

Original Research Article

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Mulching Practices and Awareness of Farmers for Biodegradable Mulches made from Textile Waste from Mansa and Moga

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ABSTRACT

The present investigation was undertaken to study mulching practices and awareness of farmers for textile mulches in Mansa and Moga, which are two high vegetable growing districts from the south western zone of Punjab. Fifteen farmers from each district were selected randomly and an interview schedule was used for collecting data. The results indicated that majority farmers in both districts were in the age group of 25-35 years and were educated at graduate level. Most of the farmers at both places worked on their own land as large and medium farmers. Moga farmers almost grew all different vegetables using both paddy straw and plastic mulches as compared to Mansa farmers who were mostly using paddy straw mulch. Majority farmers (80%) claimed that they always used mulch in cultivation at Moga in contrast to 66.6 percent farmers at Mansa. Maximum farmers at Mansa opined that mulch usage resulted in increase in crop yield by 10 to 20 percent but in Moga farmers estimated that mulch improved the crop yield by 50-60 percent. Motivation for usage of mulch was credited by the farmers to colleagues and Agricultural Technicians from PAU or KVKs. Farmers at both places did not receive any subsidy by the government on mulch usage. At Moga, 86.6 percent farmers hired labour for placing the mulch in field during cultivation which was higher as compared to Mansa farmers. Data on the awareness of the farmers under study for different biodegradable textile mulches indicate that very few farmers (between 30-35%) had the requisite knowledge but most of them were willing to buy and use such mulches. Hence, there is a need to popularize such mulches as these can be easily made on a commercial level because of the availability of textile waste material from different industries in Punjab.

Keywords

Biodegradable, farmers, labour, mulching, paddy straw, textile waste

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Introduction

Mulching is used for weed control, reducing the need for tillage and herbicides (Bhardwaj, 2013). It can also increase the yield and improve the fruit quality. Mulches commonly used by the farmers are:

plastic, polyethylene film, polypropylene fabric etc. Black polyethylene is most commonly used mulch in vegetable farming (Kasirajan and Ngouajio, 2012). But the use of polyethylene films does not contribute organic matters to soils. So organic mulches are best alternative to polyethylene mulches

and it improves the physical, chemical and biological properties of soil and also adds nutrients to the soil, ultimately enhancing the growth and yield of crops (Bhavani *et al.*, 2017). Woven and non-woven and spun bonded agro textile mats are preferred for this application as they provide durability and better breathability (Platt, 2006).

Materials and Methods

The sample consisted of thirty farmers which were drawn randomly from south western zone of Punjab. The sample selection was made through multi-stage purpose cum random sampling technique. Out of the seven districts in central plain zone, two highly vegetable cultivated districts were selected.

Data was collected using an interview schedule. Fifteen farmers from each district were selected randomly for collecting the data. A complete list of farmers was procured from horticulture department and KVK in each district.

Results and Discussion

Socio- personal background of the farmers

The data indicated that maximum farmers in Mansa and Moga were in the age group of 25-35 years. In both districts, no farmer was found in the age group of 55-60 years. As educational status, majority of farmers in Mansa and Moga were graduate and were belong to nuclear families.

As far as six monthly income of the farmers in Mansa was concerned, it was observed that the largest percentage of farmers had family income between ₹2,00,000-3,00,000. In Moga, the largest percentage of farmers had family income between ₹1,00,000-2,00,000 (Table 1).

Land on lease and operational holder status

In Moga and Mansa, 53.3 and 66.6 percent of the farmers were cultivating on their own land respectively in sub western zone. Based on the area

of operational holding of land, 46.6 percent of the farmers belonged to medium farmer category in Mansa. Whereas in Moga, 40 percent of farmers belonged to large and medium farmer category.

Crops cultivated by the farmers

It was observed that at Mansa, majority of farmers grew vegetable crops on land area <5acres. Grain was widely cultivated from land areas majorly 5-10acres. At Moga, 86.6 percent raised vegetable crops on area <5 acres. Grain crops were again highly cultivated here by the farmers.

Vegetables cultivated by farmers

Large numbers of farmers were adopting multiple cropping system and growing different type of vegetables. In Mansa 20 percent farmers grew all type of vegetables, which is also similar to the farmers who cultivated the combination of root tubers and green leafy vegetables. Comparing to the farmers living in Moga, 60 percent farmers cultivated all type of vegetables on their fields

Awareness of biodegradable mulch mats made from textile waste

Data on the awareness of the farmers under study show that they had knowledge about mulch and all had used mulch during their course of cultivation.

