FOODPRINT

Epizootics are a global problem

35 ways to improve crop insurance

How to insure the uninsurable?

The Food & Agri magazine of the GrECo Group | *Summer 2022*

Feed the world and save the planet

Contents

Impressum

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Editorial

Managing the risks in Food & Agriculture is particularly important as any business active in this industry – from farmers, breeders and producers to suppliers, supermarkets, and restaurants – helps maintain stability in our society. Their financial resilience is also key to the supply, processing, distribution, and protection of food.

Tailoring solutions for clients means keeping the Food & Agriculture industry's peculiarity in mind. This sector requires a much larger variety of insurance lines than any other segment of the economy. We help our clients step up their financial resilience which, in turn, helps them to eventually produce and deliver enough quantities of quality products.

In our new publication FOODprint we address a variety of topics and insurance solutions and also highlight the growing importance of risk management and alternative solutions like parametric insurance.

Enjoy reading!

Maksym Shylov
Group Practice Leader
Food & Agriculture

How to feed the world and save the planet?

In need of a compromise to feed the world´s growing population

Half of the world's GDP is tied to nature, be it food production or water supplies. The United Nations estimates that 840 million people will be affected by hunger by 2030. How can we feed the 7.9 billion people without exceeding the limits of our planet?

Climate change is just as evident. The intensification of agriculture, which has resulted in high nitrogen emissions, exacerbates the problem. It accounts for nearly 11% of the greenhouse gas emissions in the world. Particularly concerning are nitrous oxide emissions from over-fertilization of land, which is 300 times more potent than carbon dioxide, causing global warming.

Tackling the challenge of feeding the world, while solving environmental problems and preventing further global warming is not an easy task. The latter implies curbing and reducing the intensification of agriculture.

Curbing agriculture may lead to a reduction of land used for agricultural purposes, less protection of crops, and, as a result, less crop production. At the same time, this spurs outside-the-box thinking to find a compromise that could solve the dilemma. New ways of more efficient agriculture, producing healthier pesticide-free products in smaller areas well protected from production risks (pests, diseases, natural disasters, etc.) could be the solution.

Preserving nature

The EU Green Deal developed in 2020 is a roadmap to more sustainable economies. It sets new targets for achieving greener agriculture over the next ten years by:

- reducing the use of chemical and more hazardous pesticides by 50%,
- reducing nutrient losses by at least 50%,
- reducing fertilizer use by at least 20%,
- reducing the sale of antimicrobials for farmed animals and in aquaculture by 50%
- helping the EU organic farming grow, aiming at 25% of total farmland by 2030.

New technologies for global problems

The development of digital technologies, precision farming and the use of artificial intelligence can help humankind to some extent to produce sufficient food while conserving natural resources. For example, artificial intelligence and nanotechnology can improve crop and soil yields while maintaining soil health and protecting the quality of the environment.

New risks in the transformation of the food and agriculture sector

How can we help farmers cope with crises while still providing a fair and reliable income base? How does the food industry adapt production and distribution processes to meet challenges of both climate change and government efforts aiming at making agriculture more environmentally friendly? Without a doubt, the food and agriculture sector is subject to changes and transformations. However, these very same changes also bring about new risks. The time has come to think ahead, identify risks, and prevent and reduce potential losses.

Management more exposed to claims under new rules

Increasingly, management decisions are guided by compliance with new rules, primarily related to preserving the environment and maintaining public health, i.e. in line with the EU Green Deal. As a result, the insurance industry will have to deal with potential new claims made against directors, government officers, shareholders and other stakeholders.

More cyber risks in the food and agriculture sector

More reliance on digitization means increased cyber threats. Modern and fully automated IT farms, for example, may suffer from business interruption and losses caused by cyber-attacks, software failures or human error.

Supply chain sustainability

Climate change creates new challenges for farmers and the food industry and may result in catastrophic losses.

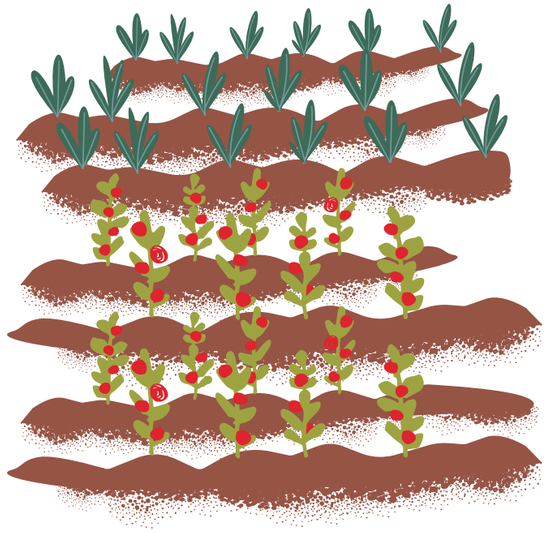
It is prudent to plan and consider lternative resources, increased costs due to additional transport require-ments or even a limited supply.

In addition, one should not lose sight of the new risks of a pandemic. These can be substantial, as the Covid-19 crisis has shown since 2019. Various business sectors registered a serious shift in the structure of demand and experienced restricted labour mobility. Personnel in the health sector were hard hit, timely availability of basic resources was a challenge for farmers and the food sector, and different channel infrastructure was built to ensure food delivery. New biosafety requirements were set up, delays and disruptions in transport and logistics services became the order of the day, and the costs of international freight transport

surged. Many of these consequences continue to affect businesses and human lives.

Business interruption coverage in the spotlight
The insurance industry is set to increasingly focus on business interruption products.

Nowadays, livestock insurers opt for gross profit loss insurance rather than animal value insurance. At the same time, every hectare of land will have a higher value. Because they are subject to risks associated with reductions in inland areas, there is an increase in the industry capital intensity and its digitization.



Moving from conventional to organic farming despite higher production risks
The sustainable yield performance of organic farming is still questionable. Historically, conventional agriculture provided better-guaranteed protection of yields against adverse perils. The rapid transformation of many areas from conventional to organic farming entails additional yield production risks. These should be taken into account and handled accordingly.

Modification of agricultural resources and new farming methods leads to new liability risks
New crop varieties, chemicals and fertilizers will be created because of the increasing need to fight hunger and save the planet. Any modifications involve unknown risk factors for property damage and personal injury and, therefore, may lead to additional claims and costs of product recalls. As an example, there are specific concerns and doubts about the effects of genetically modified organisms (GMOs) on humans.

Several incidents cast a shadow on the safety of GMOs and, importantly, on the ability to control the spread of these organisms in food production and distribution networks, not to mention the environment in general.

Increased risks due to a lack of water
Water, the world's most precious resource, also plays a crucial role in solving agricultural problems. Water is one of the crucial factors in irrigation facilities deployment as more rainfed lands need to be irrigated due to desertification, resulting from global warming. Unfortunately, many natural water sources have also become unreliable, more polluted, or both.

