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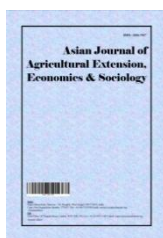
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## **A Study on Adoption Level of Black Gram VBN 8 among Farmers of Pudukkottai District, Tamil Nadu**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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### **ABSTRACT**

Pulses are important in Indian agriculture because of their high protein content (17–25%) compared to grains (6–10%), as well as their capacity to fix atmospheric nitrogen and to enhance soil fertility. Black gram (*Vigna mungo* L.), also known as Urd bean, Urid, or mash, is a major pulse crop. The study on adoption of Black gram VBN 8 was conducted in Pudukkottai district of Tamil Nadu. Out of 13 blocks in the district, three blocks were selected based on the area under black gram VBN 8 cultivation. The data collected were analysed and presented using descriptive statistics. The results of the study revealed that three fifth (60.80%) of the respondents belonged to medium level of adoption category, followed by 20.00 per cent and 19.20 per cent of the respondents in low and high level of adoption categories.

**Keywords:** Adoption; black gram; ex post facto research design; Vamban 8.

### **1. INTRODUCTION**

Pulses are an important component of the Indian diet since they are a major source of protein.

Pulses are known as "poor man's meat" since dairy and animal products are seldom consumed by India's poorest people, both in rural and urban areas. Pulses are utilized as a green manure and

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it helps to improve soil health. India accounts for about 25 per cent of global pulse production and it is also the largest consumer (27%) and importer (14%) of the pulses [1]. Total Pulses production in the country was about 23.02 million tonnes [2]. Black gram, green gram, chickpea, pigeon pea, lentil, and field pea are the most common pulse crops grown in India. In a vegetarian diet, black gram is the primary source of protein and amino acids. It has protein content of 24-26 per cent, carbohydrate content of 56 per cent, and fat content of 2 per cent. Calcium, iron, and niacin are all abundant in black gram. India is now the world's leading producer of black gram, accounting for more than 70 per cent of worldwide output. Myanmar and Pakistan come in second and third, respectively. India has an area of 45.33 lakh ha under black gram cultivation, its production and productivity accounts for 20.84 lakh tonnes and 459 Kg/ha respectively. The total area under black gram cultivation in Tamil Nadu is 4.05 lakh hectares. Black gram production and productivity are 3.17 lakh tonnes and 783Kg/ha, respectively [3]. Pudukkottai district was purposively selected as it has geographical proximity to National Pulse Research Centre, which has achieved considerable progress in all areas of pulse research in order to enhance the production, stability, and food quality of the state's main pulse crops that are suitable for rainfed and less fertile soils. Pudukkottai district has an area of 4649 ha under black gram cultivation and its

production and productivity are 2353 tonnes and 506 Kg/ha respectively [4]. Black gram VBN 8 is one of the recently released variety which is suitable for growing in all season. This variety is being popularized among farmers on a large scale as it has synchronized maturity and is resistant to Mungbean Yellow Mosaic Virus & leaf crinkle. In order to analyse the spread and acceptance of black gram VBN 8, this study was conducted.

## 2. METHODOLOGY

The *ex post facto* research design was used for the study. The present study was conducted in Pudukkottai district of Tamil Nadu. Out of 13 blocks in the district 3 blocks, Gandharvakottai, Thiruvankulam, Karambakudi were purposively selected based on the area under black gram VBN 8 cultivation. Two villages were selected from each block, based on consultation with the scientists of National Pulse Research Centre, Vamban and Krishi Vigyan Kendra. A total sample size of 120 was arrived using the simple random sampling, selecting 20 black gram VBN 8 growers from each village. The scale followed Anusuya (2015) was adopted in the study [5]. A well-structured interview schedule was developed and each farmer was interviewed personally to obtain the data. The data collected were analysed using the descriptive statistics like frequency, percentage, mean and standard deviation.

## 3. RESULTS AND DISCUSSION

**Table 1. Distribution of respondents based on adoption level of Black Gram VBN 8 cultivation technologies**

		(n=120)	
S. No	Statements	Adoption	Non-adoption
1.	Season for sowing Vamban 8 in Pudukkottai (September-November)	120 (100.00)	0
2.	Main field preparation-Fine tilth and form beds and channels.	50 (41.70)	70 (58.30)
3.	Soil surface crusting- Apply lime at the rate of 2t /ha along with FYM at 12.5 t/ha or composted coir pith at 12.5 t/ha	0	120 (100.00)
4.	Seed rate - 20kg/ha	85 (70.80)	35 (29.20)
5.	Carbendazim or Thiram @ 2 g/kg of seed (or) Trichoderma viride @ 4g/kg of seed (or) Pseudomonas fluorescens @ 10 g/kg seed.	36 (30.00)	84 (70.00)
6.	Seed treatment with biofertilizer – 200 g each of Rhizobial culture COG 15, Phosphobacteria and PGPR (Pseudomonas sp.) with rice gruel (or) 25 g each of powder formulation of Rhizobium and AM fungi using binder (polymer)- 1 ha seeds	26 (21.70)	94 (78.30)
7.	No seed treatment - Apply 2 kg each Rhizobial culture, Phosphobacteria and PGPR (Pseudomonas sp.) with 25 kg of FYM and 25 kg of sand.	0	120 (100.00)

