ISSN : 2350-0743

www.ijramr.com

International Journal of Recent Advances in Multidisciplinary Research

Vol. 08, Issue 07, pp. 7015-7017, July, 2021

RESEARCH ARTICLE

REVIEW ARTICLE ON INFLUENCE OF SPACING ON SEED YIELD AND SEED QUALITY CHARACTERISTICS OF FLOWER CROPS

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ARTICLE INFO

Article History:

Received 25th April, 2021
Received in revised form
14th May, 2021
Accepted 10th June, 2021
Published online 30th July, 2021

Keywords:

Influence,
Characteristics,
Flower crops.

ABSTRACT

Optimum plant population per unit area is considered as one of the agronomic management practice to boost up the yield of commercial crop which aid in provision of adequate sunlight, nutrient, water and space for proliferation (Biradar patil et al., 1991). Seed crop is not exempting from this rule and in addition seed crop require still more adequate spacing for rouging and to improve the size of seed (Savithri and Srimathi, 2002). Hence, in seed production the geometry should be adjusted in such a way that the quality of seed is yielded at higher order at the optimum plant spacing

INTRODUCTION

Optimum plant population per unit area is considered as one of the agronomic management practice to boost up the yield of commercial crop which aid in provision of adequate sunlight, nutrient, water and space for proliferation (Biradar patil *et al.*, 1991). Seed crop is not exempting from this rule and in addition seed crop require still more adequate spacing for rouging and to improve the size of seed (Savithri and Srimathi, 2002). Hence, in seed production the geometry should be adjusted in such a way that the quality of seed is yielded at higher order at the optimum plant spacing (Puste and Jana, 1996). The optimum spacing recommended for various flower crops to get higher flower/seed yield by several scientists are reviewed here under. Study made with different spacings expressed that the evaluated plant height, the phenotypic character of crop was highly influenced by the plant spacings, where the closer spacing (45 x 15 cm) recorded taller plants than others owing to their tendency to etiolate and to withstand the competition created due to the non availability of adequate solar radiation and plant nutrients compared to wider spacings (60 x 30 to 75 x 60 cm) as per the phenomenon of adoptive mechanism But the number of branches were more in wider spaced plants due to their faster growth rate which proliferates with more branches that would have resulted with the availability of nutrients, water and light in adequate quantity that would have been converted to morphological growth factors. The evaluated pod characters *viz.*, number of pods plant^{-1}, weight pod^{-1}, pod yield plant^{-1}were also more in wider spacing than in closer spacing due to the higher rate of morphological and photosynthetic efficiency that have resulted in the more number of branches produced per plant and inturn the more number of pods. The improved yield also could be due to the higher opportunity for proper growth and development of individual plants as the availability of adequate moisture, plant nutrients, space and other growth promoting factors were more in wider spacing as stated by Jain *et al.* (1990). Increasing in yield attributing characters and the translocation of higher photosynthates with sink was also as causes for higher production plant^{-1}as reported by Sharma (1969), Kirby (1969) elucidated that the grain yield at given population was determined by the carbohydrate's supply during the grain filling period which might be more in lower spacing due to higher plant population that resulted in increased yield. Under high plant populations mutual shading leads to tiller mortality and reduced in grain size (Pucxridge and Donald, 1967 and Willey and Holliday, 1971) and in turn reduced the seed quality characters as supported by Ashby (1936).

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Influence of spacing on flower and seed yield of flower crops

