Deep Ocean Water as the Cooling Source Used to Induce Spike Emergence on *Phalaenopsis*[1]

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Abstract

Use of 9-11℃ deep ocean water (D.O.W.) as a natural refrigerant through high-efficiency plate heat exchanger could produce 10-12℃ cool water, this cool water was piped to the air blower in D.O.W. cooling house and blowing 19-20℃ cool wind for flower forcing of *Phalaenopsis*. During the hot summer season, this system could maintain average daily temperature and day/night temperature at 21.9℃ and 23.9/20.0℃ respectively in 66 m² double plastic film greenhouse, that could be lower almost 10℃ than the outdoor temperature. Cultivars of *Phal*. Sogo Yukidian 'Ping Tung King', *Phal.* Hwafeng Redjewel, *Dtps.* Sin-Yaun Golden Beauty and *Dtps.* Queen Beer 'Red Sky' were 100 % be forced to bloom after forcing in D.O.W. cooling house. These 4 cultivars took about 100 days to bloom after forcing, the flowering quality of them was similar to the forcing greenhouse at high altitude and even better than air-conditioned cooling house at low altitude in Hualien county. The electric cost of *Phalaenopsis* flower forcing in D.O.W. cooling house was 13.3 NTD/pot, that was only half the cost of flower forcing at high altitude and was saved almost 80% cost of flower forcing at the air-conditioned cooling house.

Key words: spiking, flower forcing, energy conservation, flowering, cooling, *Doritaenopsis* spp.

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