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## **COMPARATIVE ANALYSIS OF SPECIAL TERMS AND CONDITIONS FOR CROP INSURANCE IN THE AGRICULTURE INSURANCE MARKET IN SERBIA**

REVIEW ARTICLE

### **Abstract**

Crop insurance i.e. the insurance of crops and fruit in Serbia is effected on a voluntary basis, under the general and special insurance terms and conditions defined by insurance companies (insurers) in accordance with the Insurance Law. The aim of this paper is to analyse the offer of crop insurance in the agriculture insurance market in Serbia and identify if the causes for insufficient development of this type of insurance lie in the offer. For that purpose, the paper will use the comparative research method to compare and analyse special crop insurance terms and conditions i.e. terms and conditions for insurance of crops and fruit issued by the four major domestic insurers. Based on the conducted research, it can be concluded that on the agricultural insurance market in Serbia, there is a satisfactory offer regarding crop insurance, that is, the reasons for insufficient development of this insurance line do not lie in the offer. Instead, demand will need to be encouraged and developed, as is the case with majority of other insurance lines on the domestic market.

**Key words:** *crop insurance, special insurance terms and conditions, agricultural insurance market, insurance in Serbia*

### **1. Introduction**

The basic features of crop production are: soil, which represents the means of crop production, crops, which are the subject of production, whereas people and nature

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are the factors of such production. Crop production is classified according to the type of grown crops into: crop farming, vegetable growing, fruit growing and winegrowing.<sup>2</sup>

Crop insurance, that is, insurance of crops and fruit has been in place for three centuries. In Europe, crops and fruit were first insured against the risk of hail. This insurance was first to appear in Germany in 1719, in France in 1802, and has been effected in the United Kingdom since 1840. It was not until 1870 that crop insurance against the risk of hail took roots in America i.e. the United States of America.<sup>3</sup> Today, crop insurance accounts for about 90% of the total global agricultural insurance premium written.<sup>4</sup>

Crop insurance, as a type of security, provides economic protection for annual and perennial plants, regardless of whether they are the main crops, sub-crops or stubble crops. Subject of insurance may be arable crops, vegetable crops, orchards, vineyards, planting material, flowers and ornamental plants, as well as young forest plants. Subject of insurance can even be those plants which are not the subject of cultivation, that is, those which freely grow in the nature, such as poplar and reed. Regardless of whether being annual or perennial, only annual yield is insured. The subject matter of insurance is mostly fruit, but other parts of the plant can also be insured (flower, stem, leaf, or root).

A common belief that can be found in literature is that the crop insurance is one of the riskiest insurance and thus, the insurance protection is provided only against a limited number of risks.<sup>5</sup> In modern times, climate changes influence the crop production and produce an increasing need for crop insurance. Climate changes also call for the changed production technology where insurance programmes take an important place in the protection against hazards related to climate changes such as floods or droughts. Their outreach and availability to farmers differ from country to country.<sup>6</sup> A group of authors (Žarković at al. 2016) highlighted the risk of drought as a current global problem of agricultural production, mentioning that this risk is covered by insurance in a proportionately small number of countries where the government is directly involved in subsidising catastrophic losses and in their insurance or reinsurance.<sup>7</sup>

Hail, fire and lightning are among standard insurable risks of crop production. The risk of hail is among the most represented risks, according to both its prevalence and severity of its consequences. It is estimated that in Serbia, insurance against the risk of hail accounts for 90% of crop insurance. Additional insurable risks of crop

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<sup>2</sup> *Priručnik za praksu u osiguranju i reosiguranju DDOR Novi Sad*, Financing Centre, Novi Sad, 1996, p. 245.

<sup>3</sup> Swiss Re (2011): *Product innovation in non-life insurance markets*, Sigma, Vol. 4, p. 1.

<sup>4</sup> Ramiro Iturrioz, *Agricultural Insurance*, Example Series on Insurance, Washington, DC, 2009, p. 11.

<sup>5</sup> Miroslava Petrevska, Bruno Toscano, Dragiša Milošev, *Osiguranje biljne proizvodnje*, Beoknjiga, Beograd, 2010, p. 1.

<sup>6</sup> Mannava V. K. Sivakumar, Raymond P. Motha, *Managing weather and climate risks in agriculture*, Springer Verlag Berlin and Heidelberg, Berlin, Germany, 2010, p. 536.; Hermann Lotze-Campen, *Climate change, population growth, and crop production: An overview*, In: Shyam Singh Yadav et al. (Eds.), *Crop adaptation to climate change*, Wiley, Hoboken, NJ, 2011, p. 9.

<sup>7</sup> Nebojša Žarković, Jova Miloradić, Slobodan Samardžić, „The Risk of Drought in Crop Production Insurance”, *Economics of Agriculture*, 63 (4) 2016, 2016, p. 1301.

insurance are storm, flood, spring and autumn frost.<sup>8</sup> Crop insurance i.e. insurance against crop and fruit may be concluded separately, for each supplementary insurance, provided that standard risks had been previously covered.

