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Agronomic Practices Adopted by Farmers in Kharar Division SAS Nagar, Punjab, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The agriculture industry in India contributes over 20% of its GDP, which is a significant amount to the national economy. 70% of India's population is dependent on it for existence. Agriculture is a crucial sector of the Indian economy, making up around 20 percent of its GDP. Agronomic techniques include everything a farmer does from seed to seed, from planting seeds to collecting and storing them. The study was conducted in Kharar block of SAS Nagar district of Punjab. Shakrullapur, Rora, Bibipur, Batta, and Fatehpuri Therhi were the villages selected. A questionnaire was developed to conduct interviews with the farmers. After gathering information from respondents, it was organized and put through the necessary statistical tests for analysis. 97 percent of respondents cultivate rice, while all cultivators produce wheat in their fields, according to the data collected. In addition, 28% of farmers cultivate maize from these crops, while 76% grow sorghum and berseem as fodder crops. Additionally, it was shown that farmers use more fertilizer, chemicals pesticides, and seeds than is advised. Wheat and paddy had an average yield of 30 q/ha and 65 q/ha, respectively.

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1. INTRODUCTION

The backbone of the Indian economy and an important economic sector is agriculture. Over 65% of the population in India is supported directly by agriculture. Thus, guaranteeing a rise in agricultural production as well as sustainability in productivity, environmental and ecological security, technological viability, employment stability, and equality in distribution requires a strong commitment to agricultural education. Numerous people have acknowledged Punjab's contribution to India's food self-sufficiency [1]. A key component of a sustainable food system is agricultural technology. A good example of how scale-independent technology changed agricultural production is the Green Revolution. Among other advantages, the Green Revolution has raised yields, decreased poverty, improved infrastructure, increased food availability, and decreased food prices [2,3]. All of the procedures that a farmer follows from seed to seed, from seed sowing through seed harvesting and storage, are referred to as agronomical practices. The crop's production is directly correlated with agronomic methods. Farmers must adhere to the optimum agronomic methods according to the season and agroclimatic zone to produce a decent harvest. Regional variations exist in these practices [4]. Punjab has 6 different agroclimatic zones. The Undulating Plain Zone, where SAS Nagar is located, has chilly, humid-to-subhumid, and semi-arid-to-humid climates. Rainfall ranges between 165 to 1000 millimeters. The soil in this region is ideal for growing crops including sorghum, wheat, maize, rice, and vegetables. For the production of crops, farmers in this region use standard or fundamental agronomical approaches [5,6]. It was essential in ensuring improved agricultural practices in nations like India and allaying worries that we had reached the point of food surplus capacity, which happens when agricultural production cannot keep up with the demand from the population. Only a small portion of the world's land is used for agriculture, but India ranks second globally in terms of agricultural productivity.

1.1 Objectives of Study

- To research the agronomic practices used by the farmers that responded.
- To assess respondents' understanding of the amounts of pesticides, fertilizer, and seedsthat should be used.

2. MATERIALS AND METHODS

In Mohali, Punjab's kharar block district, the study was carried out. Shakrullapur, Rora, Bibipur, Batta, and Fatehpur Theri are the five villages in Mohali district where the study was conducted. From these 5 villages, 105 farmers in all were interrogated. 18 farmers from Shakrullapur, 19 farmers from Rora, 25 farmers from Bibipur, 25 farmers from Batta, and 18 farmers from the village of Fathepur Therhi were surveyed. We had a lengthy conversation with the farmers about their socioeconomic status and the agronomic methods they use all year long. The respondents were questioned at both their homes and farms. To cover every aspect of the farmers' agronomic practices, a questionnaire was developed for conducting interviews with the farmers and meticulously analyzing each parameter.

The information was classified and analyzed using the correct statistical techniques, including percentages, visual representations, graphs with bars, and pie charts, once the respondents' data had been gathered.

