International Journal of Advance and Innovative Research
Volume 13, Issue 2: April - June 2026
ISSN 2394 - 7780

ENHANCING COWPEA PRODUCTIVITY THROUGH FOLIAR NUTRITION

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ABSTRACT

The experiment was conducted at ICAR Krishi Vigyan Kendra, Perambalur during summer season of 2025-26 to study the effect of foliar nutrition on the productivity of Cowpea. The experiment was laid out in Randomized Block Design and replicated thrice with eight treatments comprising of T_1- Control + T_2- Foliar spray of DAP 2% + T_3- Foliar spray of KCl 2% + T_4-Foliar spray of Pulse wonder @ 2 kg ac^{-1} + T_5- Foliar spray of Panchakavya 5% + T_6- Foliar spray of Cow urine 5% + T_7- Foliar spray of Vermiwash 5% + T_8–Foliarspray of NAA 50 ppm. The highest growth parameters, plant height, number of branches per plant, leaf Area Index and dry matter production (g/$plant^{-1}$) were recorded with the foliar application of TNAU Pulse wonder @ 2 kg ac^{-1}. The same treatment had significantly recorded higher grain yield of 938 kg ha^{-1}. It was followed by the application Panchakavya 5% registered 930 kg ha^{-1}. From the above results, it has been concluded that foliar spray of TNAU Pulse wonder @ 2 kg ac^{-1} to enhance the productivity and higher profitability in Cowpea.

Key words: *Cowpea, Crop, Plant height, productivity and yield*

INTRODUCTION

Cowpea (Vigna unguiculata (L.) is an important legume crop for human and livestock feed because it is a cheap source of protein. When compared to other grain legumes cowpea is highly resistant to low fertility because of its remarkable nitrogen-fixing ability, well organized symbiosis with mycorrhizae and ability to thrive in soil with a wider range of Ph. Excessive or immoderate yield, uplifted or decreased development of crop and physiological changes of the crop are all brought about by variation in nutrient availability of the crop. The productivity of cowpeas in India is deprived, so there is a necessity to allocate several agronomic strategies to elevate the output of the crop. Under existing scenarios, foliar application of mineral nutrients has become an inevitable agricultural practice for sustainable crop production worldwide (Chaudhary *et al*., 2023) which fully puts to use the genetic potential of the crop. Foliar application of nutrients has several benefits easy and effective absorption of nutrients, avoidance of nutrient loss through leaching and volatilization, fixation and regulating plant nutrient uptake.

MATERIALS AND METHODS

The experiments were laid out in B block of ICAR Krishi Vigyan Kendra Farm. The Experimental farm is located in Tamil Nadu between 10º 53’ and 11º31’ N latitude and 73º 38˙ and 79º 31˙ E longitude. The temperature ranges from 22 °C - 39 °C with mean annual rainfall of 908 mm. North East monsoon period receives comparatively more rainfall *i.e*. 475 mm followed by 314 mm during South West monsoon, 91 mm during summer and 28 mm during winter season. The experimental soil is clay and moderately drained. The experiment was laid out in Randomized Block Design (RBD) with eight treatments and three replications.

Eight foliar nutrients treatment combinations were performed in a randomized block design. The treatments consisted of control foliar application of water spray (T1), DAP @ 2 % (T2), KCl @ 2% (T3), TNAU Pulse wonder @ 2 kg/ac (T4), Panchagavya @ 5% (T5), Cow urine @ 5% (T6), Vermiwash @ 5 % (T7), NAA 50 ppm (T8) was given. First spray was given at flower initiation and second spray at 15 days after the first spray. As per the schedule the treatments were imposed. The crop was fertilized with a recommended fertilizer dosage of 25 kg N, 50 kg P2O5, 25kg K2O ha^{-1} which was applied through urea, SSP and MOP in lines, incorporated at the time of sowing. The experimental plots were measured at 4 m× 5m ($20m^2$). For this field experiment, cowpea variety VBN 3 was used, and it was adapted with 45 cm ×15 cm to maintain optimum plant population. Biometric observations were recorded by five plants from each net plot area were chosen randomly and tagged. These plants were used for recording all biometric observations of crop growth at different stages. Observations are recorded on plant plant height (cm), number of branches per plant, LAI and dry matter plant (g), grain yield, and Haulm yield (kg ha-1). Recommended plant protection measures and other management practices were followed as per the Crop Production Guide. The biometric observations were taken and analyzed the data statistically.

