

Research Note :**EFFECT OF NPK AND POTTING MEDIA ON PLANT GROWTH AND SPIKE YIELD OF *DENDROBIUM ORCHID* CV. SONIA HISKULA****Gufran Ahmad* and S. Saravanan***Department of Horticulture, Allahabad School of Agriculture, Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHIATS), Allahabad***E-mail: gufran9415@gmail.com*

ABSTRACT : An experimental was laid out in the CRB Design having 10 treatment and 3 replications. The treatment T₉ (10:30:30 NPK + 0.3% Brick pieces + Gravel + Poultry manure) was found to be statistically significant over other treatments which recorded highest plant height (29.61cm), number of leaves (9.69), leaf area (36.11cm²), number of new shoots per plant (4.58), shoot girth (3.16 cm), root length (16.73cm), number of root per plant (20.25), total number of spikes per plant (3.47), number of florets per spike (10.69), spike length (33.91cm), and longevity of spike (42.91 days) under shade net condition.

Keywords: *Orchid, NPK, potting media, growth, spike, shelf life.*

Dendrobium, the second largest genus in family Orchidaceae with nearly 1600 species of orchids, is one of the most important genera with many horticulturally interesting species. The plants are epiphytic in nature showing great variability for plant and flower characters. India is bestowed with wide range of environment to grow almost all types of orchid species and one of the richest centre of diversity for orchids in the world. In spite of this fact, the commercial exploitation of orchids is still in nascent stage in the country. In Tamil Nadu, cultivation of orchids on a commercial scale was first started by private growers at Chengalpet, near Chennai. The government of Kerala itself actively engaged in the cultivation and marketing of orchids through Horticultural Corporation (Chadha, 1). *Dendrobium* spp. of orchids is being successfully grown under agroclimatic conditions of central Uttar Pradesh. Therefore, an attempt has been made to study the effect of NPK and potting media on plant growth and spike field of *Dendrobium* orchid cv. Sonia Hiskula under the agro-climatic conditions of Allahabad.

This experiment was conducted in Floriculture Unit, Department of Horticulture, Allahabad School of Agriculture, SHIATS, Allahabad during 2012. The experiment was laid out in Complete Randomized Block Design (CRBD) with three replications. Among total 10 treatments comprised of NPK and potting media at different level of each viz. T₁ : 20:20:20 NPK + (0.3 % Coconut fibre + FYM+ Wheat husk), T₂:10:30:20 NPK + (0.3% Charcoal + Coconut fibre + Brick pieces), T₃:15:15:15 NPK + (0.3% Brick pieces + FYM + Leaf

mould), T₄: 20:15:15 NPK + (0.3% Wheat husk + FYM + Gravel), T₅: 20:10:20 NPK + (0.3% Coconut fibre + Poultry manure + Brick pieces), T₆: 19:19:19 NPK + (0.3% Brick pieces + Rice husk + Charcoal), T₇ : 10:15:20 NPK + (0.3% FYM + Poultry manure + Brick pieces), T₈ : 20:10:10 NPK + (0.3% Leaf mould + Gravel + Rice husk) and T₉ : 10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure) alongwith a control (T₀ : Rice husk + leaf mould + gravel) were adopted. The plants were collected from Sheel Bio-tech limited, Tughlakabad New Delhi. Procured plants of uniform size were transferred in perforated 12 inch earthen pots under shed net house. The pots were placed over 5 cm sand surface. The growth and yield parameters for each treatment were observed in three plants selected by random sampling method. The data were statistically analyzed and critical differences were worked to draw statistical conclusions.

Results revealed that the maximum plant height (29.61 cm) of *Dendrobium* cv. Sonia Hiskula was recorded in T₉-10:30:30 NPK+ (0.3% Brick pieces + Gravel + Poultry manure) followed by T₈, T₇ and T₆. The shortest plants (23.42 cm) were recorded in control at 180DAP. The increase in plant height might be due to improved aeration and water holding capacity of the potting media that modified the physical and chemical properties (Savithri and Khan, 5). The maximum number of leaves (9.69 leaves/plant) at 180 DAP were registered in T₉-10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure) and the minimum number of leaves (7.25 leaves/plant) was recorded in control. The high lignin content and wide C : N ratio of

Table 1 : Effect of NPK and potting media on plant growth and spike yield of *Dendrobium Orchid* cv. Sonia Hiskula.

