

# AUTOMATION AND SOLUBLE FERTILISER FOR THE MODERN FARMER

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# AGENDA

- Background
- What is Automation
- Different Applications
- Photos (Current Practice)
- What to expect from Automation in the Future
- Summary





## AUTOMATION & SOLUBLE FERTILISERS



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GROWING MORE WITH LESS



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# APPROACH TO AUTOMATION

**Irrigation is a long term investment!**

**What effect does irrigation & automation have on your business success?**

**Is it possible to increase efficiency?**

**Irrigate more trees with your current water supply & fertiliser?**

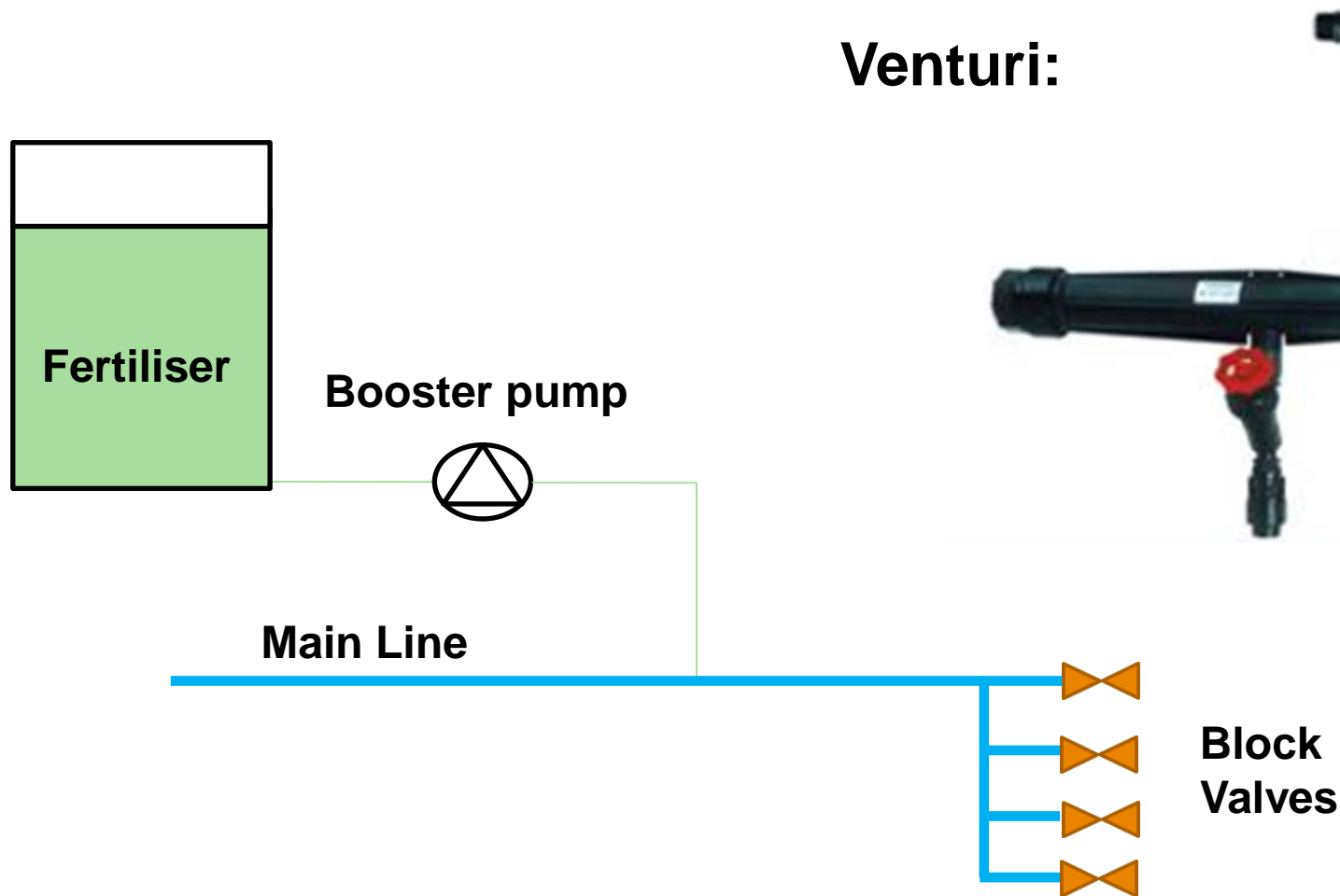




# FERTIGATION THROUGH IRRIGATION SYSTEMS



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# FERTIGATION THROUGH IRRIGATION SYSTEMS

## Hydraulic dosing pump

The hydraulic pump can inject fertiliser into the system between 0.3 - 2.5% of the irrigation flow rate