PPP in agricultural insurance will gain in importance
Stepping up public-private partnerships by introducing new agricultural insurance products to better protect farmers against catastrophic risks, such as drought and epizootic diseases, will help improve the agricultural sector's financial sustainability. Governments will be challenged to find ways to encourage farmers to buy more agricultural insurance. They may have to introduce compulsory baseline production insurance, tie prerequisite insurance policies to other government support, develop other measures to prevent the risk of crop and animal loss, and help farmers to define effective mechanisms to reduce losses.

Insurance specialization will intensify
The insurance sector is undergoing a significant change. Already, we are experiencing increasing digitization, ready-made basic solutions and artificial intelligence, which will ultimately automate the communication between the client and the insurer. However, the food and agriculture sector will continue to require highly professional advice from insurance experts who understand the industry, speak a common language, and can develop and tailor the right solutions.

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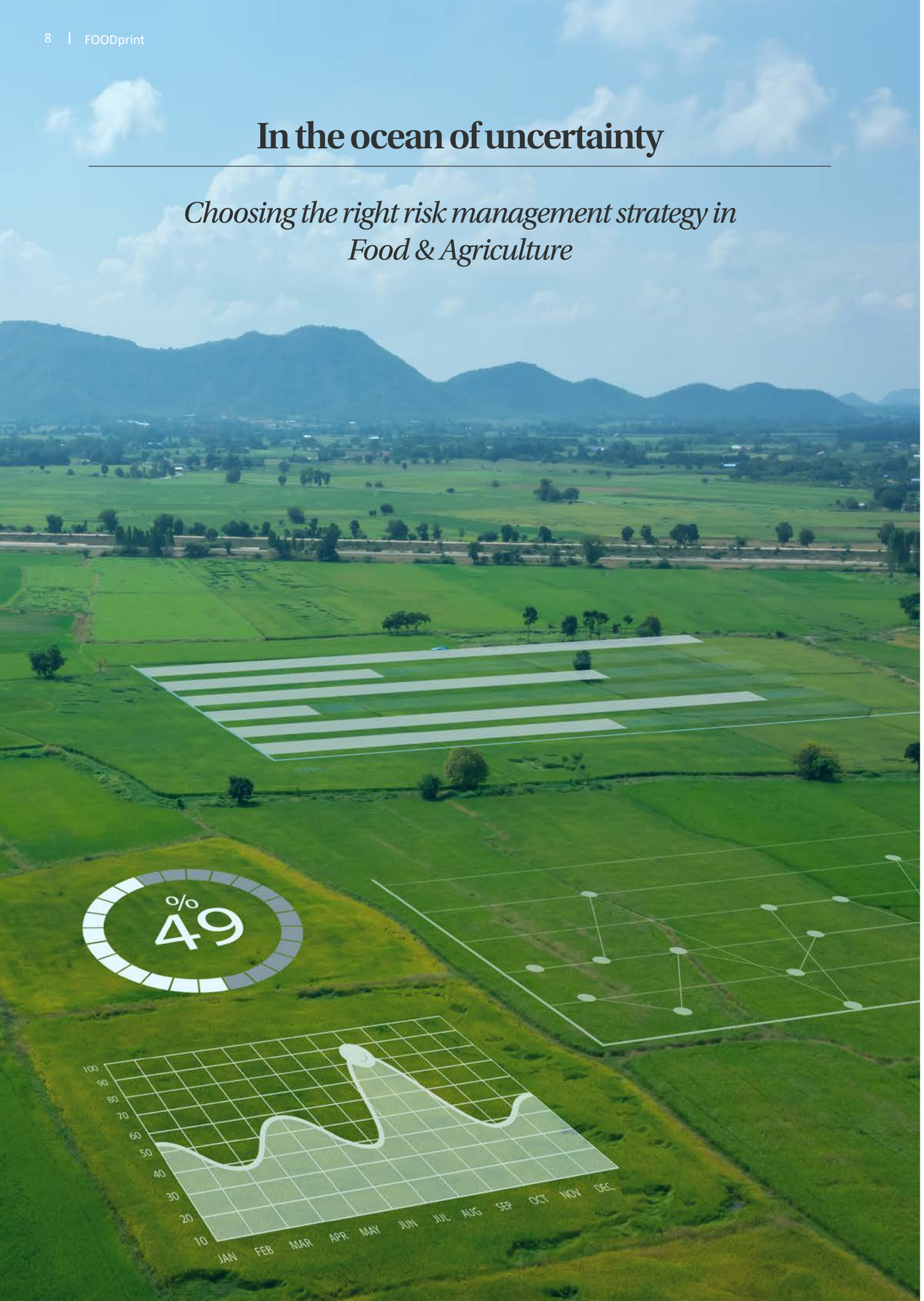
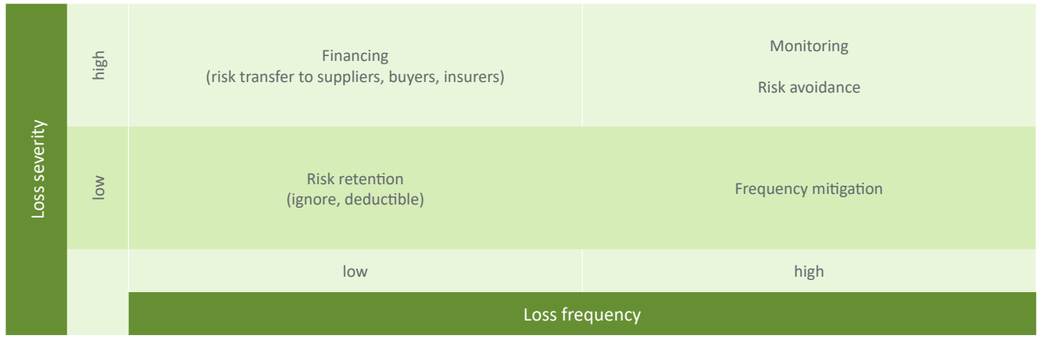
In the ocean of uncertainty

Choosing the right risk management strategy in Food & Agriculture



Risk managers often ask themselves what to insure first. Between cost and potential benefit, what should we choose?



Depending on the combination of frequency and severity, the enterprise decides:

1. Transfer the risk to, for example, an insurance company
2. Retain the occurred loss
3. Avoid the risk
4. Reduce the frequency of losses.

Food & Agriculture customers use the methodology developed by us to map 100 insurance risks, divided into 12 categories:

- Commercial property;
- Property in construction;
- Stock;
- Software;
- Money;
- Business Interruption;
- Crops;
- Livestock;
- Transport;
- Transport Liability;
- The other liabilities;
- Personnel

A risk map is a graphical depiction of a select number of a company's risks designed to illustrate the impact or risk's significance on one axis and the likelihood or frequency on the other. Risk mapping assists in identifying, prioritizing, and quantifying risks to an organization. This representation often takes the form of a two-dimensional grid with frequency (or likelihood of occurrence) on one axis and severity (or degree of financial impact) on the other axis; the risks that fall in the high-frequency/high-severity quadrant get priority risk management attention.

