


Travel time to V1?
3.5 Min

Travel time to V5?
10mins

Assume the velocity is 2m/sec

Farm Irrigation Hydraulic Layout



Impact of Ring main

Velocity in mainline

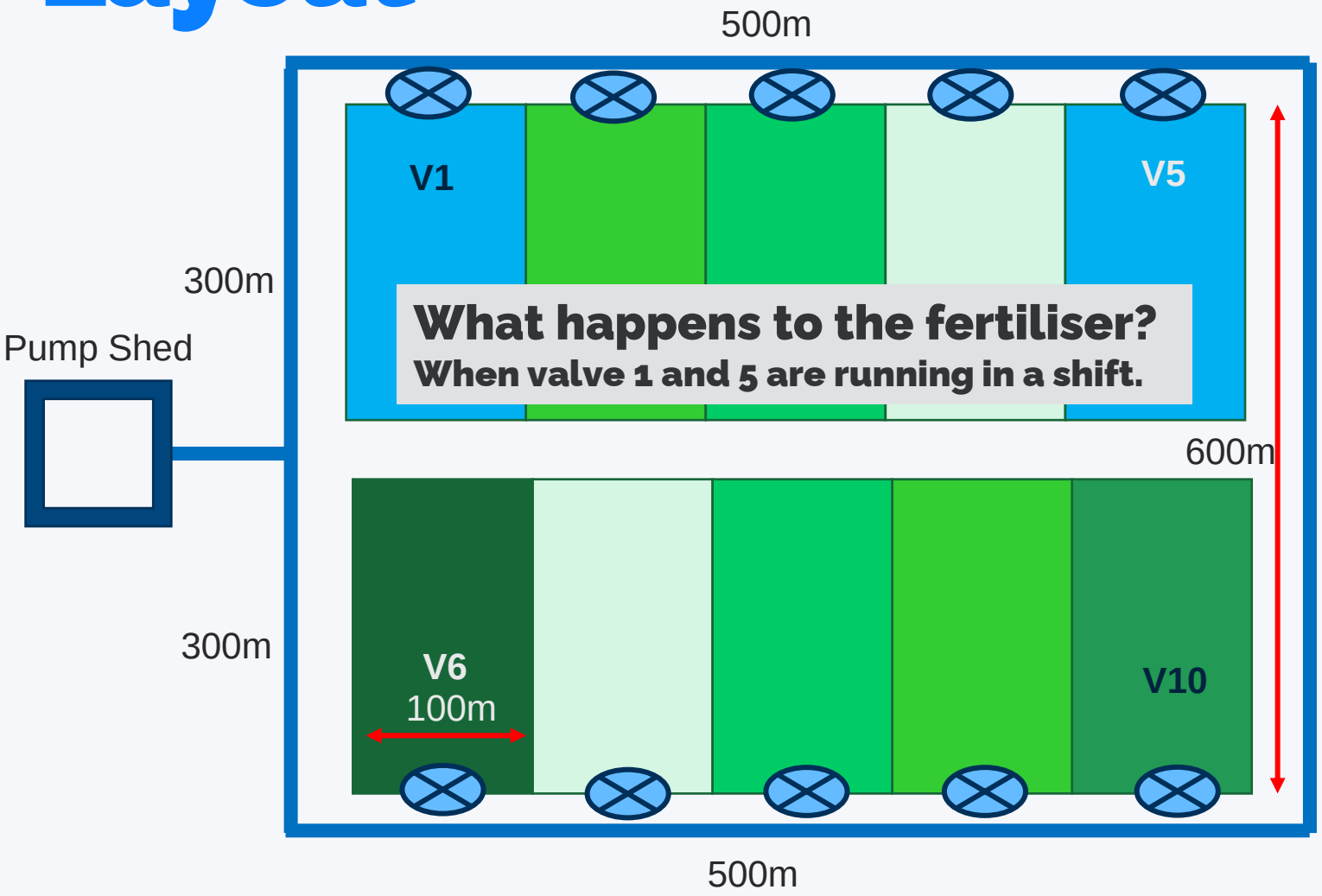
- **0.5m/sec**

Travel time to V1?
Total Main length 400m
Therefore 800sec
10-14mins

Travel time to V5?
Total Main length 800m
Therefore 1600sec
20-28mins

***Assuming all pipes are the same size**

Farm Irrigation Hydraulic Layout



Impact of Ring main

Velocity in mainline

- **1m/sec**

Travel time to V1?

