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Effect of spacing and corm size on growth, flowering and corm production of sword lily (*Gladiolus palustris*)

Bineeta Singh, Diwakar Chatterjee and KR Maurya

Abstract

A field trial was carried out to quantify the effect of spacing and corm size on growth, flowering and corm production of sword Lily during the year 2018-2019 at Horticultural Research Farm of the Department of Horticulture, AKS University, Satna (M.P.). There were three spacing viz. 25 cm x 10 cm, 25 cm x 20 cm and 25 cm x 30 cm and three corm size viz. 3-4 cm, 4.1 x 5 cm, 5.1 to 6 cm and their interactions replicated three times. The data recorded revealed clearly that corms of 5.1 to 6 cm diameter grown at a spacing of 25 cm x 30 cm produced highest average number of florets of (15.68), diameter of florets (9.96 cm) and number of corms/plant (3.11) and diameter of new corms (6.33) which was at par with spacing of 25cm x 30 cm and corm size of 4.1 to 5 cm.

Keywords: sword lily, spacing, corm size and corm production

Introduction

Sword lily (*Gladiolus Palustris*) is chiefly grown for cut flower trade and essential oil industry. It is grown commercially from the corms. The yield of flowers depend much on the size of corms used and their planting distances (Sadhu and Bose, [5]. Sharga and Basario [6] observed fast multiplication and production of top quality spikes by planting the biggest corms of gladiolus. Wider spacing promotes the plant growth, flowering and corm development (Bhattacharjee *et al.*, and Yadav *et al.*) [8]. Therefore, a study was conducted to see the effect of spacing and corm size on growth and flowering of Sword lily

Materials and Methods

A field experiment under split plot design (SPD) at the Horticultural Research Farm of AKS University, Satna (M.P.) during the winter season of 2018–2019. Three spacing viz. (25 x 10 cm, 25 x 20 cm and 25 x 30 cm) were kept in the main plots, whereas the sub-plots were allocated with three levels of corm size (3-4 cm, 4.1-5 cm and 5.1-6 cm) making a total of treatment combinations replicated four times. Sword lily variety – Arti was selected for trial. Before planting, the dried scales of corm were removed. As a preventive measure against the soil-borne diseases, corms were soaked in 0.1% Bavistin for 30 minutes. The treated corms were then left under the shade for 24 h to dry up to level suitable for planting. Corms were planted in pits at the depth of 7 cm maintaining the planting distance 25 x 10 cm, 25 x 20 cm and 25 x 30 cm respectively on 17th October, 2018 in well prepared beds well rotten cow dung manure @ 10 kg/m² was applied a fortnight prior to planting of corms. Irrigation was given at ten days interval until flowering and subsequently watering was withheld for the maturation of corms. A light irrigation was given after the sprouting of corms. A light irrigation was given after the sprouting of corms to accelerate their growth. Intercultural operation along with irrigation were given at 15 day intervals for proper growth and development of the plant. The observations were recorded from 5 representative plants of each treatment in all replications.

Result and Discussion

A significant positive effects of spacing were observed in the characters studied. The maximum plant height, number of leaves/plant, number of spikes/per plant, spike length, number of florets/spike, diameter of floret, numbers of corms/plant, diameter of new corm and earliest spike emergence and first floret opening was observed under the widest (S₃) spacing (Table 1). This might be due to the wider spacing as it provides more light for photosynthesis and less competition for nutrients. Similar results were also reported by Bhattacharjee *et al.* [1] and Yadav *et al.* [8] in tuberose. Excluding plant height and days taken to first emergence of spikes, the size of corm significantly affected the characters under study (Table 1).

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The maximum number of leaves/ plant, spike length, number of florets/spike, diameter of floret, diameter of new corm and earliest floret opening were recorded with the use of biggest corm (G₃), which were at par with those obtained with the use of medium sized corm. This might be due to sufficient stored food materials. Similar results were also reported by Kale and Bhujbal^[2], Pathak *et al.*^[3] and Ahmed & Maurya^[10] in tuberose. Delayed spike emergence and opening of florets in smaller corms might be ascribed to the presence of least amount of gibberellins and carbohydrates (Singh *et al.*, Ahmed and Maurya and Maurya)^[7, 10, 3].

The interaction of spacing and corm size showed significant effect on Vegetating growth, flowering and corms characteristics except for plant height and days taken to first emergence of spikes. The maximum number of leaves/plant, number of spikes/plant, spike length, number of florets/spike, diameter of floret number of corms/plant, diameter of new corm and earliest floret opening were recorded under the treatment combination i.e. corm size of 5.1 to 6 cm grown at a spacing of 25 x 30 cm. However, this treatment was found to be at par with spacing of 25 x 30 cm with a corm size of 4.1 to 5 cm. These results are in agreement of Ahmed and Maurya^[9], Bhattacharya *et al.*^[1], Yadav *et al.*^[8] and Maurya^[3].

Table 1: Effect of spacing and corm size on plant growth, flowering and corm production in sword lily.

Spacing	Plant height (cm)	No. of leaves per plant	Days taken to 1 st emergence of spikes	No. of spikes per plant	Spike Length (cm)	Days taken to 1 st florets open	No. of florets per spike	Diameter of floret (cm)	No. of corms per plant	Diameter of new corm (cm)
S ₁ (25 x 10 cm)	137.82	5.91	71.22	1.19	71.71	81.22	11.10	7.70	1.16	3.41
S ₂ (25 x 20 cm)	144.76	7.87	67.67	2.15	82.90	78.56	13.26	8.41	2.17	5.13
S ₃ (25 x 30 cm)	152.28	10.11	62.44	2.53	87.31	72.89	14.75	9.35	2.47	6.00
CD at 5%	5.29	0.79	3.19	0.08	2.46	3.00	0.53	0.40	0.18	0.21
Corm size										
G ₁ 3-4 cm	142.03	6.49	69.33	1.22	77.70	79.78	12.39	8.00	1.18	4.58
G ₂ 4.1-5 cm	146.35	8.60	66.22	2.23	81.18	76.44	13.27	8.65	2.23	4.93
G ₃ 5.1-6 cm	146.47	8.79	65.78	2.42	83.04	76.44	13.44	8.81	2.40	5.03
CD at 5%	NS	0.58	NS	0.14	3.11	1.95	0.60	0.37	0.08	0.17
Interaction										
S ₁ G ₁	136.64	5.22	72.67	1.00	72.12	82.33	10.88	7.59	1.03	3.31
S ₁ G ₂	138.38	6.18	70.67	1.22	72.38	80.67	11.13	7.68	1.14	3.49
S ₁ G ₃	138.43	6.34	70.33	1.37	70.64	80.67	11.28	7.84	1.32	3.45
S ₂ G ₁	141.26	6.78	68.67	1.23	79.32	79.00	13.05	7.92	1.18	4.96
S ₂ G ₂	146.36	8.38	67.67	2.55	83.52	78.33	13.33	8.66	2.58	5.11
S ₂ G ₃	146.66	8.44	66.67	2.68	85.86	78.33	13.39	8.65	2.77	5.33
S ₃ G ₁	148.20	7.48	67.67	1.45	81.68	78.00	13.24	8.49	1.34	5.49
S ₃ G ₂	154.32	11.24	60.33	2.94	87.64	70.33	15.36	9.61	2.97	6.20
S ₃ G ₃	154.32	11.60	60.33	3.22	92.63	70.33	15.64	9.96	3.11	6.33
CD at 5%	NS	1.10	NS	0.26	5.62	3.77	1.09	0.70	0.14	0.32

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