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## Original Research Article

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## Estimation to changing trend of growing rice varieties in agro-climatic zone of Gujranwala

**Falak Sher<sup>\*1</sup>, Muhammad Tahir Latif<sup>1</sup>, Mazher Farid Iqbal<sup>2</sup>,  
Muzammil Hussain<sup>1</sup>, Masood Qadir Waqar<sup>3</sup>and Muhammad Anjum Ali<sup>4</sup>**

Adaptive Research Farm, Gujranwala<sup>1</sup>

Adaptive Research Station, Sialkot<sup>2</sup>

Directorate of Agriculture (Adaptive Research) Punjab-Lahore<sup>3</sup>

Directorate General of Agriculture (Extension and Adaptive Research) Punjab Lahore<sup>4</sup>

\*Corresponding author: [ssmsagronomygrw4@gmail.com](mailto:ssmsagronomygrw4@gmail.com)

### **Abstract**

A field survey was conducted to estimate the changing trend of growing rice varieties overtime in agro-climatic zone of Gujranwala, Pakistan during kharif 2015. About 75 respondents from each district among six districts was interviewed by convenience sampling methods keeping in view the time and cost constraints. Overall total rice area was decreased by 6.4% in kharif-2015 than previous year. The area of super basmati, Pakistan selection (PS-2) and basmati-515 was decreased by 15%, 4% and 30% respectively while area of PK-386, supri and super fine was respectively increased by 4%, 31% and 14%. The uncertain market economic conditions, diseases and lodging factors recorded as determinants for changing trend of growing rice varieties overtime in the zone. The Government of Pakistan should extend export process to supply the bulk amount available in the country so that the prevailing price may be increased in the benefit of farming community.

**Keywords:** Change, Rice, Trend, Kharif, Variety, Gujranwala, Punjab-Pakistan.

### **Introduction**

Rice is the second largest staple food crop and an exportable item of Pakistan. It accounts for 3.2 % in the value added in agriculture and 0.7 % in GDP. During July-March 2014-15, rice export earned

foreign exchange of \$ 1.53 billion. During 2014-15, rice was sown on an area of 2891 thousand hectares showing an increase of 3.6 % over last year's area of 2789 thousand hectares (Table 1).

**Table 1: Over time percent change in rice area of Pakistan**

Year	Area	
	000 hectares	%change
2010-11	2365	-
2011-12	2571	8.7
2012-13	2309	-10.2
2013-14	2789	20.8
2014-15 (P)	2891	3.6

Source: Pakistan Bureau of Statistics

P: Provisional (July-March)

The production increased due to increase in area while yield remained impressive due to flood, excessive rains splashes, attack of leaf roller and bacterial leaf blight in some cultivated areas (Anonymous, 2015). Due to prevailing agro-climatic and soil conditions the Punjab is producing 100 % of Basmati rice in the country (Pakistan). Important rice producing districts in Punjab are Gujranwala, Sheikhupura, Sialkot, Okara, Hafizabad, Mandi Bahauddin Din and Jhang accounting for more than 70 percent of Basmati rice production in the country (Abedullah *et al.*, 2007). The wheat-rice rotation is one of the world's largest agricultural production system and occupies 14 million hectares of cultivated land in India, Pakistan, Bangladesh and Nepal (Zia *et al.*, 2000). As with most agricultural commodity markets, the rice market also suffers from the cobweb phenomenon where price fluctuations are caused by the time lag between making the decision to cultivate the crop and the ultimate selling of the crop.

Basmati rice being famous for its grain length, softness, aroma and high cooking and eating quality is a leading foreign exchange earner of Pakistan which accounted for more than two-thirds of the world's basmati production (Siddiq *et al.*, 2012). But Pakistan's competitive edge in basmati world market has been eroded in recent years because of productivity and quality constraints. The decline came after India lifted a ban on its rice exports in 2012 and sold the commodity at lower price than Pakistan: about \$ 100 cheaper per ton against Pakistan's basmati (\$1100 - \$ 1150 per ton) due to its higher yield of non aromatic varieties (Anonymous, 2013). The major blockage in Pakistan's basmati value chain is at the upstream segment, or farm production. Higher production costs and declining yield of current basmati varieties make its cultivation a less profitable practice for Punjab rice farmers, resulting some farmers shifting to other varieties for better yield. Compared to Indian farmers who have access to several high yielding varieties, Pakistani farmers have access to and cultivate mainly one variety, the super basmati which was introduced in 1996 and is grown in 70 percent of the total basmati (fine varieties) area in Punjab. Basmati 515 was introduced in 2011, but its adoption has been slow as farmers have limited access to certified seeds and proper training for its production technology. Both super basmati and basmati 515 are neither resistant to bacterial leaf blight (BLB) nor tolerant of extended dry spells, which occur increasingly in basmati growing areas (Anonymous, 2013).

