WHY RICE IS SO IMPORTANT?

- Rice is the 2nd important cash crop after cotton covering 11% of total cropped area.
- Rice is a major export commodity after cotton that earned US$ 2.2 billion foreign exchange during 2011- 12.
- Basmati is premium rice that fetches about US$ 1150 per ton as compared to US$ 550 per ton of coarse rice from the international market.
- The share of Pakistan in total world rice trade is around 11% by value and 8.9% by quantity.

HISTORY OF RICE RESEARCH

Work on varietal improvement in rice started in 1926 with the establishment of **Rice Farm** at Kala Shah Kaku in the famous rice bowl called "Kalar tract" of the Punjab. Rice Farm was elevated to the level of **Rice Research Station** in 1965 and later upgraded to the status of full-fledged **Rice Research Institute** during 1970 with eight research disciplines i.e., Plant Breeding, Agronomy, Soil Chemistry, Entomology, Plant Pathology, Agricultural Engineering, Rice Technology and Economics & Statistics.

The Institute is 17 kilometers to the north of Lahore on G.T. Road at 31°43.1654'N, 74°16.1162'E and 210m a.s.l.

OBJECTIVES

- To develop high yielding, early maturing and short stature rice varieties having better grain quality and resistance to insect pests and diseases alongwith their suitable production technology.
- To evaluate the genetic stock/ new lines for grain quality characteristics and high contents of iron, zinc and pro-vitamin A.
- To develop genetic resources.
- To produce pre-basic and basic seed of different approved rice varieties.

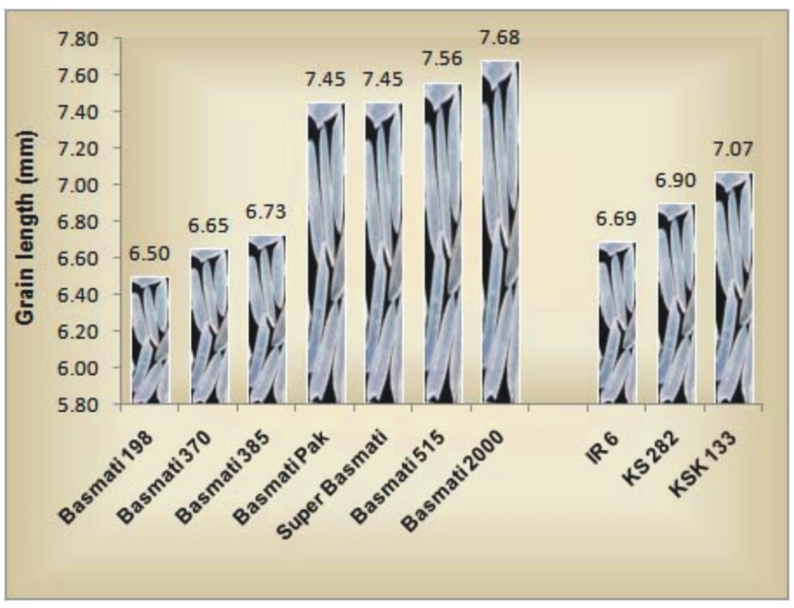
VARIETIES DEVELOPED AND RELEASED

Sr.#	Variety	Year of release	Type
1	Basmati 370	1933	Basmati
2	Jhona 349*	1933	Non Basmati
3	Mushkan 41**	1933	Non Basmati (Aromatic)
4	Mushkan 7**	1933	
5	Sathra 278**	1934	Non Basmati
6	Mahlar 346*	1939	Non Basmati
7	Pulman Sufaid**	1939	Non Basmati
8	Basmati C622**	1964	Basmati
9	Basmati Pak	1968	Basmati
10	IRRI Pak (IR8)*	1969	Non Basmati
11	IR 6	1971	Non Basmati
12	Basmati 198	1972	Basmati
13	PK 177**	1977	Basmati
14	KS 282	1982	Non Basmati
15	Basmati 385	1985	Basmati
16	Super Basmati	1996	Basmati
17	Basmati 2000	2000	Basmati
18	KSK 133	2006	Non Basmati
19	Basmati 515	2011	Basmati