The Mixrite can be plumbed directly into the mainline or as a bypass unit

Mainline Pressure 0.2 – 8 bar

Smallest unit: Mainline flow rate 7 l/h – 2500 l/h

Largest unit: Mainline flow rate 2000 l/h – 25000 l/h



**MORE CONTROL OF INJECTING FERTILISER**

# SYSTEM LAYOUTS

## Single Mainline

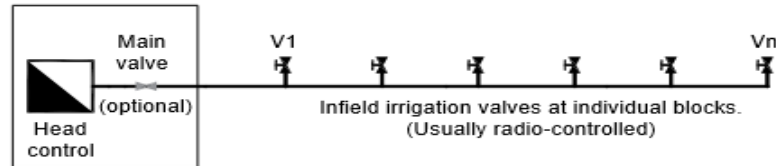


FIGURE 14. Single mainline

## One Mainline per Sub-Area

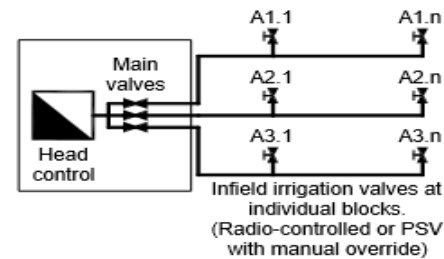


FIGURE 15. One mainline per sub-area

## Dedicated Mainline

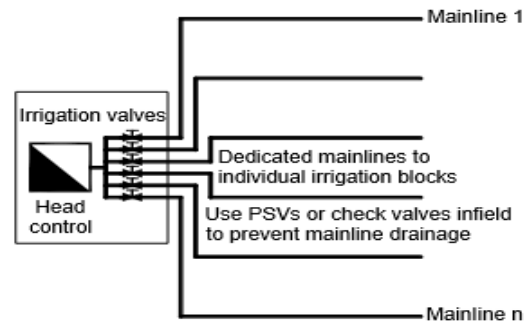


FIGURE 16. Dedicated mainlines



# WHAT IS AUTOMATION ?

**Automation is the Remote Switching of IRR. Valves;  
Fert. Valves; Pumps; Flushing of Filters etc.**



# WHY AUTOMATION

- Stay with a schedule (Manage irrigation time effectively)
- Confirmation of tasks done (Irrigation History)
- Quick changes to manipulate irrigation scheduling as required by the trees
- Monitoring of actual water and fertilisers





# DRIPPERS



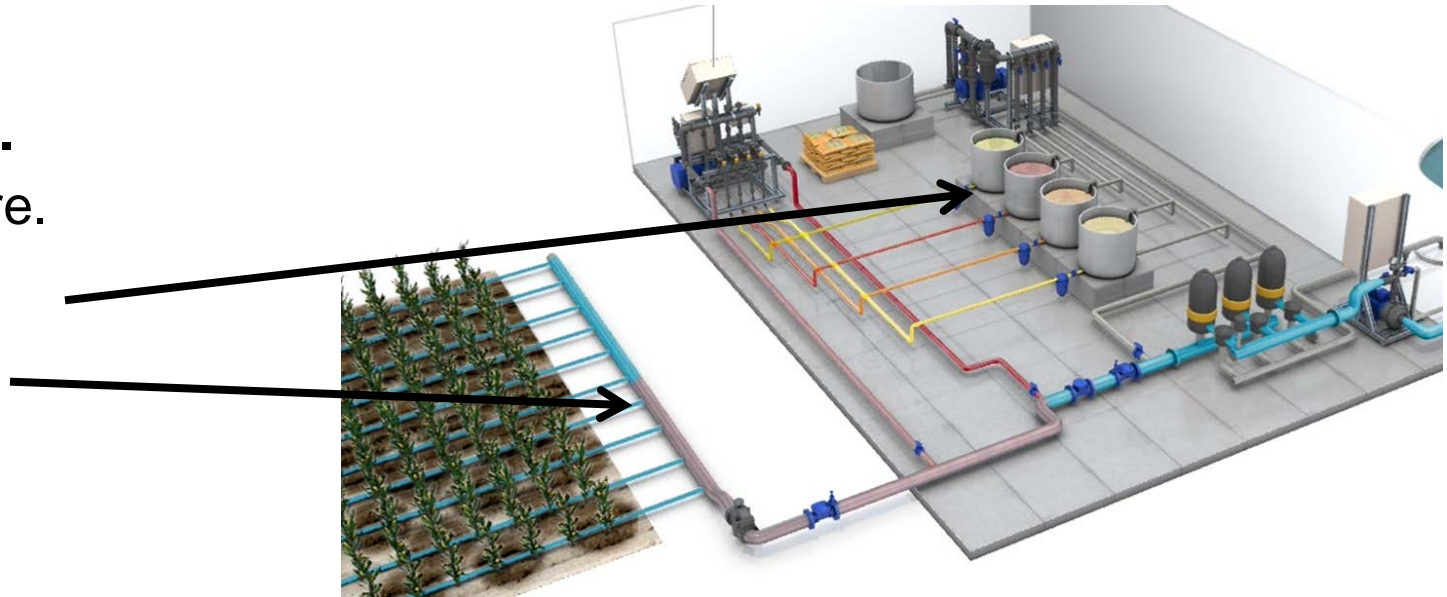
# MICRO'S





# DOSING

- **Get it right.**
  - From here.
  - To here.



