

Investigation on effects of research findings transference programs on performance of potato cultivators of Ardebil province

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ABSTRACT: Potato has important role in human nutrition, as it is entitled as hidden wealth of land. Based on FAO statistics, Iran was ranked 17th and 12th with 180 thousand hectares cultivated area and production of 5.4 million tones of potato between 158 potato producer countries in the world in the year 2012, respectively. On the other hand, Ardebil province has occupied second place in the country with 14.8 percent of total potato cultivated area in 2011. Considering this importance, the present study aims to investigate the effects of implemented programs for potato cultivators in the form of research findings transference in this province using descriptive and inferential analysis. The necessary data in this research collected through completion of questionnaire from 184 potato producers, which were selected by simple random sampling method. The results showed that 73.4 percent of studied potato producers were satisfied from all extension and education programs and activities of potato research findings transference. The results also indicated that there is weak relationship between effectiveness of research findings transference and product performance.

Keywords: Effects, Research findings, Potato, Performance.

INTRODUCTION

Potato is a product that has high volatility in price and production. This product in the third world countries, after wheat and rice, is the main food of people. On the other hand, potato production and processing play a significant role in creating job opportunities. In addition, a wide range of food products, including potato powder, chips, concentrates, sour milk and even the production of vaccine from its residues, are obtained directly or indirectly from this product.

According to FAO in 2012, Iran has a hedge of 180,000 hectares and a production of 5.4 million tons of potatoes, ranked 17th and 12th among the 158 countries that produce this product in the world (Faostat, 2012). In addition, in the crop year of 2010-2011, the cropping area of this crop was 186,000 hectares in the country. Regarding the level of cultivation, Hamedan and Ardabil provinces with 14 and 13 percent of the total land under cultivation were ranked first and second among provinces of the country (Ministry of Jihad-e-Agriculture(2013).

The research transfer plan is a program implemented with the participation of a researcher, extension expert or promoter, and a farmer to implement the technology or to adapt it to the conditions of the farmers. These programs include research-comparative projects, research-extensions and accelerated transfer of findings. In order to implement these plans, individuals who have been selected from different units of the Jihad-e-Agriculture Organization of the province have been co-operating under the title of "responsible, executive or collaborator", and the farmers, before the implementation of the plan, will be informed by organizers about the objectives and manner of implementation of the plan and type The co-operation that should be done with the project is justified.

Considering the economic and social importance of potato in supplying a significant portion of the food needs of the community as well as the position of this product in creating job opportunities, especially in Ardebil province, this research intends to investigate the effects of research findings on potato yield This province will be investigated.

An overview of the research background

Araji (1989) investigated the effects of public investment in wheat research on the yield of this product in the West of America between 1952 and 1986. He used the Cobb-Douglas function for this purpose. The results of this study showed that investments in wheat research in the studied period increased the yield of this product by 76.5%.

Amirkhani et al.(2013) studied the factors influencing farmers' use of drought management techniques and technologies in Varamin province. The results of this research showed that the variables of social participation rate and the use of consulting services companies are one of the most important factors affecting the transfer and utilization of technologies.

Hassanpour et al (2006) determined the cost-effectiveness of research on new barley cultivars in Kohkiluyeh, Boyerahmad and Kermanshah provinces. They used a hierarchical method for this purpose. The results of this study showed that the use of modified barley has increased to 8592 thousand tons of this product in the two provinces.

Hosseini et al. (2006) evaluated the rate of social return on racial breed researches of Rasoul cultivar. The results of this study showed that the cultivar Rasoul Sugar beet has a domestic rate of return on investment for the development of this figure is 117%. At the same time, the currency savings resulting from the introduction of this figure due to a decrease in sugar imports were estimated at about \$ 28.7 million a year.

Zamani et al (2009) in a study to rank the factors affecting the effectiveness of the transfer plans of agricultural sector in Fars province from the viewpoint of the organizers. The results showed that the good and respectful treatment of the project organizers with the cooperative farmer, the positive attitude of the employees to promoting the suggested technologies and choosing the appropriate time and the season for the implementation of the plan were the most important of these factors, respectively.

The Agricultural Research, Education and Promotion Organization (2009) presented a report on the performance of potato research transmissions. The results of the research findings in potatoes show that by proper and timely planting, harvesting and harvesting based on the results of the research carried out and complying with the relevant technical guidelines, at least 20% of production costs decreased and yielded and Production quality has improved.

Shahabi et al.(2012) investigated the effects of educational training on farmers' performance in Frieden County. The results showed that these tutorials have a positive impact on the promotion of occupational awareness and skill levels and the use of modern livestock practices.

Munoz-Canavate and Hipola(2010) investigated the structure of information transfer in the Spanish agricultural sector. The results of this study indicate that the data transmission structure in the agricultural sector of the country is largely state-owned and only a limited number of private companies are involved. In addition, the Spanish government did not succeed in translating research findings and the private sector did not have the ability to transfer research findings.