ISSN 2394 - 7780

RESULTS AND DISCUSSION

Growth parameters

Growth attributing characters viz., plant height (cm), number of branches per plant, LAI and dry matter plant (g) were influenced significantly due to different treatments (Table1). The highest plant height (32.65cm), number of branches plant^{-1} (5), LAI (1.65) and Dry matter production (11.34 g/plant), were observed under the foliar application of TNAU Pulse wonder at 2 kg ac-1 (T4) significantly, which was followed by the application of Panchagavya 5% (T5). Lowest plant height (24.30 cm), Number of branches per plant (2), LAI (0.52) and Dry matter production (8.54g/plant) was recorded with control plot (T1) except first spray remaining all stages of observation.

The plant height might be due to the additional supply of major, micronutrients and growth hormones through foliar spray of pulse wonder. These findings were well supported by the work of Dixit *et al.,* (2008) and Anandhakrishnaveni *et al*., 2004. The higher leaf area index ad number of ranches per plant might be due to the foliar application of nitrogen enhancing the accumulation and translocation of nutrients which resulted in prolonged vegetative phase and better photosynthetic rate of the green gram foliar application of TNAU Pulse wonder aided in the supply of photosynthates for the development of pods and grains and also intensification of metabolic activity and efficient utilization of N. These findings were well supported by the work of Rajeskumar *et al.,* (2017) and Arun Raj *et al*., 2018. The significant increase of dry matter accumulation was due to the fact that nitrogen helps in maintaining higher auxin level.

Yield

TNAU Pulse wonder @ 2kg ac^{-1} (T4) produced significantly highest grain yield (938 kg ha^{-1}) and haulm yield (1558 kg ha^{-1}). Followed by Panchagavya 5% (T5) (930 kg ha-1) and (1435 kg ha^{-1}). This might be due to reduce the flower droppings, improved the pod formation and seed setting percentage leading to increased yield attributes. The findings in the present study are in conformity with Elayaraja and Angayarkanni (2005) and (Hemalath and Sreemathi (2018). The lowest grain yield was obtained in without foliar spray (control plot) (856 kg ha^{-1}). These findings were well supported by the work of Ghosh and Joseph (2008) and Kumar *et al.,* (2011) (Table 2).

Table.1 Effect of foliar spray on growth parameters of green gram

	Treatment	Plant Height(cm)	Number of branchesper plant	Leaf area index (LAI)	Dry Matter Production (g/plant)
T_1	Control plot	24.30	2	0.52	8.54
T_2	DAP 2%	30.21	3	1.23	10.54
T_3	KCL 2%	27.34	3	0.86	9.95
T_4	TNAU Pulse Wonder @2 kg/ac	32.65	5	1.65	11.34
T_5	Panchagavya 5%	31.04	4	1.40	10.88
T_6	Cowurine 5%	27.85	2	0.61	9.03
T_7	Vermiwash 5%	29.20	3	1.16	9.68
T_8	NAA 50 ppm	30.41	3	1.18	10.12
	SEd	0.57	0.41	0.23	0.45
	CD(5%)	**1.25**	**0.89**	**0.41**	**0.91**

	Treatment	Seed yield (Kgha^{-1})	Haulm yield (Kgha^{-1})
T_1	Control	856	968
T_2	DAP2%	922	1324
T_3	KCL2%	874	979
T_4	TNAUPulseWonder@2 kg/ac	938	1558
T_5	Panchagavya 5%	930	1435
T_6	Cowurine5%	880	1252
T_7	Vermiwash5%	893	1318
T_8	PPFM	920	1340
	SEd	15.9	32.5
	CD(5%)	34.3	66

ISSN 2394 - 7780

From the above results, it has been concluded that TNAU Pulse Wonder @ 2 kg ac-1 at flowering enhances the productivity in Cowpea. Moreover, this study gives the option to the farmers *i.e.*, if the farmer likes inorganic foliar nutrition (TNAU pulse wonder) and Organic nutrition (Panchgavya @ 5 %) would be adopted.

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