Current data show that in Serbia, the most represented insurance is the crop insurance against standard risks, whereas there is no significant interest in insuring additional risks due to an adverse status of agriculture i.e. of the majority of individual farms.<sup>9</sup>

## 2. Methodology

The aim of this paper is to analyse the crop insurance offer on the agricultural insurance market in Serbia to identify whether its insufficient development in the domestic market is caused by the offer of this insurance. For such purpose, the paper will use a comparative research method to compare and analyse special crop insurance terms and conditions, that is, the terms and conditions for insurance of crops and fruit of the four major insurers dealing with this line of insurance in the domestic market.

To that extent, we will analyse the terms and conditions offered by four insurance companies, which together cover almost the entire market of agricultural insurance in Serbia. The insurers whose insurance terms and conditions are the subject of research in this paper are: Dunav Insurance Company a.d.o., Beograd; „DDOR Novi Sad“ a.d.o., Novi Sad; Triglav insurance a.d.o., Beograd and Generali insurance Srbija a.d.o., Beograd.

## 3. Research Findings

There is a diverse offer of crop insurance i.e. insurance of crops and fruit on the market of agricultural insurance in Serbia. This insurance is effected on a voluntary basis, under the general and special insurance terms and conditions which are defined by insurance companies (insurers) in accordance with the Insurance Law.

General terms and conditions regulate the most important parts of insurance contract. Special terms and conditions for crop insurance are effected for insurance against particular types of risks (perils). The main characteristic of all types of special terms and conditions is that they are conditioned by the previous conclusion of the standard insurance of crops and fruit in accordance with the general insurance terms and conditions.

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<sup>8</sup> *Training handbook for state licence exam for the title of authorised insurance broker and authorised insurance agent*, Chamber of Commerce and Industry of Serbia, Belgrade, 2015, p. 397.

<sup>9</sup> Gordana Radović, *Poljoprivredno osiguranje kao moguća vrsta obaveznog osiguranja u Republici Srbiji*, Doctoral Dissertation, John Naisbitt University, Beograd, Faculty of Business Studies, Beograd, 2016, p. 215-220.

### **3.1. Special Insurance Terms and Conditions**

Special terms and conditions for crop insurance offered by the four analysed insurance companies which are, at the same time, the major domestic insurance companies in this class of insurance, include: (1) special terms and conditions for insurance of crops and fruit against spring frost; (2) special terms and conditions for insurance of crops and fruit against floods; (3) special terms and conditions for insurance of crops and fruit against storm; (4) special terms and conditions for insurance of crops and fruit against the risk of drought; (5) special terms and conditions for insurance of crops and fruit against the risk of excessive precipitations; (6) special terms and conditions for insurance of crops and fruit against the loss of profit; (7) special terms and conditions for insurance of crops and fruit against the risk of winter frost; (8) special terms and conditions for insurance of crops and fruit in glass houses and plastic covered greenhouses; (9) special terms and conditions for insurance of seed corn and loss of seed quality due to autumn frost; (10) special terms and conditions for insurance of crops and fruit after the harvest or picking; (11) special terms and conditions for experimental insurance of oilseed rape against winter freezing; (12) special terms and conditions for insurance of crops and fruit against the loss of seed quality; (13) special terms and conditions for insurance of table grapes against the loss of quantity and quality; (14) special terms and conditions for insurance of fruit against the loss of quantity and quality; (15) special terms and conditions for insurance of fruit trees and grape vines – when bearing fruit (16) special terms and conditions for insurance of fruit trees and grape vines – young plantations until bearing fruit.

Special terms and conditions for crop insurance, offered by the four major insurers operating in the agricultural insurance market in Serbia, are the subject of comparative analysis in this paper.

#### **3.1.1. Special Terms and Conditions for Insurance of Crops and Fruit against Spring Frost**

*Subject matter of insurance* are crops and fruit insured according to the general terms and conditions for insurance of crops and fruit, as indicated in the special insurance terms and conditions of DDOR Novi Sad.<sup>10</sup>

*Insured perils (risks)* are the losses caused by the damage to, or loss of the insured crops and fruit due to freezing caused by the spring frost. According to the special insurance terms and conditions of Triglav insurance, and the same text is also contained in the special insurance terms and conditions of DDOR Novi Sad,

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<sup>10</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Crops and Fruit against Spring Frost*, Article 1.

spring frost is considered the drop in air temperature below 0°C, occurring in the period from 1 March to 31 May. The actuation of the said risk is evidenced by the data shown in the meteorological instruments installed in the insured building or according to the nature of damage to the insured crops and fruit or plants situated in the immediate vicinity.<sup>11</sup>

*Beginning and end of the insurer's liability* – DDOR Novi Sad and Triglav insurance identically stipulate the beginning and end of the liability of insurance company to indemnify the losses occurred due to spring frost. Insurer's liability begins at 24.00 hours, on the 10th day from the date indicated in the policy as the insurance inception date. However, there are exceptions to this. The liability of the insurer is effective for: (a) fruit – not before 15 March; (b) vineyards, raspberries and hop – not before 1 March; (c) fruit, grapevine and forest reproductive material, ornamental shrubs and young forest cultures – not before 1 March; (d) vegetables, tobacco and flowers – not before 1 May, except for coastal areas where the liability of the insurer begins on 15 April; (e) other crops and fruit – not before 1 March.<sup>12</sup> The liability of the insurer ends on 31 May at 24.00 hours.

