

**AN INVESTIGATION ON THE PERCEPTION OF THE APPLE ORCHARDISTS
ABOUT THE ROLE OF EXTENSION EDUCATION ACTIVITIES IN PREVENTION
OF POSTHARVEST LOSSES IN DAMAVAND TOWNSHIP, IRAN**

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Abstract

This study utilized a descriptive-correlational surveying approach to examine the role of extension education activities in Prevention of apple Postharvest Losses in Damavand Township, Iran. The population of the study included all apple orchardists in Damavand. Orchardists were selected through stratified random sampling technique. Questionnaire reliability was estimated by calculating Cronbach alpha at 0.85. Apple orchardists who participated in the study was predominately male and was on average 50 years of age, majority of them had diploma degree and had on average 32 years of farming experience. The average of the land size in this township estimated about 21 hectare. Instructing appropriate method of harvesting is the most effective factor regarding prevention from apple postharvest losses. There is a significant relationship between age, land size, education and perception about extension education activities.

Introduction

Farmers and food sellers have been concerned about losses since agriculture began. Yet the problem of how much food is lost after harvest to processing, spoilage, insects and rodents, or to other factors takes on greater importance as world food demand grows. Reducing postharvest losses could, presumably, add a sizable quantity to the global food supply, thus reducing the need to intensify production in the future (Anonymous, 1998).

The year round supply of fresh produce is influence not only by the climate conditions of wet and dry season, but also by the lack of understanding and limited skills of postharvest handling system (Aseidu, 2003).

Every year about 15 percent of apple produced in Tehran Province become wasted. Apple losses have a negative effect on the economy because it reduces the production rate, increases the need for import and wastes the production elements (Shadan, 2004).

Factors affecting postharvest losses of perishables vary widely from place to place and become more and more complex as systems of marketing become more complex. A farmer who is growing fruit for his family's consumption probably doesn't mind if his produce has a few blemishes and bruises. If he is producing for a market at any distance from his own locality,

however, he and his workers, if he has any, must have a different attitude if he hopes to get the best money return on his work (Anonymous, 1989).

Generally the factors which cause losses are: 1) Physical factors 2) Physiological factors 3) Biological factors 4) Mechanical factors 5) Social and economical factors. The last one includes lack of economical, technological and human resources. The most important reason causing agriculture losses in developing countries are related to transportation, processing, packaging, storage and marketing (Minaiee, 2003).

Proper postharvest processing and handling is an important part of modern agricultural production. Postharvest processes include the integrated functions of harvesting, cleaning, grading, cooling, storing, and packaging, transporting and marketing. The technology of postharvest handling bridges the gap between the producer and the consumer - a gap often of time and distance. Postharvest handling involves the practical application of engineering principles and knowledge of fruit and vegetable physiology to solve problems (Boyette, 2005)

Historically, in developing countries, the international focus has been on the production more and the importance of the postharvest sector has not been acknowledged. An early recognition of the importance of reducing postharvest losses was made at the world food conference in Rome 1974 and in 1975 the UN General Assembly set a target of reducing postharvest losses by 50% by 1985 (Salunkhe & Desai, 1984). Nowadays there is an increasing understanding that greater attention to the postharvest sector is essential for food security, poverty alleviation and rural employment (Heyes, 2003).

The governments of developing countries, as well as a number of NGOs, bilateral and multilateral international cooperation agencies, and especially FAO, have been engaged for several years in projects aimed at the prevention of post harvest losses. The experience acquired during these interventions has often demonstrated the need not only for improving production methods but also for making both farmers and concerned institutions aware of the problem of post-harvest losses (Lucia et al, 2004).

For solving loss problem we should increase the level of knowledge, technology and human resources and reduce the level of risk from production to consumption.

