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Quantifying Flower Development Rate in *Phalaenopsis* Taisuco Moonriver x *Phalaenopsis equestris 'Alba'* (H88-145)

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Introduction

Phalaenopsis have become an economical important flowering potted crop. They are now the second largest flowering potted plant according to 2001 USDA statistics. Little specific quantitative information is available on the plant relating plant development to the environment.

Objective

The objective of this investigation was to quantify the effects of temperature and plant maturity on time from spike emergence to flowering of *Phalaenopsis*.

Material and Methods

Sixty plants with a 25-cm leaf span were received from Taiwan.

Repetition 1

25/20 °C day/night for 4 weeks to initiate flower spikes.

Once flowering spikes were visible,

plants were placed into one of six growth chambers.

Constant temperature set points of 14, 17, 20, 23, 26, or 28°C. average daily temperatures were 14.3, 16.9, 19.5, 22.2, 25.5 ,and 28.6°C.

Repetition 2

Once plants finished flowering in each growth chamber, they were transferred to a greenhouse set at 28°C for additional vegetative development. Plants had produced two or more leaves during the proceeding year and had a leaf span greater than 32 cm.

25/20 °C day/night for 4 weeks to initiate flower spikes.

Constant temperature set points of 20, 23, or 26°C. average daily temperatures were 19.5,22.5,and 25.5°C.

Time to appearance of nodes, time to visible flower bud, and time to flower were recorded as were final flower size and flower number.

Results

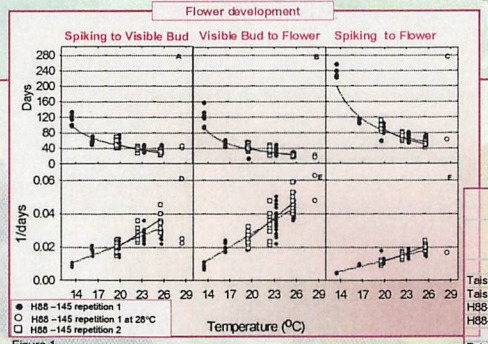

Figure 1

Table 1. Flower Development: Parameters of linear regression

Cultivars	Intercept (b_o) 1/d	Slope (b_1) (1/d)/°C	T_b (°C)	degree days	r^2
Spiking to visible bud					
Taisuco Smile (1)[y]	-0.0248	-0.0022	11.2	454	0.84
Taisuco Smile (2)	-0.0264	-0.0023	11.5	436	0.60
H88-145 (1)	-0.0129	-0.0017	7.5	578	0.77
H88-145 (2)	-0.0370	-0.0029	12.8	347	0.80
Visible bud to flower					
Taisuco Smile (1)	-0.0330	-0.0030	11.0	333	0.81
Taisuco Smile (2)	-0.0142	-0.0022	6.5	459	0.47
H88-145 (1)	-0.0249	-0.0027	11.0	442	0.64
H88-145 (2)	-0.0487	-0.0036	13.7	280	0.76
Spiking to flower					
Taisuco Smile (1)	-0.0141	-0.0013	10.8	769	0.9
Taisuco Smile (2)	-0.0152	-0.0013	11.4	751	0.77
H88-145 (1)	-0.0094	-0.0011	8.7	933	0.84

[y] Repetition (1) and (2)

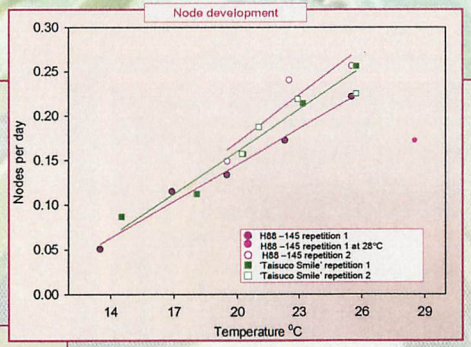

Figure 2

Table 2. Node Development: Parameters of linear regression

Cultivars	Intercept (b_o) 1/d	Slope (b_1) (1/d)/°C	T_b (°C)	r^2
Taisuco Smile' (1)	-0.1568	0.0158	9.9	0.97
H88-145 (1)	-0.1277	0.0136	9.4	0.98
H88-145 (2)	-0.1873	0.0179	10.5	0.86

[y] Repetition (1) and (2)

Conclusions

Plant maturity did not affect the rate of plant development, number or size of flowers, node count or spike height.

Average time to flower for H88-145 increased from 5 weeks to 14 weeks as temperature decreased from 25.5 to 14.3°C (Figure 1 and Table 1). These durations were similar to our previous work on *Phalaenopsis* 'Taisuco Smile'.

Node and flower development above 26°C was superoptimum for reproductive development (Figures 1 and 2).

Node development also increased linearly from 14.5 to 25.5 °C with each 3 °C increase resulting in an additional 0.04 nodes per day (Figure 2 and Table 2).

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