

2020 Year in Review

By NCIS Staff

At the end of 2019, all of agriculture breathed a sigh of relief as the year of prevented planting was behind us and optimism prevailed for the new season that lay ahead. Unfortunately, the world became very different in 2020. Moving into the end of the first quarter we were struck with the initial news of the emergence of a global health crisis of unprecedented proportion in modern times. First, it is important to recognize the tragic loss of life and the severe personal and economic hardships brought on by the pandemic. Once the gravity of the pandemic was reasonably understood and public declarations of emergency were gaining traction on a broad scale, a series of actions were taken to maintain the important role of crop insurance in support of American agriculture.

It is also important to recall that both agriculture and insurance were categorized as “essential infrastructure” early in the pandemic. This determination was critical in allowing our industry to continue to function, albeit recognizing social distancing and other public health protocols. It is important to note that the U.S. Department of Agriculture’s Risk Management Agency (RMA) clearly stated and reiterated that Covid-19 was not an insurable cause of loss under the Federal crop insurance policy and no sales closing dates were moved. Weekly calls with the RMA administration through the middle of the summer ensured the necessary modifications to existing procedures were in place to keep the delivery system operating smoothly and avoid service disruptions to insureds. Everyone involved is owed a debt of gratitude for all the work that was done in these most difficult of times.

Hopefully, the coming year will see relief from the worst of the pandemic and the beginning of a move toward a new normal. Until that

finally occurs, we can find some relief that at the end of 2020, RMA issued MGR 20-030 that extends the existing Covid-19 relief and flexibilities established in 2020.

As if the trials resulting from the pandemic were not enough to deal with, Mother Nature presented U.S. agriculture with a host of catastrophic, albeit somewhat localized, weather events that challenged the crop insurance industry. This article reports on those aspects of the 2020 season that included a record number of hurricane and tropical storms, horrendous wildfires, and the derecho; all of which affected the farming community and the crop insurance industry. We begin this article with a discussion

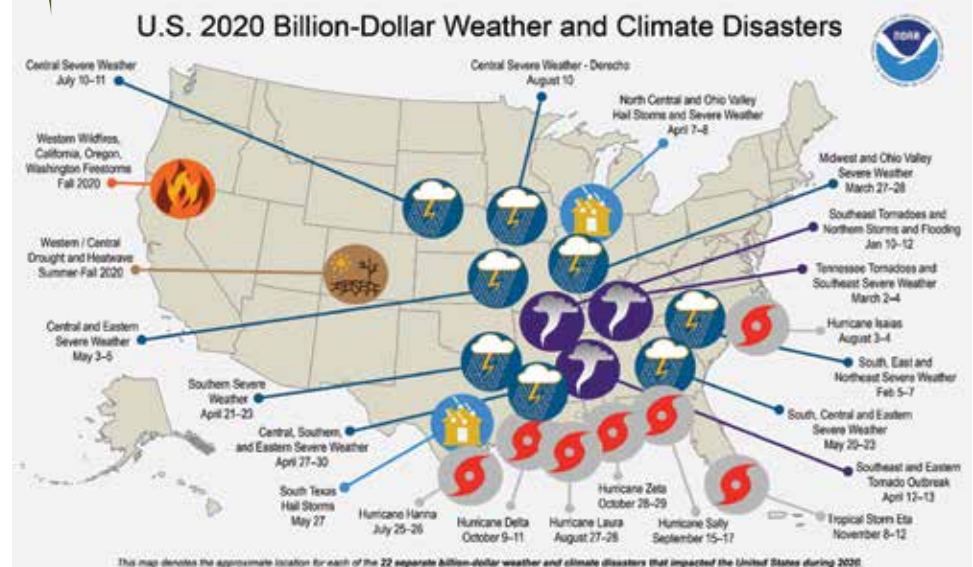
of the weather events and how crop production fared during the year, followed by a discussion of developments in commodity markets and prices. A summary of the overall results for the crop insurance industry in this most unusual year are then presented and we wrap up the 2020 Year in Review article by providing a review of the results of the Crop-Hail programs for the United States and Canada.

U.S. Weather and Production of Major Crops

The weather and climate in 2020 were exceptional, even relative to the previous three years, which were notable in terms of negative

Figure 1

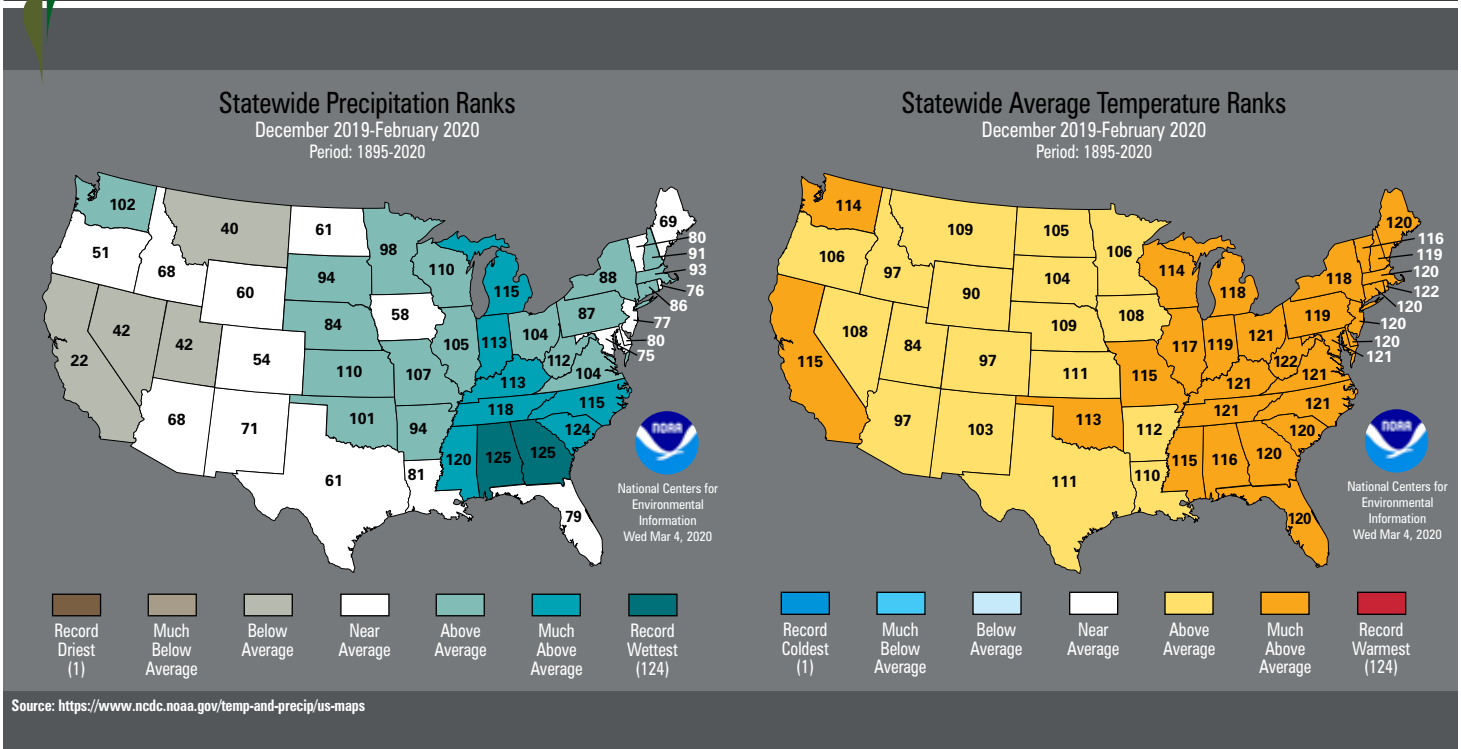
Major U.S. Weather Events in 2020



Source: <https://www.ncdc.noaa.gov/billions/mapping/freq/1980-2020>

Figure 2

Winter 2020 (Dec-Feb): Statewide Precipitation and Temperature Ranks 1895-2020



events. In 2018, there were 14 weather/climate disaster events in the United States with each loss exceeding \$1 billion in inflation adjusted dollars per event. These events included one drought event, eight severe storm events, two tropical cyclone events, one wildfire event, and two winter storm events. In 2019, there were again 14 weather/climate disaster events in the United States with losses exceeding \$1 billion real dollars per event. These events included three flooding events, eight severe storm events, two tropical cyclone events, and one wildfire event. In 2020, this disturbing pattern continued as the United States experienced 22 distinct billion-dollar weather and climate related disasters (Figure 1). This makes 2020 the most turbulent weather and climate year experienced in the 20 years since The National Oceanic and Atmospheric Administration (NOAA) began keeping such records. Over this period, crop insurance was consistently there to help farmers and ranchers affected by these events and provide a foundation for their recovery.

Winter 2019-2020

Except for occasional cold outbreaks, warm temperatures dominated the country

during the winter of 2019-2020 (Figure 2). Above-normal temperatures were especially notable east of the Mississippi River, leading to one of the warmest winters on record in most states. Meanwhile, wet weather persisted through another season in much of the central and eastern United States, leading to pockets of mid- to late-winter flooding. Much of the Southeast was especially wet, with Alabama and Georgia reporting record-high winter precipitation. However, parts of the Deep South, mostly from southern Texas to peninsular Florida, experienced drier-than-normal weather. In fact, drought appreciably intensified during the winter in the western Gulf Coast region, including the Deep South and Texas.

