Assoc. Professor Dimitre Nikolov, PhD, Assoc. Professor Minka Anastassova, PhD, Elizabeth Ivanova

INSURANCE PRODUCTS IN AGRICULTURE AND FARM INSURANCE BEHAVIOUR

On the grounds of some main theoretical formulations for the risk management in agriculture, an outlook has been made of the practice in the country for the last years. Insurance in agriculture in the country dates back to the first years after the Liberation. The aim of the paper is to analyse the insurance development in agriculture in the recent years – from 2003 until 2011 and of the reactions of agricultural producers concerning the insurance. The methods of retrospective, comparative, statistic descriptive and probabilty analysis have been applied. As a result of the analysis, propositions have been made related to the risk management improvement in agriculture. On the basis of the obtained results conclusions were made regarding the insurance state in agriculture and the relation between different factors of agricultural farms management and insurance activity.

JEL: G22; Q1

Measures for risk management acquire bigger importance against the background of climate changes, on one hand and the reform of the support within EU CAP for market sustainability, on the other hand.

Risk management in agriculture is particularly important for some reasons. The lack of risk management has a direct impact on agricultural producers' incomes, market stability in the sector and potential food safety. The sources of risk in agriculture are numerous and varied. Markets for agricultural inputs and outputs have a direct effect on the risk on the farm, especially on price. Variety of probabilities of adverse events related to weather, pests and diseases or personal circumstances determine agricultural production in ways that are beyond the control of the farmer. Unexpected changes can occur in access to credit and other sources of income that affect the financial stability of the farm. Framework or changes in it can lead to a number of obstacles and political risks. Some risks are catastrophic, as they are very rare, but cause much damage, and they are often systematic and non-systematic at the same time. Their occurrence and associated damages are largely unknown. Cognitive impairment that makes them very difficult to manage, both from individuals and from markets. Other risks related to weather such as droughts and floods have component systems as they affect most farmers all over the region or the country. Another group of risks such as hail are more common and easier to explore. Many risks are interrelated. Some of them related to prices of raw materials and finished products can be positively correlated. Consideration of these relationships is crucial in developing effective strategies for risk management.

Analysis of the proposed insurance products for agriculture in Bulgaria is presented regarding the two main sectors – crop production and livestock breeding. Change of the proposed insurance products is influenced by different

factors as economic environment, changes of the state policy in the sector, global climate changes etc.; for Bulgaria essential is the factor for the EU membership and this is the reason for accentuate on the insurance changes for the periods before and after the EU accession.

Risk segmentation

Usually in the literature the emphasis is on the catastrophic risk and on the market failure probability in case of catastrophic risk occurrence (World Bank, 2005). This argument is based on the main technique of risk management consisting of risk segmentation in different layers. This segmentation can help for correspondence of each risks set with different risk "buyers" or available mechanisms for risk management. These layers could be defined in respect to the probability of occurrence and to the losses amount, therefore to the catastrophic degree of the risk.

The first layer includes losses, which are result from existing risks in the normal business environment. They are very frequent, but provoke minor losses. Farmers have to manage themselves such kind of risk by tools and strategies on a farm level. Apart from the last-mentioned, there are also strategies, related to incomes diversification and market consumption relief (financial assets management, non-agricultural activities) or implementation of governmental policies (fiscal policy). This layer is "normal" or *layer of risk retention.*

The second layer corresponds to risks, which are more significant and rarer. This layer enables the farmers to use supplementary specific market tools; for instance insurance or market options, especially designed to facilitate farmers risk overcoming. This is the *layer of insurance market.*

The third level contains risks, which are catastrophic by their nature. They could cause enormous losses, even if their frequency is low. This risk is difficult to share or combine through market mechanisms, particularly if it is a system risk. There are arguments in favour of some governmental actions, in case of catastrophic risks. This layer is called "catastrophic" or *layer of market failure.*

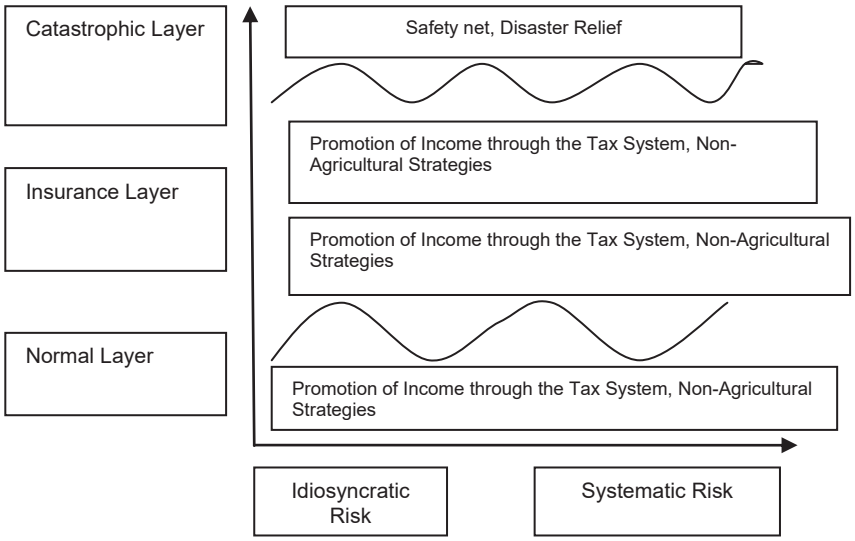
Risks differentiation, regarding two different criteria – their frequency of occurrence and the losses' amount – could be in contradiction if big losses are not related to low probability. Many risks or risks combinations exist, which could lead to the distribution of consequences, causing big losses, related to lower probabilities. Most results would be for the first layer, where it is considered that the risk could be managed by the farmer. Only a small part of results would be for the third layer – of the market failure.

