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Sukhdeep Singh
Department of Agronomy, OPJS
University, Churu, Rajasthan,
India

Narpat Singh
Associate Professor, Department
of Agronomy, OPJS University,
Churu, Rajasthan, India

Ramandeep Kumar
Assistant Professor, Department
of Agriculture, Baba Farid
College, Bathinda, Punjab, India

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“Effect of dates of sowing and mulching on grain yield, straw yield and harvesting index of Summer Mash (*Vigna Mungo*)”

Sukhdeep Singh, Narpat Singh and Ramandeep Kumar

Abstract

The present investigation entitled, “Effect of dates of sowing and mulching on grain yield, straw yield and harvesting index of Summer Mash (*Vigna Mungo*)” was carried out at Experimental Farm, Mr Yadvinder Singh at VPO-Bhangala Tehsil Abohar District Fazilka - Punjab during kharif 2014. The experiment comprising of different dates (5th and 25th April) for sowing in main plot, three mulch levels (0, 3 and 6 t/ha) in sub plot was laid out in split plot design. The treatment combinations were replicated four times. The date of sowing showed beneficial effect on grain yield, straw yield and harvesting index of Summer Mash. The findings can be useful for improving productivity and profitability of Summer mash. The sowing of Summer mash on 5th April significantly gave 21.9% higher grain yield and 17.7% straw yield over 25th April sown crop. The mulch application at 3 and 6 t/ha increased grain yield to the extent of 8.1% and 30.6% respectively over no mulch application. The percent harvest index was higher i.e. (41.9) in case of 5th April sown crop. The interaction effect between sowing time and mulch levels showed non-significant effect on harvest index.

Keywords: mulching on grain yield, harvesting index of Summer Mash.

Introduction

Pulses a poor man’s meat in developing world provide a balance diet for the people when taken in combination with wheat, rice and other cereals. They are also used as feed to animal in the form of hay and straw (Maqsood *et al.* 2001) [3]. In addition, the legumes also included in cropping system and have the ability to provide nitrogen through nitrogen fixing rhizobacteria and increasing soil fertility. The legume crop partially replaces expensive nitrogenous fertilizers.

Vigna mungo commonly referred to as urd bean, urd black gram, black lentil is grown in southern Asia. Black gram is originated from central Asia and India. It is grown worldwide as a pulse crop and India tops in production. In Punjab, it is cultivated in 2.2 thousand hectares with an average grain yield of 464 Kg/ha during 2012-13. Mash bean is one of the commonly grown pulse crop in many countries of the world. The importance of Mash is based on its high protein content (24%), carbohydrates (66%) and fats (Ali *et al.* 2002) [1]. Moreover, it is also recommended for diabetics.

Out of several factors time of sowing and mulching are crucial and assumes greater importance in cultivation of mash. Timely sown crop has mark able effect on growth as well as yield and delay in sowing beyond optimum, usually result reduction in yield (Vange and Obi. 2006) [8].

The application of mulch effects the absorption of solar radiation and decrease the thermal admittance of the surface relative to that of bare soil (Tanner *et al.* 1987) [6]. Application of sugarcane trash in summer mungbean (Trivadi *et al.* 1994) and use of water hyacinth in tomato (Rehman *et al.* 2006) [4] increased the plant growth.

Sandhu *et al.* (1992) [5] studied the effect of mulching on Summer Mungbean and reported 98% higher mungbean yield with 6t/ha rice straw application over no treatment during 1982 and 1985 in loamy sand soil.

Choudary *et al.* (1989) concluded that the date of planting resulted in significant variation in seed and Stover yield of urd bean. The highest seed (12.0 t/ha) and Stover (38.12 t/ha) was

Correspondence
Sukhdeep Singh
Department of Agronomy, OPJS
University, Churu, Rajasthan,
India

recorded in crop planted on 6 July.

However, information is available on the effect of date of sowing and use of mulch material on performance of meagre summer Mash in south western parts of Punjab. Keeping in view the above facts the present investigation was undertaken with following objectives to study the effect of dates of sowing and mulching on grain yield, straw yield and harvesting index of Summer (*Vigna Mungo*)

2. Material and Methods

The present investigation was carried out at experimental farm, Mr Yadvinder Singh VPO-Bhangala Tehsil Abohar District fazilka - Punjab. during kharif 2014. The experiment comprised of two dates of sowing (5th April and 25th April) and three straw mulch levels (0, 3 & 6 t/ha) in Summer mash-1008. The details of the experiment are described below.