The winter began with continued snow cover across the northern part of the Corn Belt, which plagued farms with late season corn and soybean harvest. Snow cover also remained for most of December in the Northeast from heavy snows that occurred earlier in the month. In contrast, mild temperatures and dry weather reduced the snow cover in the middle of the country with negative impacts on the winter wheat crop across the High Plains and continued stress on already

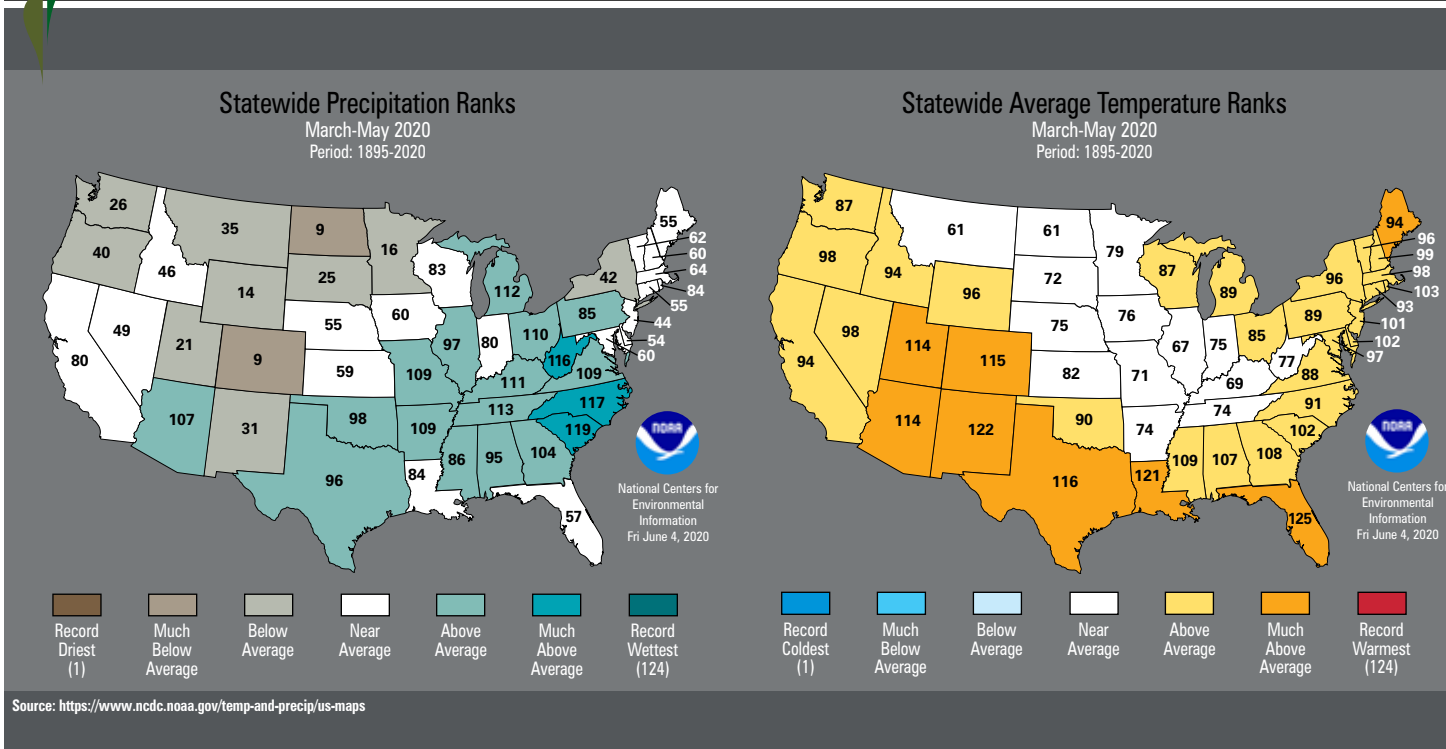
drought affected pastures and rangeland. In the Northwest, limited snow accumulations in Idaho, Oregon, and Washington resulted in drier than normal conditions. However, the Sierra Nevada and Rockies experienced above normal snow pack resulting from numerous December storms. Overall temperatures were above normal throughout the country in December, despite several short-lived cold spells.

January saw a reversal in weather patterns in the West with wet conditions in the Northwest and drier air covering California and the Southwest. As a result, the snow pack in the Northwest returned to near normal levels while the Sierra Nevada had little additional snow in that important California watershed area. Across the rest of the country, increasing precipitation in the Midwest continued to delay harvest while exceptional winter flooding occurred from the Illinois and Wabash River basins to the lower Mississippi Valley area. Once again, limited cold periods did not offset normal to above-normal temperatures across the country for the month of January.

The dry conditions continued in the West where California had record shortfalls in precipitation during the month of February. The Northwest benefited from some rain and snow

Figure 3

Spring 2020 (Mar-May): Statewide Precipitation and Temperature Ranks 1895-2020



but some areas on the eastern slopes of the Cascades and south-central Idaho remained dry. Flooding in northeastern Oregon, caused by heavy rains early in the month, was an exception to the otherwise drier conditions in the region. Across the rest of the country, from the Plains to the Atlantic Seaboard, heavy precipitation continued. Flooding from some rivers in the south fueled anticipation of potential spring floods in the lower Midwest and northern Corn Belt. Above-normal temperatures continued to dominate throughout the month even though a below zero arctic blast briefly extended as far south as Colorado and Nebraska. Temperatures reached more than 5°F above normal in many areas east of the Mississippi River.¹

Spring 2020

For the most part, the country experienced a mild spring apart from cold weather and related freeze damage in parts of the Plains, Midwest, mid-South, and Inter-mountain West. The good news for the spring of 2020 was that, while flooding occurred in some

areas, it was far less disruptive than what was experienced in 2019. The bad news was that, in early spring, several tornadoes resulted in multiple fatalities, the most recorded during this period since 2011. In addition, an early tropical storm hit the Carolinas (Figure 3).

March began with severe weather across the mid-South, including three deadly tornadoes, which touched down in central Tennessee resulting in 24 fatalities. In other parts of the country, early spring rains created soggy conditions in fields and feedlots across the Midwest. Areas of drought persisted in the High Plains and the Gulf Coast region received little or no rainfall. In Florida, there was record setting dryness with Lakeland and Tampa recording no rain in March, the first time that has happened since October 2010.

Weather changed abruptly in early April in the Central and Southern Plains with freezing temperatures following a warmer than normal March. Impacts of the colder temperatures were most pronounced in wheat, while a variety of specialty crops sustained some freeze damage across a wide area from

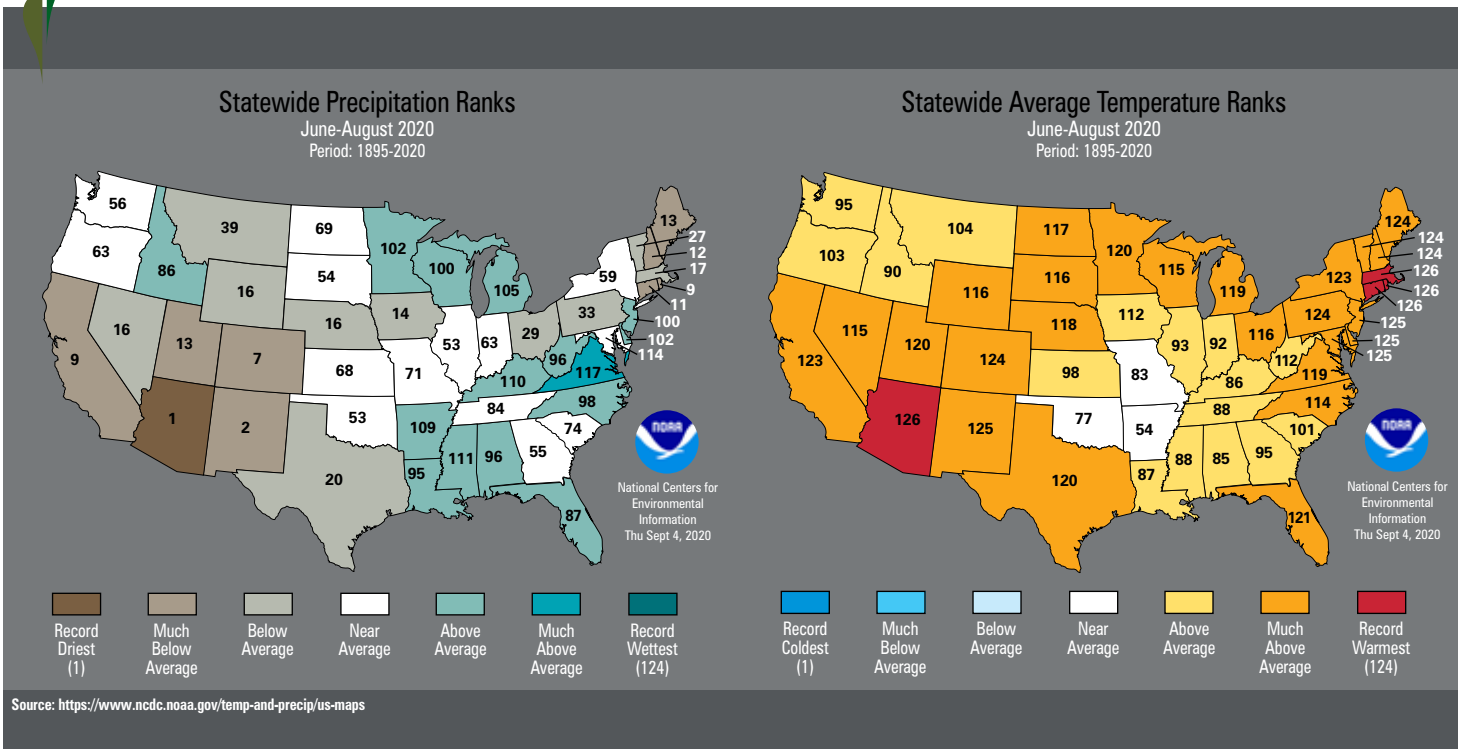
the Inter-mountain West to the Northeast and mid-South. Later in April, while the colder conditions remained east of the Mississippi, warmer weather dominated the western and central parts of the country. The late month warmer temperatures allowed for field work and planting across the Plains, along with the western and central Corn Belt. In mid to late April, severe weather events resulted in another outbreak of deadly tornadoes, with 40 fatalities reported across eight states in the South, with Mississippi, South Carolina and Georgia being hit the hardest. Later in the month three more deadly tornadoes struck across Oklahoma, Texas, and Louisiana.