About different biodegradable textile mulches, it was found that very few farmers, only 20 percent in Mansa and 33.3 percent in Moga were aware thus, strengthening the need to popularize such mulches for discouraging the use of plastic ones.

Further, an attempt was made to find out that if given an opportunity, whether the farmers were willing to buy biodegradable mulches or not.

Figure 3 show that 60 percent of farmers at Mansa and 66.6 percent at Moga were conscious about environment and hence willing to buy and use the biodegradable mulches made out of textile waste.

Vegetables grown using mulches

Among the different type of vegetables, potato (53.3%) was grown by highest number of growers in Mansa district. Whereas, at Moga district, 40percent of the growers were cultivating all type of seasonal vegetables. In present study, no farmer was noticed growing either chilli or radish using mulch at Moga district.

Motivation for mulch usage

In Mansa, maximum number of farmers started using mulching after motivation from their colleagues and PAU, KVKs and other institutes (Fig.5). At Moga, the highest percentages of farmers (53.3%) were influenced by their colleagues' using mulches.

Time frame for usage of mulch by farmers

At Mansa and Moga, maximum number of farmers 73.3 and 60 percent respectively started mulching practices less than 5 years ago. Whereas, in Moga, 40 percent of the growers were adopting the mulching practices form last 5 to 10 years.

Subsidy available to farmers for mulch

The farmers were questioned about whether they got any subsidy from the government for mulch usage or not. So, very poor responses were found in both the districts. At Mansa, only 6.6 percent of the farmers obtained subsidy and in Moga, no farmer had ever got subsidy for mulches.

Frequency of usage of mulch by farmers during cultivation

At Mansa, 66.6 percent of the farmers always used mulch for their cultivation in contrast to 80 percent farmers in Moga.

Mulch types and mode of purchase used by farmers

At Mansa, 40 percent farmers used paddy straw as a mulching material. At Moga district, equal

percentage of farmers utilized paddy straw and plastic sheets as mulching material. It was also observed that more number of farmers was utilizing both types of mulches at Mansa (26.6%) and Moga (26.6%) districts (fig.9). Most of the farmers at Mansa purchased mulch from the retailers and even used their own paddy mulch (33%). At Moga, 40 percent of the farmers used their own paddy mulch. At Mansa, 13 percent of farmers were noticed to rely on online sources for the purchase of the mulch (fig.10).

Effect of mulch usage on various crop

At Mansa, crop yield enhancement, 80 percent of farmers reported it between 10 -20percent and in Moga, 33 percent farmers noticed it increased by 20-30percent and other 33 percent of farmers noticed it 50-60percent (fig.11).

Labour hired while placement of mulch in field

It was observed that at Moga, high percentage of farmers (86.6%) hired labour for mulch placement while at Mansa 60 percent farmers did so. More number of farmers at Mansa engaged themselves in placing and removing mulch during cultivation (Fig. 12).

Problems faced by farmers in mulch usage

Farmers at Moga (80%) faced more problems as compared to the farmers at Mansa (53.3%) in application of mulches at field (Fig. 13). Some of the issues they listed were the high cost of labour for placing and removing mulch from the field along with the disposal of the plastic mulch and land filling cost was a concern for them.

Comparison of mulching practices among farmers in Mansa and Moga

Few similarities and some dissimilarities were observed as far as the mulching practices of farmers in Mansa and Moga are concerned. These are discussed as under:

Table.1 Socio-personal traits of farmers

Socio-personal traits	Mansa n=15	Moga n=15	Total n=30
	Frequency (%)	Frequency (%)	Frequency (%)
Age (in years)			
25-35	12 (80)	7 (46.67)	19 (63.33)
35-45	3 (20)	3 (20)	6 (20)
45-55	0	5 (33.33)	5 (16.67)
Educational qualification			
Matriculate	1 (6.67)	5 (33.33)	6 (20)
Higher Secondary (+2)	5 (33.33)	6 (40)	11 (36.67)
Graduate	9 (60)	7 (46.67)	16 (53.33)
Family type			
Nuclear	10 (66.66)	12 (80)	22 (73.33)
Joint	5 (33.33)	3 (20)	8 (26.67)
Six monthly income in (₹)			
Below 1,00,000	4 (26.67)	1 (6.67)	5 (16.67)
1,00,000 - 2,00,000	2 (13.33)	9 (60)	11 (36.67)
2,00,000 - 3,00,000	5 (33.33)	5 (33.33)	10 (33.33)
Above 3,00,000	4 (26.67)	0	4 (13.34)

