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## **An Examination Some of Educational – Extension Factors Influencing Use of Transgenic Plants (Case Study: Ilam, Iran)**

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### **Abstract**

The purpose of this study was to examine the effect of educational – extension factors on the use of transgenic plants. This study was conducted through a survey design. The research was an applied study type. The research method of this study is descriptive-correlation. Statistical population of the study consisted of all of biotechnology experts of Research Center of Agriculture of Ilam Province (N=63). Census method was used in this study. A questionnaire was the main tool which the face and content its validity was confirmed by panel of University Experts. Reliability Coefficient (Cronbach's alpha) of the questionnaire was 92%. Results showed that the use of media (radio and TV) was the most important factor in the use of transgenic plants. The result of Spearman correlation coefficients showed that, there was a significant relationship between the variables such as the use of communication media, communication with extension professionals, and scientific rank of professional with use of transgenic plants. Multiple regression analysis results showed that variables like scientific rank, relationship with extension professionals and mass media have positive effect on the dependent variable of application of transgenic plants, describing 53.2% of the changes of the mentioned dependent variable.

**Keywords:**

*Educational Extension Factors, Transgenic plants, Biotechnology Specialists*

## INTRODUCTION

Agricultural biotechnology is a modern technology that has passed the stage of pure science and as a stabilized industry has introduced itself to the today world. Recent assessment indicates that about 800 million people are undernourished in developing countries. But today, the vast scientific and technological developments in the modern world, especially in the field of modern biotechnology and production of transgenic plants have created great hopes for providing food security and health among people (Takavar, 2004). In the current conditions is predicted that world population will reach 8 billion people by 2030, therefore, is an unavoidable increase in the quantity and quality of food. In this regard, genetic change technology was developed for the first time in 1980 that one of its most important achievements has been the production of transgenic plants. Transgenic plants are plants similar to their natural equivalent with this difference they have comparative advantages such as being resistant to the pests and insects, high performance, better nutritional value and desirable characteristics of natural plants. So, transgenic plants will be carrying the genes for increasing value and quality products (Mittelman, 2009). Today, transgenic plants are the part of modern technologies in the field of biotechnology and agriculture which is heavily invested in it by most countries during the past 20 years, so that now about 15 developing countries and 10 developed countries grow transgenic plants (James, 2008). Perhaps one of the most important factors influencing on the diffusion and dissemination of this technology has been strong performance of agricultural extension section. In the simplest form, agricultural extension is the interface between agricultural research section and farmers as technology receiver groups. To do this mission agricultural extension uses all of their equipment in order to increase success. These factors include extension human resources such as extension agent and Extension professionals, instructional methods and techniques. But, the important point is that for choosing appropriate instructional methods should be consider to the expert's view of transgenic plants technology (Contado, 2009).

Akbri and Asadi (2008) in their study have

reached this result that the mass media (Radio and TV) are the most important communication channels influencing on audience attitudes towards organic farming. In other research have obtained similar results (Aerni, 2005; Akbari and Asadi, 2008; Mittelaman, 2009; Zhou and Chen, 2007). Aerni (2005); Mittelman (2009); Zhou and Chen (2007) and Wheeler (2005) in his study showed existence significant difference between genders with their attitude to the transgenic plants. In this study was not obtained meaningful significant between work experience and their attitude to the transgenic plants. Catron (2007) is not observed significant differences between male and female attitude to the production of transgenic plants. (Karami *et al.*, 2008) have considered visiting the farms, contact with progressive farmers and communicating with agricultural extension agents as the most important factors influencing acceptance of biotechnology. (Mohamadian *et al.*, 2008) in their research showed positive attitude of audience to the consumption of Transgenic products. In this study books and the internet have had a major role in informing the transgenic products. Therefore, this study tries to examine the impact of educational-Extension factors on the use of transgenic plants. Specific objectives of this research were to:

- 1- Describe the importance using of transgenic plants from the view of biotechnology experts.
- 2- Identify and describe the educational- extension factors influencing use of transgenic plants.
- 3- Identify correlation between educational-extension factors and application of transgenic plants
- 4- Determine the collective role of the independent variables in explaining the dependent variable

## MATERIALS AND METHODS

The present research was correlation- descriptive research type. The study is used survey methods to collect the required data. Statistical population of this study was all biotechnology professionals who are working in the center of agricultural research in Ilam Province (N=63). Due to the limited number of statistical population census

Table1: Prioritization questions related to using transgenic plants

Items	M	SD	Rank
Transgenic plant technology is a supporter of sustainable agriculture	2.58	1.22	1
Due to population growth, Production and applying transgenic plants is necessary	2.57	1.30	2
Using transgenic plants is associated with food security and poverty reduction	2.44	1.07	3
Transgenic plants can be used to reduce the use of fossil fuels	2.41	.96	4
Transgenic plants eliminates toxicity caused by the spraying	2.32	1.26	5
Transgenic plants reduce soil erosion rates	2.28	1.03	6
Production of transgenic plants can increase farmers' incomes	2.22	1.05	7
Transgenic plants are able to reduce 37% of the damage caused by pests	2.17	1.25	8
Cultivation of transgenic plants reduces the cost of agricultural inputs	2.15	0.90	9
Transgenic plants provide more comfort and flexibility of farmers in agricultural operations	2.10	0.86	10
Cultivation of transgenic plants reduce rural youth unemployment	2.01	0.95	11

method was used to collect data. A researcher made questionnaire was used as the main tool for gathering data. The face and content validity of the questionnaire were confirmed by a panel of university professors and biotechnology experts. Also, the reliability of the questionnaire was confirmed through calculating the Cronbach alpha coefficient ( $\alpha = 0.92$ ). The questionnaire was composed of three parts. In the first part of the questionnaire were asked questions about the use of transgenic plants. In the second part were asked questions about educational – extension factors and in the third section of the questionnaire were asked questions about the personal characteristics the statistical research community. Dependent variable of this research was the use of transgenic plants. Independent variables of research included: mass media, making culture of the production and consumption of transgenic plants, educational films, extension workshop, relationship with the extension agent and professionals, contact with the progressive farmers, training classes, meeting with the local leaders, extension magazine, scientific conferences and seminars, farm visits and individual characteristics of statistical community. Data processing was performed using SPSS statistical software, as well as descriptive statistics and analytical statistics (correlation coefficients analysis).