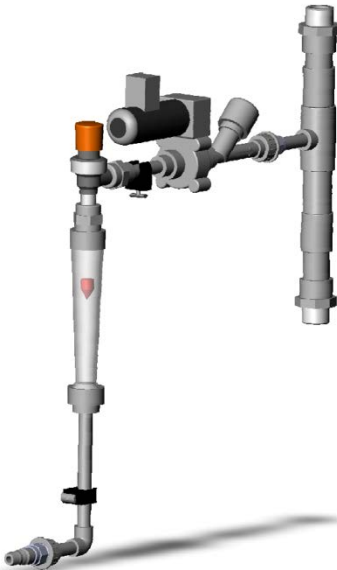
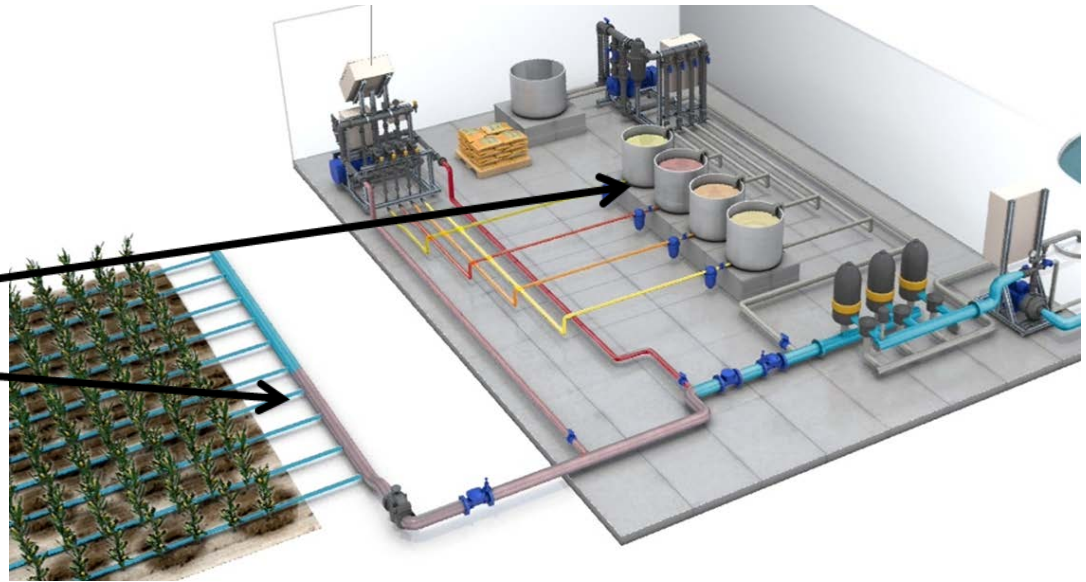
Irrigation period – with fertiliser

  
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# DOSING

- **The link.**
  - From the fertiliser tank.
  - Into the irrigation system.



- **The dosing channel**



# DOSING

## Two main types

- Batch
- Proportional



# DOSING

- **Batch.**

- During the whole irrigation period.
- Unfertilised irrigation water before and/or after the irrigation period.



Irrigation – no fertiliser

Irrigation period – with fertiliser

Irrigation – no fertiliser

  
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# DOSING

## Proportional.

- Direct proportional. Flow-on-flow. Fixed litres fertiliser per m<sup>3</sup> irrigation water.
- Electrical conductivity of irrigation water (EC). Constant millisiemens/cm (mS/cm).



Irrigation period – with fertiliser

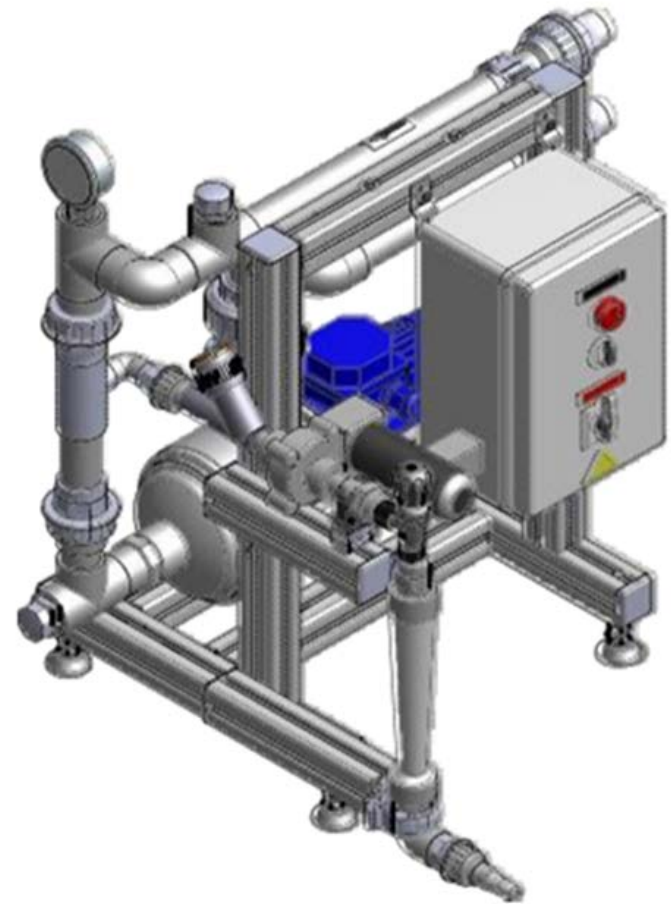
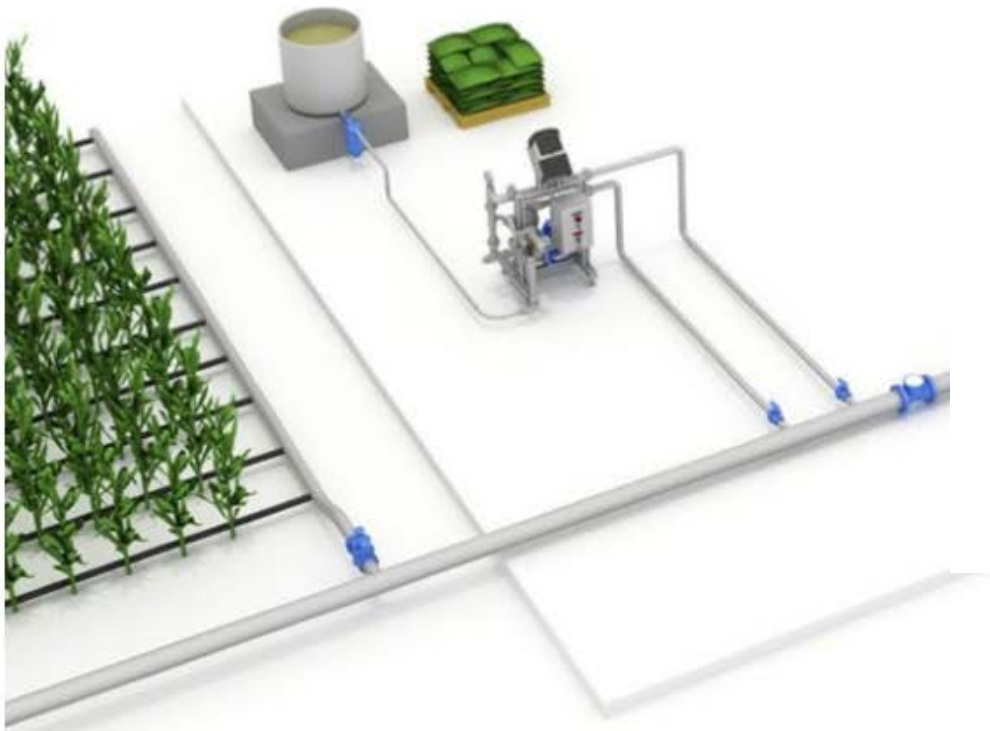




