Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.7156

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **6 (6):** 390-392 (2018)

Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Growth and Yield of Cowpea as Influenced by Foliar Nutrition and Phosphobacteria

S. Krishnaprabu*

Department of Agronomy, Faculty of Agriculture, Annamalai University,
Annamalainagar – 608 002, Tamil Nadu

*Corresponding Author E-mail: prabu1977krishna@gmail.com

Received: 5.10.2018 | Revised: 13.11.2018 | Accepted: 17.11.2018

ABSTRACT

A field experiment was conducted on clay loam soil texture with pH of 6.9 and EC is 0.51 dSm^{-1} on cowpea with twelve treatments in a randomized block design during the year of summer 2014 at Experimental Farm, Annamalai Univeristy, Annamalainagar to evaluate the impact of foliar nutrition and phosphobacteria on growth and yield of cowpea. Application of phosphobacteria along with diammonium phosphate spray by two times and combined with panchagavya at 15, 25 and at 35 days after sowing significantly influenced on growth and yield parameters of cowpea compared with control.

Key words: *Cowpea, Foliar fertilization, Phosphobacteria, Seed treatment and Panchagavya*

INTRODUCTION

Cowpea (*Vigna unguiculata*) is one of the most important pulse crop among the various green legumes. Pulses contain a high percentage of quality protein nearly three times as much as cereals. It provides minerals and vitamins to the diet. Cowpea is called as vegetable meat due to high amount of protein in grain and better biological value on dry weight basis. Cowpea grain contains 23.4 per cent protein, 1.8 per cent fat and 60.3 per cent carbohydrates. It checks the soil erosion and also forms a good silage and green manure crop. It is a drought tolerant and warm-weather crop. It has the ability for fix about 70-150 kg atmospheric nitrogen per hectare through its nodules, cowpea is compatible grown as intercrop with maize, millets, sugarcane and cotton.

The continuous use of fertilizers under intensive cropping system has adverse impact on soil properties such as soil structure, pH, organic matter and nutrient cycle, causes soil health hazards. Integrated nutrient management, which enhances the maintenance of soil fertility to an optimum level for crop productivity to obtain maximum benefit from all sources of nutrients[8,3].

Panchagavya is a foliar nutrition prepared by organic growers of Tamil Nadu as a indigenous material and is used widely for agricultural and horticultural crop[5]. Therefore, keeping the above facts in view, the present investigation was undertaken to evaluate the impact of foliar nutrition and phosphobacteria inoculation on growth and productivity of cowpea.

Cite this article: Krishnaprabu, S., Growth and Yield of Cowpea as Influenced by Foliar Nutrition and Phosphobacteria, *Int. J. Pure App. Biosci.* **6(6):** 390-392 (2018). doi: http://dx.doi.org/10.18782/2320-7051.7156

MATERIAL AND METHODS

A field experiment was conducted during season of summer 2014 at Experimental Farm at Annamalai University. The soil was low in available phosphorus and pH 7.1 and EC 0.53 dSm^{-1}. The experiment was laid out in randomized block design with twelve treatments comprising of T_1 – Control, T_2 – DAP spray of 2 times (Pre-flowering and 15 days after sowing), T_3 – Phosphobacteria (Seed treatment), T_4 – Panchagavya spray at 15, 25 and 35 DAS, T_5 – Panchagavya spray at 15, 25, 35 and at 45 DAS, T_6 – DAP spray 2 times + Panchagavya spray at 15, 25 and 35 DAS, T_7 – DAP spray 2 times + Panchagavya spray at 15, 25, 35 and 45 DAS, T_8 – PSB + DAP spray 2 times, T_9 – PSB + DAP spray 2 times + Panchagavya at 15, 25 and at 35 DAS, T_{10} – PSB + DAP spray 2 times + Panchagavya at 15, 25, 35 and 45 DAS, T_{11} – PSB + Panchagavya at 15, 25 and 35 DAS and T_{12} – PSB + Panchagavya at 15, 25, 35 and at 45 DAS. All the data of observations recorded in the experiments were statistically analysed as suggested by Panse and Sukhatme[7]. the critical differences were worked out at five percent probability level.

The field experiment was completed with three replications and crop was fertilized and irrigated as per treatment schedule. Variety VBN 1 was sown at a spacing of 30 × 15 cm. Periodical observations were taken up with different growth stages. The experimental data on observations were statistically analyzed by adopting the procedure of Panse and Sukhatme[7]. The critical difference was calculated at five per cent probability level to draw statistical calculations.

RESULTS AND DISCUSSION

The data on plant height (cm) of cowpea was recorded in Table 1. Highest seed yield of cowpea was recorded with application of phosphobacteria two times along with DAP two times and with panchagavya at 15, 25, 35 and 45 days after sowing. (884.0 kg ha^{-1}) as compared to other treatments. These findings are in a correlated with bengalgram[1], Kundu *et al.*[4], Gorade *et al.*[2].

