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Research Article



Reasons for decreasing cultivated area of mash crop

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Abstract

The study was conducted at Adaptive Research Farm, Gujranwala during kharif 2010-2011 to evaluate the reasons for decreasing area under mash. Each year 67 farmers were selected randomly from Narowal and Sialkot districts. The selected respondents were interviewed thoroughly according to a well designed pretested questionnaire. Cost of production and income of mash along with other kharif crops like rice, bajra (grain) and sorghum (fodder) were calculated. Maximum net income was recorded from bajra (grain) Rs. 32500ha⁻¹ followed by rice (Rs.35000ha⁻¹) and sorghum fodder (Rs.32500ha⁻¹). However minimum net income was recorded by mash crop I.e. Rs. 15000ha⁻¹ which was significantly less than other crops. At the end it was concluded that mash crop did not compete with other kharif crops grown in the area. That's why area under mash crop was decreasing day by day.

Keywords: Mash; Benefits; economic; Return, District, Narowal, Sialkot

Introduction

Pulses are cultivated in all parts of the world, and they occupy an important place in human diet as a substitute of meat protein (Chaudhry *et. al.*, 2013). They are cultivated on 5% of the total cropped area in Pakistan (PARC, 2011). Due to day neutral behavior and short growing period, they can be grown successfully, both in spring and autumn seasons. They can be grown successfully on most of the soils except salt affected and water logged soils (Anonymus, 2003). Pulses improve soil fertility by converting and fixing atmospheric nitrogen available in air through symbiosis with rhizobial strains. Research showed that nodulated mash bean has a potential to fix 30-60kgha⁻¹ of nitrogen from atmosphere depending upon the soil and environmental conditions (Firth *et al.*, 1973). Mash bean check soil erosion used as a cover crop and

sometimes, it can be used as a green manuring and fodder crop (Malik, 1994). Due to low water requirement pulses are generally cultivated on dry lands in sub-mountainous districts of the Punjab. In agro-ecological zone of Gujranwala pulses are grown in rain fed areas of Sialkot and Narowal districts. In these two districts among kharif pulses only mash (*Vigna Mungo*) crop is grown. Mash bean (black gram) is an important pulse crop of Pakistan and ranks second after chick pea. It is most popular pulse because of its delicious taste and good nutritional value. Its seed contains mineral elements like phosphorous, Iron, vitamins A and B in addition to protein contents of 22-25% (Malik *et.al.*, 1994). During the last 18 years, the area under mash crop has decreased in Pakistan as well as in Punjab by 55% and

63% respectively (Anonymous,2009). But due to the increase in population of Pakistan, the demand has been increased, eventually; the prices of mash have also been increased tremendously. Area under pulses in Pakistan declined from 1.56 million hectares in 1995-96 to 1.33 million hectares during 2010-11 (Anonymous, 2012 b), exhibiting a shrinkage by 17 %. Similarly, production of pulses in Pakistan has fallen down from 0.92 million tons to 0.66 million tons during the corresponding period, showing contraction by 29 %. However, production of pulses is declining in the face of rapid growth in population. Eventually, import of pulses from Pakistan is also on surge. Alone in recent two years, import of pulses in Pakistan has risen from US\$ 230 million in 2009-10 to US\$ 420 million in 2011-12 (Anonymous, 2013). Hence, there is a dire need for a study to identify reasons of decline. Current literature hardly answers this question. In order to bridge up the gap in literature, a study was conducted in Gujranwala Division. Specific objectives of the study are to identify factor causing decrease in the area of pulses in general and mash in particular.

Materials and Methods

The study was conducted at Adaptive Research Farm, Gujranwala during kharif 2010-2011. A questionnaire was developed to collect the required data from sampled respondents. It contained questions related to farmers, crops sown during kharif season along with their production technology adopted, yield and price of produce etc. Moreover reasons for decreasing cultivated area under pulses were also included in the

questionnaire. In Gujranwala Division, Kharif pulses are generally grown in the rainfed areas of Sialkot and Narowal districts. Five tehsils of these two districts including Sialkot, Narowal, Pasrur, Zafarwal and Shakargarh were selected where kharif pulses were grown to some extent. A sample of 67 farmers was selected each year during 2010 and 2011 using simple random sampling technique. The data was collected through personal interview method by using structured high profile questionnaire.