7mins

Travel time to V5?

14mins

***Assuming all pipes are the same size**

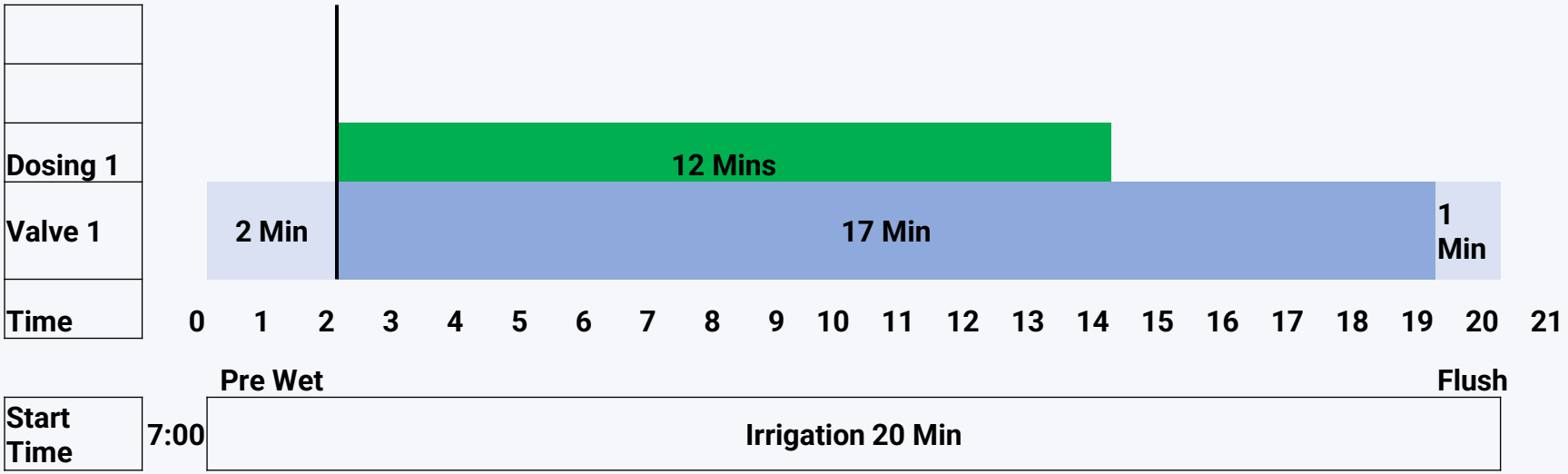
Bulk Fertigation

Irrigation program 1	
Start Time	07:00
Valve #	1
Run Time #	1
Dosing prog #	1

Water Run Time Program 1				
#	Method	Water	Before	After
1	TIME	00:20:00	00:02:00	00:01:00

Dosing Program - 1			
Injection per dosing channel			
1			
Passive			
12			
Passive dosing method			Time

Dosing Configuration	
Dosing by Time. Method	Bulk



Bulk Fertigation

Advantages		Disadvantages
Low cost: Just requires a pump		Timing typically fortnightly [because of manual operation]
Usual method for manual application		High Concentration of salts in root zone, Change in EC and pH
Can be used at valve level		Usually only a single channel
Can be automated		High labour cost
		Usually a program per valve or shift
		Best suited to single valve application

