PlantControl CX: A league of its own!

NL 5 2014

The production of berries with a high yield and quality requires a lot of experience and is also associated with high labor costs. The optimal irrigation of crops is an important factor that decides between success and failure. The PlantControl CX irrigation computer is ideally suited to meet the needs of a professional berry production. This has already been demonstrated at several farms in Switzerland and Austria. In this newsletter, a case study of the PlantControl CX in a berry farm, located in Kesswil at the Lake of Constance / Switzerland and owned by the family Vogel is described.

Strawberries are undoubtedly one of the most sensitive, but as seen from the financial aspects also one of the most attractive crops in the agricultural world. The professional production of strawberries requires precise knowledge of all influencing factors, such as fertilization, irrigation, substrate type, light availability, and others. Also the right time and the type of disease treatment and pest control have a significant impact on the yield. In addition, strawberry varieties may require different growth parameters.

The optimum irrigation plays a central role. Strawberries need - like other berries too- relatively wet substrates. Depending on which substrate is used - natural grown soil or substrate like Hors-Sol - the irrigation may vary. The water requirement of the plant is, however, not constant over time. Adult plants with large leaf area and many fruits need more water than young plants. Also on hot days, more water is needed than during colder periods. Another problem is the accumulated drain water. This is loaded with fertilizers and fungicides and must be - at least in some countries - collected and recycled or disposed of. This also represents a significant cost factor.

Fig.1 Strawberry crops planted in pots and put in drain water channels as well as in Hors-Sol cultures

The Vogel family produces strawberries, raspberries, blackberries and blueberries in high quality, of with a good portion is sold at the own farm shop. The strawberries are produced either in pots placed in drain water channels, or with the Hors-Sol method (Fig.1).

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Fig.2: Arrangement of the irrigated areas, the sensors , valves and radio repeaters

In 2012, Mr. Vogel has decided to invest in a PlantControl CX irrigation computer, since the irrigation monitoring of different cultures with different water demand required a great deal of his time. Due to the very positive experiences during 2013, further beery fields which are farther away from the farm were integrated in 2014 into the automatic irrigation control by means of radio repeaters.

Although the PlantControl CX is capable of controlling three different fertilizer injectors, an existing Netajet system was additionally connected to the system.

According to berry specialists, it is very important that strawberry crops should not get too dry, nor should they get too wet. Too dry leads to too small fruits and reduced yield. A too high moisture leads to increased susceptibility to fungal infestation and also to reduced yield. However, the mean soil moisture should be quite high.

The PlantControl CX not only allows setting the run-time exact to the second, but also the automatic monitoring of a defined moisture band-width, resulting in virtually constant substrate moisture over time (Fig. 3). At the same time the system can be configured to minimize drain water surplus. The analysis of the data also shows that strawberries obviously need water and fertilizer during the night too (Fig. 4) and experiments at other berry producers with raspberries and blackberries confirm this finding.

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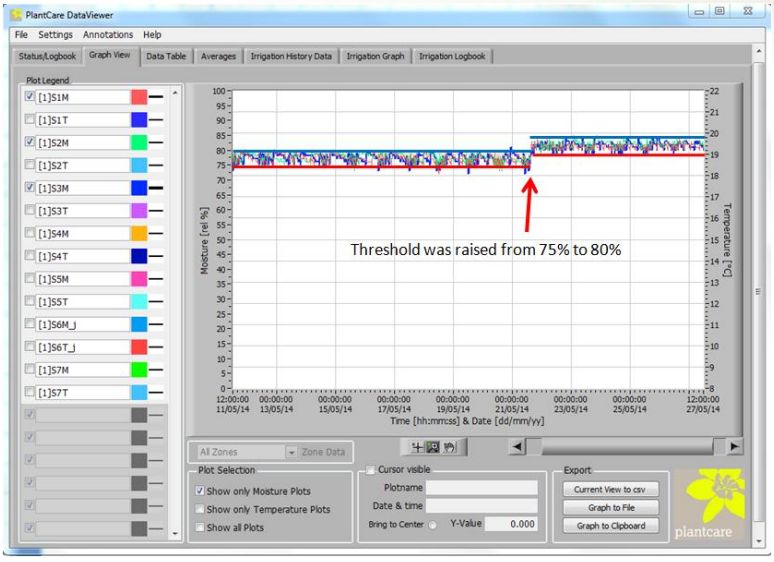


Fig.3: Soil Moisture measurement for sensors 1, 2 and 3.