Note: Figures in parentheses indicate percentage

Table.2 Total land on lease and operational holder status of the farmers

Land on lease	Mansa n=15	Moga n=15	Total (n=30)
	f (%)	f (%)	f (%)
Yes	7 (46.67)	5 (33.33)	12 (40)
No	8 (53.33)	10 (66.66)	18 (60)
Operational holder status			
Small Farmer (2.5-5 acre)	3 (20)	5 (33.33)	8 (26.67)
Semi- Medium Farmer (5-10 acre)	3 (20)	4(26.66)	7 (23.33)
Medium Farmer (10-25 acre)	7 (46.67)	6 (40)	7 (23.33)
Large Farmer (above 25 acre)	2 (13.33)	6 (40)	8 (26.67)

Note: Figures in parentheses indicate percentage

Table.3 Crops cultivated by the farmers from south western zone

n=30

Mansa n=15					Moga n=15			
Different crops								
Land area (acres)	Veg	Fruits	Grains	Others	Veg	Fruits	Grains	Others
0	0	10(66.67)	0	3(20)	0	10(66.67)	0	3(20)
Less than 5	13(86.66)	5(33.33)	3(20)	-	13(86.67)	5(33.33)	3(20)	-
5-10	1 (6.67)	0	8(53.33)	-	1(6.67)	0	8(53.33)	-
10-15	1(6.67)	0	1(6.67)	-	1(6.67)	0	1(6.67)	-
15-20	0	0	1(6.67)	-	0	0	1(6.67)	-
20-25	0	0	1(6.67)	-	0	0	1(6.67)	-
Above 25	0	0	1(6.67)	-	0	0	1(6.67)	-

