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Insurance as a Risk Management Tool in Crop Production

Introduction

Agriculture in Ukraine, especially crop production, is one of the most risky activities, as it is carried out in the vague and non-regulated climatic and natural conditions. An effective market tool for its support and continuity of the reproductive process is crop insurance, that indemnifying for losses incurred enables to stabilize production as well as ensure the financial stability of enterprises, creates conditions to achieve a certain level of food security of the country. Therefore, the public policy should be based on the developed concept of formation and development of agricultural insurance system and its regulation with the help of various forms and methods of support.

Fundamental changes in insurance related to the market conditions of management limited the use of the compulsory forms of insurance coverage traditionally used as a means of state influence on agricultural production. Issues of improvement in the quality of insurance services, combination of the interests of participants in the insurance relations, structure of agricultural insurance system need to be addressed. Therefore, there is a need for further study of the theoretical and practical aspects of the formation of crop insurance system as a risk management tool in crop production with government support.

Research Goals, Tasks, Objects and Methods

The goal of the research is to draft scientifically grounded proposals on development of the crop insurance system in Ukraine by improving the existing provisions and developing theoretical, methodological and organizational ones. Implementation of this goal is associated with the solution to the following tasks:

- to clarify the line of anti-risky activity of agricultural enterprises in order to provide their insurance coverage;

- to evaluate the current state, features of risks insurance of crop production in Ukraine and its methodological support;
- to analyze trends of crop insurance and the need for government support in conjunction with the other forms of insurance coverage;
- to justify the ways of development of crop insurance system in order to improve insurance coverage of agricultural production.

The object of research is crop insurance in Ukraine, its state support and the practice of its implementation as a risk management tool in crop production.

The following methods were used in the research: analytical, statistical, normative, formalization, observation, etc.

Anti-Risky Activity of Agricultural Enterprises

Climatic and natural conditions and risks of natural origin, economic risks that shape market conditions have a significant impact on the performance results in agriculture. Therefore, risk management is of great importance in order to reduce and prevent emergencies. There are several modern approaches with the help of which farmers can adjust the effect of risks, which are divided into two main groups: strategies to reduce risks in the economy and strategy to transfer risks to other entities. At a farm level it is expedient to apply all methods to reduce and eliminate the existing and potential risks:

- risk avoidance – choosing of such activities that will give less income, but are less risky;
- selection of products and production methods that are less subject to risks and have a short term production, usage of technology concepts;
- diversification of crop production and cultivation, maintenance of sufficient liquidity of revenue reserves;
- staged investment;
- search for additional sources of income, etc.

Among the key strategies of risk transfer are as following: involvement of contractors, vertical integration, hedging on futures and options market, attraction of external sources of funds and insurance.

Anti-risky activities of agricultural enterprises to arrange insurance coverage are carried out also through the provision of appropriate insurance reserves, funds (Figure 1).

Now in consideration of financing, a compensatory form which reflects the actual insurance coverage plays a priority role in anti-risky activity in the agrarian sector of Ukraine. And prevention is of a secondary significance, although it has developed into an independent function of insurance. The forms of anti-

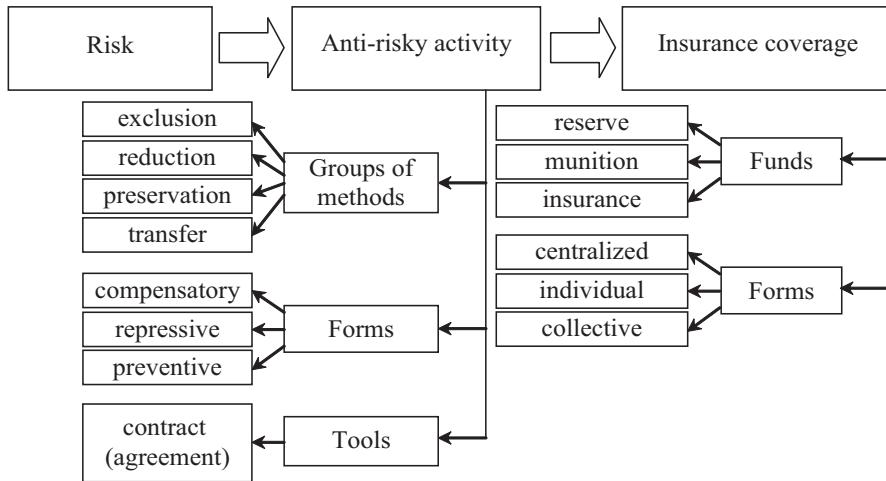


Figure 1
Risk Coverage of the Agrarian Sector

Source: Authors' presentation.

