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Agronomic evaluation of mungbean genotypes under delayed sowing conditions

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ABSTRACT

High yielding varieties and suitable sowing time are the most important factors affecting the mungbean yield. Field experiments were carried out during *kharif* 2013 and 2014 at Dryland Agricultural Research Station, Budgam, Sher-e-Kashmir University of Agricultural Sciences and Technology Kashmir, India to find out the suitable genotype of mungbean under delayed sowing conditions. The early sowing (first fortnight of June) recorded higher yield contributing characters (seeds/plant and 100 seed weight) and seed yield than delayed sowing. Among genotypes 'SKUA-M-365' recorded higher 100-seed weight and seed yield in early sowing as well as under delayed sowing conditions.

Key words: Genotypes, Mungbean, Sowing dates.

INTRODUCTION

In India 28.17 million hectares of land is under pulses producing about 18.31 million tons of pulses annually (FAO.2013). Still, to meet the demand, about 2-3 million tons of pulses needed are imported every year (IIPR, 2013). The pulse productivity (650 kg/ha) is less than the global average (904 kg/ha) (FAO.2013) and the per capita availability (40 grams), is less than what nutritionists recommend. The demand for pulses in India will increase further with a growing population as well as sustained economic growth. Munngbean is one of important *khraif* pulses after chickpea and pegionpea. Too early sowing may not successfully germinate, while yield from too late sown crop may be low due to unfavourable condition for growth and development of mungbean (Hussain *et al*. 2004). Planting time of mungbean varieties had differential response to planting time (Sadeghipour O, 2008) due to variation in climatic parameters. Under climatic conditions of Kashmir valley the main *Rabi* crops (oat, brown sarson etc) are grown under rainfed conditions and normally harvested in the first fortnight of May, however sometimes harvesting gets delayed due to variability in weather condition during spring months. Under such conditions the maize grown after *rabi* crops is not suitable and mungbean being short duration crop can be grown in such situation. Therefore present investigation was undertaken with the objective of finding suitability of mungbean genotype under delayed plating conditions.

MATERIALS AND METHODS

The experiment was carried out at Dryland Agriculture Research Station of Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir during *kharif* 2013 and 2014. The experimental site is located at 33. 98º N latitude, 74.80º E longitude and at an altitude of 1592 meters above mean sea level characterised by temperate climatic conditions. The soil of experimental site was silty clay in texture with 1.36% organic carbon, 13 kg/ha available P, 258 kg/ha exchangeable K. The field experiment was carried out in split plot design with three replication. The main plot treatment comprised four sowing dates (15 June, 25 June, 5 July, 15 July during *kharif* 2013 and 31 May, 10 June, 20 June , 30 June in *kharif* 2014) and sub-plot comprised of four genotypes ('Shalimar Moong-1', 'Shalimar Moong-2', 'SKUA-M-365' and 'DGGS-4'). The genotypes were sown at defined dates using seed rate of 25 kg/ha at a spacing of 30cm X 20cm. Other management practices were followed as per recommendation about this crop. Cost of cultivation and gross returns were computed on the basis of prevailing market price of inputs and outputs and Benefit cost ratio (B:C) was worked out by dividing gross returns with cost of cultivation. Statistically significant differences were measured by analysis of variance (ANOVA) and LSD ($P<0.05$) was used to compare the means.

RESULTS AND DISCUSSION

Date of sowing induced significant variation in yield attributers and seed yield. In *kharif* 2013, 15th June of sowing recorded significantly higher seeds/plant, followed by 25th June, 5th July and 15th July of sowing. Almost similar tend observed in seeds/plant in *kharif* 2014 on defined date of sowing (31 May, 10 June, 20 June , 30 June) (Table 1 &2). Dhanjal *et al*. (2000) and Singh and Vashit (2005) also observed higher seed yield of mungbean in early sowing compared to delayed sowing. The 100 seed weight was also found significantly higher with 15th June sowing in *kharif*

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Table 1: Influence of sowing dates on seeds/plant, 100seed weight and seed yield of different genotypes of mungbean in *kharif* 2013

Treatments	Seeds/plant	100 seed weight (g)	seed yield Kg/ha
Sowing Date			
15 June	77.50	4.63	1031.5
25 June	71.65	4.51	943.0
05 July	64.11	4.36	900.3
15 July	55.62	4.28	727.6
S.E m±	1.04	0.08	17.94
C.D(p=0.05)	2.36	0.22	51.94
Genotypes			
Shalimar moong-1	76.50	3.35	820.3
Shalimar moong-2	80.60	3.48	899.6
SKUA-M-365	60.15	5.60	946.8
DGGS-4	51.94	5.35	929.4
S.E m±	1.53	0.09	15.71
C.D(p=0.05)	4.71	0.26	48.31
Sowing date x Genotypes	NS	NS	NS

2013 than remaining date of sowing , however was par to 25th June sowing. In *kharif* 2014 early sowing (31 May) produced significantly higher 100 seed weight than delayed sowing. Rehman *et al*. (2009) also found that number of pods/plant,1000-grain weight of mungbean were higher for 30th March than recorded for 15th July.

