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*The method of calculation and evaluation of temperature stresses and strains that occur in thin-cutting tools. Reviewed level of cyclic temperature stresses That lead to plastic deformation in the blade. It is shown that increasing the durability of knives is necessary to raise the maximum elastic deformation of the cutting edge.*

***Thin-cutting tools, thermal stress, elastic deformation plasticity.***

*The calculation and estimation technique of the temperature stresses and deformations, arising in the thin-walled cutting tool, is proposed. The level of the cyclic thermal stresses leading to the plastic deformation in the blade is estimated. It is shown that in order to increase the durability of knives it is necessary to enhance the maximum elastic deformation of the cutting edge*

***Thin-walled cutting tools, thermal stresses, elastic deformation plasticity.***

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## **METHODOLOGICAL BASIS STRAHUVANNYASILSKOHO SPODARSKYH land: innovative aspects**

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*The article substantiates the need for insurance of agricultural lands from the deterioration of the quality of. Proposed guidelines for assessing damages*

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*due to deterioration of quality indicators of land upon the occurrence of the insured event of natural or anthropogenic.*

***Insurance, land, quality condition score loss.***

**Formulation of the problem.** Go to different forms of ownership requires the use of market mechanisms to protect land. Therefore, the

issue of expanding the scope of insurance and use it as part of the mechanism of protection of agricultural land is particularly not only practical, but also scientific (including the need to develop a number of related methodological issues) value.

**Analysis of basic research.** The issue of environmental security and environmental risks studied such famous scholars as VD Bazylevych, KS Bazylevych, OM Vilenchuk, SS Osadets, IA Saadzhan, SK Harichkov and others [1, 2, 6, 7, 8, 9, 10]. However, the quality of insurance land remains promising and innovative ways.

Insurance of land in terms of deterioration of qualitative characteristics still not carried out, which is caused by the imperfection of the legal framework, lack of information and financial support, lack of methodological support and trained personnel.

**The purpose of research** is to improve the organization and methodological support estimates of losses from deterioration in the quality of land for insurance of land.

**Results.** The analysis of insurance risks identified in the scientific and educational literature [1, 2, 6, 7, 8, 9, 10], it is appropriate to allocate these to groups that may occur in the land use, natural, anthropogenic, organizational -legal, technological.

Land resources and the more - agricultural land, as part of the environment, while, in insurance are not included, although they always negatively affect a number of risk factors, and owners and users of land are for that reason damage. And of course provide that each entity that hosts in the land, is interested in compensation of incurred losses in this case. Probability of occurrence stimulates interest in the protection of land and land user is a potential carrier of insurable interest (Fig. 1).

The study found that insurance in land relations began to fight their way and are organized, so far in two directions. The first - a risk insurance loss, violation or restriction of the rights of policyholders arising from their ownership, possession and use and disposal of land - so-called "title insurance". Second - is the insurance risk of loss (damage) of land from adverse actions against them natural and man-made, which can be a liability insurance the most land users to ensure the conservation and sustainable use of land and insurance specific tracts of land in the aggregate display of factors risk.