risky activities mentioned above are manifested in the following functions of insurance: compensatory, repressive and preventive. The most common source of compensation for losses in agriculture is creation of munitions, then attraction of external sources and further insurance.

Whereas food market and agricultural production are not a self-regulating system, especially in conditions of high risk (uncertainty) of economic management, disproportionate changes in prices and deterioration in the state of agricultural producers, there is the need to develop the mechanism of the state support of the agrarian sector and form reserve funds and allocate public funds as external sources of compensation for losses in the agricultural production.

In Ukraine in the system of financing of anti-risky activities of agricultural enterprises, insurance is in the third place, although it is a priority in the developed countries.

Features of Risk Insurance in Crop Production

Insurance is one of the ways to mitigate loss and adverse effect of risk. Although, its compensatory form is the most capital-intensive. But loss occurrence is almost always damage, which does not contribute to the stabilization of financial and economic activity of entity, especially in agriculture. Therefore, in anti-risky activities a considerable attention should be paid to the preventive

form, which is less expensive, much cheaper (for an insurer there is limitation of insurance liability, differentiation of contributions considering the security of the objects insured, return of the part of premium, deductibles, etc.). This approach is due to the fact that the criteria of efficiency of insurance coverage are its universality, completeness, reality. Therefore, among the methods of influence on agricultural risks, insurance should be considered as one of the most important ways of protection from natural and other risks.

The objective of risk insurance in crop production is indemnity and reduction of the adverse effects that result from the action of natural and climatic phenomena. The advantage of insurance in comparison with other methods of influence on risk is that it enables to stabilize the income of farmers over time. In addition, the development of agricultural insurance in the country as a whole has a positive social impact, giving agricultural producers confidence in their business. Insurance coverage is considered to be optimal, if it is bigger than expected loss.

From the perspective of a systemic approach, agricultural insurance is a multidimensional complex economic system, that consists of subsystems, each of