Note: Figures in parentheses indicate percentage

Fig.1 Different vegetables cultivated by farmers

n=15

n=15

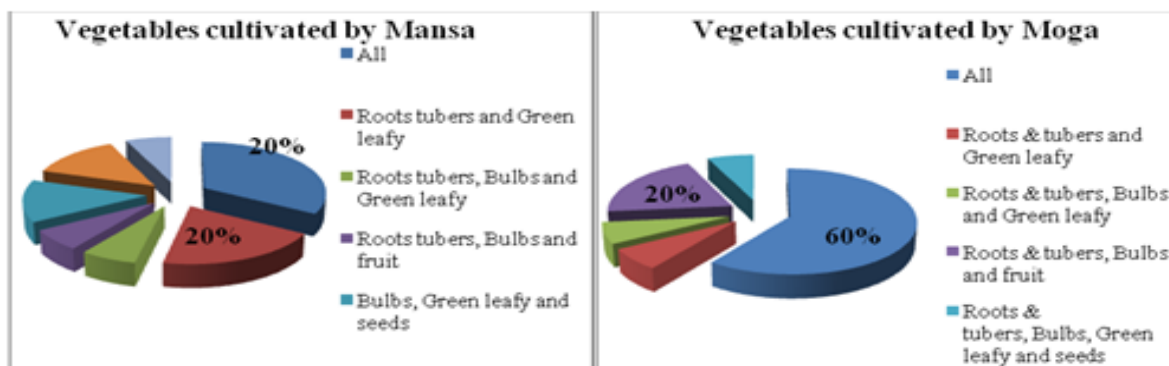


Fig.2 Awareness about various biodegradable mulch mats

n=15

n=15

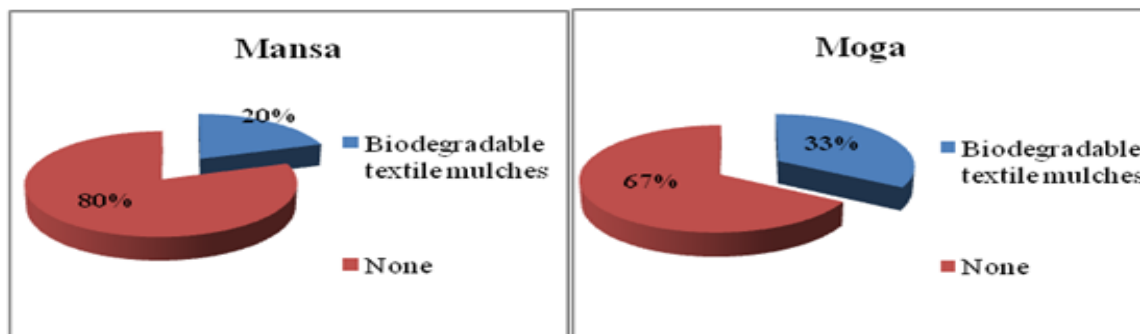


Fig.3 Willingness to buy biodegradable mulches made from textile waste

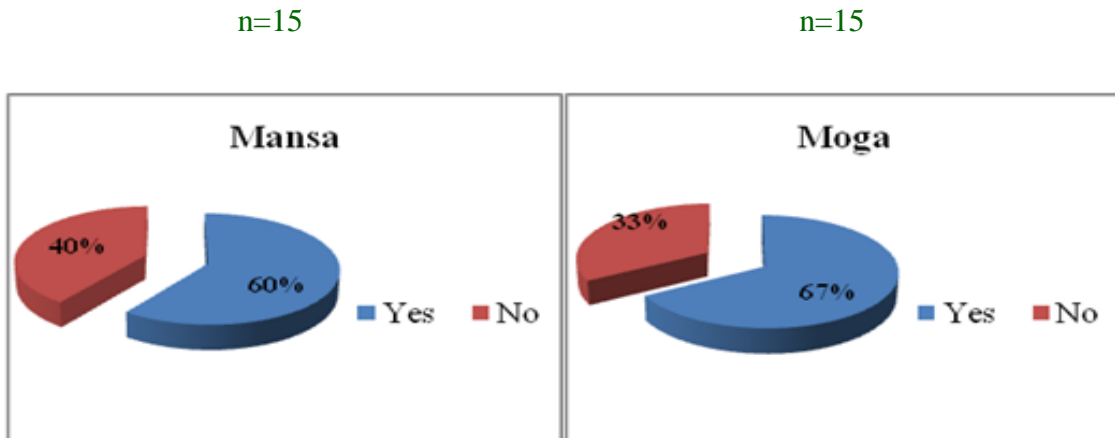


