



# Screening of Rajmash Varieties against Major Insect Pest

N. Ramesh Naik, L. Suryanarayana, Y. Mounika, B.N. Sandeep Naik,  
P. Venkataraman, K. Babuji Naidu, G. Rama Rao,

10.18805/ag.D-5617

## ABSTRACT

Among seven varieties screened, Amber was found resistant to Thrips and Bean Cowpea Yellow Mosaic Virus and tolerant to cold with yield of 13.66 q/ha, followed by Utkarsh susceptible to all sucking insect pest, but found tolerant to BCMV and Cold with yield of 11.58 q/ha. Uday (Bold seeded) variety was at par with Utkarsh with yield of 11.22 q/ha, but susceptible to sucking insect pest, BCMV and cold. Moderate yields were recorded in Arun (6.96 q/ha) which is also found susceptible to all sucking pests, Arka Komal (6.14 q/ha) and Chintapalle Red (5.62 q/ha). Phalgun recorded minimum yield (2.08 q/ha), as it was found susceptible to Whitefly and Thrips.

**Key words:** Screening, Sucking Insect Pest, Varieties.

## INTRODUCTION

Rajmash (*Phaseolus vulgaris*) is also known as French bean, Kidney bean and Field bean and is an important legume crop used as vegetable (Green Pod) as well as pulse (Dry Pod) and it form an integral part of Indian dietary. It has been reported to contain 23 per cent protein and 60-63 per cent carbohydrate (Nwokolo and Smartt, 1996). Therefore, it is regarded as highly nutritious pulse. It is grown in an area of about 1.0 lakh ha with a production of 1000 tonnes per year mainly in the states of Maharashtra, Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh (Nilgiri), Tamil Nadu (Palni hills) Kerala, Karnataka (Chickmangalur) and West Bengal (Darjeeling hills) (Prasad, 2005). Rajmash is a traditional crop in Agency area of Visakhapatnam andhra Pradesh cultivated in slopy and undulated lands in Late *Kharif* from 02<sup>nd</sup> Fortnight of August to 01<sup>st</sup> Fortnight of September. Major constraints in production of Rajmash is lack of high yielding varieties suitable for Agency area of Visakhapatnam and other constraint was untimely sowing due to heavy rains during sowing time, drought and heavy rainfall during flowering period and sustainable farming in agency area of Visakhapatnam aids in low productivity of this crop. About 30 species of insects have been reported damaging French bean (Srivastava and Butani, 1998). Among these, pests, flea beetles, hopper, aphids, whitefly, thrips, mites, stem fly and leaf webber are responsible for causing considerable losses in the yield. In order to mitigate the high yielding variety constraint, seven varieties were screened for Resistance or Tolerance to the pests and suitable variety for the agency area of Visakhapatnam. In order to replace the existing low yielding local varieties *i.e.* Chintapalle Red and Arka Komal, Present reaserch was carried with certain Rajmash varieties brought from IIPR, Kanpur.

## MATERIALS AND METHODS

Experiment was conducted during late *kharif*, 2018 at Regional Agricultural Research Station, Chintapalle, Visakhapatnam. The soil is Red sandy loam soils under

Acharya N.G. Ranga Agricultural University, Regional Agricultural Research Station, Visakhapatnam, Chintapalle-531 111 Andhra Pradesh, India.

**Corresponding Author:** N. Ramesh Naik, Acharya N.G. Ranga Agricultural University, Regional Agricultural Research Station, Visakhapatnam, Chintapalle-531 111 Andhra Pradesh, India.  
Email: kvkbanavasi@gmail.com

**How to cite this article:** Naik, N.R., Suryanarayana, L., Mounika, Y., Naik, B.N.S., Venkataraman, P., Naidu, K.B. and Rao, G.R. (2022). Screening of Rajmash Varieties against Major Insect Pest. Agricultural Science Digest. doi: 10.18805/ag.D-5617.