This distinction is easy to execute, if there are clearly defined borders between layers. Generally it is not a case. The first difficulty is related to the definition of the respective variable value of the risk distribution. Second difficulty is related to definition of actual probabilistic distribution. Third difficulty is related to the definition of limits regarding the probability. Finally, this approach must have appropriate tools for risk handling at every layer.

The risk segmentation in layers could be the first step to create a risks' map and the suitable tools for risk management. Fig. 1 presents the three risks levels, with continuity between specific and systematic risk, and approximate picture of risk management tools. When markets failed out of catastrophic risks occurrence, social protection and help for disasters would be important instruments for risk management. Nevertheless, according to farmer's situation, he can still have access to savings or work out of the farm and deal or not with specific catastrophic events. In fact, these tools could be potentially accessible for every layer of risk.

Figure 1

Map tools for risk management



Source. Risk management in agriculture: a holistic approach (OECD, 2009).

"Insurance" or market layer could include different kinds of tools for different degrees of correspondence between market agents. For instance, insurance of independent risk at hail or frost and futures and options for the price risk management. Apart from this, some hybrid insurance contracts could be proposed, for loss of yields or profits. Private associations (cooperatives or mutual funds) or such associations at the food chain could be also precious tools for some risks management.

"Normal" risk layer is managed by the agricultural producer. At this layer common tools of the fiscal system are used, which could have a stimulating effect on incomes from agriculture. Mechanisms of savings (deposits) and loans are also normal tools, which should be completely accessible and to be used by farmers in the same way and by other economic entities and households.

Existence and development of some instruments and strategies for agricultural risk management could not be analyzed separately from the availability of other tools.

Insurance of agricultural risks

From the point of view of the agricultural production sensitivity to meteorological or other risks, there is a potential demand of crops insurance. Agricultural crops insurance exists in many countries and it depends to a great extent on the state support (Greece, France and other). Non-subsidized private insurance is mostly limited to one risk, as the hail insurance. The main difficulty is the high transaction cost, related to insurance markets of the harvest, because of the presence of informational asymmetry. This makes private premiums very expensive regarding payments and reduces or eliminates the demand from the part of farmers. The demand for insurance also is influenced by the relative costs for alternative strategies, as for example diversification and financial management. Many governments have the willing not to ignore the subsequent demand of compensation after the disaster.

Insurance contract means that the farmer pays premium for insurance purchase. The contract gives right to compensation for specific events (one-risk insurance) or for yield/production diminution under the threshold value (multi-risk insurance). Insurance amount is related to evaluation of suffered losses. High costs for insurance contracts' offer are partly related to information asymmetry. Moral risk in this context appears when it is impossible or extremely expensive to prepare a contract on the grounds of everything that the farmer could perform and affect its yields. Unfavourable choice occurs when contracts based on all significant parameters, connected to the environment, are not feasible. Both – unfavourable choice and moral risk – are widely discussed in literature on the grounds of multi-risk insurance (Knight and Coble, 1997).

Crops insurance provides compensations based on the average yield of suitable big area, which removes the problem with the moral risk and lead to potential reduction of unfavourable choice (Mahul, 1999). Nevertheless, this insurance is made at the expense of addition of basic risk, which could be charged by the farmer. Such arguments could be made regarding the weather index insurance, which is often proposed as a solution in the developing countries (Barnett, andMahul, 2007) and World Bank, 2005), for which there are many examples (Skees, 2007). Revenue insurance is also a popular conception, because it concerns directly the combination between price and production risk, standing in front of farmers. Unlike any combination between futures contracts and harvest insurance, this insurance could be stabilize completely the incomes. This could increase the impact of the welfare of a particular price or cost for the production risk management (Hennessy et al., 1997).

Usually literature provides a standard solution for insecurity management in developing markets, namely insurance markets. These markets facilitate the risk

exchange with other agents, the realization of potential profits from integration and sharing of risk. Nevertheless, not all risks, influencing agriculture, have a respective insurance market. Not all risks could be insured, insurance contracts do not exist for some risks, because the insurance premium including all costs would be extremely big. There are some conditions, which should be known for the risk insurance. They could be grouped, as follows (Skees, and Barnett, 1999):

• Appropriate risks for different agents should be independent or special. Risks, which are strongly correlated, could not be easily integrated and can generate big potential losses, with very big obligations for the insurer. These big obligations are very difficult and expensive for reinsurance.

• There should be available information or some method for assessment of probability for risk event occurrence in order to make evaluation of financial costs, related to each event. Assessment of the risk distribution is necessary to evaluate the correct premium.

• Information could be widely accessible among market agents, so the potential for moral risk and the unfavourable choice to be minimized.

• The probability of risk occurrence should be in a "middle" range: if the probability is big, the premium would not be accessible; if it is very low, the use of materialized unfavourable events for the most precise assessment of the probable distribution would not be possible.

An agricultural risk, meeting all these strict insurance requirements can hardly exist. Miranda and Glauber, (1997) underline the necessity for the risk to be independent among the insured. Due to the ratio between different crops yields, insurers are exposed to risk "portfolio", which is about ten times bigger than the risk for private insurers, proposing more conventional insurance lines (cars, fire etc.). Reinsurers are willing to take portfolio, because of the probability of very big obligations. There is a continuous process of risks on one axis, moving from completely independent to a correlated risk. Cars, life and fire danger are very close to independent extremity and are suitable for insurance solutions. Agricultural goods' prices are very close to a perfect correlated extremity and are more suitable for options and futures market. The harvest is somewhere between. Some specific meteorological dangers, concerning the yields, as hail or frost, are more independent than others. Insurance against the animal diseases, including infectious diseases, is made also in some countries, as Spain and Germany (MAP, 2008).

