

# 34th AIAG Congress Warsaw, Poland

## *Climate Change, Remote Sensing and Big Data — New Challenges for Agricultural Insurance*

By J. Matthew South, NCIS

The International Association of Agricultural Production Insurers (“AIAG”) was founded in 1951 to serve as an educational forum to increase awareness of crop insurance knowledge, practices and experiences from around the world. AIAG holds biennial international congresses, during which current topics of interest related to agricultural insurance are discussed. In 2015, the Congress was held in Kansas City. Then Secretary of Agriculture, Tom Vilsack, was the keynote speaker. This was the first time the Congress had

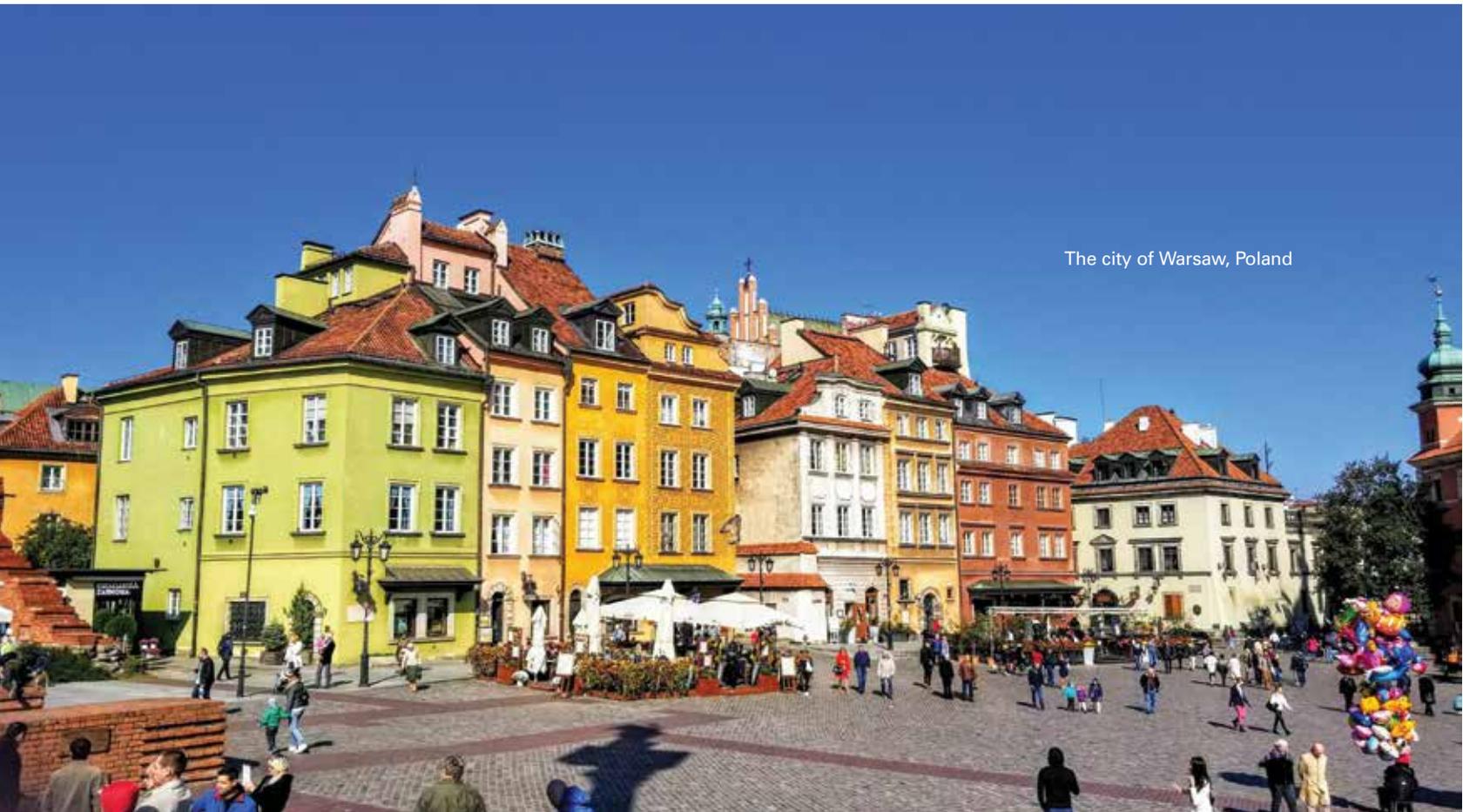
been held in the United States. The 34th Congress was held October 1-4, 2017, in Warsaw, Poland; the first time Poland has acted as Congress host.