To correct the food production system, we need to coordinate all the direct and the indirect factors. And two ways of solving this problem are upgrading the knowledge and the policy making (Goletti, 2003). Chizari and Hosseini (1995) stated that extension education activities are done to change the behavior, the notion and the knowledge of producers. Most of the developed countries owe their advancement to the targeted education. By designing an organized and targeted educational plan about the process of production management and marketing we would reduce a great amount of the losses and become closer to the agricultural sustainable development.

Purpose and objectives

Apple postharvest losses in Damavand Township, estimated by 12 percent of production. The purpose of this study is to determine the influence of extension education activities on prevention from apple postharvest losses in Damavand Township, Iran. Specific objectives of the study were to:

1. Describe apple orchardists by demographic characteristics,
2. Identify extension education factors which prevent from apple postharvest losses,
3. Determine relationship between personal characteristics of apple orchardists and their perceptions about influence of extension education factors on prevention from apple

postharvest losses.

4.

Methods and procedures

This study utilized a descriptive-correlational surveying approach to examine the role of extension education activities in Prevention from apple Postharvest Losses in Damavand Township, Iran. The population of the study included all apple orchardist in Damavand (N= 4400) in year 2005. Orchardists (n= 354) were selected through stratified random sampling technique. Questionnaire and interview were used for gathering data.

Content and face validity were established by a panel of expert consisting of faculty members at college of agriculture (Extension Education Department) of Tarbiat Modares University. A pilot test was conducted with 30 orchardists. Questionnaire reliability was estimated by calculating Coronbach alpha. Reliability for the overall instrument was estimated at 0.85.

Independent variables includes age, gender, land size and working experience and the only dependent variable is respondent's perception about the influence of extension education activities on prevention from postharvest losses

Findings

The descriptive analysis gives some useful data about personal characteristics. Findings of this study about the personal characteristics show that; Apple orchardists who participated in this study were predominately male and were on average 50 years of age, 34.6 percent of the orchardists were 51-60 years of age.

The majority (50%) of the orchardists had diploma degree. About 10% of them were illiterate and more than 20 percent have bachelor degree. Respondents had on average 32 years of farming experience. About 45 percent of the orchardists reported 21- 40 years of working experience followed by 36 percent with 1- 20 years of working experience. The average of the land size in this township estimated about 21 hectare. One forth of the respondents has less than 10-hectare orchard and more than 30% of them express they have between 11 and 20-hectare orchard. Approximately 30 percent of respondents represented they had 11- 20 hectare apple orchard and twenty five percent had less than 10 hectare, about 22 percent of them had more than 31 hectare apple orchard.

Apple orchardists were asked to rate 11 statements using Lykert- type scale from 1 to 5. As indicated in Table 1, orchardists stated that Instructing appropriate method of harvesting is the most effective factor regarding prevention from apple postharvest losses (M = 4.26). The next factor, which has effect on prevention from apple postharvest losses, is instructing appropriate method of harvesting (M = 4.13).

Table 1. Means and Standard Deviations regarding perception towards extension education activities.

Rank	Extension Education Activities	Mean	S.D
1	Instructing appropriate method of harvesting reduce postharvest losses	4.26	0.98
2	Instructing the proper time of harvesting reduce postharvest losses	4.13	0.07
3	Instructing using mineral nutrition such as calcium and bor reduce postharvest losses	3.79	0.09
4	Instruction of proper time and method of thinning reduce postharvest losses	3.75	0.10

5	Instructing the proper method of storing reduce postharvest losses	3.66	1.06
6	Instructing sorting after harvesting and before storing reduce postharvest losses	3.64	1.22
7	Instructing the proper method of processing at home reduce postharvest losses	3.58	1.19
8	Instructing packaging in orchard reduce postharvest losses	3.46	1.03
9	Developing production formation reduce postharvest losses	3.45	1.20
10	Training the society for the habit of fruit consumption reduce postharvest losses	3.35	1.34
11	Encouraging to build processing industry reduce postharvest losses	3.15	1.34

Note Mean range from 1 (strongly disagree) to 5 (strongly agree)

Kendall's tau correlation coefficient used to identify the relationship between age and perception about extension education activities influence postharvest losses (Table 2). The results show that there is a significant correlation between age and perception about dependent variable. The total correlation coefficient between orchardists' age and their perception is -0.192, this is negative correlation, it shows younger people have more positive perception in compare with older people.

