



Christ Monden of De Kruidenaer (right) and Jos Duijvestijn of Voshol with the basil crop grown on water under hybrid lighting almost ready for harvesting.

Herb grower Christ Monden of De Kruidenaer:

“Stronger and healthier basil plants thanks to LED lighting”

Christ and Jacqueline Monden of De Kruidenaer in the Netherlands installed hybrid lighting in their new basil greenhouse a year ago. Their experiences so far have been positive, especially as far as quality, shelf life and resilience are concerned. “We want to grow the best basil in Europe.”

De Kruidenaer is a household name in fresh herb cultivation, with 8.5 hectares of glass, 23 hectares of open field production with tunnels, and a packaging company with a staff of 60. Basil on water is currently one of the company’s biggest crops. Sweet pepper production still accounts for a major part their output, with 5 hectares, but the owners

expect this to make way for fresh herbs within the next five years. They also grow lettuce on water on 1 hectare.

The company currently supplies 24 different herbs all year round and also imports them if they run out of stock due to high customer demand. Their customers are retailers, foodservice companies and exporters.

Hybrid lighting

In 2017 Christ Monden installed a new 14,000 m² greenhouse with diffuse glass, air humidification and hybrid lighting to grow basil on water (hydroponically). It is grown in six 2,100 m² tanks which he calls “ponds”. He also propagates young plants in this greenhouse and

transplants them into rafts with plant holes after 1-2 weeks. The tanks are parallel to each other, with no aisles in between, which makes optimum use of the available space.

The rafts with young plants are placed on the water on one side of the greenhouse and drift over to the other side, where they are lifted out for harvesting after between 3½ and 5 weeks. The short growing cycle, partly due to the intensive lighting, ensures a continuous supply six days a week. In addition to diffuse daylight, the plants also receive artificial light from a combination of Oreon Grow Light LED fittings and Gavita HPS, both of which have a maximum output of 55 µmol/m²/s. The light fittings hang above the crop in a chequerboard arrangement and provide both light

and heat. The lighting plan was produced by Voshol Warmte-Elektrotechniek, who also installed the system.

Water-cooled LEDs

Why did Monden choose hybrid lighting? “These LED fittings came out best in the trials we ran in 2016. The plants grew very uniformly and were super strong. In the end we opted for 50% HPS and 50% LED, because basil can really use the warmth given off by the HPS. We can light the crops with one or both types of lamps. Sometimes it’s too hot outside to turn on the HPS, so we just use the LEDs. They are water cooled. We can recover and reuse this heat (50°C) for heating the tanks, which means we don’t waste any energy.”

Water cooling has another benefit, says Jos Duijvesteijn of Voshol. “It prevents the light fittings from getting too hot so they last a lot longer. The light output from the LEDs is also much higher and they use half the energy of HPS lights.”

Improved quality

The new greenhouse was completed at the end of August 2017. Eighteen months down the line, Monden doesn’t want to take stock just yet, but his experiences so far have been positive. “We can harvest and plant six days a week, and that’s the most important thing. We achieve the kilograms we are aiming for and the quality is a lot better than it used to be. And judging from our customers’ reactions, the plants have a better shelf life. We also managed well last summer, when temperatures topped 35°C - better than I’d expected.”

The lights are used as much as possible, up to 20 hours a day. When they switch them on or off, and which lights they use, depends on various factors including market demand. “Over the past year I used the HPS lights more than I had expected to, but the crop can tolerate the extra heat well. We usually use HPS or a combination of both. We don’t often use the LEDs on their own just yet.” Monden reckons they ran the LED lights for 2,000 hours over



The rafts with young plants in the new greenhouse. The rafts are lifted out of the water at the other end of the tank and harvested after 3½ to 5 weeks.

the past year, although he can’t give us exact figures. But thanks to the LEDs, he can now light the crop for longer and get started earlier in the season, extending it by roughly four to six weeks.

Plant resilience

One of the consequences of the new greenhouse is that De Kruidenaer is having to import or buy in less product to meet customer demand. Customers prefer locally grown basil with the PlanetProof sustainability label. “We aim to grow for resilience, because basil is a very fragile plant. It’s a proper prima donna that requires constant attention. There are no guarantees with this crop.”

Mildew is the biggest problem, says Monden. “We keep a close eye on the relative humidity. We don’t have a disinfectant and we don’t use chemical crop protection either. It’s very simple: you don’t use chemicals in hydroponics. We have insect mesh, but some still manage to get inside, especially aphids or whitefly. We only use biological controls against those.”

Monden is convinced that the LED lights

help make plants more resilient. “During the trials we saw a stronger crop, with sturdier leaves and shorter internodes,” he says. “The colour was also better. I’m convinced this system makes the basil more vigorous. We’re seeing these results again in the current crop.”

Investment

Although buying the LED fittings bumped up the investment in the new greenhouse quite considerably, Christ and Jacqueline Monden are happy with the results. “When we started, we thought: ouch, that’s quite a lot of extra money. But this kind of investment is worth it if it helps you achieve your goals. Thanks to the LEDs, we can now light the crop for longer, both in the mornings and in the evenings, especially at this time of year. We can now grow almost all our basil ourselves, especially in the season. The aspect I’m happiest with is the quality of the crop. We want to grow the best basil in Europe. And stop growing sweet peppers altogether in five years’ time. We’re getting there!”



Thanks to the LEDs, De Kruidenaer can now light the crop for longer and start earlier in the season, extending it by roughly four to six weeks.

Summary

For the past year, De Kruidenaer in the Netherlands has been growing basil on water in a new greenhouse with diffuse glass, air humidification and hybrid lighting. Water-cooled LED light fittings are enabling them to light the crop for longer. The results have been positive so far, especially with regard to continuity, quality, shelf life and plant resilience. This is giving grower Christ Monden a helping hand in his quest to grow the best basil in Europe.