RISK AND RISK MANAGEMENT IN PLANT PRODUCTION

LŐRINCZ, ZSUZSANNA – KACZ, KÁROLY – KALMÁR, SÁNDOR

Keywords: plant production, risk factors, risk management.

SUMMARY FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Investigations were carried out to study how plant production enterprises operating in the West-Transdanubian region of Hungary relate to risk management; how they view, in terms of risk factors, the production, market, financial, technological, legal and human elements affecting production. Research also covered which risk management methods are applied by the plant producers to reduce the negative impact of uncertainty factors. On the basis of the summarised results, farmers indicated the following as significant sources of risk: the price fluctuation of main produce, the late payment of agricultural support, the uncertainty of agricultural policy, and changes in resource prices. The primary method of risk management is to spread the risk, "*standing on several feet*" (production of different crops, having other income sources besides plant production), but farmers also emphasised the importance of obtaining market information.

INTRODUCTION

Farmers engaged in plant production on arable land face several decision-making tasks, in which besides profitability and sustainability issues, the associated risk of the decision is playing an increasingly important role year by year (*Ladányi, 1995*). Risk is the possibility of variance between the expected and actual results. Risk can be both positive and negative. In terms of farming, negative outputs are usually more significant because of the losses (*Buzás et al., 2000*), therefore the risks must be managed by the use of various tools.

The primary goal of farmers is income generation, which is determined by yields, production costs (expenditures) and sales prices (*Láng – Csete, 1992; Tóth, 1981*). The variability and possibility of the occurrence of these factors defines the risky or uncertain nature of plant production. Farmers included in the research considered that the probability and impact of negative outputs that affect income generation activities means a risk for the operation.

RESEARCH RESULTS

The importance of risk sources and uncertainty factors was investigated using questionnaires; questions were developed on the basis of the directives of *Castle et al. (1992).* According to this method risk factors were divided into six groups: production risks, market risks, financial risks, technological risks, legal risks and risks caused by human resources. Farmers classified the different factors on a Likert-scale (from 1 to 5), considering how the particular factors affect their production activity. The least important risk factor has a low possibility of occurrence or effect on the economic operation; therefore they only play a minor role in the decision-making process. The most important risk factor has

a high possibility of occurrence and/or has a considerable effect on plant production.

A database of farmers was available at our Institute from previous research; farmers were selected from this existing database by stratified sampling. During the summer of 2005, 1000 questionnaires were mailed to farmers operating in Győr-Moson-Sopron, Vas and Zala Counties; 261 questionnaires were returned. Questionnaires were worked up with the use of Excel software.

The questionnaire consisted of three parts; the first part included questions on general farming data, as knowing some of the respondees' characteristics is very important.

The main field of activity of the farmers is the following (n=261):

- plant production: 62%
- animal husbandry: 36%
- mixed structure: 2%
- total: 100%

The target group was primarily plant producers; however, due to various changes within farming operations the returned questionnaires included answers from farmers dealing with animal husbandry and both animal husbandry and plant production (mixed structure).

The share of farmers responding on the basis of their production objectives is as follows (n=261):

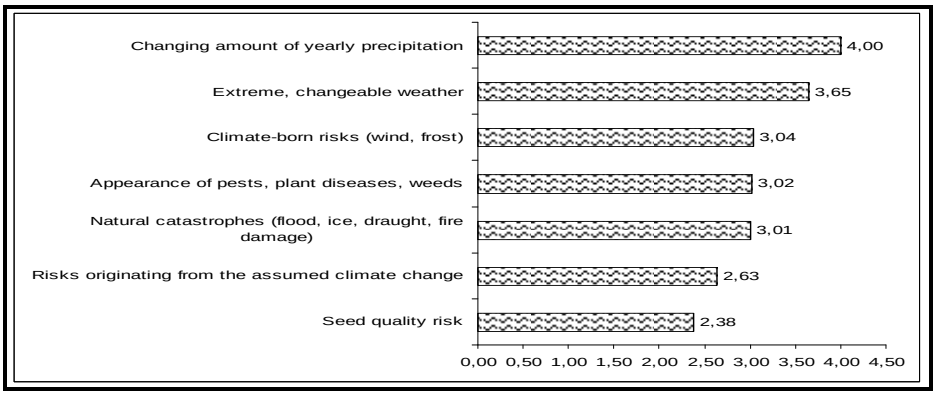
- production for own consumption: 4%
- surplus sold on market: 2%
- production primarily for sale: 76%
- offers agricultural services: 4%
- total: 100%

Objectives were defined on the basis of the *Central Statistical Office (KSH)* nomenclature *(2004)*. The main objective of plant producers is selling. Comparing the two figures it can be stated that the share of animal husbandry is the same as the share of farmers producing for their own consumption; these enterprises produce fodder for use in their own animal husbandry operation.