Fig.4 Vegetables grown by mulching method in Mansa and Moga

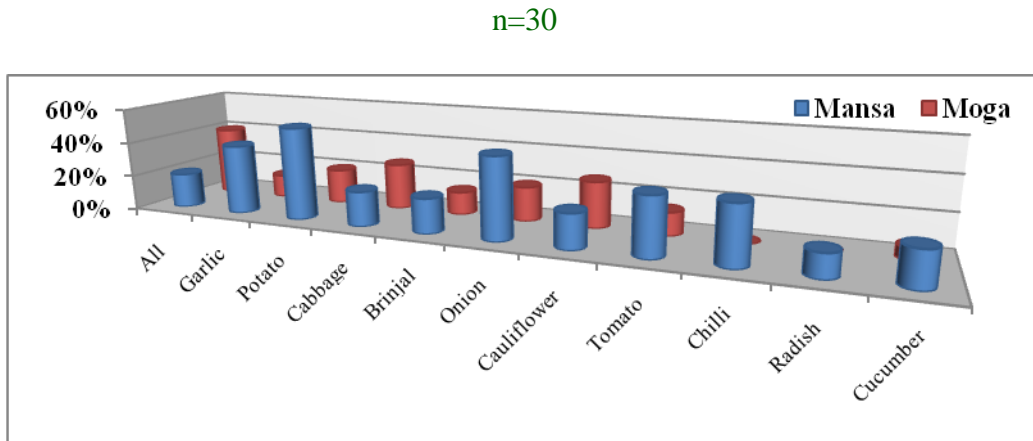


Fig.5 Sources for motivation of mulch usage to farmers at Mansa and Moga

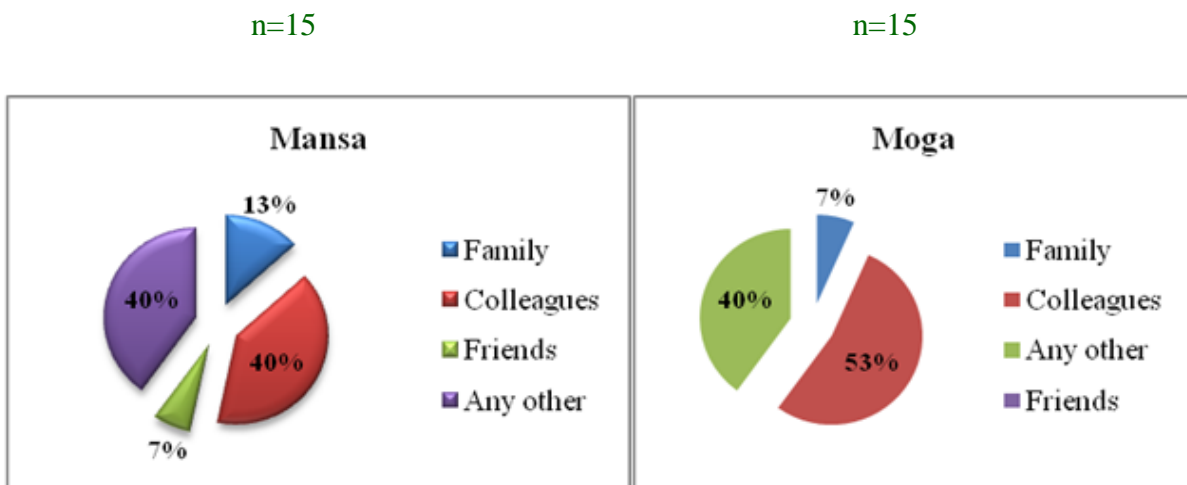


Fig.6 Time frame for the usage of mulch by the farmers at Mansa and Moga

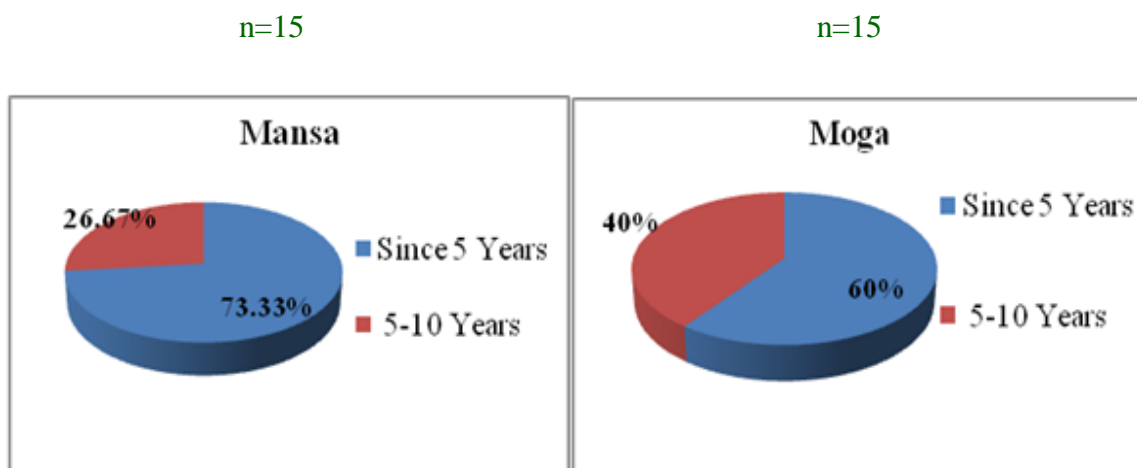