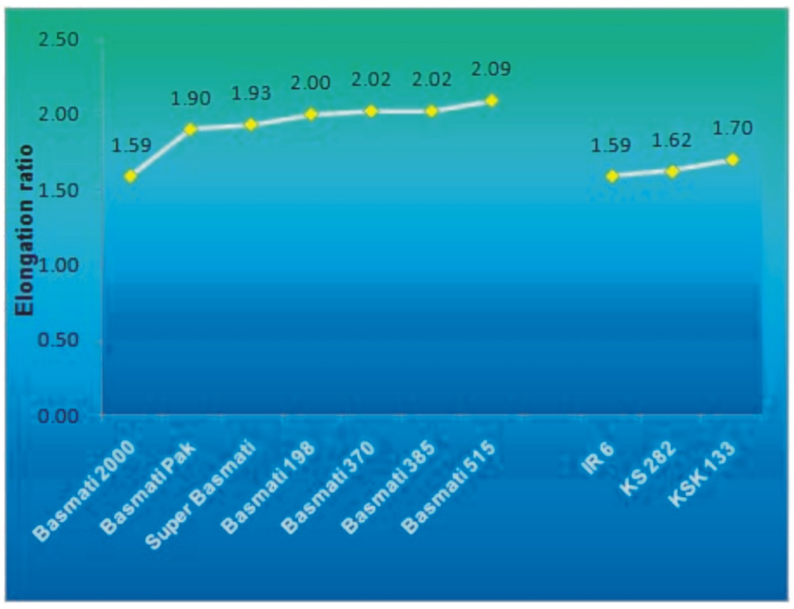
* Out dated ** Banned

GRAIN QUALITY IMPROVEMENT

Average grain length in case of Basmati 2000 has been increased upto 7.68mm as compared to 6.50mm (Basmati 198). Similarly, grain length in coarse varieties has been improved to 7.07 in KSK 133.



This all improved the cooking quality as well.



INTEGRATED PEST & DISEASE MANAGEMENT

Different integrated management techniques were devised against different notorious pest insects to keep their population below economic injury level. Similarly to check the infection of rice diseases, different integrated disease management strategies were developed.

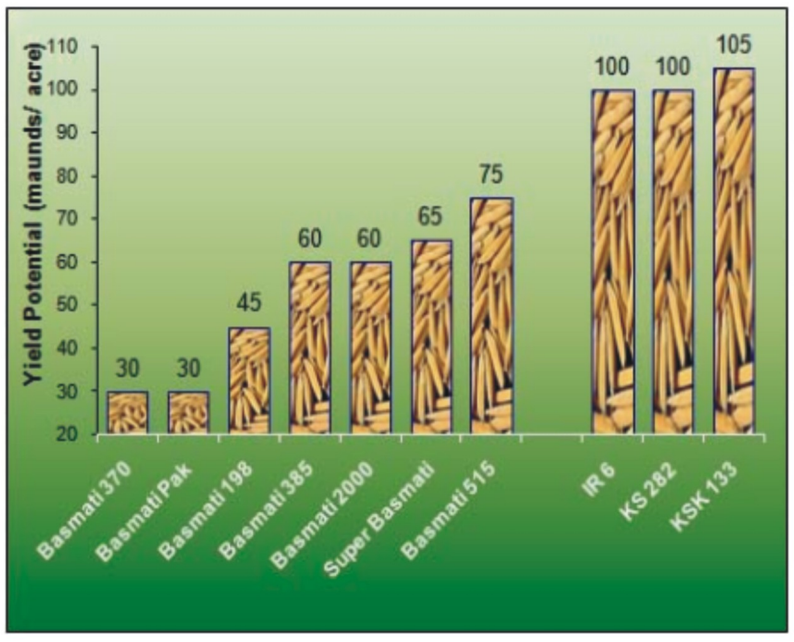
NUTRIENT MANAGEMENT

Use of nitrogen (split application as a basal, 30- 35 DAS and 45- 50 DAS), potash, phosphorous, zinc sulphate and boron increase the crop profitability.