S. No	Statements	Adoption	Non-adoption
8.	Spacing- Irrigated crop- 30 x 10 cm; Rainfed crop- 25 cm x 10 cm	39 (32.50)	81 (67.50)
9.	Basal application-. Rainfed: 12.5 kg N + 25 kg P <sub>2</sub> O <sub>5</sub> + 12.5 kg K <sub>2</sub> O +20 kg S/ha; Irrigated: 25 kg N + 50 kg P <sub>2</sub> O <sub>5</sub> + 25 kg K <sub>2</sub> O + 40 kg S/ha	52 (43.30)	68 (56.70)
10.	Soil application of 25 kg ZnSO <sub>4</sub> /ha under irrigated condition.	12 (10.00)	108 (90.00)
11.	TNAU micronutrient mixture @ 5 kg/ha as Enriched FYM (1:10 ratio of MN mixture & FYM)	36 (30.00)	84 (70.00)
12.	Foliar spray of for yield improvement in black gram (1% urea or 2% DAP)	120 (100.00)	0
13.	Foliar spraying of 0.5% ZnSO <sub>4</sub> , 1% FeSO <sub>4</sub> + 0.1% citric acid at 30, 45 DAS (Deficiency)	0	120 (100.00)
14.	Foliar spraying of 2% KCl + 100 ppm Boric acid (moisture stress)	0	120 (100.00)
15.	Life irrigation- 3 Days After Sowing	120 (100.00)	0
16.	Irrigation at intervals of 7 to 10 days	120 (100.00)	0
17.	Critical periods- Flowering and pod formation stages.	120 (100.00)	0
18.	Foliar spray of NAA 40 mg/litre once at pre-flowering and on 15 days (reduce flower shedding)	23 (19.20)	97 (80.80)
19.	Foliar spray of TNAU Pulse wonder @ 5 kg/ha once at flowering	34 (28.30)	86 (71.70)
20.	Foliar spray of salicylic acid 100 mg/litre once at pre-flowering and on 15 days (improve seed yield)	85 (70.80)	35 (29.20)
21.	Pre emergence application of Pendimethalin 1.0 litres/ha under irrigated condition 0.75 litres/ha under rainfed condition on 3 DAS followed by one hand weeding at 20 DAS.	55 (45.80)	65 (54.20)
22.	No herbicide application- Two hand weeding on 15 and 30 DAS	90 (75.00)	30 (25.00)
23.	Tobacco caterpillar- Chlorpyrifos 20 EC 3750 ml/ha Chlorantraniliprole 18.5% SC @150 ml/ha Flubendiamide 39.35% SC 100ml/ha	80 (66.70)	40 (33.30)
24.	Pod bug- Dimethoate 30% EC 500ml/ha Methyl demeton 25% EC 500ml/ha	61 (50.80)	59 (49.20)
25.	Aphid- Methyl demeton 25% EC 500 ml/ha or Dimethoate 30% EC 500 ml/ha	92 (76.70)	28 (23.30)
26.	Powdery mildew- Spray carbendazim @ 500 g or wettable sulphur 1500 g/ha or propiconazole 500 ml/ha at initiation of the disease and 10 days later	74 (61.70)	46 (38.30)
27.	Leaf spot- Spray carbendazim @ 500 g/ha or mancozeb @ 1000g /ha at initiation of the disease and 10 days later	56 (46.70)	64 (53.30)
28.	Harvesting time- When 70-80% pods mature and turn black	120 (100.00)	0
29.	Method of harvesting -Picking the matured pods, drying, and processing.	42 (35.00)	78 (65.00)
30.	Method of harvesting -Uprooting or cutting the whole plants, heaping, drying and processing	120 (100.00)	0

*\*Figures in parentheses are percentage to total*

It could be observed from the Table 1, that all (100%) the respondents adopted the right season for sowing Black gram VBN 8 to reap its

