

Growth, Flowering and Yield Parameters of Garden Pea (*Pisum sativum* L.) as Influenced by Different Biofertilizers

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ABSTRACT

Present study was conducted during rabi season of 2012 at Horticulture Instructional Farm, C. P. College of Agriculture, S. D. Agricultural University, Sardarkrushinagar. The experiment was laid out in Randomised Block Design with three replications. In present investigation, six biofertilizers i.e., Azotobacter, Acetobacter, PSB, KMB, Azospirillum, Rhizobium applied through seed treatment alone or in combination with soil application. The results of present investigation revealed that seed treatment along with soil application of PSB recorded minimum days for germination (8.33), maximum germination percentage (93.33), vine length at 30 DAS (29.52cm) and vine length at 60 DAS (79.21cm). The minimum days taken for flower initiation (52.33) and highest yield per hectare (164.33q) was found with application of KMB (seed treatment along with soil application).

Keywords: Biofertilizer, Bonneville, garden pea.

1. INTRODUCTION

India is thickly populated country and most of the residents of this country are vegetarian. The population being increased without check is the main handicap in our progress which challenges the food shortage and malnutrition, these challenges can be handled to some extent by adoption of intensive cultivation of vegetable crops. Out of different vegetables the garden pea (*Pisum sativum* L.) is one of the highly nutritious leguminous crop and which helps to fix atmospheric nitrogen to the soil. With organic farming being pursued as the state policy our long-term objective remains to evaluate different plant growth-promoting micro-organisms and used as a viable, economic and environment-friendly alternative of synthetic chemicals (Bahadur *et al.* 2003, 2006).

2. MATERIALS AND METHODS

The experiment was conducted during rabi season of 2012 at Horticulture Instructional Farm, C. P. College of Agriculture, S. D. Agricultural University, Sardarkrushinagar. Six biofertilizers were taken under the study *viz.*, Azotobacter, Acetobacter, PSB, KMB, Azospirillum and Rhizobium applied through seed treatment alone or in combination with soil application making total twelve

treatment combinations. The very popular and introduced garden pea cultivar, Bonneville was undertaken for study. The application of biofertilizers was done through seed treatment @ 250g per 10 kg seed and soil application @ 4 kg/acre at the time of sowing. Vermicompost @ 10 t/ha before sowing was applied uniformly in all the treatments. The biofertilizers were obtained from the Department of Microbiology, Navsari Agricultural University, Navsari.

The experiment was laid out in a Randomized Block Design with three replications. The status of soil (149kg N/ha, 26kg P/ha, 287kg K/ha and 7.8 pH) was analyzed before research conducted. To raise the crop recommended package of practices were followed. The different treatments were evaluated on the basis of growth (days for germination, germination percent, vine length at 30 and 60 DAS), flowering (days for flower initiation) and yield (yield q/ha) performance. The various parameters were recorded from five randomly selected tagged plants. The mean data were subjected to statistical analysis following analysis of variance technique (Gomez and Gomez, 1984).

3. RESULTS AND DISCUSSION

Use of biofertilizers showed significant impact on growth and flowering attributes of garden pea. The minimum days for germination *i.e.* 8.33 were recorded with treatment T₁₁ (Seed treatment with PSB + Soil application with PSB) and it was statistically at par with treatments T₂, T₆, T₁₂, T₁₃ and T₁₄. The maximum germination percentage *i.e.* 93.33 was recorded with treatment T₁₁ (Seed treatment with PSB + Soil application with PSB) and which was statistically at par with treatments T₁₂, and T₁₄.

The maximum length of vine at 30 and 60 days after sowing *i.e.* 29.52 cm and 79.21 cm, respectively was recorded with treatment T₁₁ (Seed treatment with PSB + Soil application with PSB) and it was found significantly superior over all other treatments. The minimum days taken for flower initiation *i.e.* 52.33 was recorded with treatment T₁₂ (Seed treatment with KMB + Soil application with KMB) and it was statistically at par with treatments T₁₁, T₆, T₉, T₁₀, T₅, T₁₃ and T₁₄. The significantly superior yield (164.33q/ha) over all other treatments were recorded with treatment T₁₂ (Seed treatment with KMB + Soil application with KMB). The results are in line with Bahadur *et al.* 2006 and Jaipaul *et al.* 2011.

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Table 1: Growth, flowering and yield parameters of garden pea as influenced by different biofertilizers

Treatments	Days taken for germination	Germination (%)	Vine length at 30 DAS (cm)	Vine length at 60 DAS (cm)	Days taken for flower initiation	Yield per hectare (q)
T ₁ RDF of NPK (25:70:50 kg/ha) + seed treatment with Rhizobium	10.33	78.00	20.54	63.88	56.66	107.33
T ₂ Recommended dose of NPK+FYM+seed treatment with Rhizobium	8.66	83.00	23.27	70.98	55.66	117.33
T ₃ Seed treatment with Azotobacter	10.33	64.00	18.69	63.42	54.66	90.67
T ₄ Seed treatment with Acetobacter	10.33	78.00	18.34	65.10	54.66	80.33
T ₅ Seed treatment with PSB	10.33	84.33	19.06	62.96	53.00	98.67
T ₆ Seed treatment with KMB	8.66	79.00	18.58	62.18	54.33	120.67
T ₇ Seed treatment with Azospirillum	10.00	77.66	18.10	66.33	55.00	111.67
T ₈ Seed treatment with Rhizobium	9.66	77.33	18.75	68.65	55.66	118.33
T ₉ Seed treatment with Azotobacter+Soil application of Azotobacter	10.33	75.33	19.45	70.88	54.33	107.33
T ₁₀ Seed treatment with Acetobacter+Soil application of Acetobacter	10.33	79.33	21.49	70.52	54.33	106.33
T ₁₁ Seed treatment with PSB + Soil application of PSB	8.33	93.33	29.52	79.21	53.00	152.67
T ₁₂ Seed treatment with KMB + Soil application of KMB	8.66	90.00	25.80	74.06	52.33	164.33
T ₁₃ Seed treatment with Azospirillum + Soil application of Azospirillum	8.66	86.33	23.92	70.57	53.66	117.67
T ₁₄ Seed treatment with Rhizobium + Soil application of Rhizobium	8.66	89.66	25.74	72.16	53.33	127.67
C.D. at 5%	1.13	4.06	2.17	2.39	2.22	8.62