Crop Survey for Estimation/Assessment of Acreage, Crop Health and Expected Yield of Basmati Rice during Kharif-2023

Volume: V

Submitted To:

Basmati Export Development Foundation

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Contents

1. Executive Summary:

The purpose of this study (Volume-V) is to offer a farmers survey report on basmati rice based on questionnaires. As per the study survey was completed in order to gather a variety of data and provide a range of results. A general overview of field operations, market intelligence, and future planning is provided in the survey questionnaire.

Detailed were collected under the following sub headings: Farmer's personal information, Field information, Cropping Pattern, Planting & harvesting, Seed source and quantity used per acre (variety-wise), Sowing and Harvesting Period, Variety wise production, selling information, Weed controlling method, Manure & fertilizer used, Pests & Disease Management, Plant disease occurred, technical advancement, Total cost of cultivation, yield, price, profit details, Farmer's Suggestions. The survey was done for all 6 states viz. Haryana, Punjab, Uttar Pradesh, Jammu & Kashmir, Himachal Pradesh, Uttarakhand. The farmers were randomly selected from all these basmati growing states.

Alluvial soil is the predominant soil type in the Basmati farming regions. Punjab has primarily dark, sandy, clay-loamy soil. Haryana has sandy to loamy soil. Both clay and loam are found in Uttar Pradesh. Fields used to cultivate basmati are completely irrigated.

Rice/wheat/mustard/potato, rice/vegetables, rice/sugarcane and rice/fodder, rice/potato, rice/wheat/barseem/fodder, rice/mustard/sugarcane, and rice/pulses are the main cropping patterns that are found.

The most widely planted variety is PB-1121/PB-1718, which is followed in order by PB-1509/PB-1692, which is the second most often planted type. Notable varieties include PB1401 (PB1, PB4, PB5, and PB6), Basmati370, and CSR-30. CSR 30 was found majorly in J&K and Haryana. Other traditional varieties are not seen in the study area and probably are not in tradition to grow now the survey revealed.

During the survey in different states, it is found that private organizations are the primary source of seed procurement. On the other hand, some farmers utilise their own seeds, and others obtain seeds from government platforms.

Major rice transplanting is completed in the month of July. The varieties PB-1509 and PB 1692 are early-sown. In July, PB-1121, PB-1718, and PB-1401 CSR-30 had a significant transplant. Early seeded cultivars were harvested by the end of September or the beginning of October. Additionally, late-planted Basmati cultivars were harvested between late October and early November. Due to flood impact, transplanting and harvesting was delayed this year.

Most farmers have employed both hand weeding and herbicides to control weeds. Pretilachlor 50 EC, Pendimethalin 30 EC, Butachlor 50 EC, and Anilofos 30 EC are the most often used herbicides. Herbicides are used wisely by farmers to better manage weeds. In every state under survey, the two main types of fertilizers are urea and DAP. Zinc is also supplied via zinc sulphate.

Production of PB1509 and PB1692 has increased this year. The farmer prefers 1692,1509 varieties because of less time to grow so that they can take more than one crop in a year. A greater spread of PB1847 was also seen in the study area with increased production. Compared to the manual approach, the mechanical harvesting method was used more often. The majority of farmers sell their produce as soon as it is harvested.

The price of Basmati varieties is known to fluctuate suddenly. All of the Basmati varieties' market prices rose this year compared to the previous year. There are more chance than Farmers will grow Basmati varieties in the next year because of their increased price.300-400 INR each Rates of hand harvested and machine harvested basmati may vary.

Satellite data and Field-based Basmati varieties Acreage & Production Details: 2023

Satellite Data and Field-based Basmati Rice and Other Varieties Area Details (Area in '000 ha, Production ('000 tons)										
States	Total Acreage	Total Production	PB 1121, PB 1718, PB 1885		PB 1509, PB 1692, PB 1847		PB 1401, PB 01, PB 06, PB 1882		CSR 30, B370,HBC 19	
			Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production
Punjab	812.39	3843.39	477.39	2163.02	190.63	967.74	144.37	712.62		
Haryana	787.60	3678.54	476.73	2180.09	196.53	955.65	100.68	491.33	13.66	51.46
Uttar Pradesh	461.74	2049.67	207.29	894.23	248.10	1130.78	6.35	24.67		
Jammu Kashmi	46.61	163.90	4.76	17.18					41.85	146.71
Himachal Prad	7.62	30.64			6.37	26.70			1.25	3.94
Uttarakhand	19.40	79.60	12.71	51.76	5.46	23.98			1.23	3.86
Grand Total	2135.36	9845.73	1178.88	5306.29	647.09	3104.85	251.40	1228.62	57.99	205.97

Note: The Basmati Rice Area is being given excluding Sharbati and Sugandha Area

Satellite data and Field-based non-Basmati varieties Acreage & Production Details-2023:

Satellite Data and Field-based Non-Basmati Rice Varieties Area Details (Area in '000 ha, Production ('000 tons)						
States	Total Acreage	Total Production	Sharbati		Sugandha	
			Acreage	Production	Acreage	Production
Haryana	5.35	22.86	5.35	22.86		
Uttar Pradesh	151.64	577.33	128.04	486.19	23.60	91.14
Jammu Kashmir	14.81	60.59	14.81	60.59		
Uttarakhand	11.78	47.33	11.78	47.33		
Grand Total	183.58	708.11	159.98	616.97	23.60	91.14

Note: The figures are for only non-Basmati varieties like Sharbati and Sugandha Area

2. Introduction:

Basmati rice is an important export commodity among the food grains exported from India. In India, Basmati rice is mainly grown for exporting purpose. A huge amount of income generated from export of this aromatic Rice product. India is the largest producer and exporter of basmati rice in the world. It accounts 75% of global Basmati Rice production. Almost 132 countries have been importing Basmati from India every year. Out of which, Iran, Saudi Arabia, UAE and Iraq are the major importers. In this context timely information about crop acreage, crop health and its varietal distribution may be crucial for the exporters as well as Farmers. It helps exporters and other decision makers involved in Basmati trade to take decisions about the quantum and time.

LeadsConnect services Pvt. Ltd. is involved with BEDF for the estimation/assessment of acreage, crop health and expected yield of Basmati rice during 2023. Basmati occupies a special status in Rice cultivation. It is a variety of long, slender grained, aromatic rice. In India, Basmati rice is grown in the specific geographical area, at the Himalayan foot-hills confined into few states of India. As part of scope, Basmati survey to be carried out in seven area viz., Punjab, Haryana, Himachal Pradesh, Uttarakhand, Delhi, Western UP and J&K. These states are located at northern parts of our country.

Keeping this in view, the Basmati Export Development Foundation (BEDF), New Delhi awarded M/s. LeadsConnect services Pvt. Ltd. the work of Crop Survey for estimation/assessment of acreage, crop health and expected yield of Basmati rice during 2023. This will include the all basmati rice crop varieties differentiated in traditional and evolved varieties of Basmati rice and Sharbati and Sugandha varieties of Non- Basmati. Survey will be attempted through the satellite imageries and field based methods for assessment of acreage, crop health and yield of Basmati rice during Kharif 2023.

The use of Satellite Image based Remote Sensing and GIS technique offers an effective system for monitoring crops, its type, Crop health and acreage estimation at large spatial extent. The remotely sensed solution is comparatively fast, cost-efficient, and effective. In addition, the repetitive data acquisition capability of remote sensing sensors makes them an ideal choice for retrieving temporal information of crop phenology, plants health (stress), response to weather and soil nutrients (i.e., manure and fertilizer). The free availability of optical remote sensing data of Sentinel-2 satellites with multiple spectral bands in the red, red edge, and near infrared (NIR) is making Remote Sensing an ideal choice for monitoring agricultural crops, vegetationphenology of export.