Table 1. Total selected farmers

Sr. No.	Village	Total number of farmers
1.	Shakrullapur	18
2.	Rora	19
3.	Bibipur	25
4.	Batta	25
5.	Fatehpur Therhi	18

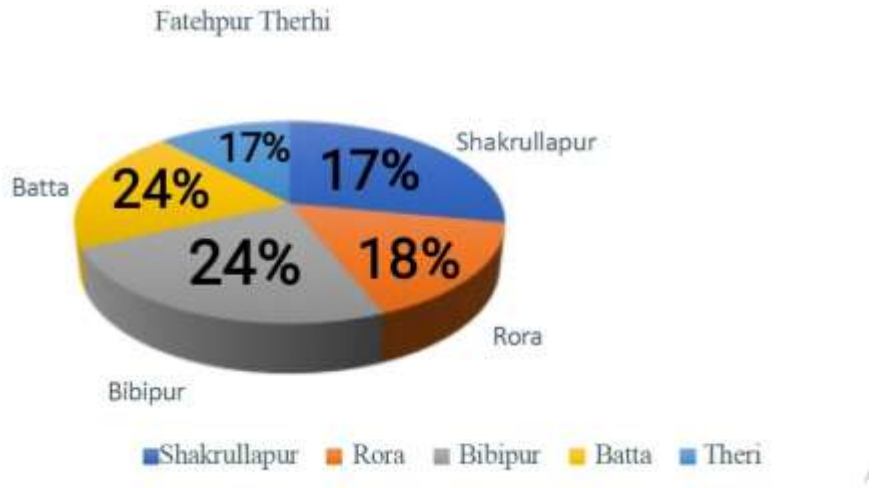

Fig. 1. Total selected farmers

3. RESULTS AND DISCUSSION

Agronomic practices are a vital part of farming systems. These are practices that farmers incorporate to improve soil quality, enhance water usage, manage crops, and improve the environment [7]. Agronomic practices focus on better fertilizer management as a way of improving agricultural practices. Through interaction with the respondent farmers, we get to know about the different crops and practices followed in the Shakrullapur, Rora, Theri, Batta, and Bibipur villages of Punjab state. It was found that during the kharif season, most of them cultivate rice. While in the rabi season, wheat was cultivated mostly. Few of them cultivated sorghum and pearl millet for fodder use.

3.1 Crop Grown in Area

Table 2 shows the percentage of farmers and total area of different crops cultivated in five villages: Shakrulla Pur, Rora, Bibipur, Batta, and Fatehpur Therhi, with an overall total of 105 farmers.

For wheat, all villages were cultivated, and it accounted for 71% of the total area. Similarly, paddy was cultivated in all villages except Fatehpur Therhi, and it accounted for 97% of the total area. Sugarcane was cultivated in four villages, and it accounted for 34% of the total area. Mustard was cultivated in all villages, and it accounted for 38% of the total area. Maize was cultivated in three villages, and it accounted for 28% of the total area. Sorghum was cultivated in four villages, and it accounted for 24% of the total area. Berseem was cultivated in all villages, and it accounted for 76% of the total area. Pearl millet was only cultivated in two villages and accounted for 10% of the total area, while cauliflower and potato were cultivated in only one village each and accounted for 5% and 4% of the total area, respectively.

3.2 Seed Variety Grown

The Table 3 provided shows the performance of three different rice varieties in (Shakrulla pur, Rora, Bibipur, Batta, and Fatehpur Therhi) and their overall percentage in terms of yield.

For each rice variety, the table shows the number of farmers that grew the variety and the percentage of farmers that achieved the highest yield. For example, for Basmati rice 1121, 9 out of the 18 farmers (50%) that grew this variety achieved the highest yield in Shakrullapur. Similarly, for PR-26, 13 out of the 25 farmers (52%) achieved the highest yield in Batta.

The overall percentage for each variety is the percentage of all farmers (105 in total) that achieved the highest yield for that variety. For example, the overall percentage for PR-26 is 43%, which means that 43% of all 105 farms achieved the highest yield for this variety and lowest Basmati rice1121 is 26%.