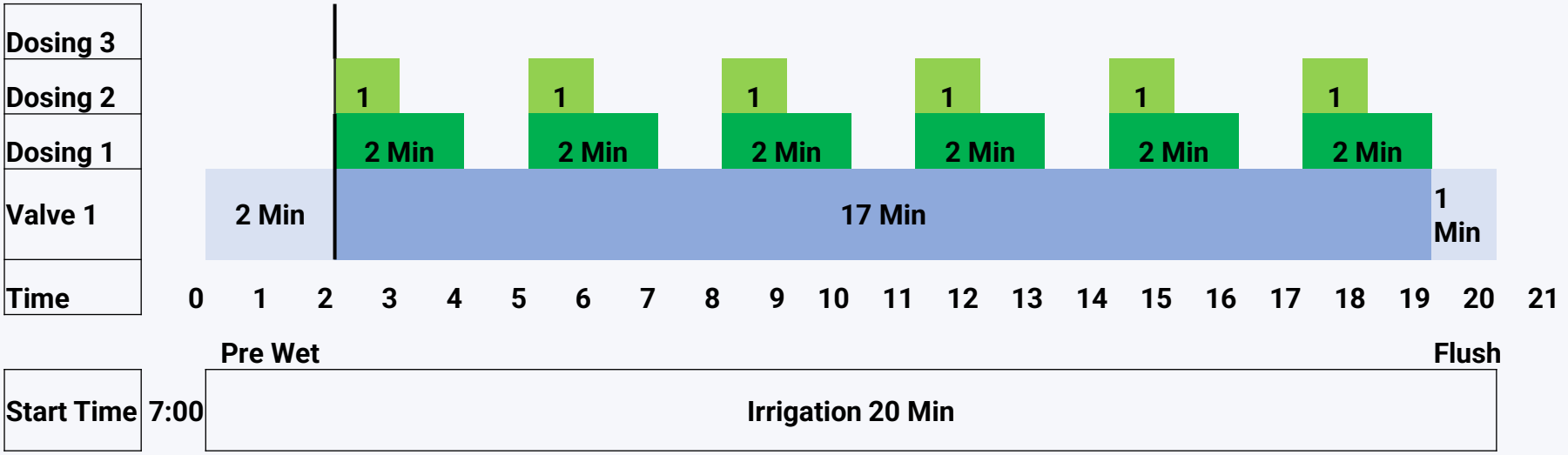
Spread [Bulk] Fertigation

Irrigation program 1	
Start Time	07:00
Valve #	2
Run Time #	1
Dosing prog #	2

Water Run Time Program 1				
#	Method	Water	Before	After
1	TIME	00:20:00	00:02:00	00:01:00

Dosing Program - 2			
Injection per dosing channel			
1	2		
Passive	Passive		
12	6		
Passive dosing method			Time

