

## Energy loss through leaking greenhouse cladding

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This series is about energy saving in greenhouse operations in view of the rising energy prices. The focus is on greenhouse heating, since this is where most of the energy is used for. Some basic energy-saving actions can be taken, some don't even require an investment. This applies to repair of leaks in the greenhouse cladding and adjustment of vents opening. These actions should get top priority before the winter arrives. Vents may need to be checked and adjusted regularly throughout the winter. Basic actions and common sense make a difference. The photos tell the story.

### Broken glass

Broken glass panes in the greenhouse cladding cause heat loss. The worst energy-wasters are holes in the roof (**photo 1 & 2**), because they act as a chimney. Heat rises and rapidly escapes, while cold air replaces the warm air. **Photo 2** is an Infra-Red image of the hole in **photo 1**. It shows there is nothing between the plants and the cold sky. Some greenhouses have structural gaps between glass panes or between vent and frame (**photo 3 & 4**), causing major heat loss throughout the greenhouse. Holes in walls (**photo 5**) are less detrimental, but on the other hand they cause an unwanted draught. This not only costs energy but moreover the air flow can carry pests and diseases. Random leaks also cause temperature gradients: cold spots appear while other places remain warmer. These are all good reasons to do some necessary repairs before the winter.

### Vents

A particular problem is wear and tear of the vents (**photo 6**). After some time, some vents don't close anymore. Uncontrolled vent cracking causes a lot of heat loss. Proper tuning and adjusting of the vents and vent motors (**photo 7**) can reduce this problem. Some computers auto-calibrate the vent opening, but this often does not completely overcome the problem. Regular manual adjustment can be required. Also, if two doors are left open on a cold day at opposite sides, the air exchange rate can double and the heat loss increases considerably (**photo 8 & 9**). Common sense and basic actions are the very first steps towards energy saving, and they do make a difference.

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## Energy in greenhouses - part 24

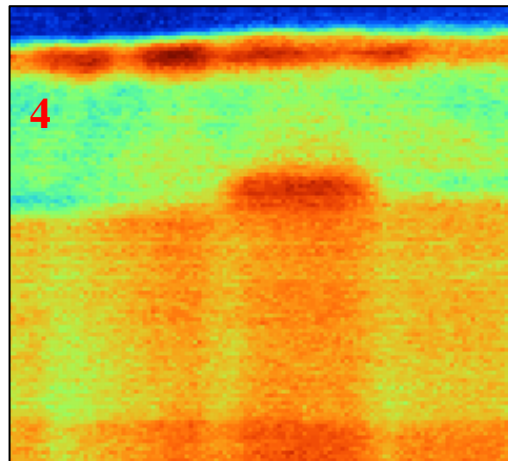
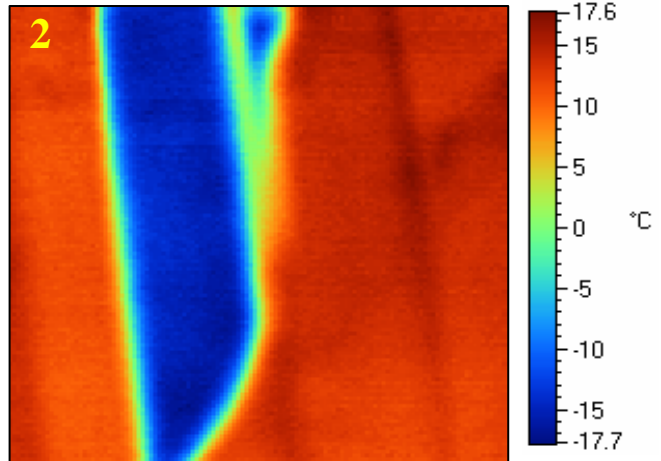
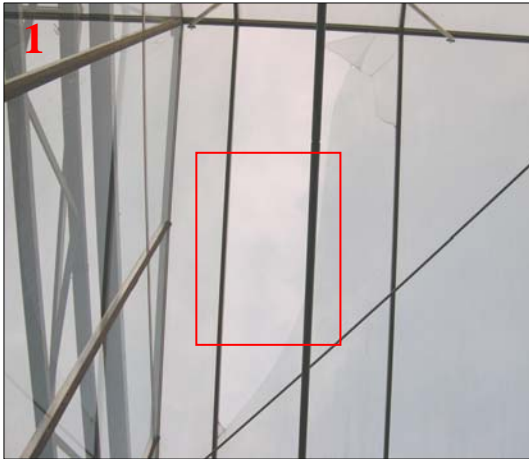
**Photo 1:** A hole in a glass pane in the glasshouse roof acts as a 'chimney' where heat escapes.

**Photo 2:** Infra-Red image of the same hole; nothing between the plants and the cold sky.

**Photo 3:** Gaps between glass panes or at vents are places where heat escapes.

**Photo 4:** An Infra-Red image of the same cracks shows that they are 'hot spots'.

**Photo 5:** A broken glass pane in a wall causes draught and heat loss, and can be an entrance for pests and diseases.



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**Photo 6:** Vents often don't close very well, which causes uncontrolled air exchange (= leak).

**Photo 7:** Proper tuning and adjustment of the vents and vent motors can reduce this problem.

**Photo 8:** Doors left open can double the air exchange rate, and increase the heat loss.

**Photo 9:** Infra-red photo of the same door, showing heating pipes and cold outdoor air.

