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Performance Assessment of Different Mungbean (*Vigna radiata L.*) Varieties in Relation with Thermal Indices under Temperate Region of Jammu & Kashmir

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A B S T R A C T

The field experiments (On farm trails) were conducted for two successive years during Kharif seasons of 2017-18 and 2018-19 by ICAR-CITH, KVK Baramulla, at farmers field for assessing the performance of different improved varieties of Mungbean crop grown under temperate region. The varieties selected for assessment of mungbean crop in terms of yield and economics are SML-668 and SML-832, procured from PAU, Ludhiana and assessed with Local check plots of farmers' as regular in practice. The problem diagnosed/defined was retention of lower productivity of mungbean on using locally available crop seed with indigenous practice without technical guidance by the farmers. The experiment was based on Apple based system (Inter cropping) and meanwhile, through study it was revealed that SML 832 recorded higher GDD (467.4 ^{o}C day) and yield (1260 kg/ha) followed by SML 668, GDD (411.4 ^{o}C day) and yield (1120 kg/ha) during first crop season and during second crop season, as similar, the cultivar SML 832 recorded higher GDD (460.9 ^{o}C day) and yield (1268 kg/ha) followed by SML 668, GDD (410.2 ^{o}C day) and yield (1145 kg/ha). The final recommendation for micro level situation was also suggested that SML 832 variety may be recommended for cultivation in the valley. Discussion with farmers followed by field visit with technical guidance was also undertaken by the specialist/experts meanwhile the two years crop duration.

Introduction

Mungbean is one of the main pulse crop grown in India. It is a good source of protein for vegetarian population of the country. It is consumed in the form of whole pulse as well as split pulse. Green gram or moong dal helps in losing weight, a good source of fiber and iron and helps to regulate the blood pressure**.** Being a short duration and self pollinated crop, it is suitable for the intensive crop rotations. After harvesting the pods, the green plants are uprooted or cut from the ground level and chopped into small pieces and fed to the cattle. The crop also helps in improving soil fertility.

Mungbean crop is sown as a subordinate crop in the Kashmir Division (Temperate Region) during last week of May to first week of June,

with optimum moisture availability in soil. To increase income of the farmers and nutritional status of farm families, mungbean cultivation is being promoted in the Baramulla district, by ICAR-Krishi Vigyan Kendra. The cultivation of improved varieties might increase the production significantly higher level. To select locally suitable varieties, KVK, Baramulla conducted On Farm Trials with two varieties *viz.*, SML 668 and SML 832 for two consecutive years (2017-18 and 2018-19) during Kharif season. Local check plots as farmers' practice were also laid along with trial plots. Data on yield in Trial plots as well as local check plots were recorded. Assessments on impact of local environments during the crop growing seasons were also assessed through analysis of accumulated Growing degree days. The Technology Gap, Extension Gap and Technology Index were calculated to assess the performance of technological interventions on mungbean cultivation through on farm trails using the formulas as given below:

Agromet indices

$$\text{Accumulated GDD } (^{o}C \text{ day}) = \sum \frac{\text{Max Temp.} + \text{Min. Temp.}}{2} - \text{Base Temperature } (7.5^{o}C)$$

Yield Gap analysis parameters

$$\text{Percent increase over farmers practice (\%)} = \frac{\text{Demonstrated Yield (Py)} - \text{Farmers Practice Yield (Fpy)}}{\text{Farmers Practice Yield (Fpy)}} \times 100$$

Technology gap = Potential yield - Demonstration yield (PY - DY)

Extension gap = Demonstration yield - Farmer's yield (DY - FY)

$$\text{Technology index} = \frac{\text{Potential yield (PY)} - \text{Demonstration yield (DY)}}{\text{Potential yield (PY)}} \times 100$$

The accumulated growing degree days of mungbean crop cultivars with local check for two crop growing seasons were analysed and evaluated, on analysis it was observed that upto maturity the higher number of GDD was accumulated by variety SML 832 followed by SML 668 and local check during both the crop seasons. Among two crop seasons, on comparison it was assessed that greater number of GDD was accumulated during 2018-19 crop season for each growth phase than 2017-18 crop season with some exceptions during maturity phase. The attainment of higher GDD upto maturity during second crop season results higher assimilates gain and yield than first crop season. Similar findings were reported by Singh *et al* (2015).

Result of on farm trails (OFTs) (Table 2) for cultivation of mungbean crop for the two successive years, revealed that the cultivation practices as suggested with proper technical guidance by experts/specialist are comprised under OFTs *viz*., use of improved varieties, proper seed rate, soil test based application of fertilizer, integrated pest management, irrigation and hand weeding, helped to attain the better results in terms of yield and economic gain than local farmers practice with local available seed. Throughout the study it was analysed that both the cultivars as practiced viz., SML-668 and SML-832 responded better during both the crop seasons, than local farmer practice and among them for both the crop seasons, the SML-832 attained higher yield with better photosynthetic efficiency and greater retention of dry matter partitions. As, similar the net return and benefit: cost ratio is also attained more on cultivation of variety SML-832 followed by SML-668 and farmers practice, during both crop season. On comparison between both the crop season, it was evaluated that the more; yield, net returns and B:C ratio was accumulated during 2018-19, kharif than

2017-18, kharif crop season. The resultant higher net gain with yield and greater B:C ratio attainment is possible during second year than first year due large duration of growing period given with higher growing degree days and sunshine duration attained by the crop during the season with better higher net assimilation rate. (Singh and Singh, 2015)

Percentage (%) increase over farmers practice

The average yield (Table 3) of mungbean crop and its crop assimilates gain on introduction of technological interventions through OFTs for comparing the treatments with the farmers' practice under the trails for the periods *i.e. kharif*, 2017-18 to *kharif*, 2018-19 was found to be 21.35%. The more increase in percentage yield gain was attained by SML-832 followed by SML-668 during both crop seasons, and the percent (%) increase in yields over farmers' practice ranged from 14.29 to 28.57%. Similar results of yield enhancement of mungbean crop under trails were indicated by Trivedi *et al.*, (2019).