Fig.7 Subsidy availability to farmers for mulch usage at Mansa and Moga

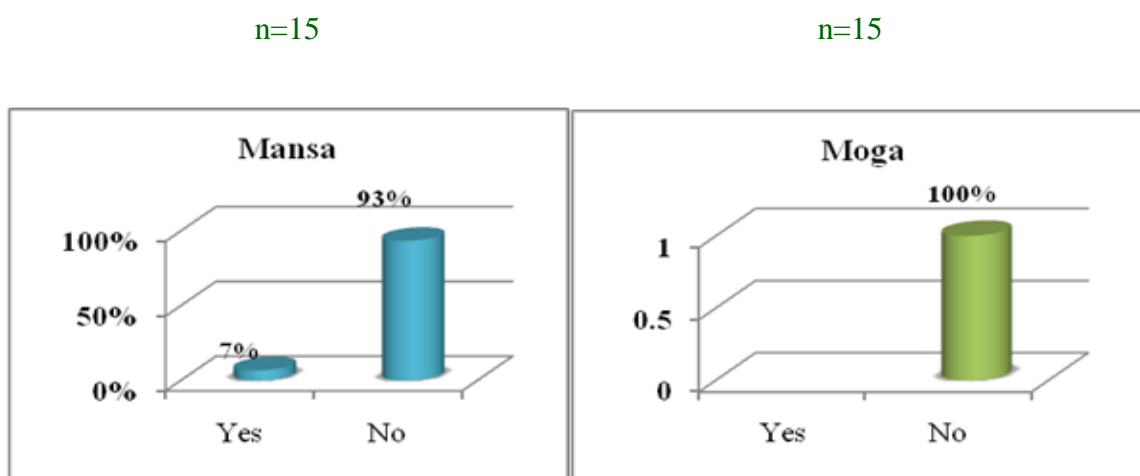


Fig.8 Frequency of mulch usage amongst the farmers at Mansa and Moga

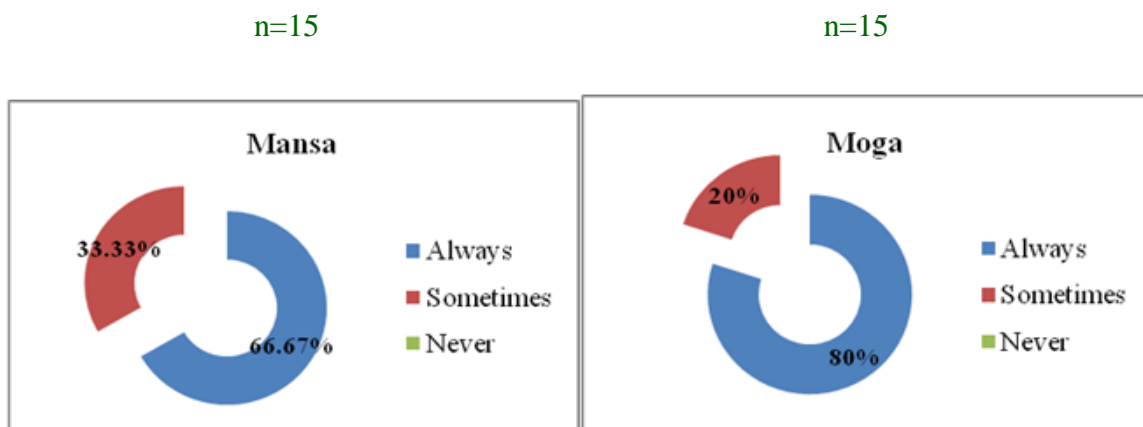


Fig.9 Different types of mulches used by farmers at Mansa and Moga

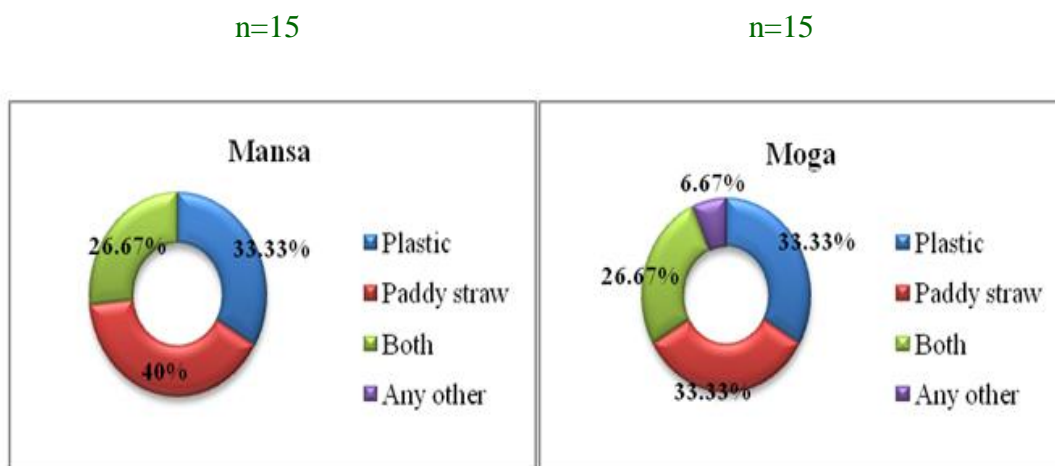