The theme of this year’s Congress was “Climate Change, Remote Sensing and Big Data — New Challenges for Agricultural Insurance,” and drew more than 300 participants from 39 countries. Simultaneous translation of the 22 informative presentations was available in six languages: Polish, German, Italian, French, English, and Russian. The Polish hosts arranged a group din-

ner at the Kubicki Arcades, followed by a tour of the Royal Castle on the final evening to close out the Congress.

Arnaud de Beaucaron, AIAG President, opened the Congress by welcoming participants and thanking Poland’s Agriculture Ministry, Chamber of Commerce, and crop insurer host sponsors. AIAG’s Board of Directors was introduced, as was Mr. Karol Bujoczek, Chief Editor of Poland’s leading agricultural magazine Top Agrar, who acted as the Congresses’ moderator.

The city of Warsaw, Poland





A panel of distinguished guests at the 34th AIAG Congress.

Representing the United States were Mr. Robert Johansson, Chief Economist of the United States Department of Agriculture (USDA), who presented “Agricultural Development – Global and in the U.S.,” and Tom Zacharias, President of NCIS and Vice President of AIAG, who discussed, “Outlook on Crop and Revenue Insurance in the U.S.”

The remaining presentations fell into three broad categories: the impact of climate change on crop insurance and livestock disease; the use of big data and the internet of things (IoT) in crop insurance; and, overviews of crop insurance in Poland, China, France, Russia, and South America.

## Overview of Crop Insurance in Poland

Several presentations combined to provide an in-depth understanding of the Polish agriculture sector: key production and ownership statistics, how the insurance system functions, and what farmers expect from agricultural insurance as well as barriers to market development.

### *Polish Agriculture — Key Notes of Development*

Professor Sebastian Stepień noted that Polish farms are small compared to those in other countries, employ a much larger share of the workforce, and have much lower productivity at roughly 30 percent of farms in the European Union. Of the 1.4 million farms in Poland, more than one million are 10 hectares (approximately 25 acres) or less, while only one percent of farms have an area of 50 hectares or more. These larger units represent 30 percent of the total farmland

in Poland, versus 80 to 90 percent in Western Europe. While there has been a slow trend towards larger, more efficient farms, the EU’s Common Agricultural Policy, a form of direct payments to farmers which represents 50 percent of farm income, has prolonged continued fragmentation of the sector by propping up small, less efficient operations. While agricultural employment remains relatively large, farming is the primary source of income for only 25 percent of farmers. Agriculture contributes 2.6 percent of Poland’s GDP while employing 12 percent of the workforce, both down considerably from the end of Socialist era in 1990. Poland is a net exporter of food products, with a positive trade balance in 2016 of 7.1 billion Euros.

### *Polish Subsidized System of Agricultural Insurance*

Krzysztof Lyskawa, PhD, related that Polish farmers developed a negative attitude towards the country’s system of compulsory crop insurance under communism, seeing it as just another tax to be avoided rather than a risk management tool. Although drastic changes have been made to the Polish crop insurance system to comply with EU regulations, farmers’ poor perception of crop insurance persists. Education and subsidized crop insurance are viewed as the solution, with subsidy levels now at 65 percent of premium for the following perils: winterkill, spring frost, hail, drought, flood, hurricane, torrential rain, lightning, avalanche, and landslide. Due to poor farmer participation, the government now requires farmers to insure at least 50 percent of their acreage against at least one of the following risks: hail, spring frost, winterkill, drought,

or flood. Drought coverage is triggered by the Climatic Water Balance falling below a specified level for each crop/soil type combination, but is viewed as too expensive by farmers. Cereals, rapeseed, and maize are the primary crops insured, with hail, winterkill, and spring frost the most frequently insured perils. Losses for winterkill and spring frost vary widely from year to year, and can greatly exceed losses due to hail. The introduction of Western European high-yield crop varieties, which are not well adapted to Poland’s climate, has contributed to increased claims.

### *Agricultural Insurance System — Farmer’s Expectations and Barriers of Development*

The Polish farmers’ perspective was provided by Wiktor Szmulewicz, President of the National Council of Agricultural Chambers. Farmers are more concerned about variation in revenue at the whole farm level due to natural disasters rather than price declines. A significant concern is that, although droughts are becoming more prevalent, little insurance coverage is available as insurers are concerned about accumulation of risk. Farmers are selective in which crops to insure, with more than 80 percent market penetration for rapeseed and hops and 49 percent for tobacco, but much lower levels for other crops where rates are high or risks are perceived to be low. To encourage participation, the government has increased the amount of funds available to provide premium subsidies, but frequent changes to the program, limitations on payments, and inconsistencies in loss adjustment procedures have been issues. Finally, it was noted that larger operations see a greater need for crop insurance with nearly 50 percent purchasing coverage. However, awareness is low for most farmers with only 17 percent of the smallest farms covered.