*Conditions to be met in order to conclude insurance* are also identically defined by both insurance companies. Accordingly, insurance against spring frost is conditioned by insurance against standard risks taken out according to the general insurance terms and conditions for insurance of crops and fruit, unless they are protected by anti-hail net. This type of insurance may be effected during the vegetation period, except for perennial plantations for which insurance can be concluded each year, until 1 March.<sup>13</sup>

### **3.1.2. Special Terms and Conditions for Insurance of Crops and Fruit against Flood**

*Subject matter of insurance* are crops and fruit insured according to the general terms and conditions for insurance of crops and fruit. According to the special insurance terms and conditions of DDOR Novi Sad, the subject matter of insurance may not be crop and fruit in wetlands, land between rivers and dykes, and the land which does not have a dyke and crops and fruit are regularly flooded.<sup>14</sup>

*Insured peril* is the risk of flood, that is, insurance company is obliged to indemnify the losses caused by damage to, or destruction of all crops and fruit

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<sup>11</sup> Triglav osiguranje a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against Spring Frost*, Article 2.

<sup>12</sup> Ibid, Article 4.

<sup>13</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special terms and conditions for insurance of crops and fruit against spring frost*, Article 3.

<sup>14</sup> DDOR Novi Sad, a.d.o., Novi Sad *Special terms and conditions for insurance of crops and fruit against flood*, Article 2, item 3.

insured against floods. Special insurance terms and conditions of Dunav Insurance Company define the flood as „elemental, unexpected inundation of the terrain due to outflow of river from its bed, canal and because it broke through a dyke or a dam.“<sup>15</sup> The special insurance terms and conditions of Triglav insurance stipulate that the insurer is not liable to pay the insurance indemnity for the losses occurred due to other excessive waters such as ground waters, prolonged rains or by leakage of dyke due to non-functional drainage channels or intentional destruction of a channel or dyke. In addition, insurance company is not obliged to indemnify the losses occurred by the implementation of orders issued by a competent authority in connection with particular situations concerning the status of waters, unless such orders were issued with the consent of the insurer for the purpose of preventing further flooding i.e. the increase of damage to the crops and fruit.<sup>16</sup>

*Beginning of the insurer's liability* for crops is from the moment when sowing ends, and for fruit, from the moment when planting ends. The insurer's liability ends according to the general terms and conditions for insurance of crops and fruit.<sup>17</sup>

The analysed special terms and conditions for insurance of crops and fruit developed by the four major insurers operating on the domestic market stipulate that the contract for insurance against floods can be concluded until the beginning of sowing or planting. For perennial plantations and perennial cultures, this contract can be concluded until 1 March each year, provided that at the time of insurance application there is no immediate flood hazard. The insured is obliged to insure all areas under crops and fruit of the same kind, and it is possible to take out this special insurance if the crops and fruit are insured against standard perils, according to the general insurance terms and conditions, unless the crops and fruit are protected by an anti-hail net.

*Obligations of the insured* relate to preventing the occurrence of the insured event.

### **3.1.3. Special Terms and Conditions for Insurance of Crops and Fruit against Storm**

*Subject matter of insurance* are crops and fruit insured according to the general terms and conditions for insurance of crops and fruit.

*Insured peril* is the risk of storm, that is, insurance company is obliged to indemnify the losses caused by damage to, or destruction of crops and fruit occurred due to the insured event caused by storm. In literature, storm is defined as „movement of air masses, that is, the wind measuring 17.2 m/sec. and more.“<sup>18</sup> The actuation of the

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<sup>15</sup> Dunav insurance a.d.o., Beograd, *Special terms and conditions for insurance of crops and fruit against flood*, Article 2, item 1.

<sup>16</sup> Triglav osiguranje a.d.o., Beograd, *Special terms and conditions for insurance of crops and fruit against spring frost*, Article 2, item 2.

<sup>17</sup> Dunav Insurance a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against Flood*, Article 5.

<sup>18</sup> Nebojša Žarković, *Pojmovnik osiguranja*, Skonto, Novi Sad, 2013, p. 252.

risk of storm is evidenced by the reports of the meteorological service of the wind speed or data from the meteorological instruments installed in the insured building.<sup>19</sup> Other provisions relating to this insured peril are similar in the analysed offers of all four insurers.

*Conditions to be met in order to conclude insurance* are also identically defined in the analysed insurance terms and conditions of insurance companies. Insurance against storm may be concluded for small grains until 15 May, and for the other crops, until 15 June.

### **3.1.4. Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Drought<sup>20</sup>**

On the domestic market of agricultural insurance, the risk of drought is offered only by Generali insurance. In order to meet the demands of agricultural entities, which are the result of climate changes and global warming, this insurance company has been insuring crops against the risk of drought since 2013.

*The subject matter of insurance* may not be fruit, but only crops, as follows: (a) mercantile and seed maize; (b) mercantile and seed soy; (c) mercantile sugar beet.