State policy

The market result in standard economies could not be optimal, according the Pareto principle. In this context two questions are important, in terms of the governmental role. The first is whether the economy of the country provides the most proper "set" of markets. If not, government could try to develop a basis for new markets creation, related to the risk. The second question is whether resources have been distributed in a right way, taking in consideration already

existing markets. If not, government could play a crucial role in welfare improvement. The main potential for market failure of the risky markets is due to the presence of information asymmetry and transaction costs, related to the access to the respective market information. The government capacity for improvement of resources distribution depends on the access to information and its capacity or effectiveness for information creation and transfer.

Government can pursue aims, different from increasing the effectiveness. It is indisputable that government, through redistribution budget aims, especially in case of catastrophic events, can focus on on some economic agents' groups, including agricultural producers. Sometimes these aims are expressed in diminution of some specific risks or deviations. In terms of political economy, government purpose is to react by some adequate actions, when agricultural producers "suffer" or are "vulnerable". The degree, up to which these aims are "good", is a political question without answer. For example, the purpose for price fluctuation diminution, in front of farmers, could seem economically absurd, because the farmers' welfare depends on incomes or on their access to consumers and the corresponding market fluctuations. It depends on many other components and circumstances and it is not related to price change. If this is the target, the economy, itself, has specific obligations regarding the effectiveness of the measure to achieve this aim, the consequences for households' incomes variability, the interaction with other strategies for diminution of the risk and the consequences of effectiveness and redistribution.

Information and methods

The analysis of insurance market of the country is based on information from regulatory documents, from internet sites of insurance companies, statistical data from the Commission for Financial Supervision (Annual Reports of the Commission for Financial Supervision …) and State Fund "Agriculture" (Anguelova, 2012).

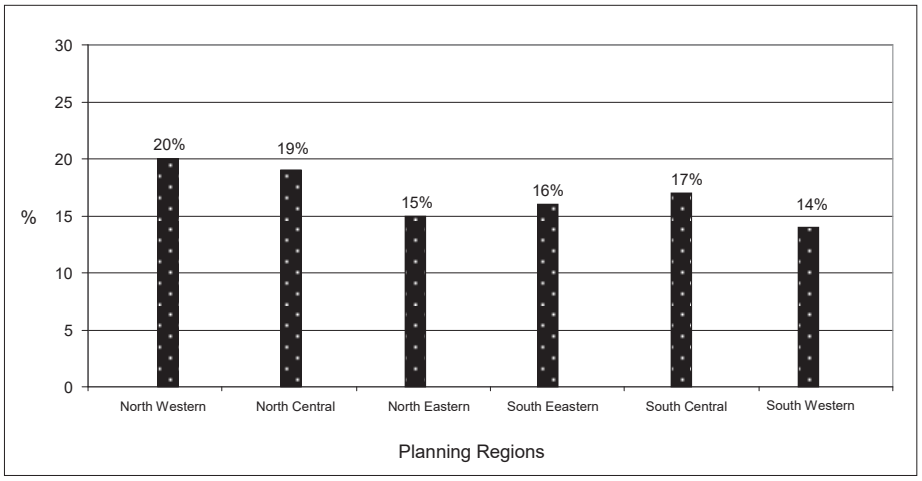
The analysis has used data from national survey, conducted at the end of 2011 from the Institute of Agricultural Economics with the support of the National Agricultural Advisory Service (NAAS). The research covered 297 agricultural farms, selected proportionately from the six planning regions of the country. From the received inquiry forms 65 were rejected. The farm distribution by regions of planning is presented in Fig. 2.

The survey includes 39 farms, on the average, from one planning region, whereas the North-West region has the largest share. The respondents are distributed according the farm type, as: crop farms; livestock-breeding farms and mixed farms.

The farms are divided in two main groups: crop production and livestock-breeding farms. The share of the first group is 79% and 21% of the second group. The share of the narrowly-specialized farms in the livestock-breeding sector only is 11%. The other livestock-breeding farms are mixed – 10%. From the livestock farms (specialized and mixed) these producing cow milk – 40%, bee honey – 29% and sheep milk – 19% prevail.

Figure 2

Distribution of farms in the survey on the areas of planning



Source. Own calculations.

Structure of the insurance market

Insurance companies

Insurance market in Bulgaria includes four main groups of participants, which could be Bulgarian trade associations and branches of foreign insurance companies. The first group is *insurance companies* (general insurance and life-insurance). The other three groups are: *insurance cooperatives, reinsurance companies, insurance mediators* (insurance brokers and insurant agents). Insurance agents could be physical persons, legal entities or sole traders (see Insurance Code).

At the end of 2011, *35 insurance companies* opeate on the Bulgarian insurance market operate, of which:

- 18 Bulgarian insurance companies with general insurance activity in Bulgaria;
- 9 Insurance companies from EU member-states, performing activity of general insurance in Bulgaria, under the right of establishment conditions (branches);
- 14 life-insurance companies.

Most of the insurance companies have insurance associations for both insurance kinds – general insurance and life-insurance, which makes the difference of the total number.

In addition to the above-mentioned, two mutual insurance cooperatives operate on the market – a Bulgaria company (Mutual Insurance Cooperative “Dobrudja–M–

Life") and a foreign company, having a branch in Bulgaria ("Gratzer Vexelzeitige Ferziherung" – Joint-Stock Company, branch Bulgaria, Sofia) and one association for export insurance ("Bulgarian Agency for Export Insurance – BAEZ" Ltd.).

four general insurance associations carry out reinsurance activities, one life insurance association and one reinsurer of general insurance (see Sector "General Insurance" with positive result…). Also 373 licensed insurance brokers and 28 765 licensed insurance agents operate on the insurance market. The Commission for Financial Supervision has received 1018 notifications from insurance brokers of EU. Five insurance associations were declared insolvent in 2011.