3.3 Wheat Variety Grown

The Table 4 shows the performance of four different wheat varieties in (Shakrulla pur, Rora, Bibipur, Fatehpur Therhi, and Batta) and their overall percentage in terms of yield.

Table 2. Crop grown in area

Sr. no.	Crops	Shakrulla pur (n=18)		Rora (n=19)		Bibipur(n=25)		Batta (n=25)		Fatehpur Therhi (n=18)		Overall(n=105)	
		No.of the farmer(%)	Totalarea (Ha)	No. Of farmers (%)	Totalarea (Ha)	No.of farmers(%)	Total area (Ha)	No. of farmers (%)	Total is a (Ha)	No. of farmers (%)	Total area (Ha)	Percentage%	Total area (Ha)
1.	Wheat	18(100%)	15	19(100%)	12	25(100%)	18	25(100%)	6	18(100%)	20	100%	71
2.	Paddy	18(100%)	10	18(96%)	11	24(96%)	20	24(96%)	6	18(100%)	10	97%	57
3.	Sugarcane	8(44%)	2	9(47%)	2	9(36%)	3	6(24%)	1	4(22%)	1	34%	9
4.	Mustard	10(56%)	4	12(63%)	2	8(32%)	4	5(20%)	1	5(28%)	1	38%	12
5.	Maize	12(67%)	0	5(26%)	1	5(20%)	0	4(16%)	0	3(17%)	0	28%	1
6.	Sorghum	5(28%)	1	4(21%)	1	6(24%)	1	5(20%)	0	3(17%)	1	24%	4
7.	Berseem	15(83%)	0.5	14(74%)	0.5	16(64%)	1	20(80%)	1	15(83%)	0.5	76%	3.5
8.	Peralmillet	0	0	0	0	5(20%)	1	5(20%)	1	0	0	10%	1
9.	Cauliflower	0	0	0	0.5	5(20%)	0.5	0	0	0	0	5%	1
10.	Potato	0	0	0	0	4(16%)	0.5	0	0	0	0	4%	0.5

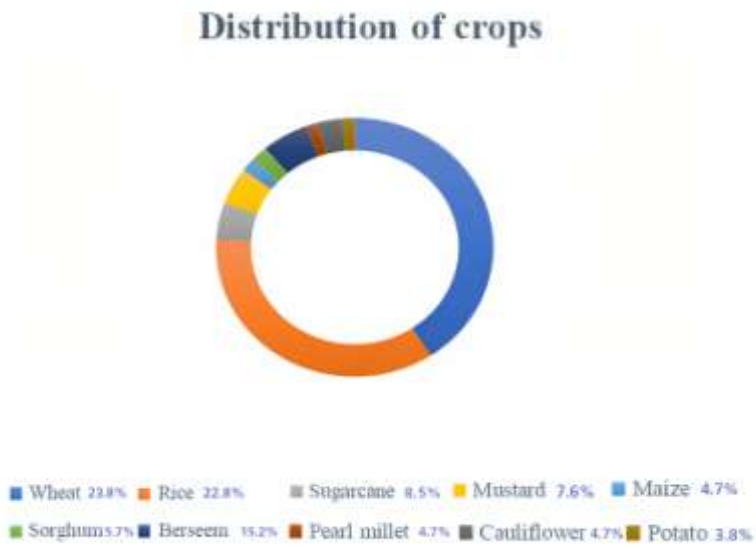

Fig. 2. Distribution of crops

Table 3. Seed variety grown

Sr. No.	Rice variety	Shakrullapur (n- 18)	Rora (n-19)	Bibipur (n-25)	Batta (n-25)	Fatehpur therhi (n-18)	Overall %(N-105)
1.	**Basmati rice 1121**	9(50%)	5(26.%)	3(12%)	4(16%)	6(33.3%)	27 (26%)
2.	**PR-127**	6(33.3%)	8(42.%)	10(4%)	8(32%)	3(16.6%)	35(33%)
3.	**PR-26**	3(16.6%)	6(31.%)	12(48%)	13(52%)	9(5%)	43(43%)

For each wheat variety, the table shows the number of farmers that grew the variety and the percentage of farms that achieved the highest yield. For example, for HD-2967, 10 out of the 18 farmers (55%) that grew this variety achieved the highest yield. Similarly, for DBW-303, only 5 out of the 18 farmers (27.7%) achieved the highest yield.

