FARM USE PESTICIDES AND FACTORS THAT INFLUENCE FARMERS DECISION ON IT

Silvana Dervishi
Agriculture University of Tirana
ALBANIA

ABSTRACT

Today, more and more countries are facing the effects of globalization and increasing unfair competition across the globe. On the other hand, consumers are becoming more and more sensitive to consuming quality products. The definition of quality and information on it is more and more an indisputable element of the strategies developed by the economic actors (Bramley, Biénabe, and Kirsten, 2008.) Under these conditions only a good management of the farm gives the farmers the opportunity to be competitive in the market as well as to have a sustainable development by using human, economic and natural resources efficiently. Our study attempts to analyze the main factors that influence the farmers' selection of pesticides. To explore this process, we conducted surveys with farmers in the area of Ndroq near Tirana, capital of Albania. The data analysis is done through the decision tree.

Keywords: Decision making, decision tree, farmer, pesticide.

INTRODUCTION

Sustainable farms require not only good farmers but also good managers that have the ability to properly use resources by choosing the right targets and tools to achieve optimal results. Today, the producers' tendency to increase profits through increasing yields or improving the form of products has been increasingly noted, without taking into consideration food safety in terms, using chemical fertilizers. These methods lead to less secure agricultural products and misuse of natural resource.

Agricultural yield is sensitive to direct effects (Abdullah, A & al 2004) such as changes in temperature, precipitation or concentrations of carbon dioxide and indirect effects (Abdullah, A & al 2005) through changes in soil moisture and distribution and frequency of pests and diseases. Farmers use pesticides to protect crops from pests and diseases. In these conditions we have raised the following research questions:

- ✓ Is the sustainability and productivity of household farm production integrated in the environmental sustainability?
- ✓ What are the factors that influence the farmer's use of pesticides and farm medicines?

Technological advancement has made it possible to store large amounts of data in different fields. The information provided by the research data contributes to the improvement of the services provided in these areas or decision-making etc. But analyzing and interpreting a large amount of data poses many challenges.

In order to advance the economic activity of a farm, a farmer has to take a series of decisions related to the technical, economic, financial and social operations that he will conduct. According to Veenadhari, S. (2007), the impact of climate factors on the production of agricultural crops is considered important. Also, modeling the information system based on the decision tree model provides advisory services to growers regarding pests, diseases and

their control measures. The web-based system also has provisions for growers to interact with other growers in cultivation management practices (Babu, M, 2010).

The effect of pesticides on humans cannot be directly controlled because of the poisonous nature of pesticides (Rabia I 2005) and consumers seek optimization of pesticide use (Abdullah, A & al 2004). Key elements of the decision-making process are the costs associated with the cancellation of pesticide use, the benefits coming from the use of pesticides and the risks associated with their use.

METHODOLOGY

Primary and secondary data were used for the study. The Administrative Unit of Ndroq was the main area taken into consideration when conducting the study. The choice of farmers within the municipality was made at random casual. The questionnaire was conducted with 10 farmers. It was updated with the changes resulting from the testing. The questionnaire was done through face-to-face interviews. During the period February - March 2017, 100 surveys were conducted. Two of them were invalid.

The Tree Decision Technique was used in our study to answer the following questions:
- ✓ Is the sustainability and productivity of household farm production integrated in the environmental sustainability?
- ✓ What are the factors that influence the farmer's use of pesticides and farm medicines?

These questions led us to analyze and review the decision tree by taking it as a whole and by observing the percentage of correct classification. This provides the degree of classification error for the tree as a whole, but it is also important to pay attention to the quality of the particular tree branches. Every path of the tree represents a rule, and some rules are better than the others. At each node, we can measure:
- ✓ The number of records entering the node.
- ✓ The proportion of records in each class.
- ✓ How would those records be classified if this node was a leafe.
- ✓ Percentage of records correctly classified in this node.
- ✓ The variance in distribution between the training community and the test community.

RESULTS AND CONCLUSIONS

From the information received about the nature of the farms in the Administrative Unit of Ndroq, it turns out that the farms are mainly integrated in Agriculture and Livestock, followed by Polyculture. Industrial farms, farms producing cereals, vegetables or horticulture farms are the least farms widespread in the area.

It turns out that farmers are mostly affected by the advice of a technician or agronomist in their decision, followed by the low pesticide price. The consumer safety guarantee and the low environmental impact are the least-selected reasons in their decision making.

The decision tree implemented on farmer's data is presented below.
- o IF Type of farm="Livestock" And Farm area <= 3 Ha Then The main element that affects Farmers' selection of pesticides = "advice of a technician or agronomist"
- o IF Type of farm =" Livestock" And Farm area > 3 Ha Then The main element that affects Farmers' selection of pesticides = " positive impact on performance"
- o IF Type of farm ="Cereals" Then The main element that affects Farmers' selection of pesticides = " low price"