The questionnaire-based farmer survey report for Basmati rice is included in this report. The purpose of the survey evaluation was to gather a variety of information, including insights into market trends, field practises, and future planning. Data was gathered in the following headings: Personal details of the farmer Cropping pattern; planting and harvesting; source and amount of seed used per acre (per variety); sowing and harvesting period. Marketing includes producing a range of products, providing information to consumers, managing pests and diseases, reducing weeds, applying fertiliser and manure, and addressing plant diseases. General Information : The basis for the variety selection, any technological advancements, Details on total cost, yield, pricing, profit, and farmer's recommendations. All six states—Haryana, Punjab, Uttar Pradesh, Jammu & Kashmir, Himachal Pradesh, and Uttarakhand were included in the survey.

3. Objective and Scope of work:

The major objective of the project can be listed as:

1. "Field based survey to be carried out on the basis of sample group of farmers selected at district level in seven GI area states viz., Punjab, Haryana, Himachal Pradesh, Uttarakhand, Delhi, Western UP and J&K".
2. To provide Remote Sensing based estimation of Crop Area, Crop Health and Production estimate of notified Basmati Rice varieties.

The scope of work which included satellite imageries and field-based survey will cover the following activities:

1. Acreage estimation of all basmati rice crop varieties differentiated in traditional and evolved varieties of Basmati rice and Sharbati and Sugandha varieties of non-Basmati. Reports will be submitted on district level basis for each state.
2. Variety-wise Crop Health Monitoring and Analysis.
3. Variety-wise Crop maturity survey, describing the percentage of acreage under particular crop growth.
4. Climate based yield modeling using historical yield and climate data (10 years) in order to predict yield well in advance.
5. Questionnaire based sample survey of farmers for area/districts mentioned above with a suitable sample size covering all blocks of the respective districts. The sample size may be arrived at, taking in to view the crop density in the concerned block. The contact details of the farmers included in the survey may be provided. Reports to mention as to how many farmers and how much crop area has been covered from each block/district.
6. Percentage-wise sale/distribution of basmati seeds by different agencies including Govt. sources, private sector foreach variety. This information should be contained in report for the month of July.
7. Crop cutting experiment in sample areas for yield estimation.

4. StudyArea:

The study area includes total 85districtsofBasmatiriceandnon-Basmati rice (Sharbati and Sugandha),which includes

- 23 Districts of Punjab,
- 30Districtsof Uttar Pradesh,
- 22 Districts of Haryana,
- 3 Districts of Jammu &Kashmir,
- 4 Districts of Uttarakhand,
- 2DistrictofHimachalPradeshand

The map of the entire study areaincludingalldistrictsinthedesignatedStatesisbeinggivenbelow:

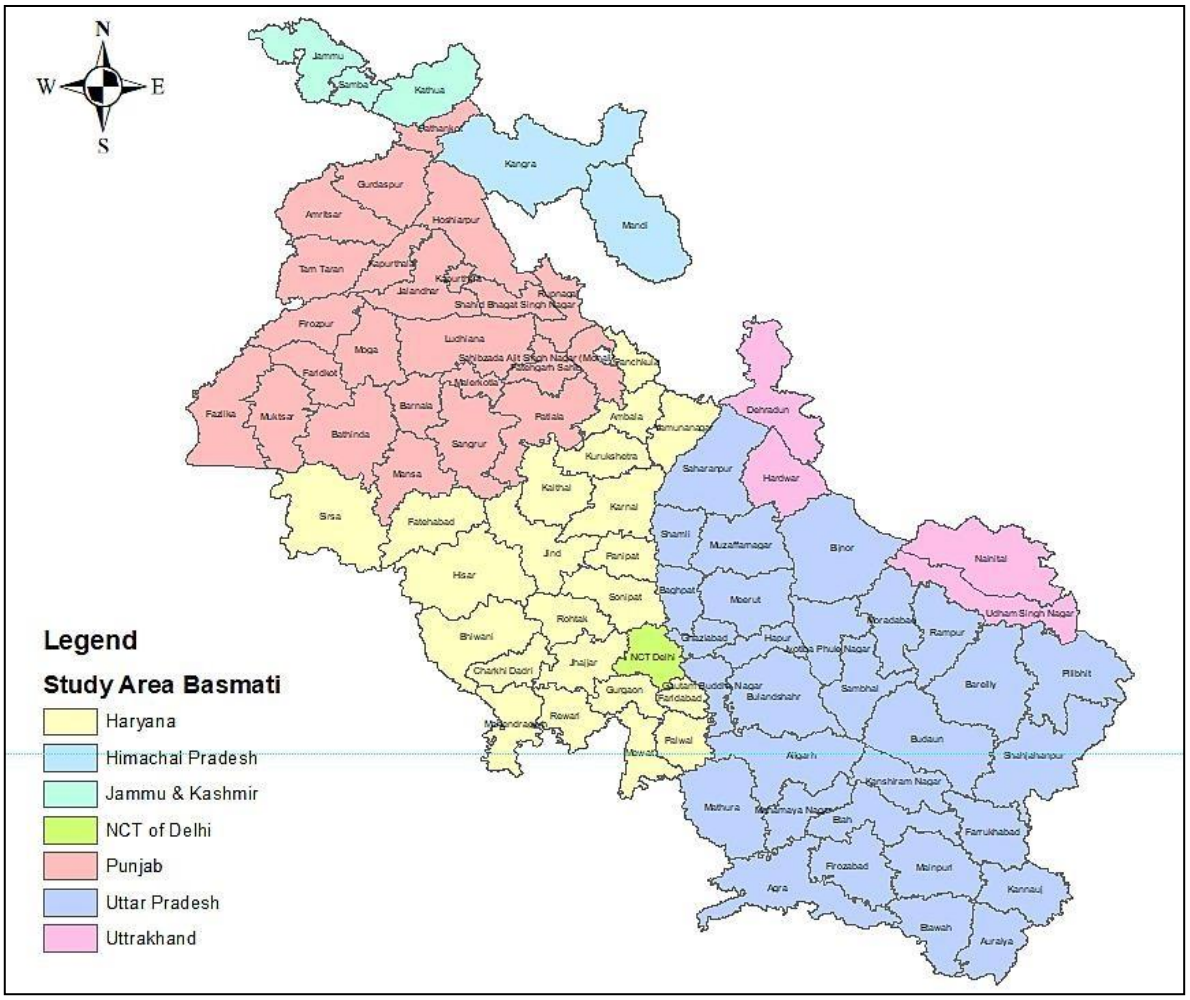

Fig.1:ProjectStudyarea

5. Approach&Methodology:

Questionnaire Based survey:

A questionnaire-based survey was conducted for the present study in order to gain insight into a variety of data. In order to get conclusions on field practises, market intelligence, and future planning, an evaluation was conducted. Annexure-1 has a sample questionnaire. Here are a few of the key data points gathered from the survey.

1. **Farmer's personal information:** Name, area owned by farmer, soil type, source of irrigation.
2. **Cropping Pattern:**Last year and current year crops grown, Basmati varieties grown and their area.
3. **Planting & harvesting:** Seed source and quantity used per acre (variety-wise), Sowing and Harvesting Period.
4. **Marketing:** variety wise production, selling information, channel used for selling, rate of selling. (for last year & Current year).
5. Weed controlling method used last year and current year.
6. **Manure & fertilizer:** Inorganic fertilizer, organic fertilizer, green manure used last year and current year.
7. **Pests & Disease Management:**Pest & insects attack details, control measures taken, preventive measures taken. Plant disease occurred, stage, extent of damage, control measures, preventive measures taken.
8. **General Information:**Basiss of selection of variety, technical advancement if any, Total cost, yield, price, profit details (for Last year & current year).
9. **Farmer's Suggestions:**Farmer's plan to increase yield, support needed from government and from private parties.

All six of the states—Haryana, Punjab, Uttar Pradesh, Jammu & Kashmir, Himachal Pradesh, and Uttarakhand—were included in the study conducted above using questionnaires. From each of these states where basmati is grown, a random selection of farmers is executed.