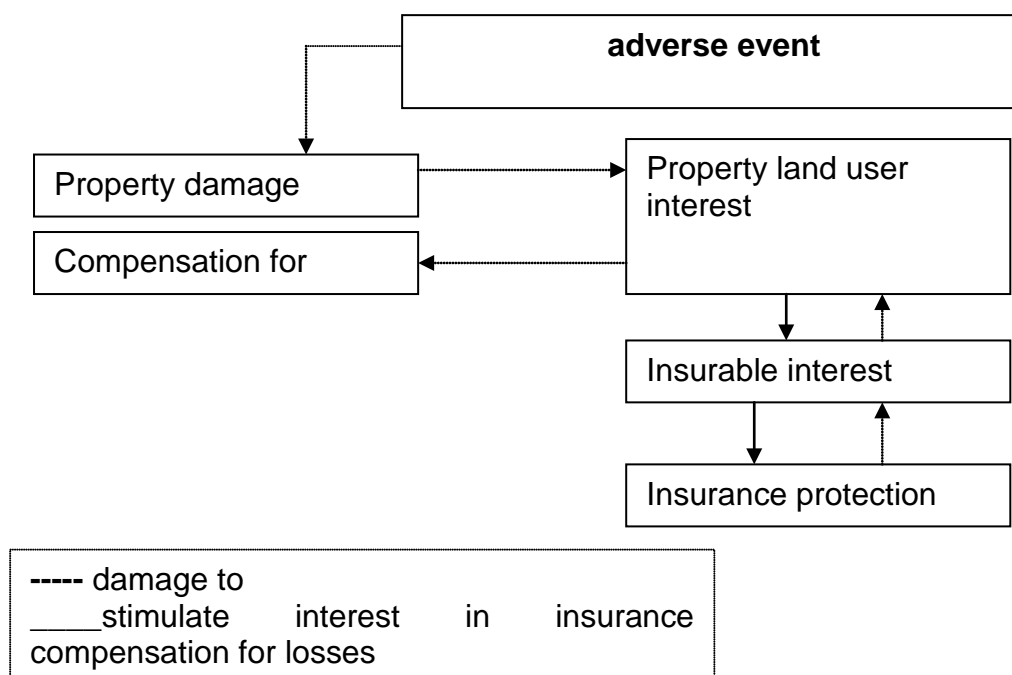


Fig. 1. A negative event as stimulus of interest to land users of insurance coverage.

The practice of insurance of land may be extended to agricultural land in Ukraine, provided relevant legislation regarding agricultural land and demand for such insurance.

Private ownership of land has put a number of new questions that require primarily on science its reasonable answers. As a result, in the nineties, scientists turned to the issues of land valuation methods of calculating land tax and rent. The increased number of participants in land relations and market economy exacerbated the issue of general land - preservation of agricultural land and its productive capacity, economic support mechanisms required to owners and users of land. In scientific articles have appeared on the organization offers system defense land, the creation of a special reserve fund, by means of which could decide on liquidation of consequences of natural disasters, financing of investment projects to protect and restore the land and works to reduce insurance risks in potentially dangerous areas , agriculture risk, environmental risk.

To assess the areas of negative impacts and benefited cartograms that reflect qualitative features of land Kamenetz-Podolsk district, and their cadastral evaluation.

Our calculations showed that the negative impact of natural and anthropogenic factors reduces the cost of agricultural land in the whole area of almost 20% (or 127 800 000. USD), including: flushing of soils - 1.4% (1.78 mln. USD); Deflation - the 0.01% (0.01 mln. USD); ravine erosion - 15% (19.7 mln. USD); wetlands

- 0.1% (0.13 mln. USD); eutrophication - 2.7% (3.45 million. UAH); pollution industrial emissions - by 0.5% (0.64 mln. USD).

All these risks can be accepted for insurance provided reliance on land user as a potential insured duties of soil to perform certain actions. The responsibility of the insurance company for compensation for costs incurred during the period of insurance land user of land, there is in this case provided that the insurer complies with all the requirements stipulated by the contract of rational land use, but the damage or deterioration of the quality of land occurred only under the influence of objective phenomena.

Insurance companies would go to the insurance of agricultural land subject to development of its rules of driving. The main task in implementing land insurance, avoid when creating a new kind of insurance services errors in assessing risk. For an objective assessment of their need to collect, compile and analyze information about the frequency and intensity of expression of adverse events. Unfortunately, at present access to such information virtually none. However, for the organization of insurance lands should be preceded coordinated work of a number of ministries and departments, first, on the formation of a data bank of susceptibility of agricultural land subject to dangerous natural processes, their intensity and area of distribution, and secondly, by collecting, organizing and centralizing data the impact on agricultural land potentially hazardous activities and determining the amount of hazard for each region. This in turn requires scientific support in the form of development and study of methods for identification of typical allocation risk, assessing the likelihood of their occurrence and the manifestation of power and possible losses in land use. This will create the same for all of the insurance market rules for insurance operations.

