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Agronomic Practices Followed by Farmers in Order to Attain Maximum Yield

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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

In India, Agriculture has 65% of total population directly dependent on itself making it the backbone of the Indian economy. The farmer while producing crops aims at getting maximum yields. A study on agronomic practices followed by 120 farmers from three villages viz. Hasanpur (42 farmers), Kalewal 54 farmers), Singhpura 24 farmers) was carried out. Major crops cultivated were known to be wheat, paddy, mustard, sugarcane, maize, berseem, cauliflower and carrot. The collected from the respondents included the seed rate, fertilizer dosage, seed treatment, number of irrigations provided, organic manure used, major weeds infesting the fields, herbicides used, major pest attacking crops, pesticides used, major diseases infesting the fields, disease chemicals used and yield range of crops. The findings of the study showed the practices followed by the farmers in the fields for optimum crop stand and get maximum yields.

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Keywords: Agriculture; farmer; agronomic practices; major crops; optimum crop stand; yield.

1. INTRODUCTION

Agriculture in India is a major economic sector and it is the backbone of Indian Economy. About 65% of Indian population directly depend on agriculture. Therefore, education on agriculture is an important tool in ensuring increase in agricultural productivity along with sustainability in productivity, environmental & ecological security, technical feasibility, job security and equity in distribution. Punjab's contribution towards India's food self-suffi ciency has been widely acknowledged (Mann et al).

In crop production, the ultimate goal of any farmer is to get maximum yield per unit area. To obtain high yield, effective crop management practices, which are otherwise known as cultural practices, appeared to be of paramount value [1,2]. Cultural practices simply refer to all the operations carried out in the farm, right from the beginning of the farming season to the end [3]. Good Agricultural Practices (GAP) are practices "that address Environmental, Economic, and Social Sustainability for on farm processes and result in safe and quality food and non-food agri products" (FAO CAOG 2003 GAP Paper). Agronomic Practices followed by a farmer represent his knowledge about farming and his experience in it.

1.1 Objectives

- To study about the agronomic practices followed by the respondent farmers.
- To Check the knowledge of respondents on recommended doses of chemicals, fertilizers and seeds.

2. METHODOLOGY

The study was conducted in three villages viz. Hasanpur, Kalewal and Singhpura. An extensive interview was planned to gather data. Going from home to home and collecting data and providing certain information by verbally requesting relating to their scepticism. A questionnaire was prepared for data collection which was the basis of the interview. Analysing the amount of input produced by each field and comparing it to scientific theory and some traditional practises. Every question on the questionnaire was answered as completely as possible each day.

A total of 120 respondents were interviewed and the data was collected. From Hasanpur village 42 respondents were interviewed followed by 54 respondents from Kalewal and 24 respondents from Singhpura village making a total of 120. During the survey, land use pattern and cropping pattern were observed to be distributed mainly between two crops i.e., wheat and paddy. Other crops like sugarcane, vegetables and fodder crops constituted a very less area.

3. RESULTS AND DISCUSSION

Over the past ten years, farmer-to-farmer video has been developed as a new method. The videos have affectively increased the capacity of the rural poor to innovate through enhanced skills and knowledge. Farmer-to-farmer videos have helped farmers to teach and learn from each other through the creation of networks enabling the exchange of information and resources. While face-to-face education is costly and unattainable for most rural people, video has proven to be an efficient way to democratize knowledge while engaging farmers with the evolving market, whether they are literate or not. Audio and video based mechanisms are used to support reporting and to build trust among virtual communities of participants and its approach works with existing, people-based extension systems to amplify their effectiveness [4,5]. Local social networks are tapped to connect farmers with experts; the thrill of appearing "on TV" motivates farmers. The local presence makes it possible to connect with farmers on a sustained basis and it emphasizes the development and delivery of digital content to improve the cost-effectiveness of organization extension and the goal is to strengthen existing institutions and groups, not to create new ones Karen (2013). The modern technological know how are being utilized by the Government, Non-Governmental, State Agricultural Universities and private organizations for the purpose of rural development. The advanced communication technologies are incorporated in the field of extension for self-sustainable development of rural areas and in providing them self-sufficiency and decision making power. The advancements of science and technology in the field of agriculture, education, health services, women welfare and grass root development can be applied to ensure an

accountable, responsive and citizen friendly atmosphere for rural people [6,7]. Learning is made easier when ideas are expressed in pictures and that 70% of communication to individuals is non-verbal such that visual presentation helps to overcome illiteracy and language barriers [8]. Video films based on new agricultural technologies appear to be an appropriate extension tool. This medium is suited for the transmission of skills, information and knowledge allows for t.