From the functioning 18 companies, operating general insurance, 12 propose insurance products for farmers. They include insurance of agricultural crops and animals.

The *insurance companies'* number in the country for the period 2003-2011 was changed; for the period 2003-2005 in Bulgaria there were 31 insurance associations; from 2006 to 2009 they increased to 37 and for 2011 there were 36. The number of *general insurance associations* in the examined period (2003-2011) is relatively stable - 19-20; for 2011 they diminished to 18. *Life insurance associations'* number increased twice – from 8 in 2003 to 16 in 2011, as the number increased quickly up to 2007 (from 8 to 15). After 2007 the number was relatively stable – 14-16.

There were two *mutual insurance cooperatives* in the period 2004-2011, as for 2003 their number was three. Foreign companies' number was 9 and this number was constant for the period 2009-2011. For the years 2003-2009 no data were published for *foreign insurance companies' representatives* on our market.

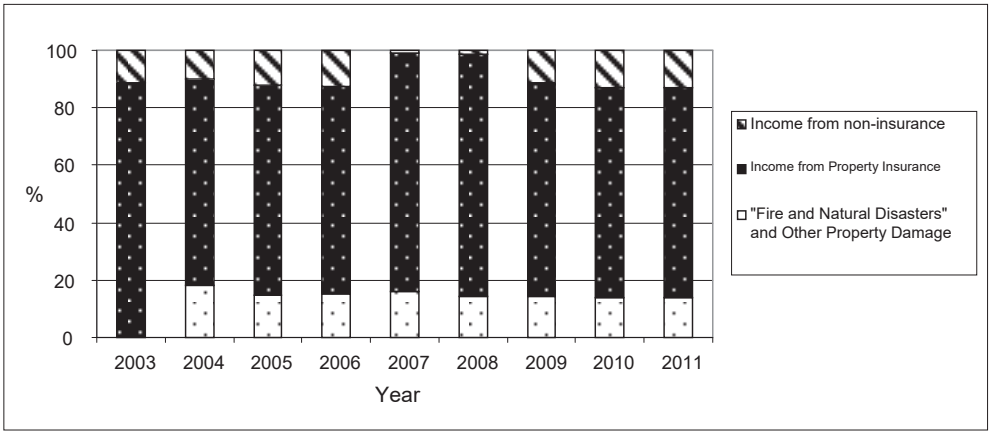
In 2008 the Commission for Financial Supervision granted license for *reinsurance activity* for "GP Reinsurance" Ltd., which was the first and remained the only professional reinsurer up to 2011, operating reinsurance of general insurance in the country.

Insurance mediation is presented by *insurance brokers* and *insurance agents (individuals, legal entities and sole traders)*. In the period 2003-2011 brokers' number has increased over 3 times – from 129 to 337, agents' number decreased twice – from 60 thousands to 29 thousands.

Gross premium revenue

The gross premium revenue for 2011 of associations for general insurance (the part for property insurance includes also insurances for agricultural crops and animals) amounts to 1365 million BGN, which is a decrease of annual base with 0.9% for 2011 against 2010. The share of the premium revenue of general insurance associations compared to the total gross premium revenue was the highest in 2007 and 2008, respectively 99.21% and 98.63% and the lowest in 2011 – 84.78%. The change of the premium revenue of general insurance associations, including property insurances, especially against "Fire and natural calamities" and "Other property damages", compared to the total gross premium revenue for 2003-2011, is presented by Fig. 3.

Figure 3
Dynamics of the Income Premium of Insurance Companies for the period 2003 - 2011 (mln BGN)

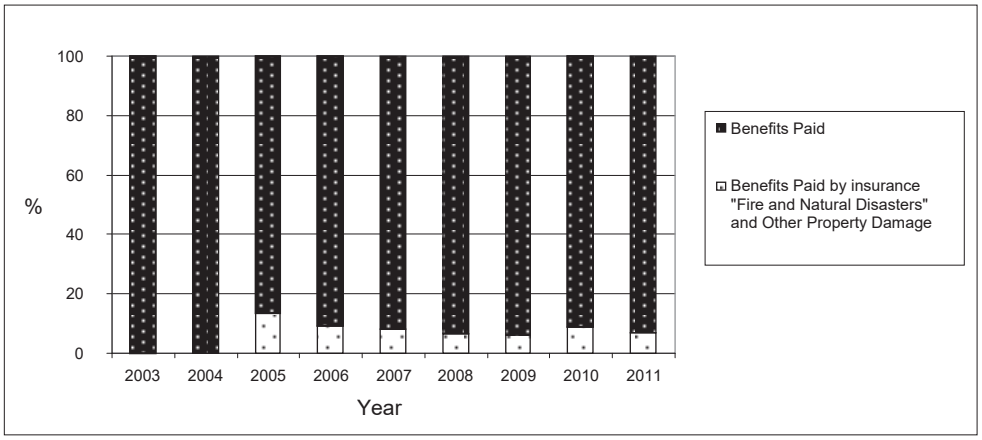


Source: Annual reports of the FSC for 2003-2011, and own calculations.

Paid indemnities

For the period 2003-2011 there is a growth of the *paid indemnities of property insurances,* until 2010. In 2011 a decrease in annual base compared to 2010 with about 15% was reported (Fig. 4).

Figure 4
Paid life insurance benefits to insurance companies based in Bulgaria for the period 2003-2011



Source: Annual reports of the FSC for 2003-2011, and own calculations

The paid indemnities in groups “Fire and natural calamities” and “Other property damages” have the highest share for 2005 – 13.7%, compared to all paid indemnities. The lowest share is in 2009 – 6.0%.

