



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(11): 342-343
© 2023 TPI
www.thepharmajournal.com
Received: 26-09-2023
Accepted: 30-10-2023

Mukesh Bharati
Assistant Technology Manger,
ATMA, office-S.A.D.O. Block,
Patharia, Damoh,
Madhya Pradesh, India

Dwarka
Jawaharlal Nehru Krishi Vishwa
Vidyalaya, Jabalpur,
Madhya Pradesh, India

Study the effect of potassium levels in physiological parameters on pigeon pea (*Cajanus cajan* L.) cultivars under rainfed condition

Mukesh Bharati and Dwarka

Abstract

An experiment was conducted at Rajaula Agriculture farm of Mahatma Gandhi Chitrakoot Gramodaya Vishwa Vidyalaya, Chitrakoot, Satna (M.P.) during *Kharif* season 2010. Results revealed that higher plant height was recorded in variety Uday-2788 (160.80 cm.) than UPAS-120 (153.38 cm.) at 135 days. Application of potassium did not much affect the plant height, number of leaves, number of branches significantly. Pigeon pea variety UPAS-120 was found superior over UDAY 2788.

Keywords: UPAS-120, Uday-2788, UPAS-120, plant height

Introduction

Pigeon pea is an important pulse crops of India Pigeonpea in long duration crop sown in *Kharif* season and continued till end and of Rabi season, thus single crop is taken in whole year, short duration varieties are also available which compete their life cycle with in khaki season, thus they can be grown in double cropping sequence even in rainfed situation. Pulses play an important role in Indian agriculture. They pigeon pea ranks second only after chickpea. In India pigeon pea is growing on the area of 3.53 millions hectares. With 2.31 million toes of annual production and 63 kg/ha. Productivity (Kantar *et al.* 2005) ^[6]. Pigeon pea is grown on 0.32 million hectare of area with 737 kg/ ha productivity. (Ali and Kumar, 2007) ^[7]. In rain fed conditions, mostly single crop of pigeon pea is taken either as pure crop or in different mired cropping. Pigeon pea exhibits disturbances is reproductive phase and fruit setting and yields are poor and uncertain, short durable Pigeon pea variety have provided the opportunity for multiple cropping is imitated and rainfed areas as well. Adoption of short durable variety in different cropping systems may be helpful in increasing the Pigeon pea area in the country and also the total crop production. Along with variety proper nutrition is essential to exploit yield potential of a variety in particular situation, grain legumes in general require high amounts of potassium for normal growth and development. Potash is major nutrient and is different in Pigeon pea field causing field reduction. So, different scientists recommended application of 20 kg/ha over control (Kulkarni and Panwar, 1980 and Yadav *et al.* 1993) ^[2, 8]. There is report of minimum amount of potash in Chitrakoot soil of Madhya Pradesh state, keeping all above points in view presents study was carried out.

Materials and Methods

The treatments comprised of 10 combination of 2 Pigeon pea variety of short duration and 5 levels of potassium. Two short durable variety were UPAS 120 and UDAY 2788. 5 levels of potassium were 0 kg, 20 kg, 40 kg, 60 kg and 80 kg/ha. In this wary total treatment combinations were 10 including control, all the 10 treatments were tested in a factorial randomized block design with three replication gross plot size was 3 m x 5 m with total experimental area 693.5 m². Treatments were allocated randomly to different plots in each replication, soil of experimental field was prepared by giving cross ploughing with tractor drawn disc grow by cross ploughing with tractor, each plinking was done after each. ploughing. A uniform dose of 110 kg/ ha. Diammonium phasphate containing 18 per cent N and 46 per cent P was applied uniformly in all treatment plots to supply 20 kg N and 50 kg P/ha. In experimental crop. Potashic fertilizer was applied in form of marinate of potash as per treatment to supply 20, 40, 60 and 80 kg/ha. Regained quantity of MOP as per treatment was mired with DAP and applied with the help of funnel known as chonga attached with country plough used for seed sowing. Treat seeds with thiram @29 g/kg seed + carbandazim @1g/kg

Corresponding Author:
Mukesh Bharati
Assistant Technology Manger,
ATMA, office-S.A.D.O. Block,
Patharia, Damoh,
Madhya Pradesh, India

were also treated with rhizobium culture as per recommendation, dried in shade for an hour and used in showing, sowing of seeds was done behind country plough in furrows opened 50 cm apart. To save the crop from insect pests, two spraying of monocrotophos 36 EC @ 1 liter/ ha. per spraying were done on crop, crop in each net plot was harvested separately, tied in bundles plot wise and properly tagged were sun dried and weighed plot wise, threshing was done by beating with woodless sticks, seeds were separated from straw by winnowing final stand of plant was maintained after thinning for observation., To individual plant observation 5 sample plants in each net plot are selected randomly plant height of these plants was measured from base to top with meter scale., The sum of 5 plants height was divided by 5 and mean plant height was recorded in arm for different treatment plots. In this way observation numbers of branches, numbers of primary branches, number of secondary branches, numbers of root nodules/ plant fresh weight (gm/ plant), plant dry weight, number of days to flowering and 75% podding was done.