The first part of May saw continued cool weather patterns in the Northeast along with intermittent freezing conditions in the Midwest. Later in the month, warmer temperatures were ushered in by an early-season heatwave providing relief from the colder conditions in the Midwest and Northeast. However, the West continued to experience hot weather. The middle Atlantic states and parts of the South were plagued by heavy rains resulting from two named tropical storms, which developed prior to the official hurricane season. Particularly heavy rains hit parts of North and South Carolina resulting in the nation's highest topsoil mois-

¹ Monthly weather and crop summary information available from: <https://downloads.usda.library.cornell.edu.usda-esmis/files/cj82k728n/mp48t420z/377213168/wwwcb4120.pdf>

Figure 4

Summer 2020 (Jun-Aug): Statewide Precipitation and Temperature Ranks 1895-2020



ture ratings. Excessive rainfall in the middle of the month also resulted in flooding and fieldwork delays in the Midwest with areas of Illinois and Michigan most affected. Despite the adverse events in certain regions, the National Centers for Environmental Information reported the nation's May temperatures at only slightly above the 20th century mean value while the average precipitation was four percent above normal.

Summer 2020

Despite overall favorable conditions for major crops in June, the summer would end up being highlighted by several severe weather and climate related events across the country. Beneficial rainfall in June was abundant over a large portion of the country including the Southeast, Midwest, parts of the northern Plains and the Northwest. In contrast, serious drought conditions prevailed in the four corners region into the southern half of the High Plains. In a glimpse of what was to come, on June 7, tropical storm Cristobal hit southeastern Louisiana, dumping excess rainfall from the mouth of the Mississippi River to the upper Great Lakes. This would be the first of several summer storm events (Figure 4).

Summer heat prevailed in July, bringing benefits to crop development in some areas and fueling persistent drought conditions in others.

Record warm and much above average temperatures were experienced in the lower Great Lakes states, the Northeast and along the Atlantic coast. Only the northern High Plains and the Northwest escaped the heat with below normal temperatures for the month. Drought conditions were evident from northeastern Nebraska into central Iowa and the eastern most corn and soybean production areas. At the same time, approximately 63 percent of the 11-state Western region was reported by the U.S. Drought Monitor to be experiencing moderate to extreme drought.

In stark contrast to drought conditions in the West, tropical storm activity once again affected areas of the Atlantic Coast and southern Texas. On July 10, Tropical Storm Fay made landfall in New Jersey, bringing heavy rains and high winds across the area. On July 25, Hurricane Hanna made landfall on Padre Island, Texas, and then again just north of Port Mansfield, Texas. Flooding and high winds caused damage to cotton and citrus in the lower Rio Grande Valley.

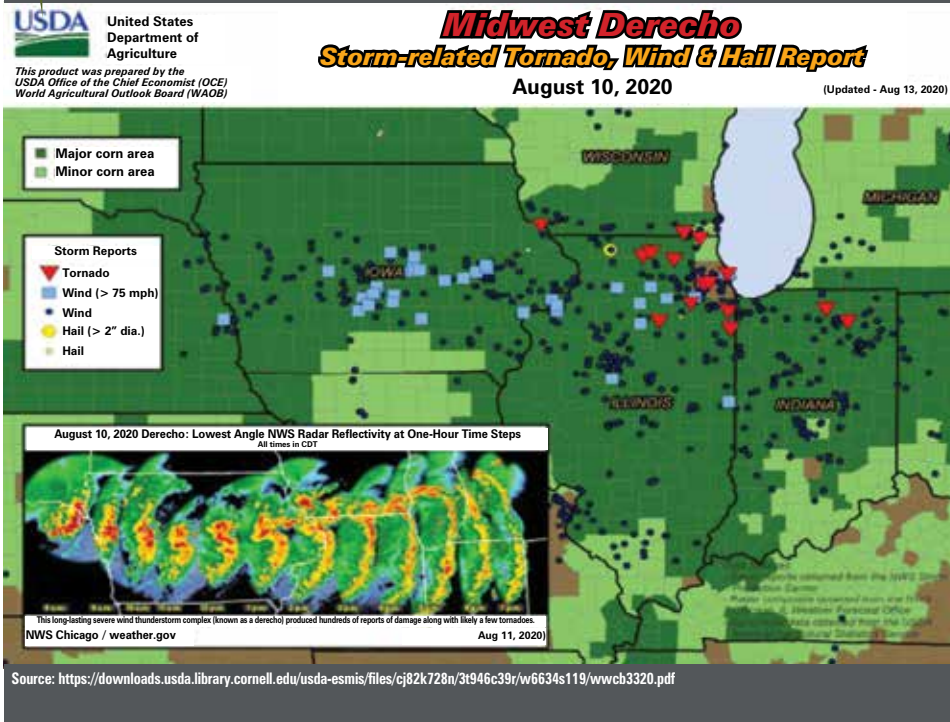
Turbulent August weather rounded out an active summer with a mix of disastrous extreme weather and climate events. A wide area of the country experienced significant damage most notably attributable to wildfires in the West, hurricanes in the South, and the derecho wind

event in the Midwest. The month began with Hurricane Isaias making landfall in Ocean Isle Beach, North Carolina, on August 4. Isaias continued a north-northeast path spreading heavy rains and damaging winds in the Atlantic Coastal Plains up to New England. Meanwhile, prolonged dry weather in the northern High Plains and the Northwest benefited fieldwork and small grain harvest. Drought continued in the West as some of the Midwest and Northeast also remained parched.

One of the most destructive weather events of the summer occurred on August 10 when, in a period of about 14 hours, a 770-mile path of the Midwest was hit by winds with gusts of 60 to 140 mph (Figure 5). Such powerful storms of this intensity, known as "derechos," occur roughly once-in-a-decade in this region. Other notable derechos occurred in 1998 and 2011. What was unique about this event, which resulted in extended damage, was the long duration of the high winds.

Storms initially developed in northern Nebraska and southeast South Dakota early in the morning, and quickly moved eastward into Iowa gaining strength along the way. The damaging winds struck initially near and around the Des Moines metro area. As the storms intensified, widespread wind damage was reported in

Figure 5
2020 Derecho Event



eastern Iowa. The winds damaged or destroyed outbuildings, barns, grain bins, homes, mobile homes, apartment buildings, trees, and power poles in parts of Benton, Linn, Jones, Cedar, and Clinton counties. The Cedar Rapids area was particularly hard hit. Several homes, apartment complexes, and businesses sustained damage consistent with 130-140 mph winds. Radio transmission towers in Marion and Clinton, Iowa, collapsed due to winds that were estimated at approximately 130 mph. Wind gusts of 80-100 mph were common as the line of storms moved through the Quad Cities area and then through northwest Illinois. In addition to the structural damage, millions of acres of crops were damaged or destroyed.

The damage across the path of the storm, primarily to corn and soybean crops, was estimated by RMA cause of loss information and state Crop-Hail insurance figures combined to be more than \$400 million.² High crop insurance participation rates by farmers in the region helped provide needed relief to producers who suffered losses and serves as a vivid example of the benefits of the Federal crop insurance program when disasters strike.

As the Midwest struggled with recovery from the derecho, the remnants of storms in

the Eastern Pacific spread across the western United States in mid-August. Multiple lightning strikes resulted in many large wildfires in California, which consumed vegetation over more than one million acres in less than a week's time. These fires in the Coastal Range east of San Jose, in the foothills north of Napa and east of Santa Rosa, and in the Mendocino National Forest were the second, third, and fourth largest in the state's history. Meanwhile, wildfires in the Colorado wilderness north of Grand Junction were the state's largest in modern history, burning over 139,000 acres.

The summer ended with yet another weather disaster of a different kind. Hurricane Laura struck the coast of Louisiana near Cameron, a Category 4 storm with sustained winds of 150 mph. Laura was the strongest hurricane to make landfall in Louisiana since 1856, comparable in terms to an area affected in modern times only to Audrey in 1957. Laura inflicted severe damage in the coastal areas of Louisiana and southeastern Texas, spreading high winds and record-breaking rainfall as far north as Arkansas.

² <https://www.rma.usda.gov/SummaryOfBusiness/CauseOfLoss> Data accessed as of 3/24/2021.

Fall 2020

Turbulent storms and wildfires were an important part of the weather story throughout the fall. By the end of the hurricane season, another three hurricanes and two storms made landfall in the United States. This brought the total for the year to a record 12 storms, surpassing the previous record of nine in 2016. The additional fall hurricane activity brought the total for the year to six, tying the records set in 1886 and 1985. At the same time, the La Niña, which developed during the second half of the year, contributed to the already dry conditions from the Pacific Coast to the High Plains. The dry conditions lead to outbreaks of devastating wildfires in California, Washington, Oregon, and Colorado (Figure 6).