*Insured peril* is a risk of drought, which means a reduced relevant quantity of precipitations compared to the relevant multi-year quantity of precipitations.

*Insured event* is considered to have occurred by the actuation of the insured peril of drought or after the fulfilment of both of the following conditions: (1) that the recorded authoritative amount of precipitation is lower than the authoritative multi-year amount of precipitation for more than 30% in the specific risk zone; (2) that a fixed yield per area unit is reduced by more than 10% owing to the reduction of authoritative amount of precipitation relative to the authoritative multi-year amount of precipitation in that risk zone.

*Insurance period*— insurance against the risk of drought may be effected: (a) for mercantile sugar beet until 30 April of the current year; (b) for mercantile seed maize until 10 May of the current year; (c) for mercantile seed soy until 31 May of the current year.

The insurance terms and conditions stipulate that insurer can extend the periods for insurance of mentioned crops, depending on optimum sowing deadlines postponement due to climate changes. Liability of the insurer starts after the expiry of 24th hour of the date indicated in insurance policy as the insurance inception date, if the insurance premium is timely paid, and it ends after the expiry of 24th hour of the date indicated in the insurance policy as the insurance expiration date.

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<sup>19</sup> Triglav osiguranje a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against Storm*, Article 2.

<sup>20</sup> Generali osiguranje Srbija a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Drought*.

*The basis for the calculation of premium per unit area is a contracted value of insured crop per area unit, which is calculated as a product of contracted yield and price per unit mass at the time of conclusion of a contract, for each insured object individually.*

Despite the existing demand, insurance against the risk of drought is not offered by insurance companies which do business in the Serbian agricultural insurance market. The reason lies mostly in the fact that insurers do not find it profitable to offer the insurance against this risk since they need to allocate significant funds for indemnity. Therefore, insurance companies think that the compensation of damage caused by drought should be divided between the insurers and the state.<sup>21</sup>

### **3.1.5. Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Excessive Precipitation<sup>22</sup>**

In the Serbian market, the insurance of crops and fruit against the risk of excessive precipitation is included only in the offer of Generali insurance.

*Subject matter of insurance* may be mercantile and seed corn, soy, sugar beet, sunflower, oil seed rape and small grains (wheat, barley, oats, and rye).

*Insured perils* are excessive precipitation which mean extremely high quantities of precipitation causing the creation of a water mass on the insured plots.

*Insured event* is considered to have occurred if the following conditions are met: at a particular excessive precipitation risk zone, the relevant precipitation quantity is higher than 125 mm and the yield from insured crops is reduced due to excessive precipitation.

*Insurance period* – the insurance against this risk cannot be effected after 30 April, except in the cases when, due to climate characteristics, optimum sowing periods are postponed, whereof the insurer will take a special decision. The beginning and end of the insurer's liability and the basis for premium calculation are defined in the same way as in the special terms and conditions for insurance of crops against the risk of drought of General Insurance.

### **3.1.6. Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Income<sup>23</sup>**

Generali Insurance is the only insurance company to offer in the Serbian market the insurance of crops and fruit against the loss of income.

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<sup>21</sup> *Svet osiguranja*, Ponuda tanka, a pomalo i nepristojna, Number 3/2016, 2016, p. 29.

<sup>22</sup> Generali osiguranje Srbija a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Excessive Precipitation*.

<sup>23</sup> Generali osiguranje Srbija a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Income*.



*Subject matter of insurance* are crops, mercantile wheat and mercantile corn.

*Insured perils* include the insurance against the risk of the decline in the prices of the subject matter of insurance, that is, against the risk of crop price being lower than expected. In accordance with the terms and conditions of Generali Insurance, this risk may be insured against only if the insured has in place the insurance against hail, fire and lightning, in accordance with the general terms and conditions, and the insurance against the risk of drought and storm, in accordance with the special terms and conditions of this insurer for a particular subject of insurance.

*Insured event* is considered to have occurred in accordance with the subject insurance terms and conditions if the insured perils have occurred, that is, the insured event is considered to have occurred if the agreed insured income was reduced due to one or more insured perils, provided that these perils are contracted in the insurance policy.

### **3.1.7. Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Winter Frost<sup>24</sup>**

Generali Insurance is the only insurance company in the Serbian agricultural insurance market to offer the insurance of crops against the risks of winter frost.

*Subject matter of insurance* may be winter crops: (a) winter wheat, barley, triticale and rye; (b) winter oilseed rape; (c) mixed winter fodder plants.

*Insured risks* are winter killing and heaving during the insurance period as a consequence of low temperatures during a winter period. *Winter killing* means adverse effects of low temperatures on crops, which are the subject matter of insurance, that results in the destruction of the plant. Low temperatures are considered those, which are below critical temperatures for particular types of crops during the insurance period. *Heaving* is the creation of ice in the zone of the root system of crops, which results in the destruction of such crop.

*Insured event* occurs when due to winter killing and/or frost heaving on the insured plot, less than 70% of oilseed rape remains relative to the agreed optimum, that is, less than 50% of other winter crops remain relative to their optimum. The agreed optimum of crops means the optimum number of plants per unit area for each plant species, based on the recommendation of the relevant professional institutions and the recommendations of the seed manufacturer. The optimum so determined is entered in the insurance policy for each winter crop which is the subject matter of insurance.