Materials and Methods

The purpose of this study is applied and is descriptive-correlational in terms of the method. The statistical population of this research included all the petrochemicals who received the research findings from 2009 to 2013 in Ardebil province. Meanwhile, a simple random sampling method was used to determine the sample size using the Cochran formula for the size of the identified population. Accordingly, the total sample size was determined for 182 apples in the study area.

In this research, the validity of the questionnaire was confirmed using the views of 15 scientific and executive experts. On the other hand, Cronbach's alpha coefficient was used to assess the reliability of the questionnaire. The coefficient for the designed questionnaire is 0/84 It was determined that showed the reliability of the research tool.

The main variables of this research include the effectiveness of the transfer of research findings, the transfer of research findings, the cost of production, the frequency of referrals to farmers, the level of education of farmers, the yield of production, the area under cultivation, the cost of transferring research findings to farmers and the like. On the other hand, in this research, descriptive statistics including mean, percent, frequency and inferential statistics including Spearman, Pearson, Eta and Lambda correlation coefficients were used. Meanwhile, data processing was performed using SPSS and Excel software.

Results and Discussion

Some of the individual and occupational characteristics of the respondents studied are presented in Table 1. This table shows that despite the role of literacy on the level of learning and awareness of audiences in educational and extension activities, 74% of surveyed apple farmers are illiterate or have elementary education. In addition, only the main occupation is less than 39% of them, potato production, and almost all of them live in the village. All this suggests the need to carry out village-driven research findings. The results of Table 1 also indicate that more than

61% of the studied apple cultivators participated in one or more educational and promotional programs related to their productive activities, which took place during the five years leading up to 2013.

Table 1. Individual and job characteristics of respondents

| Variable | Variable Levels | Frequency | Percent |
|--|----------------------------------|-----------|---------|
| Level of education | illiterate | 51 | 27/8 |
| | Elementary | 85 | 46/2 |
| | Guidance | 24 | 13 |
| | High school | 3 | 1/6 |
| | Diploma | 13 | 7/1 |
| | Academic | 8 | 4/3 |
| The main occupation of the exploiter | Agriculture | 71 | 38/6 |
| | Agriculture and Animal Husbandry | 109 | 59/2 |
| | Other | 4 | 2/2 |
| Land ownership status | Personal | 170 | 92/2 |
| | Rentals | 14 | 7/8 |
| Operator's Location | City | 1 | 0/5 |
| | Village | 183 | 99/5 |
| Participation of children in agricultural activities | Yes | 108 | 58/7 |
| | No | 76 | 41/3 |
| Participate in educational and promotional programs | Yes | 113 | 61/4 |
| | No | 71 | 38/6 |

Source: Research findings

On the other hand, the important technical properties of potato production by the apples examined in Table 2 are shown. As it is seen in this table, the average yield of potato producers in the sample is 21.9 tons per hectare in 2012, which is more than the global average (18.99 tons per hectare) during the year. Meanwhile, more than 80% of the cultivated land is small and less than 5 hectares. The results also show that the production cost of one hectare of potatoes is over 46 million rials and seed supply and purchase costs account for the largest share in the total cost of potato production.

Table 2. Technical characteristics of potato production

| Variable | Variable levels | Abundance | Percent | Average | Standard deviation | Domain Minimum | Maximum |
|--|-----------------|-----------|---------|---------|--------------------|----------------|---------|
| Area under cultivation (Ha) | <1 | 6 | 3/3 | 3/1 | 3/06 | 0/25 | 34 |
| | 1-5 | 145 | 78/8 | | | | |
| | 5-10 | 31 | 16/8 | | | | |
| | >10 | 2 | 1/1 | | | | |
| Production performance (Tons / ha) | <10 | 25 | 13/6 | 21/9 | 17/7 | 1 | 160 |
| | 10-20 | 51 | 27/7 | | | | |
| | 20-30 | 91 | 49/5 | | | | |
| | >30 | 17 | 9/2 | | | | |
| Cost of production (Million rials / hectare) | <40 | 69 | 37/5 | 46/3 | 17/08 | 12/3 | 155 |
| | 30-60 | 86 | 46/7 | | | | |
| | 60-80 | 22 | 12 | | | | |
| | >80 | 7 | 3/8 | | | | |

Source: Research findings

The teaching method used in educational and extension programs is a very important factor in the level of learning by the audiences. The results of this study showed that more than 77% of respondents, observational training and presence in the field have been evaluated as the most appropriate method of training in extension and educational programs (Table 3).