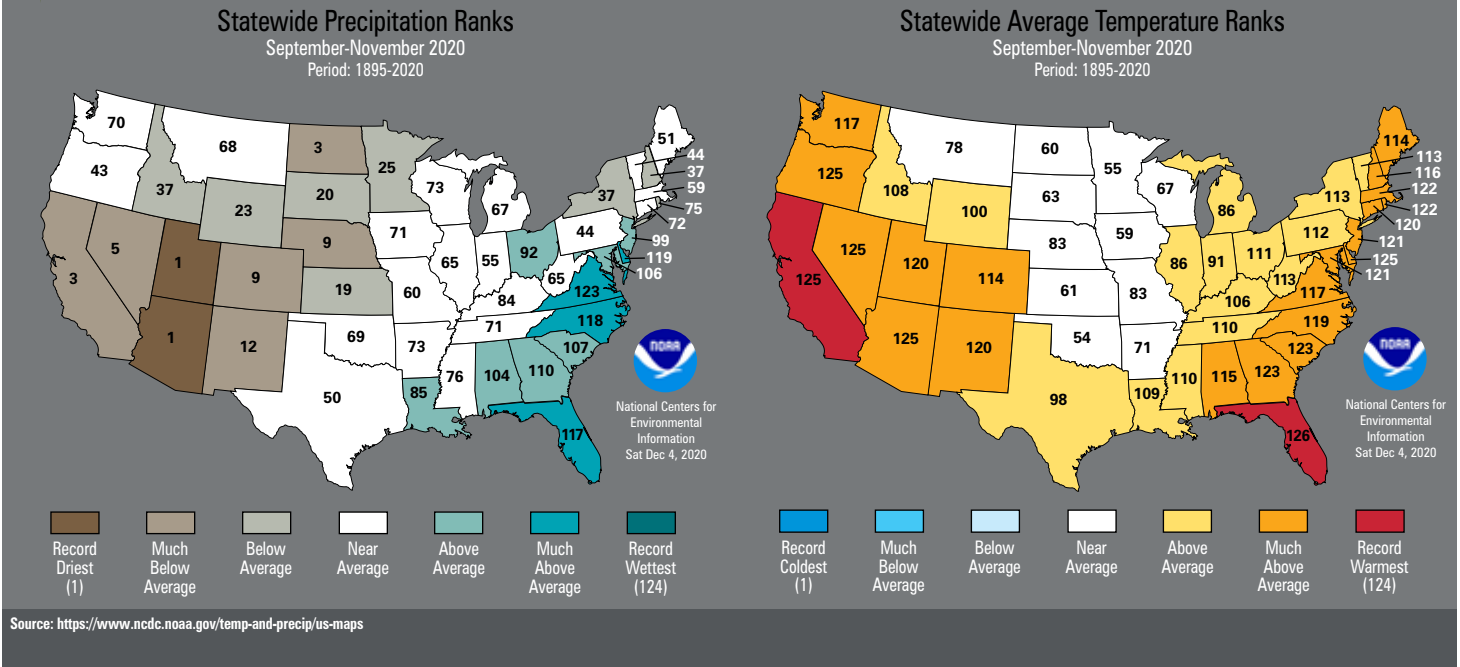
In early September, Hurricane Laura recovery efforts in Southwest Louisiana continued while high heat and strong winds in the drought-plagued West contributed to an outbreak of devastating wildfires. Northeast of Fresno, Calif., the Creek Fire burned more than 330,000 acres and destroyed over 850 structures. Fires continued to rage, and, by mid-September, 15 fires had consumed another 100,000 acres across California, Oregon, and Washington.

On September 16, Hurricane Sally made landfall near Gulf Shores, Ala. A Category 2 storm with winds up to 121 mph and heavy rainfall hammered the area. Wind damage and record flooding was experienced across southern Alabama and western Florida. The storm continued to produce excessive rainfall as it played out as far north as southern Virginia.

In October, another two hurricanes, Delta and Zeta, struck the United States in Louisiana. This multiple storm activity resulted in crop damage in the Southeast, including damage to rice, cotton, and peanuts. On October 9, Hurricane Delta made landfall near Creole, La., just nine miles from where Hurricane Laura had pushed ashore a little over six weeks earlier. A Category 2 hurricane with winds above 100 mph and torrential rains, Delta caused damage as far west as the Texas state line, Mississippi, and across the Southeast. Delta resulted in 16 parishes in Louisiana and six counties in eastern Texas being named as approved counties under the new crop insurance Hurricane Insurance Protection - Wind Index (HIP-WI) program. All but two of the areas had previously been

Figure 6

Fall 2020 (Sept-Nov): Statewide Precipitation and Temperature Ranks 1895-2020



subject to approval because of Hurricane Laura. Later in the month, October 28, Hurricane Zeta made landfall in Cocodrie, La., farther east in the state than Laura and Delta had hit. Zeta was a fast-moving storm with damaging winds of 110 mph; however, it had less excessive rainfall than the previous two storms. Counties affected by damage from Zeta extended through eastern Louisiana and Mississippi, and as far north as Pickens County Alabama.

In other parts of the country, early season calm weather gave way to cold and stormy conditions across the Plains and the Midwest. Record snowfall in the upper Midwest and northern Plains slowed harvest work while rains and record low temperatures also contributed to a slowdown in fall fieldwork. While some of the precipitation reached the Rockies easing drought conditions, the far West remained extremely dry. The dry conditions helped contribute to wildfire outbreaks in Colorado where, on October 14, a fire near Lake Granby developed into the second-largest wildfire in modern history. Over the month of October, the nation was warmer and dryer than normal with nationwide higher-than-average temperatures and precipitation.

November began with above-normal warm temperatures in and across the Plains to the

Atlantic Coast. Meanwhile normal to cooler temperatures in the West help ease the wildfire effects, although by then the fires had consumed more than 140 percent of the 10-year average area, around 9.5 million acres. The cooler temperatures help offset the continued dryness that ranged from parts of the Plains, the northern Mississippi Delta, California, and the Southwest. The dry conditions were favorable to help

farmers wrap up harvest in most sections of the country and only the middle and southern Atlantic Coast states had to deal with heavy rains, which delayed the harvest of cotton, soybeans, and other crops. Some of the excess moisture was attributable to Tropical Storm Eta, the 12th tropical cyclone to make landfall in the United States in 2020, which made the year a record one, with 12 storms hitting the mainland. Eta

Table 1

Crop Yields and Production

CROP	2019 YIELD	2020 YIELD	2019 PRODUCTION	2020 PRODUCTION	% CHANGE IN PRODUCTION
	Bu./Harv. Ac.	Bu./Harv. Ac.	Mill. Bu.	Mill. Bu.	
Corn	168.0	172.0	13,691	14,182	3.6
Barley	77.7	77.5	170	165	-2.9
Grain Sorghum	73.0	73.2	341	373	9.4
Soybeans	47.4	.2	3,552	4,135	16.4
All Wheat	51.7	49.7	1,920	1,825	-4.9
Winter Wheat	53.6	50.9	1,304	1,171	-10.2
Other Spring Wheat	48.2	48.6	562	585	4.1
Durum	45.7	41.4	54	68.8	27.4
	Lbs./Harv. Ac.	Lbs./Harv. Ac.	1,000 Bales	1,000 Bales	
Upland Cotton	810	813	19,227	14,401	-25.1
	Lbs./Harv. Ac.	Lbs./Harv. Ac.	1,000 Cwt.	1,000 Cwt.	
Rice	7,473	7,619	185,104	227,583	22.9

Source: NASS Crop Production Annual Summary, January 2021

created flash floods and gusty winds causing damage across southeastern Florida. As Autumn ended, November was the fourth warmest and 33rd driest in the past 126-year period.

The information sources for this section were: National Agricultural Statistics Service, ISSN:

1057-7823, Crop Production 2020 Summary, January 2021; <https://downloads.usda.library.cornell.edu/usda-esmis/files/k3569432s/w3764081j/5712n018r/cropan21.pdf> and Weekly Weather and Crop Bulletins, USDA, WAOB; <https://usda.library.cornell.edu/concern/publications/cj82k728n>

Crop Production Summary

Despite the turbulent weather events of the past year outlined above, the overall weather conditions farmers experienced throughout the growing season were substantially improved from those that lead to widespread decline in crop production in 2019. Unlike that year, which saw record prevented plantings among major crops of around 19.6 million acres, 2020 had just under nine million acres of prevented planting. Among the seven major crops monitored, only barley, winter wheat, and cotton posted declines in production output over the previous year (Table 1).

Coarse Grains and Soybeans

The combination of increased corn yields, up 2.4 percent in 2019, and an increase of just over one million acres resulted in an increase in production of 3.6 percent, to 14.182 billion bushels. A decline in barley production resulted from a reduction in acreage, with planted acres down four percent from 2019 while yields remained virtually unchanged. In contrast, an increase in sorghum production was linked to an increase in planted acres in 2020, up 12 percent from last year's record low level of 5.27 million acres to 5.88 million acres, combined with modestly higher yields. Soybean production rebounded from the previous crop year decline with both acreage and yield returning closer to 2018 levels. Harvested soybean acreage increased 10 percent, to 82.3 million acres, with yields reaching 50.2 bushels per acre, an increase of 2.8 bushels per acre in 2020. The combination of better yields and increased acres resulted a 16.4 percent increase in soybean production, to 4.1 billion bushels in 2020.

Wheat

Wheat production declined by about five percent in 2020, from 1.920 to 1.825 billion

bushels. Overall production declines were linked to yield declines of almost four percent from the previous year combined with a reduction of two million harvested acres, to 36.7 million acres. There was an overall decline in winter wheat production in hard red winter wheat, which is the primary winter wheat, accounting for 56 percent of total production. Production of hard red winter wheat was down 22 percent from 2019 due to lower yields and reduced acreage in major growing states. Cold and dry conditions during planting season in large portions of western Kansas, Oklahoma, Texas, and Colorado contributed to the yield fall in 2020. Other winter wheat crops experienced increased production. Soft red winter, the second largest production class, was up 11 percent from 2019 to 266 million bushels. White winter wheat, the third largest production class, increased by six percent to reach 246 million bushels.