3.1 Major Crops grown

Data represented in the Table 1 shows the crops grown by the farmers in a year. The overall majority of farmers (100%) grow wheat followed by 75% paddy. More other crops are also being cultivated like 45 % farmers grow mustard, 25% grow maize, 25% fodder, 10 % cole crops, 5% sugarcane and 5% carrot.

Data represented in the Table 2 shows that how many farmers stick to the recommended seed rate and how many farmers use seed above recommended level. Overall majority of farmers (55%) use seed above recommendation and 45% sticked to the recommended level.

In Hasanpur, 57% apply more seed and 43% apply recommended seed rate. In Kalewal, 56% apply recommended seed rate and 44% apply above recommendation. In Singhpura, 75% farmers apply more seed while 25% stick to recommendations.

3.2 Fertilizer Dose

Table 3 represents the data of dose of urea applied according to recommendation, above recommendation and below recommended level. Overall, 75% farmers applied urea above recommended level, 20% applied recommended dose and 5% use less than recommended.

In Hasanpur, 72% farmers applied urea above recommended level, 14% applied recommended dose and 14% use less than recommended. In Kalewal, 67% farmers applied urea above recommended level and 33% applied recommended dose. In Singhpura, 100% farmers applied urea above recommended level.

Table 1. Crops grown by respondent farmers

Sr. No.	Crops Grown	Hasanpur	Kalewal	Singhpura	Overall
1.	Wheat	100%	100%	100%	100%
2.	Paddy	57%	78%	100%	75%
3.	Mustard	42.8%	44.45%	50%	45%
4.	Sugarcane	0	12%	0	5%
5.	Maize	42.8%	22.2%	0	25%
6.	Berseem	28.5%	22.2%	25%	25%
7.	Cauliflower	14.2%	11.1%	0	10%
8.	Carrot	0	11.1%	0	5%

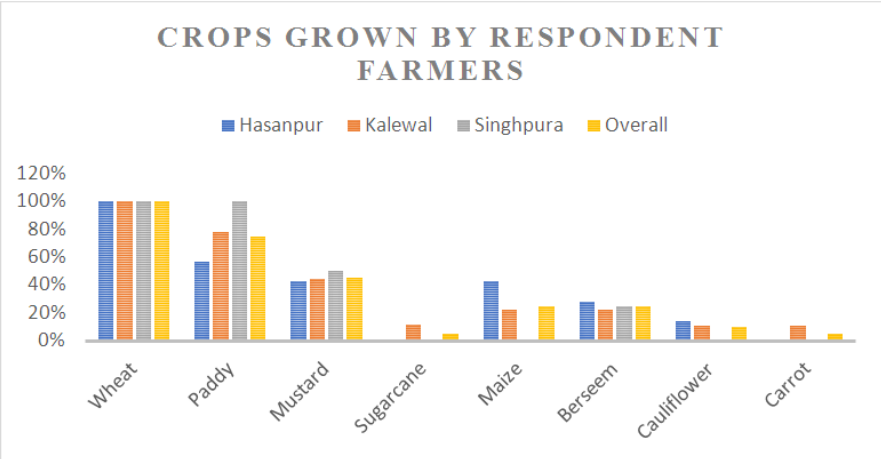

Fig. 1. Crops grown by respondent farmers

Table 2. Seed rate

Sr. No.	Seed Rate	Hasanpur	Kalewal	Singhpura	Overall
1.	Recommended	43%	56%	25%	45%
2.	Above Recommended	57%	44%	75%	55%

