

J & K GROWERS LAS CRUCES, NEW MEXICO

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Geo-Heat Center



J & K Growers are located adjacent to the New Mexico State University (NMSU) campus in Las Cruces. They use geothermal energy to heat 1.6 acres of 18 poly-covered greenhouses and cold frames. At first the owners, Kerry and John Krumrine, grew all potted plants and bedding crops on the ground to limit costs, especially with the use of in-ground heat. However, later they decided to put the crops on benches and further, from the buried heating source to increase air circulation, lower soil temperature and thus, decrease disease and pest problems. Also, this limited the stress of working at ground level. They initially produced potted crops, mostly cyclamen, exacum, and geraniums; however, they have changed to bedding plants as they have proven to be less work and more profitable. They also grow some poinsettias.

The Krumrines got their start in 1988 by leasing the 6,000-ft² "incubator" greenhouse on NMSU administered by the Southwest Technology Development Institute (STDI). This greenhouse is provided to potential commercial growers to get their feet wet and to see if the client really wants to have a "green thumb." After a year successfully growing poinsettias, they moved to their present location on land owned by a gravel pit business. The landowner drilled the geothermal well by accident, but did not need the hot water to wash his sand and gravel. Thus, the Krumrines uses only the heat and return the water to a pond for the landowners use. A 50-gpm pump draws water from the well at 148°F into a 30,000-gallon tank adjacent to the greenhouses.

The geothermal water is used directly from the tank in the green-house heating systems which consists of 3-inch black poly-butylene pipe main supply and return lines with simple thermostats connected to spa pumps to push water

through the system. Each greenhouse of approximately 3,000-ft² in area, has 2-inch branch lines that run at about bench height (2-feet off the ground), and then 3/4-inch branch lines from these pipes run underground at four to six inches beneath the gravel greenhouse floor and buried in sand. These underground loops are each about 1,000 feet in length. An additional line heats 15,000 ft² of cold frames to keep the crops from freezing.

The geothermal system proved its value when strong winds collapsed one of the greenhouses. The below bench and underground heating system kept the plants warm, even though the Krumrine's had to crawl on their hands and knees to service the crops. An overhead system would have been destroyed. They also have installed kerosene back-up heaters, but only have had to use them once--which created an unpleasant odor in the greenhouses.

The cost to operate the heating system is about 60 percent of natural gas heat costs. The hot water bill at the peak (about four weeks out of the year) is around \$500 per month (1992 figures), and considerably less the rest of the year. The only drawback is that since the geothermal water is used directly in the heating system, calcite deposits have built up inside the pipes reducing the flow and heat output. The well is on federal land; thus, a royalty is paid based on an annual average energy use per acre.

This material was summarized and edited from an article in *Greenhouse Manager* magazine (June, 1992) by Sami Harman Thomas title: "Geothermal Energy Fuels Success - New Mexico Couple Find Down-to-Earth Heat Supply," pp. 56-60, and from the Editor/Author's visit to the site (see page 30, Figure 1, for location map).