



PHYTOSTEM • PLANT MONITORING

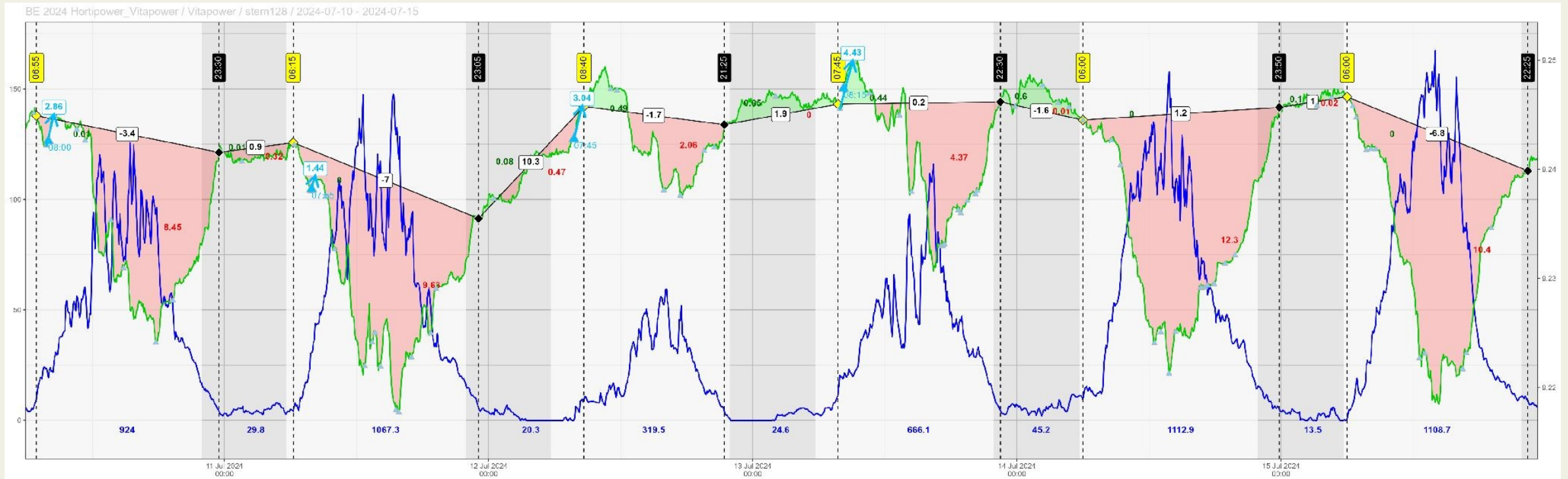
How **PhytoStem** works

Real-world examples from the daily monitoring of plant activity.

Science. Technology. Results.