SALIENT RESEARCH OUTCOMES

Better yield potential

Basmati varieties released before 80's viz., Basmati 370 and Basmati Pak had lower yield potential (30 maunds/ acre) but now this has increased upto 75 maunds/ acre with the release of Basmati 515. This increase in yield has ultimately uplifted the socio economic status of the farming community on one hand and foreign exchange earnings on the other.



Crop maturity

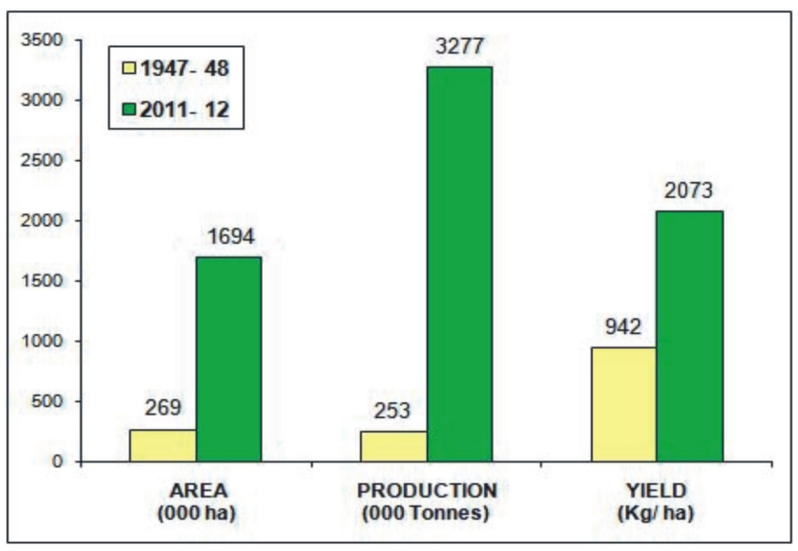
Basmati varieties released prior to 1985 were photoperiod sensitive and late maturing around third week of November resulting in delayed sowing of wheat and hence decrease wheat yield. Release of Basmati 385, Super Basmati and Basmati 2000 (early maturing varieties i.e., first week of November) accommodates timely sowing of wheat resulting better yield around 100 Kg/ acre that has uplifted the economic status the farmers. The overall impact of such development has been the essence cause of attaining the self sufficiency.

SALIENT PROJECTS (COMPLETED AND IN PROCESS)

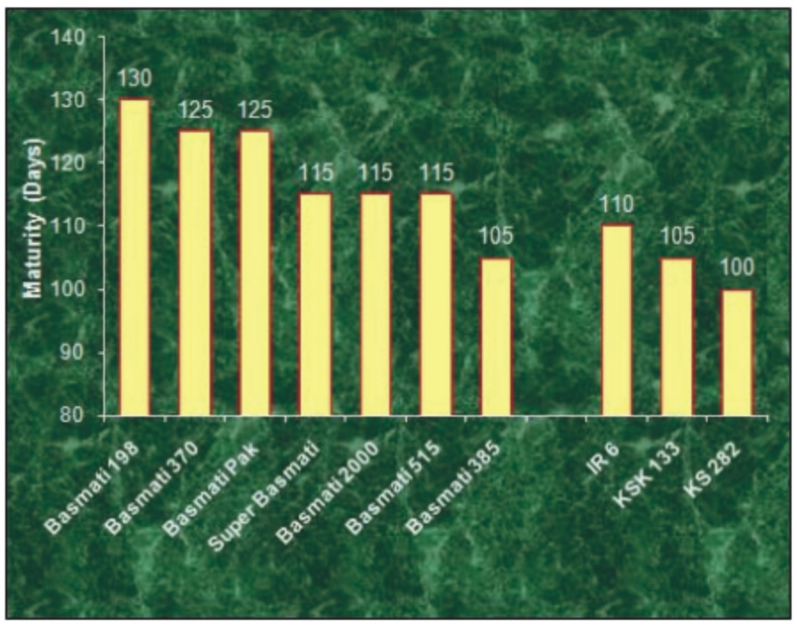
- **Development of Resistant Basmati Varieties against Bacterial Leaf Blight (BLB):**
  Introgression of BLB resistant genes (Xa4, Xa5, Xa7, Xa13 and Xa21) in Basmati lines has been done and varietal development is in process.
- **Standardization of Parboiling Technology for Different Varieties:**
  Parboiling techniques have not been standardized yet resulting in inconsistent production of parboiled rice such as colour variation, off- odour and less milling recovery. To address these problems parboiling technology for new lines/ varieties (extra long grain) is being determined for standardization.
- **Production of Rice Bran Oil:**
  Bran is a bye- product of rice milling and is generally used for poultry feed in the country. It contains 15- 20% nutraceutical oil that is excellent for heart patients. Stabilization techniques are being developed to get bran oil for human consumption.
- **Direct Seeding of Rice:**
  This technology in addition to saving 15- 20% irrigation water and labour also enables the farmers to achieve the required plant population of 80,000/ acre. As a result farmers get 20- 25% increase in rice yield.
- **Mechanized Transplanting:**
  Mechanical Transplanting reduces drudgery on one hand and enables timely transplanting of rice nursery on the other, resulting increase in the produce. This method further saves time and farmers can transplant 6- 8 acres/ day.
- **Establishment of Rice Research Station, Bahawalnager:**
  It is engaged to test the genetic material developed by the RRI, KSK best suited for Southern Punjab on one hand and develop technologies for best quality parboiled rice besides imparting training to different stakeholders on the other.

