

Studies on Seed Yield and Quality as Influenced by Organics in Capsicum (*Capsicum annuum*)

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Capsicum is one of the important commercial vegetable crops grown in India. The recent developments related to agriculture at national and international level have again renewed the interest in organic recycling. Research reports on the effect of organic manure application on various field crops indicate to sustain crop productivity besides maintaining soil health. The value of vegetable lies in its quality attributes. Organically produced vegetables are considered superior and valuable. It is also believed that the post-harvest losses of such vegetables are considerably low as compared to conventionally grown vegetables. Keeping these aspects in view, the present investigation were carried out to study the influence of farmyard manure, vermicompost, biofertilizer and neem cake on seed production of capsicum.

The field experiment was conducted at Agricultural Research Station Bagalkot, University of Agricultural Sciences, Dharwad, during summer 2007-08. The experiments were laid out in a randomized block design with factorial concept with three replications. There were 16 treatments with combinations of two factors; soil application(s) as one factor, viz. RDF (100 : 50 : 50 kg NPK/ha) + FYM (25 t/ha) S₁, FYM (50%) + vermicompost (50%) S₂, FYM (50%) + vermicompost (50%) + neemcake (500 kg/ha) S₃, FYM (50%) + vermicompost (50%) + biofertilizer (5 kg/ha each azospirillum + PSB) S₄, Foliar application as another factor (F) panchagavya (5%) F₁, vermiwash (5%) F₂, NAA (10 ppm) F₃ and the control (water spray) F₄.

The manures were applied at the time of land preparation and the biofertilizers were applied at the time of transplanting. Thirty-five days old vigorous healthy uniform size seedlings were transplanted in the main field. The observations were recorded on growth, fruit, seed yield and quality parameters by adopting standard procedures and results were analyzed statistically and presented in Table 1.

Significantly higher fruit and seed yields were recorded in treatment S₄ [i.e. soil application of FYM (50%) + vermicompost (50%) + biofertilizer]. The increase in seed yield/ha (475.31 kg) may be attributed to contribution of yield parameters such as number of seeds/fruit (137.18), seed weight/plot (321.40 g) and 100-seed weight (0.83 g). The fruit yield/ha (13.99 tonnes) differed significantly. This is because of total number of fruits/plant (12.61), fruit yield/plant (380.57 g) and fruit yield/plot (9.29 kg). The increase in fruit and seed yield may be due to the better source sink relationship between photosynthetic area and assimilating points. This may be attributed to the application of vermicompost and direct role of biofertilizer in nitrogen fixation, production of phytohormones like substances and increased uptake of nutrients that might have contributed to higher growth and helped to increase the fruit and seed yield in this treatment [4]. Bindiya *et al.* [1] reported similar results in cucumber. The increase in seed yield and seed quality parameters were recorded in plants which were inoculated with bio-fertilizers. This could be attributed to the effect of growth hormones,

like IAA, cytokinin, auxin, gibberelin like substances produced by azospirillum. The FYM might have enhanced the efficacy of applied N and P. The efficacy of inorganic manure was pronounced when they were combined with organic fertilizers, individually or synergistically resulted in the increased yield as was reported by Nanthakumar and Veeraraghavatham in brinjal [2].

Seed quality parameters such as the seed germination percentage, root-shoot length and seedling vigour index, electrical conductivity, seedling dry weight differed significantly due to soil application of organics. The higher seed germination (93.42%), shoot length (5.32 cm), root length (5.62 cm), seedling vigour index (1002) seedling dry weight (43.64) and lower electrical conductivity (0.366 dSm^{-1}) were observed in the treatment S_4 [i.e. soil application of FYM (50%) + vermicompost (50%) + biofertilizers]. This might be due to better nutrient status in the soil and better assimilation of nutrients by plants. Higher seed germination and 100-seed weight may be more because of more availability of nitrogen in the soil for longer duration as organics reduce the leaching loss and there is more availability of nitrogen for prolonged duration [3].

The foliar spray of NAA (10 ppm) produced significantly higher fruit yield and seed yield and its parameters, like number of seeds/fruit (128.78), seed weight/plant (11.93g), seed yield/plot (280.67g) and also seed yield/ha (414.82 kg). Number of fruits/plant (12.57), fruit yield/plant (361.52 g), fruit yield/plot (9.00 kg), fruit yield/ha (13.18 tonnes) were increased due to NAA spray. This may be due to presence of growth promoting seed regulatory substances, like cytokinins, etc. The higher germination (92.58), shoot length (5.28 cm), root length (5.49 cm) and seedling vigour index (997) and lower electrical conductivity (0.384 dSm^{-1}) were recorded in the

treatment F_3 i.e. foliar spray of NAA @ 10 ppm. This may be due to presence of growth regulatory substances in the seed which enhanced the seed yield and its components.

Interaction of soil and foliar application

The interaction S_4F_3 [FYM (50%) + vermicompost (50%) + biofertilizer and foliar spray of NAA @ 10 ppm] was found to be superior over rest of the treatments and it recorded the seed yield attributes, like 100-seed weight, seed yield/plant, seed weight/plot and number of seeds (1.03 g, 17.49 g, 434.50 g, 152.63, respectively) and fruit yield attributes, like number of fruits/plant, fruit yield/plot, fruit yield/ha (14.33, 10.93 kg, 16.33 tonnes/ha, respectively). Soil application of FYM (50%) + vermicompost (50%) + biofertilizer and foliar spray of NAA (10 ppm) recorded germination (95%), shoot length (5.83 cm), root length (5.94 cm) and seedling vigour index (1106), lower electrical conductivity (0.331 dSm^{-1}) and higher seedling dry weight (43.54 mg) in S_4F_3 treatment as compared to rest of the treatments.

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