Secondary data on area and production of pulses have been taken from Agricultural Statistics of Pakistan 2010-11, while data on population has been taken from Pakistan Economic Survey 2006-07 and 2010-11. The data was processed and analyzed by using SPSS v. 19.

Results and Discussion

Size of land holding

All the categories of farmers i.e. small, medium and large were covered during the survey as shown in the figure-1. Forty six farmers (34%) were selected from the category of small farmers (having land holding less than five acres). Medium farmers (land holding 5-24 acres) were 49% while, only 17% were selected from the category of large farmers (land holding 25 acres and above). Minimum farmers were selected from the category of large farmers because farmers of this region mostly do not belong to this category while majority of farmers are small and medium.

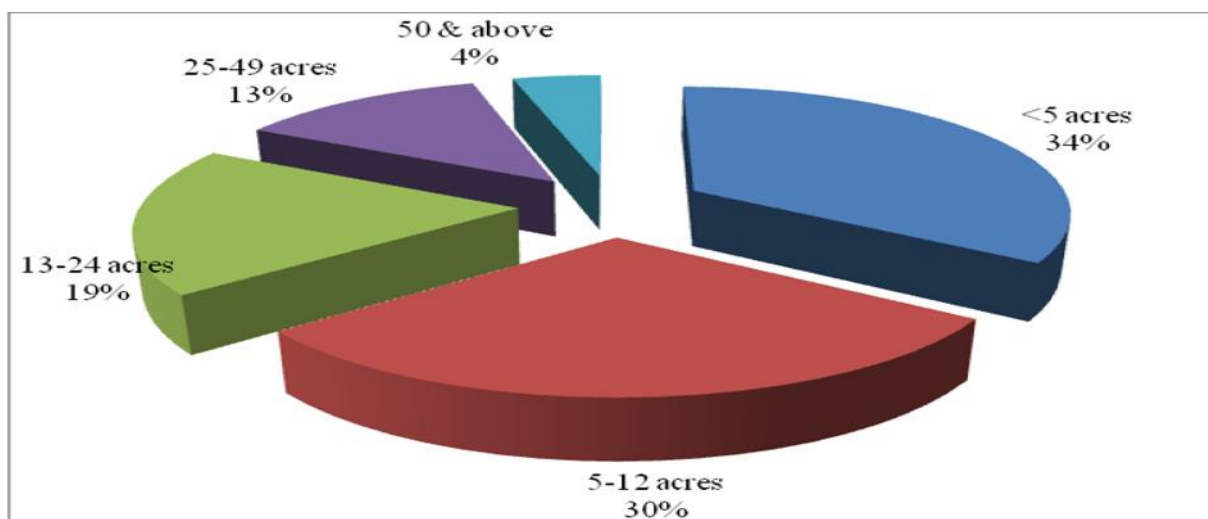


Figure 1 Landholdings of the farmers covered by the survey

Trend in area and production of pulses

Area under pulses cultivation in Pakistan based on Agricultural Statistics of Pakistan, 2010-11 is

declining as shown in figure declining (Fig 3) and per capita production of pulses is also exhibiting similar trend ().

