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Precisionfarming in Fruittree Nursery

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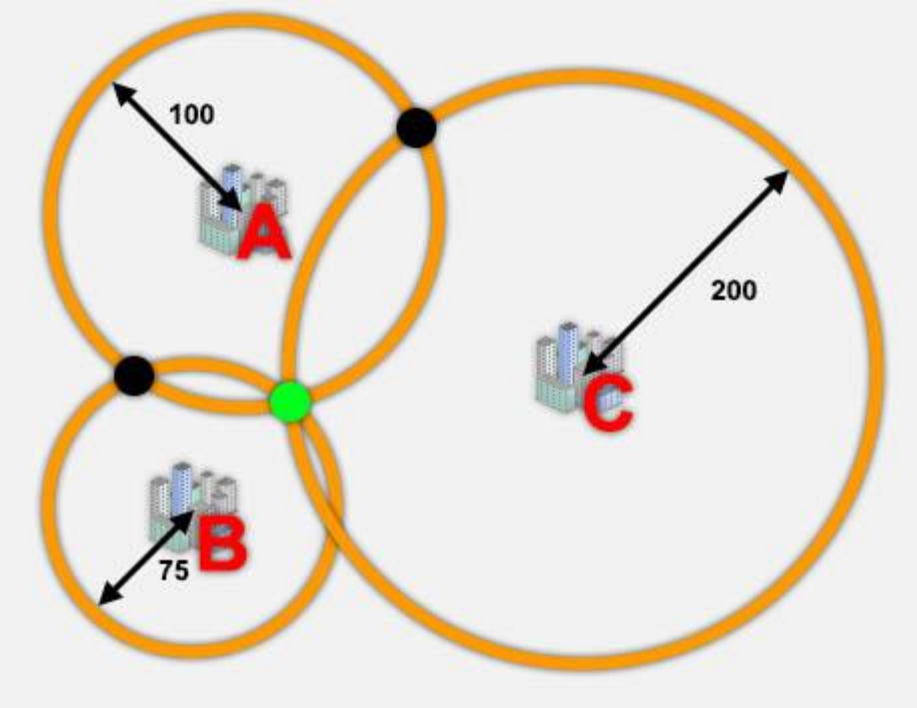
Introduction

Name:	Yannick Smedts
Age:	29
Country:	Netherlands
Education:	MAS, HAS (University)
Specialisation:	Precisielandbouw
Employed:	Tree Nursery Henri Fleuren

What is GPS?

- GPS is an GNSS
- Calculate by measuring time
- Calculate intersections



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What is the definition of precision Farming ?

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How old is precision farming?

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- **Why would you cultivate on averages?**

Precision Farming

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Accuracy of Precisionfarming ?

Precisionfarmingcyclus

VAN DEN BORNE AARDAPPELEN

WINTER

1 Mapping fields

2 Soilscan

3 Calculate tramlines

SPRING

4 Organic fertilizer

5 Soil cultivation

6 Variable planting

SUMMER

7 Crop protection

SUMMER

8 Irrigation

9 Crop sensing

10 UAV sensing

11 Crop measuring

12 Variable fertilizing

AUTUMN

13 Harvesting

14 Storage

Precision Farming

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WINTER

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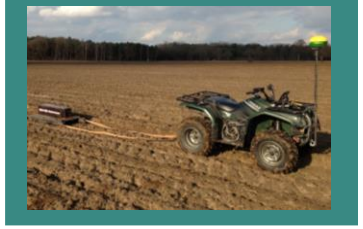
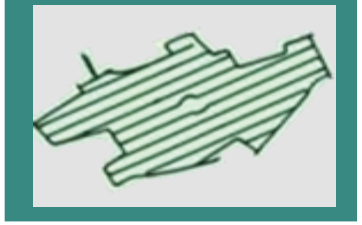
2 Soilscan



3 Calculate tramlines



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Mapping fields

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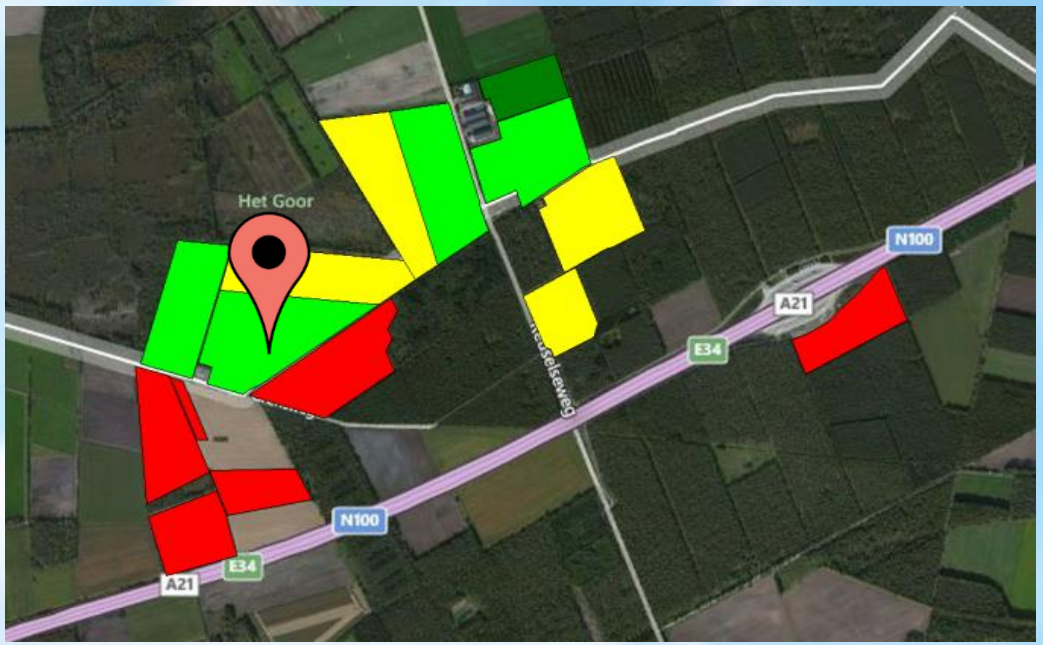
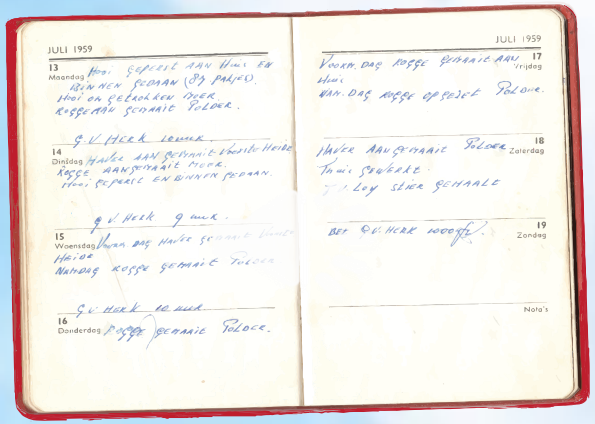
1

Mapping fields

CROP-R





Field Level

Soil scan

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2

Soil scan

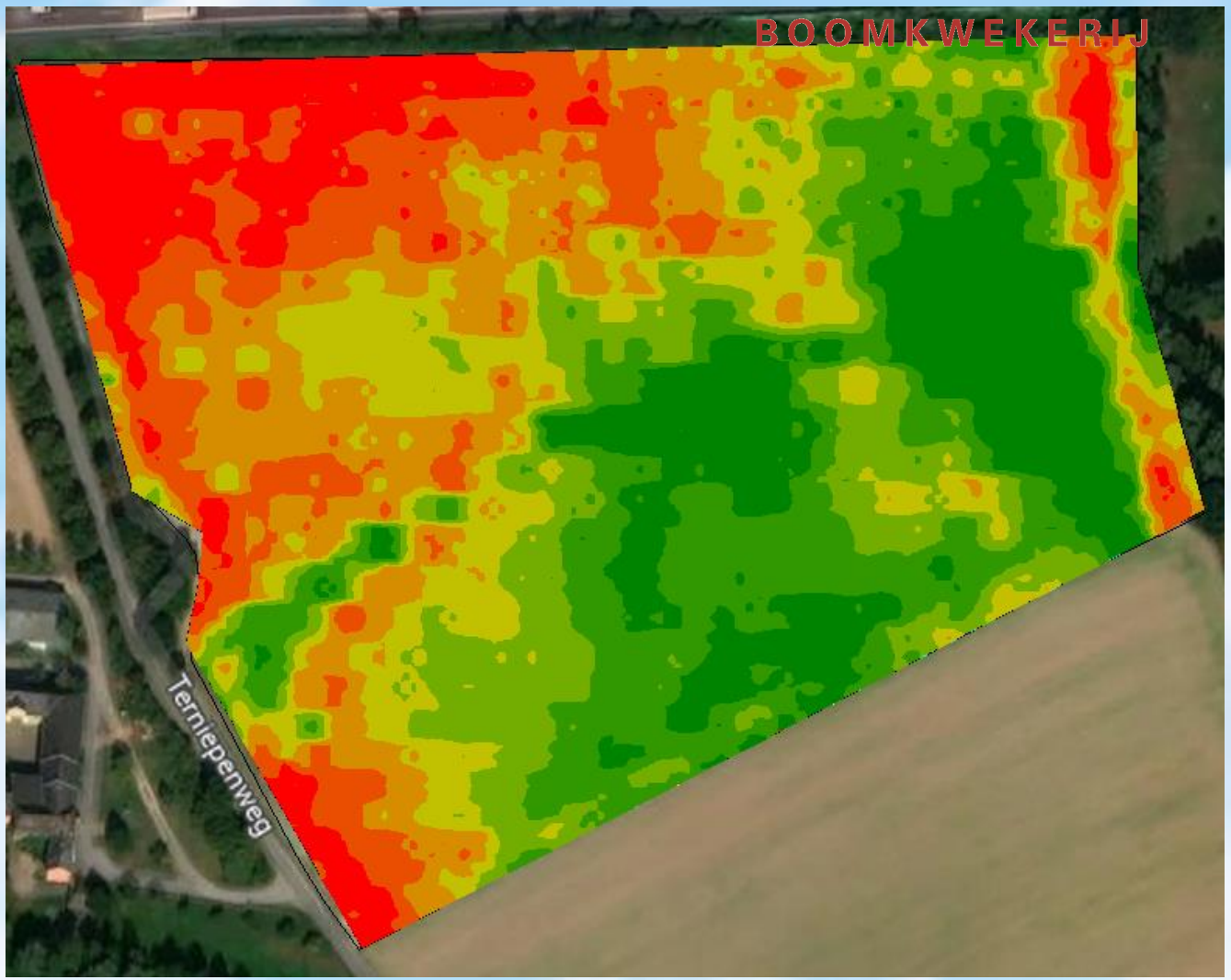
Zone Level

Soil scan

2

Soil scan

- What’s measured?
- What does it mean?