In the second part of the questionnaire farmers evaluated the risk factors affecting their plant production operation based on how these factors influence them in the decision-making process. Figure 1 shows the evaluation of production risks. Production risks appear as a consequence of unforeseeable factors resulting in yield loss such as the weather, plant diseases, pests and genetic variants. According to the answers the fluctuation of yearly precipitation should be emphasised.

Figure 1

Order of importance of production risks on the basis of the average values of the Likert-scale (n=261)



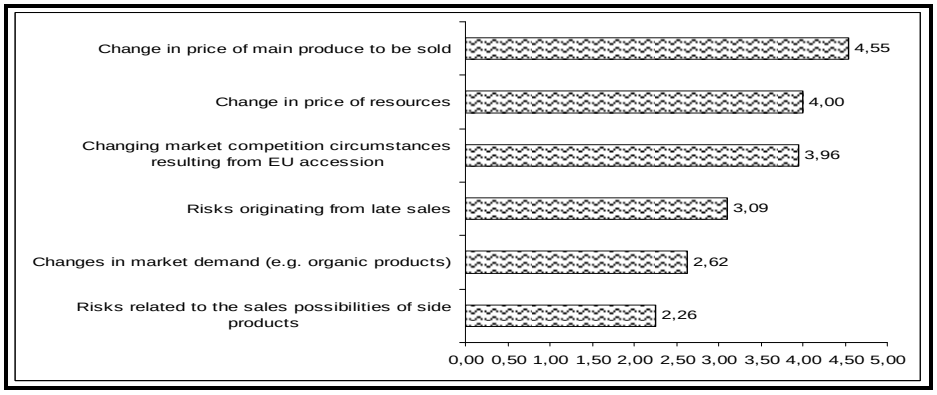
Source: Own calculations

The following group of risk factors are market risks (Figure 2). The group includes price fluctuation and uncertainty of input materials, what they receive for the produce and also covers the changes of market demand and supply.

Figure 2 shows that farmers consider changes in the main product to be sold and in the price of resources to be the highest risk factors. Primarily these factors define income and production costs, therefore the net income of the year. The changes in market demand are considered to be less important; their effect appears in the long-term, therefore farmers have more opportunities to handle the risk.

Figure 2

Order of importance of market risks (n=261)

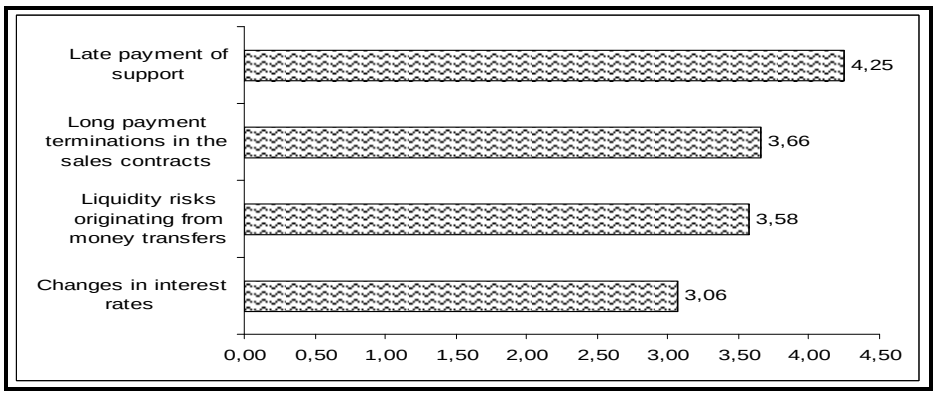


Source: Own calculations

Financial risks refer to financing the assets of the enterprise. The increasing use of external capital and unpredictable cash-flow give rise to the probability that as farmers lack the necessary money they are unable to make payments in time and their liquidity problems increase. In terms of financial risk factors, farmers in Hungary placed the late payment of agricultural support in first place (Figure 3).