*Insurance period* – the insurance against the risk of winter frost may be concluded until 30 November, and even later, depending on the optimum periods

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<sup>24</sup> Generali osiguranje Srbija a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Risk of Winter Frost*.

and climate characteristics in a particular year, all according to the agreement reached with the insurer. The inception and termination of insurance is the same as in other special terms and conditions for insurance of crops and fruit, and the insured is obliged to insure all areas under the crops of the same type.

*The basis for premium calculation* is the expected yield and the expected price for a particular winter crop at the moment of concluding the insurance contract. In the event of occurrence, the maximum compensation that can be received by the insured is 20% of the agreed premium calculation basis.

*Liability of the insurer* is to indemnify the insured after the occurrence of the insured event, to the amount of resowing costs. If the insured fails to resow until 31 May of the current year, the insurer has the right to ask for the return of the paid insurance indemnity.

### **3.1.8. Special Terms and Conditions for Insurance of Crops and Fruit in Glasshouses and Plastic-covered Greenhouses**

According to the research results, this type of insurance can be found only in the offer of DDOR Novi Sad and Triglav osiguranje.

*Subject matter of insurance* includes crops and fruit which are insured in accordance with the general terms and conditions for insurance of crops and fruit grown in glasshouses and plastic-covered greenhouses; provided that these facilities have installed thermographs in each unit greater than 0.20 hectares and that the plastic foil in greenhouses is not older than one year.<sup>25</sup>

*Insured perils (risks)* – according to the terms and conditions of Triglav Insurance, insurance company is liable to pay the insurance compensation for the losses caused by damage to or destruction of the insured crops and fruit against the following risks:<sup>26</sup>

- 1) frost i.e. winter kill of crops and fruit as a consequence of damage to a glasshouse or plastic-covered greenhouse;
- 2) hail, fire, lightning, storm, accumulation of snow, ice, hail and water on the glass house or greenhouse, landslide or landslide, earthquake, flood, avalanche, impact of own motor vehicle or working machine resulting in the damage of the greenhouse or glass house;
- 3) frost i.e. winter killing of crops or fruit due to the delay in electricity supply or gas supply to the glass house as a result of damage or breakdown;

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<sup>25</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Crops and Fruit in Glass Houses and Plastic-Covered Greenhouses*, Article 1.

<sup>26</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit in Glass Houses and Greenhouses*, Article 2.

- 4) frost i.e. winter killing of crops or fruit due to the breakdown of the heating system i.e. due to the drop in the outside temperature in glass houses or greenhouses which do not have the heating system,
- 5) temperature increase occurred due to the breakdown of the heating system;
- 6) hail, fire, lightning or storm, which may cause direct or indirect damage to the greenhouse or glasshouse by the fall of the structure or part of the structure;
- 7) flood, water spillage from water supply system, hot water supply system or sewerage.

In all of the above cases, according to the terms and conditions of Triglav Insurance, insurance company is liable to pay the insurance indemnity for the losses caused by the damage to, or destruction of the insured crops and fruit occurred when preventing the occurrence of the insured event, that is, occurred in the course of salvage.

*Beginning and end of insurer's liability* – the general terms and conditions for insurance of crops and fruit of both insurers define the beginning of the insurer's liability. The liability ends after the completion of picking i.e. taking out of insured crops and fruit and, not later than upon the expiry of one year from the conclusion of the insurance contract. The liability of the insurer to pay the insurance indemnity for crops and fruit in glasshouses or greenhouses which do not have a heating system begins on 15 March and ends on 31 October of the current year.

*Obligation to insure all crops and fruit* is similarly stipulated by both DDOR Novi Sad and Triglav Insurance, and involves the obligation of the insured to insure all areas under crops and fruit grown in all glasshouses or greenhouses and to insure all sowing i.e. planting periods.

*Obligations of the insured* are to regularly record the data on the production process in a glass house or a greenhouse and take all necessary actions to prevent the occurrence of the insured event and immediately report to the insurance company any damage to a glass house or a greenhouse. The insured is obliged to always have in stock a reserve material necessary for covering, in the quantity, which makes 5% of the total protected area of the glasshouse or greenhouse, as stated in the insurance terms and conditions of DDOR Novi Sad.<sup>27</sup>

*Determination of risk occurrence* is made based on the damage characteristics on plants and facilities. According to the terms and conditions of Triglav Insurance, in the event of storm, the report of hydrometeorological service shall be authoritative, and in the event of frost, the thermograph data will serve as an evidence.<sup>28</sup>

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<sup>27</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Crops and Fruit in Glass Houses and Plastic-Covered Greenhouses*, Article 6, item 3.

<sup>28</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit in Glass Houses and Plastic-Covered Greenhouses*, Article 7.

### **3.1.9. Special Terms and Conditions for Insurance of Seed Corn against the Loss of Seed Quality Due to Autumn Frost**

*Subject matter of insurance* is corn produced for seeds (seed corn). According to the results of the research, the insurance against this risk is included only in the offer of Triglav Insurance and DDOR Novi Sad.