**Submitted:** 18-06-2022 **Accepted:** 24-11-2022 **Online:** 01-02-2023

Rainfed conditions with cropping pattern of Early *Kharif* / *Kharif*, Rice and Maize followed by Late *kharif* / Early *Rabi* as, Rajmash and Niger. Experiment was laid out in randomized block design with three replication of Seven treatments *i.e.* T<sub>1</sub> Amber, T<sub>2</sub> Arka Komal, T<sub>3</sub> Utkarsh, T<sub>4</sub> Arun, T<sub>5</sub> Phalgun, T<sub>6</sub> Uday and T<sub>7</sub> Chintapalle Red (Control) in 5 × 5 m<sup>2</sup> plot size. Ten plants from each plot were selected randomly and tagged to record the observations on sucking pest population. Observations were recorded at weekly interval during early morning hours from Germination to harvest of the crop. The mean value of sucking pest (Hopper, Aphid and Whitefly) was calculated number per plant (Number basis). Data regarding duration of varieties, test weight and yield (q/ha) were also recorded.

## RESULTS AND DISCUSSION

The result pertaining to screening of Rajmash varieties suitable to agency area of Visakhapatnam presented in Table 1 which revealed that, the incidence of Hopper was least in Phalgun (0.42/03 leaves) followed by Utkarsh (0.82/03 leaves) which was at par with Arka komal (0.86/03 leaves), Chintapalle Red (0.90/03 leaves) and Amber (0.98/03

**Table 1:** Screening of Rajmash varieties against major insect pest.

Variety	Hopper (No./3 leaves)	Aphid (No./3 leaves)	Whitefly (No./3 leaves)	Thrips (No./3 leaves)	Yield (q/ha)
Amber	0.98 (1.21)	1.66 (1.46)	0.62 (1.05)	0.68 (1.08)	13.66
Arka Komal	0.86 (1.16)	1.46 (1.4)	0.82 (1.14)	0.92 (1.19)	6.14
Utkarsh	0.82 (1.14)	1.16 (1.28)	0.88 (1.17)	0.86 (1.16)	11.58
Arun	1.00 (1.22)	0.98 (1.21)	0.82 (1.14)	0.66 (1.07)	6.96
Phalguna	0.42 (0.95)	0.67 (1.18)	0.45 (0.97)	0.72 (1.10)	2.08
Uday	1.28 (1.33)	0.70 (1.09)	0.60 (1.04)	0.82 (1.14)	11.22
Chintapalle Red	0.90 (1.18)	1.06 (1.46)	0.50 (1.0)	0.78 (1.13)	5.62
Mean	0.89	1.10	0.67	0.78	8.18
SD	0.24	0.34	0.16	0.09	
Cut off Value	0.65	0.76	0.51	0.69	
F test	S	S	S	NS	
SEM	0.05	0.04	0.05	0.03	1.02
CD 5%	0.16	0.12	0.17	0.11	3.13

**Table 2:** Certain characters observed in screened varieties.

Variety	Duration (Days)	Test weight
Amber	110-120	37.4
Arka Komal	70-75	28.0
Utkarsh	110-120	36.7
Arun	110-120	39.3
Phalguna	70-75	34.1
Uday	110-120	38.9
Chintapalle Red	110-120	27.2

leaves) and higher incidence was recorded in Arun (1.28/03 leaves) and Uday (1.00/03 leaves). While, the incidence of Aphid was least in Phalguna (0.67/03 leaves) which was at par with Uday (0.70/03 leaves) followed by Arun (0.98/03 leaves) which was at par with Chintapalle Red (1.06/03 leaves) and higher incidence was recorded in Amber (1.66/03 leaves) and Utkarsh (1.16/03 leaves). While, the incidence of Whitefly was least in Phalguna (0.45/03 leaves) which was at par with Chintapalle Red (0.50/03 leaves) followed by Uday (0.60/03 leaves) which was at par with Amber (0.62/03 leaves) and higher incidence was recorded in Amber (1.66/03 leaves) and Utkarsh (0.88/03 leaves). While, the incidence of Thrips was least in Arun (0.66/03 leaves) which was at par with Chintapalle Red (0.50/03 leaves) followed by Uday (0.60/03 leaves) which was at par with Amber (0.62/03 leaves) and higher incidence was recorded in Arka Komal (0.92/03 leaves).