Investigating the agricultural insurance as one of the most effective means of protecting productive agricultural lands, we conclude that there is every reason to believe insurance of agricultural land is a problem. To implement the land necessary legislative resolution of insurance documents and scientific developments that have appeared in recent years. All of this can be seen as scientific and legal framework development are concrete proposals on issues of the formation mechanism of insurance of agricultural land. Prerequisites insurance farmland reflects Fig. 2 [3, 4, 5].

The objective conditions	
Natural risks	Man-made risks
Floods, earthquakes, mudflows, landslides, avalanches, flooding, other natural factors action	Cluttering land contamination, damage and destruction of the upper fertile layer of the earth

ECONOMIC BACKGROUND	
Deficit for zemlevidnovlyuvalnyh work. Arrears yields from loss of fertile agricultural properties in the case of the negative impact of natural and man-made factors. Lack of land insurance system of land relations.	
LEGAL BACKGROUND	
1. Law of Ukraine "On state registration of rights to immovable property and their limitations" from 01.07.2004 № 1952IV // Supreme Council of Ukraine 2004 - number 51 - Art. 553. 2. The Civil Code of Ukraine of 16.01.2003 № 435IV // Supreme Council of Ukraine of 03.10.2003 - 2003., Number 40, article 356. 4. The Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on documents certifying the right to land, as well as the order of division and unification of land" from 05.03.2009 number 1066VIVR // Voice of Ukraine of 01.04.2009 - № 58.	
ORGANIZATIONAL BACKGROUND	
The availability of insurance agencies and insurance opportunity to expand the scope to include objects of the agricultural insurance. The availability of cost (cadastral) evaluation of farmland.	

Fig. 2. Background of insurance farmland.

Studies have shown the possibility of compensation and financing zemlevidnovlyuvalnyh works by insurance organizations of agricultural land. Insurance land - a specific area of insurance, where no long developed practical applications implementation mechanism of insurance relations, the basis of which is to address the following methodological issues are interrelated: determining the insurance value and sum insured land; calculation of insurance rate, on an assessment of the likelihood of adverse natural and anthropogenic processes; determining premiums land users; assessment of damage to natural land plots and technological developments; The amount of insurance claims.

For the security of land it is proposed to calculate the insurance value based on the base price at which to take his inventory evaluation; thus obtained value used to determine the sum insured parcels.

Errors in assessing the land, or may lead insurers to pay extra fees, or their insurers shortfall. In the first case, the tenant suffers unjustified losses in the second - the insurance company.

The size of the sum insured determined in agreement with the insurer, as a percentage of the insured value, established by the insurance company. Study of Insurance Practice shows that most types of insurance of property insurance amount is set slightly less than the insured value, meaning it encourage the insured to take all necessary

measures to ensure the safety of property. For example, crops insured in the amount of 70% of the crop.

Where the land is insured for full value insurance amount equal to the insurance value of the site.

If the revaluation of land or changes in the calculation of basic norms of the insurance amount is also subject to that revision because insurance provides better coverage of possible loss.

Insurance rates for insurance of land is expected, as with other insurance facilities count considering the probability of occurrence of insured events, based on the evidence of adverse effects for several years, taking into account specific regional dangers.

To obtain such information resort to analyze and assess the impact on the ground accident that occurred, disasters and other natural processes, the size of the damage and the amount of resources required for the response. Their classification allows to formalize the details of an accident or natural disasters, to reduce the diversity of their manifestations typical groups. Collection and systematization of data on the impact of hazardous activities, the creation of a data bank about the facts, circumstances and consequences of natural manifestation of negative actions will determine the amount of hazard for each region and their adequate insurance rates.

As a result of research we propose the following method of insurance farmland.