## Impact of Climate Change on Crop Insurance

Among the issues discussed during the Congress were the implications of climate change for crop insurance and livestock disease, the effect of El Niño / La Niña on agricultural risks, and winterkill modeling using weather data.

### *Livestock Disease*

Nadav Galon, former Chief Veterinary Officer of Israel, described the impact of climate change and geopolitics on livestock disease and insurance. The existence of modern, intensive



Tom Zacharias, NCIS



Robert Johannson, USDA



Arnad de Beaucaron, AIAG President

animal husbandry alongside extensive, traditional pastoral methods can and has combined to facilitate the rapid spread of transboundary livestock diseases such as Foot and Mouth Disease, rabies, Blue Tongue Virus, Lumpy Skin Disease, Bovine Ephemeral Fever, and Avian Influenza over wide areas and within modern farms. In addition, breeding programs may transport diseased individuals around the globe while they are asymptomatic. Technology has been deployed to monitor each animal within high intensity farms to rapidly detect changes in animal heat production, activity levels and rumination, all early warning signs of disease. Programs to vaccinate traditional herds are in place; however, active combat zones and international politics can pose serious challenges. Once a disease outbreak has occurred, contingency plans for control are employed, including: Total Stamping Out, Partial Stamping Out, and Minimal Stamping Out combined with Vaccination.

### ***Climate Change: Implications for Crop Insurance***

Dr. Eberhard Faust, Head of Research: Climate Risks and Natural Hazards, Munich Re, detailed the implications of climate change on the length of the growing season as well as the effect on risks such as late frost, hail, heavy precipitation and flooding, heat, drought, pests, and disease. Extreme weather events and damaging late frost were projected to become more frequent and the negative effects of climate change are likely to be compounded by pests and disease which thrive in warmer temperatures. With increased warmth, for example,

fruit trees will bloom earlier in the season, increasing the risk of severe losses resulting from freeze. While the expected number of freeze events in a year is expected to decline as the weather continues to warm, the earlier start to the growing season may more than offset this effect. Hail incidence is predicted to gradually decrease over time in the eastern portion of the United States, while it increases in the Great Plains region. Heavy precipitation and flooding is expected to increase throughout the world, with the magnitude of the increase depending on location. The overall conclusion was that yields are likely to be negatively impacted by up to -14 percent per decade, accompanied by increased yield variability. Under these conditions, risk transfer will become more important and public-sector co-financing of (peak) risk more necessary.

### ***Impact of El Nino / La Nina on Agricultural Risks***

After describing the El Nino Southern Oscillation (“ENSO”) and noting that it has been exacerbated by climate change, Mario Tiscareño, PhD of Protección Agropecuaria Compañía de Seguros Mexico, noted that these phenomena provide only a partial explanation of dry and wet year and warm-wet winters for specific geographic regions. The intensity of an ENSO event is not a good predictor of its effect on crop production, with the impact depending on location, timing, and severity of the event. The ENSO Index is utilized primarily as an early warning system of possible drought, wet, hot, or cool conditions soon so as to prevent agricultural disasters and loss of human life.

### **Use of Big Data and the Internet of Things**

The use of satellite imagery and drones to assist in loss assessment, as well as the placement of “Internet of Things” (IoT) monitoring systems directly in fields were discussed, and laptop based, GPS-enabled, integrated policy information/claims adjustment systems were demonstrated.

### ***How BIG is Data in Agriculture Really? — The Trend Sensors, Sensor Carriers and Data in Agriculture and their Relevance for Agricultural Insurance***

Gottfried Pessl, Pessl Instruments, Austria, presented an overview of his company’s offerings of remote sensing solutions for agriculture in the areas of optimal planting time, fertilizer application, irrigation, pesticide application, frost mitigation, harvest timing, and storage monitoring. Pessl Instruments offerings include use of satellite imaging, local ground weather monitoring stations, and weather forecasting within a three-kilometer radius, remote field monitoring of both crops and insects, as well as soil monitoring whose data is used for moisture modeling and irrigation management.

### ***iBISS — An Integrated Inventory, Information and Claim System***

Dr. Arnaud Fietzke of itestra GmbH (Germany) and Reinhard Kern of Österreichische Hagelversicherung (Austria) presented itestra’s integrated policy and claim management software iBISS (“integrierte Bestands-, Informations-, und SchadensSoftware”, i.e. integrated insurance pol-

icy, information and claim software). The customer facing web portal, company document management, accounting, customer relationship management, claims reporting and management are all tied together. Adjusters and agents have real-time access to policyholder information, including latitude/longitude field designators and GPS routing on their wireless enabled laptops / tablets. iBISS is deployed in six countries using six languages and is capable of handling transactions in four different currencies.