Soil scan

2

Soil scan

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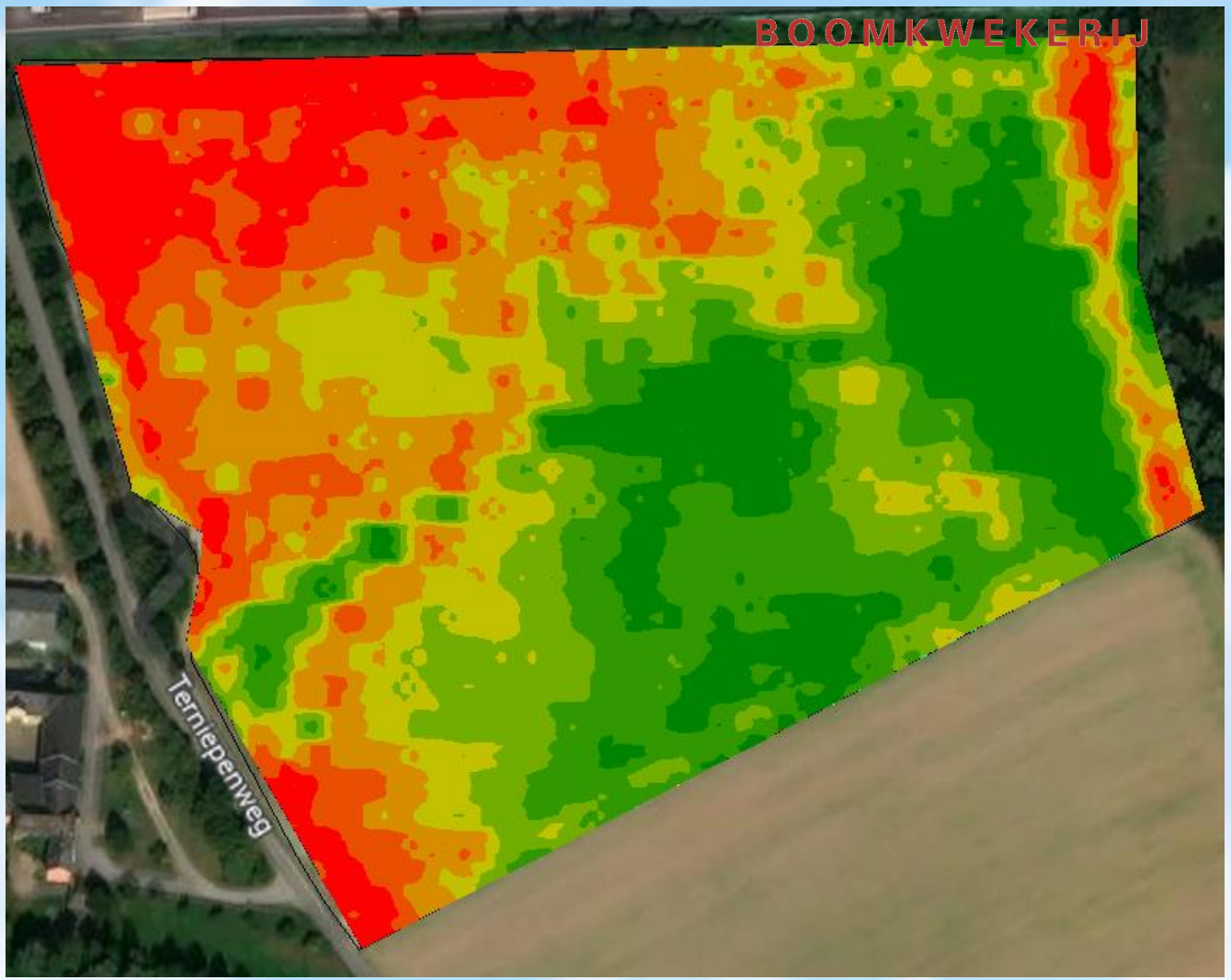
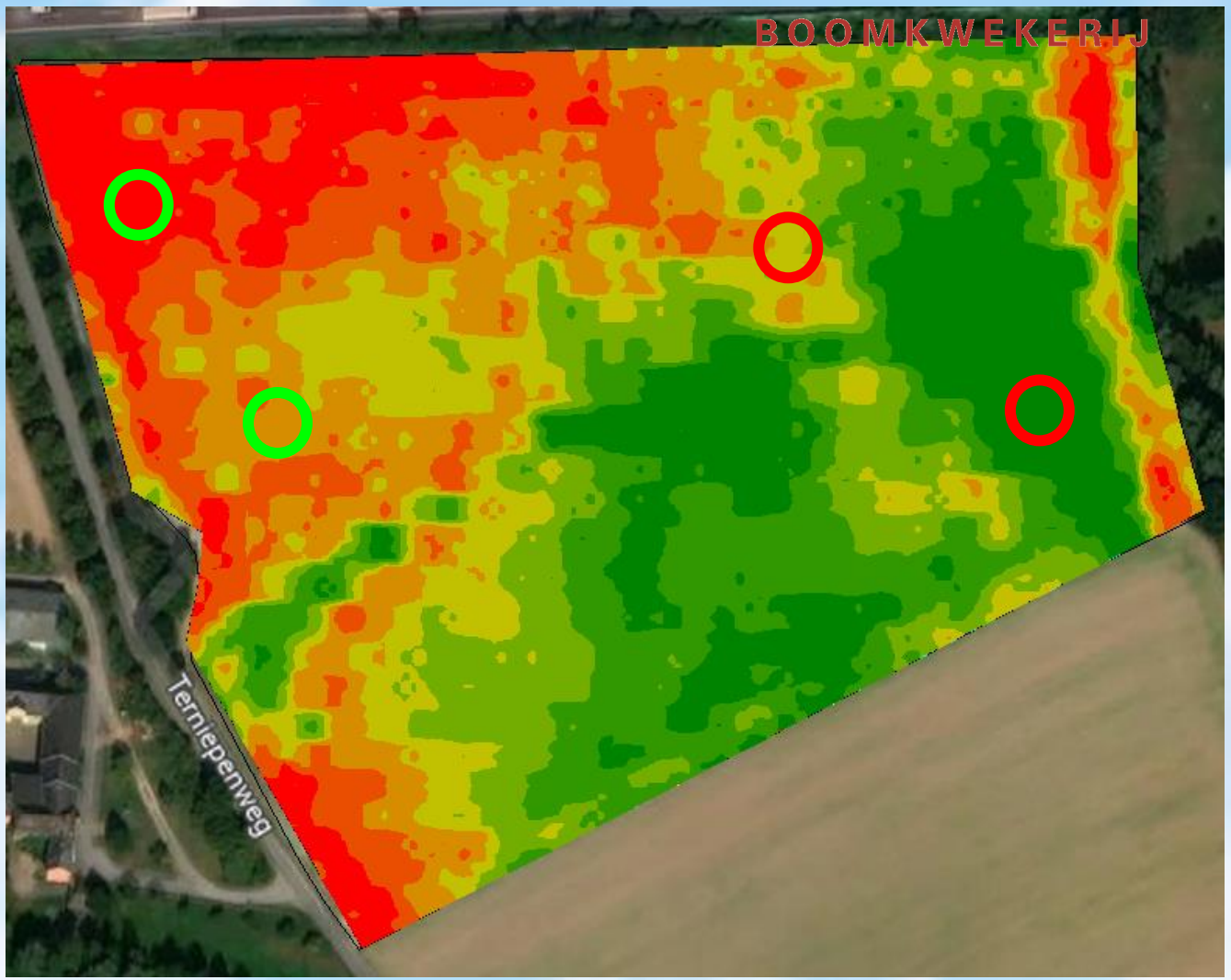
- What does it mean?



Soil scan

2

Soil scan



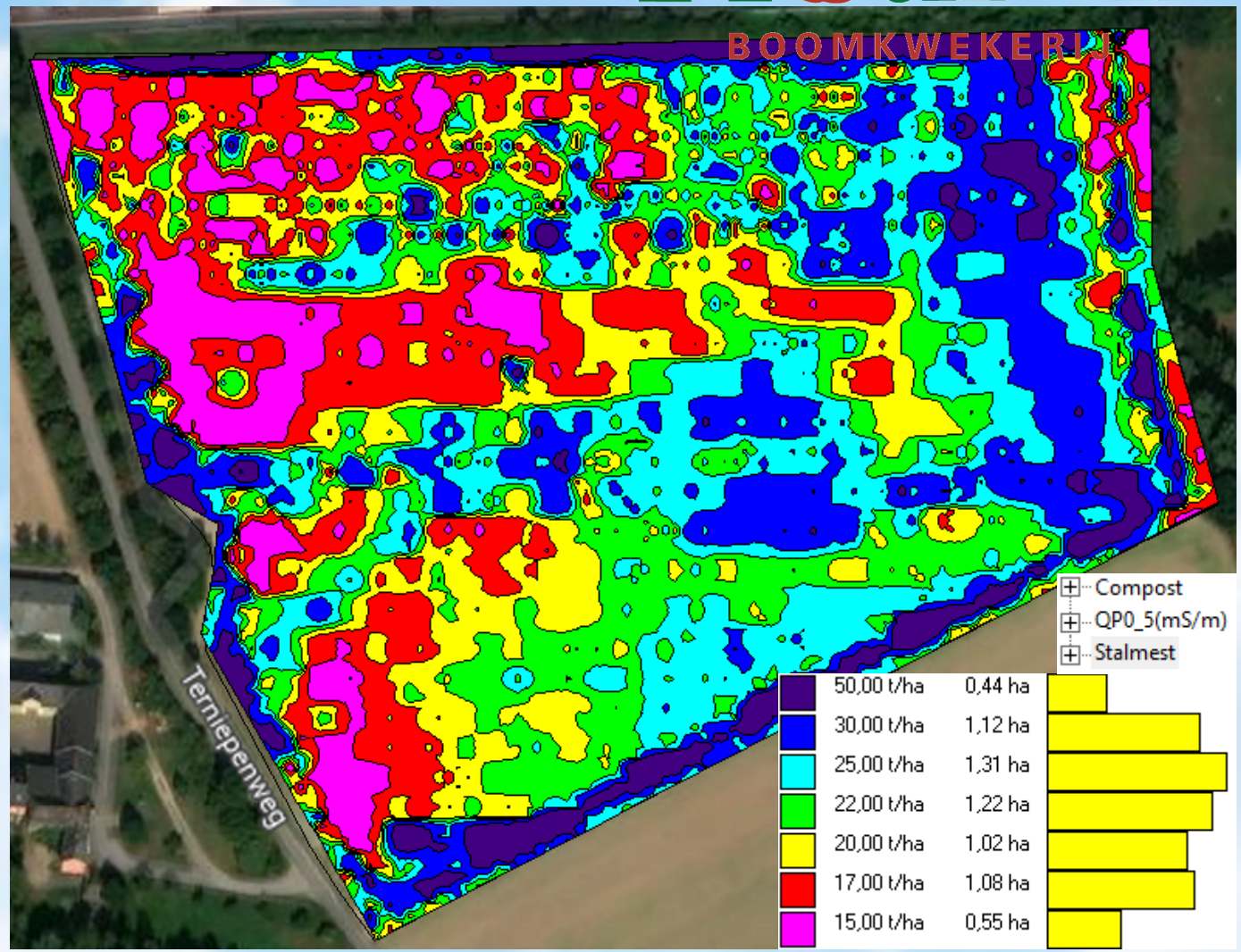
- Till a few years ago, 1 soilsample per field
- Now: 4 per field
- Afterwards: VRA Fertilizers

