

PERFORMANCE OF BIO AND CHEMICALS SEED TREATMENT OF BROAD BEAN (*VECIA FABA L.*) VARIETIES IN CENTRAL UTTAR PRADESH

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Abstracts: A field experiments was conducted at Students' Instructional Farm of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur-208002 (UP) during Rabi season of 2016-17. The experiment comprising of twelve treatments was laid out in a Factorial Randomized Block Design with three replications. Treatment comprised three varieties of Bakla (*Vicia faba*) viz., Pant Nagar local, Pusa Palam (Samridhi) and Kanpur local and four bio & chemical seed treatments viz., Malathion @ 3.0 g/kg seed Carbendazim @ 3.0 g/kg seed, Neem Powder @ 250 g/kg seed and Control (water) each treated seed soaked in four hours. The soil of the experimental field was sandy loam in texture with pH of 7.5 and EC of 0.20 mmhos/cm at 25°C. Seed rate of Faba bean @80 kg/ha was row to row spacing 30cm and plant to plant 20cm was sown by country plough on dated: 30.11.2016. Remaining practices were applied as per recommendation. Crop was harvested on March 03, 2017. The results indicated that all observed growth parameters in respect of seed germination, plant height and maximum flowering at all stages were significantly higher under the variety of Pant Nagar local along with bio & chemical seed treatments of Carbendism in present experiment. The yield attributing characters viz., pods/ plant, pod weight/ plant and seed/ biomass weight/ plant were significantly higher in variety of Pant Nagar local with bio & chemical seed treatments of Carbendism in present trail. The Pant Nagar local variety gave higher yield (10.64 q/ha) and straw yield (19.41 q/ha) in comparison to all other varieties. Among the bio & chemicals seed treated the significantly higher seed (11.14 q/ha) and straw yield (16.87 q/ha) was recorded under seed treatments with Carbendism than malathion, neem powder and control seed treatment, respectively.

Keywords: Neem Powder, Carbondazim, Malathian, Varieties of Faba bean

INTRODUCTION

Bakala is commonly known as Faba bean or Broad bean. Faba bean (*Vicia faba L.*) is a legume crop grown primarily for its edible seeds (beans). Faba bean is a major legume seed consumed by humans worldwide. The seeds of some varieties are an important livestock feed. Faba bean is also grown for fodder. *Vicia faba* is an upright annual forage legume. Faba bean is a multipurpose crop used for both food and fodder. Faba bean is a much delicious food legume in the Mediterranean region, China and Ethiopia. Faba beans has used by human being after premature harvesting. The dried seeds are cooked, canned or frozen. Mature seeds are roasted snacks eaten in India or ground to prepare falafel, sauces and various food ingredients such as meat extenders or skim- milks replacers. When faba beans are intended for livestock feeding, small-seed varieties with low-tannin, low vicine-convicine and low trypsin inhibitor contents are preferred. Faba bean seeds are rich in protein (25-33% DM) and starch (40-48% DM) and are, therefore, a valuable source of protein and energy for live stock. They have a moderate content of fibre (Crude fibre 7-11% DM). To determine the efficacy of different bio & chemicals seed treatments as malathion, carbendisim and neem powder for protection of the insect pest attacked and their effect on yield of Bakala. The productivity of Bakala may certainly be increased by

the varieties if used in practice. Such varieties being short structured and erect with branching growing habit require seed treatment to exploit their yield potential. Therefore present study to maximize growth and yield of Farabean in Central Plain Zone of Uttar Pradesh.

METHODOLOGY

A field experiments was conducted at Students' Instructional Farm of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur-208002 (UP) during Rabi season of 2016-17. The experiment comprising of twelve treatments was laid out in a Factorial Randomized Block Design with three replications. Treatment comprised three varieties of Bakla (*Vicia faba*) viz., Pant Nagar local, Pusa Palam (Smridhi) and Kanpur local and four bio and chemical seed treatments viz., Malathion @ 3.0 g/kg seed, Carbendazim @ 3.0 g/kg seed, Neem Powder @ 250 g/kg seed and control. Each treated seed soaked in said hour in said chemicals and in case of control treated seed soaked in four hour only water. The soil of the experimental field was sandy loam in texture with pH of 7.5 and EC of 0.20 mmhos / cm at 25°C. Seed rate of Faba bean @ 80 kg/ha was row to row spacing 30cm and plant to plant 20cm was sown by country plough on dated: 30.11.2016. The fertilizers doses was applied as recommended NPK (60:60:40 kg/ha). Applied in

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different sources viz., Urea, SSP & MOP. Nitrogen should be applied in split doses. Full dose of phosphorus and Potassium and half dose Nitrogen should be applied in furrows below the seed at sowing time. Remaining half dose of nitrogen should be applied as top dressing at flowering stage. Crops were irrigated thrice. Remaining practices were applied as per recommendation. Crop was harvested on March 03, 2017.