6. Results:

- **Haryana:**

➢ Soil Type and irrigation:

The soil type found in Haryana is alluvial. Alluvial soil is the predominant soil type in the Basmati farming region of Haryana. The state is located near the Ganges and Indus river valley. Most of Haryana's soil is loamy to sandy. In all irrigated areas in Haryana, basmati varieties are sown. In Haryana, canals (46%) and tube wells (54%) are the two main irrigation sources.

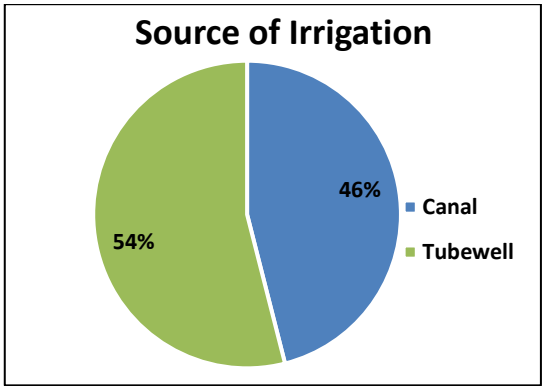

Fig.2:Source of Irrigation in Haryana State

➢ Cropping Pattern:

The principal cropping patterns seen in Haryana include rice-wheat, rice-mustard, rice-potato, rice-vegetable, rice-mustard-sugarcane, and rice-fodder. The two principal varieties of Basmati that were grown were PB-1121 and PB-1509.

➢ Prominent Varieties:

Important districts where Basmati varieties grown are- Jind, Karnal, Sonepat, Sirsa, Hisar and Panipat. PB-1121, PB-1718 and PB-1509 are the major varieties being grown in Haryana. Pusa Basmati-1121 is grown largely in Jind, Rohtak, Hisar, sonepat and Jhajjhar districts. Pusa Basmati-PB-1509 is grown largely in Kaithal, sonepat, Panipat, Rohtak and Hisar. Pusa Basmati- 1401 is prominent in Sirsa, Karnal and Jind Districts. Sharbati is prominent in Yamunanagar and Ambala. Out of 12.8 lakh ha Rice transplanted this year Basmati varieties were sown in 7.87 lakh ha area. Which is around 62% of total Rice area.

➢ Seed Supply & Rate:

As per the survey, farmers frequently plant their own seeds (18%) or purchase seeds from private seed businesses (70%). Only 10-12% of purchases are made from government agencies such as Agricultural University, State Seed Corporation, and NSC.Farmers utilise less seed than is recommended; before moving an acre of land, three to five kilogrammes of seed should be used for nursery planting.

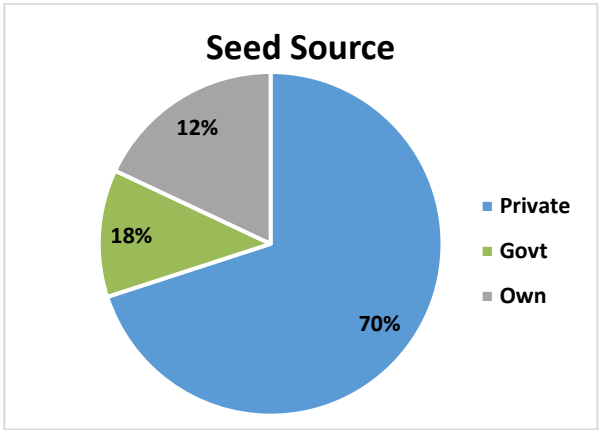

Fig.3:Source of seed

Table 1: Variety wise Seed source and % contribution of agencies in Haryana

Variety	Private Agency	Govt. Seed Agency	Own
PB 1121, PB 1718, PB 1885	80	15	5
PB 1509, PB 1692, PB 1847	75	20	5
PB 1401, PB 01, PB 06, PB 1882	55	20	25
CSR 30, HBC 19, B 370	70	15	15

➢ Sowing and transplanting:

Transplanting of PB-1509& 1692 was done in June 2nd fortnight to mid of July. Transplanting of PB-1121& PB-1718 was started in July mid and continued up end of July days. In some districts it is also observed that farmers who have sown Non-Basmati Paddy variety last year, opted for Basmati varieties this year. Fig 4 explains the relative proportion of several ground data series in stacked columns, where the sum of stacked columns is always 100%. And it can display part-to-whole ratios over time. For Example, in first Sowing date (June FN1) farmer have transplanted PB1509 only.

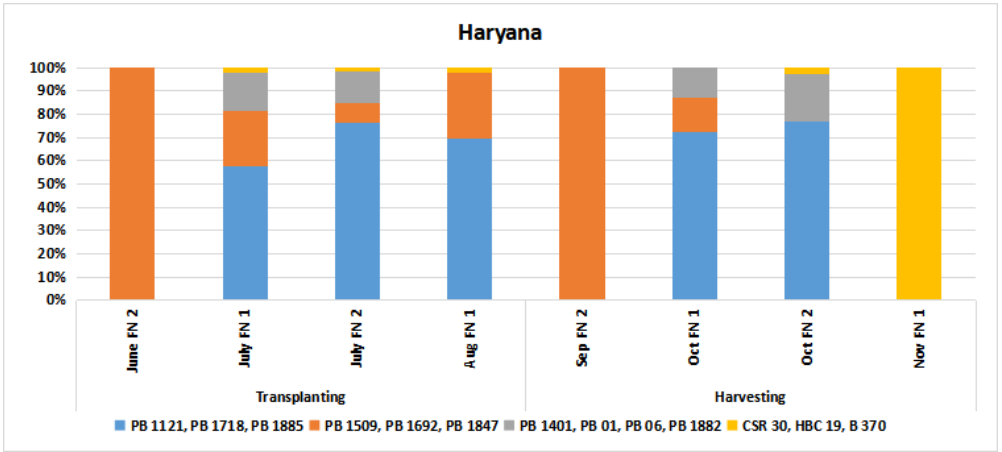

Fig.4:Transplanting and Harvesting window of Haryana State

➢ Weed Control:

Herbicide treatment and hand weeding are two methods used to manage weeds. Herbicides such as Pretilachlor 50 EC, Pendimethalin 30 EC, Butachlor 50 EC, and Anilofos 30 EC are often utilised. Herbicides are used wisely by farmers to better manage weeds.

➢ Manual fertilizers:

Organic Fertilizers : Farmers use FYM as green manure which is organic, but only before preparing the land. Rice crops greatly benefit from the use of green manures. However, relatively few farmers use green manuring since it is less available.

Inorganic fertilizers: Farmers ignore phosphate and potash and apply an excessive amount of nitrogen. For applying nitrogen, they mostly utilise urea, which weighs between 80 and 100 kg. The majority of farmers use 50–60 kg of DAP per acre for phosphorus. For the provision of zinc, almost all farmers (80–90% in different places) apply 4-5 kg of zinc sulphate to all paddy crops.

➢ Pests & Disease Control:

The rice stem borer, leaf folder, plant hoppers, and rice hispa are the main insect pests. This year, at the vegetative stage, neck blast illness was observed in PB-1121, PB-1718, 1692, and PB-1509. In certain regions, fungus diseases and yellow leaves were also observed three to six weeks after the crop was planted. Noted damage, however, is under ETL. Farmers must apply pesticides for Basmati rice, and they have to use fungicides for fungi. Because PB-1718 is more susceptible to illness than PB-1121, farmers are choosing it instead. Farmers typically use granular Cartap Hydrochloride, Fipronil, or Monocrotophos or Chlorpyriphos for spraying.The four main diseases are Blast, Foot-Rot, Sheath Blight, and Bacterial Leaf Blight (BLB). Pusa Basmati-1121 has a higher risk of developing Foot Rot (bakanae). The weather in Basmati, namely the temperature, determines BLB. Farmers use 500 ml/ha of Tilta for various diseases. Emisan6 and streptocycline seed therapy is the sole preventative measure against foot-rot and Bakane disease.