EXAMPLE REPORT • WEEKLY OVERVIEW

Client case 1 - report 10-15 July 2024



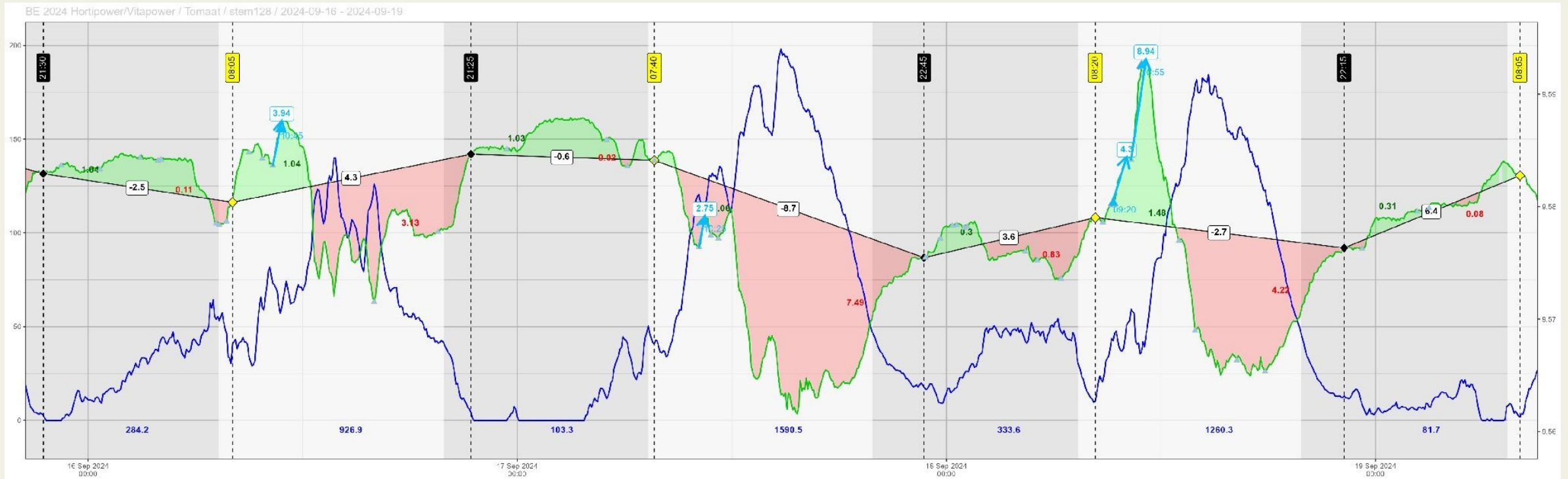
EXAMPLE REPORT • KPI TABLE

Client case 1 - daily plant KPIs

	10 Jul	11 Jul	12 Jul	13 Jul	14 Jul	15 Jul
Sap flow • plant activity [g]	924	1097	340 very low	691 low	1158 very high	1122 high
Diameter growth [µm]	-3.4 shrinkage	-6.0 shrinkage	8.6	2.1	-0.5 slight contraction	-5.8 shrinkage
Stress integral • neg pos [µm]	8.45 0.01 balanced	9.95 0.01 balanced	2.52 0.57 extremely vegetative	4.37 1.09 vegetative	12.31 0.6 extremely generative	10.42 0.1 generative
1st response to irrigation • min after sunrise	133-143	132-137	126	134-154	not detected	not detected
Diameter growth until 1st irrigation [µm]	-2.74 on time	-4.47 very late	-2.98 on time	-0.43 very early	—	—
Duration of active period [h]	16.5	16.8	12.7	14.7	17.8	16.3

