



Knowledge Gap of Agri-input Dealers in Farm Production

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Authors' contributions

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

Article Information

DOI: 10.9734/CJAST/2020/v39i430535

Editor(s):

(1) Dr. Orlando Manuel da Costa Gomes, Lisbon Accounting and Business School (ISCAL) and Lisbon Polytechnic Institute, Portugal.

Reviewers:

(1) Shaik Mohammad Shameer, Potti Sreeramulu Telugu University, India.
(2) Olutosin A. Otekunrin, Federal University of Agriculture, Abeokuta, Nigeria.
Complete Peer review History: <http://www.sdiarticle4.com/review-history/55986>

Received 24 January 2020

Accepted 30 March 2020

Published 01 April 2020

Original Research Article

ABSTRACT

Agri-input dealers are those who sell farm inputs (fertilizers, seeds, pesticides, etc.) to the farmers and also provide extension services to the farmers. Agri-input dealers are playing a most important role in farm productivity. Most of the Indian farmers are small and marginal farmers having small land holdings and limited resource availability. Hence it is very essential that knowledge related to high quality seeds, fertilizers and chemicals should be provided in raising productivity and income of the farmers by Agri-input dealers. The present study was conducted in Bhagalpur and Vaishali district of Bihar (India) during 2017-19. Data was collected from 120 Agri-input dealers through structured schedule. It was reported that most of the respondents were having secondary level of education and was having experience of 10 to 22 years as an Agri-input dealers. Majority (79.17 per cent) of the Agri-input dealers had received training on insect-pest control measure of different crops. 45.83 per cent of the respondents were having a turn over between 20 to 50 lakhs per annum. It was reported that most of the Agri-input dealers were having less knowledge about the pesticides recommendations, doses, banned pesticides and seed recommendations of various vegetables and cereals. As per the revealed data there is a need of various training programme to be conducted by government institutions and private company to increase the knowledge of the Agri-input dealers. Sensitization of Agri-input dealer is needed regarding health and hygiene.

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Keywords: Agri-input dealers; knowledge gap; agri inputs; Bihar.

1. INTRODUCTION

Agri-input dealers are seller of agricultural inputs such as seeds, fertilizers, crop protection chemicals, farm equipment and machines, veterinary products and animal feeds. Agri-input dealers are playing a most important role in farm productivity. Most of the Indian farmers are small and marginal farmers having small land holdings and limited resource availability. Hence it is very essential that knowledge related to high quality seeds, fertilizers and chemicals should be provided in raising productivity and income of the farmers.

Knowledge is the information that has been put together in a given form into a pool of facts and concepts that can be applied. Knowledge can further be defined as processed information [1]. In the classic knowledge gap hypothesis posited that as the infusion of mass media information into a social system increases, people with higher socioeconomic status tend to acquire this information at a faster rate than people with lower socioeconomic status [2]. Hence according to the above hypothesis there is a need that the Agri-input dealer should be given proper training and exposure to social media in order to get updated with various information and new technologies.

Many information consultancy pattern studies indicated that farmers consult input dealers more frequently than other sources. As per report of National Sample Survey Organization (2005) Agri-input dealers emerged as an important extension service wings for farmers as the input dealers stood second (13.10%) in access to farming community for providing information on modern agriculture technology. Percentage of farmer households accessing information through 'input dealers' was highest in West Bengal (36%), followed by Andhra Pradesh (30%) and Gujarat (24%). However, most of the Agri-input dealers do not have formal agricultural education. If these input dealers can be shaped as para-extension professionals by providing necessary knowledge, they can be professionalized extension service provider and contribute to bring a paradigm shift in Indian Agriculture. Even the Government of India has recognized the power of this category (i.e. input dealers) of extension support to farmers and offers a course at MANAGE specifically targeting input dealers who wish to brush up on the latest technical knowledge in various subsectors of agriculture [3].

Ganiger [4] revealed that the Agri-input dealers belong to three category i.e. young, middle and old age. And the per cent of respondent that belongs to these categories were 31.66, 51.66 and 16.88 per cent respectively and 49.18 per cent of the input dealers had high experience as a dealer of 26 to 36 years, followed by low experience of 6 to 16 years (33.33%) and medium experience of 16 to 26 years (17.49%). He also observed that majority 48.33 per cent of the respondents had medium trainings received followed by low trainings received (34.99%) and high trainings received (16.68%).