➢ Harvesting time & Method:

Harvesting of PB-1121 and PB-1718 began in the middle of October and went until the middle of November. Since PB-1509 and 1692 were early varieties, they were primarily harvested in September and October.Rice is harvested manually and using a combine harvester, and it is primarily sold straight to mandis. 200–300 INR each Rates of hand harvested and machine harvested basmati varietals varied by quintal.

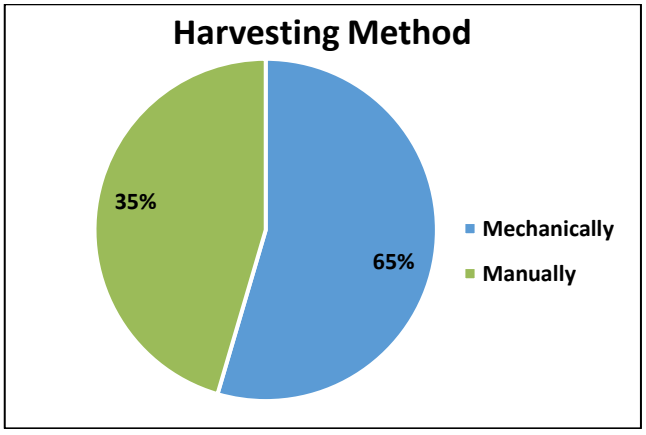

Fig.5: Harvesting Technique

➢ Marketing:

Price of paddy varies due to the percentage of moisture in the grain and other quality parameters. During the current year variety wise selling rate was analyzed & it shows that selling rate of PB-1121/PB1718 is INR 3800-4500/- per Quintal which is higher side as compare to last year. Harvesting technique also plays an important role in rate of selling. Rate of manually harvested Basmati is Rs200-300/- higher than mechanically harvested varieties. Selling rate of PB-1509 is 3200-3500/- per Quintal. PB-1401/PB01 is priced at around 3700-4400/- per Quintal.

Haryana is a high productivity area and farmers are highly adaptive to new technology. Cost of cultivation is very high due to input cost and farmers use all means to get higher productivity. Cost of cultivation in case of PB-1121/PB1718 is up to 22,000-25,000/- per Acre. For PB-1509 it has been Rs. 20,000-23,000/- per Acre. The market price of Basmati varieties during the current year has been very high than the previous year. Hence, net profit has been more than expected by the farmers.

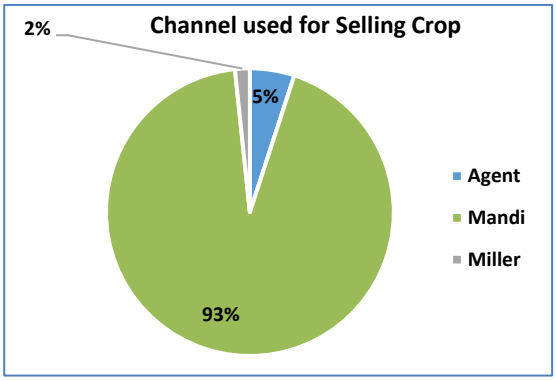

Fig.6:Channel used for Selling Crop

Table 2: Variety wise Cost of Cultivation & profitability in Haryana

Variety	Average Yield (Qtl/Acre)	Average Market Price (Rs./qtl)	Gross Income (Rs/Acre)	Cost of Cultivation (Rs/Acre)	Net Returns (Rs/Acre)
PB-1121/PB1718	18.21	4400	80,124	23,000	57,124
PB-1509/PB1692	21	3400	71,400	20,500	50,900
PB- 01/PB1401	22	4300	94,600	17,000	77,600
CSR 30	15	6400	96,000	25,000	71,000

➢ Expected change:

When choosing a variety to plant for the upcoming season, farmers often consider the overall return from an acre, which is determined by multiplying production (yield/acre) by the current rates of paddy produce. The farmer receives high yields at reduced cultivation costs. This year, the PB-1121, PB-1718, and PB-1509 Basmati types had much higher market prices. Therefore, there's a good chance that the region covered by PB-1121, PB-1718, and PB-1509 will grow the next year. Farmers favour PB-1692 varieties because of their short duration so that they can get the time for sowing of 3 crops in a year.

- **Punjab:**

➢ **Soil Type and irrigation:**

Alluvial soil is the predominant soil type in Punjab. The state is located near the Satluj, Jhelum, Chenab, Ravi, and Beas river depressions. Punjab has primarily dark, sandy, clay-loamy soil. In Punjab, canal and tube wells are the main sources of irrigation.

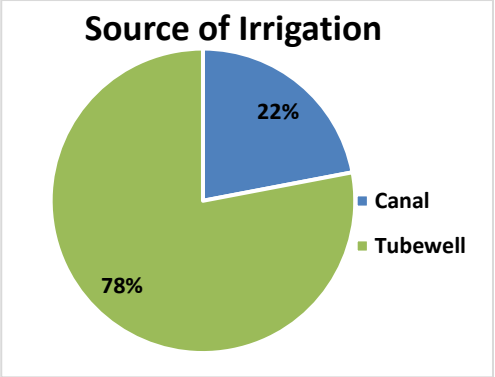

Fig.7: Source of Irrigation in Punjab State.

➢ **Cropping Pattern:**

In Punjab, the predominant cropping pattern is rice-wheat. Nonetheless, three crops are also cultivated yearly in some high-productivity regions, such as those located near cities: rice, potatoes, and vegetables. 8.12 lakh hectares of the 29.6 lakh ha of transplanted rice were planted with basmati varieties this year. According to data gathered from farmers and other sources, basmati varieties were planted on 27% of the rice-growing land. The main varieties for this year include PB-1121, PB-1718, PB-1509, 1692, and 1401.

➢ **Prominent Varieties:**

Most significant districts, including Amritsar, Tarantaran, Fazilka, Sangrur, Firozpur, and Muktsar, grow Basmati varietals. Basmati PB-1121 is dominant in Amritsar, Fazilka, Firozpur and Gurdaspur.The PB-1509 area is now grown in Amritsar, Tran Taran, Sangrur and Ludhiana. PB-1401 is reported in Fazilka and Mansa.

➢ **Seed Supply & Rate:**

Typically, farmers either grow their own seed or buy it from other farmers, commercial seed firms, or governmental agencies like the National Seed Council, Punjab State Seed Corporation, and Punjab Agricultural University.

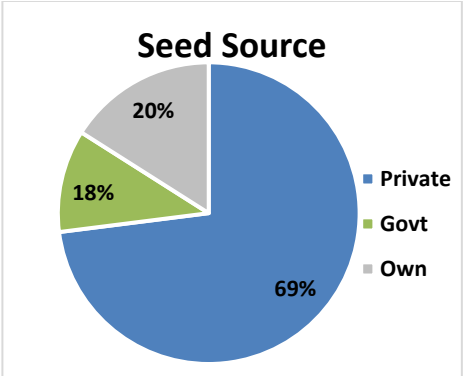

Fig.8:Source of Seed.

The percent break up of different seed sources is as follows:

Table 3: Variety wise Seed source and % contribution of agencies in Punjab

Variety	Private Agency	Govt. Seed Agency	Own
PB 1121, PB 1718, PB 1885	72	18	10
PB 1509, PB 1692, PB 1847	70	20	10
PB 1401, PB 01, PB 06, PB 1882	65	15	20

➢ Sowing and transplanting:

Almost 8.12 lakh ha area under Basmati varieties. Major area is under PB-1121. Starting in the second fortnight of June, PB-1509& 1692 are transplanted, then in the first and second fortnights of July, PB-1121&PB-1718, and Basmati-1401, respectively.