Market share of insurance associations

Leading insurer on the insurance market, on annual base of the premium revenue, both for agricultural crop production and livestock-breeding production, is “DZI – State Insurance Institute – General Insurance” Ltd., followed by the associations “Allianz Bulgaria” JSC, “Armeetz” JSC, “Bulstrad Vienna Insurance Group”, “Generali Insurance” JSC, “Interamerican Bulgaria” Ltd. etc. This is historically grounded, because in 1989 the State Insurance Institute (DZI) is the single state insurer in Bulgaria. In the transition period it was privatized by a foreign company, but tradition and experience give certain advance of the association, regarding the newly-created and foreign insurance companies. The insurance of agricultural crops hides a high risk and insurance associations use for their activity the DZI statistics for 50 years backward, which tracks the risk development (i.e. how many were the hails in this period; which were the collected premiums; which was the risk soaked up the biggest part of funds etc.).

Market share of general insurance associations is defined on the data base for (1) the general premium revenue or (2) premium revenue of direct general insurance from the insurers’ reports, presented in the Commission for Financial Supervision, according to Regulation N 30/19.07.2006. The second is obtained by deduction of the active reinsurance from the general premium revenue. Market share, based on the total premium revenue of the first 5 general insurance associations for 2010 is:

1.“Bulstrad Vienna Insurance Group” JSC – 13.1%;
2.“DZI – State Insurance Institute – General Insurance” Ltd. – 12.5%;
3.“Armeetz” JSC – 11.3%;
4.“Allianz Bulgaria” JSC – 10.3%;
5.“Bul Ins” JSC – 9.9%.

Market share of the general insurance associations in groups “Fire and natural calamities” and “Other property damages” is defined on the data base for the total premium revenue from insurers’ reports. In 2010 “Allianz Bulgaria” JSC – 10.7%, had the biggest market share in the group “Fire and natural calamities”, followed by “Bulstrad Vienna Insurance Group” JSC – 11.7% and State Insurance Institute (“DZI – General Insurance” – 11.1%; in the group “Other property damages” the first three companies are: “Uniqa” JSC – 26.7%, followed by Allianz Bulgaria” and “Generali Insurance” JSC – 16.7% market share. The the market share of “Energuia” JSC of Insurance Company “Allianz Bulgaria” was included in the associations’ classification, because it is a part of this company.

Insurance of agricultural crops in Bulgaria

Agricultural crops insurance before the EU membership of Bulgaria

In this period the emphasis is put on the insurance of autumn crops, which is about 20 % of the total amount. Two kinds of contracts have been concluded. *The*

first is for harvest insurance with duration from the germination to the harvesting, *the second (annual)* complies with the SAPARD Program conditions for newly-planted perennial crops. In the total portfolio of "Vitosha" JSC, for example, in 2005 they were 5%; in "Allianz Bulgaria" – 2.5 – 3%; in "DZI – General Insurance"- 10-12%; in "Generali Life Insurance" JSC - 2-2.5%; "HDI – Insurance" – 10% (see News-paper "Zastrahovatel", 2005, N 10).

Agricultural crops insurance after the EU membership of Bulgaria

For the analysis purposes insurance products in the spere of agricultural insurance area of *10 insurance associations* were examined, which according to the web sites of the insurance companies in Bulgaria are 83% of insurance associations, proposing insurance products for farmers.[1]

Table 1 shows the risk kinds, against which agricultural crops could be insured in crop-growing, including the vegetables production. There are five risks, against which all insurance companies propose protection of farmers, namely: storm, fire of root, drench, frost and flood.

Table 1

Risks covered by crop insurance companies in Bulgaria

Risk	Insurance Company									
	Allianz	Bul Ins	Armeetz	DZI	Bulstrad	Generali	HDI	Euroins	Interamerican*	OZK
Hail	✓	✓	✓	✓		✓	✓	✓	✓	✓
Storm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fire root	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drench	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Frost	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood	✓	✓	✓	✓		✓	✓	✓	✓	✓
Download and frost		✓	✓	✓	✓	✓	✓	✓	✓	✓
Slush		✓	✓	✓		✓	✓		✓	
Suffocation			✓	✓			✓		✓	
Falling aircraft	✓						✓			
As government programs - SFA		✓				✓				

* "Interamerican" JSC risk cover storm with wind speeds over 15 m / sec.

Source. Own Survey.

[1] Web sites of insurance companies in Bulgaria

Insurances against one risk only – *one-risk* and against a group of risks – *multi-risk* are proposed also on the insurance market in Bulgaria. Proposed products from insurers are diverse, enabling the clients to make the most appropriate set of risks for their individual case, against which to insure their output and/or animals.

Specific features have been observed of the proposed products of the different insurance associations, as:

1."Allianz Bulgaria" JSC gives opportunity to its clients (distribution of covered risks in groups from first to fourth) to choose the group of risks to insure the crops, according their interests. Combination of different risks is allowed – inclusion or exclusion of different risks from the groups.

2."Bulstrad Vienna Insurance Group" does not cover losses, caused by: drought, diseases, chemicals and preparations, rodents, insects, wild or domestic animals and birds and losses, caused by natural dying of species.

Agricultural crops, subject to insurance against the above-mentioned kinds of risks, are grouped in several main directions: field crops; orchards; vegetables yards; vineyards; essential oils; flowers for sale and seeds; crops in greenhouses and hothouses; tobacco; perennial and annual grass mixtures etc.