# FERTIGATION

## Dosing Unit: FertiOne

### TYPICAL INSTALLATION



# FERTIGATION

## Dosing Units: Fertikit

4 dosing channel (4 Fertiliser Tanks)

100 l/h to 1000 l/h per dosing channel

Controller

Booster pump

Flow rates: 60 – 400 m<sup>3</sup>/h

## Add on's:

EC/pH monitoring

Fertiliser meters

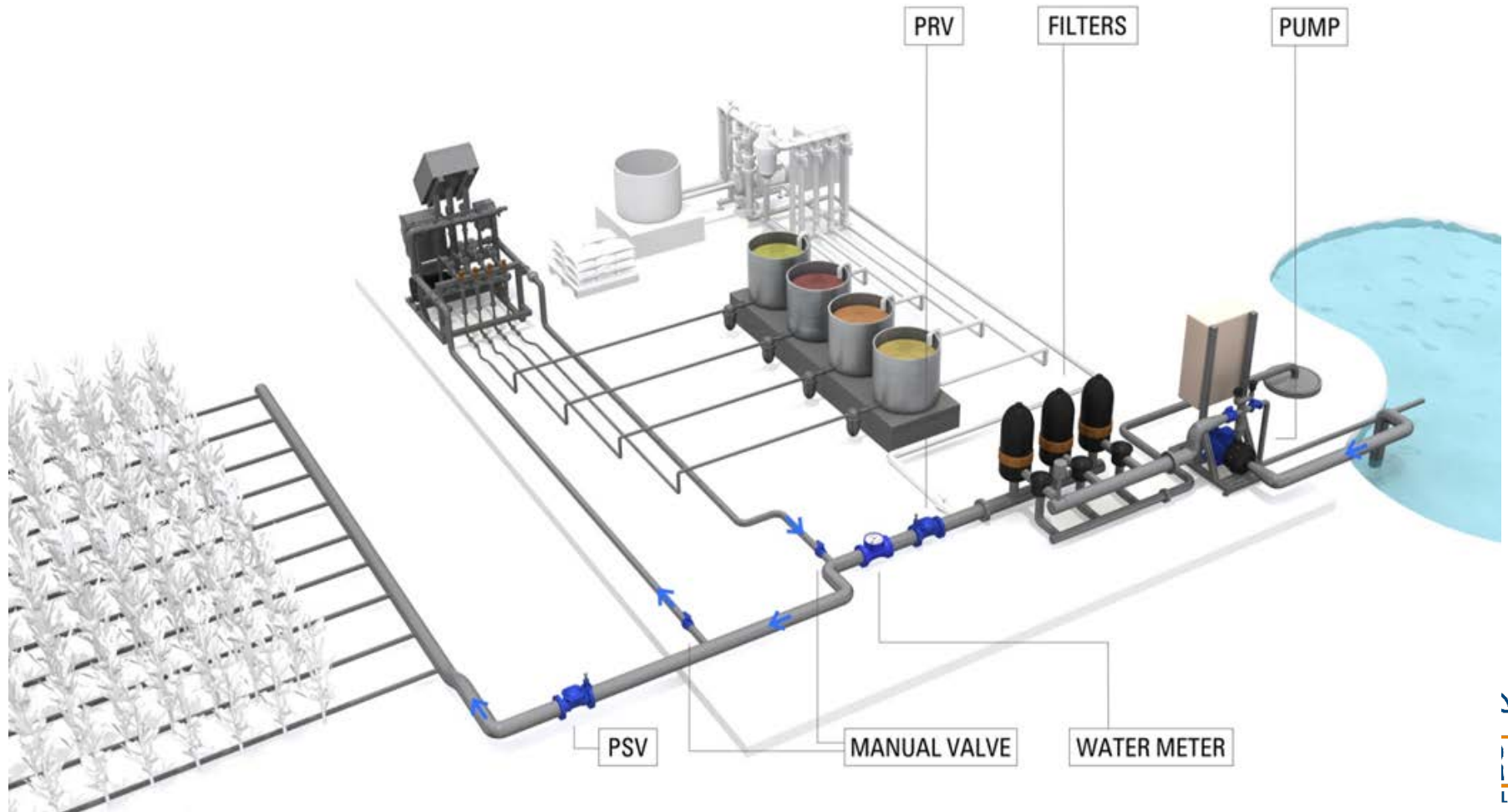
Extra dosing channels



  
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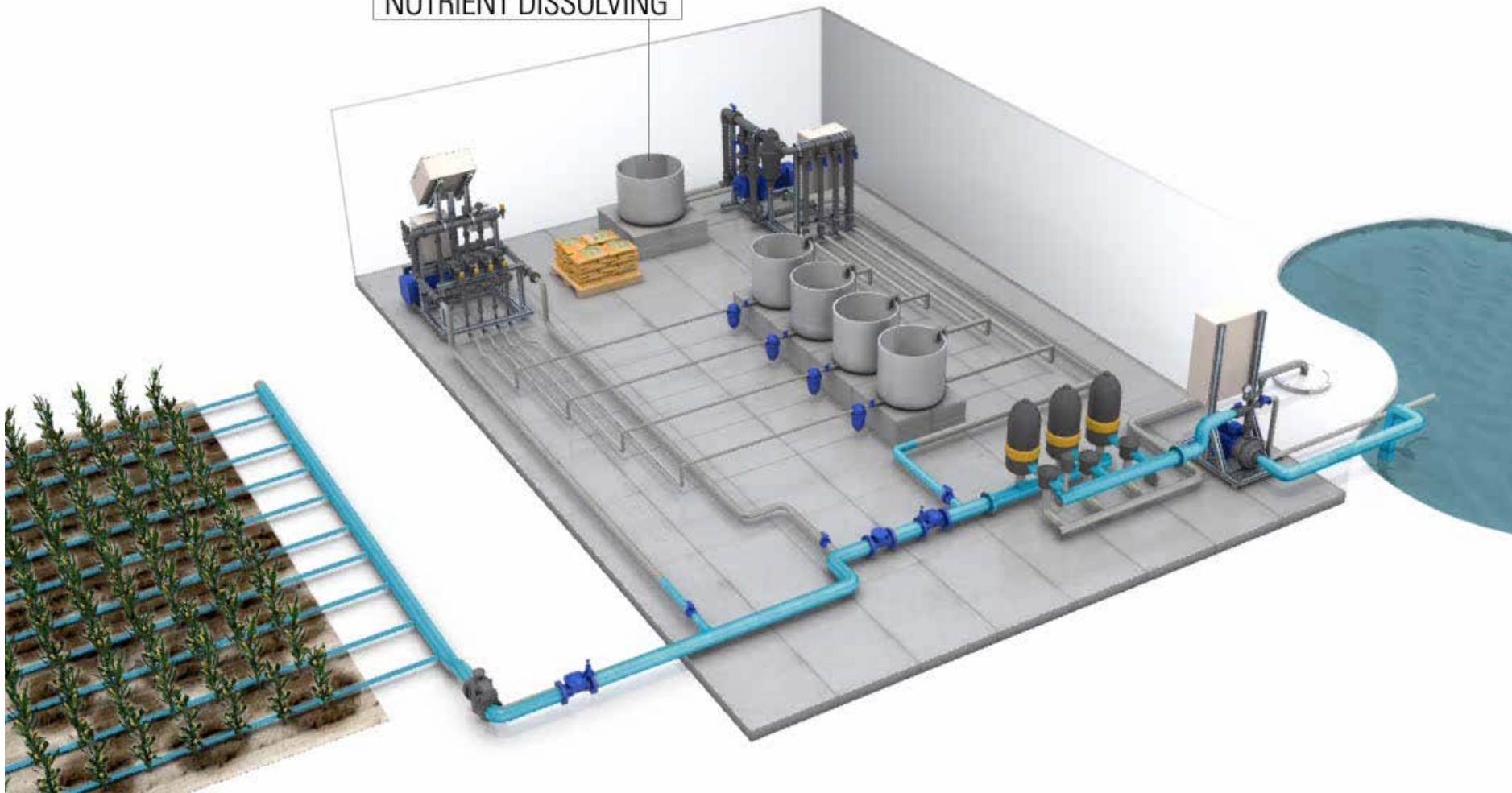
# FERTIGATION