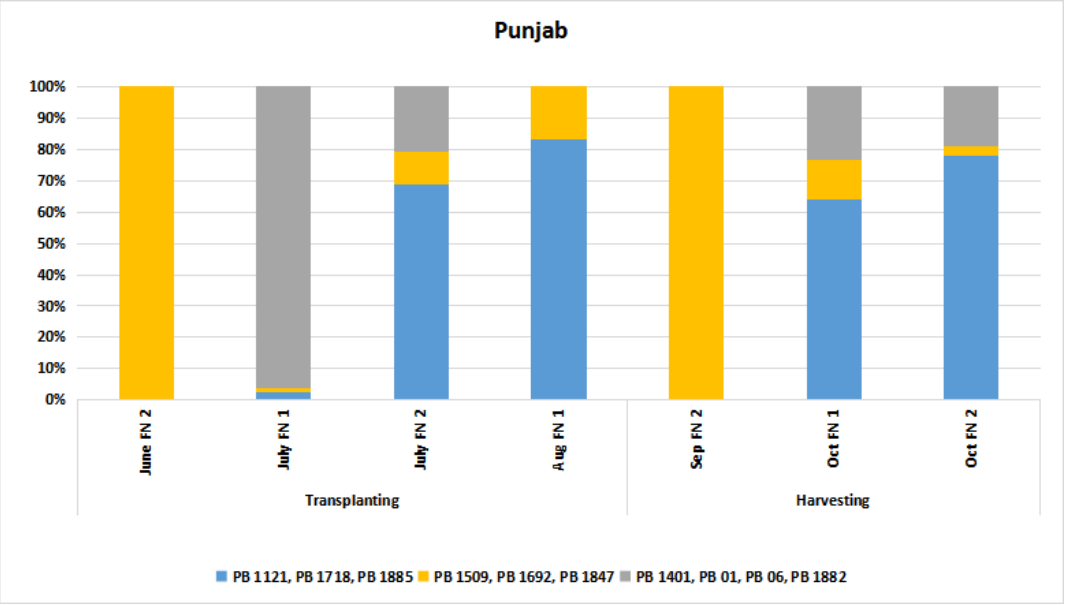

Fig.9: Transplanting and Harvesting window of Punjab State

➢ Weed Control:

Herbicide application completely (100%) eradicates weeds. Farmers utilise herbicides such as Pendamethylene, Penda 30 EC, Butachlor 50 EC, and Anilofos 30 EC 80–85% of the time. Farmers strategically use pesticides to improve weed control.

➢ Manure fertilizers:

Organic manures: Rice crops benefit greatly from green manures, which are organic fertilisers. The short window between wheat harvest and rice sowing, the high cost of midsummer seed, and the tiny fraction of farmers (3-5%) who employ green manuring are all contributing factors. Due to its limited availability, just 2% to 3% of farmers used FYM.

Inorganic fertilizers: The primary source of nitrogen in inorganic fertilisers is urea. Three equal splits weighing 90–110 kg each acre are used to apply urea to short-statured Basmati varieties, such as PB-1509& 1692, PB-1121&PB-1718, and 1401.
Most farmers use 50–60 kg of DAP per acre as a baseline dosage for phosphorus. Only 3–4% of farmers apply fertilisers containing potash. At a rate of 60 kg per hectare, muriate of potash is being applied for potassium.To supply zinc to all paddy crops, almost all farmers (80–90% in different places) use 5-7 kg

of zinc sulphate per acre.

➢ Pests & Disease Control:

Significant pests are leaf folder insects. The Leaf Folder launched attacks in September. Farmers usually sprayed 1-2 sprays of Monocrotophos 36 SL/Chlorpyriphos 20 EC or applied 1-2 applications of granular Cartap Hydrochloride 4 Gr, Fipronil, etc.
In one or two sprayings, farmers treat Black Hopper, Fungus, Blast, and Pata lapait sundi with Syngenta Tilt 25EC @ 500 ml/ha. Foot-Root is managed by treating seeds with streptocycline and the fungicide Bavistin.
Crops worldwide can be harmed by pests and diseases. Many pests have detrimental effects on agricultural crop yield. Overuse of pesticides in agriculture has several detrimental effects, such as higher plant residue levels, insect resistance, and pollution of the land, water, and air.

➢ Harvesting time & Method:

Harvesting for Sharbati and Basmati PB-1509& 1692 starts in September; other types of Basmati are harvested from the end of October to the first two weeks of November.

A combine harvester harvests most of the rice crop, which is then transported either the same day or thefollowing day straight to the grain market. The farmer avoids the expenses associated with loading, unloading, and storing. However, 95%–100% of farmers harvest their Basmati types mechanically since hand-picked product fetches a greater price on the market.

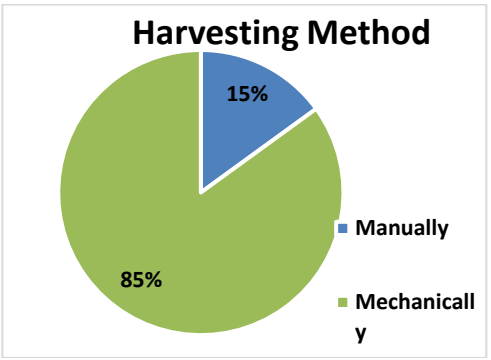

Fig.10:Harvesting Technique

➢ Marketing:

Due to Punjab's well-established marketing infrastructure, harvested product is either delivered to market the day after or on the same day as threshing. Five to ten percent of farmers store their product for a month or more in the hopes of seeing a price increase. In the market yard, paddy is cleaned by a commission agent who then offers it for public auction the same day, collecting commission from both farmers and traders. The price that is being offered is influenced by the moisture content % of the grain and other quality variables.

This year, the market prices for PB-1121/PB1718 Rs. 4100-4500 per quintal, respectively. PB-1509 has been available for between Rs. 2900 and Rs. 3400. On the other hand, Basmati-1401 cost between 3800 and 4300 rupees.

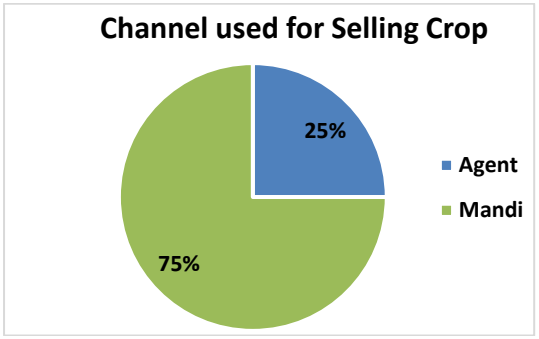

Fig.11:Channel used for Selling Crop

Table 4: Variety wise Cost of Cultivation & profitability in Punjab

Variety	Average Yield (Qtl/Acre)	Average Market Price (Rs./qtl)	Gross Income (Rs/Acre)	Cost of Cultivation (Rs/Acre)	Net Returns (Rs/Acre)
PB-1121/PB1718	19.21	4450	85,485	22,000	63,485
PB-1509/PB1692	17	3500	59,500	19,500	40,000
PB- 01/PB1401	22	4400	96,800	17,500	79,300

➢ Expected change:

Farmer are opting for PB-1692 over PB-1509 because it is being observed that PB-1509 is more susceptible to diseases and also short duration crop. Price range of Basmati varieties are quite high this year hence farmers will opt for Basmati varieties next year.

- **Uttar Pradesh &Uttarakhand:**

➢ Soil Type and irrigation:

Deep layers of alluvium, deposited by the Ganges system's sluggish rivers, envelop Uttar Pradesh. The two most common soil types in both states are clay loam and loam. Soils mostly composed of clay are used to grow rice. In general, the southern region of the state has a mixture of red and black dirt. In the two states, basmati is grown under guaranteed irrigation, and over 95% of producers have their own irrigation system. Irrigation sources include canals, pumping units, and private tube wells.