Results and Discussion

The important results were obtained after perusal of data presented in table-1 on growth character, yield attributes and yield. Plant height at 135 days was recorded higher in variety UDAY-2788. (160.80 cm) than UPAS-120 (153.38 cm). Number of primary branch, secondary branches, leaves/plant and root nodules at final stage of 135 days were found not significant by other variety both remained at par with all these growth character dry matter accumulation/ plant at final stage of 135 DAS was recorded significantly higher (151.14 g) in

variety UPAS 120 than UDAY 2788 (141.92 g) number of days to 50 per cent flowering was similar in both variety but 75% podding was observed earliest in variety UPAS 120 (115.47 days) than variety UDAY 2788 (122.34 days), variety UPAS 120 recorded higher values of pods/plant (170.30), pod length (5.66 cm.) seed/ pod (3.50), than UDAY 2788 which produced 166.80 pods/ plant, 5.36 pod length, 3.20 seeds/ pod variety UPAS 120. Effects of different levels of potassium revealed that increase in plant height beyond 20 kg/ha was not significant; thin plant height of both the variety at various level of K were 136.8., 153.45, 159.65, 165.25 and 170.30 cm. at final stage of 135 DAS increase in plant leaves beyond 20 kg/ha was not found significant numbers of leaves/ plant at final stages were 191.15, 208.20, 215.50, 219.35 and 222.00 at various dose level of potassium at final stages of 135 days. Increase in branches was recorded significant only up to 20 kg/ha. but secondary branches/ plant was not affected significantly by K application, dry matter accumulation was not found significant at various levels of K application but both variety produced higher dry matter at various levels of K application, 50 per cent flowering was not effected by K levels significantly but 75 per cent podding was delayed with increasing K level. Number of pods/ plant in both variety were found significant at 40 kg dose level/ha only pod length was significant at 40 kg/ha in both of variety. Number of seeds/pod and 100 seed weight were recorded numerically highest (3.40 seed/pod and 7.55 g 100 seed weight) at 20 kg/ha K application. Results of most of the parameter are in conformity of the results of Ali and Kumar 2008 ^[1]; Kulkarni and Panwar 1980 ^[2] and Singh, 2009 ^[5].

Table 1: Effect of different level of Potash and varieties on various parameter of pigeon pea

Variety/ K level	Physiological Parameter			Yield parameter		
	Plant height (cm)	Dry matter (gm)	No. of nodules /plant	No. of pod/plot	Pod length (cm)	No. seed/ pod
UPAS-120	153.38	151.14	8.52	170.30	5.66	3.50
UDAY- 2788	160.80	141.52	8.44	166.80	5.36	3.20
Factor V (S.Ed.)	5.14	3.57	0.27	3.32	0.05	0.04
Factor K (S.Ed.)	8.12	5.64	0.43	5.25	0.08	0.06
Factor VxK (S.Ed.)	11.48	7.98	0.60	7.45	0.12	0.09
CD (P=0.05)	NS	7.50	NS	NS	0.11	0.08
CD K	17.06	11.86	NS	11.03	0.18	NS
CD VxK.	NS	NS	NS	NS	NS	NS

Conclusion

Among that the higher plant height was recorded in variety (Variety: Uday- 2788) 160.80 cm. than (Variety: UPAS- 120) 153.38 cm. Application of potassium did not much affect the plant height, number of leaves, number of branches significantly. Pigeon pea variety UPAS- 120 was found superior compare than variety UDAY- 2788.

References

1. Ali M, Kumar S. Pulses: wide array of improved varieties. The Hindu Survey of Indian Agriculture, National prass. Kasturei Buildings, Chennai; c2008. p. 43-45.
2. Kulkarni KR, Panwar KS. International pigeonpea workshop, 15-19 Dec., 1980 at ICRISAT/ ICAR, India; c1980.
3. Mishra MK, Singh M. Potassium nutrition of pigeonpea Journal of potassium research. 1991;7:132-149.
4. Yahiya M, Khan ST, Hayat S. Influence of potassium on

growth and yield of pigeonpea (*Cajanus Cajan*) Indian Journal of Agronomy. 1996;41(3).

5. Singh SS. functions of essential plant nutrients: potassium soil fertility and nutrient management kalyani publishers, New Delhi; c2009. p. 176-197.
6. Elkoca E, Kantar F, Zengin H. Weed control in lentil (*Lens culinaris*) in eastern Turkey. New Zealand Journal of Crop and Horticultural Science. 2005 Sep 1;33(3):223-231.
7. Kumar MD, Baboota S, Ahuja A, Hasan S, Ali J. Recent advances in protein and peptide drug delivery systems. Current drug delivery. 2007 Apr 1;4(2):141-151.
8. Yadav MS, Monroe KB. How buyers perceive savings in a bundle price: An examination of a bundle's transaction value. Journal of Marketing Research. 1993 Aug;30(3):350-358.