# FERTIGATION

NUTRIENT DISSOLVING

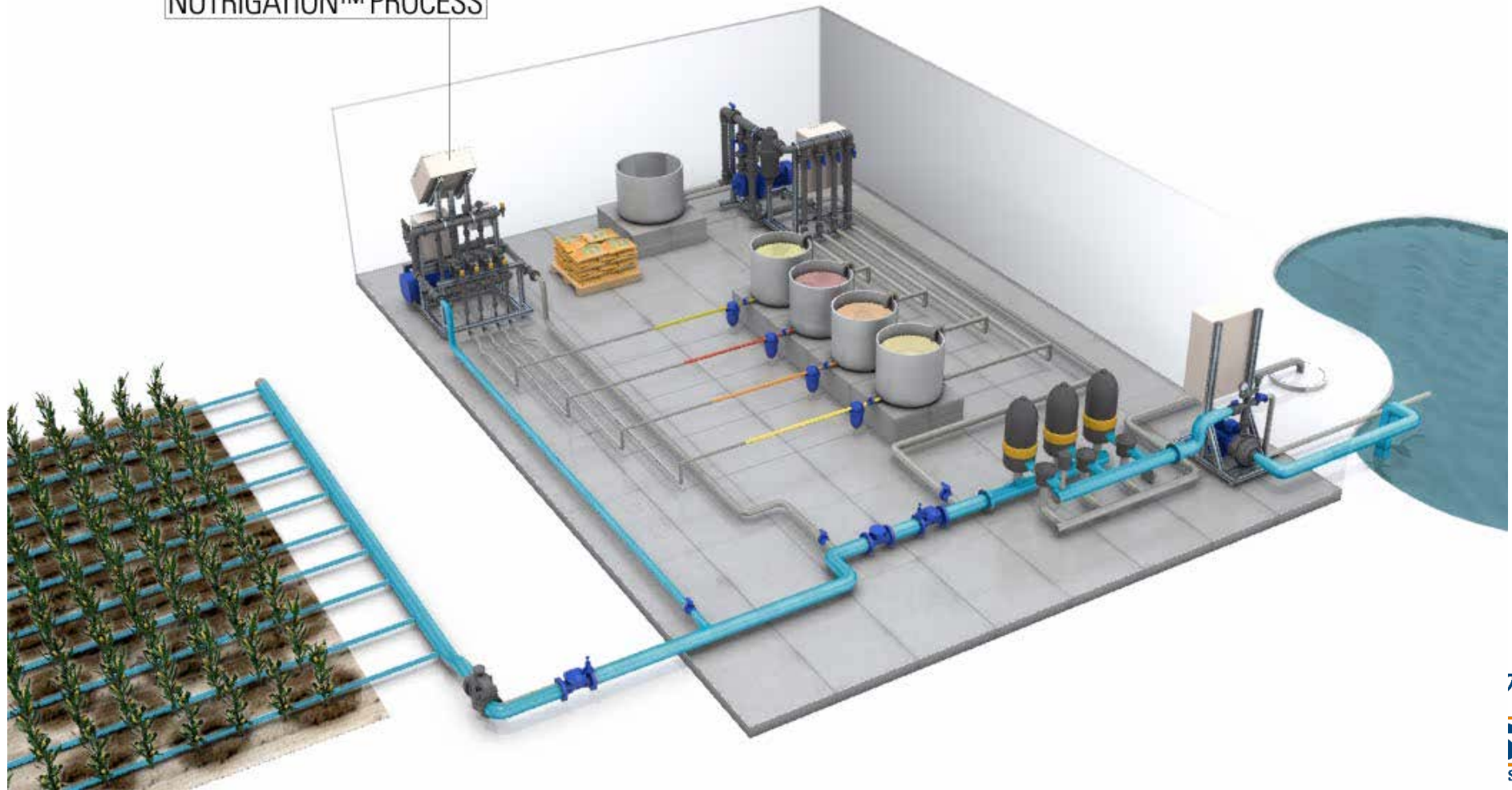


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# FERTIGATION

NUTRIGATION™ PROCESS





# CURRENT PRACTICE





# CURRENT PRACTICE





# CURRENT PRACTICE



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# CURRENT PRACTICE





# CURRENT PRACTICE



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# CURRENT PRACTICE



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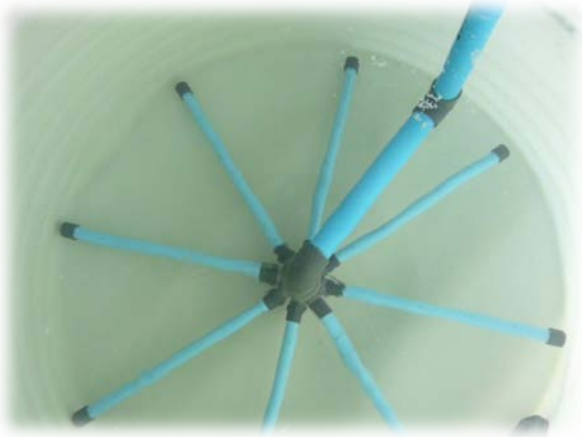
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# CURRENT PRACTICE