The overall percentage for each variety is the percentage of all farmers that achieved the highest yield for that variety. For example, the overall percentage for HD-2967 is 43.3%, which means that 43.3% of all 105 farms achieved the highest yield for this variety and the lowest is DBW-303 with the percentage of 12.3%.

Table 4. Wheat variety grown

Sr. No.	Wheat variety	Shakrullapur (n-18)	Rora (n-19)	Bibipur (n-25)	Batta (n-25)	Fatehpur therhi (n-18)	Overall % (N- 105)
1.	**HD-2967**	7(38. 8%)	9(47%)	11(44%)	8(32%	10(55%)	43.3%
2.	**HD-3086**	4(22%)	5(26%)	7(28%)	6(24%)	3(16.6%)	23.3%
3.	**DBW-187**	5(27.7%)	3(15.7%)	5(20%)	5(20%)	3(16.6%)	20%
4.	**DBW-303**	2(11%)	2(10.5%)	2(8%)	6(24%)	2(11%)	12.3%

3.4 Time of Sowing

Table 5. Time of sowing

Sr. no.	Crop	Time of sowing
1.	**Rice**	June-July
2.	**Wheat**	November-December

3.5 The Source of Seed

Most of the respondent farmers bought the seeds for cultivation from input dealers at Kharar or from cooperative societies.

3.6 Method of Sowing

Table 6. Method of sowing

Sr. no.	Crop	Method of sowing
1.	**Rice**	Broadcasting or transplanting
2.	**Wheat**	Broadcasting or drilling like by seed drillor super seeder

3.7 Irrigation Given

Table 7. Irrigation given

Crop/Variety	Source ofirrigation	No of Irrigations	Stage/DAS of irrigation
Rice	Tube well	regular	Sown in water
Wheat	Tube well	4-5 times	20-21 DAS

3.8 Seed Treatment

Most of the farmers were not treating the seed as if it were already pretreated, or it was a hybrid. The other farmers treated the seeds themselves using chemical methods.The remaining marginal portion of farmers left their seeds untreated because of the lack of awareness in their area.

3.9 Weed Management

Weed management may be defined as the procedure by which the harmful effect of weed may be maintained to the minimum level in a place". Or in another way "Weed management is a system by which the infestation of weeds ofa farm or an area is kept to lower than the economic injury level without deteriorating the environment.

The timing ofweed control is important.

- Early weeds are best controlled up to around 21 days after crop establishment, as this is the time when weeds are important in terms of yield losses.
- Later weeds tend to have little effect on crop yields but produce seeds that can create problems for grain quality and harvest, and/or significant weed problems in the subsequent crops.

3.10 Fertilizer Dosage

This Table 8 provides information on recommended fertilizer application rates for wheat and paddy crops in different villages. The recommended rates are given in kilograms per hectare (kg/ha).

For wheat, the recommended rates are 120 kg/ha of nitrogen (N) in the form of urea, 60 kg/ha of phosphorus (P) in the form of DAP, and 40 kg/ha of potassium (K) in the form of potash. The recommended amount of fertilizer application varies slightly across the different villages.

For paddy, the recommended rates are 125 kg/ha of N in the form of urea, 60 kg/ha of P in the form of DAP, and 60 kg/ha of K in the form of potash. The recommended amount of fertilizer application varies across the different villages.

Overall, the recommended amount of fertilizer application for wheat and paddy crops is based on factors such as the crop variety, soil fertility, and previous crop history, among others.

3.11 Plant Protection Observation

Grasshopper insects are an issue for 80% of farmers growing paddy. All farmers in the village of Shakrullapur have noticed this insect in their fields. Aphids were yet another pest that 74% of farmers had to deal with when growing wheat. Aphid infestation in their wheat crops caused yield losses for the majority of the respondents (Table 9).