Dosing Configuration	
Dosing by Time. Method	Spread



Spread [Bulk] Fertigation

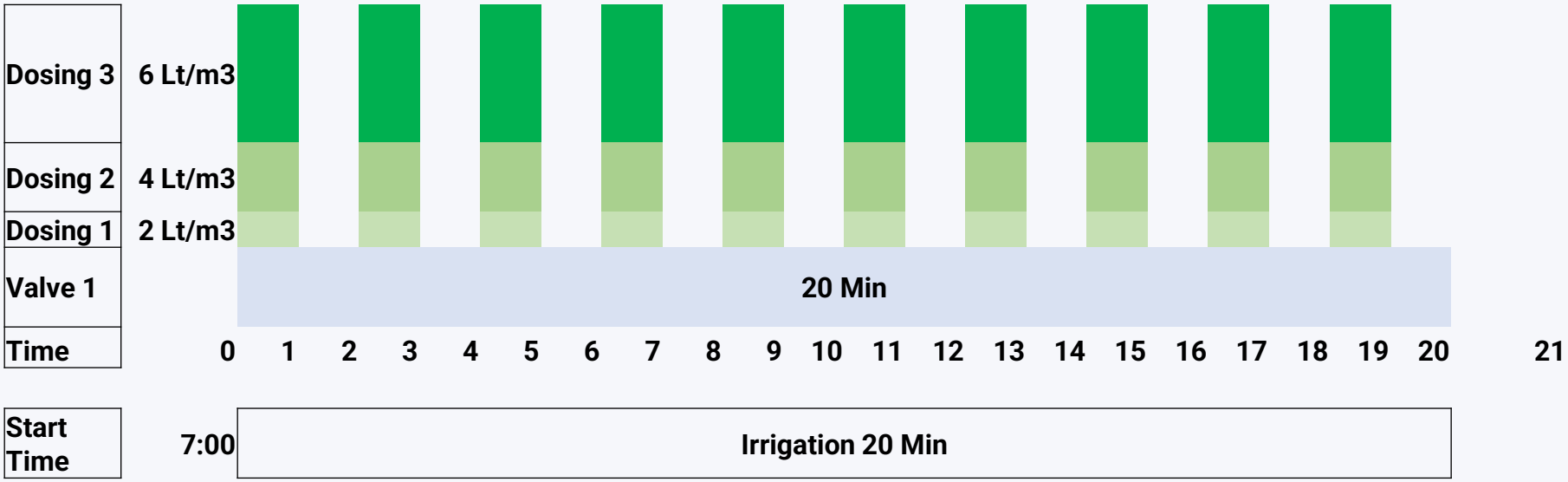
Advantages		Disadvantages
Less concentration of salts in the root zone spread of the irrigation		Requires automation
More even application to all valves in the shift		Requires a program per valve of valve shift