Crop	Recommended spacing (cm)	Effect	Authority
Seed propagation			
Snapdragons	6 x 15	Produced quality spikes	Culbert (1965)
Geranium	4 x 4	Highest flower yield	Pirumyan (1977)
Carnation	30 x 15	Highest number of flower per plant	El-Shafie (1979)
	15 x 20	Quality of flower was high	Altan and Altan (1985)
Pansy	20 x 30	Good plant growth and maximum flower production	Jhon *et al*. (1984)
	30 x 30	Highest seed yield per plant	Rupinder and Kumar (1998)
Aster	20 x 30	Highest number of flowers (30 plant^{-1}) and seed yield (121.7 kg ha^{-1})	Patil *et al*. (1987)
	30 x 10	Highest flower yield	Vijayakumar *et al*. (1988)
	27.8 plants m^{-2}	Maximum seed yield (140 gm^{-2})	Phetradap *et al*. (1993)
	62,500 to 2,50,000 plants ha^{-1}	Increased the seed yield by 15 to 35 per cent	Kobza (1995)
	20 x 30	Higher flower production	Dhamre *et al*. (1999)
	40 x 40	Maximum number of flowers (61), weight of flowers (90.84 g) and seed yield plant^{-1} (10.44 g)	Singh and Sangama (2001 a)
Chrysanthemum	20 x 30	Highest flower Yield (7.44 t ha^{-1})	Gowda and Jayanthi (1988)
	15 x 40	Highest flower yield (12.19 t ha^{-1})	Rao *et al*. (1992)
	45 x 45	Highest weight and diameter of flower	Belgaonkar *et al*. (1997)
	40 x 30	Highest flower yield	Barman and Pal (1999)
Zinnia	30 x 60	Highest plant height (127.67 cm) and flower diameter (9.07 cm)	Jhon *et al*. (1991)
	15 cm between row	Highest flower and seed yield per hectare	Rajanna and Khalak (1992)
	30 x 20	Highest seed yield plant^{-1} (15.40 g)	Poonam *et al*. (2002)
Globe Amaranth	20 x 60	Increased number of branches plant^{-1} and weight of flowers	Jhon and Paul (1992)
Daisy (*Michaelmas daisy*)	30 x 30	Highest flower yield and quality	Dixit and Keskar (1994)
Gaillardia	30 x 30	Highest flower yield	Misha (1998)
	30 x 20	Highest seed yield	Hugar and Nalawadi (1999)
Balsam	40 x 30	Highest number of flowers (175.97) and seed yield (11.23 g) plant^{-1}	Rani and Kumar (1999)
Marigold	0.6 x 0.6 m	Increase the number of flowers plant^{-1}, weight of flowers plant^{-1}	Belgraver (1966), Menhenett *et al*. (1967) and Leostar *et al*. (1967)
	0.6 x 0.6 m	More plant height were observed	Kiplinger and Tayama (1968)
	20 x 50	Highest flower yield	Narayanagowda and Jayanthi (1986)
	20 x 20	Increased the number of flower plant^{-1}	Arora and Khanna (1989)
	0.6 x 0.6 m	Increased the number and weight of flowers plant^{-1}	Patil and Kale (1992)
	45 x 30	Increased the flower diameter and yield	Balorkar *et al*. (1992) and Avari and Patel (1999)
	30 x 30	Maximum flower yield was obtained	Shah *et al*. (1994)
	40 x 30	Highest flower yield plant^{-1}	Samantaray *et al*. (1999)
	60 x 40	Largest flower diameter (13.42 cm), highest flower yield (31.25 cm) and seed yield (17.86 g) per plant^{-1}	Natarajan (2000)
Everlasting flower	83,333 plants ha^{-1}	Highest flower yield	Venugopal and Patil (2000)
Calendula	9 plants m^{-2}	Highest seed weight head^{-1} plant^{-1} (0.78 g)	Martin and Deo (2000)
Phlox	60 x 60	Higher pod yield (2.47 g) and seed yield (1.7 g) plant^{-1}	Sathyanarayanan (2000)
Coreopsis	60 x 60	Highest seed yield (49.25 g m^{-2})	Kumar and Kiranjeet Kaur (2001)
Solidago	30 x 20	Highest flower yield	Sadha and Dhaduk (2002)
Cosmos	40 x 30	Highest plant height, branch number (40.2), flower (21) and seed yield (2.07 g) plant^{-1}	Dubey *et al*. (2002)
Vegetative propagation			
Lilium longiflorum	40 x 40`	Produced large bulbs and thickest flower stems	Kamel *et al*. (1978)
Tuberose	25 x 20	Highest number of flower spikes and bulbs	Sadhu and Das (1978)
	15 x 20	Highest flower yield	Patil *et al*. (1987)
	30 x 30	Highest bulb yield	Nagaraya *et al*. (1998)
	30 x 30	Highest bulb yield	Kumar and Singh (1998) and Mohanty *et al*. (1999)
	25 x 20	Highest bulb diameter, weight and yield	Singh and Manoj Kumar (1999)

	30 x 30	Highest plant height, spike length, rachie length and fresh weight of spike	Nagaraja *et al*. (1999) and Singh and Sangama (2001)
	45 x 30	Highest growth and flower yield	Balakran *et al*. (2001)
Narrissus tazetta	25 x 25	Highest flower yield	Sharga *et al*. (1984)
Gladiolus	30 x 15	Highest flower yield	Anserwadekar and Patil (1986)
	125 corms m^{-2}	Highest corm yield and quality	Incalcaterra (1993)
	15 x 15	Highest corm yield	Bahar and Korkut (1998)
	20 x 30	Maximum plant height, weight and diameter of corm per $plant^{-1}$	Singh and Bijimol (1999)
	25 x 20	Maximum plant height, weight and dia of corm per $plant^{-1}$	Singh and Singh (2000)
		Highest number of leaves, longest leaf gradient $plant^{-1}$ and plant height	Bijimol and Singh (2001)
Polish tulip	100 bulbs m^{-2}	Optimum bulb production	Fatel (1996)
Chin cherinchee	20 x 40	Highest bulblets $plant^{-1}$ bulb weight and scape number	Bhardwaj and Kumar (2001)
Rose	30 x 45	Highest number of flower	Jayeetha *et al*. (2001)

REFERENCES

Abdul-Baki, A.A. and J.D. Anderson. 1973. Vigour determination in soybean seed by multiple criteria. Crop Sci., 13: 630-633.