Phalguna and Chintapalle Red were found more susceptible to sucking pest and recorded with poor yields, the same as reported by Sekhar *et al.* 2021. As per Rana *et al.* 1975 for scoring of Resistant and Susceptible varieties for sucking pest, Phalguna variety was found resistant to Hopper and Aphids, Chintapalle Red variety was found resistant to White fly and Amber variety was found resistant to Thrips. Utkarsh, Arun and Arka Komal were found susceptible to Hoppers, Aphids, Whitefly and Thrips, it was

in line with the findings of Jakhar and Chaudhary (2013). However, incidence of Hopper, Aphid, Whitefly and Thrips were found below ETL in all the varieties due to heavy rains in the month of August (213.2 mm Normal) and September (204.9 mm Normal) and minimum temperatures during November (13.3°C) and December (9.6°C) comparing to weekly incidence. But incidence of sucking pest (Hopper and Thrips) was found peak (03-04 number /03 leaves) only during flowering stage and early Pod setting stage.

Among seven varieties, maximum yield was recorded in Amber with 13.66 q/ha followed by Utkarsh with 11.58 q/ha and Uday with 11.22 q/ha. Moderate yield was recorded in Arun with 6.96 q/ha followed by Arka Komal with 6.14 q/ha and Chintapalle Red with 5.62 q/ha. Minimum yield was recorded in Phalguna with 2.08 q/ha. The findings on yield of varieties were in conformity with the Sekhar *et al.* 2021, Singh 2013 and Singh and Singh 2015, who were also, screened certain same varieties of our research.

Other characters recorded during screening of varieties were as follows, Among the varieties screened, Arka komal and Phalguna were found short duration with 70-75 days and remaining varieties *i.e.* Amber, Utkarsh, Arun, Uday and Chintapalle Red were found with duration of 110-120 days. While Utkarsh, Arun and Chintapalle Red were found as twining type varieties, remaining varieties (Amber, Arka komal, Phalguna and Uday) were found bushy type with erect branches Table 2. Some distinguished character observed in Amber was that, it was found tolerant to Cold and also resistant to BCMV and Thrips with bold seed. Chintapalle Red variety was also found resistant to BCMV.

## CONCLUSION

From the present study, it is concluded that Amber and Utkarsh were found suitable for agency area of Visakhapatnam, as both varieties were recorded higher yields and also low incidence of sucking insect pest population.

**Conflict of interest:** None.

## REFERENCES

- Jakhar, B.L. and Chaudhary, F.K. (2013). Screening of french bean genotypes against sucking pests. *AGRES- An International e-Journal*. 2(1): 112-114.
- Nwokolo, E. and Smartt, J. (1996). Food and Feed from Legumes and Oilseeds. Pp: 144-171. In: *Handbook of Energy Utilization in Agriculture*. [Pimentel, D. (ed.)]. Chapman and Hall, 2-6 Boundary Row, London.
- Prasad, R. (2005). Field crops production, Directorate of Information and publication of Agriculture. Indian Council of Agricultural Research, Krishi Anusandhan Bhavan, Pusa, New Delhi-110012.
- Rana, B.S., Tripathi, D.P., Balakotaiah, K., Damodar, R. and Rao, N.G.P. (1975). Genetic analysis of some exotic X Indian crosses in sorghum. Selection for shoot fly resistance. *Indian Journal of Genetics and Plant Breeding*. 35: 350-355.
- Sekhar, D., Seetharamu, P., Suryanarayana, L. and Rama Rao, G. (2021). Effect of sowing time on growth and yield of Rajmash (*Phaseolus vulgaris* L.) varieties in high altitude tribal zone of Andhra Pradesh. *The Pharma Innovation Journal*. 10(9): 1847-1850.
- Singh, P.S. and Singh, S.K. (2015). Evaluation of host plant resistance in rajmash (*Phaseolus vulgaris* L.) genotypes for leaf miner (*Chromatomyia horticola* Gaur.) and pod borers. *International Journal of Agriculture, Environment and Biotechnology*. 8(4): 999-1002.
- Singh, P.S. (2013). Screening of different Rajmash (*Phaseolus vulgaris* L.) genotypes against the infestation of Aphid, Leaf Miner and Pod borer. *Bioved*. 24(1): 29-32.
- Srivastava, K.P. and Butani, D.K. (1998). Pest management in vegetables (Part-I), Published by Research Periodicals and Book Publishing House, P.O. Box 720728, Houston, Texas- 77272, USA.