Figure 3

Order of importance of financial risks (n=261)

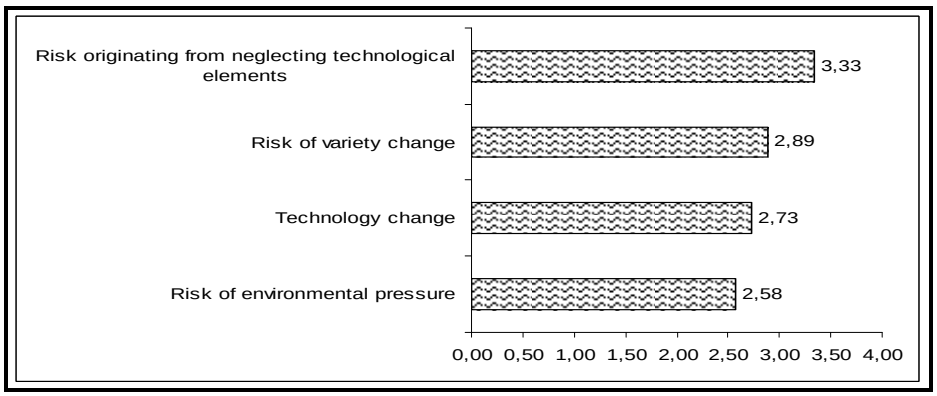


Source: Own calculations

Technological risks refer to risks originating from different technologies, from neglecting certain elements of these technologies and risks arising from changes in technology. These risk factors were evaluated as the least important (Figure 4).

Figure 4

Order of importance of technological risks

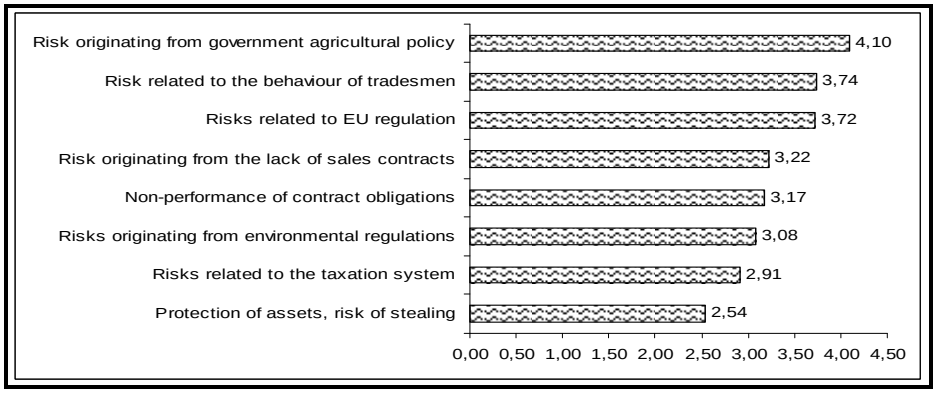


Source: Own calculations

Laws and government objectives that mirror the changing nature of society mean an increased risk. Such risk factors are for example, agricultural policy and environmental protection, but risk originating from the traders' behaviour also belongs here. The evaluation of legal risk factors is shown in Figure 5.

Figure 5

Order of importance of legal risks (n=261)



Source: Own calculations

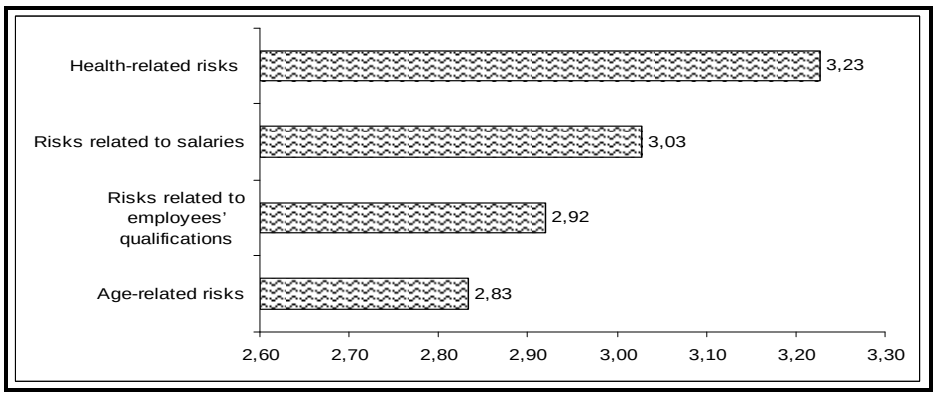
Human risk factors comprise of individuals' characteristics, state of health, behaviour and professional knowledge – including both the farmer and the employees. Figure 6 indicates that of these factors, health issues receive the most attention.