RESEARCH IMPACTS

- It is evident that the area, production and yield increased 530, 1195 and 120 percent, respectively owing to the significant contribution of varieties, technology adoption and production enhancement techniques.
- As a result per capita availability of rice increased many fold (from 04 to 40Kg).

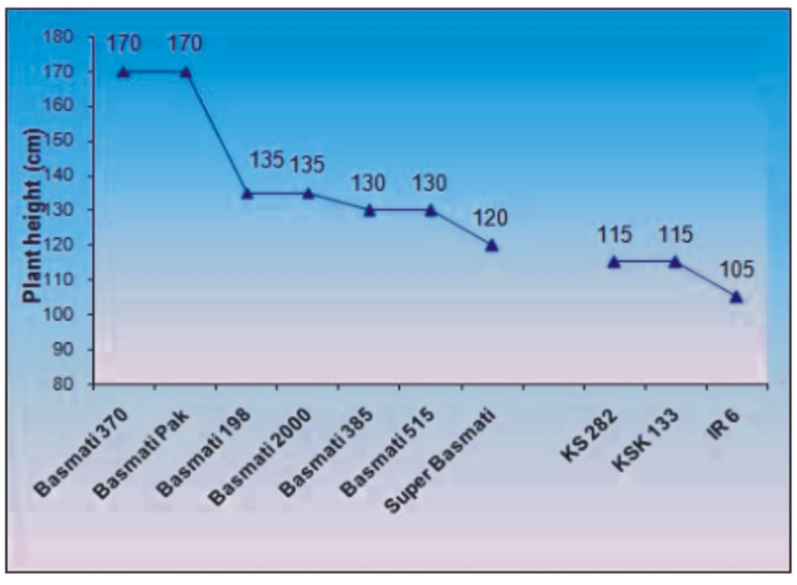


Citation: *Sabir, A. M. and M. Akhter, 2012. Glimpses of Rice Research Institute, Kala Shah Kaku.*



Plant height

Basmati varieties under cultivation upto 1987 were 170cm tall with weak stem, therefore, susceptible to lodging, resulting in low yield. But this height has been decreased to 120cm in case of Super Basmati. Although a newly released variety Basmati 515 is 130cm tall but its thick stiff stem resists lodging.



Conservation of irrigation water

Crop maximization can be achieved by efficient use of irrigation water by decreasing puddling duration from 30- 40 days to 03- 04 days. Similarly after transplanting, by maintaining standing water at the level of 01- 1.5 inches for 21 days despite 30- 40 days at the level of 03 inches conserve the precious irrigation water without affecting the yield.

Glimpses of
Rice Research Institute

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