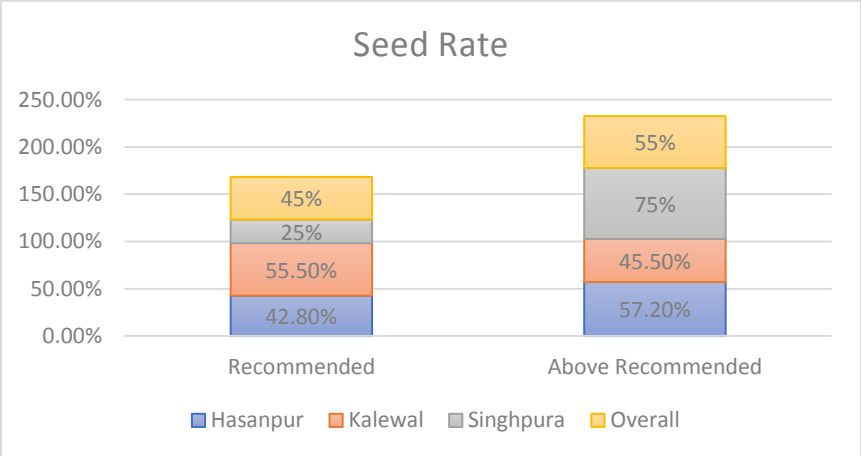

Fig. 2. Seed Rate

Table. 3. Dose of Urea applied

Sr. No.	Urea	Hasanpur	Kalewal	Singhpura	Overall
1.	Recommended	14%	33%	0	20%
2.	Below Recommended	14%	0	0	5%
3.	Above Recommended	72%	67%	100%	75%

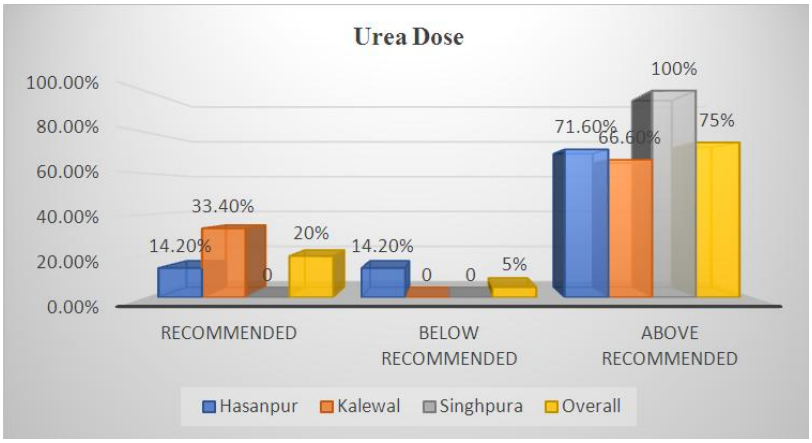

Fig. 3. Dose of Urea applied

Table 4. Dose of DAP applied

Sr. No.	DAP	Hasanpur	Kalewal	Singhpura	Overall
1.	Recommended	43%	45%	25%	40%
2.	Below Recommended	0	23%	0	10%
3.	Above Recommended	57%	34%	75%	50%

Table 4 represents the data of dose of DAP applied according to recommendation, above recommendation and below recommended level. Overall, 50% farmers applied DAP above recommended level, 40% applied recommended dose and 10% use less than recommended.

In Hasanpur, 57% farmers applied DAP above recommended level and 43% applied recommended dose. In Kalewal, 45% farmers applied DAP at recommended level, 34% applied above recommended dose and 23% use less than recommended. In Singhpura, 75% farmers applied DAP above recommended level and 25% applied recommended dose.

Table 5 represents the data of dose of MOP applied according to recommendation and below recommended level. Overall, 70% farmers applied MOP below recommended level and 30% applied recommended dose.

In Hasanpur, 72% farmers applied DAP above recommended level and 28% applied recommended dose. In Kalewal, 66% farmers applied MOP below recommended level and 34% applied recommended dose. In Singhpura, 75% farmers applied MOP below recommended level and 25% applied recommended dose.

- Varieties of wheat majorly cultivated- DBW-187, DBW-222, 3086,2967
- Varieties of Paddy majorly cultivated- PR-121, PR-126, PR-131, 1509, 1121, Sava 134.

