Design and Evaluation of Greenhouse for Gerbera (*Gerbera Jamesonii L.*) Cultivation in Humid Subtropics

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ABSTRACT

Greenhouse floriculture in humid subtropics suffers from high summer temperatures and humidity due to the lack of suitable design and cost-effective environmental control strategies. The present study aimed at in-depth investigation of microclimate variation in two different shapes of greenhouses (Quonset and Sawtooth) and cladding materials (UV stabilized and diffused films) of greenhouses suitable for gerbera production with low-cost cooling techniques. The biometric growth and flower yield performance of gerbera (*Gerbera Jamesonii L.*) was evaluated during winter and summer months of 2008. The shape and height of a greenhouse had significant influence on the internal air temperature as Sawtooth shape maintained 3°C lesser temperature variation than the Quonset shape against ambient condition at 12:30 PM during summer months. The relative humidity variation was less (13%) in the Quonset shape at 8:30 AM during summer and the solar radiation was 5 to 10% greater than that of Sawtooth shape throughout the year. The reduction of greenhouse temperature in the diffused film was greater in winter (3°C) than in summer (1.5°C) with 50% perforated shade net placed on the inner side of greenhouse. Among the two shapes of greenhouses, biometric performance of gerbera was superior in Sawtooth shape than Quonset shape in terms of plant height, leaf area index and flower yield. The cultivation of gerbera in the Sawtooth greenhouse of 84 m^2 floor area was economically viable with a net profit of Rs. 38708.00, benefit-cost ratio of 1.8 and a payback period of 3.1 years.

Key words : Benefit-cost ratio,Diffused film, Gerbera, Microclimate variation, Quonset shape, Sawtooth shape