Other wheat varieties had a better 2020. Spring wheat production increased by four percent from the previous year to 585 million bushels. A modest increase in hard red spring, the largest class, accounted for 530 million bushels. This, combined with an increase in spring soft white of 45 million bushels, up almost 28 percent, more than offset the decline in hard white



production of one million bushels, or around eight percent. Durum wheat production increased by over 27 percent in 2020. Increased acreage of 343,000 acres, mostly in the Dakotas, offset a 11 percent decline in yield leading to a 15 million bushel increase in the 2020 durum crop that reached almost 69 million bushels.

Upland Cotton

Upland cotton production fell by more than 25 percent in 2020 to 14.4 million bales from the previous year. Harvested acres declined by over 28 percent in 2020, falling from 11.3 million acres. The effects of excess moisture from hurricanes and tropical storms in the Delta

and Southeast, combined with Hurricane Hana damage in the lower Rio Grande Valley in Texas, took a toll on the 2020 crop.

Rice

Rice producers rebounded from a challenging 2019 with a 31 percent increase in planted acres of long grain, up from 1.783 to 2.332 million acres in 2020, with increased plantings in Arkansas leading the way. Medium grain planted acres were up 4.6 percent. Overall rice plantings were up 19 percent from the previous year, despite a 9.5 percent decline in medium grain. The increased acreage was complimented by a two percent increase in overall yields leading to a 2020 production of over 227 million hundred-weight (cwt), up almost 23 percent from 2019.

Dry Beans and Lentils

Almost ideal timing of moisture during the growing season resulted in a record dry bean yield of 19.66 cwt per acre, an 11 percent increase from the previous year and six percent above the 30-year trend. The record yields combined with a 35 percent increase in planted acres resulted in a production increase of 1.2 billion cwt, 57 percent greater than the previous year. Pandemic-related consumer buying of staple foods, along with a surge in other commodity prices led to increased supplier demand to ensure available stocks, assuming 2021 dry bean acreage may be down. This contributed to a 49 percent increase in the value of the 2020 dry bean crop, to \$1.006 billion.

In 2020, the nation's lentil crop rebounded from the previous year with an 8.6 percent increase in planted acres, 528,000 up from 486,000 in 2019. The increased lentil acreage was driven in part by increased global demand. Exports of all lentils more than doubled from the previous marketing year reaching 6.56 million cwt bags. Lentil demand is expected to continue to increase as traditional markets like soup manufacturers and package consumer sales are bolstered by an increase in the number of consumers exploring plant-based diets that include vegetable-based protein and gluten-free products. The area devoted to dry pea production declined by 9.3 percent in 2020 to 999,000 acres, down from 1.102 million in 2019. The decline in acreage is mainly in green pea production and partly a reflection of lagging green pea prices relative to much higher field crop prices and higher prices for yellow peas. Both domes-

tic demand from consumers and animal feed, as well as increasing foreign demand, fueled yellow pea prices.

Hay

The nation's hay crop remained relative stable in 2020. Hay harvested acres were reported to be 52.2 million acres, less than a one percent change from 2019, with an average yield of 2.43 tons per acre in 2020, decreasing only .03 of a ton from the previous year. Accordingly, overall production was down only two percent from the previous year at 126.8 million tons. The three percent decline of alfalfa and alfalfa mixtures production from the previous year was attributable to reduced harvested acres of 16.2 million and a modest decrease in yield to 3.27 tons per acre down .01 tons from 2019. Harvested acres of all other hay were up one percent to 36 million acres from the previous year. With yields only slightly lower, down .02 ton from 2019 at 2.05 tons per acre, total production was less than one percent below the previous year at 73.7 million tons.

Fresh Produce and Vegetables

Despite several obstacles, the nation's production of the 26 principal fresh market and processing vegetables, and melons in 2020 was estimated to be down less than one percent from the previous year, totaling 720 million cwt. Weather related events, including hurricane and tropical storm activity, periods of extreme heat, and wildfires in California, all contributed to the reduced output. In addition, there was also a slight reduction in harvested acres, down just over one percent from 2019 at 2.33 million acres. Overall vegetable production consists of many commodities; however, a small number of products dominate the principal group of 26. The top three commodities in terms of harvested acres are sweet corn, tomatoes, and snap beans, which account for 36 percent of the total. Leading commodities in terms of production are tomatoes, onions, and sweet corn, which represent 53 percent of total production.

The value of utilized production, a proxy for domestic consumption, for 2020 vegetable crops declined by four percent from 2019 to \$13.1 billion. The fall in value is linked to efforts to control Covid-19, which resulted in a decline in demand from restaurants and food service. Around 30 percent of the value of production



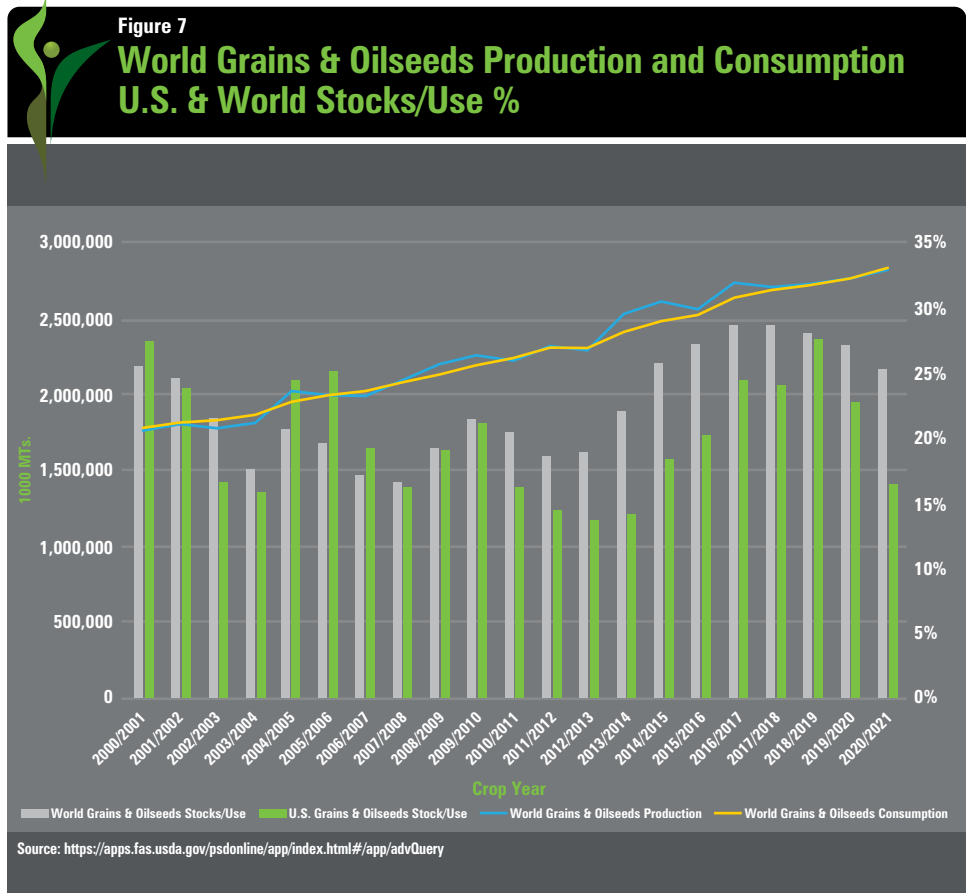
is attributable to tomatoes, head lettuce, and romaine lettuce. California remains the leading state for all metrics in 2020, being number one in harvested acres, utilized production, and value of production.

Citrus

The production of citrus fruit was down by four percent from the previous year, totaling 7.78 million tons. Once again, hurricane damage contributed to the overall decline. The nation's citrus fruit production had increased in 2019 following historically low production in 2018, primarily caused by Hurricane Irma losses in Florida. However, the rebound to near pre-hurricane levels in Florida did not signal a sustained upward trend as the large inventory of less productive older trees, continued problems with citrus greening, prices below the cost of production, and declining acreage took their toll on the state's orange crop. Florida orange production declined by six percent from the previous year to 67.3 million boxes. Meanwhile California orange production increased for the third year in a row, reaching 53.3 million boxes. Combined with a decline in Texas production of 1.060 million boxes, U.S. orange production fell by four percent to 121.94 million boxes.

In contrast to the situation with oranges, Florida grapefruit production continued to increase, reaching 4.85 million boxes, up more than seven percent from the previous year. Texas producers were not as fortunate, as the lead producing state crop declined to 4.4 million boxes, down 28 percent from last year due to damage from Hurricane Hanna. Reduced acreage and lower yields resulted in a fall in California grapefruit production as well, down nine percent from the previous year to 3.8 million boxes. As a result, U.S. grapefruit production declined by just under 12 percent, to 13.05 million boxes.

Other citrus includes lemons produced in Arizona and California, along with tangerine and mandarins produced in California and Florida. U.S. lemon production increased for the third year in a row to 27.5 million boxes, up just under 10 percent from 2019. Increases in production were recorded in California and Arizona, up eight percent and 33 percent respectively; however, Arizona accounts for only six percent of the total. Tangerines and mandarin production in Califor-



nia declined by 17 percent to 22 million tons due to reduced yields linked to their alternate bearing annual cycle. Florida mandarin production increased to 1.02 million boxes, up three percent from the previous year. However, Florida production represents just over four percent of the total and did little to offset the decline in California production. The U.S. tangerine and mandarin output dropped by slightly over 16 percent from the previous year, reported at 23.02 million boxes.