Soil scan

2

Soil scan

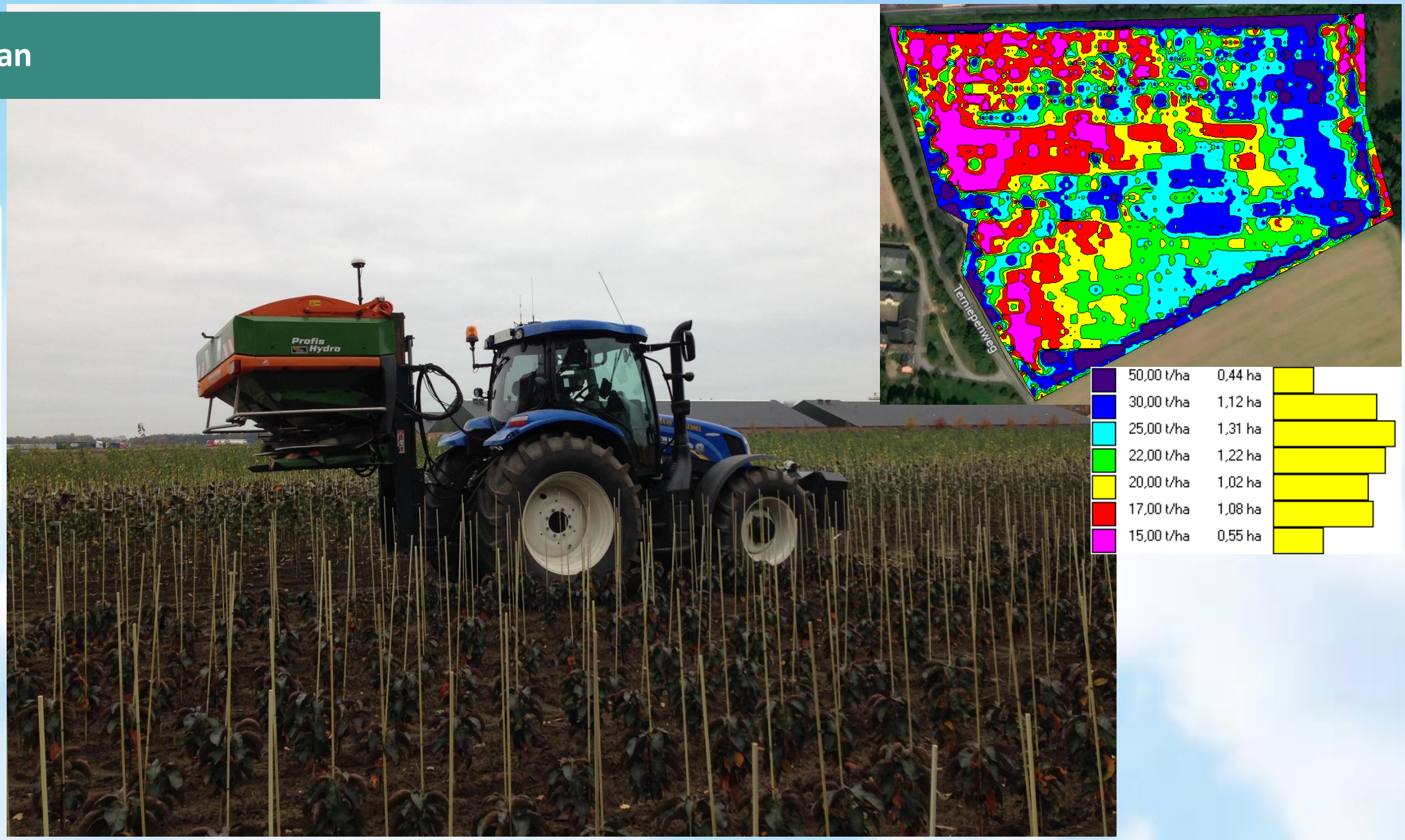
- Basemap: Soil EC and Soilsamples
- Goal: Give the plant what it needs
- Variable Rate Application (VRA)



Soil scan

2

Soil scan



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Calculate tramlines

3

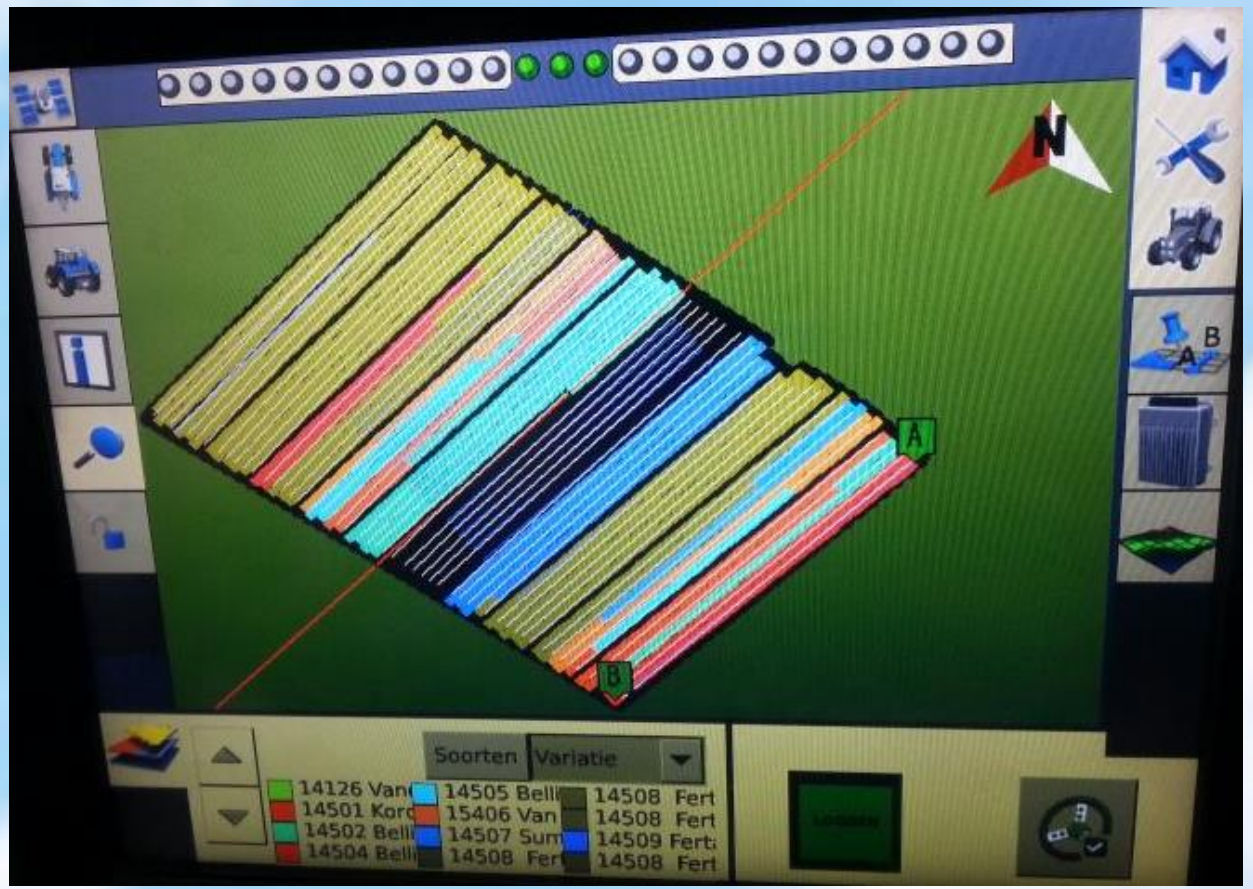
Calculate tramlines

- Optimal partitioning field
- Cost reduction by less cutivation distance
- Make a plan on behalf of the EC-soilscan