		Does not adjust for variation in shift flow
		Does not suit motor driven electric pumps [too many on/off operations
		Best suited to single valve application.

Proportional Qty [Ratio] Fertigation

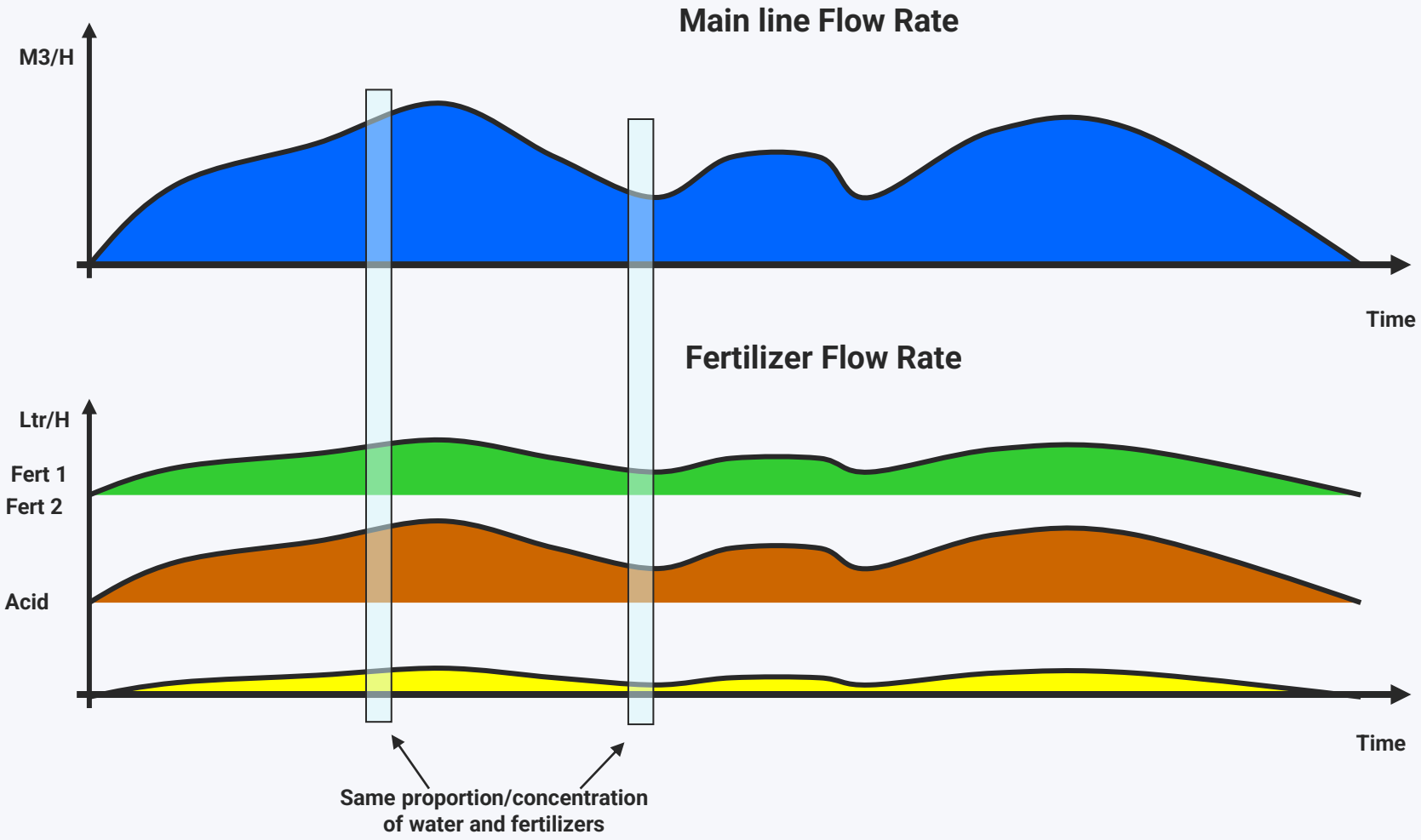
Irrigation program 1	
Start Time	07:00
Valve #	3
Run Time #	2
Dosing prog #	3