Insurance products for these crops are proposed by most of companies. Five of them - "Allianz Bulgaria" JSC, "Bul Ins" JSC, "Armeetz" JSC, "DZI – General Insurance" and "Bulstrad Vienna Insurance Group" insure all agricultural crops.

Specific particularities have been observed regarding requirements for agricultural production insurance from insurance associations, for example:

1. *Insurance association "HDI Insurance"* provides coverage at special conditions for new-created perennial plantations, as orchards, essential oils and vineyards for the following risk types: hail, storm, fire of root, frost, drench and flood.

2. *"DZI – General Insurance" JSC* provides possibility to reseeding after damaged agricultural crops, i.e. when young crops have been destroyed partly or totally, and if there is a possibility to reseed the same or other crops, the indemnity is on a percentage of the insurance sum. It refers to the following crops kinds:

- Cereals, oilseed colza and perennial fodder grasses – 30%;
- Maize, oilseed, trench, fiber and pulse crops, field pumpkins, rice and annual fodder grasses – 20%;
- Tobacco, vegetables, melon fields, trench crops for seed, medical plants and flowers for seeds or for sale – 15 %.

At a reseeding of destroyed young crops, the existing insurance is ceased and a new one is concluded for the reseeded crop.

3. *"Insurance Company" JSC* does not provide such insurances, except in some special cases:

- Trees, bushes and naves, considered as fixed assets;
- Natural and artificial meadows and pastures, forests and forest belts, plantations for embankments and ameliorations, rush, wicker, plants for green fertilization, decorative plants, forest and decorative hotbeds;

• New-planted and young non-fruit-bearing: orchards, mulberry gardens, vineyards, strawberries, raspberries, planted rosehips and blackberries, blackcurrant (cassis) etc.;

• Non-blossoming plants: oil rose, lavender, hop and other crops in experimental grounds, grown with scientific and experimental purpose.

Livestock insurance in Bulgaria

Livestock insurance before the EU membership of Bulgaria

Livestock insurance until 2007 was realized mainly by some companies – "DZI – General Insurance", "Vitosha", "Bulstrad", "Allianz Bulgaria". Companies as "Generali Life Insurance" JSC, "Victoria" JSC, "HDI – Insurance", "Bulgarian Property – Vinner Schtetishe", "OZK" also provided this insurance, but they claimed that the clients' interest was very poor. The total insurance market for livestock insurance was about 2 – 2,5 million BGN premiums. "DZI – General Insurance" JSC, since their creation, up to now, has remained a leader of this kind of insurance, holding 40% of the market with premium revenue of about 1 million BGN for 2005.

Livestock insurance after the EU membership of Bulgaria

Regarding the currently proposed insurance products for livestock farmers in the country, the variety is big; there are insurances for all farm animals at general conditions and for some elite breeds, exotic animals, sport and racing animals etc. – at special conditions on the part of the insurer, according the risk degree taken by the insurer.

Similarly to the analysis of insurance products for the crops growing, the analysis of the insurance in the livestock breeding area presents the risk kinds, covered by insurance associations; kinds of animals, which could be insured and which companies realize insurance of agricultural and other kinds of animals.

Insurance associations "Bul Ins" and "Euroins" do not propose insurance products in the livestock breeding. All other companies propose to livestock farmers insurances of farm animals (cattle, sheep and goat, poultry, equines, pigs etc.). These insurances are related to the general conditions for the main risk: death, slaughter (killing) of animals and poultry by necessity; due to fire, natural calamities, accidents, infectious, non-infectious, parasite and other diseases.

Different insurance associations also propose to clients protection against specific risks in the group of main risks, as " Loss of breeding and reproductive qualities" and "Falling into gap for grazing animals" from "DZI Insurance"; "Loss of milk production – for cows and female buffalos" from "Allianz Bulgaria" and "Explosion" from "Generali Insurance".

Thoroughbred horses, dogs having passports, ducks and geese for liver (foie gras), hives with bees, fishes and breeding fish material, rabbits, exotic, tribal and decorative animals and birds are insured At special conditions.

Among their insurance products, only "Armeetz" has insurance for rabbits breeding; two associations – "Armeetz" and "DZI" insure pheasants, rock partridges and useful wild animals, bred in breeding stations.

Insurance products in livestock breeding, proposed by insurance companies are presented on Table 2.

Table 2

Livestock, subject to insurance in Bulgaria

Livestock	Insurance Company									
	Allianz	Bul Ins	Armetzc	DZI	Bulstrad	Generali	HDI	Euroins	Interamerican	OZK
Bovine animals (cattle and buffalo)	✓		✓	✓	✓	✓	✓	✓	✓	✓
Caprine animals (sheep, goats)	✓		✓	✓	✓	✓	✓	✓	✓	✓
Equidae (horses, donkeys)	✓		✓	✓	✓	✓	✓	✓	✓	✓
Pigs	✓		✓	✓	✓	✓	✓	✓	✓	✓
Dogs	✓		✓	✓	✓	✓	✓	✓	✓	✓
Birds	✓		✓	✓	✓	✓	✓	✓	✓	✓
Fish and fry	✓		✓	✓	✓	✓	✓	✓	✓	✓
Beehives	✓		✓	✓	✓	✓	✓	✓	✓	✓
Elite and racing horses			✓	✓	✓	✓	✓	✓	✓	✓
Rabbits			✓	✓						
Ducks and geese to produce liver			✓	✓			✓	✓	✓	✓
Exotic animals			✓	✓		✓	✓	✓	✓	✓
Pheasant, rock partridge, quail and useful game reared in game farms			✓	✓						

Source. Own Survey.

Farmers' reaction about insurance

The article presents a part of results from the performed survey under the project *"Risk management in agriculture"* of the Institute of Agricultural Economics, Sofia (Nikolov et al., 2012), including also 6 questions concerning the risk managements and the present and future insurance activity of farmers.