For each category, we analyze risks as follows:

- Frequency level;
- Severity;
- Insured or not;
- If you plan to insure within 12 months;
- Estimated maximum loss.

There are five organizational steps to making a risk map:

1. Appoint a risk committee / responsible team;
2. Define risk;
3. Identify the risks;
4. Assessing risks;
5. Prioritization matrix.

The most challenging thing about risk mapping is risk assessment. For example, how to determine the maximum loss from a crop shortfall? Do we need to account for one growing season with poor productivity, or do we account for a 3-5 year cycle during which we need to estimate the total yield loss? How do we account for the inverse correlation between crop yields and agricultural commodities prices, which is high for crops in some regions? What about a negative global warming trend, on the one hand, but improving agricultural technology and productivity, on the other? Estimating the frequency and severity of losses is also challenging for cyber risks. How can we assess the loss in the event of business interruption for non-property damage? Sometimes it takes time for a company and its consultants to develop the correct methodology and gather enough information.

Risk mapping is a good starting point for implementing a holistic approach to risk management for any company and a suitable guiding star for optimizing insurance costs for maximum efficiency.

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Epizootics are a global problem

Ways to protect against risks and minimize losses for meat farmers and processors

The livestock supply chain is part of food chain threats and one of 3 areas of activity of the Food & Agriculture Organization of the United Nations (FAO). Their main aim is to increase the resilience of livelihoods to threats and crises that affect agriculture, food and nutrition.

Current situation of epizootic diseases

Epizootics animal diseases classify as transmissible diseases that have the potential for very serious and rapid spread, irrespective of national borders. The definition also states that they could have serious socio-economic or public health consequences and are of major importance in the international trade of animals and animal products.

So-called epizootics animal diseases are creating more concern, not only for farming society but also the whole countries and regions. Nowadays, epizootics animal diseases matter for food protection policy and they even can cause problems to human health.

The need to fight against animal diseases at a global level led to the creation of the Office International des Epizooties through the international Agreement signed on January 25th 1924. In May 2003 the Office became the World Organisation for Animal Health but kept its historical acronym OIE.

A crucial mission of the OIE is to collect information from its member countries on the presence and distribution of animal diseases and the methods used to control them, the purpose being to avoid the spread of epizootic diseases at the international level.

At the moment, 16 diseases are monitored monthly and contained in the so-called OIE List A, namely:

- Foot and mouth disease
- Swine vesicular disease
- Peste des petits ruminants
- Lumpy skin disease
- Bluetongue
- African horse sickness
- Classical swine fever
- Newcastle disease
- Vesicular stomatitis
- Rinderpest
- Contagious bovine pleuropneumonia
- Rift Valley fever
- Sheep pox and goat pox
- African swine fever
- Highly pathogenic avian influenza.

Development of ASF and avian influenza during the last decade

The most commonly known plagues are African Swine Fever (ASF) and Avian Influenza or Bird Flu. For example, a massive outbreak in China wiped out at least 40% of pigs in 2019. ASF has been present in Central and Eastern Europe since 2014. and is not over yet, as human factors and factors of infected wild boars spread this disease significantly.

African swine fever (ASF) is a devastating infectious disease of pigs, usually deadly. No vaccine exists to combat this virus. ASF does not affect humans and other animal species other than pigs and wild boars. It is transmitted via direct animal contact or dissemination of contaminated food (e.g. sausages or uncooked meat).

First time in 2007 ASF virus spread to Europe through the Trans Caucasus Countries and the Russian Federation. The next massive outbreak happened in 2014, affecting Russia, Ukraine and Baltic countries, and it is still lasting and moving to Western Europe.

Avian Influenza (AI), or the Bird Flu, is a highly contagious viral infection that can affect all species of birds, manifesting in different ways depending mainly on the ability of the virus to cause disease (pathogenicity) and on the affected species.

We can divide the influenza infections in birds into two groups based on their pathogenicity:

- **Highly Pathogenic Avian Influenza (HPAI)**: spreads rapidly, causing a serious disease with high mortality (up to 100% within 48 hours) in most poultry species (except domestic waterfowl).
- **Low Pathogenic Avian Influenza (LPAI)**: causes generally a mild disease that may go undetected.

While the risk from Asian H5N1 is low for most people, sporadic human infections with the Asian H5N1 virus have occurred in some Asian countries. Most human infections with Asian H5N1 viruses in other countries have occurred after prolonged and close contact with infected sick or dead birds.

We are currently witnessing the new wave of Avian Influenza in Europe, which started at the end of November 2021 in Denmark, Czechia and Poland and may spread for the next 12-15 months over Europe.

Supply-chain risks: how are they managed?

Usually, if epizootic disease occurs on the farm's premises, all animals will die or be slaughtered upon the order by the state authorities. It leads to the total loss of animals on a farm. Moreover, besides material damage related to animals, the farm suffers losses caused by the interruption of activities. It takes time to slaughter, transport and utilize animals, disinfect premises and keep them closed for enforced quarantine time (3-12 months). Additionally, the testing period lasts for 1-3 months. Therefore, business interruption and loss of gross profit can be much more substantial than just loss of culled livestock.

Besides the risk associated with the virus inside the farm and the risk of animal transportation, additional government restrictions exist. The farm can be trapped in risk control or surveillance zone, reaching a radius up to 20 km from the outbreak epicentre.

In addition, according to EU legislation, there is special zoning of infected areas, imposing additional limitations. Its derogation requires compliance with veterinary rules

if the farm wants to transport alive animals to the non-affected areas of the same country or another EU member. Such necessary measures can lead to an additional increased cost of working for a while.

The vulnerable parties in the epizootic scenario are slaughter-houses and meat processors. On the one hand, they are dependent on a stable supply of alive pigs or fresh meat, but on the other hand, export markets can be unexpectedly closed as long as epizootics occur in the country of their locations.

The case happened in Germany when the Chinese government immediately closed the border for producers of German pork after the first identified infected wild boar in German territory. The sources of risk for a slaughterhouse and meat processor are:

- Virus found on premises of a slaughterhouse or a meat processor;
- Virus found on premises of a farming supplier;
- Most farming suppliers are trapped in a control or surveillance zone, which leads to constraints in the movement of finishers to the slaughter and further processing.

Slaughterhouse or meat processors trapped in a control or surveillance zone

Events associated with the epizootic outbreaks can make farmers or slaughterhouses liable to compensate claims brought against them concerning 3rd party's product recall. They can be liable for product contamination costs and any costs resulting directly in damages to the contingents.

To prevent the spread of epizootic diseases and compensate for the financial outcomes of occurring events, governments enact an array of legislative acts concerning:

- basics of strict biosecurity measures on farms;
- measures carried out by authorities regarding the destruction of affected or suspected animals and prevention of the further spread of the disease;
- long-term zoning to regulate the movement of livestock and meat products;
- financial compensation of the value of killed and culled animals.