# CURRENT PRACTICE



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# CURRENT PRACTICE



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# WHERE AUTOMATION IS GOING



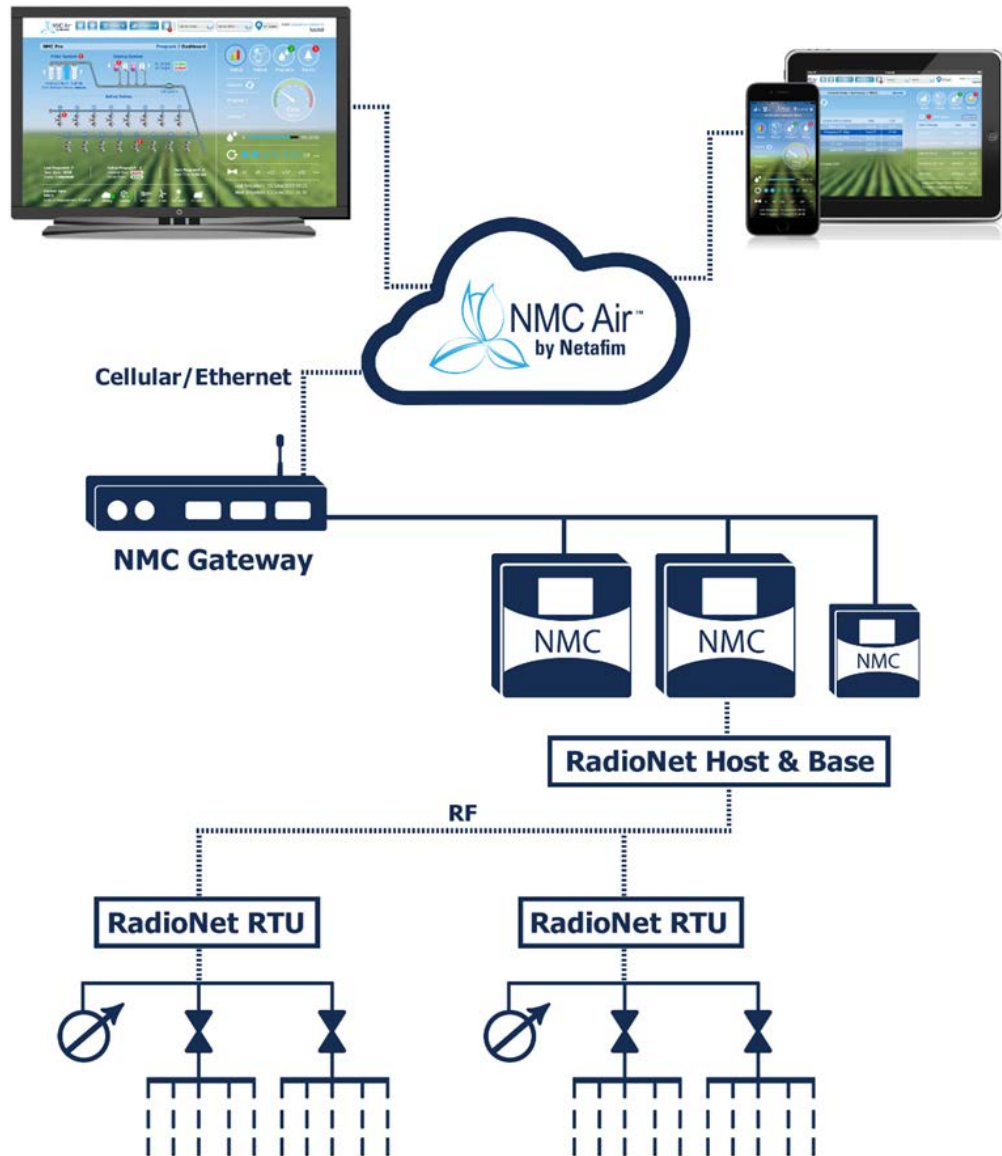
5 YEARS  
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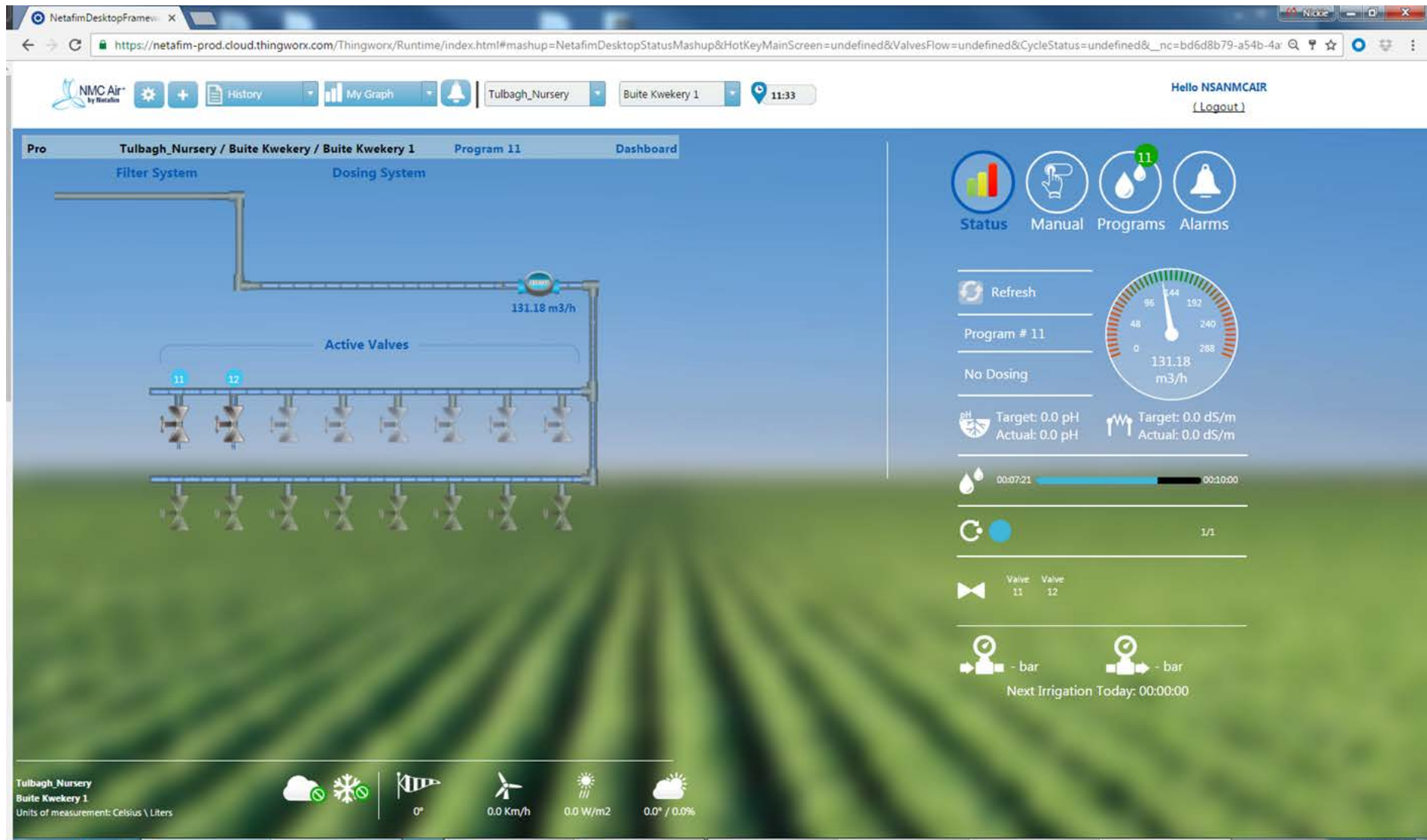
# NMC AIR