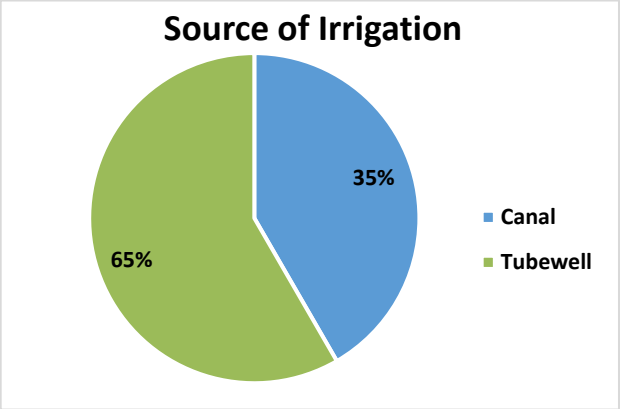

Fig.12:Source of Irrigation in UP & UK

➢ Cropping Pattern:

Rice-Wheat is a dominant planting pattern in Uttar Pradesh and Uttarakhand, with Basmati rice being a prominent crop. The cropping pattern, however, also contain other crops, such as Rice, Mustard and sugarcane, fodder, and pulses. In the cropping sequence, short duration crops and vegetable peas come after the short duration variety (Sharbati).

➢ Prominent Varieties:

Major districts where Basmati varieties grown are- Aligarh, Bulandshahr, Mathura, Etawah and Mainpuri. PB-1121, PB-1509, PB-1718, Sharbati and Sugandha are major varieties being grown in Uttar Prdesh. PB-1121 variety is prominent in GB Nagar, Aligarh, Bulandsharh, GB nagar, Etah and Mainpuri districts. PB-1509 Basmati variety is majorly being grown in the areas of Mathura, Mainpuri, Bulangshahr, and Etawah. PB-1401 & PB01 varieties are found in Bijnor, Meerut, Saharanpur and Muzaffarnagr. Sharbati is prominent in Bareilly, Shahjahanpur, Rampur, Aligarh and Bulandsahar districts. Bulandsahar, Mathura, Bijnor, JP nagar and Meerut are the distircts where Sugandha is sown. Basmati varieties were sown in 4.61 lakh area of Uttar Pradesh. Basmati crop area in districts of Uttarakhand is quite less as compared to other states. Basmati varieties were sown in 1.94 lakh ha area of Uttarakhand. In Uttarakhand the acreage of sown varieties of PB-1509,1692, 1847 collectively is higher than PB-1121. The other varieties like CSR 30, B 3709 is also reported from the state but its coverage is quite lower than others.

➢ Seed Supply & Rate:

Based on the study results, farmers mostly purchase seeds from private seed companies, using three to six kilogrammes of seed per acre.More than 80% of farmers utilise Basmati seeds that they get from reputable progressive farmers and independent seed sellers. Governmental organisations don't make a big difference in the distribution of Basmati seeds. In contrast, 15–25% of farmers cultivate using their own seed.The majority of farmers use 12–18 kg of seed per hectare for all kinds, although 20 kg per hectare is the suggested dose, depending on the quality of the seed and the nursery rearing technique.

Fig.13:Source of Seed.

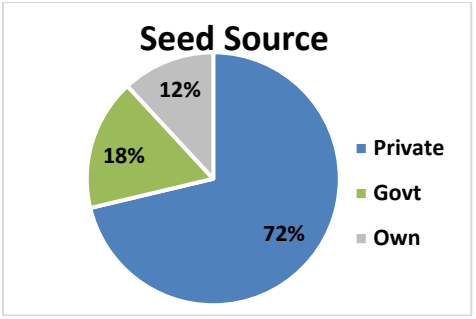

Table 5: Variety wise Seed source and % contribution of agencies in UP & UK

Variety	Private Agency	Govt. Seed Agency	Own
PB 1121, PB 1718, PB 1885	80	15	5
PB 1509, PB 1692, PB 1847	75	15	10
PB 1401, PB 01, PB 06, PB 1882	60	20	20

➢ Sowing and transplanting:

Transplanting of PB-1509& 1692 was completed in July 1st week to mid of July. Transplanting of PB-1121 & PB-1718 was started in July mid and continued up till early August days.

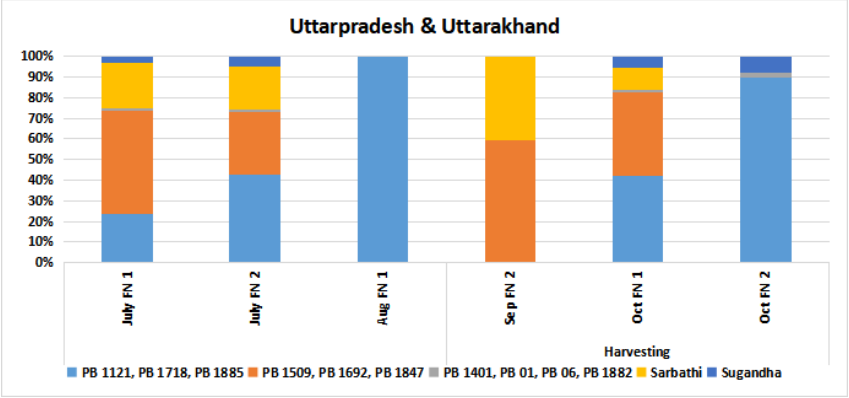

Fig.14: Transplanting and Harvesting window of Uttar Pradesh &Uttarakhand State

➢ Weed Control:

Herbicide treatment and hand weeding are two methods used to manage weeds. Pretilachlor 50 EC, Pendimethalin 30 EC, Butachlor 50 EC, and Anilofos 30 EC are the most often used herbicides. Herbicides are used wisely by farmers to better manage weeds.

➢ Manure fertilizers:

Inorganic fertilizers: The amount of fertiliser applied does not differ much between districts. Urea is mostly used by farmers to apply 80–100 kg of nitrogen. The majority of farmers use 50–60 kg of DAP per acre for phosphorus. For their supply of zinc, almost all farmers apply 4-5 kg of zinc sulphate to all of their paddy crops.At the time of field preparation farmers use FYM as green manure. Which is highly beneficial to rice crop. However, due to less availability, very few farmers follow the practice of green manuring.

➢ Pests & Disease Control:

There is a tendency in the Upper Midwest where a large number of farmers use pesticides based on dealer recommendations. The rice stem borer, leaf folder, brown plant hopper, and gundhi bug are the main insect pests. The three main illnesses are Blast, Sheath Blight, and Bacterial Leaf Blight (BLB). This year, the main causes of illness occurrence in Uttar Pradesh's Basmati rice are White Fungus and Neck. Unexpected rain in October damaged a few Uttar Pradesh districts and could have had an impact on output in other places.

Some regions have seen a prolonged dry period in August and late rains in October, which has hampered the quality and development of seed during the first week.

➢ Harvesting time & Method:

Harvesting of PB-1121 and PB-1718 began in October and went on until the middle of November. Since PB-1509, 1692, Sharbati, and Sugandha were early-sown varieties, they were primarily harvested in September and October. Harvested in the first two weeks of October is PB01. Rice can be harvested manually or with the use of a combine harvester. A combine harvester is also used for harvesting in various districts in Western U.P. and Udham Singh Nagar.