63% of respondents answered the question *"What is the meaning of the term "Risk management" in agriculture?".* From their answers:

- 37% accept main instruments for risk management in agriculture;
- 24% accept risk management in agriculture as a part of the total farm management;
- 15% have not answered.

To the question *"What do you do to decrease the risk from harvest loss?",* the answers are the following: 28% of respondents grow more than one crop; 22% seed new crops between the old ones; 22% insure their crops or livestock. Farmers, using other strategies for risk diminution, apply: good agricultural practices – 67%, prevention measures – 18%, nothing – 15%.

The next question *"For which risky situations did you make insurance in 2011?"* is answered positively by about 1/3 of respondents. Against hail are insured 33%, against drenches – 29%, against storm, frost, fire of root - 28%. Without insurance are 44% of respondents.

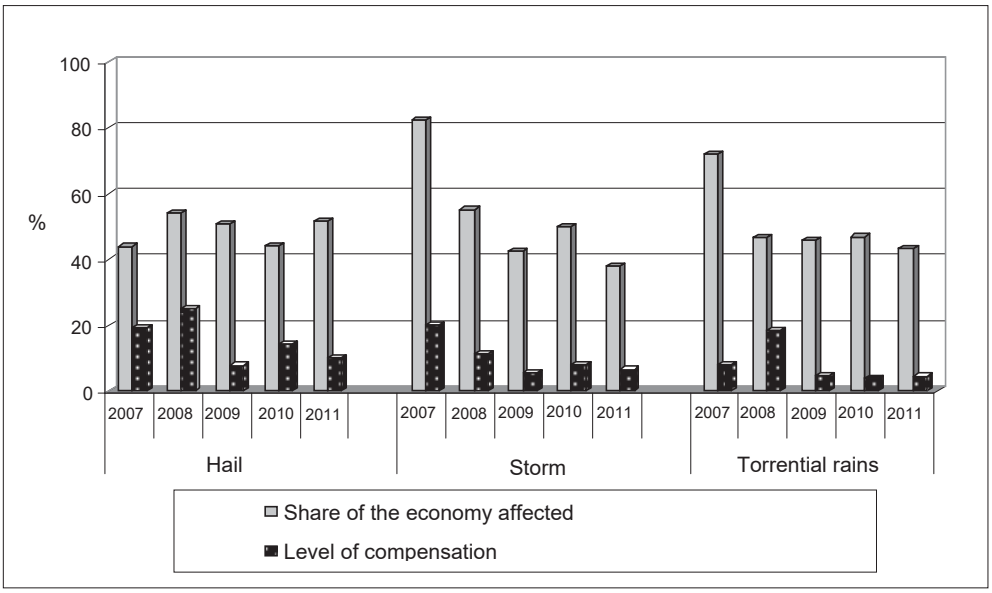
Farmers classified the *main reasons* for the lack of farm insurances, as follows:

- Contract terms with the insurance company are not satisfying – 49%;
- I do not consider the benefit from this kind of insurance – 43%;
- Compensation payment takes too much time and the delay is too big – 33%;
- There is not tradition in this respect and insurance products' market is not sufficiently developed – 32%;
- I have not enough information on the conditions and the possibilities of farm insurances – 19%.

Unsatisfying insurance level in farms is determined mainly by the low estimate by the farmers of the insurance activity. In their opinion, insurances are not able to insure enough recovery of damages, caused by natural calamities. This statement is based on the results concerning the ratio between the part of the farm, affected by natural calamities and the share of received indemnities (Fig. 5). These compensations in 88.2% of cases were realized from different insurance companies.

Figure 5

Size of the affected area and the extent of damages from hail storm and heavy rains middle of a farm during 2007-2011 (%)



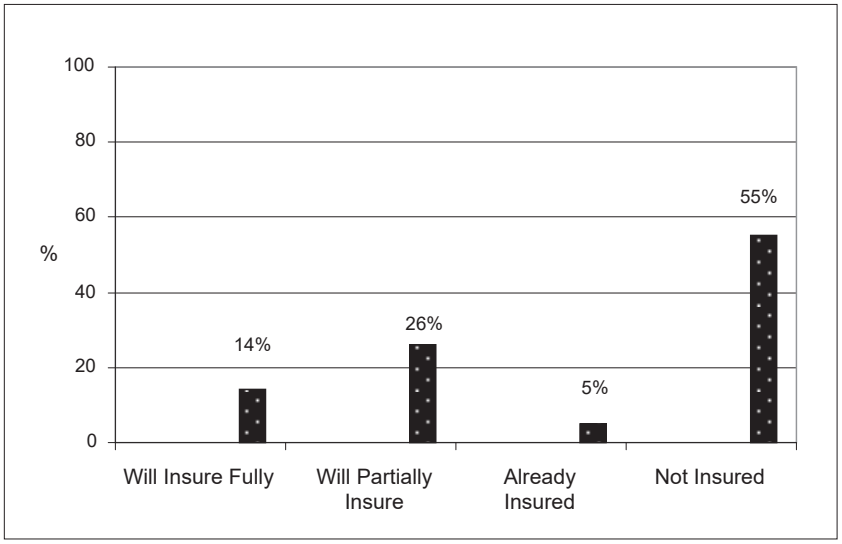
Source. Own Calculations

Results, presented by the chart, show that for the three natural calamities' types, the degree of obtained compensations is much lower than the suffered damages. With small fluctuations from the general trend, in different years, this conclusion is valid for all the period 2007-2011. The examined ratio is the most unfavourable at the caused damages due to drenches, affected its culmination points in the two last years (12.3 times and 9,6 times respectively for 2010 and 2011 the farm damage was bigger compared to the indemnities). The correlation between the affected farm part and the compensations' share is relatively smaller for the hail damages. In this case the proportion value was 2.2 times smaller in 2007 and increased to 5 times in 2011; this fact is disturbing in view of the increasing trend.

