

Agricultural drought insurance: Austria as a case study



- Insurance as an instrument for managing agricultural risk is being increasingly explored by policymakers, especially in light of EU Common Agricultural Policy reforms.
- Austria provides a case study of a country implementing progressive agricultural insurance policies.
- It has one of the most comprehensive risk coverages for the agricultural sector in the world.
- In 2016, the government decided to expand premium subsidies for agricultural insurance, in order to replace ad-hoc compensation for damages caused by insurable weather extremes.
- The indemnity-based yield insurance in the country now includes an option for index-based products against certain conditions, such as a reduction in rainfall, rather than actual yield loss.
- This factsheet outlines the Austrian insurance set-up and public involvement in it. The information is based on expert interviews with representatives from the Austrian Hail Insurance and the Austrian Ministry for Agriculture, Forestry, Environment and Water (BMLFUW), as well as official information from both institutions.



Mutual insurance: Austrian Hail Insurance

The Austrian Hail Insurance (Österreichische Hagelversicherung VVaG – ÖHV) was founded in 1947 by several hail insurance departments belonging to different Austrian insurance companies. It was set up as a ‘mutual insurance association’ (see glossary) owned by policy holders. After formation of the ÖHV, the license to offer hail insurance belonged to the new association, while individual insurance companies continued to sell the policies. In 1995, the first multi-peril insurance was introduced, which – in addition to hail – covered damage from frost for certain crops. Since then, coverage has been extended to include more crops and weather risks. In 2000, the risk of drought was included for wheat and pumpkins.

The ÖHV is reinsured exclusively by international private insurance companies. In 2016, Austria had about 150,000 businesses farming arable land (Buchgraber, 2016) and about 65,000 policies were active (Österreichische Hagelversicherung, 2016). In horticulture, reports suggest that there is almost 100% insurance coverage, 70-75% for fruits and arable land, but coverage for grassland and cattle is only about 30% (Sinabel et al., 2016).

Field crops	Grassland and animal husbandry	Horticulture	Viticulture	Fruits
<ul style="list-style-type: none"> • Hail • Drought/drought index • Storm • Frost • Soil drift • Flood/Capping • Feeding damage • Detasseling difficulties (seed corn) • Snow pressure • Fungal infection of corn • Sprout damage 	<ul style="list-style-type: none"> • Hail • Drought index • Flood • Mud • Silo plastic sheet • Round bale film • Death (cattle) • Non usable cattle for slaughter • Death (horses) • Animal epidemics (cattle/pigs) • Stillbirth (cattle) 	<ul style="list-style-type: none"> • Hail • Storm • Snow pressure • Spoilage • Frost • Soil drift • Flood • Heavy rainfall • Feeding damage 	<ul style="list-style-type: none"> • Hail • Frost • Additional effort • Spoilage resulting from hail • Storm (net)* 	<ul style="list-style-type: none"> • Hail • Frost • Drought • Storm (net)* • Snow pressure (net)*

*(net) refers to the fact that damage to protective nets is also insured.

Table 1: Insurable risks – Austrian Hail Insurance. (Kaltenböck, 2016).

Indemnity-based products

Currently, farmers can voluntarily insure crops against a long list of risks (Table 1) by means of an indemnity-based yield insurance known as AGRAR Universal. Policy holders are obliged to insure the entire production for each insured crop. Drought insurance is available for all cereal crops, corn, potatoes, pumpkins for seed oil production, soybeans, sunflowers, and peas. Grassland, sugar beets, vineyards, and fruits cannot currently be insured against drought.

The insurance covers damages if both of the following conditions are fulfilled:

- (1) The precipitation during the vegetation period is less than 90% of the average precipitation during the last 10 years or the precipitation on 30 consecutive days is less than 10 mm.
- (2) Yields per hectare are below the defined threshold value.

		Yield limit (kg/ha)		Compensation (EUR/ha)	
		Standard	Plus	Standard	Plus
Winter varieties of wheat, rye, barley, triticale, etc.		<3,000 (2,250)		200	300
Winter varieties of oats, durum, einkorn, emmer, spelt, etc.		<2,000 (1,500)		200	300
Corn		<4,500 (3,3750)	<6,000 (4,500)	400	500
Sorghum		<3,500 (2,625)	4,500 (3,375)	400	500
Sunflower		<1,000 (850)		200	300
Soybean, broad bean		<1,000 (850)	<1,500 (1,275)	200	400
Pumpkins for seed oil production		<300 (225) <150 (110)		400	500
Potatoes	Until week 25	<8,000 (6,000)	<12,000 (9,000)	750	1,000
	Weeks 26-34	+1,000 (750)/week			
	Week 35 and later	<18,000 (13,500)	<22,000 (16,500)		

Table 2: Yield limits triggering insurance payouts for drought risk. Numbers in parentheses apply to organic agriculture. Adapted from: www.hagel.at

Deductibles for drought risk apply to the entire area insured per crop and depend on the chosen product and 'loss ratio' (see glossary) of the preceding 10 years.