RESULTS AND DISCUSSION

GROWTH ATTRIBUTES

(i) Effect of genotypes of broad bean

Among the varieties the data revealed that the seed germination were counted higher under the variety of Pant Nagar local (15.42/m) at 10 days after sowing of the crop followed by Pusa Palam (14.92/m). The minimum germination was recorded under the variety of Kanpur local (13.58/m). After twenty days sowing of crop it was observed that the significantly maximum germination were recorded under the variety of Pantnagar local (30.75/m) followed by Pusa Palam (24.17/m). The significantly minimum germination was recorded under the variety of Kanpur local (21.25/m). The significantly maximum plant height were recorded under the variety of Pantnagar local (6.50 cm) followed by Pusa Palam (5.06cm) at 30 DAS. The significantly minimum in Kanpur local (4.67cm) at 30 days after sowing of crop. Broad bean variety of Pant Nagar local had significantly higher taller plant than rest of the tested varieties at 30 and 60 days after sowing, respectively. The taller plant (14.22 and 46.05 cm) was measured in Pantnagar local and the lowest plant (11.70 and 39.17 cm) in Kanpur local variety of broad bean at 60 and 90 DAS increase the variety of Pantnagr local was produced significantly higher plant height at harvesting stage than remaining varieties of field experimentation. The higher flowering were recorded under the variety of Pant Nagar local (1.89) followed by Pusa Palam (1.33) and the minimum flowering was recorded under the variety of Kanpur local (0.53) at 48 days after sowing of crop. The similar trend was also observed at 60 days after sowing of broad bean varieties in respect to maximum flowering. The number of days to 50% flowering of genotypes differed significantly where the local genotypes flowered late (47 days), in comparison with improved genotypes Hachalu (42 days) and Walki (43 days) by Kubure *et al.* (2016) and same results are in agreement with Gemechu *et al.* (2006).

(ii) Effect of bio & chemical chemical seed treatment

Among the seed treatments the higher germination was recorded when the seed treated with Carbandism (11.11/m) followed by Seed treatments with Malathion (10.91/m). The minimum germination was recorded under the control plot (9.11/m). It was observed that the significantly maximum germination

was recorded when seed treated with Carbandism (30.75/m) and followed by Malathian (26.78/m). The significantly minimum germination were recorded under the without seed treatment (20.44/m). It was also observed that the significantly maximum plant height (6.10cm) were recorded when seed treated with Carbandism followed by Malathion (5.59cm). The significantly minimum plant height (4.58cm) was recorded without seed treated plot. The similar trends were also observed at 60, 90 days after sowing of crop and at harvest stage. In seed treatment the higher flowering were recorded under the application of Carbandism (1.52) followed by Malathion (1.44). The minimum flowering recorded under the untreated plot (0.59) at 48 days after sowing of crop. The similar trend was also observed at 60 days after sowing of crop. An increase in plant growth and branches were found by inoculation of broad bean seeds before sowing by the mixture of microbein and phosphorein at rate of 1:1 reported by *Rakha and El-Said* (2013). The relatively findings were observed that the exogenous salicylic acid (SA) applied at 0.0, 0.5, 1.0 and 3.0 mm SA concentrations to Faba bean seeds showed significant increase in seed by *Soliman et al.* (2016).

YIELD ATTRIBUTES

(i) Effect of genotypes of broad bean

Among the varieties it was observed that the significantly higher pod weight per plant was recorded under the variety of Pant Nagar Local (31.56g) and significantly minimum in Kanpur local (21.17g). The significantly higher number of pods/plant were recorded under the variety of Pant Nagar local (25.30 Pods) and followed by Pusa Palam (24.03 Pods). The significantly minimum numbers of pods per plant were recorded under the variety of Kanpur local (21.58 Pods). The significantly higher seed yield per plant was recorded under the variety of Pant Nagar Local (35.75g) followed by Pusa Palam (22.86g). The significantly minimum seed yields per plant (20.66g) were recorded under the variety of Kanpur local. The significantly higher seed yield per plant were recorded under the variety of Pant Nagar local (35.75g) followed by Pusa palam (22.86g). The significantly minimum seed yield per plant was recorded under the variety of Kanpur local (20.66g). The significantly higher biomass per plant were recorded under the variety of Pant Nagar Local (11.64g) followed by Pusa Palam (8.5g). The significantly minimum biomass/ plant were recorded under the variety of Kanpur local (8.01g). Kubure *et al.* (2016) reported that the cultivation of improved varieties of faba bean Welki and Hachalu with a plant density of 44 plants/ m² (30 cm × 7.5 cm spacing) was found to be better than the local cultivar in term of yield and yield attributes. Similar type of results was also found by Kandil *et al.* (2011) and Khafaga (2009).