The question of farmers' intentions to insure their production, in 2012 agricultural year, is interesting. Their intentions are presented in Fig. 6

Figure 6

Attitudes of Farmers to Insurance



Source. Own Calculations.

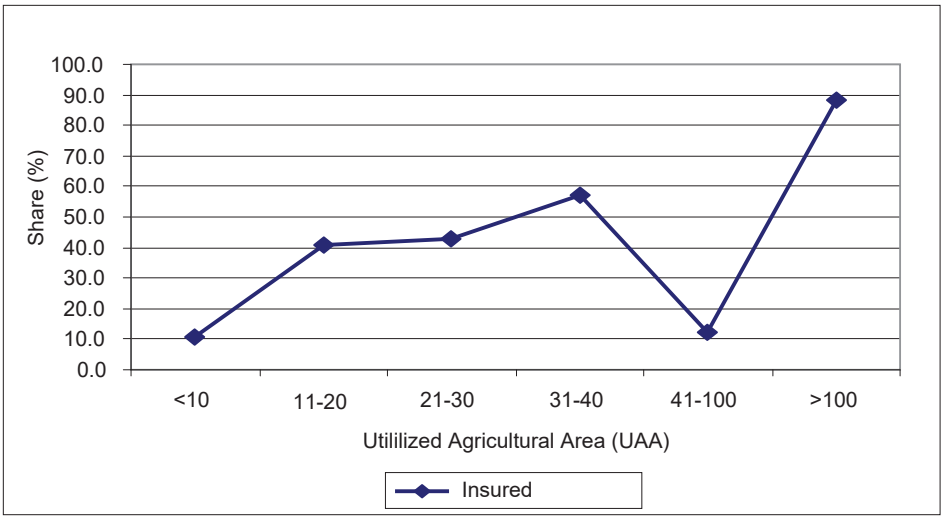
Farmers, intending to insure their farms in 2012, define the main risks, against which they would make insurance: (1) against hail – 37% and against drenches – 21%. To the question of introduction of obligatory minimal insurance within the SAPS supports, there are 26% positive answers; 52% - negative answers and 22% do not have opinion.

Results from the research show that the farmers' age and the utilized agricultural area size have important influence on their insurance activity. For

instance, at 1 year increase of the farmer's age, the probability to farm insurance decrease by 2.6% in average. This result proves that younger age groups of farmers are more interested in insurance. They have better understanding to its significance as an important instrument in the struggle against the consequences of natural calamities. Traditionally in Bulgaria there is a passive attitude to the insurance activity, including to agricultural production insurance, which is characteristic for the older population in villages. Apparently elderly farmers are more conservative regarding the insurance system opportunities use for natural risks management. This could be due to insufficient information on the conditions of different insurance companies and the specific actions, which should be undertaken for realization of the insurance act, itself. We can add probably the lack of sufficient conviction in the insurance effectiveness because of the frequent coverage delay of insured production damages. The relation between the probability for the farm to be insured and the agricultural land area in the formed group could be seen in Fig.7.

Figure 7

Relationship between the level of insurance on farm size and the utilized agricultutre area



Source. Own Calculations.

Data analysis of the chart No.7 above shows that for the farms with area until 40 ha, the insurance probability increases smoothly from 10 to 57%; in the group from 40 to 100 ha, this probability falls sharply down to 12% and in the last group with area over 100 ha increases and reaches about 90%. The observed big drop in the group from 40 to 100 ha could be explained by the fact that just 3.6% of

all farms are included in this group and consequently, the result is quite random, being not sufficiently reliable. Distinctly, we can observe the presence of a linear relation and a directly proportional increase of the insurance level and the respective area increase at the augmentation of the land area of 1 ha to 40 ha (the average increase of the insurance probability is of 8.8%). For the bigger farms, having over 100 ha UAA, with increase of the land of 1 ha, the probability for the farmer to insure his production against natural phenomena with big negative effects increases only by 1%. Actually, the insurance level is almost not influenced by the further agricultural area increase. This is because the insurance level among the big farmers is sufficiently high and in fact reaches about 90% (88.2%). The awareness of the role and signification of insurance as an important instrument in the natural risks management, among the farmers, is completely explicable, taking in consideration the large scale of their agricultural production and respectively of the expected high amount of agricultural output.

Conclusions

From the analysis of agricultural insurance in Bulgaria, we can conclude:

- In the country there is well developed insurance market of domestic and foreign insurers. There is a lack of cooperative insurance companies, at a national and at a local level. Insurance market is regulated in correspondence with the European directives.
- On the insurance market there is a large number of participants, in competition regarding prices and service quality. There is a lack of competitiveness concerning the products variety – proposed products, in general insurance sphere, are similar; clients choose between insurance associations.
- There is a difference in the methodologies for agricultural crops and livestock grouping, at different insurance associations. There is a lack of systematized information for agricultural insurance. Agricultural producers' reaction about insurance as a strategy is positive, but at the same time most of them are against the obligatory insurance.
- Farmers' interest in insurance as a tool for natural risks management until now has been on a low level. Farmer's age indicator has an important impact on the formation of positive attitude towards the insurance.
- The degree of real compensation for the insured farmers, in the period 2007-2011, is much lower in comparison to the incurred damages amount, as a result of hails, storms and drenches. Considerable is the dependence of the insurance level on the farms agricultural area. The highest insurance level is observed at farms having land over 100 ha.

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