Anitha [5] found that majority 77.50 per cent were dealing with combination of inputs, 22.50 per cent of input dealers were dealing with specific inputs and 11 per cent had combined business of seeds and chemicals. The number of farmers that benefited from other services extended to them by the survey Agri-input dealers ranged from 140 (information on soil fertility) to 302 (Information on agronomic practices for improved seeds) for male farmers and from 77 (information on soil fertility) to 152 (Information on agronomic practices for improved seeds). They have become one of the important sources of farm information to the farming community though not equipped with adequate knowledge. The network of dealers has spread to the villages and is accepted as a potent media to reach out to large farming community. In order to enable this network serve the farming community in a better way, they need to be trained in scientific agriculture [6].

2. METHODOLOGY

Ex post facto search design was used for the present study. *Ex post facto* means something done or occurring after an event with a retroactive effect on an event [7]. The study related to selected agriculture based enterprises established some years back and being run with varying degree of success. In the Sampling plan, both purposive sampling and simple random sampling techniques (lottery method) were used. Bhagalpur and Vaishali district was selected purposively from the Bihar state. Sabour, Sonhaura and Goradih (3 blocks) from the Bhagalpur district and Lalganj, Mahua and Goraul (3 blocks) from Vaishali district was selected purposively. Twenty respondents from each block were selected randomly. Hence the

sample size was 120 (hundred twenty) and total number of block was six for the study. A personal interview schedule was specially structured and prepared in order to get relevant data from farmers in face to face situation. Various statistical tools such as frequency, percentage, mean score, standard deviation and ranking were used for data analysis. The Knowledge Gap was assessed with the help of following formula and it was presented in per cent.

$$\text{Knowledge Gap} = \left(\frac{\text{Total no. of questions in the scale} - \text{No. of right answer given by the respondents}}{\text{Total no. of questions in the scale}} \right) \times 100$$

The respondents were then grouped into low, medium and high categories using “Likert type scale”.

3. RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented in Table 1.

The findings regarding socio-economic characteristics of Agri-input dealers are presented in Table 1. It was found that out of the

total samples more than half of the respondents (56.66 per cent) belonged to middle age group (36 to 55 years), followed by 16.67 per cent of young age group (up to 35 years) and 26.67 per cent of old age group (>55 years) respectively. It could be seen from above table that majority (47.50%) of the respondents were having secondary level of educational qualification followed by intermediate level (25.83%), graduation and above (16.66%) and primary level (10.00%). None of the respondents were illiterate. When comes to experience, 73.33 per cent of the Agri-input dealers had medium experience (10 to 22 years) as an Agri-input dealer, followed by high experience of more than 22 years (15.00%) and low experience of up to 9 years (11.67%) and among 120 Agri-input dealers, majority (79.17%) of the Agri-input dealers were received training on insect-pest control measure of different crops followed by on disease management (68.33%), weed management (55.83%), DAESI programme (25.00%) [8], respectively. Table 1 revealed that 45.83 per cent of respondents fall under the category of 20 to 50 lakhs, followed by 30.83 per cent of respondents fall under the category of more than 50 lakhs and 23.34 per cent respondents fall under the category of below the 20 lakhs.

Table 1. Socio-economic profile of selected agri-input dealers

Characteristics	Group	f	%	Mean
Age (in year)	Young (Up to 35 years)	20	16.67	45.91
	Middle (36-55 years)	68	56.66	
	Old (>55 years)	32	26.67	
	Total	120	100	
Educational qualification	Up to primary	12	10.00	
	Up to secondary	57	47.50	
	Up to intermediate	31	25.83	
	Graduation and above	20	16.67	
	Total	120	100	
Experience as a dealer	Low (Up to 9 Years)	14	11.67	15.42
	Medium (10-22 years)	88	73.33	
	High (>22 years)	18	15.00	
	Total	120	100	
Training received	Diploma in agricultural extension services for input dealers (DAESI)	30	25.00	
	Insect-pest control measure	95	79.17	
	Weed management	67	55.83	
	Disease management	82	68.33	
Annual business turn over	Low (Up to 20 lakhs)	28	23.34	3500000
	Medium (20 lakhs to 50 lakhs)	55	45.83	
	High (> 50 lakhs)	37	30.83	
	Total	120	100	