3.12 Disease Management

Table 10 shows Sheath Bligh in rice crops is an issue for roughly 48% of respondents, and yellow

rust in wheat crops is a problem for about 38% of respondents. Both of these illnesses lower grain quality and crop yield. Dwarf paddy plants was another serious ailment that farmers had to deal with. In their fields, this disease is seen by almost 43% of the responders. Due to this disease's up to 70% yield reduction, the farmers who contract it suffer significant financial losses.

3.13 Harvesting

According to the statistics gathered, the majority of farmers favor combine harvesters for the harvesting of cereal crops like wheat and paddy. Because it takes less time and doesn't require manpower. While only 30% of respondents choose hand harvesting, around 70% of respondents use combine harvesters to harvest their paddy and wheat crops. Only 30% of farmers in the villages of Shakrullapur and Batta who responded prefer manual harvesting to the combine. In contrast to 67% of other villages, 33% of Rora's harvest is done manually. 75% combine harvesting, 25% manual harvesting at Bibipur and Theri. Because the grains of paddy types like Basmati, 1121, etc. are long and thin, farmers typically favour manual harvesting of these varieties. Therefore, farmers harvest the grain by hand to prevent any damage.

3.14 Availability of Storage Structures

Overall, the Table 12 shows that the majority of farmers in all the villages do not have adequate storage units. Specifically, 43% of farmers from all the villages have no storage units, which could pose significant challenges for the farmers in storing their produce and protecting them from spoilage, pests, and other issues.

3.15 Yield

The Table 13 shows average wheat crop yield is about 30 qtls/ha; village Batta has the most productivity (37 qtls), while village Rora has the lowest productivity (31 qtls). Overall, there are 30 qtls/ha of wheat produced on average. However, the villages of Shakrullapur and Batta have the highest paddy crop productivity (65 qtls/ha), while Bibipur has the lowest (57 qtls), resulting in an average production of 65 qtls/ha. The production of wheat and paddy is lower this year compared to last year and to the production rate in the past because of excessive rainfall during harvest season.