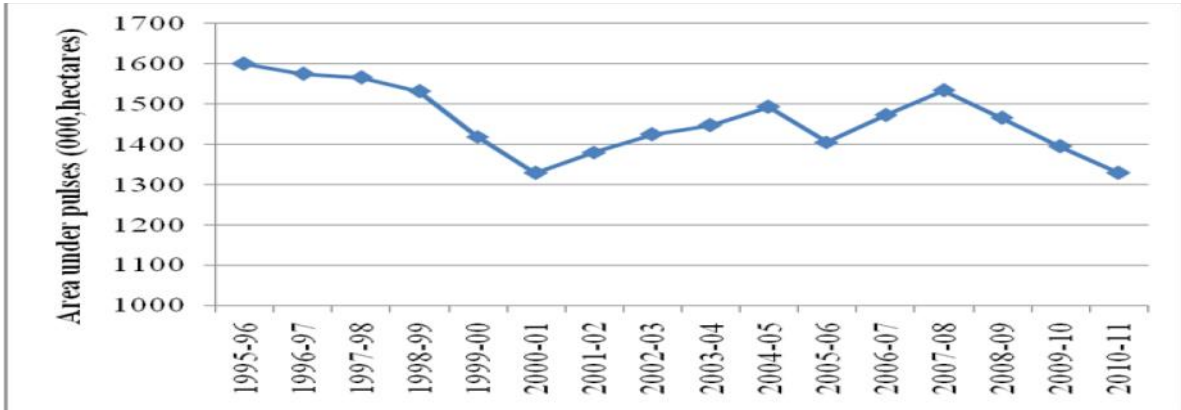


Figure 2 Trend in area under pulses

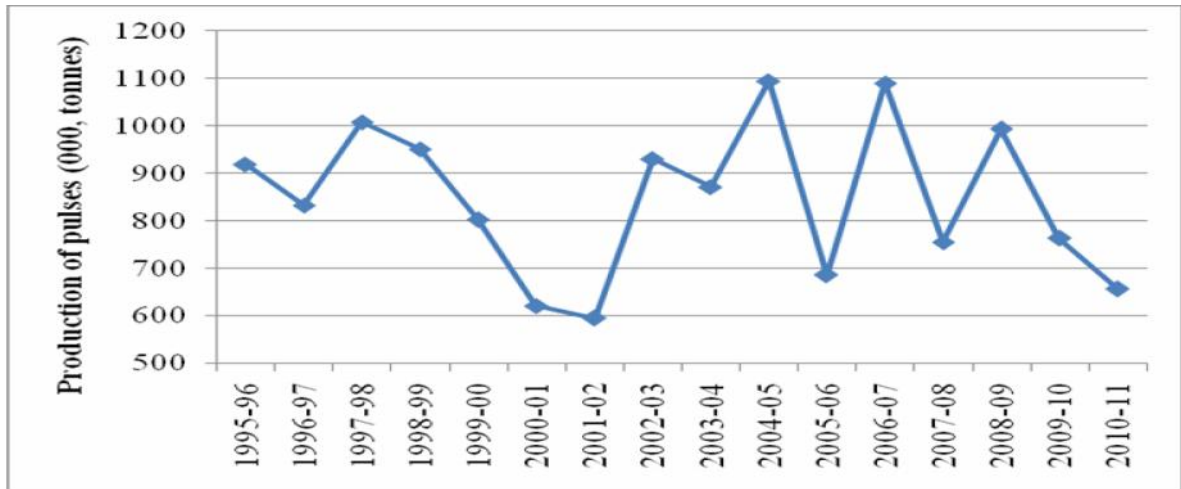


Figure 3 Trend in production of pulses

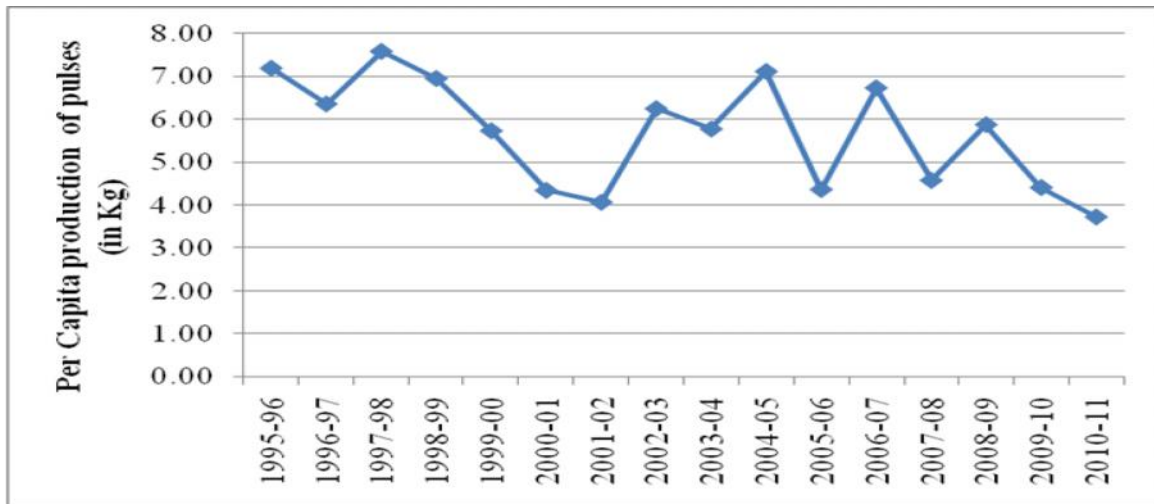


Figure 4 per capita production of pulses

Reasons of decline in the area under pulses

Area under mash crop was decreased therefore; an attempt was made to find out the reason of this reduction on the basis of farmer’s interview. It was found that among the different reasons, the main reason was low yield of mash crop which was reported by maximum (85%) farmers. Another, main reason pointed out by 56 % farmers was high level of weed