All the genotypes differed significantly in seeds/ plant and genotype Shalimar Moong-2 recorded highest number of seeds/plant followed by 'Shalimar Moong-1', S'KUA-M-365' and 'DGGS-4' in both years (2013 and 2014). However, the genotype 'SKUA-M-365' recorded significantly higher 100-seed weight than 'Shalimar Moong-1' and 'Shalimar moong-2', though was at par to 'DGGS-4' (Table 1 &2). Among genotypes, 'SKUA-M-365' recorded significantly higher seed yield in 2013 as well as in 2014 than 'Shalimar Moong-1', however was at par to 'DGGS-4' and 'Shalimar Moong-2'. It was further found that 'DGGS-4' was significantly superior with respect to seed yield than 'Shalimar moong-1'. Singh *et al* (2013) also reported variation in yield attributes and seed yield among different genotypes ('Pusa 105', 'Ganga 1', 'ML 682', 'PMB 14' and 'Pant Mung 4').

Under delayed condition, the response of all genotypes remained similar as the interaction between date of sowing and genotypes was found statistically at par with respect to grain yield and yield attributes.

Economics: The relative economics differed with genotypes and date of sowing. The early sowing recorded maximum gross returns and benefit cost ratio compared to delayed sowing (Table 3). Among the genotypes 'SKUA-M-365' recorded higher gross returns and benefit cost ratio than other

Table 2: Influence of sowing dates on seeds/plant, 100seed weight and seed yield of different genotypes of mungbean in *kharif* 2014

Treatments	Seeds/plant	100 seed weight (g)	seed yield Kg/ha
Sowing Date			
31 May	56.5	3.98	681.2
10 June	48.1	3.85	569.6
20 June	37.5	3.69	418.2
30 June	29.0	3.43	281.7
S.E m±	**0.61**	**0.03**	**17.04**
C.D(p=0.05)	**2.08**	**0.09**	**58.84**
Genotypes			
Shalimar Moong-1	48.1	2.81	435.3
Shalimar Moong-2	51.7	2.94	478.9
SKUA-M-365	36.7	4.67	539.3
DGGS-4	34.6	4.54	497.2
S.E m±	**1.27**	**0.04**	**10.01**
C.D(p=0.05)	**3.71**	**0.11**	**29.23**
Sowing date x Genotypes	**NS**	**NS**	**NS**

Table 3: Relative economics of mungbean under varied sowing dates and genotypes.

Treatments		Gross returns		B:C	
Sowing Date					
2013	**2014**	**2013**	**2014**	**2013**	**2014**
15 June	31 May	60520	32496	2.75	1.48
25 June	10 June	53440	23568	2.43	1.07
05 July	20 June	50024	11456	2.27	0.52
15 July	30 June	36208	536	1.65	0.02
Genotypes					
Shalimar moong-1		43624	12824	1.98	0.58
Shalimar moong-2		49968	16312	2.27	0.74
SKUA-M-365		53744	21144	2.44	0.96
DGGS-4		52352	17776	2.38	0.81

genotypes ('DGGS-4'>'Shalimar Moong-2'>'Shalimar Moong-1'). Variation in gross returns and B:C among the black gram genotypes ('TAU-1', 'BDU-1' and 'TPU-4') was also recoded by Jadhav *et al.* (2014). From the study it was concluded that in both years (2013 and 2014) delayed sowing reduced grain yield of mungbean. The genotype 'SKUA-M-365' consistently over yielded other genotypes in all date of sowing in both years (2013 and 2014) and thus genotype of 'SKUA-M-365' is recommended for delayed sowing under temperate conditions of Kashmir.

REFERENCES

Dhanjal, R., Om, P. and Ahlawat, l.P.S. (2000). Response of spring green gram to dates of sowing. *Annals of Agricultural Research* **21**(4): 570-571.

FAO.(2013). FAO STAT Production Statistics, Food and Agriculture Organization of United Nations. http://faostat.fao.org/site/567/Desktop Default.aspx?PageID=567#ancor on 22/06/2016

Hussain, A., Khalil, S.K., Khan, S and Khan H .(2004). Effect of sowing time and variety on grain yield of mungbean. *Sarhad Journal of Agriculture* **20(**4): 481-484.

IIPR.(2013). Vision 2050. Indian Institute of Pulses Research (Indian Council of Agricultural Research) Kanpur. http://www.iipr.res.in/pdf/vision_2050.pdf. cited on 22/06/2016

Jadhav, P.B., Kamble, D.R, Jadhav, K.T and Gadpale, D.L.(2014). Performance of black gram [Vigna mungo (L.) Hepper] varieties to different sowing dates. *Advance Research Journal of Crop Improvement.* **5**(2): 166-171

Rehman, A., Khalil, S.K., Nigar, S., Rehman, S., Haq, I., Akhtar, S., Khan, A.Z. and Rehman, S. 2009. Phenology, plant height, and yield of mungbean varieties in response to planting date. *Sarhad Journal of Agriculture* **25**(2):147-152.

Sadeghipour, O. (2008). Response of mungbean varieties to different sowing dates. *Pakistan Journal of Biological Science* **11**(16): 2048-2050

Singh, A.K., Kumar, P and Chandra N. (2013). Studies on seed production of mungbean (*Vigna radiata*) sown at different dates. *Journal of Environmental Biology* **34**: 1007-1011

Singh, H. and Vashit, K.K. (2005). Sowing time of summer mungbean under Punjab conditions. *Indian Journal of Pulses Research* **18**(1): 36-37.