To decrease the risk faced by farmers from fluctuating prices, the government should set support prices for various varieties of rice (Ahmed *et al.*, 2000). Therefore due to the importance of rice crop in the economy of Pakistan and agro-climatic change overtime, a quick survey to estimate the changing trends of growing rice varieties was need of the hour. The study was conducted to help the policy makers to make a suitable national policy in the benefit of farming community of country.

## Need of the study

Output price is the main indicator for promotion of crop production and area. Unfortunately in previous year (2014) the decrease in international price of rice, the exports was not carried out in international market and huge supply accumulated in the country which decreased the output price suddenly. Keeping in view this scenario a survey was conducted in the core area of rice to estimate the farmers' response and changing trends of rice varieties so that the causing factors may be investigated to suggest some policy measure.

## Materials and Methods

The field survey was conducted by the scientists of Adaptive Research, Gujranwala with the collaboration of Agricultural Extension staff of every Tehsil in this Division to estimate the changing area wise trends of different rice varieties. The data was collected from Gujranwala, Sialkot, Narowal, M.B.Din, Gujrat and Hafizabad during Kharif 2015. Seventy five respondents from each district (thus a 450 total sample respondents) was interviewed by convenience sampling method keeping in view the time and cost constraints. The method of sampling survey was in accordance with Sher, et., al., (2015). A well designed and pre-tested questionnaire was used to collect information from the selected respondents. Descriptive statistics was employed for data analysis and projection of results.

## Results and Discussion

The two years area wise comparison was provided to assess the overall trend of different rice varieties in every district of Gujranwala zone. The maximum area of super basmati and PK-386 rice varieties was found in Gujranwala with 30 % and 45 % share respectively. Similarly Pakistan Selection (PS-2), superi and super fine varieties were abundantly grown in Hafizabad. However basmati 515 variety was mostly found in Sialkot with 25 % share in area (Table 2).

**Table 2: Area-wise comparison of different rice varieties during 2014 and 2015 (Mean values)**

District/Variety wise area (acres)	Year	Sialkot	Gujrat	Gujranwala	Hafizabad	Narowal	M.B.Din	Overall
<b>Total Farm area</b>	2014	11	14.8	37.1	36.7	15.2	16.6	<b>21.90</b>
	2015	11	15.1	36.8	35.3	14.6	18.0	<b>21.80</b>
<b>Total owned area</b>	2014	9	12.6	24.8	12.4	15.0	10.6	<b>14.07</b>
	2015	7	12.8	24.9	12.4	15.0	9.1	<b>13.53</b>
<b>Rent per acre (Rs.)</b>	2014	36250	18857	47500	45600	27167	34500	<b>34979</b>
	2015	31205	17714	39000	38583	23154	33750	<b>30568</b>
<b>Total rice area</b>	2014	10.4	11.9	35.5	31.7	13.3	10.7	<b>18.92</b>
	2015	10.4	10.0	34.8	29.2	12.4	9.4	<b>17.70</b>
<b>Basmati Super</b>	2014	3.4	9.6	15.3	6.8	8.2	8.7	<b>8.67</b>
	2015	3.3	8.1	13.2	5.7	6.3	7.8	<b>7.40</b>
<b>Pakistan selection (PS-2)</b>	2014	2.2	0.2	5.9	12.0	1.8	0.0	<b>3.68</b>
	2015	1.2	0.2	6.7	11.5	1.5	0.0	<b>3.52</b>
<b>Basmati 515</b>	2014	0.9	0.4	0.4	1.2	0.7	0.0	<b>0.60</b>
	2015	0.6	0.3	0.5	0.3	0.6	0.2	<b>0.42</b>
<b>PK-386</b>	2014	3.9	1.6	13.6	7.5	1.5	1.9	<b>5.00</b>
	2015	5.3	1.4	14.1	6.5	2.5	1.4	<b>5.20</b>
<b>Supri</b>	2014	0	0.0	0.0	4.0	0.1	0.1	<b>0.70</b>
	2015	0	0.0	0.1	4.9	0.5	0.0	<b>0.92</b>
<b>Super fine</b>	2014	0	0.0	0.2	0.2	0.0	0.0	<b>0.07</b>
	2015	0	0.0	0.2	0.3	0.0	0.0	<b>0.08</b>

Source: Field survey

Overall rice area was decreased by 6.4 % in kharif-2015 than previous year. Similarly, the area of super basmati, Pakistan selection (PS-2) and basmati-515 was decreased by 14.6%, 4.3% and 30% respectively.