[Information sources for this section include USDA NASS, Quick Stats available at http://www.nass.usda.gov/Quick_Stats/index.php and the following: *Crop Production 2020 Summary, January 2021; Vegetables 2020 Summary, March 2021; Vegetable and Pulses Outlook: April 2020, USDA, ERS, VGS-366; Citrus Fruits 2020 Summary, August 2020; USDA, ERS, Fruit and Tree Nuts Outlook, FTS-360*

Commodity Market Developments

The world grain and oilseeds combined production increased by 2.4 percent in 2020.³ At

the same time, consumption increased by 2.7 percent. The modest global imbalance was sufficient to contribute to a continued prolonged draw-down in world stocks-to-use ratio by two percent (Figure 7). Changes in ending stocks are determined by individual country stock holding policies. In 2020, the largest contribution to the decline in ending stocks came from soybeans in the United States as a late year surge in soybean exports, combined with a modest increase in domestic consumption, contributed 91 percent of the reduction in the world oilseeds ending stocks that were down 10.9 percent from the previous year. This marked the second consecutive year of decline from record high U.S. ending stocks-to-use levels in 2018/19. At the same time, global grain ending stocks declined by 3.5 percent, attributable primarily to reductions in U.S. grain ending stocks, down 24.2 percent from 2019.

In the United States, the ending stocks-to-use ratio declined for the third year in a row, falling by seven percent in 2020 to 23 percent. The reduction was driven by a large decline in soybean stocks, bringing ending stock levels to their third lowest level since 1980, which, combined with a significant reduction in grains end-

³ Major Oilseeds includes Copra, Cottonseed, Palm Kernel, Peanut, Rapeseed, Soybeans and Sunflower seeds. Grains include barley, corn, millet, mixed grains, oats, rye, sorghum and wheat. Wheat and corn comprise 87 percent of global grains, while soybeans account for almost 60 percent of global oilseeds. Accordingly, additional detail is provided for these three crops.

Figure 8

U.S. Prices and Ending Stocks as a % of Total Use 2000-2020



ing stocks, brought the U.S. ending stocks down 24 percent from the previous year.

Wheat

Global wheat production, which accounted for 38 percent of global grain production in 2020, increased by 1.6 percent from the previous year, the second year of increased production, returning world wheat production to the upward path that began in 2013. Production in the United States declined by five percent, while wheat production in the European Union (EU) was down nine percent. However, these declines were offset by larger crops in some of the other major wheat producing countries. Most notably, the wheat crop in Russia increased by almost 15 percent from the previous year, making 2020 the largest crop in the last ten years. Russian wheat production continues its upward trend that began in 2012, with increasing yields approaching three metric tons per hectare, along with increases in harvest area reaching 28.6 million hectares in 2020. In addition, Indian wheat production increased by more than four percent, at 107.9 million metric tons, along with a Canadian crop that increased by almost eight percent from 2019, at 35.2 million metric tons. The largest rebound in production occurred in Australia as the crop more than doubled from the disastrous drought of 2019. The Australian Bureau of Agricultural and Resource estimated the 2020 wheat crop at just over 33 million

tons, up 18 million tons, or 120 percent from the 2019 drought-reduced crop of 15 million tons. Overall, world wheat domestic consumption was up 4.4 percent to 744 million metric tons. The increased consumption resulted in a modest reduction in stocks of 1.6 percent, to 295 million metric tons, bringing the stock-to-use ratio down to 38 percent, a two percent reduction from the previous year.

Corn

Corn production is the largest component of world grain production, accounting for 55 percent of the total in 2020. Five countries dominate global production of corn, with the United States as the world's leading producer, followed by China, Brazil, the EU, Argentina, and the Ukraine. In 2020, the United States was the only major producer with an increase in production, up 4.1 percent from the previous year at 360 million metric tons. Corn production declined in all other countries except for Brazil, where corn is primarily a second crop behind soybeans, which remained unchanged. Chinese production declined only slightly, less than one percent, while production in the Ukraine declined by 15.6 percent, followed by a 7.8 percent reduction in Argentina, and a 4.1 percent decline in the EU. As a result, global production increased only modestly in 2020, up one percent to 1.1 trillion metric tons. After accounting for trade from surplus producers to deficit consum-

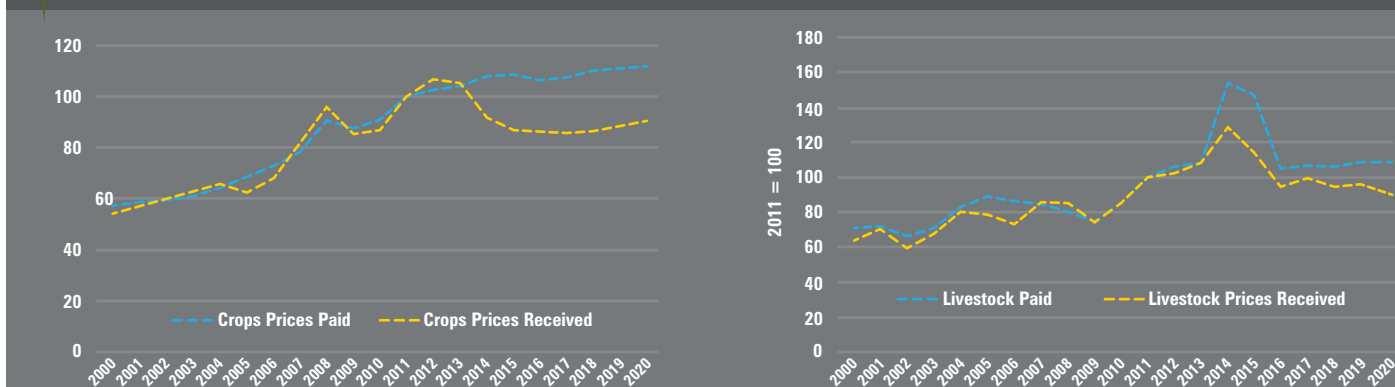
ers, world ending stocks declined to their lowest level since 2014. Much of the increase in transfers were attributable to a recovery in the swine industry in China and subsequent need for increased imports of corn for feed, which more than doubled, up from 7.6 million metric tons in 2019 to 26 million tons in 2020. The surging demand for corn by China was the primary driver behind the change in the U.S. corn situation in 2020 (Figure 8). U.S. corn exports in 2020 more than offset a less than one percent decline in domestic use, increasing by 56 percent from 2019, to 2.775 billion bushels. The resulting decline in ending stocks to 1.257 billion bushels, down 34.5 percent from the previous year, brought the stocks-to-use ratio down to its lowest point since 2013. Markets responded, driving corn prices received by farmers up 22 percent from 2019 to a 2020 marketing year weighted average of \$4.35 per bushel. Expectations for continued increased demand for corn from China and a tight global supply suggest a cautiously optimistic view for the corn market in 2021.

Soybeans

Soybeans represent more than 60 percent of world oilseeds production. Overall world production of soybeans increased by seven percent in 2020 from the previous year, reaching 363 million metric tons. While China and India produce sizable quantities of soybeans, approximately eight percent of the total, the four major

Figure 9

Index of Farm Prices Paid and Received for Crops and Animals 2000-2020



Source: USDA, NASS, Quick Stats <https://quickstats.nass.usda.gov>

USDA, NASS Agricultural Prices, various issues, <https://usda.library.cornell.edu/concern/publications/c821gj76b?locale=en#release-items>

exporting countries produce over 84 percent of the total. Brazil led global producers with 136 million metric tons in 2020, 37 percent of the total, followed by the United States with 112.5 million metric tons, accounting for 31 percent. Next is Argentina, with 49.8 million metric tons, at 13 percent, and last among the major exporters, Paraguay, had 10.1 million metric tons, accounting for three percent of global production.

Total global domestic use increased by 3.5 percent from the previous year to 369.3 million metric tons. Domestic use globally is highest in China with 114.5 million metric tons in 2020. In addition, soybean use is high in the countries of the EU and Southeast Asia and Mexico. Domestic supply and demand conditions result in production falling short of use requiring imports and/or draw-down of stocks to fill the gaps. In 2020, the shortfall in production versus domestic consumption was 83 percent in China, 86 percent in the EU, 94 percent in Southeast Asia, and 96 percent in Mexico. In 2020, import demand in these major markets accounted for 78 percent of overall global soybean trade, 130.6 million metric tons of a total 167.8 million tons.

The U.S. soybean industry benefits from a global export demand for soybeans generated by the gap between domestic production and domestic use in foreign markets. U.S. soybean farmers produced 112.5 million metric tons of soybeans in 2020 and 55 percent of that production went to service export demand. Following China's return to the market, the soybean market enjoyed robust growth in export demand, drawing down stocks and putting upward pres-

sure on market prices in 2020. U.S. exports increased 36 percent in 2020, to 62 million metric tons, increasing from 45.7 million metric tons in 2019. The increase in export volume also helped to decrease ending stocks from 2019 levels of 525 million bushels to 120 million bushels, a decline of 77 percent. As a result, the U.S. stocks-to-use ratio declined to 2.6 percent, the lowest level since 2013. Coupled with a modest increase in domestic use of a little over one percent, export demand and lower stock levels helped push the weighted average marketing year price received by farmers to \$11.25 per bushel, up more than 31 percent from the previous year price of \$8.57 (Figure 8). In addition, lower stocks and expectations of a continuing robust demand for exports helps fuel optimism about the market for 2021.

Prices Received and Prices Paid

The rebound in commodity markets toward the end of 2020 is a positive sign for the future; however, the prolonged challenging conditions facing agricultural producers is reflected in the overall indices of prices paid, and prices received by farmers (Figure 9). With hopes for a sustained increase in commodity prices notwithstanding, the rise in crop prices received by producers in 2020 continued to lag the pace of increases in prices paid for inputs. The same can be seen regarding livestock operations. While the gap is narrower, it widened in 2020 reflecting a downturn in livestock prices relative to a plateauing of input prices.