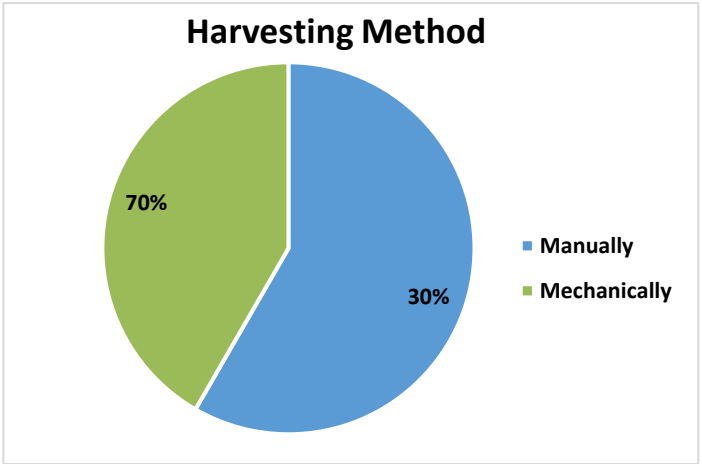

Fig.15:Harvesting Technique

➢ Marketing:

Most of the farmers sell their produce after harvest in nearby primary or secondary markets, agents and 'Mandis'. The market rates of different varieties of Basmati, evolved varieties and Sharbati vary from market to market. However, on an average the market price of the varieties studied in the project during as follows: PB-1121/PB1718 is INR 3900-4300/- per Quintal. Selling rate of PB-1509/PB1692 is 3150-3400/- per Quintal. Sharbati is 2200-2800/- per Quintal. Cost of cultivation is very high due to input cost and farmers use all means to get higher productivity. Average cost of cultivation in case of PB-1121/1718 is up to 21,000-23,000/- per Acre. For PB-1509 it has been Rs. 20,000-23,000/- per Acre.

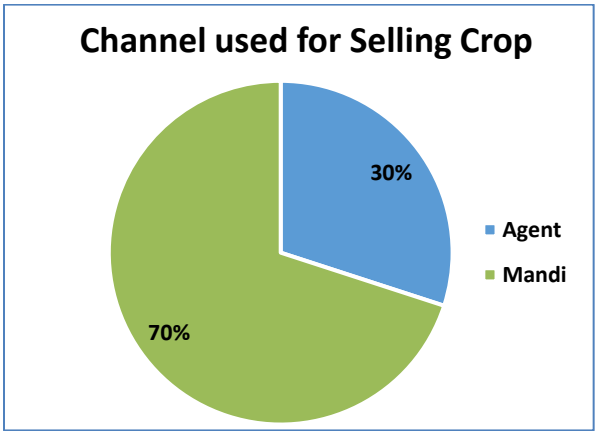

Fig.16: Channel used for Selling Crop

Table 6: Variety wise Cost of Cultivation & profitability in UP & UK

Variety	Average Yield (Qtl/Acre)	Average Market Price (Rs./qtl)	Gross Income (Rs/Acre)	Cost of Cultivation (Rs/Acre)	Net Returns (Rs/Acre)
PB-1121/PB1718	17.45	4250	74,163	22,000	52,163
PB-1509/PB1692	18.42	3300	60,786	21,000	39,786
PB- 01/PB1401	15.34	4200	64,428	20,000	44,428

- **Expected change:**

Basmati varieties PB1847 and PB1509 are being popular among the farmers. Farmers choosing the sowing of PB-1121, 1718, and specifically 1509, because of its short duration. Due to high price trend farmers will definitely prefer the Basmati sowing in next year.

7. Schedule wise Report Status:

The present report is the fifth volume of reports to be delivered. This report covers the Questionnaire based farmer survey report of Basmati rice. The status of Schedule wise report status is being given for reference below.

Report Schedule				
S. No.	**Report**	**Report Content**	**Submission Date**	**Status**
1	1st Report	District wise total rice area (Basmati + Rice) Basmati seed sale distribution (in percent)	30th July2023	Submitted
2	2nd Report	Basmati rice acreage and health monitoring	31stAugust2023	Submitted
3	3rd Report	Basmati rice acreage estimation (Variety wise evolved Sarbati and Sugandha)	30thSeptember2023	Submitted
4	4th Report	Climate based Basmati rice yield model and production	31stOctober2023	Submitted
5	5th Report	Questionnaire based farmer survey report of Basmati rice	30thNovember2023	Submitted
6	6th Report	Final Report (All statistics and maps)	30thDecember2023	In Process

Note: The green highlighted row shows report is submitted.

Annexure -1:

G B Nagar

Basmati Crop Survey

Present Location (Lat/Long) ...28.190981, 77.57 42.29.....

Name: -	Ram Autar
Phone no: -	7055570089
Village: -	Dayanat Pur
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Pump / Canal / River

Varity and area: Current Year: (i) Sowing 918 → 20 May, 1121 – 20 June (ii) Plantation 13 July, 20 June (iii) Harvesting First week Nov

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
Pusa Basmati - 1121	80%	10 kg	8-10 Man	Mandi	DAP,	3500	100%	
Pusa Basmati - 1718	70%	10K	8-10 man	4	NPK	3500-3800	100%	
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

Government/Mandi/ Market Details:- Rabupura Jewar Haryana Harvesting Instrument:- Hand Cost(Acr):-

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
	PVT					Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
80-90% Pusa Basmati - 1121	✓	10 kg	4 Q/Acre	Mandi	DAP	3200-3500	100%	
70% Pusa Basmati - 1718	✓	10 kg	4 Q/	"	NPK	3200	100%	
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures

Support From Govt: - From Private Parties: - Next year Plan: -

Any Suggestion: - Surveyor Signature: -

Alyash

Basmati Crop Survey

Present Location (Lat/Long) ....28.06552 , 77.512931.....

Name: -	Shamlal.
Phone no: -	Na.
Village: -	Gharbasa Aligarh.
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Pump / Canal /River

Varity and area: Current Year: (i) Sowing ~~[illegible]~~ May (ii) Plantation 10 July (iii) Harvesting Oct. 1st Week

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
10% Pusa Basmati - 1509/~~1692/1847~~	✓	6 Kg	4 Q	Mandi	DAP Urea	3600	100 %	
80-90% Pusa Basmati - 1121	✓	6 Kg	3 Q	"	"	4200	100 %	
40-50% Pusa Basmati - 1718	✓	6 Kg	3 Q	"	"	4200	100 %	
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

Government/Mandi/ ~~Market~~ Details:- Palwal Jattari Harvesting Instrument:- Hand Cost(Acr):-

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
57% Pusa Basmati - 1509/1692/1847	✓	6Kg	4.5 Q	Mandi	Urea DAP	3200		
80-90% Pusa Basmati - 1121	✓	6Kg	3.5 Q	"	"	3800	100 %	
60-70% Pusa Basmati - 1718	✓	6Kg	3.5 Q	"	"	3700	100 %	
Pusa Basmati - 1401/PB01/PB06/1886								
1% Sharbati	✓	6Kg	3 Q	—	"	—	—	
1% Sugandha	✓	6Kg	3 Q	—	"	—	—	

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures

Support From Govt: - From Private Parties: - Next year Plan: -

Any Suggestion: - Surveyor Signature: -

J. Phule Nagar

Point-167

Basmati Crop Survey

Present Location (Lat/Long) ..28.692636, 78.380907.....