infestation in mash crop. This problem of weed infestation is more serious as weed control in this crop is very difficult to manage. Grover *et al.* (2005) also reported that weed infestation cause reduction in the yield in pulses. Along with these reasons some other reasons are also affecting mash crop in surveyed areas as shown in table 1.

Table 1 Reason of decreasing area under cultivation of pulses (n= 134)

	Reason	frequency	%age
1	Un-favorable climate	25	26.1
2	Non-availability of certified seed	27	20.1
3	Weed Infestation	75	56
4	Non-availability of weedicides	13	9.7
5	Excessive vegetative growth	12	9
6	High incidence of pests and diseases	32	23.9
7	Non-availability of proper machinery for harvesting and threshing	17	12.7
8	Shortage of labor for picking	12	9
9	Non-availability of proper extension services	6	4.5
10	Low yield	115	85.8
11	High fluctuation in prices	15	11.2
12	Marketing problems	13	9.7
13	Low income	23	17.2

From Table 2 the result revealed that ninety one percent (91%) medium farmers were in the view that low yield of mash crop was recorded due to less cultivated area followed by large farmers (87%) and small farmers (78%). Results regarding decrease in yield were in the agreement with Grover and Singh

(2012). Moreover, 70% large farmers reported weed infestation as major problem in growing of mash crop followed by 62% medium farmers and 41% small farmers.

Table 2 Reasons of decreasing area under cultivation of pulses by landholding (n= 134) in %ages

	Reason	Small (n=46)	Medium (n=65)	Large (n=23)
1	Unfavourable climate	26.09	27.69	21.74
2	Non-availability of certified seed	13.04	23.08	26.09
3	weed infestation	41.30	61.54	69.57
4	Non-availability of weedicides	15.22	6.15	8.70
5	Excessive vegetative growth	4.35	13.85	4.35
6	High incidence of pests and diseases	15.22	23.08	43.48
7	Non-availability of proper machinery for harvesting and threshing	6.52	13.85	21.74
8	Shortage of labour for picking	0.00	12.31	17.39
9	Non-availability of proper extension services	0.00	3.08	17.39
10	Low yield	78.26	90.77	86.96
11	High fluctuation in prices	8.70	13.85	8.70
12	Marketing problems	6.52	7.69	21.74
13	Low income	10.87	21.54	17.39

Economic analysis

Net income of four major Kharif crops grown in Sialkot and Narowal districts i.e. rice, mash, bajra (grain) and sorghum (fodder) was worked out as shown in fig 5. Maximum net income per hectare was recorded from bajra (grain) i.e. Rs.37500 ha⁻¹ followed by rice and sorghum which gave Rs.35000ha⁻¹ and Rs. 32500 ha⁻¹ respectively. However, minimum net income Rs.15000 ha⁻¹ was obtained from mash crop that was significantly less than other crops. That's why mash crop did not compete with other kharif crops grown in the area with

reference to net income. Therefore, most of the farmers prefer to grow rice in irrigated areas while in some rain fed areas bajra (grain) and sorghum (fodder) were cultivated. In general, pulses were the crops of barren and uneven rain fed areas where other crops cannot be grown successfully. In past surveyed area was in the category of rain fed but now due to the availability of underground water and advancement in tube well technique most of the area has now been changed from rain fed to irrigated. Therefore, farmers have shifted from pulses to other cash crops, ultimately area under mash crop has been reduced.