The index of prices received by U.S. crop producers peaked during the period August 2012 to June 2013 and has not recovered to those levels since. 2020 ended with the crop prices paid index at 110.4, down slightly from the previous year by 1.2 points. The reduction in prices paid reflect a modest but general decline in the indices of major input components including all fuels, fertilizers, insecticides, and herbicides. Reflecting the upward move in 2020 crop prices toward the end of the year, the index of prices received by crop producers moved upward by 2.5 points. The narrowing of the gap between receipts and expenses is a positive sign and hopefully continues into 2021.

The story was not as promising for all livestock sectors. The livestock producers index of prices received in 2020 moved downward. This is a trend that has persisted since 2015, falling to 90 from 96 the previous year. In 2020, declines in meat animal prices and dairy index declined as did the index for poultry and eggs. For example, at the end of the year, cattle prices had declined to \$108 per cwt, down \$10 per cwt from the previous year. In the dairy sector, the all-milk price declined to \$18.50 per cwt, down \$2.20 per cwt from December 2019. In 2020, the prices paid by livestock producers were little changed from the previous year. The index of prices paid increased only 0.4 for the year, primarily reflecting early season lower prices for corn and soybeans. However, with the late year surge in commodity prices likely to continue into the new year, prices paid for livestock feedstuffs are expected to increase, leading to a widening of the gap for



Table 2

Insured Acres by Major Crop¹

CROP	2018	2019	2020	CHANGE 2019/20	% CHANGE 2019/20
Wheat	38,725	38,738	36,167	-2,571	-6.6
Corn	78,162	86,952	84,324	-2,628	-3.0
Sorghum	4,191	4,067	4,482	415	10.2
Soybeans	78,863	71,437	75,647	4,210	5.9
Upland Cotton	13,184	13,110	11,754	-1,356	-10.3
Pasture, Range & Forage	98,284	140,000	160,000	20,000	14.3
Total (Above Crops)	311,409	354,305	372,375	18,071	5.1
Total (All Crops)	335,166	378,808	398,278	19,470	5.1
NASS Planted Acres (Field Crops)	319,305	303,073	310,114	7,041	2.3

¹Data as of May 11, 2021 in (000) acres.
Source: RMA Summary of Business, NASS Quick Stats

producers between prices received and paid.

[The information sources for this section were: USDA, Quick Stats <https://quickstats.nass.usda.gov>, USDA, OCE, WASDE, <http://usda.gov/oce/commodity/wasde> and USDA, FAS, Market and Trade Data, PSD Online, <https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>]

Federal Crop Insurance Experience

Performance of the Federal Crop Insurance (FCI) program in 2020 was an interesting contrast to the 2019 crop year. Readers will recall 2019 as the “year of prevented planting.” In 2020,

total insured acreage increased by 5.1 percent (Table 2), with Pasture, Rangeland and Forage (PRF) continuing to expand, increasing by almost 20 million acres in 2020, a 14.3 percent increase over 2019. Insured cotton acreage declined by 10.3 percent along with a 6.6 percent decline in insured wheat acreage. Offsetting these declines were increases of 5.9 percent and 10.2 percent in insured acres of soybeans and sorghum, respectively. Although there was an increase in total acres insured and some acreage shifts among the major crops, coverage levels for the U.S. remain stable as illustrated in Figure 10. More than 80 percent of U.S. insurable acres are protected at

coverage levels exceeding 70 percent.

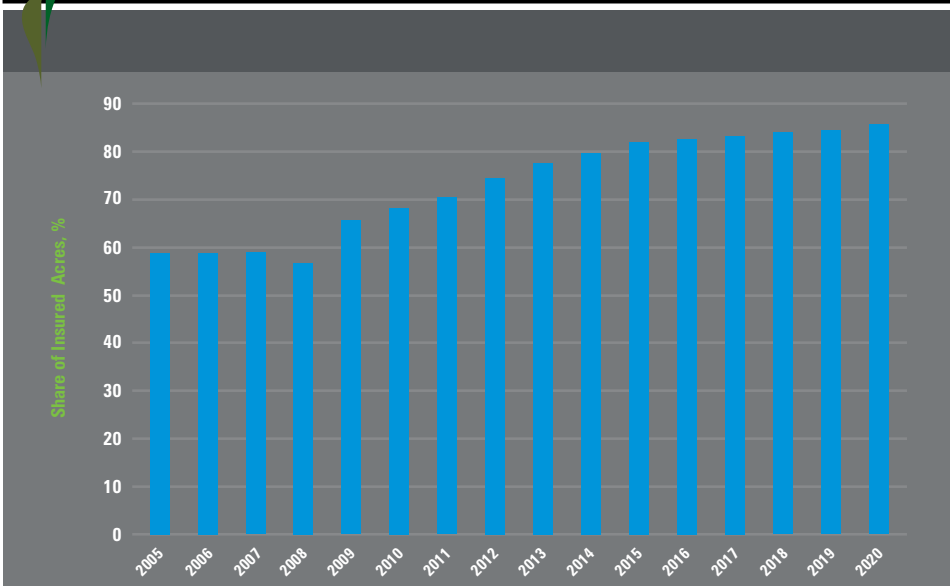
FCI underwriting performance is provided in Table 3. Indemnities for 2020 were approximately \$8.4 billion compared to \$10.6 billion in 2019. The loss ratio (indemnity divided by premium) was 83 percent for 2020, considerably less than the 105 percent loss ratio experienced in 2019. Table 4 provides a breakdown of premiums and indemnities ranked by both state and crop for 2020. In terms of premium volume, Texas, North Dakota, Illinois, Kansas, and Iowa were the top-ranking states for 2020. With respect to indemnities, Texas, North Dakota, and Iowa were the top three ranking states. It should be no surprise that corn, soybeans, and wheat were the top three crops in premium volume. And respectively, corn, cotton, and soybean indemnities were \$2.6 billion, \$1.3 billion, and just less than \$1 billion in 2020.

It is often said that “a picture is worth a thousand words.” The U.S. Loss Ratio map in Figure



Figure 10

Share of Insured Acres Covered at 70% or Higher



Data as of May 11, 2021
Source: RMA Summary of Business



Table 3

Federal Crop Insurance Program Performance, Gross Basis¹

CROP YEAR	POLICIES WITH PREMIUM	UNITS WITH PREMIUM	LIABILITY	PREMIUM	FARM-PAID PREMIUM	INDEMNITY	GROSS UNDERWRITING GAIN	INSURED ACRES	LOSS RATIO
	<i>Thousands</i>		<i>Million Dollars</i>					<i>Million</i>	
2011	1,152	2,527	114,210	11,972	4,509	10,869	1,103	266	0.91
2012	1,174	2,529	117,160	11,117	4,138	17,451	-6,334	283	1.57
2013	1,224	2,584	123,811	11,808	4,511	12,085	-277	296	1.02
2014	1,207	2,539	109,904	10,073	3,858	9,136	938	295	0.91
2015	1,205	2,547	102,539	9,769	3,679	6,316	3,452	296	0.65
2016	1,160	2,442	100,623	9,329	3,462	3,913	5,416	290	0.42
2017	1,125	2,370	106,062	10,071	3,716	5,432	4,639	312	0.54
2018	1,108	2,330	110,162	9,896	3,630	7,322	2,574	335	0.74
2019	1,106	2,355	109,865	10,128	3,758	10,592	-464	379	1.05
2020	1,112	2,433	113,929	10,064	3,747	8,358	1,707	398	0.83

¹Data as of May 11, 2021

Source: RMA Summary of Business

Table 4

Top 10 Premiums and Indemnities Ranked by State and Crop for 2020

Rank by State					
Premiums by State			Indemnity by State		
RANK	STATE	PREMIUMS (MIL.\$)	RANK	STATE	PREMIUMS (MIL.\$)
1	TX	1,023.0	1	TX	1,501.0
2	ND	866.5	2	ND	1,039.9
3	IL	644.2	3	IA	625.9
4	KS	633.6	4	CA	598.1
5	IA	609.4	5	SD	500.8
6	SD	598.6	6	NC	285.9
7	MN	576.1	7	AR	268.7
8	NE	513.9	8	CO	262.4
9	CA	476.3	9	KS	246.1
10	MO	385.2	10	MN	231.3
Top 10 Sub-Total		6,326.9	Top 10 Sub-Total		5,560.0
All Other		3,737.4	All Other		2,797.8
U.S. Total		10,064.3	U.S. Total		8,357.8
Top 10 Share of U.S.		63%	Top 10 Share of U.S.		67%

Rank by Crop					
Premiums by State			Indemnity by State		
RANK	STATE	PREMIUMS (MIL.\$)	RANK	STATE	PREMIUMS (MIL.\$)
1	Corn	3,508.2	1	Corn	2,628.7
2	Soybeans	2,002.9	2	Cotton	1,322.0
3	Wheat	894.9	3	Soybeans	984.7
4	Cotton	870.8	4	PRF	890.2
5	PRF	676.4	5	Wheat	492.2
6	Grain Sorghum	156.4	6	Grapes	288.4
7	Rice	137.1	7	Rice	256.8
8	Whole Farm Revenue	131.9	8	Grain Sorghum	116.8
9	Apples	121.7	9	Peanuts	109.6
10	Dry Beans	110.0	10	Flue Cured Tobacco	103.8
Top 10 Sub-Total		8,610.3	Top 10 Sub-Total		7,193.2
All Other		1,454.0	All Other		1,164.6
U.S. Total		10,064.3	U.S. Total		8,357.8
Top 10 Share of U.S.		86%	Top 10 Share of U.S.		86%

Source: RMA Summary of Business as of May 11, 2021

11 is just that, a picture, or in the lyrics of Rod Stewart, "...every picture tells a story, don't it..." Focusing on the Midwest, the map reveals the remarkable underwriting results in several of the major corn and soybean states. Specifically, the states of Illinois, Indiana, Kansas, Minnesota, Missouri, Nebraska, and Ohio all experienced loss ratios under 50 percent for the FCI program. The exception being Iowa at a loss ratio of 103 percent as a result of the derecho discussed elsewhere in this article.