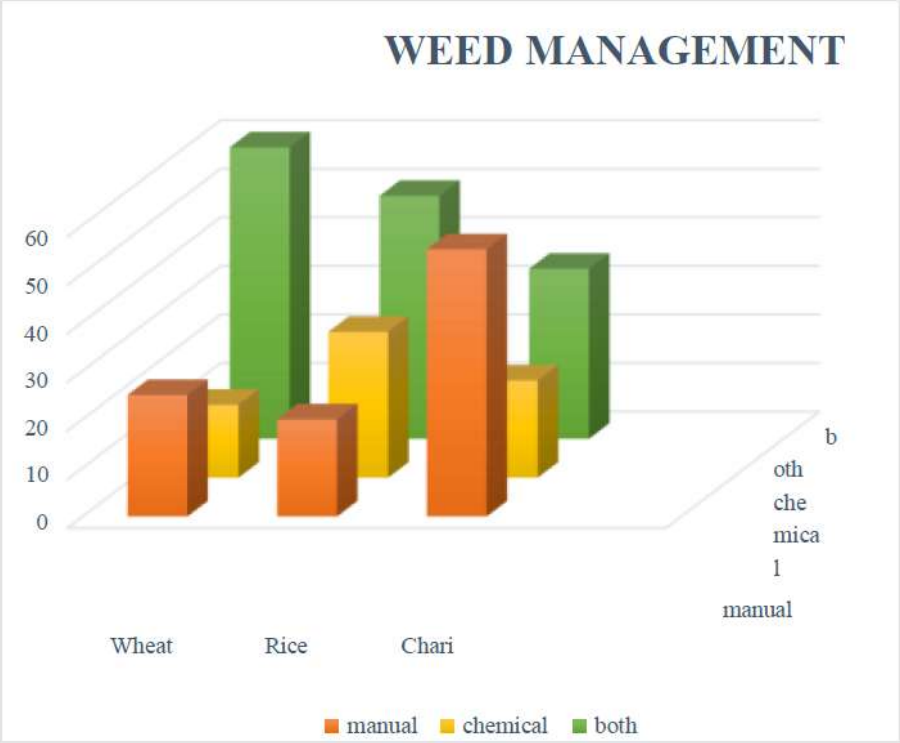

Fig. 3. Weed Management

Table 8. Fertilizer dose

Sr No.	Fertilizers	Shakrullapur (n-18)	Rora (n-19)	Bibipur (n-25)	Batta (n-25)	FatehpurTherhi (n-18)	Overall(kg/ha)	Recommended
Wheat								
1.	**Urea/ha**	300 kg/ha	275 kg/ha	324 kg/ha	300 kg/ha	315 kg/ha	302.8	120 N
2.	**DAP/ha**	250 kg/ha	187 kg/ha	200 kg/ha	170 kg/ha	200 kg/ha	201.4	60 P
3.	**Potassium/ha**	-	-	-	-	-	-	40 K
Paddy								
1.	**Urea/ha**	325 kg/ha	300 kg/ha	300 kg/ha	315 kg/ha	325kg/ha	313	125 N
2.	**DAP/ha**	187 kg/ha	150 kg/ha	125 kg/ha	185 kg/ha	150kg/ha	159.4	60 P
3.	**Potassium/ha**	**-**	**-**	**-**	**-**	**-**	**-**	60 K

Table 9. Plant protection observation

Sr.No	Parameters	Crop	Shakrulla pur (n-18)	Rora (n-19)	Bibipur (n-25)	Batta (n-25)	Fatehpur therhi (n-18)	Overall %
1.	**Grasshopper**	Paddy	15(83%)	16(84%)	20(80%)	21(84%)	12(67%)	80%
2.	**Leaf folder**	Paddy	14(78%)	15(79%)	16(64%)	18(72%)	15(83%)	74%
3.	**Aphids**	Wheat	16(89%)	14(74%)	18(72%)	16(64%)	14(78%)	74%
4.	**Beetles**	Wheat	17(94%)	18(95%)	21(84%)	20(80%)	12(67%)	84%

Table 10. Disease management

Sr. No.	Parameters	Crop	Shakrullapur (n- 18)	Rora (n-19)	Bibipur(n-25)	Batta (n-25)	Fatehpurtherhi (n-18)	Overall %
1.	**Sheathblight**	Paddy	7(39%)	8(4%)	7(28%)	9(36%)	9(50%)	48%
2.	**Dwarf plant disease**	Paddy	8(44%)	9(4%)	9(36%)	10(40%)	8(44%)	43%
3.	**Yellowrust**	Wheat	9(50%)	8(4%)	12(48%)	13(52%)	8(44%)	38%
4.	**Loosesmut**	Wheat	8(44%)	7(37%)	10(40%)	11(44%)	9(50%)	42%
5.	**Black rot**	Cauliflower	0	0	4(16%)	0	5(28%)	9%
6.	**White rust**	Mustard	10(56%)	6(32%)	5(20%)	5(20%)	4(22%)	29%
7.	**Red rot**	Sugarcane	6(33%)	7(37%)	8(32%)	5(20%)	3(17%)	28%
8.	**Red stripe**	Sugarcane	5(28%)	4(21%)	5(20%)	3(12%)	3(17%)	19%

Table 11. Harvesting

Crop	Maturity indices for harvesting	Method of harvesting
Rice	color observation- straw colored, grains arehard when chewed	Thresher, combine harvester
Wheat	Yellowing of spikelet	Thresher, combine harvester