(ii) Effect of bio & chemical chemical seed treatment

Among the seed treatments it was also observed that the when seed treated with Carbandism gave significantly higher pod weight (26.73g/plant) but it significantly at par with Malthion (26.28g/plant). Significantly minimum pod weight was recorded untreated plot (22.89g/plant). The significantly higher numbers of pod per plant were recorded when seed treated with Carbandism (25.55 Pods) followed by with the application of Malathian (23.73 Pods). Significantly minimum numbers of pods per plant were recorded under the untreated plot (21.92 Pods). When seed treated with Carbandism it gave significant higher seed yield per plant (34.82g) followed by seed treated with Malathian (24.09g). The significantly minimum seed yield per plant was recorded under the untreated plot (23.20g). The significantly higher straw yield for plants were recorded under the seed treated with Carbandism (10.12g) followed by Malathian (10.04g). The significantly minimum straw yield per plant was recorded under the untreated plot (8.48g). These

findings are in conformity with reported by Shafeell *et al.* 2016 and Dimissie *et al.* 2013.

YIELDS (q/ha)

(i) Effect of genotypes of broad bean

The data revealed that the significantly higher yield was recorded under the variety of Pantnagar local (10.64q/ha) followed by the variety of Pusa Palam (9.86q/ha). The significantly minimum yield was recorded under the variety of Kanpur local (7.05q/ha). The significantly maximum straw yield was recorded under the variety of Pant Nagar Local (19.41q/ha) followed by Pusa Palam (14.25q/ha). The significantly minimum yield was recorded under the variety of Kanpur local (13.29 q/ha). Kubure *et al.* (2016) reported with the improved genotypes, Walki (3,407 kg/ha) being comparable with Hachalu (3, 037 kg/ha) gave substantially greater seed yield than the local cultivar (2, 833 kg/ha) and the results are supported by the findings of Rakha and El-Said (2013), Mohamed and El-Abbas (2005) and Salama and Awaad (2005). These findings are in close conformity with the results reported by Abido and Seadh (2014), Husein *et al.* (2002) and Mohamed (2003).

Table 1. Effect of different varieties with bio & chemical seed treatments on growth attributes of *Faba bean* crop.

Treatments	Seed Germination/m length		Plant height (cm) at				Maximum Flowering at	
	10DAS	20 DAS	30DAS	60DAS	90DAS	Harvestin g	48 DAS	60 DAS
Varieties								
Pant nager local	15.42	30.75	6.50	14.22	46.05	57.23	1.89	5.67
Pusa Palam (Samriddhi)	14.92	24.17	5.06	12.76	44.01	48.08	1.33	4.75
Kanpur local	13.58	21.25	4.67	11.70	39.17	46.63	0.53	3.33
SE(d)±	0.924	1.121	0.229	0.528	1.215	1.360	0.131	3.17
CD at 5 %	NS	2.326	0.621	1.095	2.520	2.822	0.271	0.658
Bio & Chemical Seed treatment								
Malathian	10.91	26.78	5.59	13.03	42.61	52.12	1.44	4.33
Carbondazim	11.11	30.78	6.10	13.44	46.47	54.19	1.52	5.34
Neem Powder	10.45	23.56	5.36	12.74	42.61	51.47	1.44	4.33
Control	9.11	20.44	4.58	12.36	40.31	44.81	0.59	3.44
SE(d)±	1.151	1.295	0.346	0.610	1.215	1.571	0.151	0.366
CD at 5 %	NS	2.686	0.717	N.S.	2.520	3.258	0.313	0.760

Table 2. Effect of different varieties with bio & chemical seed treatments on yield attributes and yields (q/ha) of *Faba bean* crop.

Treatments	Branches/Plant at 90 DAS	Pod weight/Plant (g)	Pods/ Plant	Grain Weight/Plant (g)	Biomass/plant (g)	Seed Yield (q/ha.)	Straw yield (q/ha.)
Varieties							
Pant nager local	5.47	31.56	25.30	35.75	11.645	10.64	19.41
Pusa Palam (Samriddhi)	4.61	21.17	24.03	22.86	8.550	9.86	14.25
Kanpur local	4.47	23.08	21.58	20.66	8.015	7.05	13.29
SE(d)±	0.323	0.832	0.768	1.449	0.614	0.417	0.832
CD at 5 %	0.670	1.726	1.593	3.005	1.275	0.866	1.726
Bio & Chemical Seed treatment							
Malathian	4.51	26.28	23.73	24.00	10.04	9.77	15.64

Carbondazine	5.51	26.73	25.55	34.82	10.12	11.14	16.87
Neem Powder	4.51	25.18	23.33	23.60	8.97	8.97	14.95
Control	4.26	22.23	21.92	23.28	8.48	6.86	14.14
SE(d)±	0.373	0.961	0.886	1.673	0.709	0.482	0.960
CD at 5 %	0.774	1.992	1.839	3.470	N.S.	1.000	1.992

(ii) Effect of bio & chemical seed treatment

Among the seed treated the significantly higher yield were recorded under seed treatment with Carbandism (11.14q/ha) followed by seed treated with Malathian (9.77q/ha). The significantly minimum yield was recorded in without treated plot (6.86 q/ha). It was observed that the significantly higher straw yield (16.87 q/ha) was recorded with the application of Carbandism which was at par with the application of Malathian (16.64q/ha). The significantly minimum straw yield was recorded under the without treated plot (14.14q/ha). Similar results are conformed to Demissie *et al.* (2013) and Shafeek *et al.* (2016) and Soliman *et al.* (2016).

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