On a micro level, the farmer and meat processors implement special bio-security audits, and additional investments improve bio-protection and prevention measures against the disease on the farm's premises. Farmers and meat processors also develop business continuity plans, prepare their reactions and modify their business model if the disease happens. Based on GrECo Food&Agriculture practice, our cooperation with farmers and breeders associations in several countries, we counted about 100 factors of bio-security that can be analyzed and afterwards improved in order eventually to mitigate this risk.

Insurance solutions mitigate financial losses

A livestock insurance policy is the ultimate parachute for livestock breeders and meat processors. We can witness that even the modern farms which invested a lot in bio-security suffered the emergence of African swine fever or bird flu on their territory.

In designing a livestock insurance program, one should take into account the following:

- Avoid overlap with government compensation of the value of the killed and culled livestock, usually financed by authorities (e.g. in the EU);
- In many countries government usually does not fully compensate 100% of animal costs;
- For vertically integrated meat producers, the recommendation is to consider business interruption insurance coverage rather than pure material damage;
- Meat processors can be offered a livestock contingency BI program, which covers loss of gross profit resulting from disruption of livestock supply.

GrECo works with up to 20 international markets that can offer standard or bespoke livestock insurance solutions. Unfortunately, livestock material damage coverage is getting harder and harder to be placed, as insurers' appetites in the CEE/SEE regions are low.

Insurance and reinsurance companies are wary of the ongoing epizootic situation in this area, especially regarding ASF and HPAI. However, some innovative solutions and schemes have been developed by our Food&Agriculture practice to overcome such challenges, at least partially.

We should also not forget that any insurance of hard risks should go alongside risk management services of bio-security audits and business continuity plans. Risk management can always be catered to by our special GrECo Risk Management department.

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International vs local insurance

How do Food & Agriculture companies insure their plants abroad?

When an enterprise has a wide range of operations in more than one country, a convenient form of insurance ensures the entire enterprise, together with foreign entities, in an international program.

This is a tailored solution for companies with subsidiaries, commercial agencies, warehouses or production plants abroad.

Advantages of international programme

Multiple positive benefits come with international insurance programs. They allow for controlling the scope of coverage and the cost of insurance from the level of the parent company by one person responsible for the risk or insurance. It is easy to obtain a homogenous and possibly the broadest scope of insurance coverage for the entire company without leaving any gaps. International programs usually mean higher limits and broader protection than those locally available for individual companies or plants.

Thanks to their wide scope and uniform structure, international programs come with a lower premium. This is not always guaranteed, but in most cases, the premium is lower than one negotiated with many different offers for individual companies/subsidiaries.

The conclusion of an international program allows a higher level of deductible. A group of companies, acting as a whole, can retain a higher share than a single entity. The higher risk levels remaining with the client, the smaller share of risk transferred to the insurer and the lower the final premium.

In the international program, people responsible for risk or insurance have access to all claims data, which allows for better analysis of causes and minimization of unacceptable risks. Finally, control over claims also means more effective claims handling by insurers.

Limits of international programmes

However, there are several elements where international programs will not always be sufficient, and a better solution would be insurance taken on the local market. For example, there are risks exclusive to one company which do not exist at a group level (e.g. crop insurance). Also, we should not forget insurance that requires local service (e.g. health or accident insurance for employees).

As seen above, from the parent company's point of view, international programmes have many advantages but do not always cover 100% of the risks associated with the activities of local companies. Therefore, the best solution is to combine both insurances. Use an international programme for those risks and assets managed at the group level and attach local policies (to the extent that the programme does not offer full coverage).

Based on this assumption, the best solution for the client will be to use the professional assistance of an experienced broker in both the development of international programmes and with a good understanding of the local market in the many countries where he actively works.

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Insurance: a means to an agreement between farmer and partner

Tips to improve relationships, sustainability and financial resilience between actors in the supply chain.

Input producers and suppliers (chemicals, fertilizers, seeds) and food manufacturers have relations with many suppliers and buyers. Most of their success depends on how much buyers can buy or how much suppliers can supply at a competitive price.

It is increasingly important for such industries to find new access points to farmers, diversify their revenues, facilitate the supply of more crops and livestock raw materials, and develop and retain crucial buyers and suppliers.

Many external factors, including catastrophic weather events or epizootic diseases (drought, bird flu, African swine fever), could lead to individual or even massive breach of contract obligations by farmers, resulting in financial losses.

Partnership through affinity insurance

Affinity insurance and risk management services will help you strengthen your relations with counterparties and make such interaction less risky and beneficial for both parties.

Affinity programmes are insurance solutions distributed via third-party providers who are not insurance distribution specialists. An affinity program brings multiple benefits for any enterprise requiring food manufacturing or agricultural inputs supply.

Since the pooling of insurance enquiries into one affinity channel creates risk diversification and impressive business volume for the insurance company, leading to additional substantial discounts or more extended coverage. In other words, a farmer will buy better insurance from this affinity channel compared to buying individually and directly from an insurer. Moreover, an insurance policy can be fully granted to some key customers.

Examples of such solutions are:

- A poultry processor provides animal insurance for its suppliers, so that the poultry farmer receives a large discount on poultry insurance.
- Producers of raw materials for agricultural production finance 30% of the premium of a subsidised crop insurance policy for the area where the procured means of production have been implemented. This means that the policy for the farmer is free
- Additional parametric coverage is provided in the agricultural machinery policy, compensating added fuel and spare parts expenses caused by wet weather.

Insurance products can be embedded into the main product and free for a farmer or at a substantial discount, as it will be fully or partly sponsored by your company. It will help differentiate you in the market and incline a farmer to buy more main products. Moreover, cross-sales of insurance policies is one more point of communication of your sales staff with potential and existing clients.

Examples of such solutions are:

- A farmer buys a new tractor and gets a tyres insurance policy for free;
- A farmer who buys chemicals exceeding a specific amount gets a parametric drought policy for free;
- Income warranty parametric policy for solar farms deployed on farmers' fields.

Some crops are difficult to grow to achieve the required quality or quantity (e.g. starch potatoes, rapeseed, malting barley). By having a good policy sold or sponsored by crops or animal buyers, a farmer is more confident and motivated to grow a higher amount of such crops/animals for further processing.

By selling some vitally necessary insurance to your suppliers, you enhance the potential financial resilience of such farmers. Moreover, by using innovative insurance and risk management solutions, we can prevent the risks or deal better with the consequences of loss.

For example:

- The crop yield insurance payout compensates the farmer for the seed price in a bad weather year. If the farmer owes money, the debt can be restructured at a later date so as not to lose liquidity.
- Crop and livestock biosecurity monitoring to identify the cause of potential future losses in advance and make recommendations to your partners on how to minimise risk.
- IT solutions analyse the various financial and production data of buyers or suppliers in agriculture. This helps assess the risk of reliability and lack of supply or repayment of debts.