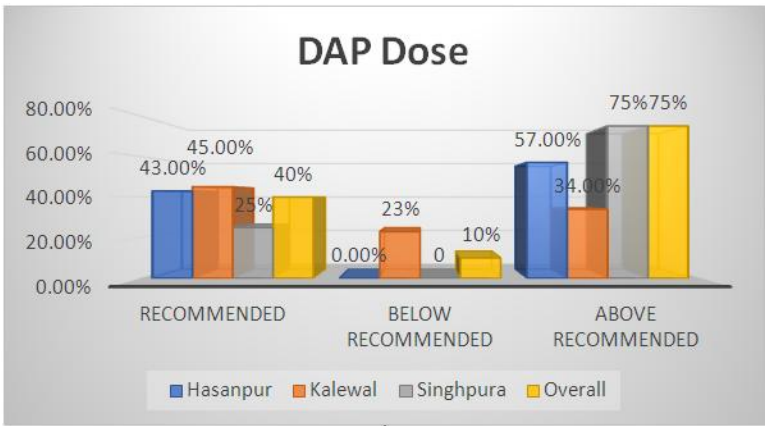

Fig. 4. Dose of DAP applied

Table 5. Dose of MOP applied

Sr. No.	MOP	Hasanpur	Kalewal	Singhpura	Overall
1.	Recommended	28%	34%	25%	30%
2.	Below recommended	72%	66%	75%	70%

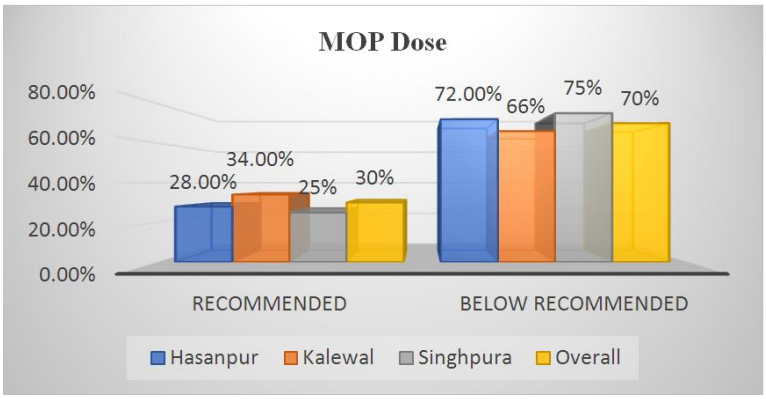

Fig. 5. MOP Dose

Table 7 represents that majority of farmers (55%) apply 3-4 irrigations in a season in their fields followed by 40% applying 5-6 irrigations and 5% applying 1-2 irrigations.

Table 8 represents the data of organic manures used by the respondent farmers. Overall, 75% farmers use FYM followed by 15% farmers using Compost and 10% farmers using Poultry manure. In Hasanpur, 72% farmers used FYM and 28% used Compost. In Kalewal, 66% farmers use FYM, 22% used Poultry manure and 12% used Compost. In Singhpura, 100% farmers used FYM.

Table 9 represents the data of major weeds that infested the fields of the respondents. Majority of farmers (100%) had heavy infestation of *Phalaris minor* followed by 20% with the problem of Wild oat and 60% with broadleaf weeds.

Table 10 represents the data of the major herbicides used by the farmers which include 80% of farmers using Nominee gold, 60% using Avkira, 25% using Axial, 20% using Ptretilachlor, 10% using Leader and 5% using Sencor.

Data represented in Table 11 shows the pests that affect the farmers' crops. Overall, 90% farmers were affected by Plant hopper, 90% were affected by Aphids, 60% by Termites, 50% by stem borer and 40% by Leaf folder.

Table 6. Seed Treatment

Sr. No.	Seed Treatment	Hasanpur	Kalewal	Singhpura	Overall
1.	Use already treated seed	71%	78%	100%	80%
2.	Use fungicide	29%	22%	0	20%

Table 7. No. of irrigations provided

Sr. No.	No. of irrigations	Hasanpur	Kalewal	Singhpura	Overall
1.	1-2	0	11%	0	5%
2.	3-4	43%	67%	50%	55%
3.	5-6	57%	22%	50%	40%

Table 8. Organic manure applied

Sr. No.	Organic Manure	Hasanpur	Kalewal	Singhpura	Overall
1.	FYM	72%	66%	100%	75%
2.	Poultry Manure	0	22%	0	10%
3.	Compost	28%	12%	0	15%

Table 9. Major weeds

Sr. No.	Major weed	Percentage
1.	*Phalaris minor*	100%
2.	Wild oat	20%
3.	Broadleaf weed	60%

Table 10. Herbicides used

Sr. No.	Herbicide	Percentage
1.	Axial	25%
2.	Leader	10%
3.	Avkira	60%
4.	Sencor	5%
5.	Nominee Gold	80%
6.	Pretilachlor	20%

