



Dutch horticultural solutions contribute to higher yields

and allow a sustainable way of using water and nutrients

In horticulture worldwide, yields are decreasing more frequently as a result of water scarcity. In addition, at many farms lack of knowledge on efficient production methods has led to a range of problems and further decreased water availability. Giving too little water can hinder the growth of the crop and too much water can also be detrimental. At the same time this leads to unnecessary costs and at the expense of water and nutrients. Bosman Van Zaal and Hoogendoorn respond to these demands by supplying horticultural solutions, training and support worldwide, in Kenya amongst other countries.

To determine the plant's water requirements, most Kenyan farmers look at the state of the crop (fresh, dry, strong, weak, growth speed) and the condition of the soil (structure, humidity, colour). When only human assessment is used to determine the irrigation strategy, this requires much

expertise and long experience. All relevant factors such as the solar radiation and crop evapotranspiration and specific circumstances need to be weighed up. This manner of estimation of the water requirement is mostly subjective and not based on exact information. It is obvious that too little water negatively effects growth, production and quality of crop. Also, over-irrigation, which results in a too moist soil

that contains little oxygen and hinders root fixation and nutrients uptake. It also causes unnecessary expenses for water and fertilizers and the wasting of valuable water. **Improved methods of Irrigation Scheduling** This is why the FAO, the Food and Agriculture Organization of the United Nations developed guidelines already in 1995 for improved methods of Irrigation Scheduling which give a



higher yield and prevent water wastage. According to many research studies solar radiation is the most significant factor for crop evapotranspiration and dehydration of the soil. By measuring the radiation and calculating the total energy in Joules/cm² a good image of the actual water requirements of the crop is created. This means that relatively simply, and at limited cost, a first crucial step can be made in the direction of optimising the crop production and quality, increasing the growth return and making the production process more sustainable.

Irrigation control based on solar radiation

The advantage of using computer systems and sensors for outside conditions such as solar radiation is that this allows the water requirements to be assessed and displayed in an objective number. This helps to make a better decision about the right moment to irrigate. Hoogendoorn provides an attractively priced system that controls irrigation in greenhouses or outdoor cultivation: the user-friendly iSii compact. The iSii compact is able to automatically regulate irrigation by taking into account the solar radiation sum. Thus based on the crop evapotranspiration and dehydration of the soil the proper starting moment, the frequency and duration of the irrigation cycle can be selected. The pH value and EC level (nutrients) can be set to compose the right recipe to grow a healthy crop.

Expandable with climate controls To avoid plant stress, pests and diseases it is for greenhouse growers important to have a uniform greenhouse temperature with constant and balanced humidity. The advantage of the iSii compact is that thanks to its modular structure, the system can easily be expanded with climate controls such as recirculation fans, screens, heating and Pad and



Fan cooling. For these controls an aspirator box with sensors that measure greenhouse temperature and humidity is needed. Based on the difference between the measured temperature and the set desired temperature e.g. roof vents can be opened or closed, and circulation fans will be switched on or off.

Solar powered greenhouse optimization

In countries as Kenya we receive an average of 9 to 10 hours of sunlight per day. That is why an increasing number of greenhouses are being equipped with solar panels, the so called solar powered greenhouses. In case the solar panels are placed on the greenhouse roof, it is necessary to reposition the vents during the day to avoid shadow cast. The ventilation control in the iSii compact can reposition the vents automatically for you so the panels will be kept fully exposed to sunlight. To accomplish this, you need a weather station (which includes GPS) to make accurate measurements of the position of the sun.

Efficient water management

Partner Bosman Van Zaal provides complete solutions for every horticultural business worldwide. Complete greenhouse projects can be realized. This includes greenhouse construction, irrigation- and CO₂ installations, maintenance service and support. One of the unique installations that contributes to sustainable water management is the patented

irrigation unit Cyclone, which allows for the removal of bi-carbonates from well water. In return it gives a better mix of water and fertilizer. Experience has shown that this reduces fertilizer use by at least 10%. This system also can be controlled with the Hoogendoorn iSii compact control system.

Experience in Africa

Bosman Van Zaal and Hoogendoorn have a wealth of experience in various African countries. Together with Green Farming partners they have been involved in a range of projects in Africa in collaboration with local authorities. With Hoogendoorn and Bosman Van Zaal as partners a long term investment and partnership is key, helping you as a farmer to always be a step ahead and reaching the maximum results out of your greenhouse or open field crops.

Do you want to view a simple explanation of the iSii compact? Scan the QR code for an animation



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