Figure 3 shows the soil moisture measurement of three sensors from May 11th till May 27th 2014. The diagram gives an impression of the precision of the sensor measurements and the irrigation control of the PlantControl CX system.

At May 21st at 1.40 pm, the dry threshold at which irrigation starts was set 5% higher, what clearly shows up in a jump in the curve.

Figure 4 shows the moisture curve (red) from May 21st till May 26th 2014. It is very easy to see how accurately the irrigation starts when the 80% threshold is reached. The blue curve shows the temperature profile. The blue bars show the irrigations, each lasting 90 seconds, so that the drain water is reduced to a minimum. In addition, the night times are marked in gray.

It turns out that irrigation was triggered during the day 7 times and in the night 2-3 times.

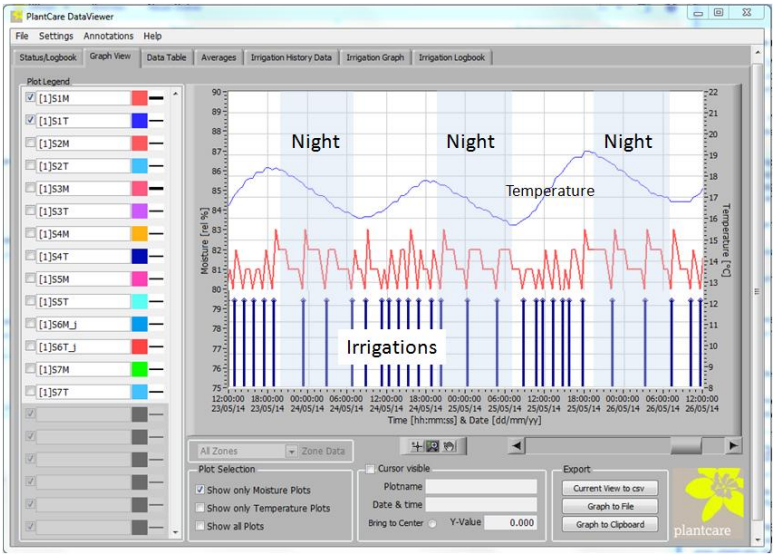
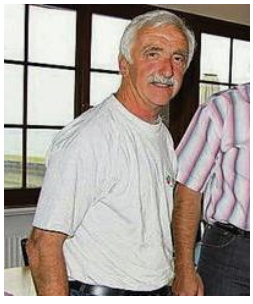


Fig.4: Soil moisture, soil temperature and triggered irrigations

Apparently, plants are able to store energy during the day that is used during the night for a reduced metabolism. When irrigation would be locked during the night, then the soil moisture would fall below 50% until the morning, which would probably not be optimal for the plants.



„Before using the PlantCare system, monitoring and controlling the irrigation system was one of my main tasks," says Mr. Vogel. "Delegating this important job was never an option as I am the only one with the necessary knowledge. With the help of the PlantControl CX, I can now take care of other important tasks on my farm and the system will send me alert notifications, whenever I need to intervene. In addition, it was totally impossible to achieve a uniform moisture bandwidth in the past, which is just standard today thanks to new technology. The PlantControl CX notes even when a dry east wind blows, which dries the plants much quicker and automatically compensates it with more water. The uniform soil moisture prevents any waterlogging and saves me money, as I have virtually no loss of plants anymore. I cannot imagine working without the PlantCare system anymore and can recommend it to any farmer facing similar challenges."

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