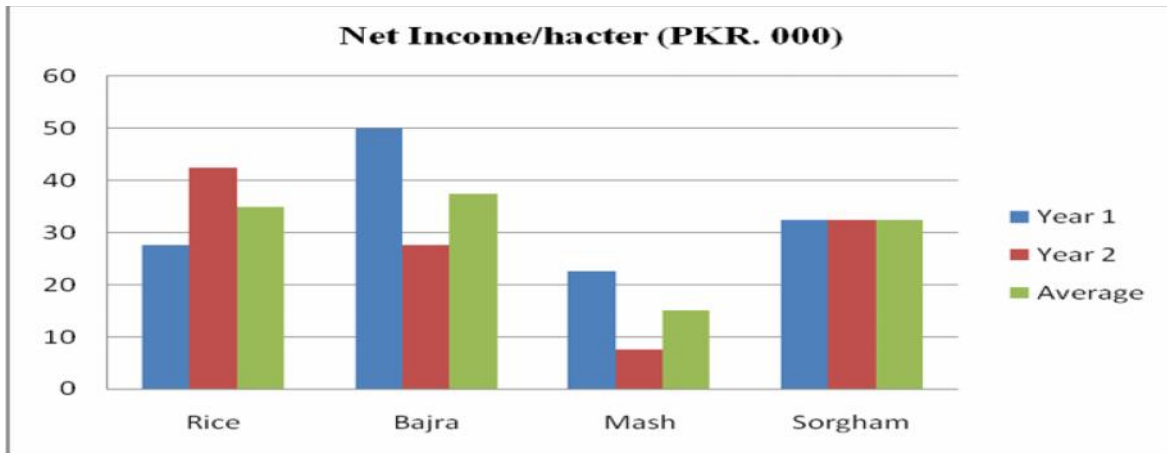


Figure 5 : Crop-wise Net Income by Year

Benefit cost ratio of four kharif crops i.e. rice, bajra, sorghum and mash cultivated in Sialkot and Narowal districts was calculated as shown in fig 6. It is evident that bajra gave maximum benefit cost ratio i.e. 5.57:1 followed by sorghum which gave CBR 2.94:1. The minimum benefit cost ratio was given by rice i.e.

1.57:1 because maximum expenditure was involved in the growing of rice crop while the benefit cost ratio of mash was 2.18:1 which was greater than rice crop. This was due to the fact that least expenditure was involved for the cultivation of mash crop.

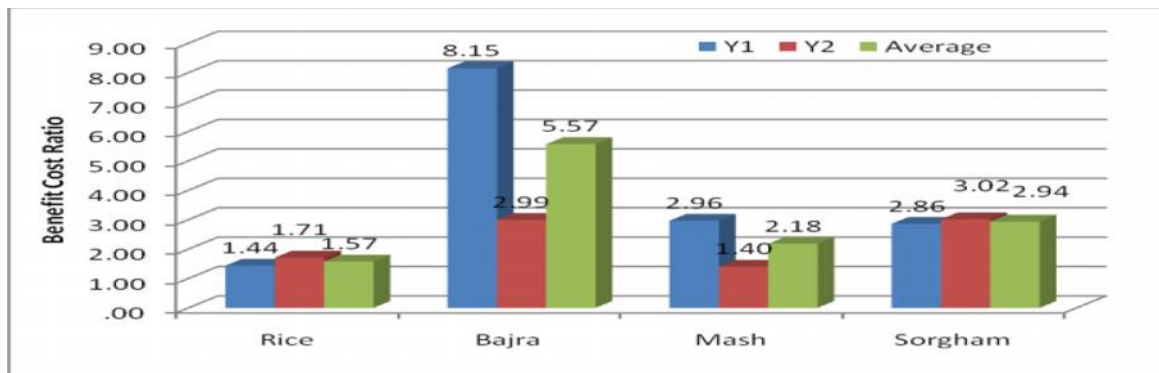


Figure 6 Crop-wise BCR by Year

Conclusion

Area and production of pulses (mash) is declining, while consumption of pulses in Pakistan is increasing day by day. Eventually, import is rising at a phenomenal rate resulting increased pressure on the foreign exchange reserves. The present study finds that a prime reason of decline in production in Pakistan is low profitability, which is attributed by low yield. Low yield is in turn linked with non-availability of good quality seed (with high potential of yield), colossal damage by the weeds, pests and diseases.

There are three options for dealing with this predicament:

- 1) Importing seed of high yielding varieties.
- 2) Investing substantial resources and efforts on the research and development of pulses production.
- 3) Fixing high procurement price for pulses.

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