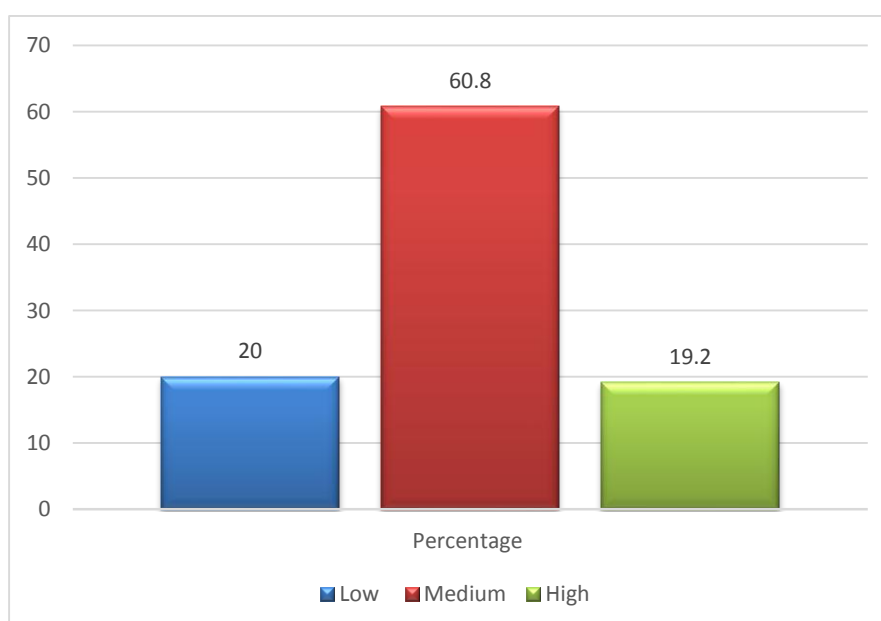
higher yield, less maturity and its resistance to the pest and diseases. Majority (70.80%) of the respondents followed the recommended seed

rate of 8 Kg/ha due its higher percentage of germination and vigour of the seeds. Only less than half (41.70%) of the respondents adopted the practice of forming beds and channels before sowing. Nearly one third (32.50%) of the respondents followed the recommended spacing, since the above practices were labour intensive and the farmers prefer to broadcast the seeds and to flood the field. About one fifth (21.70%) and 30.00 per cent of the respondents followed the seed treatment with biofertilizer and Thiram respectively, since there is inadequate supply of these inputs and the process is time consuming. None of the respondents adopted the recommendations for avoiding soil surface crusting and seed treatment nor field application of biofertilizer as they were not familiar with the practice and unavailability of the inputs in nearby areas.

More than two fifth (43.30%) of the respondents followed the recommended basal application of fertilizers and the remaining were unaware of the recommended dosage. Cent per cent of the respondents adopted foliar application of 1 per cent urea/DAP for yield improvement and all of them adopted the recommended irrigation schedule which involves life irrigation, irrigation at intervals of 7 to 10 days and critical periods of irrigation. Three-tenth (30.00%) of the respondents applied TNAU micronutrient mixture and one tenth (10.00%) of the respondents adopted the application on ZnSO<sub>4</sub>. In order to

reduce the flower shedding and to improve the yield, foliar application of NAA (19.20%), Salicylic acid (70.80%) was followed along with application of TNAU pulse wonder (28.30%). The rate of adoption of NAA, TNAU micronutrient mixture, ZnSO<sub>4</sub>, TNAU pulse wonder were low compared to salicylic acid, due to lack of awareness and non-availability of inputs. None of the respondents adopted the recommended foliar application for deficiency and moisture stress as they were unaware of the practice.

Majority (75.00%) of the respondents preferred hand weeding over herbicide application so as to reduce the usage of chemicals and the cost incurred. Three fourth (76.70%) of the respondents had adopted the recommended control measures for aphid, two third (66.70%) of the respondents used the recommended control measure for tobacco caterpillar and half (50.80%) of them followed the recommended control measure for pod borer. The respondents adopted the recommended the control measure for powdery mildew (61.70 %) and leaf spot (46.70 %), since the above pests and diseases have direct impact on the yield. Cent per cent of the farmers harvested the crop when 70-80 per cent of the pods turned black and then the whole plant was uprooted since the variety has uniform maturity and some of the respondents (35.00 %) preferred picking the mature pods and finally uprooting the plant, to overcome any delay or irregular maturation.



**Fig. 1. Overall adoption level of Black Gram VBN 8 growers about recommended cultivation practices**

### 3.1 Overall Adoption of Black Gram VBN 8 Growers about Recommended Cultivation Practices

It was concluded from the Fig. 1, that majority (60.80%) of the respondents had medium level of adoption followed by respondents with low (20.00%) and high (19.20%) levels of adoption. The reason might be because, majority of the farmers adopted the practices that are familiar to them, has direct impact on yield, labour saving and cost efficient. The findings of the present study are in concordance with the results of Ashokkumar et al., (2018) and Singh et al., (2019) [6,7].

### 4. CONCLUSION

The study revealed that majority of the respondents adopted the recommended season, irrigation schedule and method of harvesting. Recommended practices like spacing, application of TNAU micronutrient mixture and pulse wonder had least percentage of adoption among farmers. It is evident from the findings that the respondents had medium level of adoption of the recommended cultivation practices. Necessary steps have to be taken by the extension officials to ensure improved adoption of these cultivation practices. As black gram VBN 8 is performing well in Pudukkottai, steps can be taken to popularize VBN 8 in places where the climatic conditions are similar to Pudukkottai. This in turn will aid in the improvement of livelihood of the farmer.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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