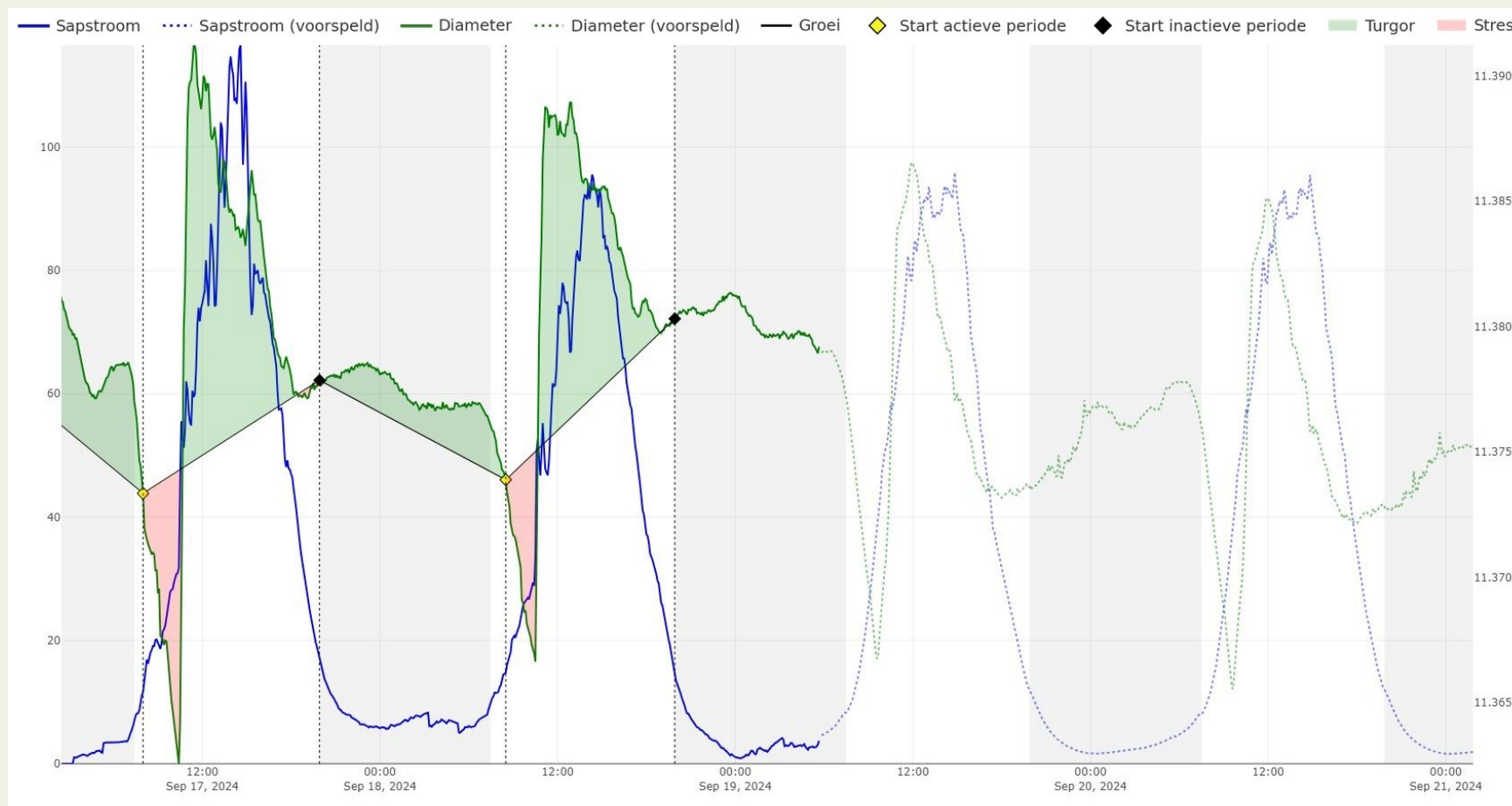
EXAMPLE REPORT • WEEKLY OVERVIEW

Client case 2 - report 16-18 Sept 2024

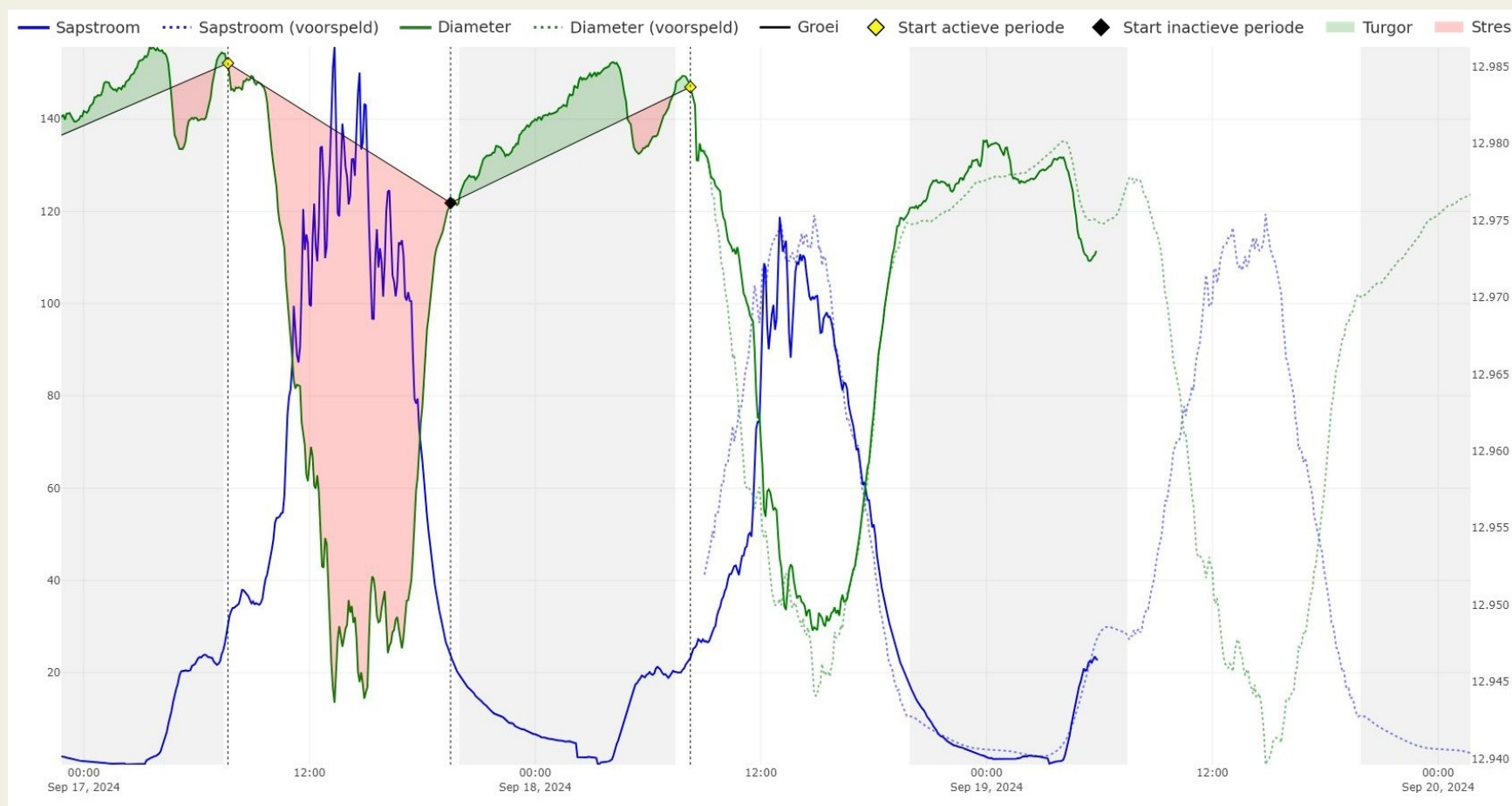


DAILY MONITORING • TOMATO

Client case 3 - tomato • 19 Sept 2024



Client case 3 - cucumber • 19 Sept 2024



DAILY MONITORING • CUCUMBER

Client case 3 - cucumber • 8 Sept 2024



PHYTOSENSE • NEW

What's new?