Using innovative insurance solutions and IT tools helps achieve maximum results from selling insurance policies to policy sales to farmer customers.

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How to insure the uninsurable?

Parametric insurance and its practical application for entrepreneurs and farmers.

Every entrepreneur in his activity accounts for the risk of delays and lack of supplies that hinder or prevent production. The reasons for such conditions may be manifold. Some are typical for insurance risks (fire, flood, theft, IT system failure), and others have a more complex cause (e.g. bankruptcy of a key supplier, change in raw material prices). While securing the risks from the first category is quite common and does not pose any problems, the latter is typical risks related only to running a business, and standard insurance does not cover such events.

In the food industry, raw materials prices for production (most often agricultural products) during the year often and significantly deviate from the contract prices established when concluding a supply contract and estimating production costs. While the reduction in prices, occurring rarely and to a small extent, has a positive impact on the producer's margin, the upward shift is a significant impact on the profitability of production of such enterprises as, for example, mills, feed processing plants, oil producers, meat plants.

You might think that the profitability of any production activity is heavily dependent on the prices of raw materials, but for agricultural produce, price volatility can surprise even very experienced entrepreneurs.

Necessary Conditions

Agriculture is a specific activity in which the productivity and effects of work depend on weather conditions. The more unusual the conditions are, e.g. prolonged winter, cold spring or dry and hot summer (recently observed due to progressive climate changes and the accompanying weather anomalies occur more often), the greater the negative impact on crops.

On the other hand, increasing globalization, also in agricultural markets, means that the situation in the local market may not have much in common with the current situation in a country. In many cases, global events have a dominant influence on the valuation of raw materials. Crop shortage occurring in globally exporting countries, associated with a smaller supply of grain in the market, affects prices everywhere.

This is the situation in 2022. The poor harvest of cereals in the largest producers and exporters - Canada, Russia and the USA - caused an increase in prices on world exchanges. Increases by over 30% y / y are amplified by speculative actions of investment funds, which, not surprisingly when analyzing the market situation, buy consumer cereals for later resale. Seeing the sharp price changes, local individual farmers refrain from selling their production, counting on a higher price within a few months.

While crop shortages occurring locally, e.g. in one country, can be compensated by importing raw materials (cereals, corn, soybeans) from abroad, there is no simple alternative when the problem concerns a larger area. We had to deal with this situation this year - an additional element that made it impossible to supplement the shortages of raw material were sudden weather phenomena in Europe during the summer. In 2021, the number of hailstorms doubled the number of hail falls recorded in 2019, which has, so far, been the most violent period in the history of measurements. In addition highly increased the number of hailstones of the largest sizes, above 5 cm in diameter.

The main reason for the increase in prices was the lower cereal yields in the Northern Hemisphere, which resulted from weather factors. Cold and wet spring delayed plant vegetation, while the following hot and dry summer significantly reduced cereal development and the formation of appropriate grain quality. All of this resulted in a drastic reduction in crop yields and a supply deficit in the grain market, leading to increasingly higher prices.

Rescue in insurance

How can an entrepreneur, whose production is grain dependent and the raw material prices have a fundamental importance in his economic calculation, find himself in this situation? Fortunately, if the risk we want to protect is somehow related to future and uncertain events, such as weather conditions, it is possible to design insurance covering this risk.

Assuming that the main factor we fear is drought (which is not local and most often covers large areas) and standard crop insurance is not available for producers other than field farmers, the solution is index (parametric) insurance.

Parametric insurance is the optimal way in many cases reluctantly accepted by insurers as part of standard solutions, e.g. the risk of drought for crops on poor-quality soils or spring crops.

Regardless of which parameter we take as the basis, the condition for triggering liability is the change of this parameter resulting in a decrease in the insured's income or profit. The parameters for constructing an insurance index may vary, but each of them must have the following features:

- Clear definition: a specific indicator, e.g. the number of days meeting certain conditions for weather parameters (rainfall, temperature).
- Independent from the policyholder / insured: the client should not influence the measured parameter value, and the weather parameters are the best solution.
- The parameter's value should be available from an independent source: In this way, we ensure the reliability of the data and the possibility of its verification by all parties to the contract. For this reason, the weather data from the state meteorological service is the most appropriate for your insurance needs. In some cases, a parameter from local customer-owned weather stations is allowed. However, this requires verification to what extent the indications of this station are consistent with independent data in the long term.

Parametric insurance in practice

An important feature of parametric insurance is also the simplicity associated with the conclusion of the contract and its service (loss adjustment). In the case of weather parameters, the risk is estimated based on historical data, and the amount of information requested from the customer is limited. For this reason, this type of insurance is ideally suited to simplified sales models, e.g. through applications, even mobile. It is possible to structure the offer so that the client, also through the application, finds out that the risk occurred and he is entitled to compensation. He can report the claim with one click, and the payment is automatic.

In the case of a cereal processing company under consideration, drought risk affects the raw material prices the most. Therefore, the insured parameter could be the number of rainy days in the insurance period. Like rainy days, we can define those days with rainfall of min. 0.5 mm. In such a solution, compensation will be due if the number of rainy days (with rainfall above 0.5 mm) in the insured period is lower than the established limit, which means the risk of drought is more likely.

Parametric insurance is the best solution for a processing plant that expects protection against the risk of changing prices of the raw material or even a lack of supplies. In many cases, it is the only one available to the client whose needs are so non-standard not fulfilled by typical insurance available on the market. Thanks to the compensation from the index insurance, the client obtains additional funds for the raw material purchase at a higher price than the existing suppliers. The client also has the opportunity to purchase grain on the free market at current prices or may cover losses if it is not possible to buy it.

A similar insurance model may also apply to clients operating farms, who also experience price changes. A higher purchase price of grain means that in the next season, the cost of purchasing seed material will be much higher because the price of the raw material accompanies proportionally higher costs of storage and seed treatment.

By using insurance based on the client-farmer index, the client-farmer gets the opportunity to compensate for losses caused by risks not be covered by the standard insurance, or its conclusion would depend on many factors that are not always influenced by the client-farmer (e.g. cultivation in a field with appropriate valuation class, reaching the appropriate stage of development by plants before the beginning of the insurance period).

As can be seen in the above examples, index insurance offers the possibility of protection in those situations where standard terms and conditions and standard insurers cannot help the client. Index insurance has multiple development opportunities if we consider the impact of climate change on agricultural activity, related uncertainty and the inability to use the standard insurance offer. Although due to their different structure, they may seem complicated, from the perspective of the ease of their conclusion and handling (claims settlement), they are a unique alternative to standard insurance.

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35 ways to improve crop insurance

Advice for farmers who already have crop insurance and those thinking of getting one.

Adverse weather conditions are common companions in our lives. It is difficult to predict weather conditions, even if there is a long experience from the past. Climate change and the probability that bad things may always happen lead us to think about how to ensure this uncertainty.

In this article, we will guide farmers who already have crop insurance and those envisaging buying an appropriate product.