Fig.10 Mode of purchase of mulch by the farmers at Mansa and Moga

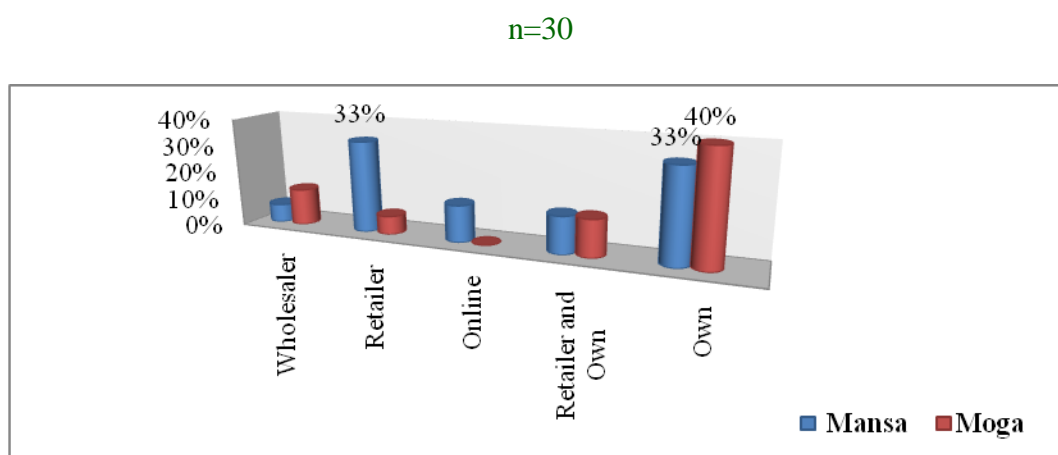


Fig.11 Percentage increase in crop yield through mulching at Mansa and Moga

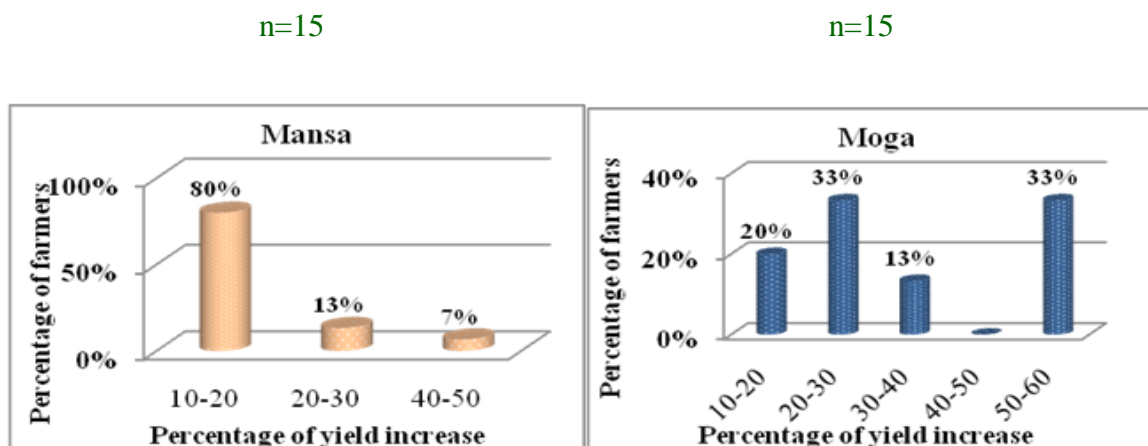


Fig.12 Status of hiring of labour for mulch placement in field at Mansa and Moga

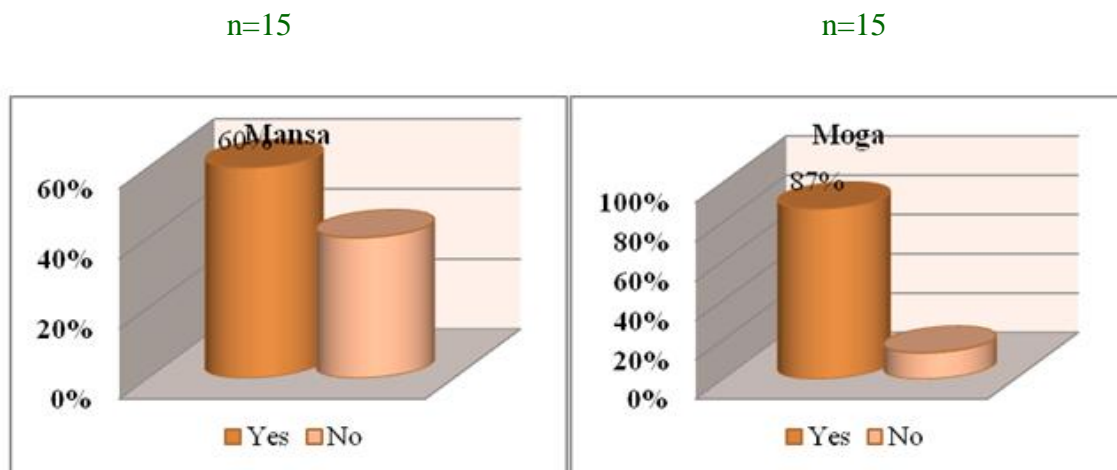
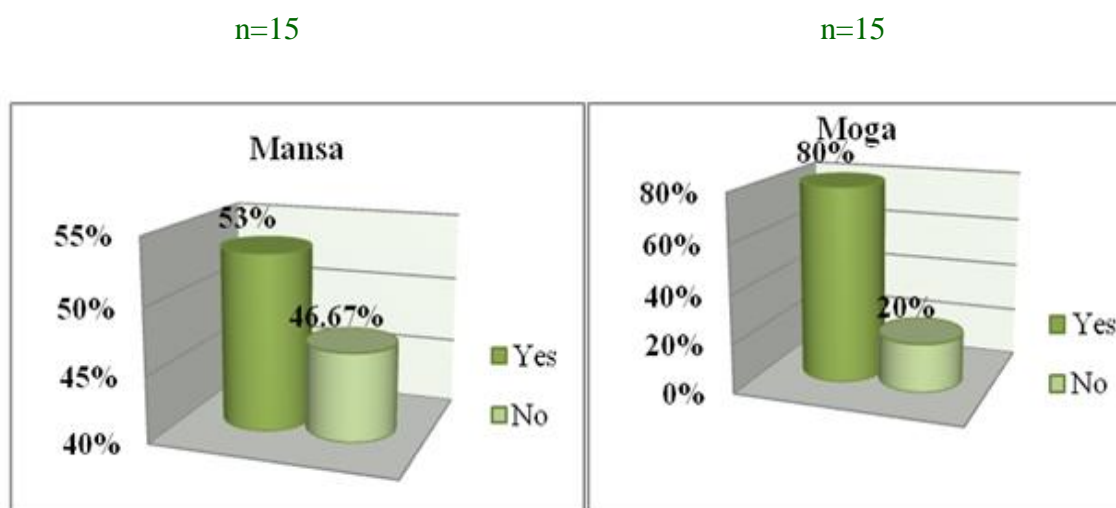