Table 12. Availability of storage structures

Sr. no.	Storage	Shakrullapur (n-18)	Rora (n-19)	Bibipur(n-25)	Batta(n-25)	Theri (n-18)	Overall %
1.	**1-2 units**	9(50%)	5(26.3%)	3(12%)	4(16%)	6(33.3%)	27 (26%)
2.	**3-4 units**	6(33.3%)	8(42.1%)	10(4%)	8(32%)	3(16.6%)	35(33%)
3.	**None**	3(16.6%)	6(31.5%)	12(48%)	13(52%)	9(5%)	43(43%)

Table 13. Yield

Sr. No.	Crop	Shakrullapur (n-18)	Rora (n-19)	Bibipur(n-25)	Batta(n-25)	Theri(n-18)	Average production
1.	**Wheat**	33 qtls/ha	30 qtl/ha	35 qtls/ha	37 qtls/ha	31 qtls/ha	**30 qtls/ha**
2.	**Paddy**	65 qtls/ha	60 qtls/ha	57qtls/ha	65 qtls/ha	62 qtls/ha	**65 qtls/ha**

Table 14. Problems

Sr. No.	Questions	Shak rullapur (n-18)	Rora (n- 19)	Bibipur (n-25)	Batta (n-25)	Therhi (n-18)	Overall % N-105
1.	Are you facing any issues whileprocuring seeds?	5(27%)	4(21%)	7(28%)	5(20%)	3(16%)	24(22%)
2.	Are you facing any issues while procuring manure and fertilizer?	2(11%)	3(15%)	2(8%)	0	1(5%)	8(7%)
3.	Are you facing any issues while applying manure and fertilizer?	2(11%)	1(5%)	0	1(4%)	1(5%)	5(4%)
4.	Are you facing any issues related toirrigation?	6(33%)	8(42%)	9(36%)	7(28%)	4(22%)	34(32%)
5.	Are you facing any issue in buying orrenting farm equipment or machinery	2(11%)	4(21%)	6(24%)	4(16%)	3(16%)	19(18%)
6.	Are you getting updates regardingthe new Govt. schemes and plans?	6(33%)	8(42%)	12(48%)	17(68%)	9(50%)	52(49%)
7.	Are the Agriculture officers/ KVKsguiding you properly?	2(11%)	3(15%)	5(20%)	8(32%)	1(5%)	19(18%)
8.	Are you facing any issues duringharvesting the crop?	5(27%)	8(42%)	6(24%)	8(32%)	4(22%)	31(29%)
9.	Are you facing any issues duringstorage of seeds?	7(38%)	8(42%)	6(24%)	9(36%)	7(38%)	37(35%)
10.	Are you getting the expected sellingprice of your product?	2(11%)	1(5%)	3(12%)	2(8%)	1(5%)	9(8%)
11.	Are you facing any issues whileselling your product?	9(50%)	5(26%)	8(32%)	12(48%)	4(22%)	38(36%)

Fig. 4. Harvesting

3.16 Problems

The Table 14 provides data on the percentage of farmers facing issues related to various aspects of agriculture in different villages. The data is arranged in descending order based on the overall percentage of farmers facing issues across all villages.

1. Issue related to irrigation: The highest percentage of farmers facing issues related to irrigation was reported in Therhi (68%), followed by Rora (42%), Bibipur (36%), Shakrullapur (33%), and Batta (28%). The overall percentage of farmers facing issues related to irrigation was 32%.
2. Issue related to selling the product: The highest percentage of farmers facing issues while selling their product was reported in Shakrullapur (50%), followed by Bibipur (48%), Therhi (48%), Rora (26%), and Batta (22%). The overall percentage of farmers facing issues while selling their product was 36%.
3. Issue related to storage of seeds: The highest percentage of farmers facing issues related to storage of seeds was reported in Shakrullapur (38%), followed by Therhi (38%), Batta (36%), Rora (42%), and Bibipur (24%). The overall percentage of farmers facing issues related to storage of seeds was 35%.
4. Issue related to getting updates regarding the new Govt. schemes and plans: The highest percentage of farmers not getting updates regarding the new Govt. schemes and plans was reported in Shakrullapur (33%), followed by Rora (33%), Bibipur (48%), Batta (50%), and Therhi (50%). The overall percentage of farmers not getting updates regarding the new Govt. schemes and plans was 49%.