Why do I need crop insurance?
In the practice of farming risk management, there are several tools for dealing with weather risks:

- Use of weather forecasts;
- Application of irrigation systems;
- Technologies of minimum tillage;
- Use of more drought-resistant varieties/hybrids;
- Diversification of crops, varieties/hybrids, growing regions, sowing dates;
- External borrowing, government support, aid from friends after the damage has occurred.

Is this enough to certainly guaranteed yield and financial results? Unfortunately, it is not.

The best irrigation technologies and moisture saving practices help prevent or mitigate the loss, but, unfortunately, not fully. As in aviation, people care for the utmost safety of flights, but there are still parachutes and oxygen masks on board.

Some farmers rely on compensating for losses of bad years by the yield surplus of good years. Such practices are still problematic, as we face more often than consecutive bad years (e.g. 2018 and 2019 in Poland and Lithuania).

Imagine if there are three bad years in a row. Such a self-retention strategy for losses requires more money than buying insurance. As a farmer, you need to say: "I will no longer buy a new Range Rover right now, as I have to freeze my funds to cover my loss caused by the next drought".

In some CEE countries, farmers do not have a long-term risk management strategy, despite facing various risky situations. If you are thinking about selling your farming business at any time, the value of your company will be much higher with a stable annual cash flow supported by an effective crop insurance policy.

And let's not forget about your health! Farmers sleep better with an appropriate insurance policy and feel safer especially if a recognized insurance company that cares for a long-term relationship provides the coverage.

Find the right insurance company!
You can trust your partner after you have made a thorough check. The complaints about insurance products and companies exist, and you should have them in mind. On the one hand, people tend to speak ten times more about a bad experience than of a positive one. But the mistrust can also be a result of a misunderstanding. Firstly, a recommendation for our farming clients is to understand who their insurers are.

The important considerations to keep in mind and ask your insurance agent:

1. Who is the shareholder of the insurance company?
2. How long do they exist?
3. Who reinsures the risks of damage to your crops?
4. How much will the insurer pay from his account in case of a catastrophic weather event, i.e. when the other farmers will also suffer loss?
5. What was the ratio between collected insurance premiums and payments in the past?
6. How many people with agronomic education or practical experience in agronomy work on their staff?
7. How many crop insurance contracts do they have in their portfolio? How many insurance claims were made?
8. Are there any substantial loss payments per single claim?
9. Are there any farmers who received significant payments and can recommend this insurance company to you?

Realize the gaps in your coverage
A second important consideration is that you need a complete understanding of your insurance cover.

In CEE/SEE markets, it is difficult to find the ideal crop insurance. Due to the nature of agriculture itself, detecting the best insurance solution is generally not easy.

Some insurance markets reach levels of excellence thanks to their long-time tradition of public and private partnerships in agriculture. However, they do not work in most cases for Central and Eastern Europe. We hear very often from European insurers about their "low-risk appetite".

Our checklist to investigate your coverage is as follows:

10. Is the sum insured high enough to cover the potential loss?
11. How is the yield to be insured defined?
12. When does the coverage incept and end?
13. How fast will my crops be admitted for insurance?
14. Are there any additional indemnity limits?
15. How is the yield loss estimated?
16. What is the methodology for calculating the predicted harvested yield?
17. Are all my production perils covered?
18. How high is the deductible?
19. How is the deductible applied (per field, per loss, per crop, per farm)?
20. Are there any additional franchises or deductibles?
21. Are all my crops covered?

If you are starting with crop insurance, we also advise making historical simulations of pay-outs. How much indemnity would you have received if you had had this crop insurance contract in the past, i.e. when your loss had occurred?

From a short-term perspective, you always pay for insurance more than you may get back in loss payments, but the insurance premium has to contain reserves for the probability of catastrophes and a possible deviation from short-term (10-15 years) statistics.

Some new losses that you did not experience in your past farming history might occur on your farm. Additionally, the climate change trend is not an optimistic one and, as a rule, does not lead to expectations of better yields.

22. If something is not possible to insure (lower deductible, higher limit, a specific peril, early risk period etc.), some gaps in the coverage can be eliminated by alternative risk transfer solutions, like parametric insurance, weather derivatives and captives.

Mind the insurance wording
Insurance wordings are boring and difficult to read, but the devil is in the details. Every detail will be relevant with a significant loss.

Please, be careful with the following clauses of insurance wording:

23. Is your insurance contract complete with all wordings? Some insurance terms & conditions may be not provided to you for your consideration. They might contain additional exclusions from insurance coverage, as well as other clauses of significance, like special warranties.
24. There should be no contradiction between single wordings. Otherwise, you need an additional clause clarifying which stipulation is the right one in a given situation.
25. Is there a right of the insurer to terminate the contract unilaterally during the contract period?
26. What are the definitions of the insured risks?
27. What is the stipulation regarding a change in risk during the policy period?
28. Is the methodology of loss estimation fully documented and clear?
29. Are all documents and additions related to the insurance contract (incl. crop survey protocols) signed by the authorized people?
30. Is the insurance company obliged to leave an original copy of any crop/loss survey report once on the farm?
31. Is there any deadline stipulated for crop surveys after the loss has occurred?
32. Is the farmer allowed to leave some samples for an alternative expert opinion?
33. How does the "gross negligence clause" look like?
34. What are the deadlines for the insurer's right to postpone their decision on claims payment?

Find the right partner to help
35. And last but not least: Never be alone! Find a third party who can help you in case of any problem with insurance products or companies. You can ask for the help of a professional broker, as they are highly skilled and experienced in respect of insurance wordings. Insurance brokers thoroughly know the insurance markets, and they have developed good working relationships with crop insurance risk carriers.

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Product contamination

Companies operating in the food industry can face many problems leading to significant losses due to incidents of product contamination. The topic is important, particularly for those businesses that operate outside their local market.

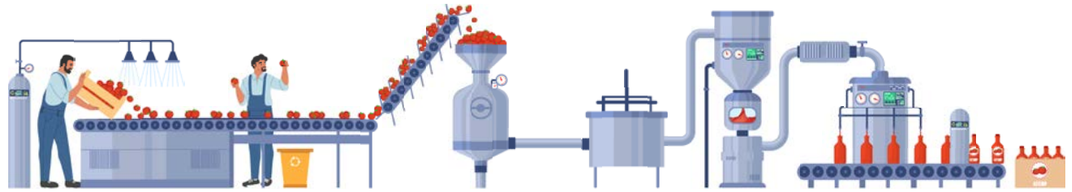
Exporters need additional organisational and financial support when reacting quickly to a real or potential threat to property or the life or health of consumers caused by their product.

According to several studies, as many as 58% of companies have been affected by events involving food recalls.

The risk of a product recall is always present
The product recall insurance offer is designed for any client who places food on the commercial market, including both unprocessed products (e.g. meat or seafood) and highly processed finished products (e.g. cold cuts pasta, confectionery, beverages).