*Insured peril* is the risk of loss of corn seed quality due to autumn frost. Autumn frost means the drop in temperature below 0°C, in the period from 1 September to 10 November.<sup>29</sup>

*Conditions to be met in order to conclude insurance* are also identically defined in other special terms and conditions. However, as indicated in the terms and conditions of Triglav Insurance, here there is one specific characteristic that the insurance against this peril is conditioned by the completion of the mother line sowing until 10 May of the current year. The deadline for the conclusion of this type of insurance is 1 July of the current year, and the insured is obliged to insure all areas under the seed corn.<sup>30</sup>

*Beginning and end of the insurer's liability* – the liability begins on 1 September and ends on 10 November at 24.00 hours.

*Insurance indemnity* is determined according to the special terms and conditions of DDOR Novi Sad, to the amount of difference between the sum insured i.e. the actual value of the seed crop and mercantile value as a new usable value of the crop.<sup>31</sup>

### **3.1.10. Special Terms and Conditions for Insurance of Crops and Fruit after the Harvest or Picking**

Based on the research results it can be concluded that the insurance against this risk is contained in the offer of Dunav Insurance, DDOR Novi Sad and Triglav Insurance.

*Subject matter of insurance* are crops and fruit the production of which requires maturation after the harvest or picking.

*Insured perils* are damages to or destructions of crops due to the occurrence of the insured event i.e. the actuation of the risk of hail, lightning, fire, storm or flood.<sup>32</sup>

*Beginning and end of the insurer's liability*– the insurer's liability begins upon the expiry of the 24th hour of the date indicated in the policy as the insurance inception date, however, not before the completed picking or harvest, whereas

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<sup>29</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Seed Corn against the Loss of Seed Quality due to Autumn Frost*, Article 2.

<sup>30</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Seed Corn against the Loss of Seed Quality due to Autumn Frost*, Article 3.

<sup>31</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Seed Corn against the Loss of Seed Quality due to Autumn Frost*, Article 5.

<sup>32</sup> Dunav Insurance a.d.o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit after the Harvest or Picking*, Article 2.

the liability of the insurance company ends 15 days upon the completed harvest or picking. If the crops or fruit were moved to the commercial yard, the liability of the insurer is extended for additional 15 days.<sup>33</sup>

### **3.1.11. Special Terms and Conditions for Experimental Insurance of Oilseed Rape against Winter Killing**

According to the results of the conducted research, this type of insurance is included only in the offer of Dunav Insurance and DDOR Novi Sad.

*Subject matter of insurance* is the crops of oilseed rape.

*Insured perils* are the losses occurred by the destruction of the oilseed rape due to winter killing which involves the effects of low temperatures in the period from 1 December to 1 March.<sup>34</sup> The terms and conditions of Dunav Insurance define the winter killing as adverse effects of low air temperature which is below -14°C, as critical temperatures for oilseed rape. According to the terms and conditions of this insurance company, insured perils are the damaged occurred by the destruction of the insured oilseed rape in the period from 1 December to 15 March.<sup>35</sup>

*Conditions to be met in order to conclude insurance contract* mean that this insurance may be concluded only for the crop of oilseed rape sown within the optimum period from 1 to 20 September. The insurance against this peril may be concluded not later than until 30 November of the current year.<sup>36</sup>

### **3.1.12. Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Seed Quality**

According to the research findings, on the domestic market of agricultural insurance, the insurance against this risk is included only in the offer of DDOR Novi Sad and Triglav Insurance.

*Subject matter of insurance* are the crops and fruit of recognised varieties and hybrids insured according to the general terms and conditions for insurance of crops and fruit, provided that they serve for the production of seeds.<sup>37</sup>

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<sup>33</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit after the Harvest or Picking*, Article 4.

<sup>34</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Experimental Insurance of Oilseed rape against Winter Killing*, Article 2.

<sup>35</sup> Dunav Insurance a.d.o., Beograd, *Special Terms and Conditions for Experimental Insurance of Oilseed rape against Winter Killing*, Article 2.

<sup>36</sup> DDOR Novi Sad a. d. o., Novi Sad, *Special Terms and Conditions for Experimental Insurance of Oilseed rape against Winter Killing*, Article 3.

<sup>37</sup> DDOR Novi Sad a. d. o., Novi Sad, *Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Seed Quality*, Article 1.

*Insured peril (risk)* is the loss of seed quality of the insured crops and fruit due to the risks insured in accordance with the general terms and conditions for insurance of crops and fruit, and due to the additional risks, in accordance with the special terms and conditions, provided that the loss of seed quality is also insured against these risks. In order to conclude this insurance, it is necessary that the insured crops and fruit had all the characteristics of seed material before the actuation of the insured risk.<sup>38</sup>

*Insurance indemnity* is determined in the amount of difference between actual value of seed crop and its mercantile i.e. new usability.<sup>39</sup>

### **3.1.13. Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality**

In the domestic agro-insurance market, insurance against this risk is highly represented. Based on the research results shown in this paper, it can be seen that this insurance is also represented in the analysed offers of all four insurance companies.