Insurance rate (TV) consists of net rate (TN), designed to create an insurance fund, and load (H) by which the accumulated funds to cover costs and income formation insurer on insurance activity:

$$TB = T_H + H. \quad (1)$$

Tariff rate, net (TN), reflecting the value of future payments under the contract (or contracts) of insurance, in turn, represents the sum of:

$$T_H = T_o + H_p, \quad (2)$$

where:  $T_o$  - the bulk of the net wage rate;  $H_p$  - risk premium (so-called "risk premium").

The bulk of the net rate depends on the probability of the insured event ( $g$ ), the average sum insured ( $S_b$ ) and the average amount of payments ( $S_b$ ) on insurance agreements.

The bulk of the net rate of 100 UAH. insurance amount is calculated on the basis of these data as follows:

$$T_o = S_g \div S \times 100 \times g. \quad (3)$$

When a new type of insurance risks and the absence of data on the value of  $g$ ,  $S$  and  $S_b$ , recommended to evaluate these values by an expert.

As in the present and in the past national practice insurance lands was not, the data value ratio (Sb: S) now no. However, given that agricultural land is part of the property and the economic complex for their insurance will take the ratio of 0.6, that is, as for property insurance. Probability of loss occurrence (or likelihood of loss) is determined by measuring qualitative and quantitative losses from negative processes certain intensity in a certain area for a certain period of time, ie the size of the potential hazard and the vulnerability of land, dependent of the past in the area of a given (by the likelihood and strength) natural and man-made impact. Recommended calculation of the allowance spending by the formula:

$$TP = 1,2 \times T0 \times a(\gamma) \times V(1-g) : (n \times g), \quad (4)$$

where: n - the number of insurance contracts (for the calculation conditionally accept their number equal to 150); and ( $\gamma$ ) - coefficient that depends on the degree of security guarantees.

*Assessment of damage to land plots unfavorable natural and man-made events.* For insurance lands no practical methodologies to assess the actual losses from adverse effects on their natural and man-made actions. Given that the amount of loss from adverse natural and anthropogenic action includes costs incurred to restore damaged land and profits during his recovery, it is proposed to define the formula:

$$C = C_p + Y_{\phi}, \quad (5)$$

where: C - amount of damage;  $C_p$  - damage caused by the need to compensate for its costs;  $Y_{\phi}$  - loss of profits, characterized by revenue foregone by the time required to restore the land.

Profits ( $Y_{\phi}$ ) determined by the formula:

$$Y_{\phi} = (J_{cp} - J_{\phi}) \times S \times K_s, \quad (6)$$

Where: JEM - the average annual income from the operation area; DF - actually received (possible) income from the operation area; S - area of damaged areas;  $K_s$  - coefficient depending on the amount of annual income that is lost, the period of restoration of damaged areas.

Average annual income is calculated on actual production volumes in physical terms on average over a number of years at prices prevailing at the time of determination of damages.

The cost of restoring the humus and mineral nutrients plants in fertile dirt mass (BB) determined by the formula:

$$B_{PK} = 0,08 + B_{PK}, \quad (7)$$

where: SH - cost of making tons of manure; G - reserves of humus in the fertile dirt mass; VPK - the total value of phosphorus, potassium; 0.08 - coefficient of humification of manure.

Volume of organic fertilizers (OOD) needed to recover lost stocks of humus (940 tons), determined by the formula:

$$O_{od} = 32 : 0,08 . \quad (8)$$

*Evaluation profits during the recovery area.* Given that organic fertilizers need to make the damaged area many times greater than the rate of annual permits entering (150-200 t / ha) to soil fertility restoration of the lost weight will take several years to restore the damaged areas.

The number of years of restoration area (TV) is given by:

$$T_g = O_{od} : D_g \times S + T , \quad (9)$$

Where: ood - total organic fertilizers; DG - annual dose of fertilizer per hectare; S - area of the damaged area; T - the number of years required for the preparation of land reclamation after organic fertilizers.