Anonymous. 1999. Crop production Guide, Tamil Nadu Agricultural Univeristy, Coimbatore.

Arora, J.S. and K. Khanna. 1987. Maharashtra J. Hort., 3(2): 87-91.

Ashby, 1936. Intital capital theory. Ann. Bot., 46: 1007-1032.

Behera, A.K., S.K. Mishra and H.S. Sha. 1994. Response of summer sesame (*Sesamum indicum*) to row spacing and phosphorus. Orissa J. Agric. Res., 7(supplement): 99-101.

Berry, G. 1967. A mathematic model relating plant yield with arrangement for regularly spaced crops. Biometrics, 23 : 505-515.

Gnanamurthy, P., H. Xavier and P. Balasubramaniyan. 1992. Spacing and nitrogen requirement of sesame (*Sesamum indicum*). Ind. J. Agron., 37(4): 358-359.

Gomez, C.J.C., O.M.G. Pena and B.S.R. Margue. 1988. Evaluation of two soybean cultivars under four population densities in villazlores. Chis, Mexico, Revista Chapingo. J. Agric. Res., 12(58-59): 66-69.

Gomez, K.A. and A.A.Gomez. 1984. Statistical procedures for agricultural research of legumes seeds of different density. Agriculture, 41:47-56

Husley,P.A. 1983. Considerations when experiments with changes in plant spacing. Working paper No.15 ICRAF, Nairobi, Kenya.

Hussain, S.Z., Shuaz Faird, M. Ancoar, M.T.Gill and M.D. Raugh. 2000. Effect of plant density and nitrogen on the yield of seed cotton - variety CIM 413. Sarhad J. Agric., 16(2): 43-147.

ISTA. 1999. International Rules for Seed Testing. Seed Sci. & Technol. (Supplement Rules), 27: 25-30.

Jain, N.K., H.C. Jain and A.K. Sharma. 1990. Row spacing on black gram (*Vigna mungo* L.) in Malwa plateau of M.P. Research and Development Reporter, 7(12):37-40.

Jensen, A. 1978. Chlorophyll's and carotenoids. In: Hellebust, A. and J.S. Crangie (eds.) Hand Book of phytological methods. Cambridge Univ. Press, London, pp. 59-70.

Khanna, K., J.S. Arora and J. Singh. 1986. Indian J. Hor., 43(1&2): 148-152.

Kirby, EJ.M. 1969. The effect of sowing date and planting density on barley. *Ann. Appl. Biol*., 63 : 513-521.

Malarkodi, K. and P. Srimathi. 2001. Effect of spacing on seed yield and seed quality in sorghum. Adv, Plant Sci., 14(1) : 283-285.

Natarajan, K. 2000. Seed technological studies in marigold cv. African giant. M.Sc. (Ag). Thesis, Tamil nadu Agricultural University, Coimbatore.

Pathmanaban, G., K. Manian, M. Thangaraj, L. Veerannan and Radhakrishnan.1996.Analytical methods in crop physiology. Published by Dept of Crop Physiology, TNAU,Coimbatore-3.pp9-10.

Patil, A.B., Y.M. Shinde and N.D. Jadhav. 1996. Influence of nitrogen levels and spacings on grain yield of sesamum. J. Maharashtra Agric. Univ., 21(3): 368-369.

Pucxridge, D.W. and C.M. Donald. 1967. Competition among wheat plants own at a wide range of densities. Aust.J.Agric.Res., 18 : 193-211.

Puste, A.M. and P.K. Jana. 1996. Response of pigeon pea cultivars to spacing. Indian Agric., 40(11) : 35-37

Sharma, B.M. 1969. Effect of sowing date, seed rate and spacing on the grain yield of blackgram. Indian J. Agron., 14(1): 245-247.

Swain, T. and W.E. Hillis, 1959. The chenoic constitutela of prunus domestica. The quantitative analyse no phenone conetituende. J. Sci. Food Agric., 10 : 63-68.

Thiagarajan, C.P. 1983. Studies on certain aspects of production, processing and storage of chilli (*Capscum annum* L.) seed. Ph.D. Thesis, Tamil nadu Agricultural University, Coimbatore.

Tiwari, K.P. and K.N. Namedeo. 1997. Response of sesame (*Sesamum indicum*) to planting geometry and nitrogen. Indian J. Agron., 42(2) : 365-369.

Willey, R.W. and R.Holliday. 1971. Plant population and shading studies on barley. J.Agric.Sci.,Camb., 77 : 445-452.

Willey, R.W. and S.W. Heath. 1969.The quantitative relationship between plant population and crop yield. Adv. Agron., 21 : 281-321.

Yoshida,S., D.A. Forno and J.S.Colo.1971.Laboratory manual for physiobiological studies of rice.IRRI Publication,Phillippines.Pp36-37.

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