Water Run Time Program 1				
#	Method	Water	Before	After
1	TIME	00:20:00	00:02:00	00:01:00

Dosing Program - 3			
Injection per dosing channel			
1	2	3	
Passive	Passive	Passive	
2	4	6	
Passive dosing method			P.QTY



Proportional Qty [Ratio] Fertigation



*** Proportional to Main Flow**

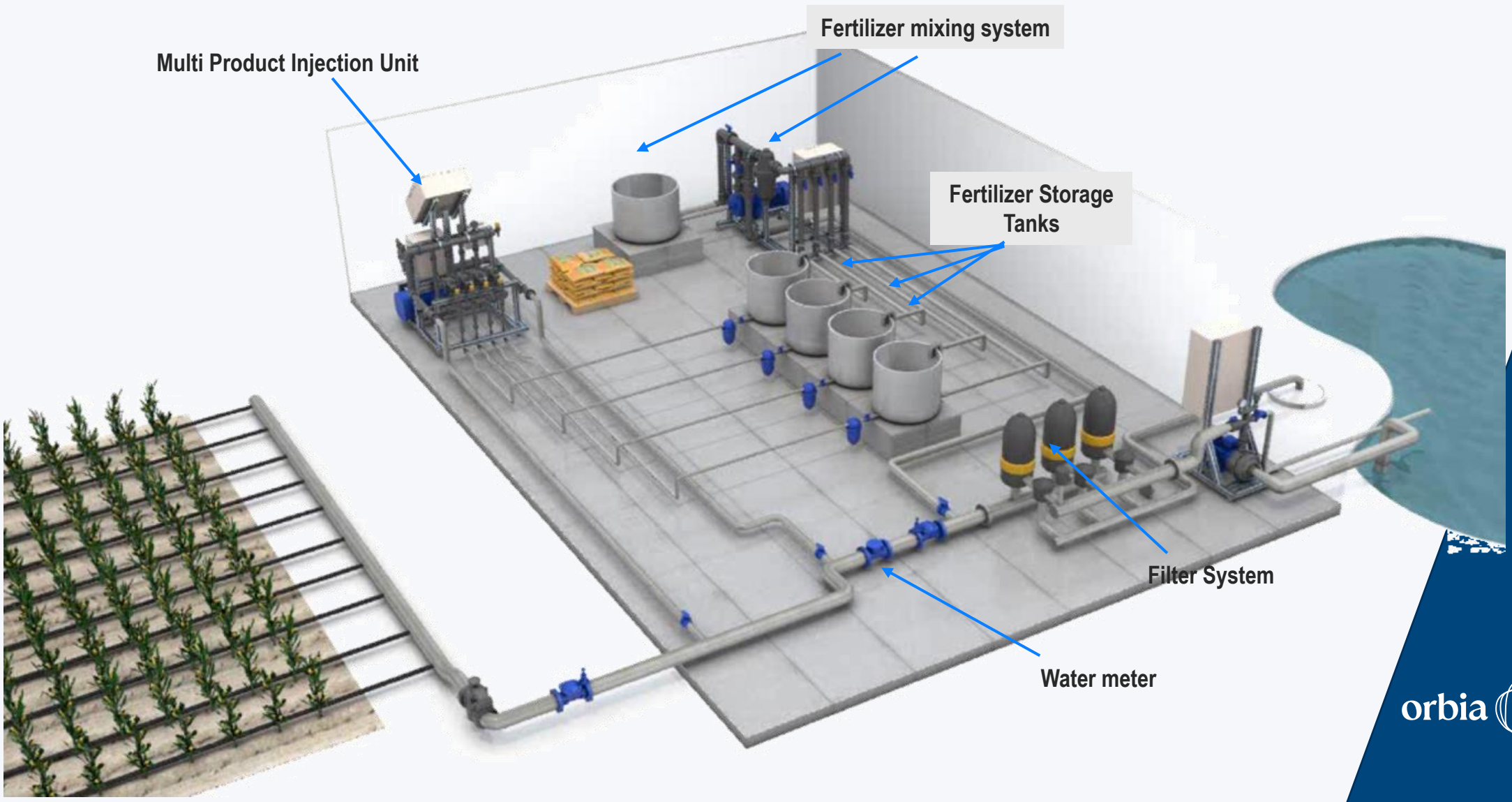
Proportional Qty [Ratio] Fertigation

Advantages		Disadvantages
Fertigation with every irrigation		Requires automation
Low concentration of fertiliser in the mainline at any time		Cannot be on/off motor driven electric pumps needs to be variable speed
Injection rate follows changes in flow		Cannot be a manual operation
Constant concentration of fertiliser throughout the system		
One fertiliser program for the crop at the same stage		
The plant root environment is almost constant, no excessive change in EC or pH		