Due to the nature of the products sold and their storage requirements, great care should be taken by those who distribute, for example, fruit and vegetables. These products are sensitive to storage conditions. Improper storage of eggs and dairy products can even lead to health problems and illnesses for consumers. It is also crucial for manufacturers who use nuts, grains or spices in their plants to be mindful of the risks associated with possible contamination of their product by these allergenic agents.

Product withdrawal from the market can happen for multiple reasons. It could be microbiological contamination, i.e. contamination of the product with bacteria; it could also be physical or chemical contamination. Mislabeling, use of unapproved ingredients, or even failure to observe the proportions between individual ingredients may cause the claim and the need to recall the product. These circumstances lead to the product being considered non-compliant or even dangerous for consumers and a recall for the entire batches of finished products.

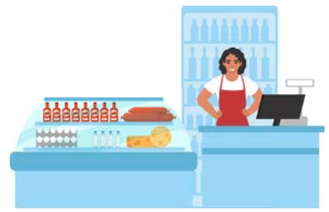


One example is a German company with a turnover of EUR 100 million that had to incur additional recall costs in the US and UK after listeria bacteria was found in its meat products. In the end, the loss amounted to EUR 90 million.

A bottle manufacturer from Poland received a USD 10 million claim related to having to recall several million bottles of beer. Only three bottles had cracks, but all of the bottles placed on the market were recalled for customer safety reasons. Insurance covered the loss.

What can you expect with Product Contamination Insurance?
Product Contamination Insurance offers a much broader range of cover than classic recall insurance and provides cover for a catalogue of costs:

- Recall replacement costs (including product value), damage-owned and third party costs and expenses.
- Interruption of the insured's business and loss of profit - inter alia if the facility is closed due to contamination and needs professional services to survey and disinfect the facility. Even one day of downtime generates a loss,



and prolonging it increases costs.

- Increased labour costs - the cost of staff working overtime or employing extra people to clean up the contamination/recall or disinfect the plant.
- Reputation restoration costs refer to the cost of bringing the brand back to its pre-recall condition. Includes sales and marketing costs, like giving a discount on your next product purchase or promotion where if you buy one product and get another one for free.
- Product recall liability damages are any damages that the insured is legally obliged to pay to its customer in the event of

contamination. Damages may include loss of client profits, rehabilitation expenses or reimbursement of purchase costs.
- Consultant costs refer to the expenses of expert consultants who will guide the insured through the crisis. A pre-incident fund is also available in the policies, and it may include reviewing crisis management plans and providing food safety training.

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The Austrian road to organic farming

Due to consumer expectations and climatic and geographical conditions, Austria has for many years relied on environmentally friendly farming methods. Instead of promoting the highest possible yield per hectare, Austria has consistently pursued a quality policy.

At the top of such a defined agricultural policy is organic farming. Austria is recognized as an organic farming pioneer in Europe, and the first organic farms in the world were registered in Austria in 1927, i.e. almost 100 years ago. Austria also became the first country to establish national regulations on organic farming ten years before the European Union adopted similar solutions. The Austrian agricultural philosophy considers organic products much more than just a niche. Austria has already achieved the EU target set in the European Commission's flagship strategy. Currently, 23% of Austrian farmers benefit from organic farming advantages, while more than 25% of all agricultural areas are managed according to high environmental standards.

The main goal is to promote the most ecological use of land to maintain a good quality of soil, water and air for the next generations.

In 2020, more than 10% of supermarket turnover in Austria came from fresh, organic products. Compliance with the requirements for organic food forces the resignation from biotechnology. Austrian consumers do not accept chemical fertilizers, pesticides or genetic engineering (commonly used in other countries). This creates serious challenges for food producers, farmers and input suppliers. Despite the limitation of the use of chemical fertilizers and pesticides, average yields of, for example, maize in Austria are higher than in the United States. High average yields raise legitimate questions about the sense of using chemical growth enhancement. As the Austrian example shows, similar results are possible by increasing the use of organic substances, promoting crop rotation or caring for animal welfare. So far, as the pioneer, Austria has avoided the introduction of genetically modified crops into its agriculture and has managed to maintain sustainable production methods with quality and hygiene throughout the food production process, from the field to the table.

EU agricultural policy - new challenges?

Implementation of the new EU agricultural policy in Austria, according to the current assumptions, would entail significant restrictions on the operation of organic farms, constituting a significant share of the total number of Austrian farmers. This is now the main concern and point of contention in talks between farmers and the Austrian government.

Notwithstanding the above, Austrian entrepreneurs are currently facing the following challenges:

- **Ownership structure, based on small and medium-sized enterprises:** This significantly hinders competitiveness in the European and global market, limiting development opportunities also in the internal market. The small scale of operations limits access to capital and qualified personnel, which results in lower expenditure on new ecological technologies.
- **Poorly developed network of connections between individual entrepreneurs:** In Austria, there are several networks of entrepreneurs and clusters, but their cooperation is quite limited. Undeveloped connections hinder the exchange of experiences and the creation of a common research and development infrastructure.
- **Poor dynamics of development in the local market:** While Austrian companies are dynamically developing on the international market, a result of a strong emphasis on the export of the ecology and environmental services sector, the local market for ecological services and products has lost its momentum and is not growing as dynamically as 10-15 years ago. Local markets reached a certain limit of growth at the current level of development of the general economy, potentially influenced by the decreasing price competitiveness of organic food. Changes in the global markets may have a further impact on household incomes, adversely affecting the growth in demand for green products and services.
- **Maintaining the profitability of farms after implementing the new EU agricultural policy:** Thanks to the government's agricultural policy, a robust organic farming sector has been built over the past few decades. Running such farms requires much more expensive than in the case of intensive farming, and a change in the method of financing organic farms may disturb their income levels.
- **Ensuring adequate animal welfare**: Austria is one of the few countries in the European Union to have legal regulations regarding the welfare of farm and farm animals, adopted in 2004. Regulation and recommendation compliance requires additional effort and resources. Also, the epizootic disease occurrences in Austria and neighbouring countries raise concerns about maintaining livestock production levels in the coming years, especially for pigs.
- **Maintaining the yield of crops, especially with the limited possibility of using chemical fertilizers and pesticides on organic farms:** While Austrian farmer productivity is currently comparable to intensive-agriculture farmers, the inevitable progression of climate change may impact growing conditions. On top of the climate change risks, there may be biological threats (new varieties of diseases) that will be difficult to combat due to the limited possibilities of using plant protection products in organic farming.

Overall, while agriculture in Austria remains at a very high level and is the world leader in organic farming, it is facing similar challenges to other farming economies in Europe. Challenges relate to a change in the EU's common agricultural policy and external threats not influenced by farmers in Austria themselves.

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Is the insurance cover sufficient?

Dealing with the agricultural drought

Drought is one of the main threats affecting the entire food supply chain. It is catastrophic as it can at some point spread over vast territories in many countries, leading to extensive crop shortages.