Calculate tramlines

3

Calculate tramlines



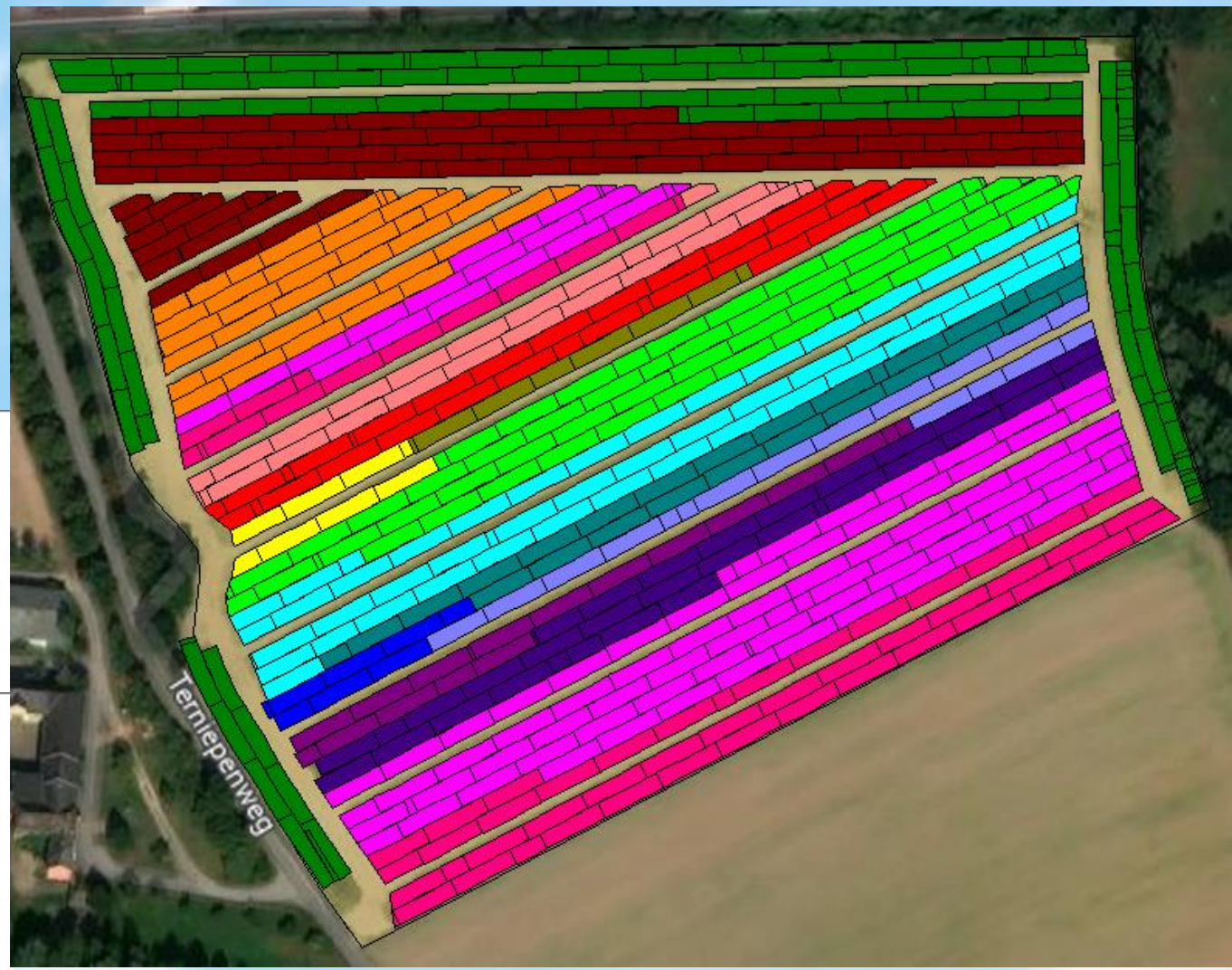
- Advantages: Rows are straight, 2cm inaccurate
- Every application afterwards done with centimeter precision
- Trees are in the right place

Calculate tramlines

3

Calculate tramlines

16201 Discovery B9	0,42 ha	
16202 Discovery B9	0,69 ha	
16203 Summerred B9	0,29 ha	
16204 R.AA R Aroma B9	0,14 ha	
16205 Discovery MM 106	0,14 ha	
16206 Katja M9	0,06 ha	
16207 Summerred M9	0,23 ha	
16208 Red Aroma M 9	0,45 ha	
16209 Mariri Red M9	0,84 ha	
16210 Wiltons Star FL56	0,48 ha	
16212 Wiltons Star FL56	0,06 ha	
16213 Wiltons Star FL56	0,06 ha	
16214 Gala B Royal B M9	0,31 ha	
16215 Gala B Royal B M9	0,65 ha	



Precisionfarmingcycle

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WINTER

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Mapping fields

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Soilscan

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Calculate tramlines

SPRING

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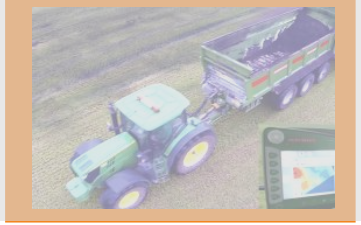
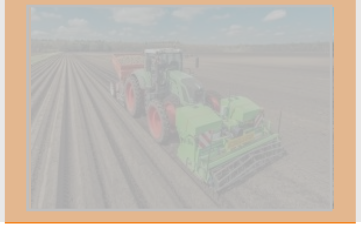
Organic fertilizer



5
Soil cultivation

6
Variable planting



SUMMER

7
Crop protection

SUMMER

8
Irrigation

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Crop sensing

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UAV sensing

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Crop measuring

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Variable fertilizing

AUTUMN

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Harvesting

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Storage

Soil Cultivation

5

Soil Cultivation

Zone Level

Soil Cultivation

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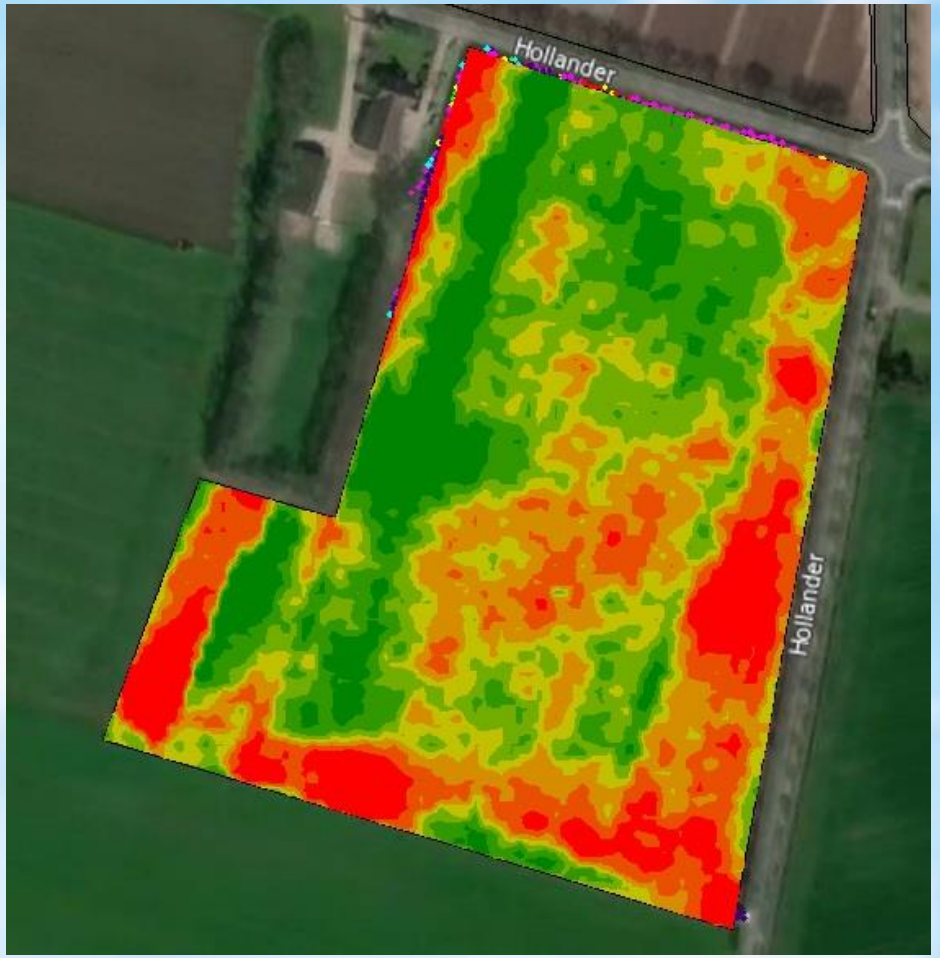
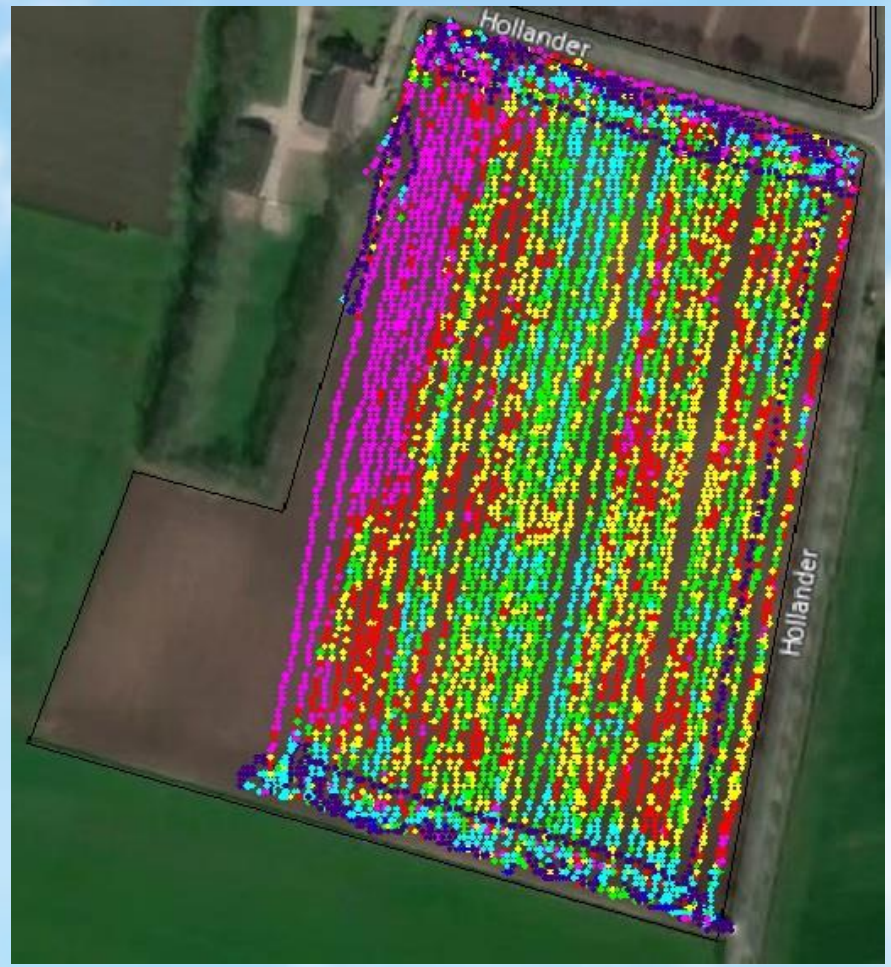
5

