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Underground air is a special energy source in Jeju and distributes lava cave, pyroclastic, open joint, and crushing zone. A possible area to utilize underground air is 85% of Jeju except to the nearby area of Sambang Mt. and 25m high coastal area from sea level. In Jeju, underground air is used for heating agricultural facilities such as greenhouse cultivated mangos, Hallbong and mandarin orange, pigsty, mushroom cultivation house, etc. and fertilizing natural CO₂ gas by suppling directly into agricultural facilities. But this heating method causes several problem because the underground air has over 90% relative humidity and is inadequate in heating for crops.

Mangos are the most widely grown tropical fruit trees and have been cultivated since 1993 in Jeju. In Jeju, the cultivating area is about 20ha and amount of harvest is 275ton/year in 2010.

In this study, the heat pump system using underground air as heat source was installed in mangos greenhouse which area is 495m². The capacity of heat pump system and heat storage tank was 10RT, 5ton respectively and heating effect and heating performance of the system were analysed.

Key words : Underground air, Heat pump system, Mango, Greenhouse, Key word

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