Sustainability in its purest form

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The whole world is clamoring for greater sustainability in agriculture. At the Fischer family's organic vegetable farm in Brütten, canton Zurich, this is already a reality. Organic farmers Max and Daniel Fischer are proving that significantly greater yields can be obtained together with much lower water consumption. Since 2013, these two innovative farmers have put their trust in PlantCare's sensor-controlled irrigation solution. Compared with 2012, father and son have increased their yields by 45% and reduced water consumption to less than a third. Their investment has been recouped in less than a year.

Organic farmers Max and Daniel Fischer with their new PlantControl CX irrigation control system.

Daniel Fischer is obviously satisfied. Since he began using PlantCare's sensor-controlled irrigation system in 2013, he has fewer irrigation problems with watering his plants.

No more timers

Irrigating vegetable crops appropriately is a challenge. Before Daniel Fischer started to use the new technology, he always glanced at the ground before turning on the irrigation to determine the right amount of water. Or he set a timer. Assessing the situation yourself is possible, but it requires in-depth knowledge of the soil. Pure guesswork, he says looking back. And there is never enough time. A major problem when producing vegetables.

Irrigation is adapted to the soil conditions

On their small organic farm in Brütten, canton Zurich, Daniel Fischer and his father cultivate two and a half acres of vegetables and salads, which they sell direct to the public at farmers' markets in Zurich and in their farm shop. A family friend first told them about the smart irrigation computer that measures the soil moisture with innovative sensors and automatically controls both the time when irrigation starts as well as the amount of water.

After giving the matter some thought, both father and son decided to take a chance. In conjunction with PlantCare, a moisture profile of the soil was produced in three of their greenhouses in the fall of 2012.

Based on this profile, the ground area was then divided up into seven zones, in which the irrigation tubes are each operated by an independently controlled valve. Irrigation can thus, be adjusted for each zone - depending on the permeability of the soil and the cultivated plants' requirements.

Each type of plant gets its own moisture bandwidth

In spring 2013, the system was fully installed and ready for its first season. Every hour, 14 wireless sensors inserted about 15 inches deep into the ground transmit a radio signal with the current soil moisture level to the controller from the different zones. For each zone, a minimum and maximum soil moisture content is defined (moisture bandwidth). If, for example, the minimum moisture level is set at 45%, the appropriate valve opens and irrigates the zone as soon as this level falls below 45%. The zone is only irrigated until the moisture level in the soil does not exceed the maximum level of, for example, 95%. On the one hand, this avoids any over-watering and, on the other hand, the irrigation control system keeps the moisture level within the set bandwidth and prevents the plant from having to adapt constantly to new conditions. This freedom from stress results in higher yields and healthier plants.

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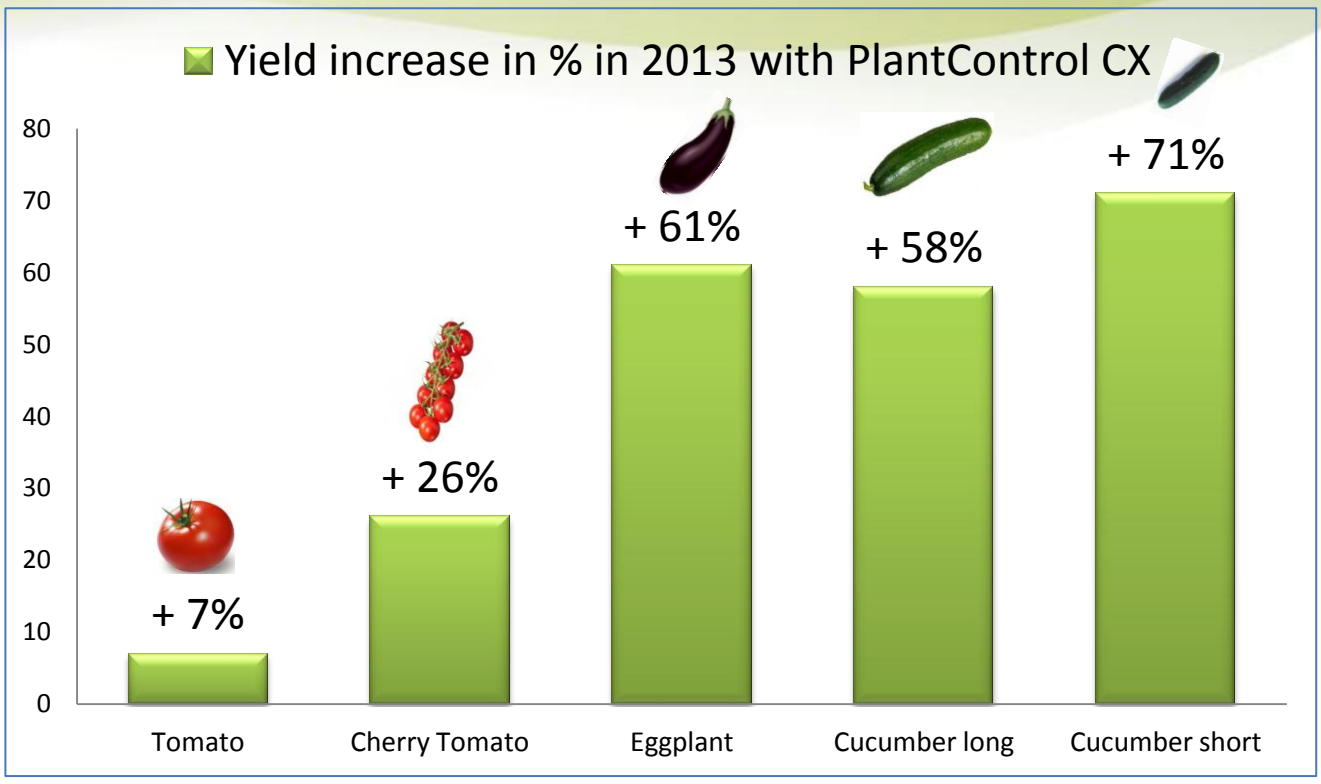