*Subject matter of insurance* is table grapes in intensive plantations, and *insured perils* are the risks of loss of yield quantity and quality due to the risk of hail.

*Condition to be met in order to conclude* this insurance is to cover by economic protection all areas under table grapes owned by one insured person.<sup>40</sup>

*Beginning of the insurer's liability* for the losses caused by the loss of quality and quantity is according to the general terms and conditions for insurance of crops and fruit, but not before the beginning of berry formation.

*End of the insurer's liability* to pay insurance indemnity is upon the completed picking.<sup>41</sup>

*Classes of damage* represent a specific provision of this type of insurance and can be found in the analysed terms and conditions of all four insurance companies (DDOR Novi Sad, Dunav Insurance, Generali osiguranje and Triglav osiguranje). According to this provision, in the event of a damage, table grapes are classified in two classes of damage: (1) the first class of damage where undamaged grapes and grapes slightly damaged on the surface by hail are classified; (2) the second class of damage, where grapes damaged by hail but useable are classified.<sup>42</sup> In the terms

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<sup>38</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Seed Quality*, Article 2.

<sup>39</sup> DDOR Novi Sad a. d. o., Novi Sad, *Special Terms and Conditions for Insurance of Crops against the Loss of Seed Quality*, Article 4; Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Crops and Fruit against the Loss of Seed Quality*, Article 4.

<sup>40</sup> Generali osiguranje Srbija a. d. o., Beograd, *Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality*, Articles 1-3.

<sup>41</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality*, Article 4.

<sup>42</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality*, Article 5.

and conditions of Dunav Insurance it was defined that the first class of damage has no less than 20% of the damaged berries, and the second class has no more than 20% of damaged berries.<sup>43</sup>

*Insurance indemnity* – Loss assessment determines the damage resulting in the loss of quantity and the damage resulting in the loss of quality, respectively. The damage resulting in the loss of quantity is determined based on the percent of totally destroyed berries and grapes, and for the rest of the yield, the damage resulting in the loss of quality is determined. In the insurance terms and conditions of DDOR Novi Sad it was specified that insurance company pays insurance indemnity to the amount of 50% of the sum insured for the part of yield declassified from the first and second class. In addition, the terms and conditions of this insurance company stipulate that by summing up the percent of the loss of quantity and the percent of the loss of quality, the total percent of insurance indemnity is obtained, and that the total loss amounts to 5% or less, whereas the insurance company does not pay insurance indemnity.<sup>44</sup>

### **3.1.14. Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality**

The insurance against this risk is contained in the offer of all four insurance companies whose insurance terms and conditions were the subject of research in this paper.

*Subject matter of insurance* are the fruit of apples, pears and peaches in intensive plantations, according to the insurance terms and conditions of DDOR Novi Sad. In accordance with the terms and conditions of Dunav Insurance and Triglav Insurance, the subject matter of insurance may also be apricots and the terms and conditions of Generali Insurance include sour cherries and cherries.<sup>45</sup>

*Insured perils* include the damages caused by the loss of yield quantity and quality due to the risk of hail, as mentioned in the analysed insurance terms and conditions of all four insurance companies.

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<sup>43</sup> Dunav Insurance a.d.o., Beograd, *Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality*, Article 5.

<sup>44</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Table Grapes against the Loss of Quantity and Quality*, Article 6.

<sup>45</sup> DDOR NoviSad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 1; Dunav Insurance a.d.o., Beograd, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 1; Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 1; Generali osiguranje Srbija a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 1.

*Classes of damage*, as in the insurance of table grapes against the loss of quantity and quality, the fruit which is the subject matter of this insurance may be classified in the classes of damage. According to the insurance terms and conditions of DDOR Novi Sad, there are three classes of damage for apples and pears and two classes of damage for peaches.<sup>46</sup> There is a similar situation in other insurance companies, whereas differences lie only in the type of fruit which is the subject matter of insurance.

*Insurance indemnity is determined* as the percent of the sum insured, depending on the class of damage to the individual fruit, as specified in the terms and conditions of Dunav Insurance. This provision is similarly defined by other insurance companies whose insurance terms and conditions were the subject of analysis.<sup>47</sup> According to the analysed terms and conditions of all four insurers, the indemnity is not paid if the total damage amounts to 5% of the sum insured, or less.

### **3.1.15. Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – when Bearing Fruit**

The insurance against this risk can be found in the offer of all four insurance companies whose insurance terms and conditions were the subject of the research and analysis.

*Subject matter of insurance* are fruit plantations (orchards) and grape vine (vineyard) when bearing fruit. In orchards, trees are insured whereas in vineyards, insured are grape vines.

*Insured perils*, according to the insurance terms and conditions of Triglav Insurance are: destruction of trees or grape vines due to hail, fire, lightning, storm, avalanche, accumulation of snow and ice in tree crowns, as well as landslip and landslide. Liability to indemnify the loss exist only for completely destroyed trees or grape vines. According to the mentioned terms and conditions, insurance company is not liable to indemnify the costs of rehabilitation of landslide-affected soil.<sup>48</sup>

*Sum insured* is determined per one tree i.e. grape vine, as well as for the total area, separately for each year within the insurance period, as laid out in the terms and conditions of Generali Insurance. According to the terms and conditions of this insurance company, the sum insured may not be greater than the net book value of orchard or vineyard.<sup>49</sup>

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<sup>46</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 4.

