

# Greenhouse matters – part 1

*Elly Nederhoff*

*CropHouse Ltd, New Zealand*

*Elly@CropHouse.co.nz*

*Published in the Grower 63(4), 2008, p. 46-48*

This new feature presents information on greenhouse horticulture from overseas, mainly in the Netherlands. The texts below are especially written for the NZ Grower, based on information from various sources (see at the bottom) and personal visits. Topics and themes will vary from month to month. This first issue covers some general topics, namely open days, semi-closed greenhouses, new greenhouse sites and energy.

## **Greenhouse open day festivities**

An overwhelming 185,000 people visited the open days of the Dutch greenhouse industry held on 5 and 6 April 2008. About 300 growers in 24 regions in the Netherlands opened their greenhouse to showcase their production process and products. This was the 31<sup>st</sup> edition of the annual event known as 'Kom in de kas'.

Early April is the beginning of spring in Holland, and people are eager to get out. The greenhouse industry presents themselves at their best. The participating sites are welcoming and festive. Not only do they offer information, but also demonstrations, food tasting, entertainment, food and drinks. It is very much a family festival with fun activities for the kids. This year's theme was 'Your future in flowers and food', and focused on opportunities for study and work. Organisers say there were noticeable more young visitors this year. New promotion material is produced each year addressing the general public or in this case the youngsters.

With 10,000 hectares of glasshouses and 150,000 people working in it, the greenhouse industry is one of the largest employers in the Netherlands. It becomes more difficult to find enough employees, skilled and unskilled. This annual event contributes greatly to the good reputation of the industry as a producer and employer. Perhaps this is an idea for the NZ horticultural industry? Source: [www.komindekas.nl](http://www.komindekas.nl).

## **Seminar on closed and semi-closed greenhouses**

Recently a growers seminar called 'Energiek2020 event' was organised in Holland with special attention on closed and semi-closed glasshouses. The seminar gave a good overview of the many projects and techniques, indicated by the term 'conditioned growing'. Semi-closed greenhouses and 'conditioned growing' are for real and have become an integrated part of the Dutch greenhouse industry. There is at least a dozen multi-hectare semi-closed greenhouses, and more are built.

First a brief explanation of the principle: the greenhouse vents are kept closed, or nearly closed, even in hot summer conditions. Cooling is achieved by using heat exchangers that use cold water from the aquifer (= water layer deep in the ground). This water absorbs the heat and is then pumped back into the underground. In summer heat is pumped into the aquifer, while in winter the luke-warm water is pumped up again and used for heating. Because this water is only tepid instead of hot, the heat transfer between water and air must be very efficient. Various techniques of heat transfer have been developed.

The advantages of (semi-)closed greenhouses are energy saving and increased production due to better CO<sub>2</sub> enrichment. Depending on the amount of heat that is stored, greenhouses can become energy-neutral or even produce heat. A grower in Venlo is already supplying heat to a rest home. Researcher/developer Peter Klapwijk was the seminar's key note speaker. He stated that the production in semi-closed greenhouses is now 15 % higher than in a normal greenhouse and this will rise to 30% in 2018. Energy use is currently reduced by 25 %, but this will turn into energy production in ten years time.

### Challenges

(Semi-)closed greenhouses offer a lot of challenges though. The investment is enormous, especially for drilling the pipes into the aquifer. This is not feasible for small greenhouses, so the (semi-)closed projects are always on a scale of several hectares glasshouse. Due to the magnitude, the innovative nature and the risk associated with these new developments, the growers receive considerable innovation subsidy and/or tax benefits. In return their greenhouse becomes a demonstration project, and they have to share the information.

Growers using (semi-)closed greenhouses have discovered the strengths but also the weaknesses of their systems. Climate control is more complicated than in normal greenhouses, and growers say they have to learn again how to grow. Some people are critical about the whole concept, or about the excessive costs, or concerned about the aquifers. Because the government has set goals for the greenhouse industry to become energy-neutral, the industry is encouraged to adopt very drastic measures such as (semi-) closed greenhouses. Only time will tell if this innovation will be the break-through that is hoped for.

### New greenhouse locations

Two new greenhouse areas in the vicinity of Amsterdam have come into production recently. One area called the Grootslag is now 80 ha and is set to grow to 280 ha. The other, Agriport A7, is now 70 hectares, and has space for 480 ha glasshouses.

The new sites are not all expansion, but also relocation. Some growers have to move from the traditional glasshouse regions which are now claimed for residential development. Also, growers need more space nowadays because only large-scale is economic. Another reason is that glasshouse growers must combine their energy supply. The hub of most new developments is the power plant, which is generally a CHP (combined heat and power plant). Most are gas-fired but there are developments towards CHP fired by biofuel.

For example, six growers in Agriport have just started their 200 MegaWatt gas-fired CHP. This produces heat, CO<sub>2</sub> and electricity. A part of the electricity is used by the grower (e.g. for lighting) but the major part of the electricity is sold to the grid. This power plant is large enough to supply power to tens of thousands of households. Localised (distributed) power production is beneficial for power companies, the community and the growers. Some tomato growers earn more income from electricity than from tomato production.

### Less heat & enough light

Plants benefit from abundant light from the sun. It does not happen often that there is too much light, not even in summer. But the amount of heat that comes with sun light is often too much for plants. In summer it would be good if light could be let in and heat could be blocked out of a glasshouse.

A new type of glass with an anti reflection (AR) coating is advertised as doing exactly that. The manufacturer of Groglass AR-glass claims their product has 8% higher transmission of light (PAR = photosynthetic active radiation) and a 10% lower transmission of heat (NIR = near infra-red radiation). See [www.groglass.com](http://www.groglass.com).

There are other products too that aim to overcome excessive temperature in sunny weather. A product called ReduHeat from Mardenkro can be sprayed on a glasshouse to reflect the heat while transmitting a good percentage of light (PAR). However, this product reduces the light transmission of the glass it is sprayed on. See [www.mardenkro.com](http://www.mardenkro.com).

The new glass and the spray both result in a cooler greenhouse climate, which is a great advantage in summer. In Europe it is especially recommended for closed greenhouses, so that less heat has to be removed by active cooling. Like everything new, these products are not cheap.

**Sources:** [www.weekbladgroentenenfruit.nl](http://www.weekbladgroentenenfruit.nl); [www.energiek2020.nu](http://www.energiek2020.nu); [www.kasalsenergiebron.nl](http://www.kasalsenergiebron.nl); [www.vakbladvoordebloemisterij.nl](http://www.vakbladvoordebloemisterij.nl); [www.agd.nl](http://www.agd.nl) and more.

**Other useful links:** while on internet, check out our new website [www.crophouse.co.nz](http://www.crophouse.co.nz) and also the website belonging to CropRecord and CropAdvice: [www.cropadvice.co.nz](http://www.cropadvice.co.nz). For further info contact us at [Elly@crophouse.co.nz](mailto:Elly@crophouse.co.nz) or [Bert@crophouse.co.nz](mailto:Bert@crophouse.co.nz).