***2013**: Average increase in yield of 45% using the PlantCare system compared with manual/timer-controlled irrigation in 2012.*

Malfunctions reported directly by text message

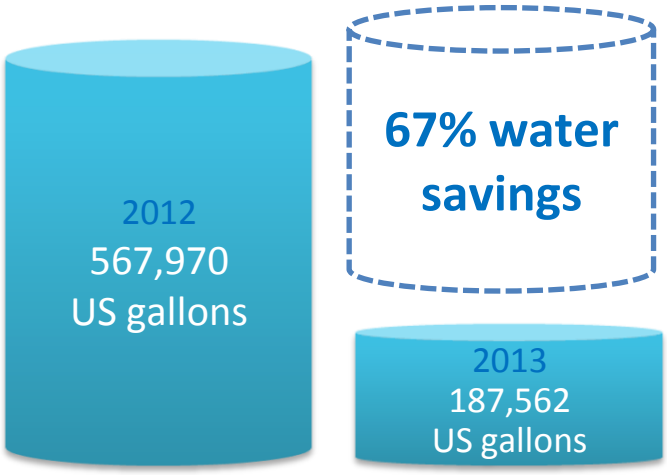
The diagnostic software in the irrigation control system constantly monitors all parameters. If, for example, no increase in moisture is observed after an irrigation cycle, the system informs Daniel Fischer with a text message. This means that faulty valves, clogged water filters or faulty pumps can be repaired before the plants suffer or before there is any danger of losing an entire crop. Not only do plants live free of stress, but Daniel Fischer can also take care of other things on the farm with a clear conscience.

Fertilizer applied directly with each irrigation cycle

The diluted fertilizer is connected directly to the irrigation system and added in small amounts with each irrigation cycle. The supply of nutrients is thus kept as constant as possible in the soil. What is special about the bio-cultures is that the fertilizer used by Daniel Fischer consists of diluted molasses and is therefore sticky. To prevent the pipes and valves from being blocked permanently, another irrigation control mechanism comes into play. The supply of fertilizer is automatically shut off a few minutes before the irrigation cycle comes to an end, which means that only water flows through the system and cleans all of its components.

Less fungus and practically no more red spider mites

Organic farmer Daniel Fischer also confirms what has already been established at the Zurich University of Applied Sciences in irrigation trials with eggplants using the PlantCare system.



67% water savings with sensor-controlled irrigation.

In the very first year with the new system, he has observed considerably less fungus and practically no more red spider mites.

Worthwhile investment

For Daniel Fischer, the investment paid off in its first year, without counting the savings in labor and energy costs. On the same area of land, he harvested 45% more vegetables than in the previous year while reducing water consumption by 67 percent. He is also particularly pleased with the reduction in time needed to attend to the irrigation of his plants. No doubt about his satisfaction: "I now have much more time for other things on our farm."

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