- o IF Type of farm =" Integrated (Agriculture + Livestock)" And (where are pesticides bought= "Internet" Or where are pesticides bought = "Cooperative" Or where are pesticides bought = "Local agricutlutal entity" Or where are pesticides bought = "produced by themselves") Then The main element that affects Farmers' selection of pesticides = " positive impact on performance"
- o IF Type of farm =" Integrated (Agriculture + Livestock)" And where are pesticides bought = "Specialized sales points for agricultural products" And where are pesticides bought = "individual trader" Then The main element that affects Farmers' selection of pesticides = " advice from the agricultural pharmacy"
- o IF Type of farm =" Integrated (Agriculture + Livestock)" And where are pesticides bought = "Specialized sales points for agricultural products" And (where are the products sold = "processing industry" Or where are the products sold = "individual trader" Or where are the products sold = " individual trader, retail and wholesale" Or where are the products sold =" individual trader, retail" Or where are the products sold = "retail trader" Or where are the products sold = "wholesale trader") Then The main element that affects Farmers' selection of pesticides = " positive impact on performance"
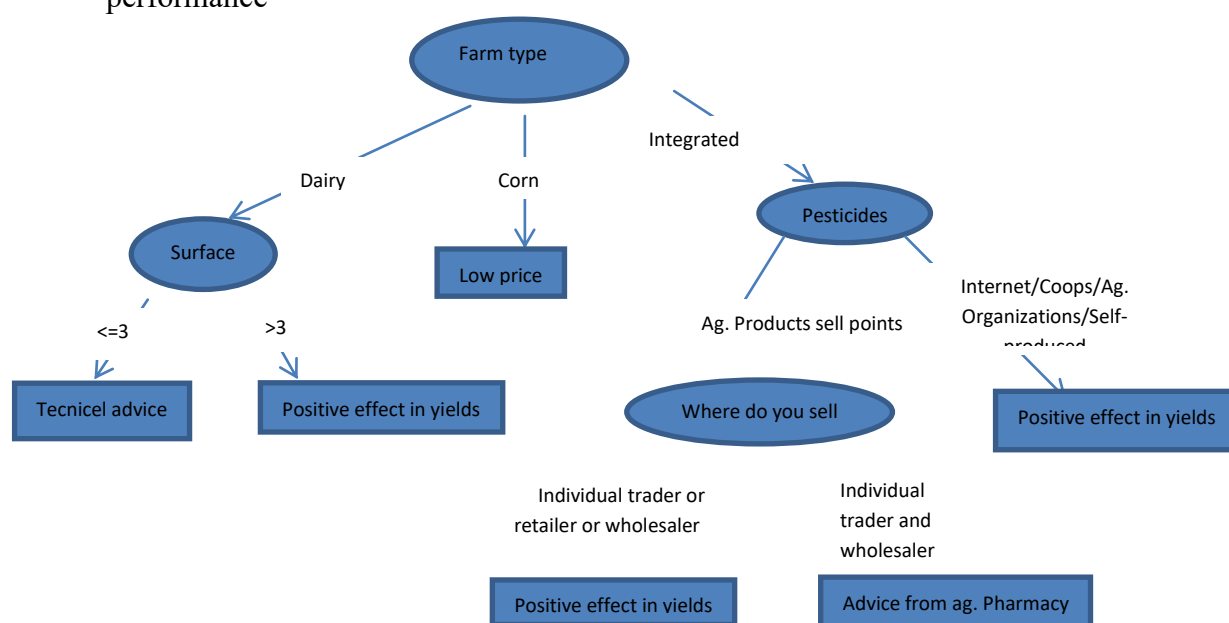

Figure 1 Results on decision tree

The data analysis shows that farmers generally sell their products individually. Processing industries are the least-selected destination.

On the other hand, it turns out that farmers are mostly affected by the advice of a technician or agronomist in their choice, followed by the low pesticide price. The consumer safety guarantee and the low environmental impact are the least-selected reasons for them.

In their choice, farmers are mainly affected by favorable payment methods followed by reasonable prices. The impact on the quality of products is the least-chosen factor of the farmers.

BIBLIOGRAPHY

[1] Abdullah, A., Brobst, S and M.Umer M. 2004. The case for an agri data ware house: Enabling analytical exploration of integrated agricultural data. Proceedings of IASTED International Conference on Databases and Applications. Austria. Feb.

[2] Abdullah, A., Brobst, S, Pervaiz.I., Umer M.,A.Nisar. 2004. "Learning dynamics of pesticide abuse through data mining". Proc. of Australian Workshop on Data Mining and Web Intelligence, New Zealand, January

[3] Abdullah, A., Bulbul.R., and Tahir Mehmood. 2005. Mapping nominal values to numbers by data mining spectral properties of leaves. Proceedings of 3rd International Symposium on Intelligent Information Technology in Agriculture. Beijing, China. Oct, 2005.

[4] Babu, MSP., Ramana Murthy, NV, SVNL Narayana, 2010. "A web based tomato crop expert information system based on artificial intelligence and machine learning algorithms". Int. J. of Comp. Sci., and Information Technologies. Vol. 1(1) . pp. 6-15

[5] Rabia Imitiaz, Malik Sikandar Hayat Khiyal, Shahid Khalil , Ahsan Abdullah, 2005, "Effect of pesticides on human life through visual data mining". Journal of Theoretical and Applied Information Technology. pp. 104-109.

[6] Veenadhari, S. 2007, "Crop productivity mapping based on decision tree and Bayesian classification". Unpublished M.Tech Thesis submitted to Makhanlal Chaturvedi National University of Journalism and Communication, Bhopal.