Technology Gap (kg/ha)

The gap existed on adoption of varying improved cultivars in a new climatic field, resulted that among higher yielding varieties *i.e.* SML-668 in comparison to its realizable potential yield attained less technology gap interventions than SML-832 during both crop season. The average gap as 255.3 $kgha^{-1}$ is gained during the two years studies. This gap might be attributed to the differences in the soil fertility status, environmental conditions and adaptability of the demonstrated technologies under the field conditions. These results are supported by Mishra *et al* (2018).

Table.1 Accumulated growing degree days (^{o}C day) of Mungbean cultivars for two crop seasons

Year	Variety	Germination	Vegetative	Reproductive	PM*
2017-18	LOCAL	27.4	163.1	258.5	325.8
	SML 668	27.4	202.5	341.7	411.4
	SML 832	36.4	222.5	365.8	467.4
2018-19	LOCAL	38.2	188.4	269	335.7
	SML 668	38.2	208.1	355.2	410.2
	SML 832	53.5	229.3	377.6	460.9

*****PM: Physiological Maturity

Table.2 Yield and economic analysis of different treatments

Season and Year	Treatments	Yield (kg/ha)	Net Return (Rs./Unit)	B:C ratio
Kharif, 2017-18	Farmers Practice	980	44100	1.55
	SML-668	1120	49350	1.48
	SML-832	1260	53400	1.69
Kharif, 2018-19	Farmers Practice	995	45150	1.56
	SML-668	1145	51100	1.62
	SML-832	1268	53960	1.76
Mean		**1128**	**49510**	**1.61**

Table.3 Percentage increase in yield over farmers practice, Technology gap, Extension gap and Technology index estimation during OFTs on Mungbean crop at farmers'

Year	Treatments	% increase in yield over farmers practice	Technology Gap (kg/ha)	Extension Gap (kg/ha)	Technology Index (%)
2017-18	SML-668	14.29	243	140	17.83
	SML-832	28.57	284	280	18.39
2018-19	SML-668	15.08	218	150	15.99
	SML-832	27.44	276	273	17.88
Mean		**21.35**	**255.3**	**210.8**	**17.52**

Extension gap (kg/ha)

The average extension gap for the periods analysed during trails and was found to be 210.8 kg ha^{-1} and this gap analyses the difference between the demonstrated and farmers yield on behalf the technological interventions as guided and notified that on demonstration of new cultivar than local farmers practice can help to achieve greater returns (yield) and as resulted the greater extension gap is retained by SML-832 than others during both crop season. Similar results reported by Saravanakumar *et al.,* (2018).

Technology index (%)

The technology index is helpful in finding out the efficacy of the demonstrated technology at the farmers' field, than the farmers practice. As, with lower value of the index, the feasibility of the technology can be more as predicted at farmers' level, and during OFTs it was analysed that SML-668 gained lower value of index during both crop season than SML-832 and the average value of technology index for the periods studied under OFTs was found to be 17.52%. These findings are confirmed by Meena *et al* (2012).

In conclusion, the increase in the yields with greater B:C ratios and net returns were resulted on framing the technological interventions with beneficial guidance to the farmers of the district during mungbean crop demonstrations for the two years. A high degree of yield retention was gained on cultivation of SML-832, due higher GDD accumulated as similar, the technology gap, extension gap, technology index was also attained more during both crop seasons. The high value for all indices on cultivation of SML-832 revealed that there is need of location specific refinements for attainment of desired yield and production of mungbean in the district. The final recommendation for micro level situation was also suggested that SML 832 variety may be recommended for cultivation than local farmer practice.

References

Meena, O.P., Sharma, K.C., Meena, R.H. and Mitharwal, B.S. 2012. Technology transfer through FLDs on mung bean in semi-arid region of Rajasthan. *Rajasthan Journal of Extension Education, 20*, pp.182-186.

Mishra, K., Panigrahi, S. and Sarangi, D. 2018. Evaluation of cluster front line demonstration in greengram crop. *International Journal of Current Microbiology and Applied Sciences, 7*(10), pp.3344-3350.

Saravanakumar, S. 2018. Yield gap analysis of mung bean through Frontline

demonstration in Erode district of TamilNadu. *International Journal of Tropical Agriculture*, *36*(4), pp.969-973.

Singh, H. and Singh, G.. 2015. Growth, phenology and thermal indices of mungbean as influenced by sowing time, varieties and planting geometry. *Indian J. Agric. Res*, *49*(5), pp.472-475.

Trivedi, H.K., Jain, V.K., Tomar, S.S., Gupta, B.S. and Panika, A.K. 2019. Enhancing the Productivity of Green gram (moong) through Cluster Front Line Demonstration in the Ashoknagar District of Madhya Pradesh. *Technofame*, *8*(2), pp.63-66.

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