Table 2. Distribution of respondents as per their knowledge gap about pesticides recommendations

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	46	38.33
2	21-40%	46	38.33
3	41-60%	20	16.67
4	61-80%	8	06.67
5	>80%	0	00.00
Total		120	100

Table 3. Distribution of respondents as per their level of knowledge gap about pesticides recommendation

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 15)	16	13.33
2	Medium (Score 16 to 52)	86	71.67
3	High (> Score 52)	18	15.00
Total		120	100

Mean = 33.67, SD = 18.51

Table 4. Distribution of respondents as per their knowledge gap about banned pesticide

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	82	68.33
2	21-40%	24	20.00
3	41-60%	8	06.67
4	61-80%	6	05.00
5	>80%	0	00.00
Total		120	100

Table 5. Distribution of respondents as per their level of knowledge gap about banned pesticide

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 1)	40	33.33
2	Medium (Score 2 to 45)	66	55.00
3	High (> Score 45)	14	11.67
Total		120	100

Mean = 23.00, SD = 22.00

The results regarding knowledge gap about pesticide recommendation (Table 2) revealed that most respondents fall equally in the range of up to 20 per cent and 21-40 per cent category with 38.33 per cent in each category while none of the respondents were present in more than 80 per cent category.

As per Table 3 it was found that 71.67 per cent respondents have medium (Score 16 to 52) level of knowledge gap about pesticides while almost equal number of respondents possess either low or high level of knowledge gap about pesticides.

From the Table 4 results regarding knowledge gap about banned pesticide it could be inferred that most respondents fall under the range of Up to 20 per cent category with 68.33 per cent while none of the respondents were present in more than 80 per cent category.

In the Table 5 it was found that 55.00 per cent respondents have medium (score 2 to 45) level of knowledge gap in banned pesticide followed by 33.33 percent respondents have low (Up to score 1) and 11.67 per cent respondents have high (> score 45) level of knowledge gap about banned pesticide.

Table 6. Distribution of respondents as per their knowledge gap in seed rate recommendation for cereal

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	43	35.83
2	21-40%	54	45.00
3	41-60%	10	08.33
4	61-80%	8	06.67
5	>80%	5	04.17
	Total	120	100

Table 7. Distribution of respondents as per their level of knowledge gap in seed rate recommendation for cereal

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 15)	02	01.67
2	Medium (Score 16 to 50)	105	87.50
3	High (> Score 50)	13	10.83
	Total	120	100

Mean = 32.77, SD = 17.81

Table 8. Distribution of respondents as per their knowledge gap in seed rate recommendation for vegetable

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	76	63.33
2	21-40%	26	21.67
3	41-60%	16	13.33
4	61-80%	2	01.67
5	>80%	0	00.00
	Total	120	100

Table 9. Distribution of respondents as per their level of knowledge gap in seed rate recommendation for vegetable

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 5)	30	25.00
2	Medium (Score 6 to 46)	72	60.00
3	High (> Score 46)	18	15.00
	Total	120	100

Mean = 25.67, SD = 20.77

The findings of Table 6 regarding knowledge gap in seed rate recommendation for cereal revealed that most respondents fall under the range of 21 to 40 per cent category with 45.00 per cent while 04.17 per cent of the respondents were present in more than 80 per cent category.

Table 7 shows that 87.50 per cent respondents have medium (score 16 to 50) level of knowledge gap in cereals related seed rate followed by 10.83 per cent respondents have high (> score 50) and 01.67 per cent respondents have low (up to score 15) level of knowledge gap in seed rate recommendation for cereal.

The results regarding (Table 8) knowledge gap in seed rate recommendation for vegetable revealed that most respondents fall under the range of up to 20 per cent category with 63.33 per cent while none of the respondents were present in more than 80 per cent category.

Table 9 shows that most 60.00 per cent respondents have medium (score 6 to 46) level of knowledge gap in vegetable related seed rate followed by 25.00 per cent respondents have low (up to score 5) and 15.00 per cent respondents have high (> score 46) level of knowledge gap in seed rate recommendation for vegetable.

