

Commercially Usage of Geothermal Energy for Growing *Gerbera* in Rotorua[©]

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For more than 10 years Connie and Harald Esendam from PlentyFlora have been making use of geothermal fluid to heat their 2,688 m² glasshouse used to produce *Gerbera* for the New Zealand cut-flower market. PlentyFlora's glasshouse is located on the Central Plateau, where the winter conditions can be very harsh, with an average of 20 to 30 frost days with -8°C (17.6°F) as the lowest measured temperature. *Gerbera* is a subtropical plant originating from South Africa, and requiring a minimum temperature of 14°C (57°F).

Supplementary heating for the PlentyFlora's greenhouse is provided by geothermal energy from two shallow (approximately 300 m depth) geothermal bores. The original bore produces about 70 m³ per 24 h of 100°C (212°F) liquid, while the second bore produces 30 m³ per 24 h of 65°C (149°F) liquid. The two bores are working as two individual heating systems. After passing the energy through a heat-exchange system the fluid is injected back into the shallow geothermal reservoir to complete the re-cycling. PlentyFlora has just completed an upgrade to improve the output of the original bore with the installation of a compressor, which is used to inject air in the bore, enabling an increase in the volume of geothermal liquid produced and so increasing the pipe temperature, inside the glasshouse, from 38°C (100°F) to up to 60°C (140°F). The existing diesel peak-heating system on a fan coil unit, which is forcing hot air on the plants, will now be used as a back-up system only. The new systems will save up to \$15,000 in severe winters and will have less of an environmental impact.

Each year PlentyFlora produces, from 14,000 plants, around 600,000 *Gerbera* cut-flowers of both the standard diameter size (10-13 cm) as well as the mini-size (7-9 cm). Seventy different cultivars are grown, representing four categories of Standards with black and light centres and Minis with dark and light centres. The plants are hanging in custom designed, self-made tables at convenient heights in accordance with the latest cut-flower growing technology from The Netherlands. The climate control and the nutrient control systems are fully computerised so the flowers receive the appropriate water and fertiliser, depending on requirements. The gerbera daisy flowers are harvested by being pulled out rather than cut. They are sleeved straight after picking, boxed and sent directly to 60 florists, two wholesale companies, and two auction houses in the North Island.

