Effect of organic nutrient management on growth and flowering of muskmelon (*Cucumis melo* L) cv GMM 3

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ABSTRACT

The experiment was carried out to study the effect of organic nutrient management on growth and flowering of muskmelon (*Cucumis melo* L) cv GMM 3 during summer 2017 at College of Horticulture (SDAU), Jagudan, Gujarat. Nine levels of organic nutrients were tested in the randomized block design with three replications. Treatments were evaluated on the basis of growth and flowering characteristics of muskmelon. Application of organic nutrients significantly affected growth and flowering parameters. Maximum vine length at 30 and 60 DAS, number of branches per plant, leaf area at 45 DAS, days taken to flower initiation, number of male and female flowers per plant, sex ratio and per cent fruit set were recorded with treatment 50 per cent N from FYM + 50 per cent N from poultry manure + bio-fertilizer [*Azospirillium* + phosphorus solubilizing bacteria (PSB) + KSM] + *Trichoderma viride* + neem oil.

Keywords: Bio-fertilizers; flowering; growth; muskmelon; KSM; PSB; *Trichoderma viride*

INTRODUCTION

Muskmelon (*Cucumis melo* L) is a vine crop that belongs to the family Cucurbitaceae and is believed to be a native of India. It is popular vegetable grown under both rainfed and irrigated conditions. It has immense popularity due to its attractive green flesh texture fruits with sweet taste and good aroma, short duration and high production potential as well as high nutritive value. It contains 95.2 g moisture, 0.3 g protein, 0.2 g fat, 0.08 mg riboflavin, 32 mg calcium, 14 mg phosphorus, 1.4 mg iron and 5.89 per cent total sugar content per 100 g of fresh edible portion (Thamburaj and Singh 2013).

To compensate the short supply and to mitigate recent price hike in inorganic fertilizers use of indigenous and traditional sources of nutrients like farmyard manure, vermicompost, poultry manure, cakes etc may be used. Use of organic manures not only helps to sustain crop yields but also plays a key role in improving the physical, chemical and biological properties and also increases the efficiency of applied fertilizers (Singh and Biswas 2000). Instead of using any single organic manure it is better to use different organic manures in combination to improve their efficiency and efficacy. Use of organic manures in combination with bio-fertilizers helps in proper supply of nutrition and maintaining soil health.

MATERIAL and METHODS

Present experiment was conducted in open field conditions of College of Horticulture (SDAU), Jagudan, Gujarat to study the effect of organic nutrient management on growth and flowering of muskmelon (*Cucumis melo* L) cultivar GMM 3 which was commonly grown in this region. Four organic manures (FYM, poultry manure, neem cake and castor cake) in various combinations and bio-fertilizers [*Azospirillium*

+ phosphorus solubilizing bacteria (PSB) + KSM] were tried. Total nine treatments viz T_1 (50% N from FYM + 50% N from poultry manure), T_2 (50% N from neem cake + 50% N from poultry manure), T_3 (50% N from castor cake + 50% N from poultry manure), T_4 [T_1+ bio-fertilizer {*Azospirillium* + phosphorus solubilizing bacteria (PSB) + KSM}], T_5 [T_2 + bio-fertilizer (*Azospirillium* + PSB + KSM)], T_6 [T_3 + bio-fertilizer (*Azospirillium* + PSB + KSM)], T_7 (T_4 + *Trichoderma viride* + neem oil), T_8 (T_5 + *T viride* + neem oil) and T_9 (T_6 + *T viride* + neem oil). All the treatments were applied at the time of field preparation. Observations on growth and flowering were recorded and the mean data were subjected to statistical analysis following analysis of variance technique (Panse and Sukhatme 1985).

RESULTS and DISCUSSION

Data in Table 1 show the effect of different treatments on growth and flowering parameters of muskmelon.

Effect of organic nutrient management on growth

Significantly maximum vine length (43.51 and 242.23 cm) at 30 and 60 days after sowing (DAS) respectively, maximum number of branches per plant at 45 DAS (4.48), maximum leaf area (635.54 cm^2) and minimum days taken for initiation of flowering (33.64) were recorded with application of 50 per cent N from FYM + 50 per cent N from poultry manure + bio-fertilizer (*Azospirillium* + PSB + KSM)+ *T viride* + neem oil (T_7) and it was statistically at par with T_8.