Table 10. Distribution of respondents as per their knowledge gap in tag colour in seed packet and pesticide container

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	25	20.83
2	21-40%	50	41.67
3	41-60%	28	23.33
4	61-80%	17	14.17
5	>80%	0	00.00
Total		120	100

Table 11. Distribution of respondents as per their level of knowledge gap in tag colour in seed packet and pesticide container

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 27)	25	20.83
2	Medium (Score 28 to 65)	78	65.00
3	High (> Score 65)	17	14.17
Total		120	100

Mean = 46.33, SD = 19.23

Table 12. Distribution of respondents as per their knowledge gap in fertilizer dose

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	20	16.67%
2	21-40%	38	31.67%
3	41-60%	40	33.33%
4	61-80%	18	15.00%
5	>80%	4	03.33%
Total		120	100

Table 13. Distribution of respondents as per their level of knowledge gap in fertilizer dose

Sl. No.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 25)	20	16.67
2	Medium (Score 26 to 60)	78	65.00
3	High (> Score 60)	22	18.33
Total		120	100

Mean= 42.77, SD= 17.38

The findings of Table 10 regarding knowledge gap in tag colour in seed packet and pesticide container noted that most respondents fall under the range of 21 to 40 per cent category with 41.67 per cent while none of the respondents were present in more than 80 per cent category.

The Table 11 shows that 65.00 per cent respondents have medium (score 28 to 65) level of knowledge gap in in tag colour in seed packet and pesticide container followed by 20.83 per cent respondents have low (up to score 27) and 14.17 per cent respondents have high (> score 65) level of knowledge gap in tag colour in seed packet and pesticide container.

From Table 12 regarding knowledge gap in fertilizer dose it could be inferred that most respondents fall under the range of 41 to 60per cent category with 33.33 per cent while 03.33 per cent of the respondents were present in more than 80 per cent category.

The Table 13 shows that 65.00 per cent respondents have medium (score 26 to 60) level of knowledge gap in fertilizer followed by 18.33 per cent respondents have high (> score 60) and 16.67 per cent respondents have low (up to score 25) level of knowledge gap in fertilizer dose.

Table 14. Distribution of respondents as per their knowledge gap in insects and diseases pest management

Sl. no.	Knowledge gap range	Frequency (f)	Per cent (%)
1	Up to 20%	40	33.33%
2	21-40%	42	35.00%
3	41-60%	20	16.67%
4	61-80%	12	10.00%
5	>80%	6	05.00%
Total		120	100

Table 15. Distribution of respondents as per their level of knowledge gap in insects and diseases pest management

Sl. no.	Categories	Frequency (f)	Per cent (%)
1	Low (Up to Score 8)	20	16.67
2	Medium (Score 9 to 57)	82	68.33
3	High (> Score 57)	18	15.00
Total		120	100

Mean = 32.71, SD = 24.80

The results regarding (Table 14) knowledge gap in insects and diseases pest management revealed that most respondents fall under the range of 21 to 40 per cent category with 35.00 per cent while 05.00 per cent of the respondents were present in more than 80 per cent category.

Table 15 shows that most 68.33 per cent respondents have medium (score 9 to 57) level of knowledge gap in insects and diseases followed by 16.67 per cent respondents have low (up to score 8) and 15.00 per cent respondents have high (> score 57) level of knowledge gap in insects and diseases pest management.

Table 16 indicates relationship between various dependent and independent attributes about how each variable is correlated with other variables. The education of the respondents was found to have highly significant and negative correlation (-0.689**) with age of the respondents. Experience of respondents had highly significant and positive correlation with age (0.668**) whereas it had highly significant negative correlation (-0.519**) with education of the respondents. Relation of training with age of the respondents (0.186*) was found to be positively significant and that with education was found to be highly negatively significant (-0.262**) but no significant relation was found between training and experience. Annual business turnover was found to have positive and highly significant relationship with age (0.259**) and experience (0.396**) of the respondents and significant negative correlation

(-0.233*) with education of the respondents and no relationship with training of the respondents. The age of the respondents was found to have significant and negative correlation (-0.218*) with knowledge gap in fertilizer. Experience of respondents had significant and negative correlation (-0.207) with knowledge gap in seed rate recommendation for cereal. Training was found to have highly negative relationship with knowledge gap in seed rate recommendation for vegetable (-0.307**) and highly significant and negative relationship with knowledge gap in tag colour in seed packet and pesticide (-0.271**).