Soil Cultivation





Zone Level

Soil Cultivation

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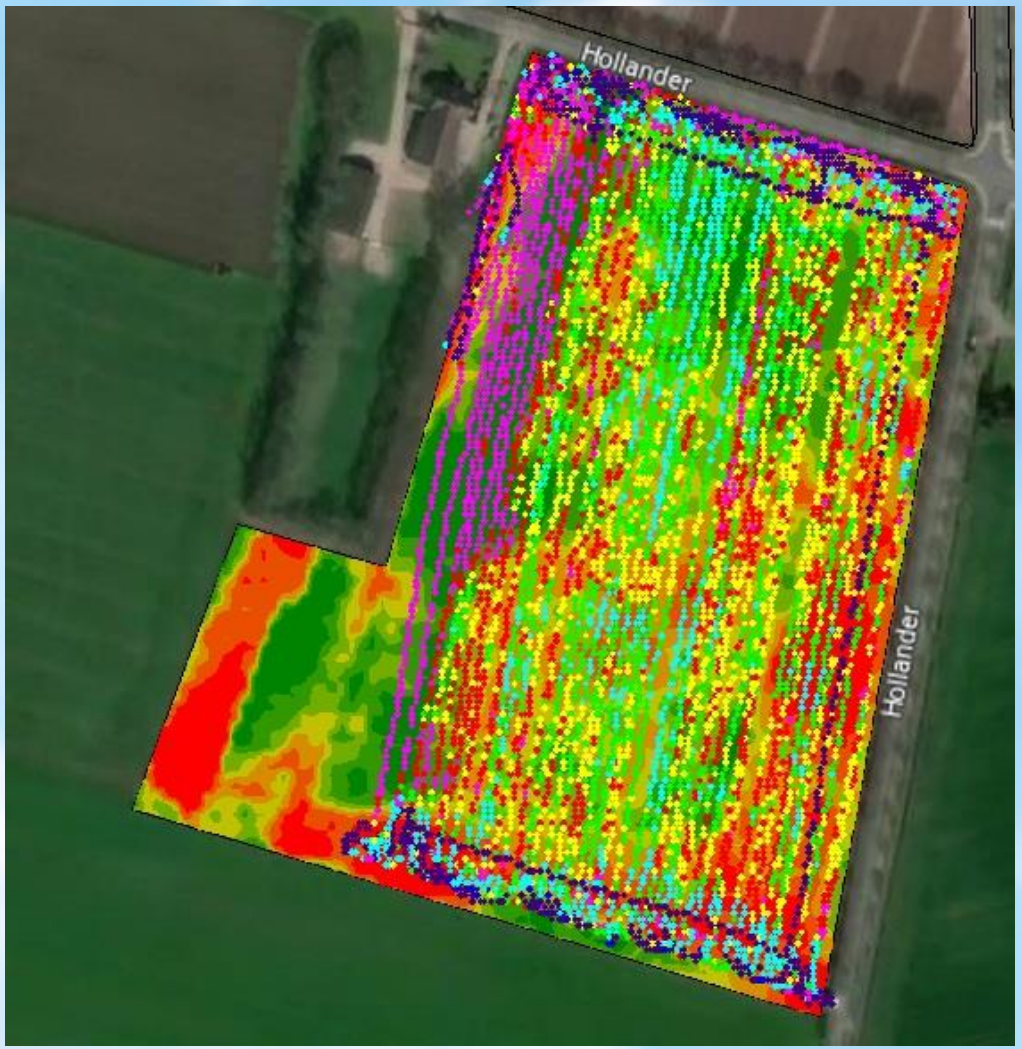
5

Soil Cultivation



Zone Level

Variable planting

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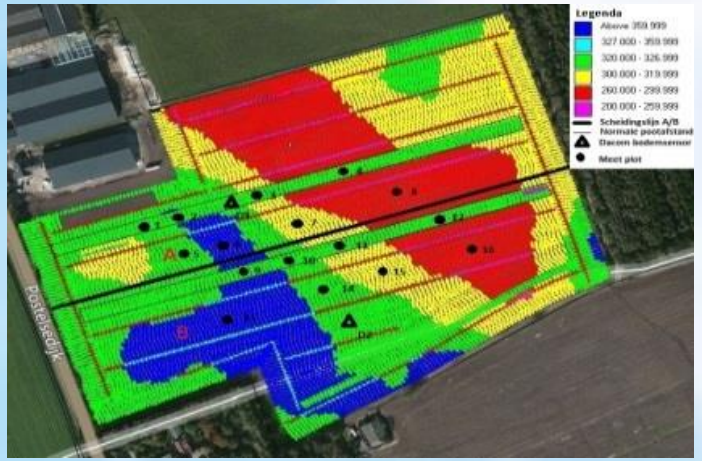
6

Variable planting



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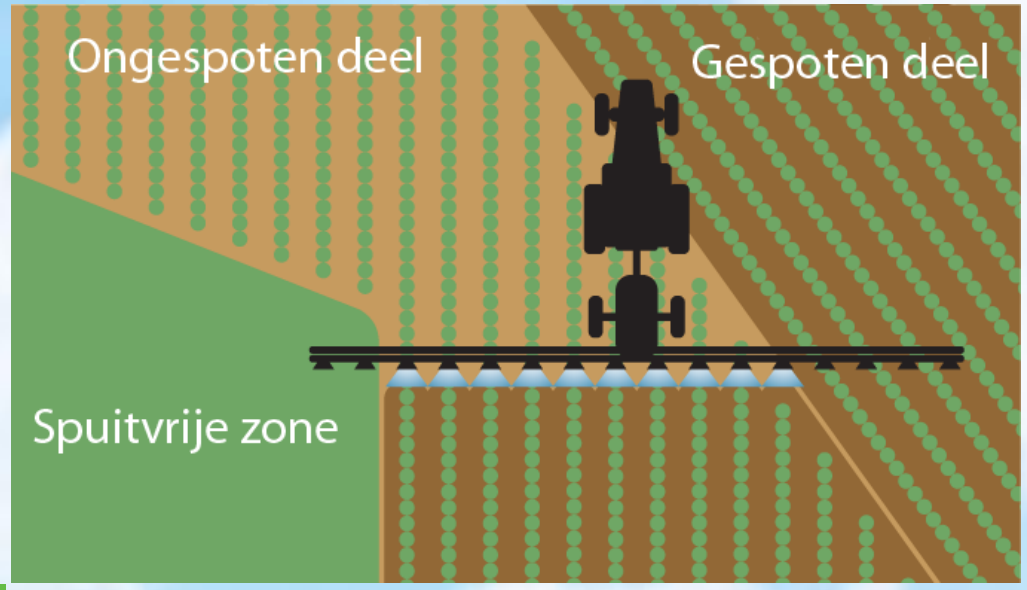
Crop protection

7

Crop protection

- Apply where leafs are
- More Leafs > Greater volume
- Less Leafs < Smaller volume
- Auto spraysections open/close



Crop protection

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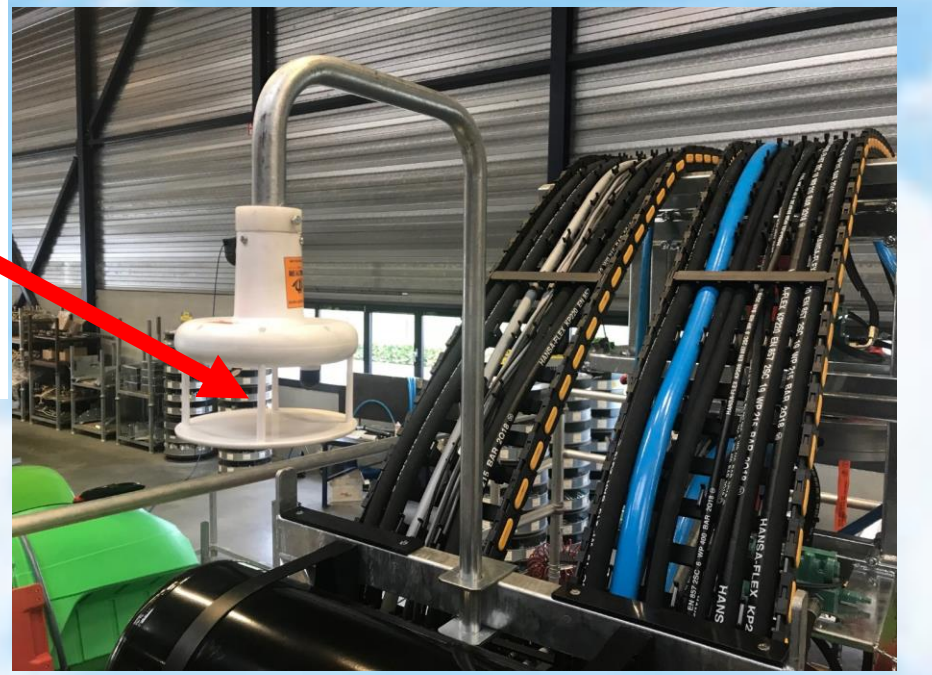
7