1

3 sensors per compartment

Higher reliability and representativeness of your data.

2

Automatic data annotation

Simpler, more intuitive interpretation of the graphs.

3

48h forecast of sap flow and diameter

Proactive advice based on expected plant behaviour.

4

KPIs in table form

Seamless integration into your management system.

5

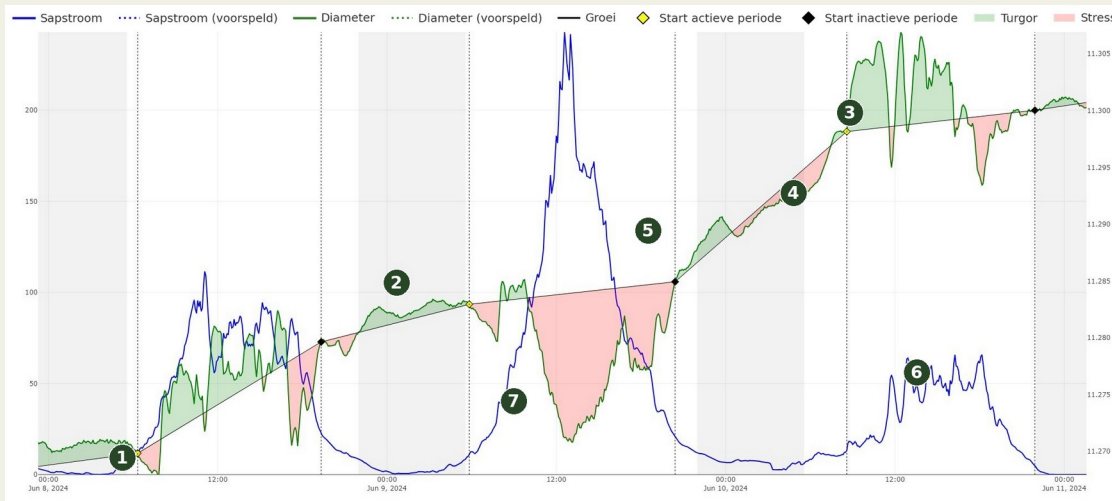
Daily advice via WhatsApp

Concrete advice every day, straight to your phone.

CASE STUDY • TOMATO

Tomato case: steering the irrigation start in **variable weather**

Keeping the plant in good balance.



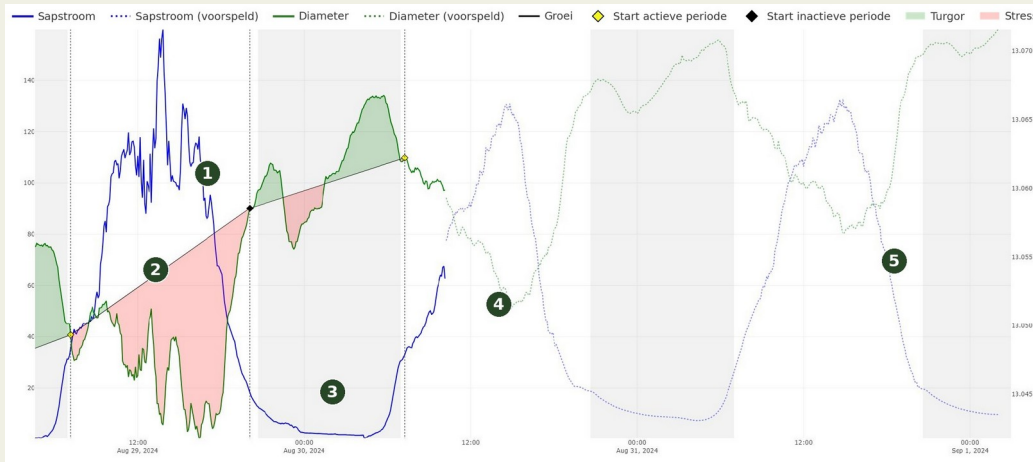
- 1 Early start of irrigation
- 2 Limited loss of generativity (missed potential)
- 3 Turgor (overpressure)
- 4 Irrigation too early (swelling and guttation)
- 5 Low dry-back because irrigation was stopped late
- 6 No activity at the time of irrigation
- 7 Stress

Variable weather makes it hard to keep a plant regular and well balanced. In this example, 8 June was overcast all day. After sunrise the diameter started to drop as transpiration increased and the plant drew on its internal water reserves — a sign of stress. Irrigation started early and the roots supplied water, so the plant could replenish those reserves. During the day the water supply exceeded demand, with a vegetative effect on the plant. That could have been avoided by postponing irrigation and lowering the volume. The next day was much sunnier with a higher sap flow; irrigation was still slightly too early (a cautious choice), which let the plant recover briefly before transpiration exceeded supply and stress set in (generative effect). Irrigation was stopped late and the diameter increased strongly the following night (less dry-back). 10 June was a dark day with hardly any sap flow before 11:00. Irrigation started too early, when the plant did not need water yet — resulting in swelling, a risk of guttation and a strongly undesirable vegetative effect.