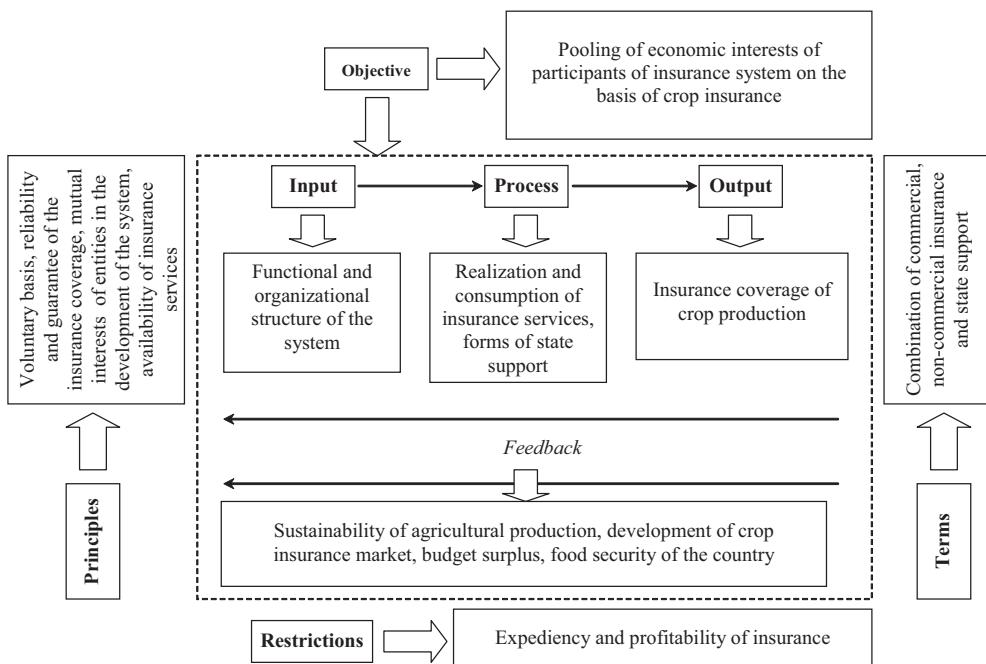


Figure 2
Model of Crop Insurance in Ukraine

Source: Authors' presentation.

which is a self-contained system with a specific list of components. Depending on the form of its carrying out, the system of agricultural insurance can be divided into subsystems of compulsory and voluntary insurance. The differences in the insurance objects can identify the subsystem insurance by sectors and types of insurance. The sectoral classification of insurance enables to consider every sector and sub-sector as an independent system. The hierarchy of the system allows to assert that the agricultural insurance creates an independent system, subsystem of which is insurance of crop production, and in it – crop insurance.

Whereas the system of crop insurance refers to the open economic systems, the system objects are input, process, output, objective, feedback and restrictions (Figure 2).

Subsidization at Crop Insurance

In Ukraine it is possible to make large-scale crop insurance using budget funds only, so principle of efficiency of state support (subsidies) is of significant importance that should be accompanied by targeted control of these funds. The government develops basic tariff rates on crop insurance and fixes the amount of premium that is subsidized. Generally, for 70% of coverage and with 30% of deductible, subsidy is 50% of insurance premium.

In Ukraine the financial support from the state budget is provided to agricultural producers on 16 major budget programs, which cover 29 business lines of agricultural enterprises. This state support for crop production is 17–19% of the total financial support for farmers [Shulezhko 2009]. Agriculture annually sustains a significant loss from the insurance of many events and incidents, natural disasters and emergencies in particular. In insurance events of agricultural production, 56% of cases are of climatic nature.

In modern conditions of formation and development of insurance in agriculture in Ukraine complete and reliable information is not available on the insurance of agricultural risks, including crop insurance. Thus, according to various sources at the end of 2010 on the insurance market of Ukraine there were only 14–17 insurers engaged in insurance in agriculture. And according to the analytical note of IFC project “Development of agro-insurance in Ukraine” the number of settled contracts and amount of agro-insurance premiums depend on insurance model and budgetary funds to subsidize this process (Table 1).

According to the analytical data of 2005 (Table 1) with the introduction of the state aid for insurance of crops and perennial plantings, the number of settled contracts, the volume of insured area and collected insurance premiums in the state increased, and due to the suspension of the public subsidization of insurance

Table 1

Volume of Insurance Premiums, Paid Subsidies, Number of Settled Contracts in Agro-Insurance for 2005–2010

Year	Subsidy, million UAH*	Number of insurers on agricultural insurance market	Number of contracts, unit	Insured area, thousand ha	Insurance premiums, million UAH*	Actual insurance premiums per ha of farmland, UAH*
2005	5.8	120	910	390	12.8	2.44
2006	12.5	–	1,330	1,270	28.5	0.47
2007	74.8	62	4,397	2,360	117.1	2.38
2008	72.8	58	1,637	1,170	155.4	2.89
2009**	0	16	1,980	510	42.0	0
2010**	0	13	524	546	80.01	0

* Exchange rate was 9.25 UAH/EUR in 2010.

**Data given by the insurance companies which disclosed information for analysis.

Source: Calculated according to the data of the IFC, World Bank Group: <http://www.agroinsurance.com/ru/analytics?pid=11203>; <http://www.agroinsurance.com/ru/analytics?pid=13718>; Shinkarenko 2011: <http://www.agroinsurance.com/ru/news/?pid=15298&print=1>.

operations these indicators began to decline. This is especially clearly seen in the indicators of 2010. In addition, the number of insurance companies, entering into contracts of subsidized agro-insurance, amounted to 120 in 2005 and 58 in 2008, that is 51.57% less than in 2005. And in 2009 only 16 of all insurance companies of Ukraine disclosed the information on their participation in agro-insurance. In 2010 13 of 16 insurance companies that actually carried out agro-insurance in the country, collected 90.5% more of insurance premiums compared to 2009.