Crop protection



Field Level

Crop protection

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Crop protection

Field Level

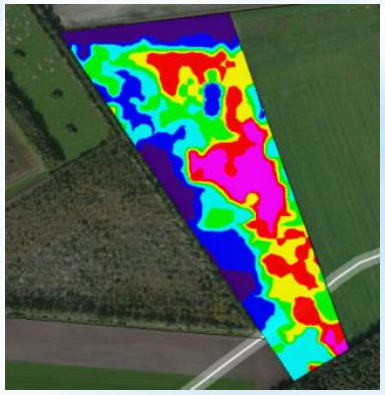
Irrigation

8

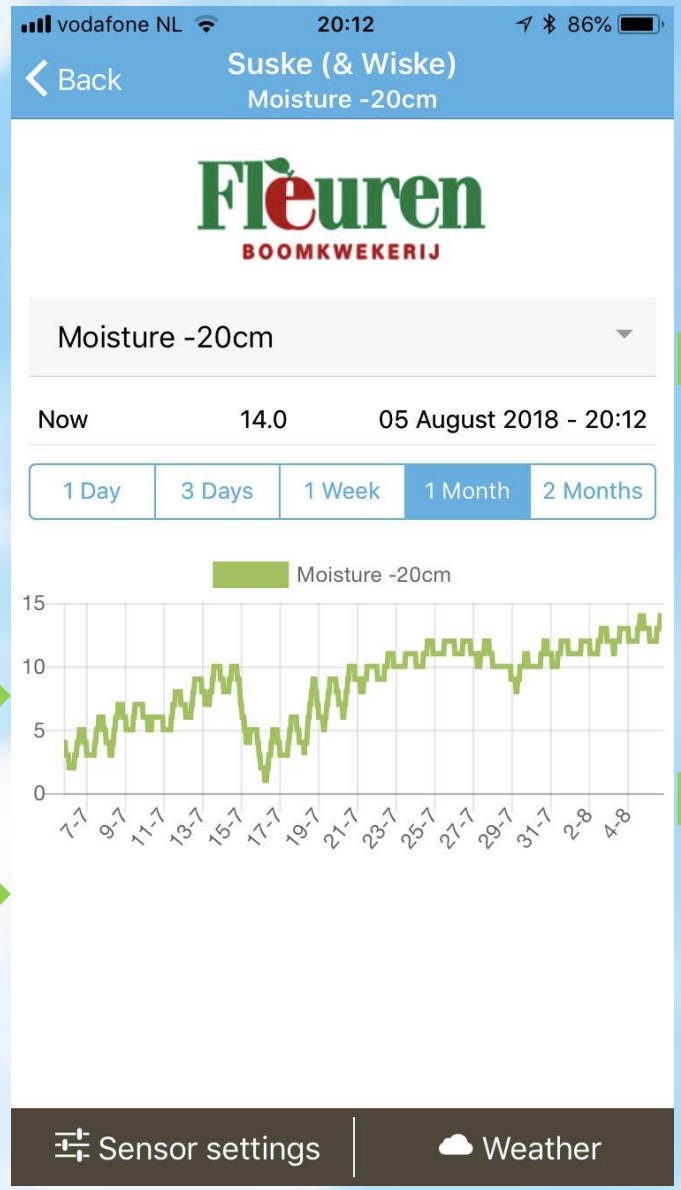
Irrigation

Weather data

Soilconductivity



Soilmoisture



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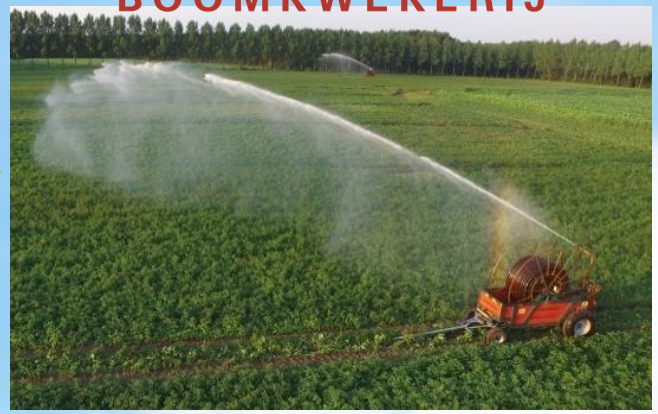
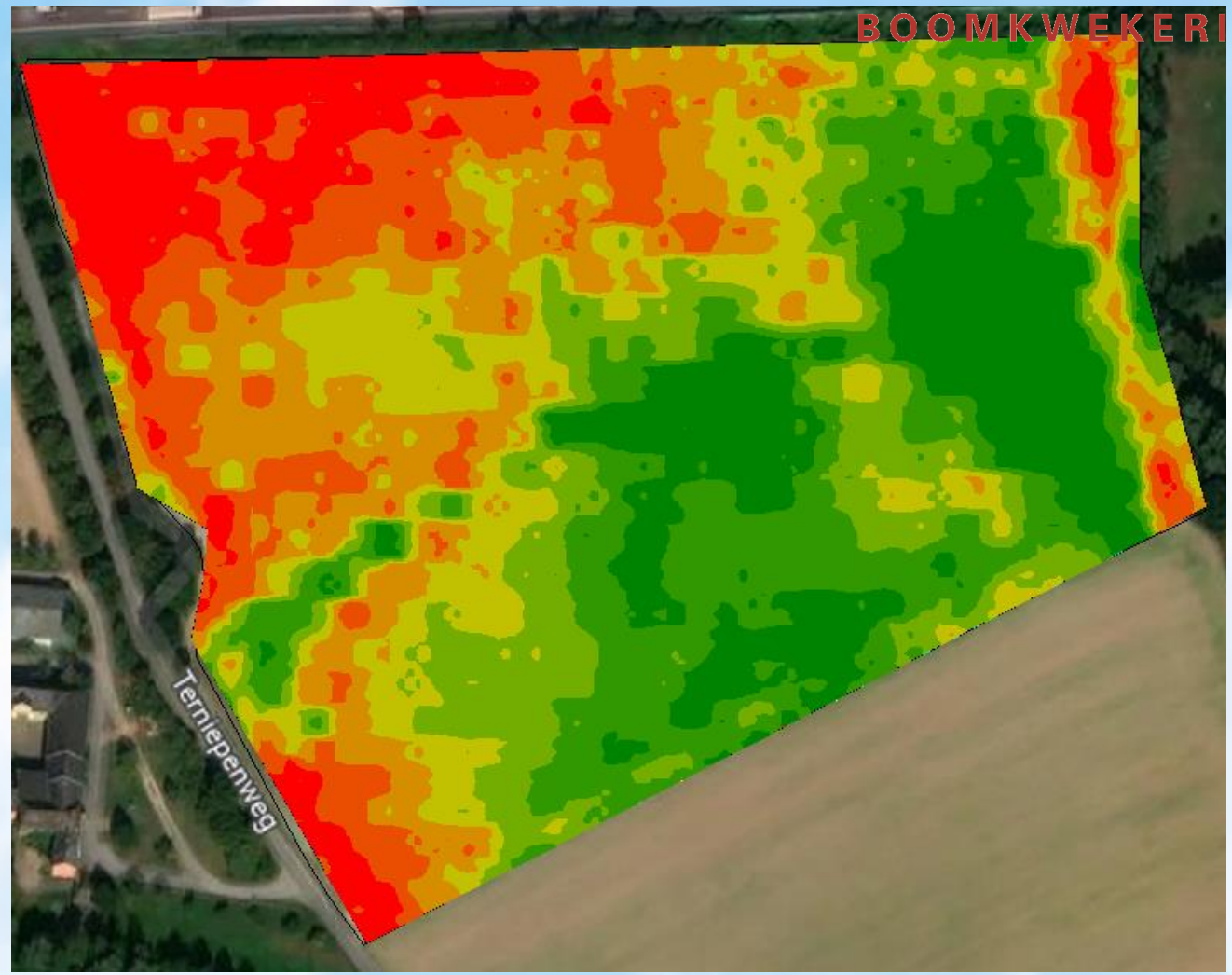


Irrigation

8

Irrigation

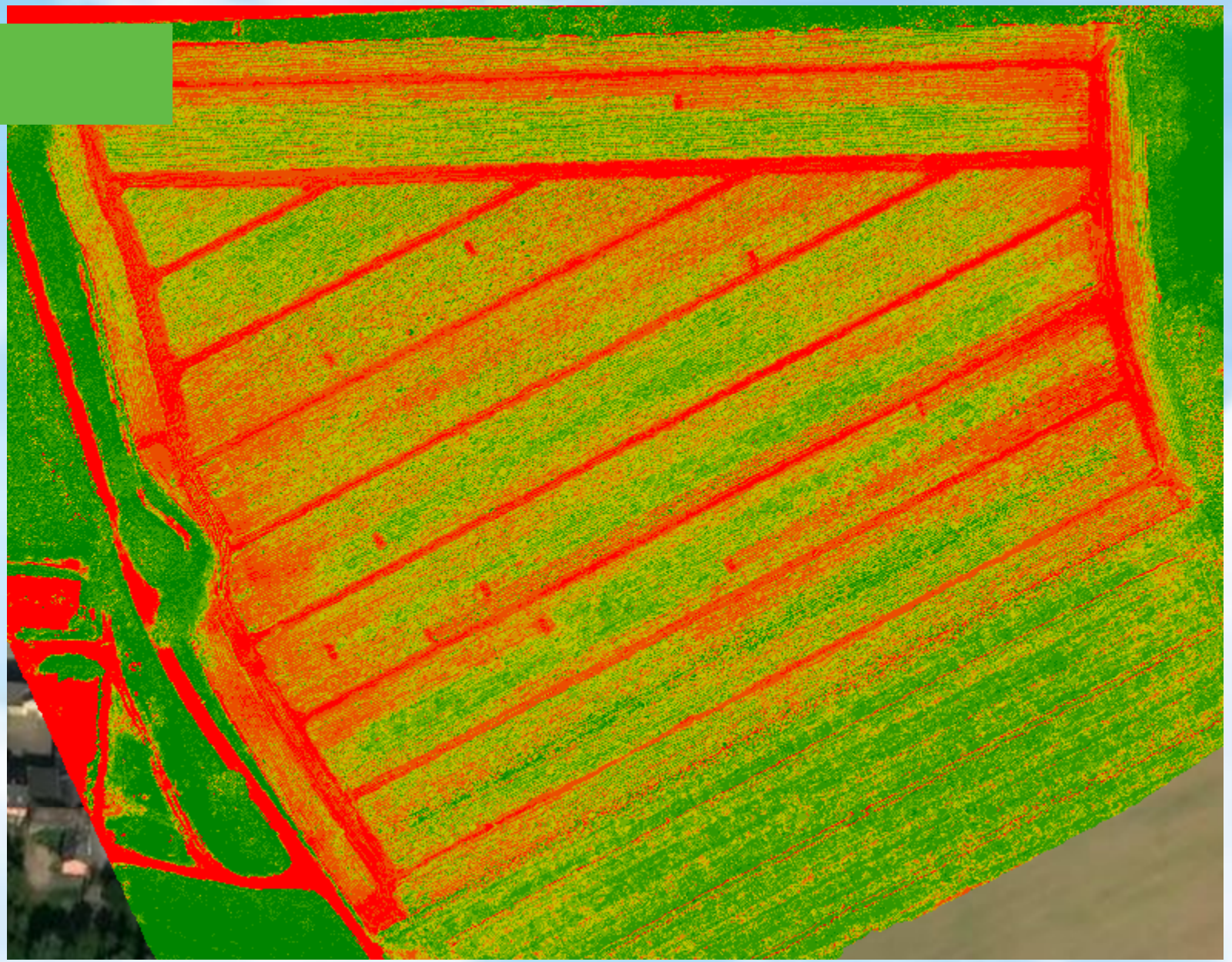
- Where to drip first?
- Where to drip longest?