CASE STUDY • CUCUMBER

Cucumber case: using the forecast for maximum activity

Growth + stress = strong, generative plant expected



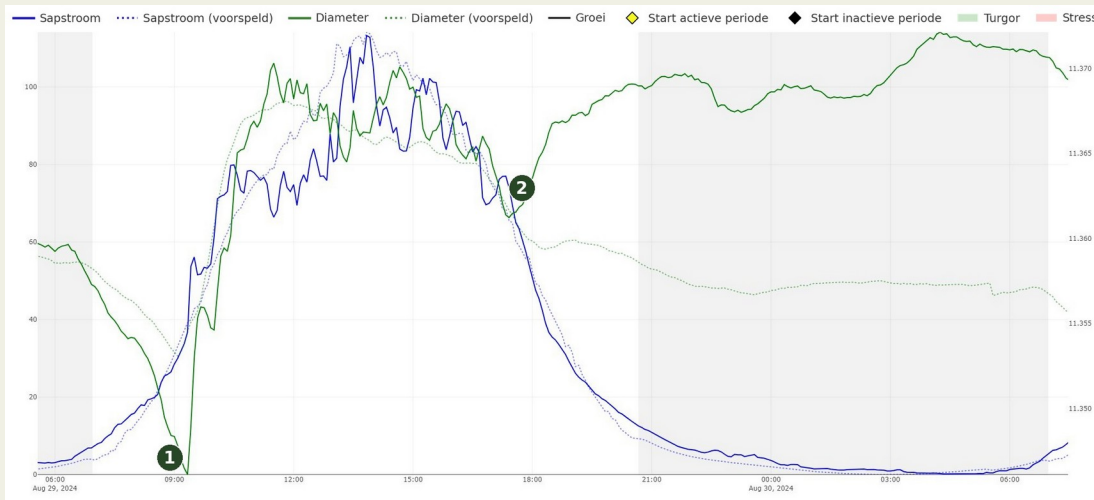
- 1 Growth in diameter
- 2 High stress during the day
- 3 Increased activity from LED lighting
- 4 Good recovery, low abortion risk
- 5 Good recovery, low abortion risk

A 48h forecast of sap flow and diameter shows the expected plant behaviour based on the current climate control and the expected outside weather. The underlying model is trained on the grower's own data and specific greenhouse conditions, and reaches an accuracy of +95% for sap flow and +70% for diameter. With these predictions the grower can assess the expected plant balance and adjust the greenhouse climate in line with their own crop targets. In this example the grower recently started using extra lighting in the morning to raise sap flow activity, aiming for a maximally generative and productive plant with minimal risk of insufficient recovery, shrinkage and flower abortion. With the current climate and the current activity, a strongly generative plant is expected, with overall growth in diameter and sufficient recovery — confirming for the grower that the current strategy is optimal for reaching this goal.

CASE STUDY • TOMATO

Tomato case: evaluating climate actions in real time

Solid line = measured • dotted line = forecast.



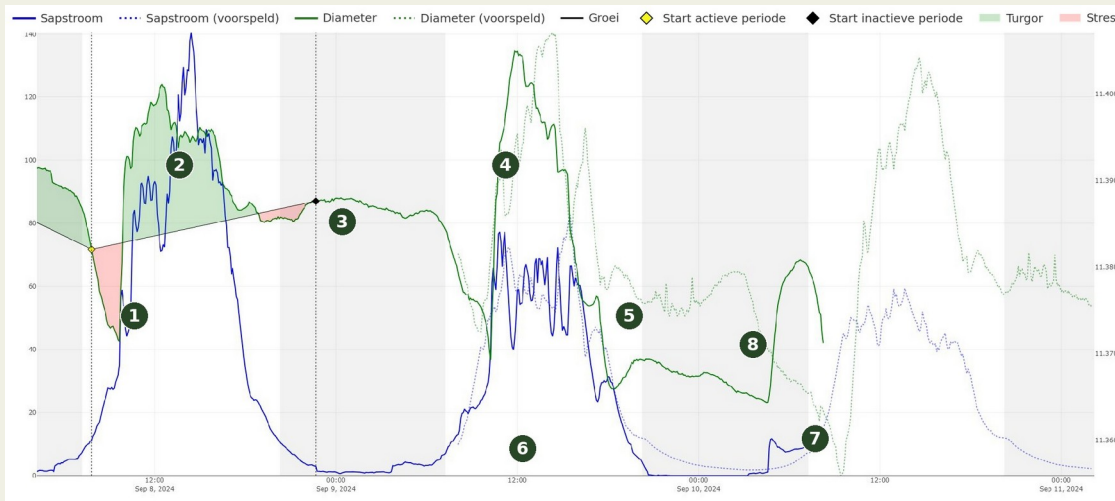
- 1 High dry-back in the substrate
- 2 Vents closed → humidity deficit drops

