https://doi.org/10.29321/MAJ.10.A02844

Madras agric. J. 67 (6): 366 – 368. June. 1980

Effect of Foliar Application of Di-Ammonium Phosphate on Growth and Yield of Blackgram*

S. RAMASAMY[1] and S. RAMIAH[2]

A field experiment was conducted on CO 4 blackgram (*Vigna mungo* (L.) Hepper) to study the effect of 3% DAP (18 : 46 : O/NPK) as foliar spray. DAP was sprayed once at commencement of flowering and then a fortnight later as compared with water spray at the corresponding stages. The results indicated that spraying of 3% DAP twice increased the number of pods per plant, shelling percentage, hundred grain weight and ultimately resulted in increased grain yield.

Phosphorus is readily fixed in most soils and recovery by crops is relatively low (Dean, 1956). During flowering and fruit development stages of many crops the supply of P is inadequate in many soils and this may seriously reduce crop yields (Skinner and Purvis, 1949). Application of P through the soil at later stages is not very useful (Davis and cook, 1954): It has been well established that the fertiliser elements which are adsorded through roots can also be adsorbed with equal efficiency through foliage (De, 1967). Foliar application has found favour in early maturing crops where the soil applied P may not become fully available before maturity of crop, especially in the case of crops grown under rainfed conditions.

MATERIAL AND METHODS

A field experiment was conducted in Tamil Nadu Agricultural University farm during summer and *kharif* seasons of 1978 to study the effect of foliar application of di-ammonium phosphate (18 : 46 : O NPK) on blackgram var. CO 4. Split-plot design was adopted with four replications. DAP 3% foliar spray once (at flower commencement) and twice (at commencement of flowering and a fortnight later), mere water sprays corresponding to DAP sprays and one control were alloted to sub-plots.

Foliar application was done with 3% DAP (18 : 46.0) spray solution prepared. Spray solution was prepared just before taking up the spray. Supernatant solution was decanted and filtered through glass wool to get a clear solution. Then it was neutralized to pH 6.0 by adding calciam hydroxide. Teepol, a surfactant, was mixed at the rate of one ml/litre of spray fluid. Spraying was done in early morning and late evening, avoiding drippings.

RESULTS AND DISCUSSION

(i) *Growth characters* :

Plant height at harvest was not influenced by either water spray or DAP spray (Table I). Spraying DAP

---

* Part of M. Sc. (Ag.) thesis submitted by the first author to Tamil Nadu Agricultural University, Coimbatore

1. Agri. Res. Station, Aduthurai and 2. Kumara Perumal Farm Science Centre, Trichy.

twice recorded significantly higher dry matter production after pod maturation stage. Adequate supply of P through foliar application would have increased its uptake which in turn, would have resulted in increased production of drymatter.

(ii) *Yield components :*

Foliar application of P significantly increased the number of pods per plant. This is in agreement with the earlier findings of Singh and Saxena (1969), who observed increased number of pods per plant and hundred grain weight due to the addition of P in soybean. Length of pod and number of seeds per pod were not affected by foliar sprays while hundred grain weight was increased significantly by foliar application of DAP. Subramaniam (1978) in blackgram, Iswaran and Altamirano (1975) in cowpea and Singh and Saxena (1969) in Soybean have reported increased hundred grain weight due to foliar application of phosphorus. Shelling percentage was also increased by DAP foliar spray.

(iii) *Grain yield* :

In summer season, water spray once (F_1) and twice (F_2) recorded higher grain yield over unsprayed control (Fo). Water spray twice was comparable to one spray with 3% DAP at flower commencement (F_3). Moisture supply through foliar spray during the dry period of summer might have increased the grain yield. DAP foliar spray twice (F_4) recorded the maximum grain yield of 1187 kg/ha, as compared to 975 kg/ha in control during summer season, the increase being 22% over control. DAP foliar spray once (F_3) recorded 1101 kg/ha (an increase of 13% over control.) It appears that the foliar applied N and P through DAP at critical stages of crop growth are effectively absorbed by blackgram and translocated more efficiently, to the developing pods for proper filling up of grain. This is very well reflected in the higher values obtained for the mean size and weight of grain. Similar increase in grain yield was observed through DAP foliar spray at Aduthurai under rice fallow conditions (Anon., 1974).

This response was not seen in the *kharif* season crop. This lack of response was probably due to the continuous drizzling in the crop growth period.

REFERENCES

ANONYMOUS, 1974. Wetland Pulses - Ways and means of maximising production. Tech. Bulletin Director of Agriculture, Madras pp. 60-61.

DAVIS, J.R. and R.L. COOK 1954. Fertilizing through irrigation water. *Mich. Ext. Bull.* 324.

DE, R. 1967. A review of foliar application of crops, *Indian Fertil. News* 16 (12) : 77 - 81.

DEAN, E. A. 1956. Application of radioisotopes to the study of soil and fertilizers: A review. *Proc. Internatl. Conf. peaceful uses of Atomic Energy* 12: 89-96.

ISWARAN and ALTAMIRANO, 1975. Influence of sugar and phosphate at the flowering stage of cowpea (*vigna sinensis*) *Sci. cult.* 41: 241-42.

SINGH, J. N. and M. C. SAXENA, 1969. Soybean at Pantnagar, *Tech. Bull. GVPAU.*

SKINNER, J. J. and E. R. PURVIS, 1949. *Hunger signs in crops.* American Society of Agronomy and the National Fertilizer Association.

SUBRAMANIAN, A. 1978. Studies on the response of blackgram (*vigna mungo* (L) Hepper) to phosphorus in different systems of cultivation. Ph. D. thesis. Tamil Nadu Agri. Univ., Coimbatore.

TABLE I Response of CO_4 blackgram to foliar application of P.

Treatments	Number of pods/plant	Length of pod (cm)	Number of seeds/ pod	Hundred grain weight (g)	Shelling percentage	Plant height at harvest (cm)	Drymatter production (kg/ha)	Grain yield (kg/ha)
Summer 1978								
Control	16.15	5.49	6.14	4.775	67.65	29.6	3221	975
Water spray (once)	16.98	5.50	6 06	4.763	67.84	30.1	3370	1022
„ „ (twice)	17.48	5 50	6.45	4.800	68.03	30.2	3468	1050
DAP 3% spray (once)	18.31	5.50	6.27	4.902	69.87	29.7	3626	1101
„ „ (twice)	9.41	5.51	6.16	4 969	70.57	29.6	3930	1187
SE	0.28	0 20	0.23	0.019	0.14	0.31	62.5	25
CD	0.79	N.S.	N.S.	0.055	0.39	N.S.	177.7	71
Kharif 1978								
Control	10.73	5 40	6.37	4 745	65.84	23.3	1968	499
Water spray (once)	10.77	5.39	6.39	4.784	66.12	23 1	1960	493
„ „ (twice)	10.69	5.39	6.59	4.786	65.52	23.6	1971	498
DAP 3% spray (once)	11.24	5.34	6.33	4.802	67.16	23.0	2041	514
„ „ (twice)	11.62	6.40	6.61	4.917	67.17	23.5	2090	526
SE	0.37	0.03	0.26	0.027	0.27	0.47	45.9	20
CD	N.S.	N.S.	N.S.	0.077	0.76	N.S.	N.S.	N.S.

N. S.=Not significant