Organic manures are potential source of nutrients and better resource for soil amelioration which influence growth parameters (Musara and Chitamba 2014). Albeit, organic manure along with bio-fertilizer increased the organic matter content, improved the physical and chemical properties of the soil and maintained the nutrients balance for crop and accelerated the growth (Aldal'in and Alhrout 2016). Organic manures and bio-fertilizers improve water holding capacity, availability of nutrients and micronutrients (Negi et al 2017).

According to Dauda et al (2008) poultry manure and other organic manures are essential for establishing and maintaining optimum soil physical condition and are important for plant growth. The present results are in accordance with the results of Aliyu and Kuchinda (2002) in pepper, Dauda et al (2005) in brinjal and Dauda et al (2008) in watermelon.

Effect of organic nutrient management on flowering

Different levels of organic nutrients were unable to exert statistically significant variation in number of male flowers per plant. But significantly maximum female flowers per plant (27.34), sex ratio (2.17) and fruit set (15.81%) were recorded with treatment T_7 that was statistically at par with the treatment T_8.

Table 1. Effect of organic nutrient management on growth and flowering parameters of muskmelon

Treatment	Vine length (cm) at		Number of sub-vines at 45 DAS	Leaf area/ plant at 45 DAS (cm^2)	Days taken to flower initiation	Number of male flowers/ plant	Number of female flowers/plant	Sex ratio	Fruit set (%)
	30 DAS	60 DAS							
T_1	34.64	213.57	2.74	344.84	37.57	55.26	23.97	2.09	12.37
T_2	33.48	212.76	2.64	336.77	38.03	56.58	23.67	2.08	12.06
T_3	32.33	211.69	2.54	269.94	38.30	57.68	23.60	2.07	11.92
T_4	39.08	229.27	3.48	508.28	35.72	52.53	25.23	2.14	14.05
T_5	36.61	227.88	3.27	443.90	35.82	53.28	25.06	2.14	13.80
T_6	36.22	225.86	3.28	397.15	35.98	53.29	24.96	2.12	13.41
T_7	43.51	242.32	4.48	635.54	33.64	51.03	27.34	2.17	15.81
T_8	42.27	240.66	4.27	632.84	34.17	51.48	26.75	2.16	15.27
T_9	41.48	238.31	4.18	606.35	34.32	51.62	26.52	2.15	15.15
SEm±	1.45	8.02	0.153	23.03	1.10	1.605	0.90	0.01	0.53
$CD_{0.05}$	4.18	23.06	0.43	66.18	3.18	NS	2.60	0.03	1.54
CV (%)	9.46	8.66	10.90	12.16	7.55	7.33	8.79	1.26	9.56

T_1: 50% N from FYM + 50% N from poultry manure, T_2: 50% N from neem cake + 50% N from poultry manure, T_3: 50% N from castor cake + 50% N from poultry manure, T_4: T_1+ bio-fertilizer [*Azospirillium* + phosphorus solubilizing bacteria (PSB) + KSM], T_5: T_2 + bio-fertilizer (*Azospirillium* + PSB + KSM), T_6: T_3 + bio-fertilizer (*Azospirillium* + PSB + KSM), T_7: T_4 + *Trichoderma viride* + neem oil, T_8: T_5 + *T viride* + neem oil, T_9: T_6 + *T viride* + neem oil

Organic manures and bio-fertilizers improve the biological activities of desirable microorganisms in the soil and thus improve plant growth parameters. Similar results have been shown by Bahadur et al (2004) in cabbage and Singh et al (2016) in capsicum.

CONCLUSION

It can be concluded that to obtain better growth and flowering of muskmelon the treatment of 50 per cent N from FYM + 50 per cent N from poultry manure + bio-fertilizer (*Azospirillium* + PSB + KSM) + *T viride* + neem oil may be applied.

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