The realised sap flow and diameter can be compared with the forecast pattern, so the effect of climate adjustments can be followed in real time. In this example a vegetative pattern was expected because of the overcast weather. The grower allowed more dry-back the night before, which caused a deeper drop in diameter (generative effect). When irrigation started just after 9:00, the plant swelled strongly — exactly as predicted. At 17:30 the vents were closed completely and the humidity deficit dropped. Transpiration then decreases and the plant starts storing water, which increases the diameter (vegetative effect). In the evening the grower usually maintains a higher humidity deficit, which explains the difference between the forecast and the observed diameter. This is how plant behaviour can be followed in real time and compared with the forecast, helping the grower decide on climate actions that influence plant balance and productivity.

CASE STUDY • TOMATO

Tomato case: enough drainage, no cracked fruit

With low plant activity and rising EC.



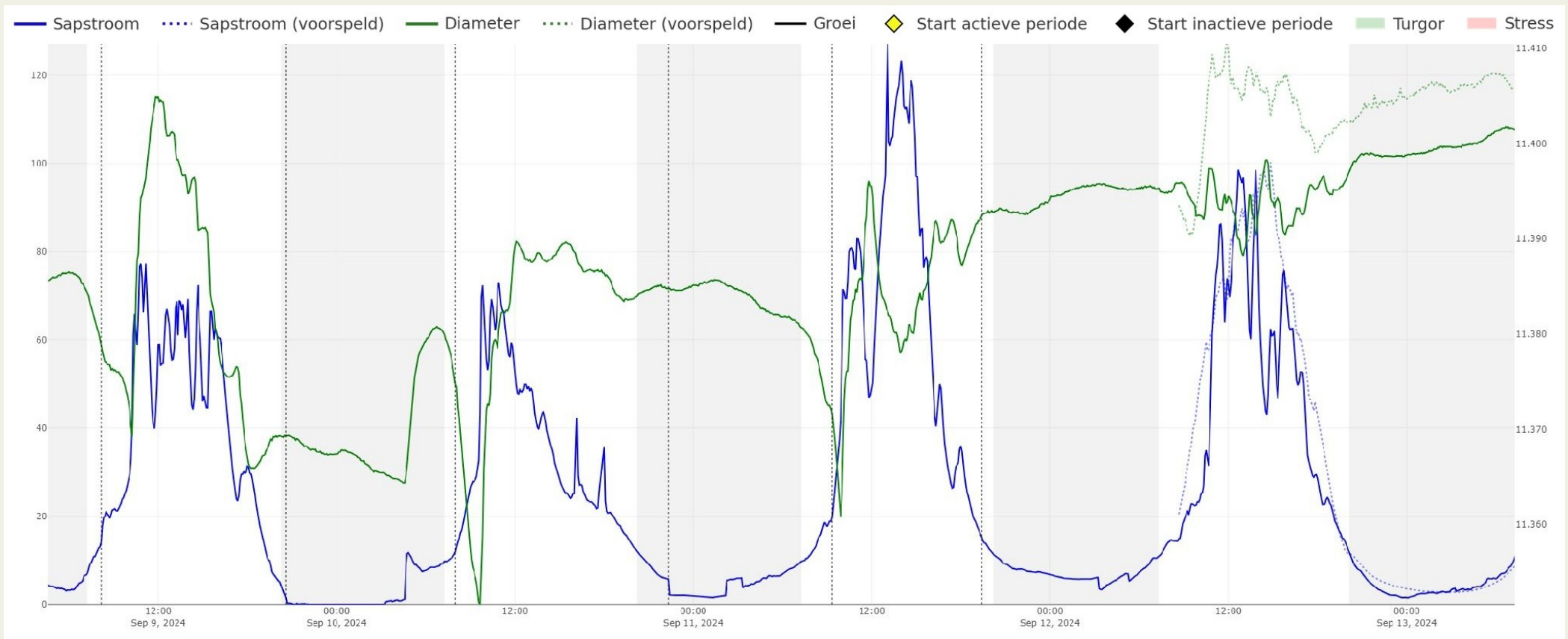
- 1 Strong response to first irrigation (+21 µm)
- 2 High turgor during the day (overpressure)
- 3 High dry-back and humidity deficit
- 4 Intensified response to first irrigation (+36 µm)
- 5 Irrigation stopped early → high dry-back
- 6 Low plant activity
- 7 Low forecast plant activity
- 8 Early irrigation at 4:30 to prevent cracked fruit