Damage ratio (LR)	Type 1	Type 2	Type 3	Type 4
	Deductible in % of area per crop for drought risk			
LR ≤ 50%	0	0	0	0
50% < LR ≤ 100%	10	0	0	0
100% < LR ≤ 200%	20	10	0	0
200% < LR	30	02	0	0

Table 3: Deductibles for drought risk. Source: www.hagel.at

Index-based products

Index-based insurance pays compensation if a set parameter—for example, rainfall—deviates from a pre-specified level. In other words, products are insured against events that cause loss, like drought, not against the direct loss in the fields. The first drought index insurance was introduced for grassland in 2015. Grassland is normally difficult to insure because of the differing number of harvests per year, and small-scale differences in damages; index-based insurance provides a solution to this. In 2016 and 2017 drought index insurance for corn, winter wheat, and sugar beets also became available, and more products may be added in the future.

Currently, drought coverage as part of the AGRAR Universal yield insurance and the index insurance products run in parallel. Indeed, index insurance can only be purchased as an extension to an AGRAR Universal package.

The drought index is based on the 10-year average precipitation. claims are paid if precipitation remains below this average over a pre-determined period of time:

- (1) The “short period” refers to a number of consecutive days with such a precipitation deficit. In this period, days with a maximum temperature above a certain level are considered “hot days”. Each of these hot days increases the precipitation deficit by one percentage point. A precipitation deficit where 70% or less of the annual average amount of rain falls triggers compensation payments.
- (2) The “full period” refers to a predetermined vegetation period during which compensations are paid if the precipitation deficit reaches 36% of the 10-year average precipitation. Hot days are not considered here.

If the conditions are met in both periods, the period with the higher compensation will be paid. Data from the central Institute for Meteorology and Geodynamics are used for calculating the precipitation deficits and every municipality has its own reference location where precipitation is measured.

Crop	Short period	Full period	Sum insured
	Duration Hot days Temperature threshold	Duration	
Grassland	1 April-31 August 42 consecutive days 30°C	1 April-31 August	Equals the chosen sum insured for hail in the underlying AGRAR Universal.
Corn	15 May-31 August 42 consecutive days 33°C	1 April-31 August	Equals the chosen sum insured for drought (yield insurance) in the underlying AGRAR Universal.
Sugar beets	1 June-31 August 42 consecutive days 30°C	1 April-31 August	The drought index add-on is only available as an addition to the product “Universal Zuckerrübe”. The sum insured is 20% of the chosen sum insured for hail.
Winter varieties of wheat, durum, emmer wheat and einkorn wheat	Zone 1*: 1 April-10 June, 35 consecutive days 30°C	1 March-10 June	Equals the chosen sum insured for drought (yield insurance) under the AGRAR Universal.
	Zone 2**: 14 April-23 June, 35 consecutive days 30°C	14 March-23 June	
	Zone 3***: 28 April-7 July 35 consecutive days 30°C	28 March-7 July	

*Easternmost regions, **Austrian lowlands, ***Alpine and northernmost regions

Table 4: Indices and sum insured for different crops. Source: www.hagel.at



Premiums

The basic premium for new insurance contracts is the sum insured multiplied by the tariff. The tariff depends on the crops' sensitivity to insurable risks (e.g. hail or drought damage) and the local hazard probability (e.g. the chance of hail or drought) and exposure (farmers can alter this by using hail nets to protect the crops, for instance). Tariffs are calculated separately for each municipality.

In subsequent years, premiums are determined by a bonus-malus-system (see glossary) based on the loss ratio of the preceding 10 years of insurance (Table 5). This means if compensation was paid in the insurance previous period, the premium may increase by up to 20% of the basic premium. If the loss ratio falls below the actual premium level, the premium is lowered automatically. The lowest premium level (60% of the basic premium) can be reached after a minimum of three years of insurance. Certain on-farm risk reduction measures, such as hail protection nets, are considered in the premium calculation.

The same reference location that serves as a reference for hail risk is used for the drought index. For drought index premiums the bonus-malus-system is used to calculate premiums independently from other insured risks (ÖHV, 2017).



Loss ratio	Percentage of basic premium
LR = 0%	60%
LR ≤ 70%	70%
70% < LR ≤ 80%	80%
80% < LR ≤ 90%	90%
90% < LR ≤ 100%	100%
100% < LR ≤ 120%	110%
120% < LR ≤ 140%	120%
140% < LR ≤ 160%	130%
160% < LR ≤ 180%	140%
180% < LR ≤ 200%	150%
LR > 200%	160%

Table 5: Premium calculation. The loss ratio for a policy is the compensation divided by the net earned premium (excluding insurance tax). Source: ÖHV 2017

Government compensation and subsidies

The law on subsidies for hail insurance (Hagelversicherungsförderungsgesetz) dates back to 1955. At the time, extensive hail damage required the government to step in with ad-hoc compensation payments. The law stated that premium subsidies from the federal government would be set at 25%, and would be conditional on equally high subsidies from provincial governments. The law was revised in 1995, and extended to premium subsidies for frost insurance in 1998.