The level of agro-insurance in crop production is shown by the calculated indicators listed in Table 2.

According to the information contained in Table 2, we can elicit that the number of concluded contracts of crop insurance per insurer increased from 2005 to 2010, but the number of insurers providing crop insurance services significantly reduced that testifies to the lack of insurers' interest in the provision of such insurance services, the cost of insurance services increased (insurance premium per ha of insured area increased nearly by 5 times from 2005 to 2010).

Lack of interest from farmers in agricultural risks insurance is indicated by the following data: during a period of 2005–2008 only about 30% of all agricultural producers, which had insured events, received insurance indemnity,

Table 2
Level of Crop Insurance in Ukraine for 2005–2010

Indicator	Year						Deviation, from 2005 to 2010 [%]
	2005	2006	2007	2008	2009	2010	
Number of contracts per insurer, unit	7.58	–	79.62	28.22	123.75	40.30	531.7
Volume of insured areas per insurance contract, thousand ha	0.43	0.95	0.54	0.71	0.23	1.04	241.9
Volume of insurance premiums, million UAH*, including per:							
insurance contract	0.01	0.02	0.03	0.09	0.03	0.15	1 500.0
ha of insured area	0.03	0.02	0.03	0.09	0.02	0.015	500

* Exchange rate was 9.25 UAH/EUR in 2010

Source: Calculated according to the data of the IFC, World Bank Group: <http://www.agroinsurance.com/ru/analytics?pid=11203>, <http://www.agroinsurance.com/ru/analytics?pid=13718>; Shinkarenko 2011: <http://www.agroinsurance.com/ru/news/?pid=15298&print=1>.

the level of compensation for 43% of the households, which received insurance payments, was less than 20% of the claims declared; the periods of insurance payments exceeded 6 months from the time of submission of the application [Kushnir 2011, p. 150].

Features of the Development of Crop Insurance

According to the results of the recent years in the portfolio of insurance companies in Ukraine percentage of sugar beet and winter wheat is the highest in the structure of insured crops (Table 3), percentage of rape and barley can be increased by 25%, balancing insurance portfolio.

Sugar beet has the quantitative advantages in the collected insurance premiums, as well as in the concluded insurance contracts, although the absolute value of these indicators for the last three years was reduced.

In Ukraine premium rates for a specific crop and on average in crop production are low and constantly declining, while crop insurance cannot be cheap. Because insurers incur certain losses on prior examinations and procedures for

Table 3
Insurance Portfolio of Insurance Companies in Ukraine Crops, %

Crop	Percentage of collected insurance premiums			Percentage of concluded insurance contracts		
	2009	2010	2010 to 2009	2009	2010	2010 to 2009
Years						
Sugar beet	32.0	72.4	40.4	45.0	32.6	-12.4
Wheat	55.0	8.2	-46.8	39.0	30.6	-8.4
Barley winter spring	1.0 3.0	0.9 2.9	-0.1 -0.1	3.0 1.0	4.0 7.4	1.0 6.4
Rye	1.0	0.02	-0.98	4.0	0.8	-3.2
Rape	2.0	0.1	-1.9	3.0	0.4	0.1
Sunflower	2.0	9.0	7.0	2.0	7.8	5.2
Vegetables and fruit	4.0	0.1	-3.9	3.0	1.5	-1.5

Source: Calculated according to the data of the IFC, World Bank Group: <http://www.agroinsurance.com/ru/analytics?pid=13718>.

provisional determining the size of damage after occurrence of insured events, monitoring under valid insurance contract. Notwithstanding the above, the average insurance rate, for example, in the insurance of wheat decreased by 3.58% (from 5.70 to 2.12%), rye – from 3.32 to 0.75%, and on average in crop production – from 5.49 to 2.26%. This situation can be somewhat explained by the fact that most insurance contracts were concluded against specific risks, and the scope of multi-risks insurance remains limited in Ukraine in contrast to the global practice of agro-insurance. However, for domestic insurance companies there is a trend towards understating premium rates (dumping) in crop insurance in order to attract customers.