Factors such as Instruction of proper time and method of thinning, Instructing sorting after harvesting and before storing, Instructing the proper method of processing at home, Instructing sorting after harvesting and before storing, Training the society for the habit of fruit consumption does not have any significant correlation with perception.

Table 2. Correlation measures between age and perception towards extension education activities which reduce apple postharvest losses.

Extension Education Activities	Kendall tau
Instructing appropriate method of harvesting reduce postharvest losses	-0.253**
Instructing the proper time of harvesting reduce postharvest losses	-0.224**
Instructing using mineral nutrition such as calcium and bor reduce postharvest losses	-0.096*
Instruction of proper time and method of thinning reduce postharvest losses	-0.076
Instructing the proper method of storing reduce postharvest losses	-0.188**
Instructing sorting after harvesting and before storing reduce postharvest losses	-0.036
Instructing the proper method of processing at home reduce postharvest losses	-0.048
Instructing packaging in orchard reduce postharvest losses	-0.0262**
Developing production formation reduce postharvest losses	-0.055
Training the society for the habit of fruit consumption reduce postharvest losses	-0.023
Encouraging to build processing industry reduce postharvest losses	-0.215**
Total	-0.192**

** : P<0.01, * : P<0.05

Table 3 shows the correlation between working experience and perception about extension education activities. There is not any significant correlation between dependent and independent variables. Only in two factors (Instructing using mineral nutrition such as calcium and Instruction of proper time and method of thinning) we see significant correlation but in overall there is not.

Table 3. Correlation measures between working experience and perception about extension education activities.

Extension Education Activities	Kendall tau
Instructing appropriate method of harvesting reduce postharvest losses	-0.005
Instructing the proper time of harvesting reduce postharvest losses	-0.024
Instructing using mineral nutrition such as calcium reduce postharvest losses	0.138**
Instruction of proper time and method of thinning reduce postharvest losses	0.156**
Instructing the proper method of storing reduce postharvest losses	-0.040
Instructing sorting after harvesting and before storing reduce postharvest losses	-0.013
Instructing the proper method of processing at home reduce postharvest losses	0.062
Instructing packaging in orchard reduce postharvest losses	-.067
Developing production formation reduce postharvest losses	0.017
Training the society for the habit of fruit consumption reduce postharvest losses	-0.073
Encouraging to build processing industry reduce postharvest losses	0.054
Total	0.058

** : $P \leq 0.01$

As Table 4 shows, orchardist's perceptions about extension education activities, which reduce apple postharvest losses, have positive significant correlation with land size (0.272). It shows in this study land size and perception is related to each other positively, orchardists who have wider land size have also more positive perception. Also all 11 factors given have significant correlation with perception.

Table 4. Correlation measures between land size experience and perception about extension education activities.

Extension Education Activities	Kendall tau
Instructing appropriate method of harvesting reduce postharvest losses	0.498**
Instructing the proper time of harvesting reduce postharvest losses	0.429**
Instructing using mineral nutrition such as calcium and bor reduce postharvest losses	0.526**
Instruction of proper time and method of thinning reduce postharvest losses	0.464**
Instructing the proper method of storing reduce postharvest losses	0.655**
Instructing sorting after harvesting and before storing reduce postharvest losses	0.499**

Instructing the proper method of processing at home reduce postharvest losses	0.656**
Instructing packaging in orchard reduce postharvest losses	0.576**
Developing production formation reduce postharvest losses	0.564**
Training the society for the habit of fruit consumption reduce postharvest losses	0.328**
Encouraging to build processing industry reduce postharvest losses	0.616**
Total	0.272**