Table 11. Major pests observed

Sr. No.	Major pest	Hasanpur (42 farmers)	Kalewal (54 farmers)	Singhpura (24 farmers)	Overall (120 farmers)
1.	Stem borer	(18) 43%	(30) 56%	(12) 50%	(60) 50%
2.	Leaf Folder	(12) 29%	(24) 44%	(12) 50%	(48) 40%
3.	Plant hopper	(42) 100%	(48) 89%	(18) 75%	(108) 90%
4.	Aphids	(42) 100%	(54) 100%	(12) 50%	(108) 90%
5.	Termites	(30) 71%	(30) 56%	(12) 50%	(72) 60%

Table 12. Major pesticides used

Sr. No.	Pesticide	Hasanpur (42 farmers)	Kalewal (54 farmers)	Singhpura (24 farmers)	Overall (120 farmers)
1.	Chloropyriphos	(24) 57%	(36) 67%	(24) 100%	(84) 70%
2.	Imidacloprid	(12) 29%	(24) 44%	(12) 50%	(48) 40%
3.	Coragen	(36) 86%	(48) 89%	(24) 100%	(108) 90%

Table 13. Major diseases observed

Sr. No.	Disease	Hasanpur (42 farmers	Kalewal (54 farmers)	Singhpura (24 farmers)	Overall (120 farmers)
1.	Brown Rust	(42) 100%	(36) 67%	(24) 100%	(102) 85%
2.	Sheath Blight	(42) 100%	(42) 78%	(24) 100%	(108) 90%
3.	False smut	(30)71%	(36) 67%	(18) 75%	(84) 70%
4.	Leaf spot	(30) 71%	(30) 56%	0	(60) 50%

Table 14. Disease Control chemicals used

Sr. No.	Disease Control Chemical	Hasanpur (42 farmers)	Kalewal (54 farmers)	Singhpura (24 farmers)	Overall (120 farmers)
1.	Nativo	(42) 100%	(54) 100%	(24) 100%	(120) 100%
2.	Propiconazol	(12) 29%	(18) 33%	(36) 25%	(36)30%
3.	Mancozeb	(18) 43%	(24) 45%	(18) 75%	(60)50%

Table 15. Wheat yield

Sr. No.	Wheat Yield/acre	Hasanpur	Kalewal	Singhpura	Overall
1.	15-20q	57%	34%	50%	45%
2.	21-25q	43%	55%	50%	50%
3.	More than 25q	0	11%	0	5%

Data represented in Table 12 shows the pesticides used by the farmers. Overall, 90% farmers use Coragen, 70% use Chloropyriphos and 40% use Imidacloprid.

Data represented in Table 13 shows the diseases that affect the farmers' crops. Overall, 90% farmers were affected by Sheath blight, 85% were affected by Brown rust, 70% by False smut and 50% by Leaf spot.

Data represented in Table 14 shows the disease control chemicals used by the farmers. Overall, 100% farmers use Nativo, 50% use Mancozeb and 30% use Propiconazol.

The Table 15 represents that 50% farmers get wheat yield in the range of 21-25 q/acre while, 45% get in the range of 15-20 q/acre and only 5% got yield above 25q/acre.

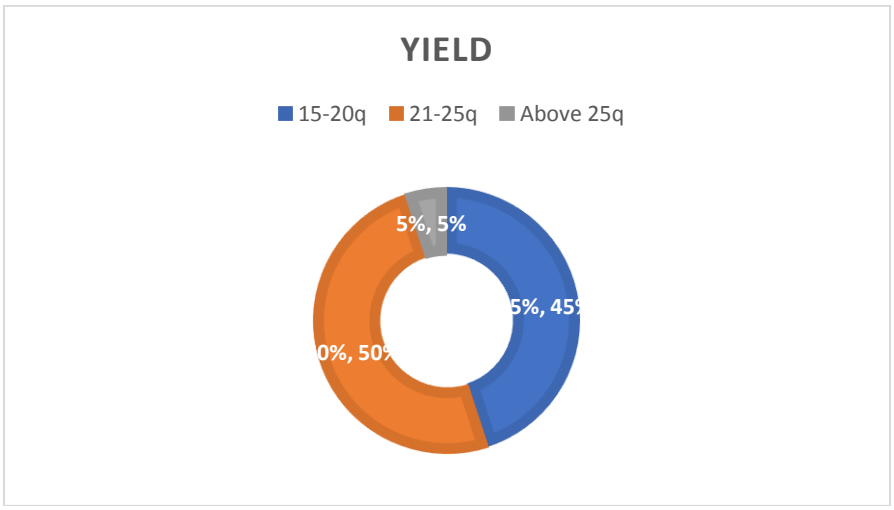

Fig. 6. Wheat yield

Table 16. Paddy yield

Sr. No.	Paddy Yield/acre	Hasanpur	Kalewal	Singhpura	Overall
1.	15-20q	57%	45%	50%	50%
2.	21q-25q	43%	55%	50%	50%