The significant improvement in seed yield of cowpea mainly attributed to significant improvement in yield parameters like number of pods $plant^{-1}$ and number of seeds pod^{-1} as compared to rest of treatments. Panchagavya is an efficient plant growth stimulant that enhanced the biological efficiency of crops. It is used to activate biological reactions and to protect the plants from disease incidence[6,11,9,3,8,10].

Table 1. Influence of foliar nutrition and phosphobacteria on growth and yield attributes of cowpea

Treatments	Plant height (cm)	Leaf area index	Dry matter production (t ha^{-1})	Number of pods $plant^{-1}$	Number of seeds pod^{-1}	Seed yield (kg ha^{-1})
T_1 – Control	32.26	39.07	1.92	1857	6.07	505
T_2 – DAP spray of 2 times (Pre-flowering and 15 days after sowing)	32.18	41.34	2.21	2145	6.34	567
T_3 – Phosphobacteria (Seed treatment)	39.09	40.27	2.05	2003	6.21	536
T_4 – Panchagavya spray at 15, 25 and 35 DAS	38.27	42.48	2.37	2289	6.45	607
T_5 – Panchagavya spray at 15, 25, 35 and at 45 DAS	35.14	43.51	2.58	2432	6.57	643
T_6 – DAP spray 2 times + Panchagavya spray at 15, 25 and 35 DAS	37.24	48.21	3.22	3009	7.20	778
T_7 – DAP spray 2 times + Panchagavya spray at 15, 25, 35 and 45 DAS	41.01	48.34	3.25	3013	8.01	784
T_8 – PSB + DAP spray 2 times	34.32	44.72	2.72	2576	6.69	678
T_9 – PSB + DAP spray 2 times + Panchagavya at 15, 25 and at 35 DAS	42.18	49.57	3.39	3158	7.423	834
T_{10} – PSB + DAP spray 2 times + Panchagavya at 15, 25, 35 and 45 DAS	44.07	50.81	3.55	3306	7.65	884
T_{11} – PSB + Panchagavya at 15, 25 and 35 DAS	33.12	45.87	2.88	27321	6.84	713
T_{12} – PSB + Panchagavya at 15, 25, 35 and at 45 DAS	31.63	47.26	3.03	2864	6.97	728
S.Ed.		0.62	0.06	60.2	0.11	24.7
CD (P=0.05)		1.24	0.12	120.4	0.22	48.14

REFERENCES

1. Reddy, C. M., Effect of foliar nutrition on the growth and yield of rice fallow blackgram cv. ADT 5 M.Sc. (Ag.) Thesis, Annamalai Univ., Annamalainagar, Tamil Nadu. (2002).
2. Gorade, V.N., Chavan, L.S., Jagtap, D.N. and Kolekar, A.B., Response of greengram varieties to INM in summer season. *Agric. Sci. Digest*, **34(1):** 36-40 (2014).
3. Kumpawat, B.S., Integrated nutrient management in blackgram and its residual effect on succeeding mustard crop. *Indian J. Agric. Sci.*, **80:** 76-79 (2010).
4. Kundu, R., Mandal, J. and Majumder, A., Growth and production potential of greengram influenced by rhizobium inoculation with different nutrient sources. *Int. Agric. Environ. Biotechnol.*, **6(3):** 344-350 (2013).
5. Natarajan, K., Panchagavya – A manual. Other India Press, Mapusa, Goa, India, p. 33. (2002).
6. Nileema S. Gore and Sreenivasa, M.N., Influence of liquid organic manures on growth, nutrient content and yield of tomato in the sterilized soil. *Kar. J. Agric. Sci.*, **24:** 153-157 (2011).
7. Panse and Sukhatme., Statistical method for agriculture workers. ICAR, New Delhi, India, p. 145. (1978).
8. Kumar, R., Bidyut, Deka, C. and Ngachan, S.V., Response of summer mungbean to sowing time, seed rate and integrated nutrient management. *Legume Res.*, **38(3):** 348-352 (2014).
9. Sarkar, S., Kundu, S.S. and Ghoriai, D., Validation of ancient liquid organics – panchagavya and Kumpaja'a as plant growth promotes. *Indian J. Trad. Knowl.*, **13:** 398-403 (2014).
10. Shinde, P.B., Prajapati, D.R., Shaulat, Ali, Munde, S.D., Soil fertility and quality parameters as influenced by INM in soybean growth during summer season under different land configuration. *Adv. Res. J. Crop Imp.*, **4(1):** 70-73 (2013).
11. Kulkarni, S., Upperi, S.N. and Jadhav, R.L., Greengram productivity enhancement through foliar spray of nutrients. *Legume Res.*, **39(5):** 814-816 (2016).