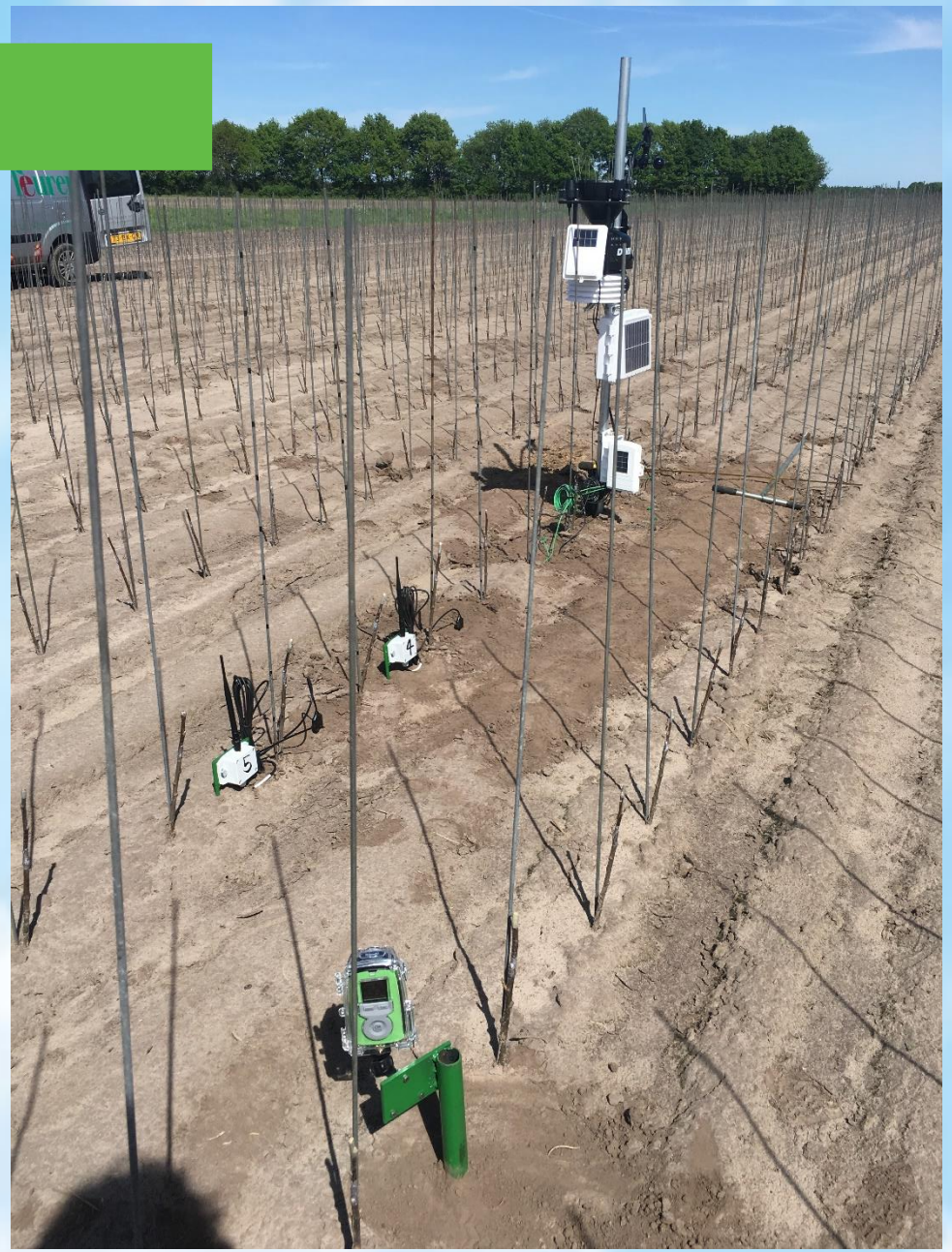
UAV sensing

10

UAV sensing



Crop measuring



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Crop measuring

Crop Level

Crop measuring

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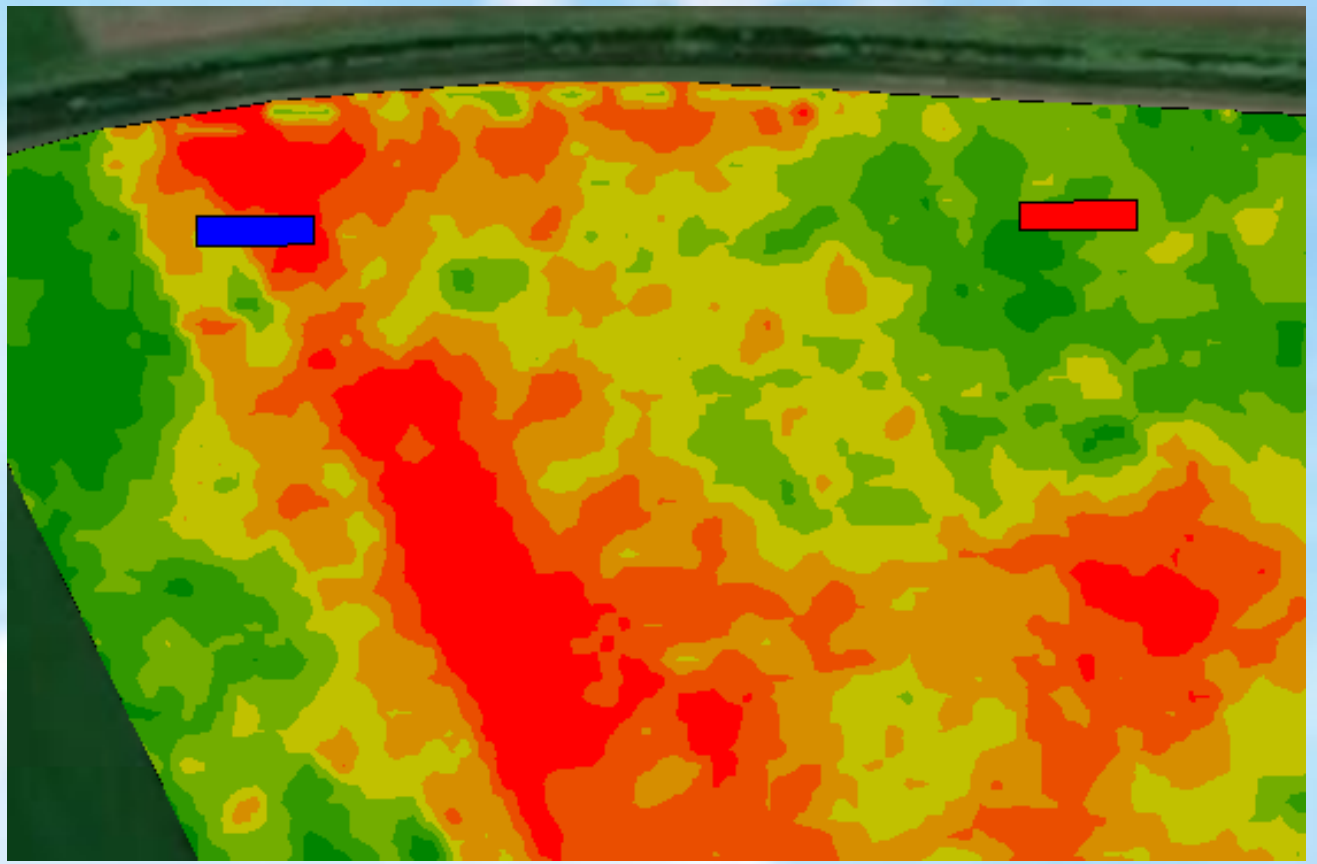
Crop measuring



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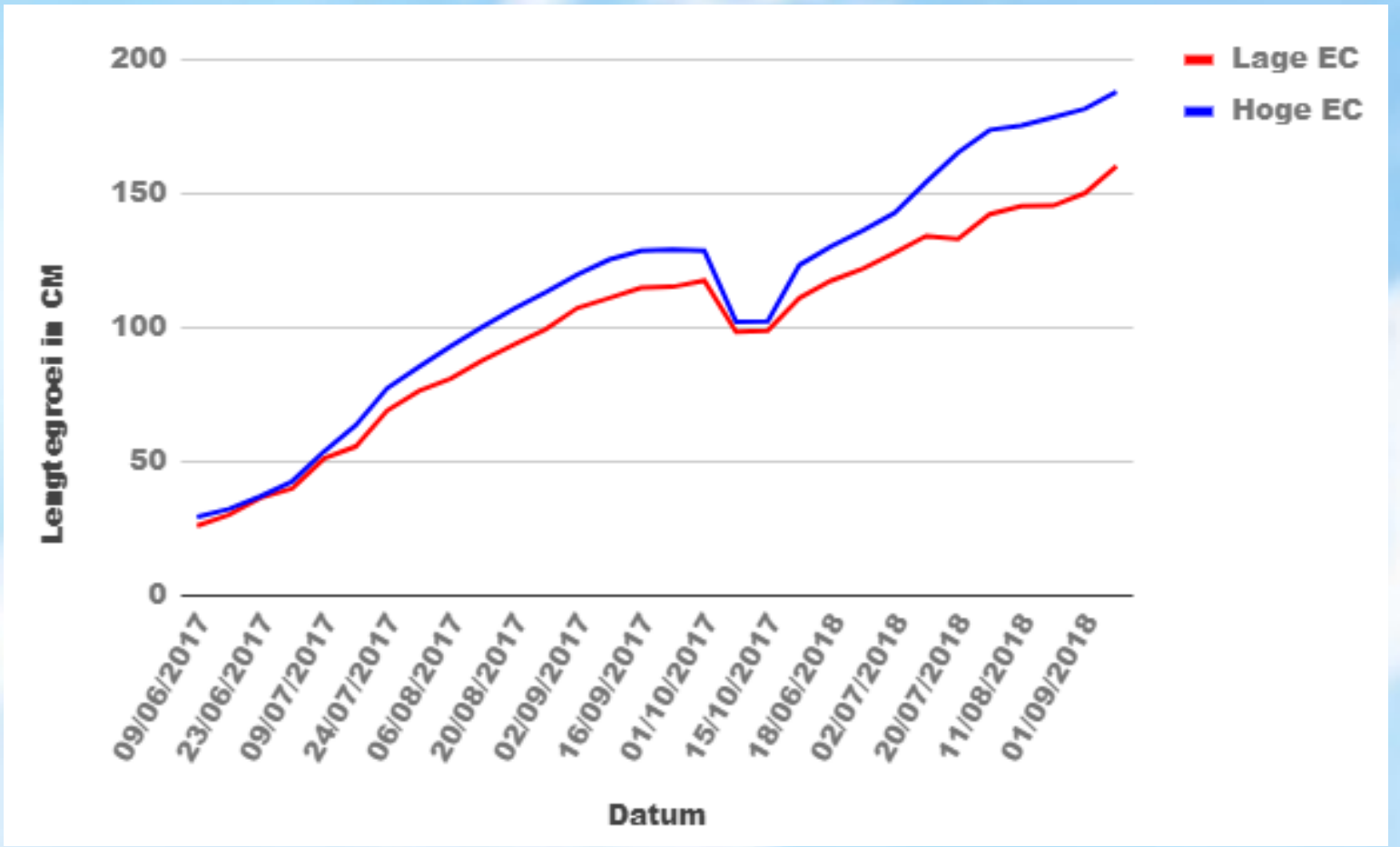

Precisionfarmingcycle

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Harvesting

Who knows how the yield?
Who knows for sure that it’s equal over the whole field?
Does any one wants to know the difference?

And in €?