*The amount of compensation.* Insurance paid in the amount of actual damages, but within the sum insured specified in the contract. In the case where it is lower than the insurance value of the land, the amount of insurance compensation is reduced in proportion to the sum insured to the insured value of the site. Expect indemnity by the formula:

$$C_g = C_c \times 3_c : B3_{cm} , \quad (10)$$

Where: St. - indemnity; SS - the sum insured; AP - loss of the insured; VZct - the insurance value of the land.

Insurance means insurance will redistribute land resources as the territories of Ukraine, and over time depending on the manifestation of adverse effects on farmland. This redistribution is very cost effective in large differences in climatic zones of Ukraine. At the time the redistribution of assets held for each insured especially, in the quiet years he will pay only the premiums, unfavorable to the negative effects of insurance claims - to receive insurance compensation incurred.

However, the distribution function of land insurance organization perform motivational, stimulating and controlling functions. In contact with the Committee for Land Resources and Land Management may control execution insurers farming, agroforestry and other soil-protecting measures, the costs of reclamation of damaged areas that will serve extent not only directly protect the interests of land relations, but also increase their interest in compliance with sustainable land use. Studies have shown that the agricultural insurance in Ukraine may be involved in all insurance companies operating now. Possible option and when organized special new system specifically for insurance at all or only land farmland with its regional network and centralization of most financial transactions. However, the experience of insurance companies operating



shows that a high level of centralization makes it difficult to work with policyholders. They are more suited such an organization where all operations related to insurance are made locally. Therefore advisable submitted scheme for which the land will be used for insurance, regional insurance companies that operate and only in their absence and as needed create new ones.

Creating specialized units consisting of insurance companies that act will not only accumulate really means to carry out preventive (erosion of soil and other measures) and restoration works, but also facilitate the work of the land committees in monitoring and stimulating land users perform complex binding measures to land protection. The task of land committees, in turn, should be informational and analytical support for insurance organizations to create the database objects of insurance, registration and classification of insurance claims, develop proposals for funding volume and order preventive measures to reduce the risks of economic activity .

The variant of farmland insurance scheme and relationships of its main participants are at. The numbers marked on the diagram the steps of the insurance process. The dotted line represents an opportunity, but not bound by such participation. In the land of insurance possible, such an option when loss estimates deal with service independent experts evaluators amount of damage. In this case, the increased accuracy of the information about the damage done to the owner (user) of land, but also increases the cost of insurance. In addition, the increase in the number of participants of insurance can reduce the efficiency of the insurance process. Subject to the foregoing may prefer to use to estimate the damage, the direct relationship of land users and insurance companies with their service evaluators.

For a better understanding of the proposed insurance scheme farmland consider its main units.

The process begins with a review of the insured with the insurance rules developed insurance organization, coordination and conditions of the insurance contract. Assessment of land invites insurance organization in the service of land cadastre Ukraine (cadastral office of the Committee for Land Resources and Land Management). Premiums paid by land users within the deadline set by the contract. Insured may be given the right to decide - to pay an annual fee or single parts. The insurance contract comes into force from the date of the first payment of the premium then the insurance organization gives the insured an insurance certificate. Analysis of general insurance practice shows that insurance contracts are usually for one year. At the same time in case of transfer of land rent, other forms of durable insurance contract may be

and the longer terms of payment of insurance premium installments, annually or once.

The contract of insurance policyholders determine responsibilities for the implementation of the area set for mandatory measures for land protection, including conservation agricultural technologies and beyond their measures to prevent loss and damage to land.

If the insured damage occurred due to land mismanagement, failure to fulfill the conditions stipulated by the contract, indemnity thereon is paid or paid partially. On the basis of documents confirming the fact and circumstances of the insured event, directed to the insurance organization Committee for Land Resources and Land Management, and if necessary - environmental prosecutor's office, and with regard to their investigations affected areas of insurance organization is an act of damage to the land, determines the value of work on its restoration, calculates the amount of insurance compensation.