In 2008 premium rates for agricultural risks insurance with state support ranged from 0.5 to 11.5%, the average rate amounted to 4.8%, slightly more than in 2007 – 4.5%.

According to the IFC in 2010 in Ukraine insurance companies carried out crop insurance with average rate of 5–7%. Although, according to the experts, some increase in insurance rates is not connected with the improvement in the quality of insurance services or relevant actuarial calculations, but with inflation in the country. So, in 2009 insurance value of 1 ha of winter crops went up from

1,200 UAH in 2009 to 1,500–1,700 UAH in 2010. Prices on agricultural products rose as well. So, earlier a ton of wheat was insured for 600 UAH and now – for 1,200 UAH and more [Shinkarenko 2011].

Global experience of formation and development of crop insurance systems with the position of agricultural producers allows to identify a number of factors, which affect the decisions on the financial risk management tool, as an agrarian insurance. These factors, first of all, include the amount of possible losses in relation to the turnover of cash flows or the expected income. So, in Ukraine there are more than 48 thousand agricultural producers, 8.6 thousand of which cover 85% of the sowing areas of the country. They are ready to plan the results of their activities and use agro-insurance tool for the protection of the expected profit even in the event of minor crop losses [Grinyuk, Roshe 2010].

The enterprises with a high level of production diversification more often use costs insurance in their anti-risky activities. For insurance of agricultural produce costs, producer should have supporting documentation of all costs have been carried out by farm in accordance with the necessary technological operations, approved in technological maps. In this case the insurer shall negotiate with the insurance company a list of necessary measures and resources to be used in loss occurrence to minimize losses from the insured events.

In insurance products for crop insurance the amount of coverage has been calculated taking into account the expected sales price or the average selling price of production insured for the last 3–5 years. With the help of this insurance product it is advisable to insure against the risks of crops with a late period of the growing season. By these products an insurer may choose either insurance with the level of deductible or with the level of coverage. It is expedient to conclude insurance contracts without deductible, adjusting the level of coverage that is easier to understand and calculate. In addition, insurance rate of this insurance product reflects more accurately the actual value of insurance services. According to practice the most appropriate is the level of coverage of 60–80%, and the level of 10–40% deductible [Shinkarenko 2011]. The level of coverage against losses, which result in lower yields, is offered by the insurer in the insurance product. World experience suggests that the level of coverage of 65–70% is acceptable enough, especially when the system of agricultural insurance is only developing, and insurers mostly have not formed the required size of insurance reserves.

Some insurance companies try to present insurance products both with coverage (50–60%) and deductible (40–50%). These insurance products in the event of risk would offset a small part of losses (50%), even though they are the cheapest. They can be used for the insurance of collateral for a loan without a reliable insurance coverage.

Table 4
Forms of Crop Insurance in Ukraine

Comparative	Insurance of						
	yield				Expenses	Income	
	multi-risks	with loss determination in each field	by index of				
Risks			crop yield	weather			
Risks	crop loss, 5–15 risks	crop loss, 1–3 risks	crop loss	crop loss	all	loss of income	
Insurance coverage	level is chosen	level is chosen and dependent on expected or average selling price for the last 3–5 years	level is chosen and dependent on expected or average selling price for the last 3–5 years	level is chosen according to losses incurred or harvest cost	full, conforms with losses incurred, does not depend on selling price	full, conforms with mean income for the last 3–5 years	
Insured value	up to 20%	3.5–7%	3–10%	up to 5%	up to 20%	up to 20%	
Deductible	not available	is chosen	not available	not available	is chosen	is chosen	
Insurance benefits	up to 40 % of loss and damage	up to 40-70 % of loss and damage	according to statistics of the region	according to weather statistics for the last 20-30 years	all damage and loss	entire amount of income loss	
Features	possible combination of certain level of insurance coverage and deductible, complexity of loss assessment	complexity of loss assessment, costly insurance examination, complexity of preparing insurance instruments	scale of payment is shown per unit of lost yield before catastrophic level, insurance with waiting period, transparency of loss determination	basis risk, when farm incurs losses and damages, and weather index is within normal parameters	list of necessary measures to minimize loss occurrence is agreed with IC availability of supporting insurance documents on insurance benefits	–	
Efficiency	advisable to insure crops with late growing season	–	with average crop yield on the farm at the regional level	in years when there are weather fluctuations outside normal weather indexes	advisable at high diversification and for plants with early growing season	impractical at the domestic insurance market	