**RESULTS**

As shown in Table1, the first priority for experts was that "Transgenic plant technology

is a supporter of sustainable agriculture. "The second priority was to that" production and applying transgenic plants is necessary due to population growth.

**The importance of educational extension factors in the application of transgenic plants:**

According to the information mentioned in Table 2, mass media communication (Radio and television) have great importance in the application of transgenic plants from the View point of experts, so that 87.5% of professionals have been chosen this factor. These results confirm that the research results (Aerni, 2005; Akbari and Asadi, 2008; James, 2008; Mittelman, 2009; Zang and Chen, 2007). Factors such as making culture of production and consumption of these products, educational films, and workshops are located the next priorities. Scientific conferences and seminars, farm visits are located in the last priorities. The reason is the need to budget and financial capital more than other factors.

**Correlation between research variables and application of transgenic plants**

The result of Spearman correlation coefficients showed that, there is a significant relationship between the variables such as the use of communication media, communication with extension professionals, and scientific rank of professional with use of transgenic plants in the level of 1% (Table 3). This means that any rate increase relationship with extension experts and more be used of media in Transgenic Plants, Thus in-

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Table 2: Prioritization of educational – extension factors influencing in the application of transgenic plants from viewpoint of experts

educational – extension factors	M	SD	Rank
Mass Media	2.85	0.67	1
Making culture of the production and consumption of transgenic plants	2.78	1.09	2
Educational films	2.48	1.06	3
Extension workshop	2.42	1.31	4
Relationship with the extension professionals	2.37	0.77	5
Relationship with the extension agent	2.30	0.97	6
Contact with the Progressive farmers	2.24	0.88	7
Training classes	2.17	1.20	8
Contact with the local leaders	2.03	1.00	9
Extension magazine	1.98	0.76	10
Scientific conferences and seminars	1.91	0.73	11
farm visits	1.82	.920	12

creased the application of rate transgenic plants. These results are consistent with the result of research (Wheeler, 2005). But the study does not conform to (Karami *et al.*, 2008).

### Multiple regression analysis

At this stage for evaluating the collective role of the independent variables on the dependent variable, stepwise multiple regression analysis has been used. In stepwise method, the most powerful variables introduced into the regression equation one at a time and this continues until the significance test error reaches to 5%. Table 4 shows the results of the regression analysis. After considering the relationships between the research variables

and the main variable, three variables such as (Scientific rank, relationship with extension professionals and mass media) were introduced into the multiple regression equation. The results showed that the regression equation is significant at the one percent level ( $P=0.01$ ,  $F= 18.172$ ).

Multiple regression analysis results in the three stage showed that variables like scientific rank, relationship with extension professionals and mass media have positive effect on the dependent variable of application of transgenic plants, describing 53.2% of the changes of the mentioned dependent variable. Significant regression equation derived from this analysis is as follows:  $Y=2.244+.465X_1+.405X_2-.252X_3$

Table 3: Correlation between research variables and application of transgenic plants

First variable	r	p- value
Farm visits	0.023	0.862
Contact with the Progressive farmers	0.168	0.224
Relationship with the extension agent	0.212	0.110
Relationship with the extension professionals	0.599**	0.001
Making culture of the production and consumption of transgenic plants	0.113	0.409
Extension workshop	0.282*	0.025
Training classes	0.088	0.519
Contact with the local leaders	0.112	0.202
Mass Media	0.88**	0.002
Educational films	0.142	0.287
Extension magazine	0.146	0.284
Scientific conferences and seminars	-0.181	0.182
Scientific rank	0.66*	0.023

\* $p<0.05$

\*\* $p<0.01$



Table 4: Multiple regression coefficients

Variables	B	Beta	t	p- value	Durbin Watson
Scientific rank	0.46	0.428	4.43	0.001	
Relationship with extension professionals	0.20	0.573	4.27	0.001	1.82
Mass media	0.25	0.23	5.68	0.001	
Constant	2.24	----	2.26	0.028	

### CONCLUSION

Today's technology of production transgenic plants has been considered by many countries as a new approach in order to achieve food security and sustainable development. The study also confirmed the importance of using transgenic plants in order to achieve food security by biotechnology experts. Unfortunately, in Iran existence of negative attitude among some officials and top administrators have made it difficult to implement the Bio safety Law and transgenic plants. Therefore, Agricultural extension and education sector can be an effective role in the application of biological technology with regard to nature of their mission in the diffusion of innovations. In other words, extension can be choosing appropriate educational – extension factors in order to dissemination of using transgenic plants.

### RECOMMENDATIONS

The following suggestions are offered according to the results of this research:

- 1- Improving the relationship and interaction between extension, education, and research sections in order to accelerate the application of the transgenic plants.
- 2- Increasing the awareness level of biotechnology experts in the field of extension duties and its mission in the disseminating the new technology.
3. Considering to the knowledge and experience of experts and Researchers who specialize in producing transgenic plants.

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