With the application of risk management tools the ability of enterprises to

survive the unfavourable consequences of risk could be improved. Figure 7 shows the role of different risk management methods in the responding farmers' management activities. According to our investigations farmers consider the obtaining of market information as the most effective risk management tool; although the creation of money reserves and the signing of sales contracts in advance are also emphasised. Irrigation and the protection of assets are indicated as being less important in risk management.

Figure 6

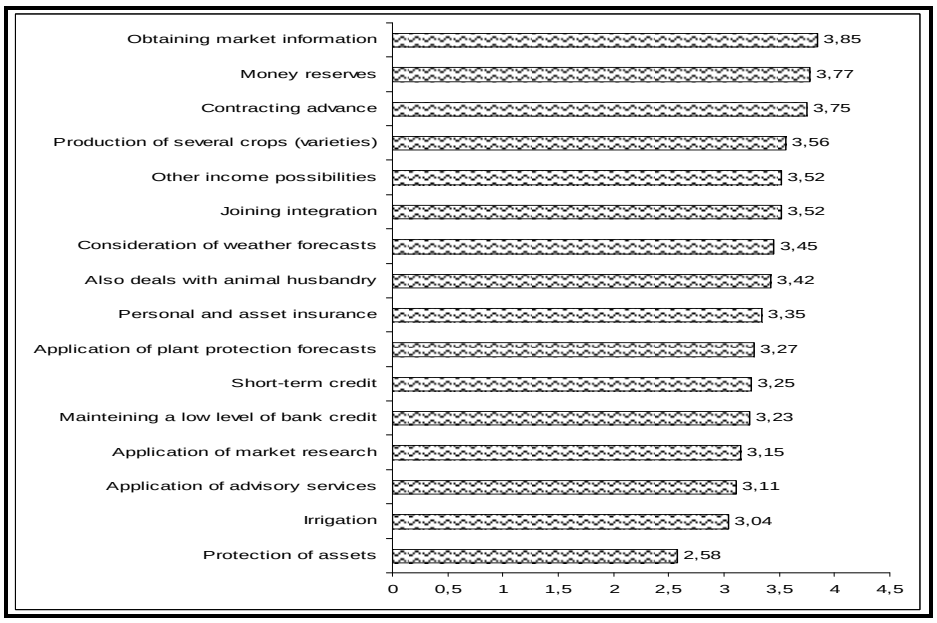
Order of importance of human risk factors (n=261)



Source: Own calculations

Figure 7

Importance of risk management processes in economic operations (n=261)