Fig.13 Farmers facing problems in mulch usage at Mansa and Moga



At Moga, more percentage of farmers was cultivating on their own land

In Mansa, majority farmers worked as medium farmers whereas in Moga more percentage of farmers worked in both large and medium category.

In Mansa and Moga both, same trend was seen and major cultivation was done on grains and vegetables respectively.

Similar type of seasonal vegetables were grown at both places by the farmers but in Moga, more

percentage of farmer were grown all seasonal vegetables.

At both places, the farmers had less knowledge about biodegradable textile mulches but in Moga, more percentage of farmers were aware as compared to Mansa. At Moga farmers were more willing to buy and use the biodegradable mulches made out of textile waste.

In Mansa, majority farmers grew potato, onion, garlic and chilli and also tomato cucumber etc. but in Moga, majority of farmers grew all seasonal

vegetables in good amounts using mulch methods. In Mansa, farmers were motivated for usage of mulch in cultivation by their colleagues and PAU, KVKs and other institutes. Whereas, at Moga, farmers gave credit to their colleagues.

Majority of farmers both at Mansa and Moga started using mulch in their cultivation recently (less than 5 years) and majority of them did not get any subsidy by the government. Those who ever got subsidy were granted only 50 percent of the amount and this subsidy had not been given to the farmers for the last 2.5-5 years.

In Mansa, majority of the farmers used paddy straw mulch whereas in Moga, farmers used both paddy straw and plastic mulches in their fields.

Differences was observed as far as increase in crop yield using mulch data was concerned as majority farmers at Mans were of the view that yield increased between 10 to 20 percent. Whereas in Moga, majority of farmers observed that yield increased between 20 to 30 and 50-60 percent.

As higher amount of paddy straw mulch was being used in both districts so, that the farmers hired labour.

In Moga, farmers faced more problems as compared to Mansa where less percentage of farmers complained about the issues faced during the mulch usage.

The farmers at Mansa and Moga through belonged to the same central plain zone but many differences were observed as far as their mulching practices were concerned. The most probable reason for these

differences might be the belief of Moga farmers for mixed cropping system as a result of which they grew all type of vegetables using mulches but in Mansa district, farmers preferred seasonal vegetables and roots tuber and green leafy vegetables at equal percentage. Moga districts farmers used paddy straw and plastic mulches on all seasonal vegetables but in Mansa, farmers used plastic mulches on specific vegetables like potato, garlic, onion etc. As farmers were not getting any subsidies on mulch usage, government should take necessary steps for providing subsidy for biodegradable mulches so that farmers are motivated to use them in their field to benefit both themselves and the environment. Moreover, the study concludes that majority of the farmers at both places were not aware about biodegradable mulches prepared from textile waste hence, there is a need to popularize such mulches as these can be easily made on a commercial level.

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