This implies that as the age of the respondents' increase, so the formal education pursuing possibility will reduce. According to the above table as the respondents' age increases the experiences, training and annual business turnover also increases but in case of knowledge gap in fertilizer dose decrease simultaneously. As per the above table education of the respondents' increase the experiences, training and annual business turnover also decrease simultaneously. As per the table experiences of Agri-input dealers' increase the annual business turn over increase but knowledge gap in seed rate recommendation for cereal decreases simultaneously. This table implies that the training received by Agri-input dealers' increase the Knowledge gap in seed rate recommendation for vegetable and knowledge gap in tag colour in seed packet and pesticide container also decreases simultaneously.

Table 16. Correlation matrix between socio-economic variables and knowledge gap variables of the agri-input dealers

Attributes	(X₁)	(X₂)	(X₃)	(X₄)	(X₅)	(X₆)	(X₇)	(X₈)	(X₉)	(X₁₀)	(X₁₁)	(X₁₂)
Age (X ₁)	1											
Education (X ₂)	-0.689**	1										
Experience (X ₃)	0.668**	-0.519**	1									
Training (X ₄)	0.186*	-0.262**	0.082	1								
Annual business turn over (X ₅)	0.259**	-0.233*	0.396**	0.086	1							
Knowledge gap about pesticiderecommendation (X ₆)	-0.082	0.177	0.097	0.073	0.004	1						
Knowledge gap about banned pesticide (X ₇)	-0.021	0.047	-0.169	-0.130	-0.065	-0.035	1					
knowledge gap in seed rate recommendation for cereal (X ₈)	-0.168	0.109	-0.207*	0.018	-0.154	0.100	0.060	1				
knowledge gap in seed rate recommendation for vegetable (X ₉)	-0.099	0.040	0.052	-0.307**	0.003	0.260**	0.108	0.054	1			
knowledge gap in tag colour in seed packet and pesticide container (X ₁₀)	0.132	0.072	0.122	-0.271**	-0.072	0.118	0.144	0.051	-0.015	1		
knowledge gap in fertilizer dose (X ₁₁)	-0.218*	0.027	-0.117	0.056	-0.174	0.179	0.028	0.107	0.254**	0.054	1	
knowledge gap in insects and diseases pest management (X ₁₂)	0.069	-0.035	0.085	-0.093	-0.089	0.272**	-0.179	0.057	0.021	0.130	0.138	1

** =Correlation is significant at the 0.01 level; * =Correlation is significant at the 0.05 level

Many literatures suggest that information given by Agri-input dealers are one of the most frequently used sources. The findings of the present study too found that 63.33 percent input dealers having less knowledge gap. In other words, they possess quite a high degree of knowledge about agricultural inputs mostly derived from various diverse sources and life experiences. This fact is further supported from the findings of Etyang [9] who said about three most important services provided to farmers by Agri input dealers were information on agronomic practices for seeds, information on agronomic practices for pesticides use, and information on agronomic practices for fertilizers application. Prajapati et al. [10] also found that Agri-input dealer possessed medium level of knowledge. The personal attributes like age, caste, experience in pesticides dealing, information sources used and training received by them was found associated with their knowledge level regarding general and specific areas of plant protection. Awareness of time methods quantity & number of spray, diseases, IPM and bio control were the major areas in which the Agri-input dealers are to be trained. It is in this context, the National Institute of Agriculture Extension Management (MANAGE) had designed and launched in the year 2003, a one-year diploma course titled 'Diploma in Agricultural Extension Services for Input Dealers (DAESI) [8], which imparts relevant and location-specific agricultural education to equip these input dealers with sufficient knowledge to transform them into para-extension professionals so as to enable them to address the day-to-day problems being faced by the farmers at field level.

4. CONCLUSION

Study shows that Agri-input dealers knowledge gap on pesticide, seed rate recommendation, tag colour in seed packet, fertilizer dose, insect and disease management was medium, hence training programme should be conducted with the help of government institution viz. KVK, Agricultural colleges and State department of agriculture. Agri-input dealers provide timely information on pest-disease management and organize training for the farmers. Agri-input dealers also facilitate demonstration of new technology in farmers' field in collaboration with private companies. Agri-input dealers expect that government in stitution viz. KVK, Agricultural colleges, state department of agriculture should provide latest in formation of their new

technology. Hence, sensitization programme should be conducted on regular basis.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/55986>