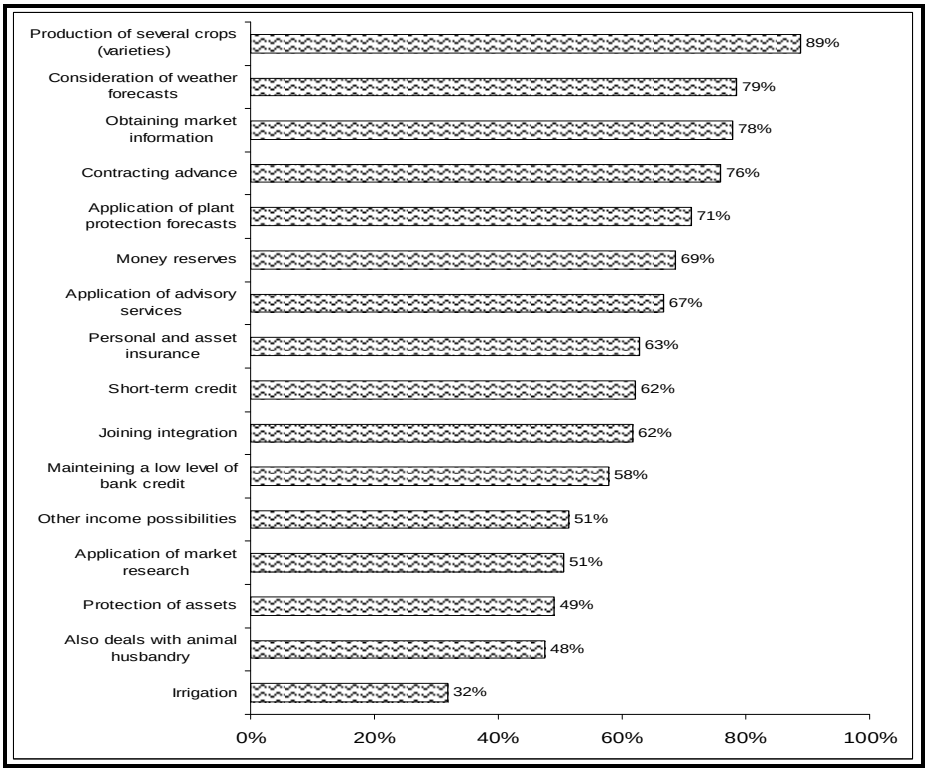


Source: Own calculations

The applied risk management methods are highly influenced by the farmer's approach to the different risk factors; therefore the applied tools could be different from farmer to farmer. Figure 8 shows the share of different risk management tools applied by the responding farmers. The majority of responding entrepreneurs, almost 90%, produce more types of crops, consider weather forecasts and receive market information.

Figure 8

Share of application of risk management methods (n=261)



Source: Own calculations

REFERENCES

(1) Buzás Gy. – Nemessályi Zs. – Székely Cs. (2000): Mezőgazdasági üzemtan I. Mezőgazdasági Szaktudás Kiadó, Budapest, 434-459. pp. – (2) Castle, E. N. – Becker, M. H. – Nelson, A. G. (1992): Farmgazdálkodás. In: Nemessályi Zsolt (szerk.): Farm Business Management, Mezőgazda Kiadó – (3) Láng I. – Csete L. (1992): Az alkalmazkodó mezőgazdaság. Agricola Kiadói és Kereskedelmi Kft., Budapest – (4) Ladányi M. (1995): Növénytermesztési modellek. „AGRO-21" Füzetek, Budapest, Vol. 11. 79-96. pp. – (5) Tóth M. (szerk.) (1981): Döntés és döntéselemzés

a mezőgazdasági nagyüzemekben. (Válogatás), Mezőgazdasági Kiadó, Budapest, 114-192. pp. – (6) Hungarian Central Statistical Office (2004): Agriculture in Hungary, 2003, Farm Structure Survey – Volume II., Budapest

ADDRESS:

Lőrincz Zsuzsanna
PhD hallgató
Nyugat-Magyarországi Egyetem
Mezőgazdaság- és Élelmiszertudományi Kar
Gazdaságtudományi Intézet
Üzemtani Tanszék
9200 Mosonmagyaróvár, Vár 2.
Tel.: 96/566-642, Fax: 96/566-610
E-mail: radnics@mtk.nyme.hu

Kacz Károly
tanszéki mérnök, PhD hallgató
Nyugat-Magyarországi Egyetem
Mezőgazdaság- és Élelmiszertudományi Kar
Gazdaságtudományi Intézet
Üzemtani Tanszék
9200 Mosonmagyaróvár, Vár 2.
Tel.: 96/566-642, Fax: 96/566-610
E-mail: k-kacz@hotmail.com

Kalmár Sándor
egyetemi tanársegéd, PhD hallgató
Nyugat-Magyarországi Egyetem
Mezőgazdaság- és Élelmiszertudományi Kar
Vezetés- és Társadalomtudományi Intézet
Termeléstechnika- és Munkaszervezéstani Tanszék
9200 Mosonmagyaróvár, Vár 2.
Tel.: 96/566-759, Fax: 96/566-794
E-mail: kalmars@mtk.nyme.hu