Name: -	Hazi Bandi
Phone no: -	9690154382
Village: -	Dhakka
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Tubewell Pump / Canal /River

Varity and area: Current Year: (i) Sowing....10 June (ii) Plantation ...15 July (iii) Harvesting....20 Sept

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847 10%	PH	5Kg	3-3.5	Mandi	DAP Urea	2600	100%	
Pusa Basmati - 1121					Zinc			
Pusa Basmati - 1718				"				
Pusa Basmati - Basanti 1401/PB01/PB06/1886 80%	"	" 5 Qtl	"	"	Iffco	2500	100%	
Sharbati	"							
~~Sugandha~~ 6741 Basmati	"	" 5 Qtl	"	"		2000	100%	

Government/Mandi/ Market Details:- Sambhal Harsanpur Harvesting Instrument:- Hand Machine Cost(Acr):- 400

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847 10%		5Kg	3 Q	Mandi	DAP Urea	2200	100%	
Pusa Basmati - 1121								
Pusa Basmati - 1718					Zinc			
Pusa Basmati - Basanti 1401/PB01/PB06/1886 ~~80%~~	"	" 5 Q	"	"	Iffco	2500	100%	
Sharbati 10%			2.5 Q	"		2300	100%	
Sugandha 6741 80%	"	" 5 Q	"	"		200	100%	

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures

Support From Govt: - From Private Parties: - Next year Plan: -

Any Suggestion: - Surveyor Signature: -

Sambhal
Point 25

Basmati Crop Survey

Present Location (Lat/Long) 28.650594, 78.621283

Name: -	Kasmuddin
Phone no: -	NA
Village: -	Mukarrapur
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Tubewell Pump / Canal /River

Varity and area: Current Year: (i) Sowing 15 June (ii) Plantation 20 July (iii) Harvesting 10 oct

	Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
							Rs	Immediate sell in (%)	After Storage in (%)
	Basmati - CSR30/HBC19/370								
2%	Pusa Basmati - 1509/1692/1847 घर से खाने के लिए								
	Pusa Basmati - 1121								
	Pusa Basmati - 1718								
50%	Pusa Basmati - 4007 ~~1401/PB01/PB06/1886~~	Pvt		3-4 q	Mandi		2600	95%	5%
5%	Sharbati								
1 no-	~~Sugandha~~ Basanti	Pvt		4 q	"		2600		

& 80-90%

Government/Mand / Market Details:- Sambhal Harvesting Instrument:- Machine Hand Cost(Acr):- 700/bigha 25 kg dhan

Varity and area: Last Year:

	Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
							Rs	Immediate sell in (%)	After Storage in (%)
	Basmati - CSR30/HBC19/370								
1-2%	Pusa Basmati - 1509/1692/1847 घर के खाने के लिए								
	Pusa Basmati - 1121								
	Pusa Basmati - 1718								
40-50%	Pusa Basmati - 4007 1401/PB01/PB06/1886	Pvt		4 q	Mandi	DAP, Urea	2600	100%	
	Sharbati								
90%	~~Sugandha~~ Basanti	Pvt		4.5 q	"	"	2600	100%	

& Majorly sown

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures

Support From Govt: - From Private Parties: - Next year Plan: - थोड़ा थोड़ा

Market rate देखते हुए बोलते हैं।

Any Suggestion: - Surveyor Signature: -

Basmati Crop Survey

Present Location (Lat/Long) .....

Name: -	Kanwarjeet Singh.
Phone no: -	94782 09693
Village: -	Udekaran, Sri Muktsar Sahib.
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Pump / Canal /River

Varity and area: Current Year: (i) Sowing..... 1 July..... (ii) Plantation 25 July..... (iii) Harvesting... 10 october

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Total 23 kila 1885 → 1 July sowing. Basmati - CSR30/HBC19/370	Own Seed.	4 kg.						
5 kila Pusa Basmati - 1509/1692/1847	11	11			Urea-2 bag DAP-0.5 bag Zinc → 1 July.	—	—	—
7 kila Pusa Basmati - 1121		1						
Pusa Basmati - 1718	11	11	1 July Sowing to 25 August plant.			—	—	—
11 kila Pusa Basmati - 1885 1401/PB01/PB06/1886	1 11	11						
Sharbati								
Sugandha								

0.5 acre Basmati 386. Government/Mandi/ Market Details:- 11 sowing → 1 July. to August → 4 July. Harvesting Instrument:- Combine Cost(Acr): 2000/acre.

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
11 kila. Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847 2 acre.	Own Seed.	4 kg.	20 q/ac.	Mandi	—	4500/-	—	—
Pusa Basmati - 1121								
Pusa Basmati - 1718 9 acre	own Seed.	4 kg.	15 q/acre	Mandi		4200/-	—	—
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures
—	—	—	—	only herbicide Nominee Gold.
—	—	—	—	

Support From Govt: -

From Private Parties: -

Next year Plan: -

Any Suggestion: -

Surveyor Signature: -

Basmati Crop Survey

Present Location (Lat/Long) ....

Name: -	Jaswant Singh S/o Nikshatar Singh
Phone no: -	94172-41090.
Village: -	Kaladi, Sangrur.
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Pump / Canal /River

Varity and area Current Year: (i) Sowing 24 May (ii) Plantation 25 June (iii) Harvesting 25 October

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
Pusa Basmati - 1121								
Pusa Basmati - 1718								
Pusa Basmati - 1401/PB01/PB06/1886	Private	4 kg/a	-	Mandi	DAP-0.5 Urea-2.5 bag.	-		
Sharbati								
Sugandha								

9 kila

Increase basmati

Government/Mandi/ Market Details:-______ Harvesting Instrument:- Combine. Cost(Acr):- 20-2200

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
Pusa Basmati - 1121								
Pusa Basmati - 1718								
Pusa Basmati - 1401/PB01/PB06/1886	Private.	4 kg/.	25 q/acre	Mandi.		3800		
Sharbati								
Sugandha								

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures
-	-	-	-	-
-	-	-	-	-

Support From Govt: - From Private Parties: - Next year Plan:- Dinotefuran 20% W/SG.

Insect - NFL Kisan Emamectin Benzoate 5% SG

Any Suggestion: - Surveyor Signature: -

Fungus - Isoprothiolane, Mancozeb + Azoxystrobin

GB Nagar

Basmati Crop Survey

Present Location (Lat/Long) ...28.190981, 77.57 42.29.....

Name: -	Ram Autar
Phone no: -	7055570089
Village: -	Dayanat Pur
Soil: -	Alluvial soils / Black Soils / Clay soil / Sandy Soil / Other
Irrigation Mode: -	Pump / Canal /River

Varity and area: Current Year: (i) Sowing 9/8 → 20 May, 11/21 → 20 June (ii) Plantation 13 July, 20 June (iii) Harvesting 1st fort week Nov

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
Pusa Basmati - 1121	80%	10 kg	8-10 Man	Mandi	DAP,	3500	100%	
Pusa Basmati - 1718	70%	10K	8-10 man	4	NPK	3500-3800	100%	
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

Government/Mandi/ Market Details: Rabupura Jewar Haryana Harvesting Instrument:- Hand Cost(Acr):-

Varity and area: Last Year:

Varity Name	Seeds Source	Seed used Acre/KG	Produce Quintal/Acre	Channel for selling (Mandi)	Fertilizers used per Acre (in KG)	Rate of Selling		
						Rs	Immediate sell in (%)	After Storage in (%)
Basmati - CSR30/HBC19/370								
Pusa Basmati - 1509/1692/1847								
Pusa Basmati - 1121	✓	10 kg	4 Q/Ac	Mandi	DAP	3200-3500	100%	
Pusa Basmati - 1718	✓	10 kg	4 Q/	11	NPK	3200	100%	
Pusa Basmati - 1401/PB01/PB06/1886								
Sharbati								
Sugandha								

80-90%
70%

Time	Damage (%)	Diseases Name	Stage (Diseases Occur)	Measures

Support From Govt: - From Private Parties: - Next year Plan: -

Any Suggestion: - Surveyor Signature: -


Latitude: 28.682636
Longitude: 78.390907
Elevation: 147.14±3 m
Accuracy: 3.9 m
Azimuth: 207° (SW)
Pitch: -14.7° (2.4°)
Time: 09-20-2023 08:07
Note: basanti
Powered by AngleCam


New Holland
3630
TX
Latitude: 28.360672
Longitude: 78.133324
Elevation: 149.64±4 m
Accuracy: 4.1 m
Azimuth: 79° (E)
Pitch: -7.7° (0.6°)
Time: 09-20-2023 12:24
Note: paddy 1509
Powered by AngleCam


Latitude: 27.729773
Longitude: 78.728118
Elevation: 123.65±3 m
Accuracy: 3.9 m
Azimuth: 85° (E)
Pitch: -7.7° (1.0°)
Time: 09-17-2023 13:21
Note: paddy
Powered by AngleCam