According to the research done by the Food & Agriculture Organization of the United Nations, the share of agriculture in losses caused by drought is 83%.

What is drought, and how to identify it?

According to EDO (European Drought Observatory), droughts are commonly grouped into three basic types: meteorological, agricultural and hydrological.

- Meteorological drought is a period with an abnormal precipitation deficit concerning the long-term average conditions for a region.
- When a meteorological drought leads to a soil moisture deficit that limits water availability for crops, the result is an agricultural drought.
- Hydrological drought is associated with the effects of periods of shortfalls of precipitation (including snowfall) on a surface streamflow, reservoir and lake levels, and groundwater).

Governments use various mathematical indices to mobilize drought loss prevention and financing measures. The most popular drought index for drought definition, recommended by the World Meteorological Organization, is the Standardized Precipitation Index (SPI).

This index calculates the difference between the actual rainfall and the average 30-year parameter over a specified period, divided by the standard deviation coefficient. SPI has the advantage of distinguishing a particularly flawed year from others. However, other factors (temperatures, soil types, wind speed, yield density, etc.) are not taken into account. This means that SPI is adequate for identifying meteorological but not agricultural drought.

How to predict potential losses?

Our experience in CEE / SEE with the data of individual farmers shows that drought causes yield losses comparing the average of the previous five years at the level of 20-40% for winter crops and 30-60% for spring crops.

As for the macro level, official statistics record losses of 20-30%. In the Panevezys region of Lithuania, for example, high temperatures combined with a moderate rainfall shortage in April-May 2018 were quite catastrophic for cereals and oilseed rape. In 2021, we saw a fairly rainless July-August, leading to poor results for spring crops, especially late varieties (corn, beans).

When a drought starts, it is helpful to know how much yields can be lowered to enable further risk prevention and cost minimization by all stakeholders in the food supply chain. A detailed effort is dedicated to developing high-accuracy yield prediction models at various stages of crop development.

For example, the Land and Water Division of FAO (Food & Agriculture Organization of the United Nations) has elaborated AquaCrop. This special holistic yield prediction model takes into account 4 groups of factors: climate parameters (eg. rainfall, maximum and minimum air temperatures), crop parameters (phenology, canopy cover, rooting depth), soil parameters (soil profile and the characteristics of the groundwater) and the crop growing management.

Providing drought loss mitigation measures

The IDMP (Integrated Drought Management Program) of the World Meteorological Organization suggests many measures to mitigate the effects of drought in the short and long term periods. Emergency action and financial recovery must be taken if this is not enough to mitigate losses.

For example, the summer of 2018 recorded very high temperatures, which caused droughts that affected agricultural production heavily (e.g. arable crops and animal feed) in many EU countries. The European Commission has activated several measures and derogations at the request of many Member States. Farmers in Europe faced more or less support from the national public authorities, each managing the crisis depending on its intensity but, depending on its financial capacity, exposing each farmer to significant disparities in treatment.

On 15 August, the federal government in Berlin passed a motion that allowed German drought-hit farmers to grow animal feed in ecological focus areas (EFAs). Farmers were allowed to grow a mixture of crops for feed purposes on EFAs. As for the share of private insurance, only 5,000 hectares in Germany were covered against the drought!

What private crop insurance against drought do you need?

At first glance, the above examples of ad hoc government activities seem like a good way to finance negative financial outcomes. Still, governments face an additional unexpected burden on the state budget and a lack of verification of the application of crop yields by farmers, leading to the ineffective public money spending. Hence, private insurance can be a way to better finance losses.

11 CEE / SEE countries became EU members in 2004-2013, following the CAP (Common Agricultural Policy), which also means subsidizing private agricultural insurance. However, the drought is poorly insured or not insured at all. Even though drought insurance is offered, there are many restrictions applied by insurance companies in terms of high deductibles, compensation sub-limits, types of crops or insured regions, etc.

How to make it more effective in CEE/SEE countries?

Why is such a "low-risk appetite"? First, crop insurance was introduced into the CEE / SEE region by German, Italian and Austrian insurers who focused mainly on the risk of hail. Before the 2018 drought, farmers and insurers hardly anticipated the need for such protection. As a result, there is a lack of extensive experience of insurance companies in assessing the risk of drought and loss adjustment. Moreover, it is technically challenging to deal with drought loss precisely and quickly. This has a cumulative effect on large areas that require a good network of highly skilled claims experts.

At the same time, the drought is a very catastrophic threat that can exhaust the collected insurance premium for many years ahead. To ensure such a risk, an insurance company needs a sustained and waste risk portfolio to reduce the volatility of expected losses. This can only be achieved through decisive government intervention in the development of crop insurance.

Strong cooperation between the government, agricultural associations and the private insurance market (Public-Private Partnership) should create the most favourable drought insurance conditions for all interested parties. Farmers want to be well insured at the best price. The government wants financial relief on the state budget and effective targeted assistance for farmers. Insurance companies want a stable portfolio with long-term profitability.

In addition, drought insurance should be available to farmers, meaning that the government has to subsidize the insurance premiums and participate in the reinsurance loss layers.

Moreover, crop insurance should be the precondition for the farmer to obtain other financial assistance. In many countries, such a measure is not so popular as such compulsory insurance can be considered a new hidden tax. However, in countries with developing insurance markets and a low insurance culture, it is a necessary step to establish a robust drought risk insurance mechanism.

Last but not least, the government should set strict conditions on when and to what extent it engages its resources in financial aid after the drought. Measures should be predetermined as a drought crisis response plan, but it does not look chaotic.

On the other hand, a clear understanding of when and how the government is involved constitutes a strict line between recovery of losses from public finances and the private insurance system. As far as EU members are concerned, such activities should follow EU directives stating that government intervention should not cause unequal opportunities in agriculture between EU countries.

Parametric insurance comes into play

Parametric or index insurance compensation is paid when the actual index (parameter) value meets a condition (trigger), compared to conventional crop insurance which compensates for a direct crop loss. The most frequently used indices (parameters) in such insurances are weather data (rainfall, temperature, soil moisture, etc.) or official statistics for surface yields. As a rule, parametric insurance is applied for risks where standard insurance does not work or the risk appetite of conventional insurers is quite limited. Drought is such a case!

In the CEE / SEE countries, such an alternative drought risk transfer tool is getting more popular among farmers, agricultural inputs suppliers and food processors. It is simple to understand, requires less paperwork, and implies fast payouts. However, there are still several challenges hindering the development of parametric insurance in the CEE / SEE region.

Conclusion

Drought is one of the main problems of agriculture and requires a fairly developed risk management system in any society. In the CEE / SEE region, many countries are at an early stage in effectively managing the risk of drought. In particular, CEE / SEE governments should pay more attention to the development of private drought insurance.
On the other hand, new innovative risk transfer tools such as parametric insurance could be considered.
Ultimately, given the large budget gaps caused by COVID and the crisis surrounding Russian military aggression, are governments again ready to compensate farmers for the heavy losses caused by the drought?

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