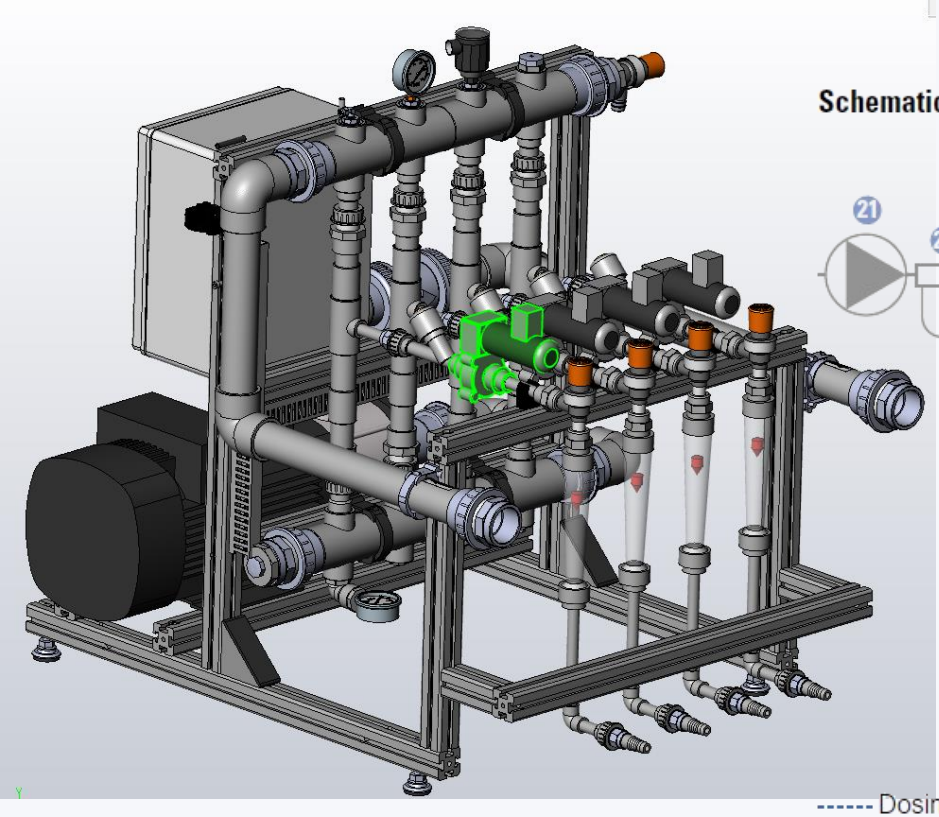
Fertigation System Components

- Water meter on the mainline
- Injection Pump [Single or multiple]
- Variable or fixed speed pump
- Fertiliser meter per pump
- Fertiliser mixing tank
- Storage tank
- Storage tank agitation