Treatments	Plant height (cm)	Number of leaves / plant	Leaf area (cm ²)	Number of shoots per plant	Shoot girth (cm)	Root length (cm)	Number of roots per plant	Total number of spike yield per plant	Number of florets per spike	Spike length (cm)	Longevity of spike per plant (Days)
T ₀	23.42	7.25	24.50	1.91	2.41	10.79	15.25	1.25	9.25	21.91	31.91
T ₁	25.82	7.36	25.38	1.91	2.66	12.32	16.25	1.47	9.47	23.58	34.58
T ₂	25.65	7.36	25.21	2.58	2.55	12.09	15.91	1.36	9.36	22.91	33.58
T ₃	25.87	7.80	25.71	2.91	2.66	12.88	16.58	1.56	9.69	24.58	35.91
T ₄	26.25	8.47	26.68	3.91	2.71	14.04	18.25	1.67	10.25	28.58	37.58
T ₅	25.91	8.25	24.78	3.58	2.82	12.88	16.91	1.58	9.80	25.58	36.91
T ₆	26.48	9.36	32.65	3.25	3.01	15.34	19.25	2.47	10.47	31.58	40.91
T ₇	26.30	8.58	30.01	2.25	2.91	14.77	18.58	2.25	10.36	30.91	40.58
T ₈	28.25	9.47	33.75	4.25	3.09	15.52	19.58	2.47	10.47	32.91	42.25
T ₉	29.61	9.69	36.11	4.58	3.16	16.73	20.25	3.47	10.69	33.91	42.91
C. D. (P=0.05)	0.789	0.747	1.070	0.234	0.132	0.005	0.441	0.234	0.145	0.088	0.909

rice husk + leaf mould + gravel made the decomposition rate very slow compared to other media (Dematte, 2). In the present study, the efficiency of different media was assessed in terms of the number of leaves produced per plant. The maximum leaf area (36.11 cm²) was also noted under T₉ followed T₈ (33.75 cm²) and T₆ (32.65 cm²). The potting mixture of Brick pieces + Gravel + Poultry manure produced the highest leaf area due to the capability of absorbing nutrient slowly and moisture retaining capacity. The maximum number of new shoots (4.58) was seen in T₉ followed by T₈, T₄, T₅ and T₆ and it was minimum (1.91) in control. The plant which would helped in better production of frame work (source) for better metabolic activities especially with regard to production of photoassimilates as well as root formed hormone such as cytokinin which would have favoured more production of shoot. The maximum shoot girth (3.16 cm) was recorded in T₉ followed by T₈, T₆, T₇. The minimum shoot girth (2.41 cm) was recorded in control (rice husk + leaf mould + gravel). At 180 DAP root length was significantly affected by NPK and potting media. Application of 10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure) showed the maximum root length (16.73 cm) which was closely followed by T₆, T₈, T₇ and T₅. For proper shoot and root growth, a medium must serve four functions *viz.*, to provide water, to supply NPK, to permit gas exchange (respiration) and to provide support for the plant. Among the different NPK and potting media applied the

treatment T₉ {10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure)} was found to be superior in the production of number of roots per plant (20.25) followed by T₈, T₆, T₇ and T₄. It was the lowest (15.25 roots/plant) in control (Rice husk + leaf mould + gravel). Paul and Rajeevan (3) had also reported similar findings in *Dendrobium*. The highest total number of spikes per plant (3.47) was observed in T₉ 10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure) followed T₈, T₆ and T₇. The least total number of spikes per plant (1.25) was observed in control. Plants grown in granulated stone gave the lowest spike yield. The highest number of florets per spike (10.69) was observed in T₉ {10:30:30 NPK + (0.3% Brick pieces + Gravel + Poultry manure)} followed T₈, T₆ and T₇. The least number of florets per spike (9.25) was observed in T₀. The number of florets per spike in Brick pieces + Gravel + Poultry manure which consists of mainly lignocellulosic material may be due to the fact that it is free from any admixture of heavy metals (Sathyanarayana *et al.*, 4). Whereas Sonia Hiskula registered a maximum spike length (33.91 cm) in T₉ which was statistically superior to next best treatment T₈ (32.91 cm) being on par which T₆ (31.58 cm). The minimum spike length (21.91 cm) was recorded in T₀. The maximum longevity of spike (42.91 days) was observed in T₉ which was statistically superior to next best treatment T₈ (42.25 days) being on par with T₆ (40.91 days). The minimum longevity of spike (31.91 days) was recorded in T₀. It is attributed to its moisture

retention capacity and the maintenance of temperature under tropical condition (Shanthi *et al.*, 6)

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