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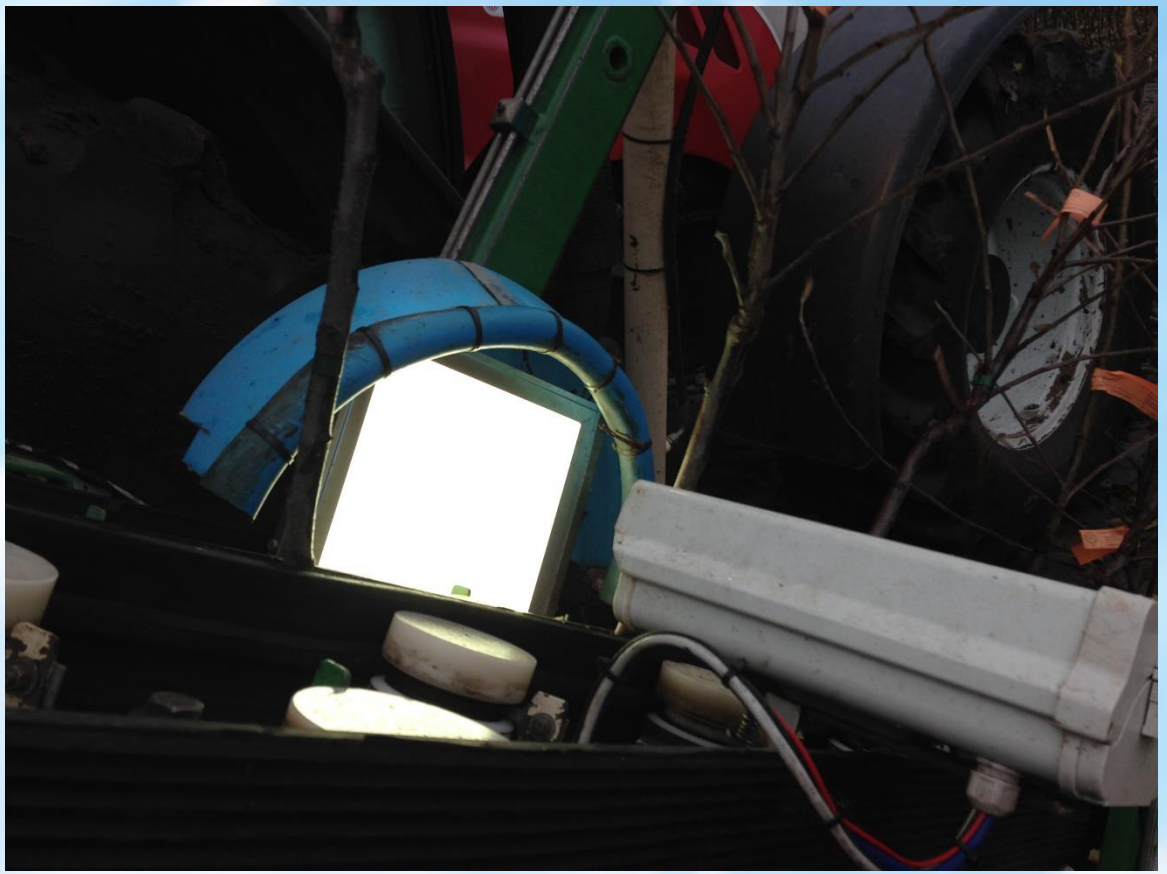
13

Harvesting

- Measuring thickness of trees during growing season;

  Discover paterns, sample and adjust



Zone Level

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13

Harvesting

Why this effort?

2033,000 - 5913,000	0,25 ha	
1909,000 - 2032,999	0,52 ha	
1815,000 - 1908,999	0,87 ha	
1726,000 - 1814,999	1,01 ha	
1637,000 - 1725,999	0,77 ha	
1494,000 - 1636,999	0,37 ha	
704,000 - 1493,999	0,14 ha	

13

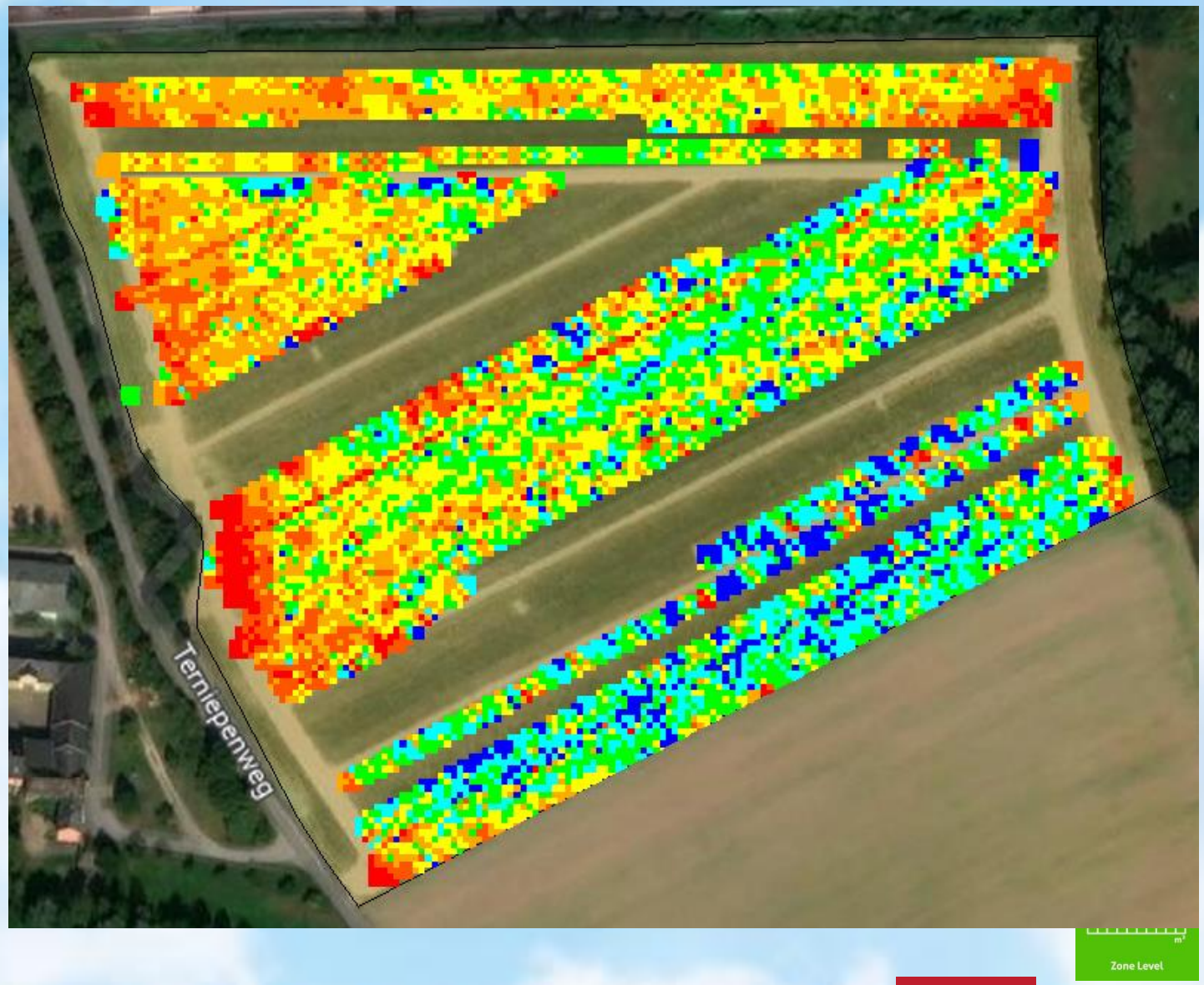
Harvesting

What if these are €?

Blue = Potential € 5,50
Red = Potential €3,00

25.000 trees/ha

Blue potential yield €31.250,-
Red potential yield €18.750,-

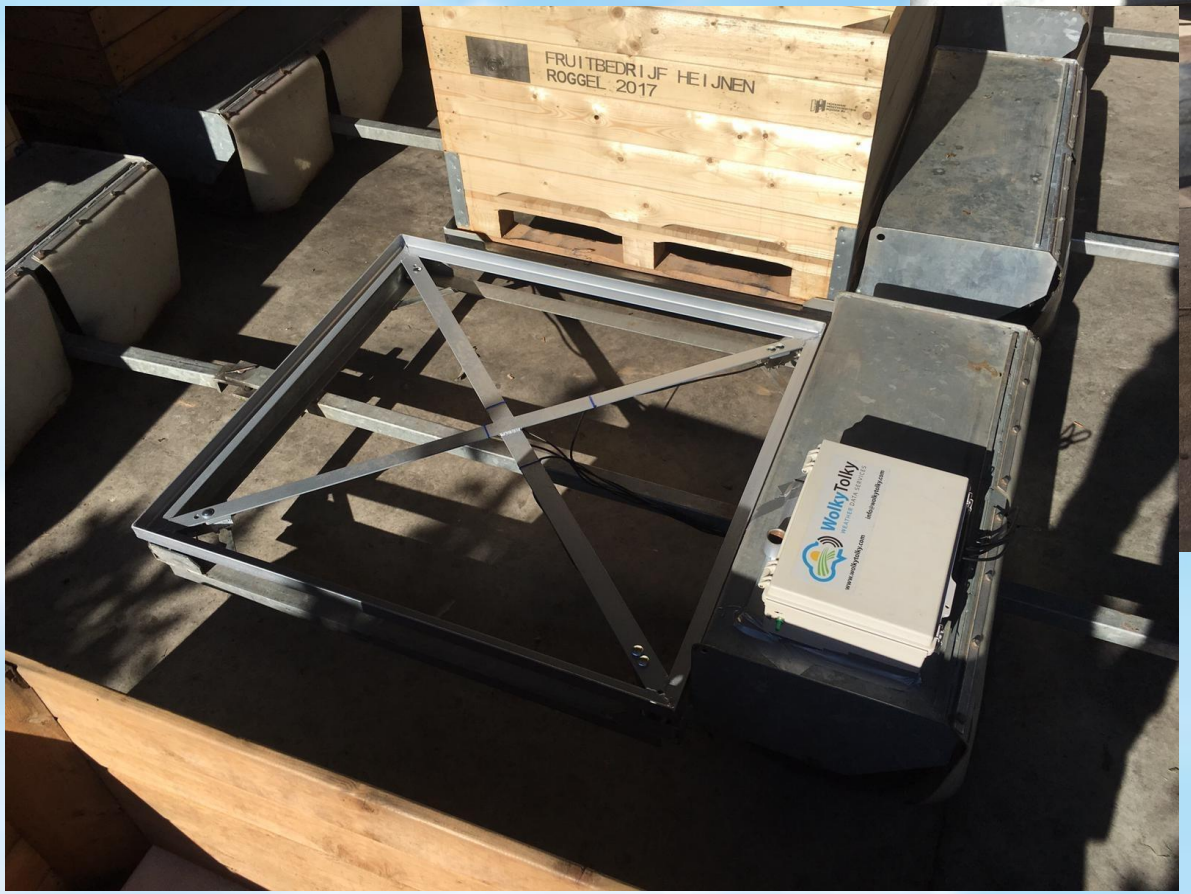


Harvesting

What is this at your own orchard?

13

Harvesting



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Conclusion

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- Future farmers and Fruit growers will be ‘dataminers’
- Computers will help to solve complex situations (Big data analyses)
- Data will be the oil of this century!