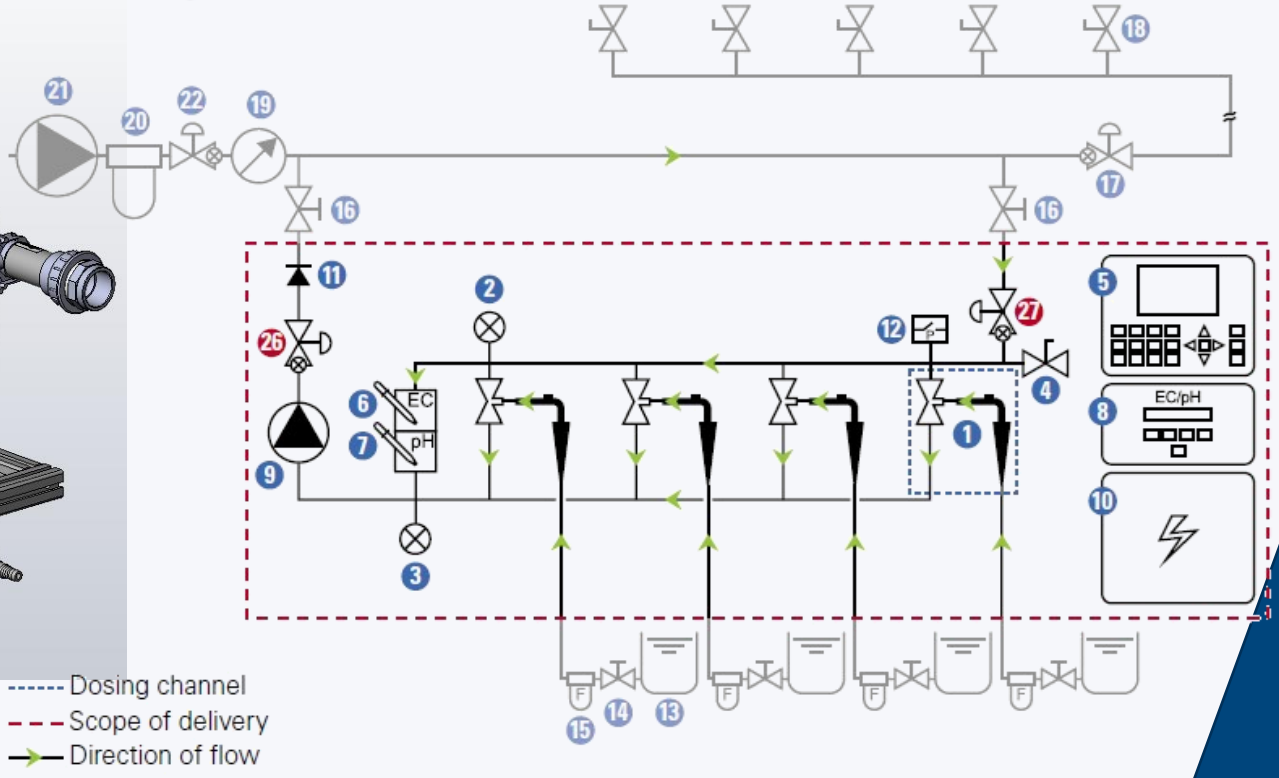
Fertigation System Components



FERTIKIT PL



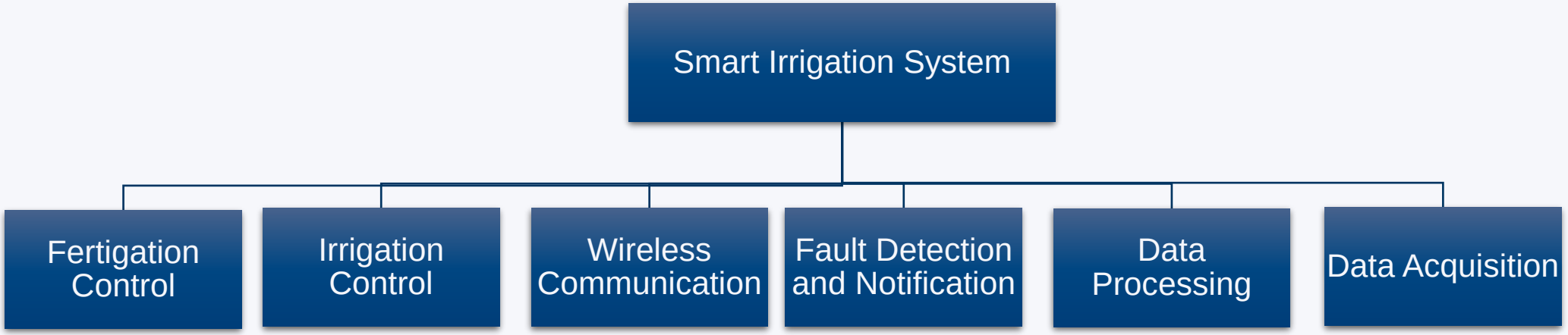
Schematic diagram



Smart Irrigation System

What is SIS?

It is the automation of your irrigation system using a unified platform, that allows easy remote control.



Smart Irrigation System

Benefits

- Reduced resource use, energy, labour and nutrients
- Better crop management
- Optimum crop growth with controller water and nutrient application
- Monitor conditions in real time.
  - From Pumps to Plants
- Prediction services help make informed decisions
- Reduced water consumption
- Disease prevention
- Use of forecasting services

Smart Irrigation System

Control for Agriculture

- From your Palm to the Farm remote control from all devices
- Alarm notification, Flow, Pressure Unopened valve etc
- Irrigation, by Time, Quantity and Depth[mm]
- **Manage multiple valves in a shift**
- Flexible programming
- Fertigation management and operation
- Filter operation
- Extensive logging

QUESTIONS?

Coolalinga Office
(Main office)
Shop 15A Coolalinga
Shopping Centre
460 Stuart Highway,
Coolalinga, 0839, NT

Darwin City Office
The Northern Australia
Development Office,
Development House,
Ground Floor,
76 The Esplanade, Darwin,
0800, NT

Katherine Office
33 Chardon Street,
Katherine, 0850,
NT

Northern Territory Farmers Association Inc (NT Farmers)
NT Farmers are dedicated to serving the interests of Industry and dealing with enquiries about the sector.

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