Thanks to research, technical innovations, better understanding and experience, growers continuously improve on production and quality. Suppliers also play an important role in increasing yield and reducing costs. Substrate producer, Grodan, advocates The New Watering: Achieve more with less through maximal recycling of drain water and fertilisers. Tomato growers Arien and René van der Lans share their positive experiences.

The crop of cocktail tomatoes at René and Arien van der Lans, is nearing the end. The grower cooperative Prominent, to which they belong, has stopped the use of ethrel in the cocktail segment so it takes a few weeks before the last trusses are harvested and the hectic change-over period starts. Between jobs René van der Lans finds time to talk to cultivation adviser Gert-Jan Goes, of Grodan. The subject of conversation is the brothers’ experience with The New Watering.

Drain percentage noticeably lower
Over the last few years Van der Lans has, step-by-step, optimised the watering. The primary reason was to improve the production results. At the same time the brothers hoped to reduce the emissions of nutrients and water use.

“Our expectations were largely met”, says René. “We managed to considerably lower the drain percentage over the last three years. Previously, on a sunny day, about 40% of the total water supplied went into the drain. Some colleagues still work with these sort of percentages. We now have on average 25 to 30%.”

He takes a critical look at the amount of drain in relation to the total water supplied. “In general: the more water supplied, the lower the necessary drain percentage. As the radiation and evaporation decrease, we reduce the watering. Then we keep the drain percentage somewhat higher so that the drain volume doesn’t get too low.”

Less waste
In order to have less drain the tomato growers first wanted to get the osmosis under control. Three years ago, new, better membranes were installed and more of the water was pumped back for recycling. This resulted in both the osmosis running at a slower pace and a lower sodium level.

Van der Lans: “Previously the sodium level in the system used to rise so quickly that we regularly had to flush through the drain..."
water. Now we only have to do that once per year.”

Consultant Gert-Jan Goes argues that a minimum of 5% of the drain water on a nursery is lost through evaporation, leaks in the system and flushing. Less drain, therefore, also means less water wastage. That is the first saving. However, even more important is the contribution that less drain makes to an optimal root environment and better productivity. “Other factors also play a role,” continues Goes.

The New Way of Growing

This move towards The New Watering is partly motivated by developments in the community, such as the reduction in emissions laid down by the European Water Framework Directive; increasing scarcity of drinking water; and the ever rising costs of energy. By using minimum amounts of water, fertilizers, crop protection products and energy, and by limiting the emissions of nutrients, residues and CO₂, growers do themselves a service as well as the public.

Goes: “You should see the emergence of The New Watering from that perspective. As greenhouses and cultivation systems are becoming more closed, it is important to optimise the watering. Each development has its own effect on the crop. Take evaporation. On cold, dark days screens are being used more often to conserve energy. This leads to less evaporation from the crop. You need to anticipate that before hand. On the other hand, on warm, light days you need to be able to speed up and let the plants work harder.”

This means that you must be prepared to fluctuate the watering frequency and drain percentages in relation to the climate and the activity of the crop. You have to see The New Watering as a continuation of The New Way of Growing. Van der Lans agrees. “After the longest day in particular, we water more cautiously.”

Optimal watering first requires a good start in and on the substrate slab. The position of the drippers in relation to the plant and the drainage hole is very important; likewise the drainage holes need to be carefully positioned.

Position of the drippers

“If the slab is 133 cm the nearest dripper should be 20 cm away from the drainage hole,” explains the cultivation advisor. If it’s too close to the hole, the water runs away without being used, the slab is not sufficiently refreshed and differences can arise in the water content, EC and mineral balance (see figure). In such a case the irrigation efficiency is low. Also, the number of drippers and the distance between them need to be the same for all slabs.

Goes: “The drainage holes should be cut at the lowest point of the slab in the direction of the slope. Growers can download a document from our website in which we describe fully how to prepare rockwool slabs for the planting of the crop.”

Irrigation efficiency

Getting off to a good start makes it much easier to obtain a high irrigation efficiency — maximum refreshment and lowering of EC in the slab with minimum drain — throughout the whole cultivation period. There are more reasons. Given that fewer losses equate to a more efficient watering strategy, generative cultivation is also easier.

The advisor: “Every time you water it’s a vegetative action. When you become more precise you can water less and less often. That is favourable for the condition and resilience of the plant. It decreases the pressure of disease, such as Botrytis, and it saves energy. In addition, the balance of minerals, at a certain drain percentage and a lower EC strategy, remains at a better level. That is particularly important for calcium and potassium.”

Fewer emissions

When asked how much he’s been able to save in the last few years, Van der Lans says: “We religiously register water use but we tend to buy in and store a large amount of fertilizer when the price is right. That makes it difficult to compare with the past. But we do make savings by being more precise, also in energy. The most important thing is that we better manage the root environment now and our emissions have greatly reduced.”

Summary

Precision growing is favourable for the crop, saves water, fertiliser and energy and lowers the emission of nutrients. Starting with good water, with a low sodium level, is the basis and reduces the need to flush through the drain water. When the drippers are well positioned on the slab, in relation to the drainage hole, a lower drain percentage is sufficient to refresh the slab and the EC strategy can be lowered. This is better for the mineral balance in the slab.