** : P≤0.01, * : P≤0.05

The one-way ANOVA results proved significant relationship at the 0.01 levels between orchardists' level of educational degree and their perception toward dependent variable. It shows Orchardists who have higher educational degree also have more positive perception towards dependent variable. The overall F ratio is 5.46, which is significant. But between factors "Instructing appropriate method of harvesting" there is not any significant relationship with dependent variable. Statements "Instructing the proper time of harvesting reduce postharvest losses, Instructing sorting after harvesting and before storing reduce postharvest losses, Training the society for the habit of fruit consumption reduce postharvest losses" have significant relationship at the level 0.05. The other factors have significant relationship at the 0.01 alpha level (Table 5).

Table 5. ANOVA results for perception towards dependent variable and level of education.

Extension Education Activities	Mean				F Ratio
	Illiterate	School degree	Diploma	Bachelor degree	
Instructing appropriate method of harvesting reduce postharvest losses	4.27	4.21	4.28	4.26	0.08
Instructing the proper time of harvesting reduce postharvest losses	4.32	4.11	4.24	3.82	3.08*
Instructing using mineral nutrition such as calcium and bor reduce postharvest losses	4.59	3.53	3.74	3.76	8.73**
Instruction of proper time and method of thinning reduce postharvest losses	4.43	3.44	3.73	3.76	8.47**
Instructing the proper method of storing reduce postharvest losses	4.48	3.51	3.48	3.83	11.29**
Instructing sorting after harvesting and before storing reduce postharvest losses	4.04	3.32	3.61	3.81	3.76*

Instructing the proper method of processing at home reduce postharvest losses	4.24	3.80	3.34	3.62	7.33**
Instructing packaging in orchard reduce postharvest losses	3.76	3.34	3.33	3.76	4.36**
Developing production formation reduce postharvest losses	3.24	3.96	3.17	3.79	8.87**
Training the society for the habit of fruit consumption reduce postharvest losses	2.70	3.57	3.35	3.49	0.87*
Encouraging to build processing industry reduce postharvest losses	3.78	3.46	3.78	3.43	10.24**
Total	4.03	3.63	3.54	3.83	5.46**

** : $P \leq 0.01$, * : $P \leq 0.05$

Conclusions and recommendations

Respondents rank 11 extension education activities with regard to their influence on reducing postharvest losses. All 11 statement received mean rang 3 and above. Respondents are agree with 7 factors but they perception is neutral about 4 of them. It needs extra research to find out why they have no idea about some of these factors. Ineffective instruction, which gives bad experience of extension education activities, can be one of the reasons. Also perception towards other factors should become more positive that need targeted program planning.

To test the correlation between orchardists' age and their perception we use Kendall tau's correlation coefficient. There is negative correlation between age and perception which shows that older orchardist are less agree with effect of extension education activities on reducing apple postharvest losses. Younger orchardists are more flexible and they accept advice more. They also take part in educational courses more and have more communication with the others.

We found in this study working experience has not any effect on orchardists perception. Prigojin et al (2003) stated that working experience has effect on people perception, but in Damavand Township and among apple orchardists we could not prove any relationship between these two.

Land size has correlation with perception. Results of the study show that orchardists who have larger orchard are more agree with extension education activities done for reducing apple postharvest losses. Respondents with wide orchard size are looking for extending their business they search for any way to increase the rate of their production. Extension agent should attention to orchardists with small orchards to train them methods, which help reducing postharvest losses.

When respondent were grouped by academic degree, significant mean scores were observed. Respondent who have higher academic degree are more agree with extension education activities have done for reducing postharvest losses. Frick et al (2004) in his research found that educational degree has influence on people perception towards different statements. People who have academic education are more searches for new information and methods. As extension agent we should more care about orchardists who are illiterate, they cannot read written information and do not follow innovation, so they need more attention.

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