<sup>47</sup> Dunav osiguranje a.d.o., Beograd, *Special Terms and Conditions for Insurance of Fruit against the Loss of Quantity and Quality*, Article 6.

<sup>48</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – when bearing fruit*, Article 2.

<sup>49</sup> Generali osiguranje Srbija a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – plantations when bearing fruit*, Article 3.



*Beginning and end of the Insurer's liability* is determined in the same way as in the other special terms and conditions for insurance of crops and fruit. However, a specific characteristic of this risk is that the insurance cannot be concluded for the period longer than one year, as specified in the terms and conditions of Dunav Insurance.<sup>50</sup>

In the analysed terms and conditions of all four insurance companies, *loss identification and assessment and insurance indemnity* are defined in the same way. The losses occurred are identified and assessed within the appropriate agro-technical period, and not later until the beginning of the subsequent vegetation. If out of the total number of trees or grape vines more than 50% are destroyed, it is considered that the total damage occurred on the whole plantation and in such case, insurance indemnity is determined according to the value of the total number of trees or grape vines, at the entire insured plantation.<sup>51</sup>

### **3.1.16. Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – Young Plantations until Bearing Fruit**

Based on the result of the conducted research it can be concluded that this type of insurance is represented in all analysed terms and conditions, that is, in the offers of the four leading insurance companies operating on the domestic market.

According to the terms and conditions of Generali insurance, *the subject matter of insurance* are young plantations of fruit trees and grape vines from planting until bearing fruit, that is, until becoming a fixed asset.<sup>52</sup> The same applies to other insurance companies.

Insured perils (risks) are the same as in the insurance terms and conditions analysed in the previous item. According to the terms and conditions of Triglav Insurance, there is a difference in the fact that according to these terms and conditions, insurance company is obliged to pay the indemnity for the damaged trees and grape vines and not only for the destroyed ones. The indemnity is paid in the amount of extraordinary salvage costs of the subject matter of insurance.<sup>53</sup>

*The sum insured* is determined per one tree or grape vine, as well as for the total area, separately for each insurance year i.e. year of establishment of long-lived

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<sup>50</sup> Dunav osiguranje a.d.o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – plantations when bearing fruit*, Article 4.

<sup>51</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – plantations when bearing fruit*, Article 5.

<sup>52</sup> Generali osiguranje Srbija a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – young plantations until bearing fruit*, Article 1.

<sup>53</sup> Triglav osiguranje a. d. o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – young plantations until bearing fruit*, Article 2.

plants. The sum insured is determined based on the total investments costs which are comprised of all the costs from the planting perennials, inclusive of the expenses planned for the current year.<sup>54</sup>

*Beginning and end of the Insurer's liability* is determined in the same way as in the other terms and conditions for insurance of crops and fruit.

*Loss identification and assessment and insurance indemnity* – loss assessment determines the number of fully or partly damaged trees or grape vines. Totally destroyed trees or grape vines are those fully dried out or incapable of further growth and production, whereas partly damaged are those trees and grape vines that are capable of further vegetation and production.

According to the terms and conditions of Dunav Insurance, total loss to a plantation in general is considered to have occurred if in the first year of vegetation 60% of the total number of trees and grape vines are destroyed, 50% in the second year of vegetation and 40% in the subsequent vegetation years. According to the mentioned terms and conditions of Dunav Insurance, the amount of insurance indemnity is determined: (a) if the total damage occurred in the amount of costs for growing and breeding of the plantation until the moment of the loss occurrence, but no more than the amount of the sum insured; (b) if the damage is partial, in the amount of extraordinary costs necessary to salvage the damage plantation, if such costs have been agreed between the insurance company and the insured, and these costs are reimbursed maximum up to 25% of the sum insured.<sup>55</sup>

## 4. Conclusion

Based on the conducted research, it can be concluded that in the agricultural insurance market in Serbia, there is a satisfactory offer concerning crop insurance. The analysed offers of the four leading insurance companies in this class of insurance contain, within the general and special insurance terms and conditions, the insurance against the most important risks of crop production. Thus, it can be concluded that the agricultural entities have the opportunity to take out good-quality insurance for their agricultural production, that is, that the reasons for insufficient development of agricultural insurance in Serbia do not lie in the offer but instead, the demand needs to be encouraged and developed, as is the case in other insurance lines on the domestic insurance market.

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<sup>54</sup> DDOR Novi Sad a.d.o., Novi Sad, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – young plantations until bearing fruit*, Article 3.

<sup>55</sup> Dunav osiguranje a.d.o., Beograd, *Special Terms and Conditions for Insurance of Fruit Trees and Grape Vines – young plantations until bearing fruit*, Article 5.

Based on the conducted research, it can be concluded that in terms of development and modelling agricultural insurance upon the international experiences, Serbian market could benefit from a more diverse offer of insurance against the risks of drought and loss of income, since currently these lines of insurance are offered by only one insurer.

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