2.1 Observation recorded

2.1.1 Grain yield and straw yield (kg/ha)

The crop was harvested at maturity. The grain and straw yield was recorded and expressed in Kg/ha.

2.1.2 Harvest index (%)

The percent harvest index was calculated as under.

$$HI (\%) = \frac{\text{Grain yield}}{\text{Straw yield} + \text{Grain yield}} \times 100$$

2.1.3 Statistical analysis

The statistical analysis of calculated data was done by using EDA (Electronic design automation), software in statistical package. The treatment comparisons were made at 5 per cent level of significance.

3. Results and Discussion

The results of the experiment found clear support for effect of dates of sowing and mulching on growth parameters

3.1 Grain Yield (kg/ha)

The data (Table 3.1) revealed that there was significant effect of sowing time on grain yield of Summer mash. The 5th April sown crop resulted in 21.9% increase in grain yield over 25th April sown crop. Similarly increase in mulch level significantly increased the grain yield. The increase in grain yield was to the extent of 8.1 % and 30.6 % with 3 and 6 t/ha mulch application, respectively over control. There was 20.8 % increase in grain yield with 6 t/ha mulch application over 3 t/ha mulch application. The increase in grain yield with 3 t/ha mulch application showed non-significant effect over control. The increase in grain yield in timely sown crop may be due to increased yield attributes and soil temperature which checks the weed population. The interaction effect between different dates of sowing and mulch levels on grain yield was non-significant.

3.2 Straw Yield (kg/ha)

The presented data (Table 3.1) concluded that sowing of Summer mash on 5th April resulted in significantly higher straw yield (1398.3 kg/ha) as compared to 25th April sown crop. Findings revealed that straw yield increased with increase in level of mulch application. The maximum straw yield (1421.5 kg/ha) was recorded with 6 t/ha mulch application as compared to other treatments. The minimum straw yield 1189.6 kg/ha was recorded in no mulch application. The interaction effect between dates of sowing and mulch levels on straw yield was non-significant.

Table 3.1: Effect of date of sowing and mulch levels on grain yield and straw yield (kg/ha)

Effect of date of sowing and mulch levels on grain yield (kg/ha)				Effect of date of sowing and mulch levels on straw yield (kg/ha)					
Sowing date	Mulch level (t/ha)			Mean	Sowing date	Mulch level (t/ha)			Mean
	0	3	6			0	3	6	
5 th April	890.7	960.1	1225.8	1025.5	5 th April	1267.7	1358.5	1568.7	1398.3
25 th April	762.6	827.3	932.9	840.9	25 th April	1111.5	1178.2	1274.2	1188.0
Mean	826.5	893.7	1079.3		Mean	1189.6	1268.4	1421.5	
CD at 5%	Sowing date = 168.7; Mulch level = 90.7; Sowing date * Mulch = NS				CD at 5%	Sowing date = 152.4; Mulch level = 78.2; Sowing date * Mulch level = NS			

3.3 Harvest Index (%)

It is an important parameter which indicated the efficiency in partitioning of dry matter to the economic part of crop. Higher harvest index, better is the economic return of the crop. The data presented in table 3.2 showed that sowing time has non-significant effect on percent harvest index of Summer mash

and the maximum value was 41.9 in 5th April sown crop. The increase in mulch application resulted in significant higher percent harvest index and was 42.9 at 6 t/ha mulch application. The data further showed that interaction effect between sowing date and mulch levels was non-significant on harvest index.

Table 3.2: Effect of date of sowing and mulch levels on percent Harvest Index

Sowing date	Mulch level (t/ha)			Mean
	0	3	6	
5 th April	41.0	41.2	43.7	41.9
25 th April	40.4	41.1	42.2	41.2
Mean	40.7	41.1	42.9	
CD at 5%	Sowing dates = NS; Mulch level = 1.3, Sowing date * Mulch level = NS			

Conclusion

Present investigations concluded that with recommended seed rate i.e. 20 kg/ha and Kera method at 22.5 cm row spacing. The salient findings of the investigation are summarized that the The sowing of Summer mash on 5th April significantly

gave 21.9% higher grain yield and 17.7% straw yield over 25th April sown crop. Application of straw mulch at the rate of 6 t/ha significantly increased both yield parameters as well as grain yield as compared to 3 t/ha and no mulch application. The maximum grain yield of Summer mash was recorded in

5th April sown crop at 6 t/ha mulch application. The percent harvest index was higher i.e. (41.9) in case of 5th April sown crop. The interaction effect between sowing time and mulch levels showed non-significant effect on harvest index.

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