Source: Authors' presentation.

When choosing an insurance product it is important to identify risks (one or more, or all) against which insurance will be carried out. Tariff rates of insurance products in insurance against 1–3 risks are on average 0.5–5%.

Multi-peril crop insurance is more expensive because it contains a list of 5 to 15 risks and more. Insurance rate reaches 20%. The main drawback of this insurance product is the complexity of determining damages and losses.

Insurance products under insurance contracts of weather indexes are the least developed and used in Ukraine. Weather index is calculated on the basis of the information on weather data for the last 20–30 years. The disadvantage of this insurance product is that there is a “basis risk” when the farm does not receive the insurance indemnity because the weather index is within normal parameters, although the farm incurs some losses and damages. Loss adjustment is carried out on the basis of data of the meteorological station nearest to the insurer. Insurance by individual index of weather is not always efficient. Therefore, in recent years multi-indexes are suggested to use in practice. However, their value is at the level of multi-peril insurance products.

Summary of advantages and disadvantages of Ukrainian insurance products for crop insurance are given in Table 4.

The system of crop insurance in Ukraine is characterized by a number of essential features. First of all, in its functional security there is a risk of increased losses, including significant accumulated losses from natural disasters. Secondly, lack of actuarial statistics on the phases of insurance process complicates its efficiency – such statistics are not kept since the collapse of the unified system of insurance in the state. Thirdly, a very small number of insurers only are capable to estimate risks adequately and settle losses – lack of experience in agriculture, required number of specialists.

Conclusions

In anti-risky activities of agricultural producer it is important to choose the optimal form of its financing and use the rational forms of insurance coverage.

Methodological support for crop insurance requires its improvement in insurance value, loss assessment at providing insurance services. Thus, in the regulations and insurance contract one should clearly specify what crop yield is taken as the basis for calculations – growing, or bunker, or other, what sale price of agricultural products is quoted – average or purchase, or intervention, or commercial etc. Approval of these issues at the level of standardization of insured products would eliminate contradictions in the relationship between insurer and insurant and increase the level of insurance coverage for farmers.

Practices of the insurance market of Ukraine show that the issue of expansion and development of agricultural risk insurance requires active and effective support from the state. However, the development of insurance in agriculture depends on the stabilization of the agrarian sector, increase in the efficiency of all its constituents, financial recovery of the whole system of agricultural production.

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Ubezpieczenia jako narzędzie zarządzania ryzykiem w produkcji rolniczej

Streszczenie

Autorzy przedstawili teoretyczne, metodologiczne i praktyczne aspekty związane z ubezpieczeniem jako narzędziem zarządzania ryzykiem w produkcji rolniczej. Analizie poddano trendy zmian w ubezpieczeniach rolniczych, przy uwzględnieniu mechanizmów wsparcia rolnictwa, wykorzystywanych przez rząd w ograniczaniu ryzyka w produkcji rolniczej. Zmiany w ubezpieczeniach rolniczych mają przyczynić się do zwiększenia ich wykorzystania w rolnictwie. W artykule udowodniono, iż wsparcie rządu w zakresie ubezpieczeń produkcji rolniczej oraz stosowania miar pozwalających na ocenę ubezpieczanych operacji objętych dotacjami jest niezbędne dla rozwoju sektora rolniczego.