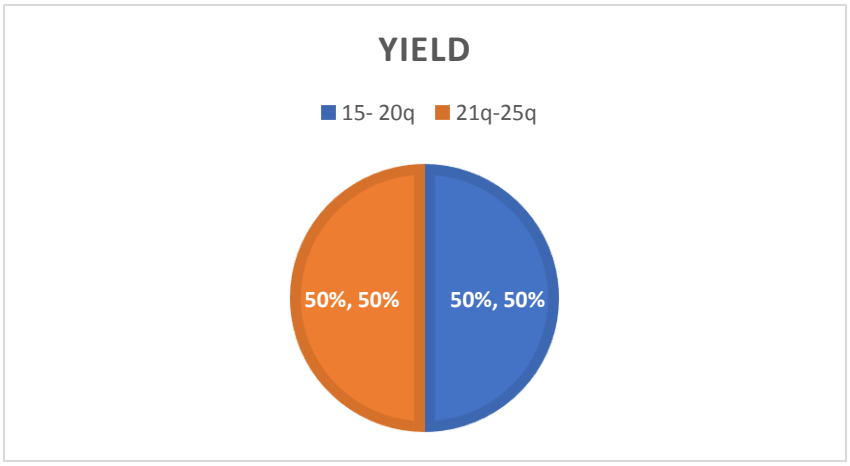

Fig. 7. Paddy Yield

The Table 16 represents that 50% farmers got wheat yield in the range of 21-25 q/acre while and 50% got in the range of 15-20 q/acre.

4. CONCLUSION

The findings of this study conclude that the major crops grown in these villages are wheat, paddy, mustard, sugarcane, maize, berseem, cauliflower and carrot. Only 55% farmers used seed according to recommended seed rate. To increase productivity, farmers exceeded the fertilizer dose recommended level except in case of MOP as there is abundance of potash already present in the fields. 80% farmers used seeds already treated with fungicides. Mostly 3-4 irrigations are provided to the crops in a season. Organic manure has been used significantly by every farmer in which FYM is the most used (75%). Every farmer had difficulty in controlling *Phalaris minor* which proved to be uncontrollable by the farmers. In wheat season major herbicide used was Avkira and Nominee Gold in case of paddy. Major pest infestation of plant hopper and aphids was seen & chloropyriphos and coragen are the major pesticides used to control pests. Brown rust, false smut, sheath blight and leaf spot are known to be major diseases infesting

the fields. Every farmer used Nativo as disease control chemical with some farmers using mancozeb and propiconazole. In case of wheat and paddy, farmers got yields ranging 21-25q.

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 52.3. 2017:30-33.
2. Tanda, Amarjit S, ed. Advances in Integrated Pest Management Technology: Innovative and Applied Aspects. Springer Nature; 2022.
3. Earnest CA. Essentials of Agricultural Science for Schools and Colleges in West Africa. Anie with God Enterprise, Lagos, Nigeria. 73 – 76
4. Deepak Parmar, B. Vidya Vardhini, Impact of Recent Agricultural Practices on Food Safety and Human Health – A Case Study in Armoor Mandal of Nizamabad District.
5. Kaur, Kamalpreet, Prabhjot Kaur, R. Dhaliwal K. Knowledge level of farmers regarding agronomic practices of direct seeded rice in Punjab. International Journal of Farm Sciences 5.1. 2015:206-209.
6. The India GAP (Part 1- Crop Base) of Bureau of Indian Standards (BSI).
7. Hadole SM. Socio-economic status of farmers adopting different farming systems in Ratnagiri district. M. Sc. (Agri.) B. B. K. K. V., Dapoli.
8. Adams, Dennis A, Ryan Nelson R, Peter A. Todd. Perceived usefulness, ease of use, and usage of information technology: A replication. MIS quarterly. 1992:227-247.

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