Cloud Base System

Up to 5 Controllers per network



# PC VIEW



# MOBILE VIEW

Same layout as the controller



  
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# HISTORY

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Date	Time	Valve	Reason	TotalWater	TotalTime	Flow	Chan1	Chan2	Chan3	Chan4	Chan5	EcLow	EcAvg	EcHigh	PhLow	PhAvg	PhHigh
2	Dec 10 2016	10:10:00	15	TIME MIN	23.45	01:00:00	23.44	75.07	0	75.22	75.15	0	0.2	0.4	0.5	6.7	6.8	7
3	Dec 10 2016	11:10:00	21	UNC PROC	0.7	00:01:00	42	0	3.88	0	0	0	0.2	0.3	0.4	6.7	6.8	7
4	Dec 10 2016	12:00:00	21	UNC PROC	0.3	00:00:30	36	0	0.89	0	0	0	0.2	0.2	0.2	7	7	7.1
5	Dec 10 2016	13:00:00	21	UNC PROC	0.3	00:00:30	36	0	1.67	0	0	0	0.2	0.2	0.2	7	7	7
6	Dec 10 2016	13:43:00	21	UNC PROC	0.4	00:00:30	48	0	0.95	0	0	0	0.2	0.2	0.2	7	7	7
7	Dec 10 2016	14:00:00	21	UNC PROC	0.4	00:00:30	48	0	0.86	0	0	0	0.2	0.2	0.2	7	7	7
8	Dec 10 2016	14:15:00	21	DRY CONT	0.8	00:01:00	48	0	4.25	0	0	0	0.2	0.2	0.2	7	7	7
9	Dec 10 2016	15:00:00	21	UNC PROC	1.3	00:01:34	49.78	0	0	0	0	0	0.2	0.2	0.2	7.1	7.1	7.1
10	Dec 10 2016	15:02:00	21	UNC PROC	0	00:00:00	0	0	0	0	0	0	0.2	0.2	0.2	7.1	7.1	7.1
11	Dec 10 2016	17:00:00	17	TIME MIN	9.6	01:00:00	9.6	31.08	0	31.08	31.11	0	0.2	0.4	0.6	6.6	6.7	6.9
12	Dec 10 2016	18:22:00	21	DRY CONT	0.8	00:01:00	48	0	4.14	0	0	0	0.2	0.2	0.3	6.9	7	7
13	Dec 10 2016	19:00:00	21	UNC PROC	0.3	00:00:30	36	0	0.89	0	0	0	0.2	0.2	0.2	7	7	7
14	Dec 10 2016	20:00:00	21	UNC PROC	0	00:00:06	0	0	0.5	0	0	0	0.2	0.2	0.2	7	7	7
15	Dec 11 2016	04:00:00	2	TIME MIN	15.906	01:00:00	15.9	50.9	0	50.91	50.88	0	0.2	0.4	0.5	6.5	6.8	6.9
16	Dec 11 2016	04:00:00	1	TIME MIN	4.894	01:00:00	4.89	15.66	0	15.66	15.66	0	0.2	0.4	0.5	6.5	6.8	6.9
17	Dec 11 2016	06:40:00	5	TIME MIN	13.133	01:00:00	13.13	42.09	0	42.02	42.06	0	0.3	0.4	0.5	6.7	6.8	7
18	Dec 11 2016	06:40:00	4	TIME MIN	13.133	01:00:00	13.13	42.09	0	42.02	42.06	0	0.3	0.4	0.5	6.7	6.8	7
19	Dec 11 2016	06:40:00	3	TIME MIN	13.133	01:00:00	13.13	42.09	0	42.02	42.06	0	0.3	0.4	0.5	6.7	6.8	7
20	Dec 11 2016	07:50:00	8	TIME MIN	13.2	01:00:00	13.19	42.09	0	42.09	42.1	0	0.3	0.4	0.4	6.8	6.8	7
21	Dec 11 2016	07:50:00	7	TIME MIN	13.2	01:00:00	13.19	42.09	0	42.09	42.1	0	0.3	0.4	0.4	6.8	6.8	7
22	Dec 11 2016	07:50:00	6	TIME MIN	13.2	01:00:00	13.19	42.09	0	42.09	42.1	0	0.3	0.4	0.4	6.8	6.8	7

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# SUMMARY

Automation is becoming a specialised field

Dosing Units were developed to overcome challenges in the past

It is about using your resources efficiently

Embrace Automation

**“Ek hou van hoe jy dink”**

**- Unknown Proverb**







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