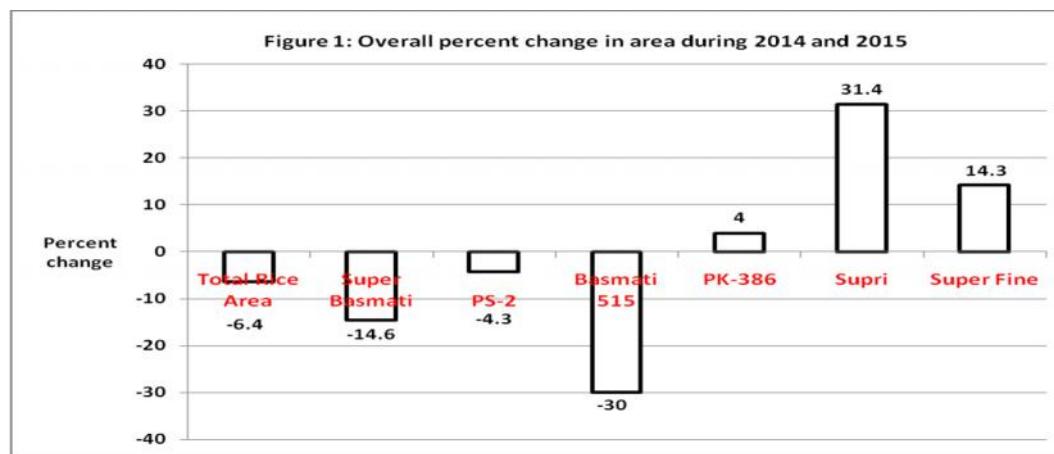
However the area of PK-386, supri and super fine was increased by 4%, 31.4% and 14.3% respectively (Table 3).

**Table 3: Comparison of percent change in area during 2014 and 2015**

District/Variety wise area in acres	Sialkot	Gujrat	Gujranwala	Hafizabad	Narowal	M.B.Din	Overall
<b>Total Farm Area</b>	0	2.0	-0.8	-3.8	-3.9	8.4	<b>-0.5</b>
<b>Total Owned Area</b>	-22.2	1.6	0.4	0.0	0.0	-14.2	<b>-3.8</b>
<b>Rent Per Acre (Rs.)</b>	-13.9	-6.1	-17.9	-15.4	-14.8	-2.2	<b>-12.6</b>
<b>Total Rice Area</b>	0	-16.0	-2.0	-7.9	-6.8	-12.1	<b>-6.4</b>
<b>Basmati Super</b>	-2.9	-15.6	-13.7	-16.2	-23.2	-10.3	<b>-14.6</b>
<b>Pakistan selection (PS-2)</b>	-45.5	0.0	13.6	-4.2	-16.7	0.0	<b>-4.3</b>
<b>Basmati 515</b>	-33	-25	25	-75	-6	0	<b>-30</b>
<b>PK-386</b>	35.9	-12.5	3.7	-13.3	66.7	-26.3	<b>4.0</b>
<b>Supri</b>	0	0	0	22.5	400	-100	<b>31.4</b>
<b>Super Fine</b>	0	0	0	50	0	0	<b>14.3</b>

Source: Field survey

The comparison among all the varieties for percent change in area is also being depicted in Figure 1.



In the light of survey the reasons for less cultivation of rice varieties particularly Basmati 515 and Pakistan selection (PS-2) are given below:

- i. The plant height of Basmati 515 and Pakistan Selection (PS-2) was recorded maximum with low tillering capacity which caused lodging resulting in low yield. If the plant population was increased upto eighty thousand then Basmati 515 gave better results however maximum yield of Basmati 515 depends upon proper time of transplantation (Iqbal et. al., 2015).
- ii. Due to late maturity and harvesting of fine varieties, the sowing of next crops (wheat and berseem) may be delayed.
- iii. In uncertain market condition of rice; farmers relied to shift on coarse varieties.
- iv. Total cultivated area of PS-2 in Gujrat was effected due to non availability of seed.
- v. The Farmers told that PS-2 had low output price compared to basmati super, however they replaced it with basmati super and PK 386.
- vi. PS-2 was susceptible to foot rot compared to all other varieties which lead to less adoption. Similarly severe infection of Bacterial Leaf Blight was recorded on PS-2 rice variety compared to Basmati 515 in some areas of Hafizabad during Kharif 2014. However the trend was changed to cultivate maximum area of PK 386, supri, super fine and fodder crops in Kharif 2015.

## Conclusion

At the end it was concluded that Government of Pakistan should facilitate the exports process to supply the bulk amount available in the country. Scientists should also be introduced disease resistant and high yielding varieties of rice to ensure maximum acreage and ultimately got maximum yield.

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