### **Digital Based Loss Adjustment**

Thomas Gehrke of Vereinigte Hagel (Germany) and Hansueli Lusti of Schweitzer Hagel (Switzerland) presented an overview of MODIS (“MOBILE DIGITALE SCHADENREGULIERUNG”), a Tablet PC based App developed to convert the entire loss adjustment process to digital format to increase efficiency and decrease the time it takes to adjust claims. The software has both online and offline modes and can direct the flight path of drones using GPS to evaluate crop damage within fields; multispectral photos are then automatically uploaded. Documents and forms can be signed electronically and all data synchronized with the home office. Loss adjustment manuals are available electronically.

Back office personnel use a second software package with built-in mapping capabilities named QlickView to manage, evaluate, and settle reported claims. PDF documents are automatically generated for communication with insureds, thereby reducing printing and postage costs, which offset the annual cost of the tablet PCs. Data entry by both claims adjusters and back office was reduced by 90 percent.

## **Overview of Crop Insurance in Selected Countries and Other Topics**

The final day of the Congress included country-specific presentations covering aspects of agricultural production and crop insurance in Russia, China, France, and South America, with an emphasis on index insurance.

### **Agricultural Insurance in China**

Mike Xin of JLT Re (Hong Kong) provided a brief overview and outlook for agricultural insurance in China. The central government supports four distinct pilot programs for crops, livestock, forest, and aquaculture. Premium volume grew to \$6.1 billion (U.S.) in 2016 as compared to \$0.7

billion in 2007, with more than 30 companies now participating in the program. A number of companies have introduced weather index products based on rainfall, temperature, and wind speed, while one company has developed its own Revenue Insurance product for rice and wheat in two districts near Shanghai. The primary difficulties with selling insurance in China include the small size of many farms, adverse selection by farmers insuring only the most vulnerable fields, the absence of a futures market to support revenue insurance, and the lack of technical know-how to develop aquaculture insurance products.

### **Crop Insurance in Russia**

Mr. Korney Bizhdof, President of the National Association of Agriculture Insurers (Russia) reviewed the history of the agricultural insurance system in Russia as the country moved away from a mandatory insurance scheme under the USSR to a government-subsidized scheme in recent years. The program is still in its early phases and market penetration is still low, with 6.9 percent of crop production and 6.3 percent of livestock production insured in 2016.

### **Winterkill**

In addition to discussions of crop insurance issues in selected countries, a discussion on the use of weather data to support product design and portfolio management for winterkill insurance was presented by Dr. Hanna Plotka of SCOR P&C (Switzerland). Winterkill, a major peril in northern Europe, is caused when a plant is damaged through exposure to low temperatures in the winter, particularly when there is little or no snow to protect the plant. The extent of damage depends on temperature, snow cover, the tolerance of the plant to winter conditions, and whether the plant is sufficiently hardened at the time cold temperatures occur. Dr. Plotka discussed a variety of mechanisms that can result in winterkill and characterized each in terms of the snow depth threshold, minimum and maximum temperatures, and number of days with these conditions within a predetermined event window. The objective of the exercise was to link meteorological data with historical loss events to improve insurers’ understanding of the risk.

### **Other topics**

Other interesting topics included a discussion of the worrisome spread of livestock diseases such as African Swine Fever and Foot and Mouth Disease across Europe and, in the case of Avian



Inside Poland’s Royal Castle

Influenza, on a worldwide basis, along with their economic importance and strategies for disease control among livestock and management of wild animal populations. The Congress finished with a summary of the loss adjustment seminars conducted in 2016 and 2017 on carrots and tomatoes. The next seminar, scheduled for 2018 in Israel, will focus on hail damage to apples and/or pears.

## **Summary**

The Congress covered a wide range of topics and discussed a variety of approaches for addressing the problems of insuring agricultural production. The program highlighted how agricultural insurance has grown to become an established product throughout the world that provides valuable protection to farmers for many of the most important risks affecting agricultural production in their countries. We can expect that future Congresses will highlight the continuing successes of agricultural insurers in providing new approaches for protecting farmers against the risks they face, in developing new technology to monitor crop conditions, and in providing information to farmers to manage their risks, even as those risks vary over time from the effects of climate change and the spread of animal diseases.

The 35th Congress will be held in France in 2019. We hope that you will be able to participate in this wonderful educational event.