Table 3. Respondents' assessment of best practices for the transmission of potato research findings

| Kind of training | Abundance | Frequency |
|---|-----------|-----------|
| -Training in class | 15 | 8/2 |
| -Farm presence and observation | 143 | 77/7 |
| -Classroom training with attendance on the farm and observation | 26 | 14/1 |
| -Total | 184 | 100 |

Source: Research findings

On the other hand, the results showed that the educational programs carried out in the framework of a research transfer plan for apple cultivators in Ardebil province during the studied period (2009 to 2013) on the principles of planting, harvesting, warehousing, mechanized cultivation, school in the field, Fight against pests and diseases, and so on. The evaluation of respondents from the research transmissions program is presented in Table 4. This table shows that the farmers surveyed had a positive evaluation of the implementation of the research transfer plan, with 75% of them evaluating the impact of these programs on improving their know-how.

Table 4. Assessment of respondents from the transfer program of potato research findings

| the subject | Assessment of respondents' opinions (%) | | | | |
|--------------------------------------|---|------|---------|------|-----------|
| | very good | Good | Average | Weak | Very weak |
| -Effect on technical knowledge | 64/2 | 10/3 | 11/4 | 9/8 | 4/3 |
| -The content of the provided content | 30 | 43/4 | 9/9 | 11/4 | 5/3 |
| -Educational experts | 28/3 | 37.5 | 15/2 | 13 | 6 |

Source: Research findings

The findings of this research also indicated that 65.8% of the studied farmers evaluated the academic ability of educational providers in the research transfer program to the optimum level. Meanwhile, 54.3 percent of respondents considered the timing of these programs to be appropriate. In addition, all trained farmers, in the form of a research findings transfer program, stated that after these training courses, their production performance increased compared to the previous one.

From the viewpoint of the audience, among the topics presented in the research findings transfer plan, land preparation and mechanization related discussions, the greatest effectiveness and timing for choosing healthy seeds and the principles of product storage were least effective. On the other hand, 51.6% of the surveyed slaughterers, through other farmers, had been informed about the transfer of research findings, indicating that the information about the programs was not desirable and needs to be reviewed.

As previously mentioned, in this research, the correlation coefficients were used to examine the relationship between the variables associated with the transfer of research findings and the relevant results are presented in Table 5. As shown in this table, despite expectation, there is a weak relationship between the effectiveness of the transfer of research findings and the performance of product production. In addition, there was no significant relationship between the effectiveness of these programs and the frequency of referrals by experts to aphrodisiacs for promotion training. All this shows that, despite the acknowledgment by respondents of the effectiveness of these programs on the performance of potato production, performance improvement has not been much affected by the implementation of these programs.

Table 5. Relationship between the variables associated with the transfer of research results of potato

| The variables studied | Type of correlation coefficient | Rate | The significance level |
|---|---------------------------------|-------|------------------------|
| - The rate of product yield and the frequency of referrals by experts to farmers | Pearson | 0/070 | 0/353 |
| -The product performance and the effectiveness of the research findings transfer program | ETA | 0/188 | - |
| -The product yield and farmer's farm in the program day | ETA | 0/034 | - |
| -The level of farmer education and the effectiveness of the research findings transfer plan | Spearman | 0/281 | 0/000 |
| -The time taken to carry out research findings and the effectiveness of the program | Lambda | 0/307 | 0/000 |
| -Skill and knowledge of the experts and the effectiveness of the research findings transfer program | Spearman | 0/618 | 0/000 |
| -How to transfer the findings and the effectiveness of the research findings transfer program | Lambda | 0/010 | 0/316 |

Source: Research findings

Table 5 also indicates that there is a positive and significant correlation between the education level of the studied siblings with the effectiveness of the research findings transfer program. This, in turn, suggests that the higher the level of utilization of the users, the efficiency of these programs has also improved. Another interesting point is that there is not a meaningful relationship between the effectiveness of the research findings transfer program and the methods used in this regard, which requires a closer examination of the causes and factors affecting the incident.

Suggestions

1. The results of the research indicate that among different methods of transmission of research findings, field-based methods and observation is more desirable for the audience. Therefore, it is suggested that the plans should be emphasized on the implementation of these programs at the farm level.
2. The findings of this research indicate that the timing of the implementation of research findings transfer programs is effective on the effectiveness of these programs. Accordingly, it is suggested that the implementation of these programs is appropriate to the timing of agricultural operations so that the operators can use them for maximum use.
3. The results showed that about 60% of the operators in addition to the food processing industry are also engaged in livestock activities. Therefore, it is necessary to pay attention to this research needs assessment program and to carry out research projects as well as educational planning. By presenting educational packages in accordance with this fact, the research results transfer plan has been added.
4. The results of this study indicate that the trainings carried out within the framework of the transfer of research findings mainly focus on the technical aspects of production. It is, however, necessary to emphasize the economic aspects and marketing of the product in these programs as an essential element in the profitability of the activity.

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