Since the early 1990s, the Austrian government has had to intervene regularly to support farmers affected by drought; most notably spending €57 and €21 million in 1992 and 1994, respectively, €32 million in 2003, and another €35 million in 2013. Measures implemented can be categorized into four groups:

- (1) technical measures, such as the Marchfeldkanal – an artificial system of canals diverting water from the Danube to arid regions in eastern Austria;
- (2) regulatory measures, such as allowing the use of conservation areas to produce feedstuff: or extending pre-defined harvesting periods;
- (3) fiscal and tax-based measures; for example, working capital loans (see glossary); and
- (4) direct compensation payments (Hochrainer-Stigler and Hanger-Kopp, 2017).

Such measures, as well as premium subsidies for agricultural insurance, are financed by a disaster fund (Katastrophenfonds). This fund is set up annually from income, capital yields, and corporate income taxes. The fund is used mostly for risk mitigation before a disaster, for large-scale protection infrastructure, and equipment for fire fighters for example, but also for compensating private households and farmers for damages from natural catastrophes. Compensation payments from the fund are matched by provincial governments, as is reflected in the law on subsidies for hail insurance. While subsidies for insurance have a legal basis, there is no legal entitlement to compensation from the fund after a disaster event.

In response to the 2013 and 2015 droughts, and extensive frost damage in spring of 2016, the Austrian government amended the law again, requiring that the existing subsidies for hail and frost insurance be extended to additional weather extremes like drought, excessive rainfall, and storm. The goal is to substitute any ad-hoc payments from the disaster fund for insurable risks, as required by the amendment to the law on the catastrophe fund (Nationalrat, 2016).

The Austrian agriculture and forestry sector

According to the agricultural census of 2013, Austria has 166,317 agricultural and forestry holdings, with on average 44.2 ha land. Most farms have under 10 ha of land, whereas the largest farms mainly produce market crops or are mixed agricultural holdings (see Figure 1). Only about 34% of Austria's areas are arable land, while more than 40% are covered by forest. This is because of the Alps, which cover large parts of Austria. 37% of holdings rely on full-time farming, whereas 55% rely on additional sources of income.



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Glossary

Earned premium: The part of the premium that was not used for claim payments, i.e., the amount of the premium that the insurer keeps after the policy period has expired. Unearned premiums may still be required for claim payments.

Loss ratio: Total compensation paid out divided by the net earned premium (see above).

Mutual insurance: A mutual insurance company (Versicherung auf Gegenseitigkeit) is owned entirely by its policy holders. Any profits are kept within the company or refunded to policy holders by means of dividend distributions or reduced premiums.

Indemnity-based insurance: Claims are based on actual losses incurred. These losses may refer to yield or revenue.

BonusIndex-based insurance: Claim payments are triggered exclusively by meteorological and hydrological indicators, and are independent from actual losses incurred.

Bonus-malus-system: The adjustment of premiums paid according to the claim history. Consequently, a bonus is a premium reduction upon renewal of a policy in the case that no claim was made for a certain period. Malus is then a premium increase if claims were made in a certain period.

Working capital loan: These are loans intended to finance the daily operations of a business, or in this case a farm, and may not be used for buying assets or making long-term investments.

References

- Buchgraber K (2016).
 "Landwirtschaftliche Nutzung in Österreich."
 presented at the 22. Österreichische Jägertagung
 in der Puttererseehalle in Aigen/Ennstal.
- Hochrainer-Stigler S & Hanger-Kopp S (2017).
 "Subsidized Drought Insurance in Austria:
 Recent Reforms and Future Challenges."
Wirtschaftspolitische Blätter 04/2017.
- Kaltenböck J (2016).
 "Produktionsrisiken Und Versicherungslösungen
 in Der Österreichischen Landwirtschaft."
- Nationalrat (2016).
*46. Bundesgesetz, Mit Dem Das
 Katastrophenfondsgesetz 1996 Und Das
 Hagelversicherungs-Förderungsgesetz
 Geändert Werden.*
- Österreichische Hagelversicherung (2016).
 "SFCR Bericht Über Die Solvabilität Und
 Finanzlage 2016." Vienna.
- Sinabell F, Url T, Heinschink K, & Lembacher F (2016).
 "A Prototype of an Index-Based Margin Insurance
 for Agriculture in Austria." presented at the 156th
 EAAE seminar: Prospects for agricultural insurance
 in Europe.
- Statistik Austria (2013).
 "Agrarstrukturerhebung 2013." Vienna.



FARM – Farmers and Risk Management: Examining subsidized drought insurance and its alternatives. FARM commenced in May 2016 as a three-year research project funded by the Austrian Climate Research Program (KR15AC8K12597). In the light of increasing climate and market risks, the project examines agricultural insurance as part of integrated drought risk management options, particularly in Austria. FARM has an international component comparing agricultural risk management arrangements in several countries.

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