Insurance compensation is paid in a period not exceeding 30 days of receipt of notification of an accident. If during this time to pay the insurance indemnity is not possible (due, for example, that in the case under investigation), the question of payment or rejection is decided after obtaining solutions (decision, judgment) of a court or other authorized organization that .

In the event of a significant size of insurance and long-term recovery period disturbed areas of insurance organization can pay its stages for the performed restoration work through a bank, serving insurance company mechanism such payments could be as follows: insurance company lists a banking institution owned by the landowner amount of insurance and estimate planned work to restore the areas for which the bank and periodically perevodytyme the amounts insured. Initially, the affected landowner transferred down payment, further payments - upon presentation of documents for the performed works. This procedure of payment of insurance claims and ensure proper use of funds allocated and easier control over their use.

When the negative man-made effects on land loss or reduction of its productive capacity is the fault of certain third party (natural or legal) persons. In such cases, the insurance organization to the amount of insurance can sue the guilty of causing damage to the interests of the insured as the insurer after payment of insurance compensation to move it within the amounts paid to those rights that the policyholder was in relation to those responsible for the damage. In case of cancellation of an insurance reimbursement of the amount paid insurance claim styahayetsya through the courts. Specialised insurance companies have more opportunities to prove the guilt of professional companies or

individuals who violated the law in the area of agricultural land. In addition, land users, with their usual most of the lack of legal awareness, lack of judicial and administrative litigation, fear of conflict with the administration of large enterprises, it is easier to make an insurance payment and be confident in insurance protection and compensation of possible damage.

What most zashchadalya this kind of insurance protection may be in areas particularly exposed to the negative influences of natural and manmade. These include land south economic areas most prone to natural disasters and land located near major chemical and steel industries, nuclear power plants, major cities and transportation arteries.

### **Conclusions**

Formation of Insurance agricultural land requires organizing the state's participation in the formulation of policies and the creation of the necessary conditions. First of all, to be included in the Law of Ukraine "On peculiarities of agricultural products insurance with state support" Schedule "on insurance of agricultural land", which establishes public-commercial nature of insurance, participation budget in its funding, the procedure of scientific, technical and human resources software. It should also:

- Create a database of inclination of dangerous areas of natural and technological processes (their intensity, area of distribution, degree of danger) required to establish insurance rates;
- Direct the state land cadastre information provision on security grounds;
- To form a part of the insurance organizations specialized units on insurance of agricultural land;
- To determine the mode of financing of agricultural insurance with funds earmarked budget funds;
- To organize the training of specialists in land insurance;
- Involve research organizations to prepare proposals on the terms of the insurance companies, lands, insurers and specialist training programs on this issue.
- To resolve the issue of funding of research and training on issues of land security.

Development and implementation of an effective system of insurance of land in its active state support will significantly increase the entry of funds from non-budgetary sources for the prevention and elimination of negative effects of natural and anthropogenic processes will improve the financial stability of agricultural production.

Insurance of the quality of land can provide compensation in the case of insurance of natural and technogenic origin for contingency, emergency, abnormal events. Assessment of losses from deterioration of soil quality can be determined on the basis of methodological

approaches cost of an equivalent amount, fertilizers, napivperepriloho manure foregone harvest. Mandatory documents for insurance is ecological and agrochemical passport and land management project. Anthropogenic and organizational and legal risks should be reduced to improve the administrative and legal responsibility.

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*In Article obosnovana Need insurance lands selskohozyaystvennoho purpose here uhudshenyia s kachestvennoho state. Predlozheny Guidelines on estimates as a result of damage to uhudshenyia kachestvennykh indicators zemelnykh plots in the offensive insured events Natural Or anthropogenic origin.*

***Insurance, zemelny uchastok, kachestvennoe STATUS, evaluation of damage.***

*The paper substantiates the need for insurance of agricultural land from worsening their quality status. Proposed guidelines for assessment of losses due to deterioration of land quality indicators when the insured event of natural or anthropogenic.*

***Insurance, land, quality condition score loss.***