On 8 September the plant reacted strongly to the start of irrigation, with swelling and a vegetative plant during the day. Irrigation is stopped early and a high humidity deficit is maintained in the afternoon to reduce the overpressure in the plant. The next morning — overcast weather and low plant activity, accurately forecast — the grower rightly postpones the start of irrigation. EC had risen, however, because of a low drainage percentage the day before, which made the response to irrigation more intense, with an even stronger reaction and more swelling. That increases the risk of cracked fruit in sensitive varieties. Irrigation is stopped early again to reduce the pressure in the plant, but just slightly too early — resulting in more substrate dry-back and shrinkage. At 4:30 an early irrigation follows to compensate and to temper the response to the first irrigation after sunrise, because another dark day with low plant activity is forecast.

CASE STUDY • TOMATO

Tomato case: drainage & cracked fruit — weekly overview

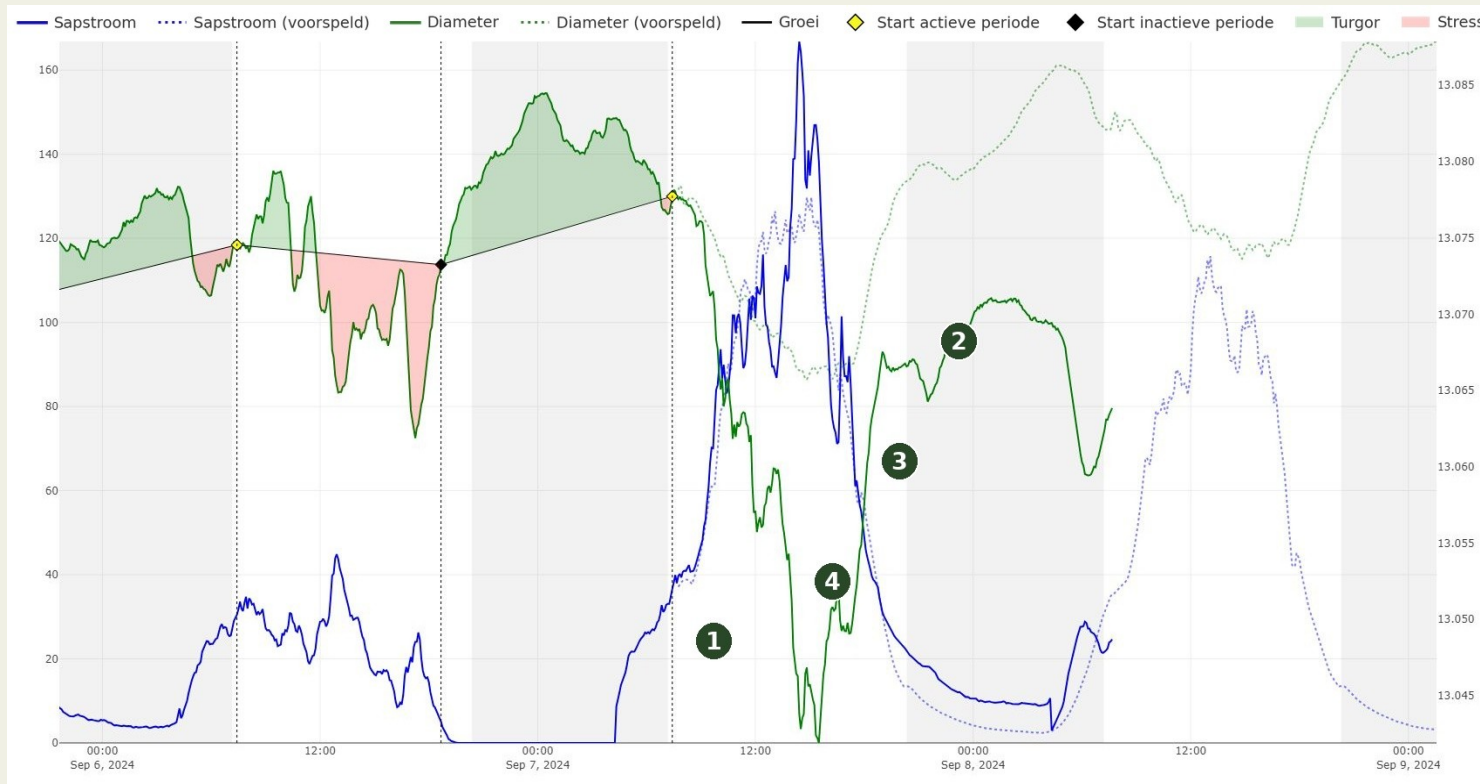
The same case across several days — the control pattern repeats itself.