4. CONCLUSION

According to the study's findings, wheat, paddy, mustard, sugarcane, maize, berseem, cauliflower, and carrot are the main crops farmed in these areas. Farmers only applied seed at the recommended rate in 58% of cases [8]. Farmers frequently applied more fertiliser than was advised to boost output, with the exception of MOP, where there was already a surplus of potash in the soil. Eighty percent of farmers used seeds that had already been fungicide-treated. Crops typically receive 3–4 irrigations per season [9]. Each farmer has made extensive use of organic manure, with FYM being the most common (75%). Phalaris minor proved to be tough for the farmers to control and was ultimately uncontrollable. PR-26 and PR-127 were the two main seed variety used in the rice variety season [10]. A significant pest invasion of Grass hoppers and aphids was observed. Major diseases that affect fields include brown rust, false smut, sheath blight, and leaf spot. Nativo was used by every farmer to control illness, with some also using mancozeb and propiconazole. Farmers received yields for wheat and paddy that ranged from 30 to 65 qtls/ha. Farmers may grow a wide range of crops during the Kharif season, including maize, which can be utilized as

both a cereal crop and a fodder crop. Farmers should also plant rice using the direct sowing technique since it requires less water than transplanting paddy crops. In this location, farmers use fertilizers in an imbalanced way and are less aware of the value of soil testing. More emphasis is placed on phosphoric and nitrogen-based fertilizers. To stay informed about the health of their soil and the state of their macro- and micronutrients, farmers should do routine soil testing. In accordance with the soil's nutritional state, they should also provide the crop with the appropriate amount of nutrients. Production and financial position may be enhanced via the use of these agronomic methods.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mann RS. Cropping pattern in Punjab (1966-67 to 2014-15). Economic and Political Weekly. 2017;52(3):30-33.
2. Kibue GW, Pan G, Zheng J, Zhengdong L, Mao L. Assessment of climate change awareness and agronomic practices in an agricultural region of Henan Province, China. Environment, Development and Sustainability. 2015 Jun; 17:379-91.
3. Kuyah S, Sileshi GW, Nkurunziza L, Chirinda N, Ndayisaba PC, Dimobe K, Öborn I. Innovative agronomic practices for sustainable intensification in sub-Saharan Africa. A review. Agronomy for Sustainable Development. 2021 Apr;41:1-21.
4. level of farmers regarding agronomic practices of direct seeded rice in Punjab. International Journal of Farm Sciences. 2015;5(1):206-209.
5. Frimpong-Manso J, Tham-Agyekum EK, Aidoo DC, Boansi D, Jones EO, Bakang JE. Cooperative Membership Status And Adoption Of Good Agronomic Practices: Empirical Evidence From Cocoa Farmers In Atwima Mponua District, Ghana. The Bangladesh Journal of Agricultural Economics. 2022 Jul 9;43(1):1-7.
6. Negera M, Alemu T, Hagos F, Haileslassie A. Determinants of adoption of climate smart agricultural practices among farmers in Bale-Eco region, Ethiopia. Heliyon. 2022 Jul 1;8(7):e09824.
7. Kaur K, Kaur P, Dhaliwal RK. Knowledge Parmar D, Vardhini BV. Impact of recent agricultural practices on food safety and human health–A case study in Armoor Mandal of Nizamabad District. Journal of Global Biosciences. 2016;5(9):4568-4578.
8. Singh H, Chopra S, Singh G. Agronomic Practices Followed by Farmers in Order to Attain Maximum Yield. Asian Journal of Agricultural Extension, Economics & Sociology. 2022;40(12):84-92.
9. Tanda Amarjit S, ed. Advances in Integrated Pest Management Technology: Innovative and Applied Aspects. Springer Nature; 2022.
10. Earnest CA. Essentials of Agricultural Science for Schools and Colleges in West Africa. Anie with God Enterprise, Lagos, Nigeria. 1995;73-76.

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