CASE STUDY • CUCUMBER

Cucumber case: ripening fruit through **maximum activity** (1/2)

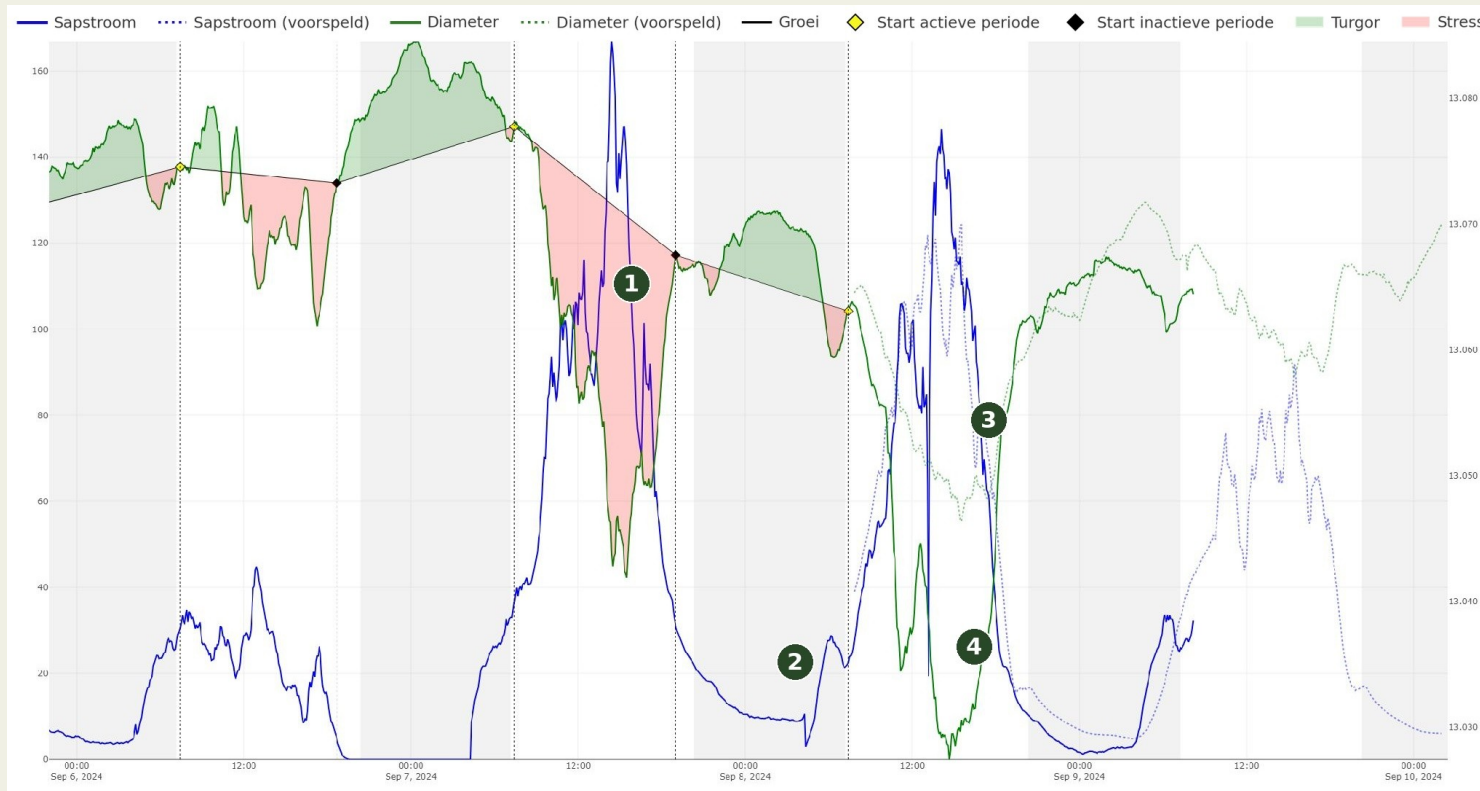
Steering the humidity deficit to limit abortion.



- 1** Very active climate → plant more generative than forecast
- 2** More stress than forecast: climate too active + high HD → shrinkage
- 3** Vents fully open again → recovery stops
- 4** Vents closed (0%) → plant recovers

CASE STUDY • CUCUMBER

Cucumber case: ripening fruit through **maximum activity** (2/2)



- 1 Shrinkage from very active climate and high HD
- 2 Climate stays very active → plant more generative than forecast
- 3 Good recovery and lower HD
- 4 Vents closed (0%) until 23:00 (<10%)



READY 2GROW?

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