Contrast the experience of the Midwest with that of the Southwest region encompassing Arizona, New Mexico, and Texas that, along with California, sustained loss ratios in excess of 100 percent. The primary cause of loss in these states was drought and/or fire. The Southeastern and Delta states also experienced loss ratios in excess of 100 percent primarily due to excess moisture and hurricanes.

Revenue Products

The projected base prices used to establish the value of a crop and the insured liability under the Revenue Protection and Yield Protection forms of insurance policies are shown in Table 5 for crop years 2014 through 2021. Projected base prices are the average of futures prices during the discovery month, i.e., the month preceding the sales closing date for a policy.

From 2019 to 2020, the projected base prices fell for all commodities reflecting the overall downturn in the farm economy and trade implications with China. The exception was rice, which increased from 10.80 to 12.10 per hundredweight; a 12 percent increase.

Remarkably and fortunately for 2021, com-



modity prices have rebounded considerably from the 2020 crop year. With the exception of rice, all commodities experienced double digit percentage increases for 2021. Most notable is the roughly 30 percent increase in the 2020 soybean base price of \$9.17 per bushel compared to \$11.87 per bushel for 2021.

Implied volatility factors (IV) derived from futures market information serve as the measure of risk for expected prices. RMA annually calculates the implied volatility factor for an insured commodity by averaging the implied volatility of near in-the-money options for a selected futures contract over the final five trading days of the discovery period for that crop. For example, implied volatilities over the final five trading days in February on the futures contract for December delivery are used to determine the IV factor in the major corn producing states. RMA uses the IV factor to simulate the expected price distribution for the crop, which is then utilized to establish the price risk component of the premium rate for the specific crop revenue plan of insurance. A high IV indicates a greater likelihood for large price movements while a

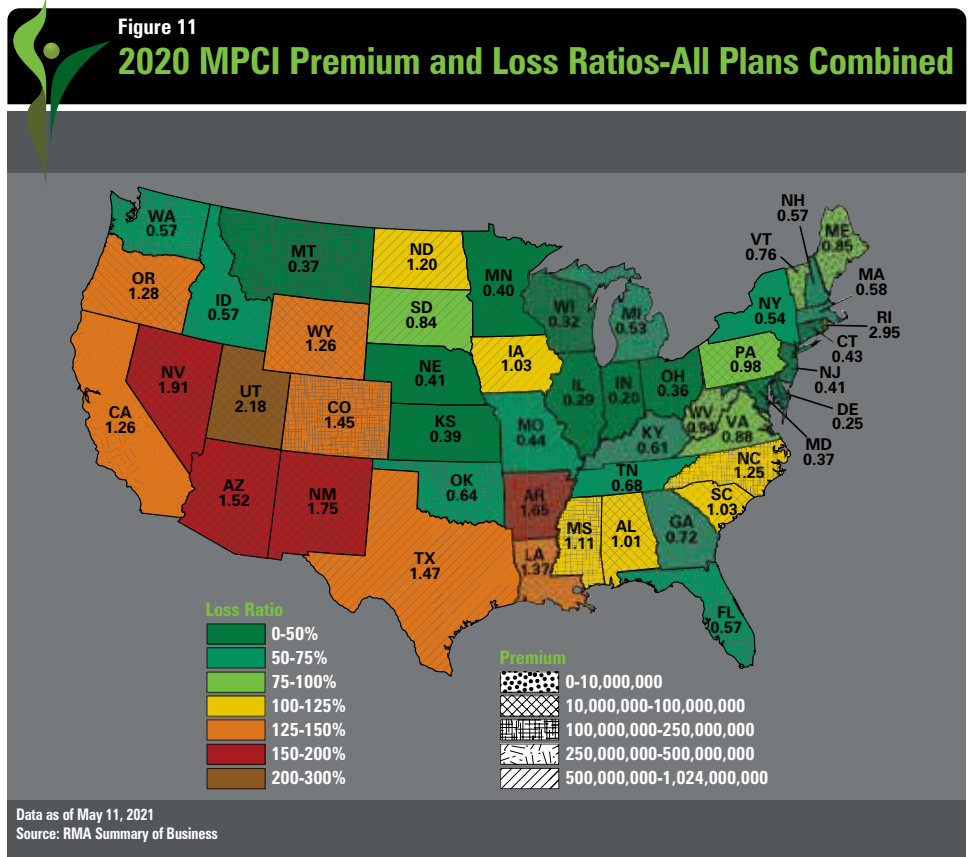


Table 5
Major Revenue Policy Base Prices¹

CROP	2014	2015	2016	2017	2018	2019	2020	2021	% CHANGE	
									2019/20	2020/21
Wheat, Winter (\$/bu) (KS)	7.02	6.30	5.20	4.59	4.87	5.74	4.35	4.90	-24.2	12.6
Wheat, Spring (\$/bu) (ND)	6.51	5.85	5.13	5.65	6.31	5.77	5.56	6.53	-3.6	17.4
Corn (\$/bu) (IL)	4.62	4.15	3.86	3.96	3.96	4.00	3.88	4.58	-3.0	18.0
Soybeans (\$/bu) (IL)	11.36	9.73	8.85	10.19	10.16	9.54	9.17	11.87	-3.9	29.4
Upland Cotton (\$/bu) (MS)	0.78	0.63	0.62	0.73	0.75	0.74	0.70	0.80	-5.4	14.3
Rice (\$/cwt)	13.90	²	11.90	10.40	11.90	10.80	12.10	12.70	12.0	5.0

¹Revenue Protection for 2014-21 as of May 11, 2021.

²Due to insufficient futures price data, revenue insurance was not available in 2015.

Source: RMA Actuarial Information Browser



Table 6
Volatility Factors

CROP	Historical Price Volatility ¹	Volatility Factor ²									
	1968-2020	2014	2015	2016	2017	2018	2019	2020	2021	% CHANGE	
										2019/20	2020/21
Wheat, Winter (\$/bu)	0.19	0.19	0.17	0.22	0.18	0.16	0.19	0.17	0.16	-10.50	-5.90
Wheat, Spring (\$/bu)	0.22	0.14	0.15	0.15	0.13	0.13	0.14	0.14	0.18	0.00	28.60
Corn (\$/bu)	0.20	0.19	0.21	0.17	0.19	0.15	0.15	0.15	0.23	0.00	53.30
Soybeans (\$/bu)	0.18	0.13	0.16	0.12	0.16	0.14	0.12	0.12	0.19	0.00	58.30
Upland Cotton (\$/bu)	0.23	0.15	0.15	0.14	0.15	0.14	0.14	0.13	0.20	-7.10	53.80
Rice (\$/cwt)	0.22	0.1	³	0.15	0.17	0.12	0.11	0.13	0.15	18.20	15.40

¹Historical volatility values are obtained by fitting log-normal distribution to the time series of the ratio of the harvest price to the base price from 1968 to 2020. For each year in that time period, the harvest and base prices are calculated by using relevant futures prices in that year. Source: Barchart.com

²Revenue Protection as of May 11, 2021.

³Due to insufficient futures price data, revenue insurance was not available in 2015
Source: Various RMA Manager's Bulletins

low IV implies a more stable market with futures prices expected to move within a smaller range. Other things being equal, higher IV factors result in higher premiums on policies providing the farmer's revenue protection, while lower IV factors result in lower premiums.

Historical IV values for selected major crops for the period 2014-2021 are shown in Table 6. The interesting takeaway from this is the relative stability in volatility factors for all the major crops (again with the exception of rice) for 2019 and 2020. The absence of volatility on an annual basis is most acute between 2019 and 2020. Amazingly enough, there were no changes in IV values for corn, soybeans, and spring wheat between crop years 2019 and 2020.

This is in sharp contrast to the volatility factors observed for 2021. With the exception of winter wheat, which exhibited a -5.9 percent decrease between 2019 and 2020, the remaining commodities all experienced incredible upward swings between 2020 and 2021. The higher level of base prices coupled with the dramatic increases in volatility factors will result in substantial increases in industry premium for 2021. Stay tuned for next year's Year in Review to see how this all turns out.

Figure 12 shows the change between the base prices established at the outset of 2020 in relation to the harvest prices established close to the end of the growing season. The harvest prices provided in Figure 12 are the average daily prices in the harvest month for the same futures contract used to establish the base price earlier in the year. Harvest prices are an essential element of the calculation process as they are used to determine the farmer's actual revenue, which in turn

is used to establish the amount of indemnity provided by Revenue Protection (RP) policies.

With the exception of spring wheat and upland cotton, harvest prices for all major commodities increased for 2020. Corn increased from \$3.88 to \$3.99 per bushel, winter wheat, from \$4.35 to \$4.44 per bushel, and rice increased from \$12.10 to \$12.40 per cwt. The largest increase in base price to harvest price was observed for soybeans increasing from \$9.17 per bushel to \$10.55 per bushel, an increase of 15 percent. Spring wheat declined from \$5.56 per bushel, approximately a nine percent drop. Upland cotton was essentially flat with a one penny decline, which was interesting.

Figure 13 contains loss ratios by state for the corn yield plan of insurance (YP) and the corn revenue plans of insurance (RP and RP-Harvest Price Exclusion) combined, referred to as RP) within the Corn Belt, which includes the states of Illinois, Iowa, Nebraska, Minnesota, Indiana, Missouri, Michigan, and Wisconsin. YP plans generally experienced higher loss ratios than the revenue plans simply due to the "natural hedge" associated with the RP plans in which aggregate yields and prices are typically negatively correlated and tend to offset one another.

For 2020, the corn RP plans within the Corn Belt states experienced loss ratios less than 50 percent, with the exception of Iowa. Obviously,

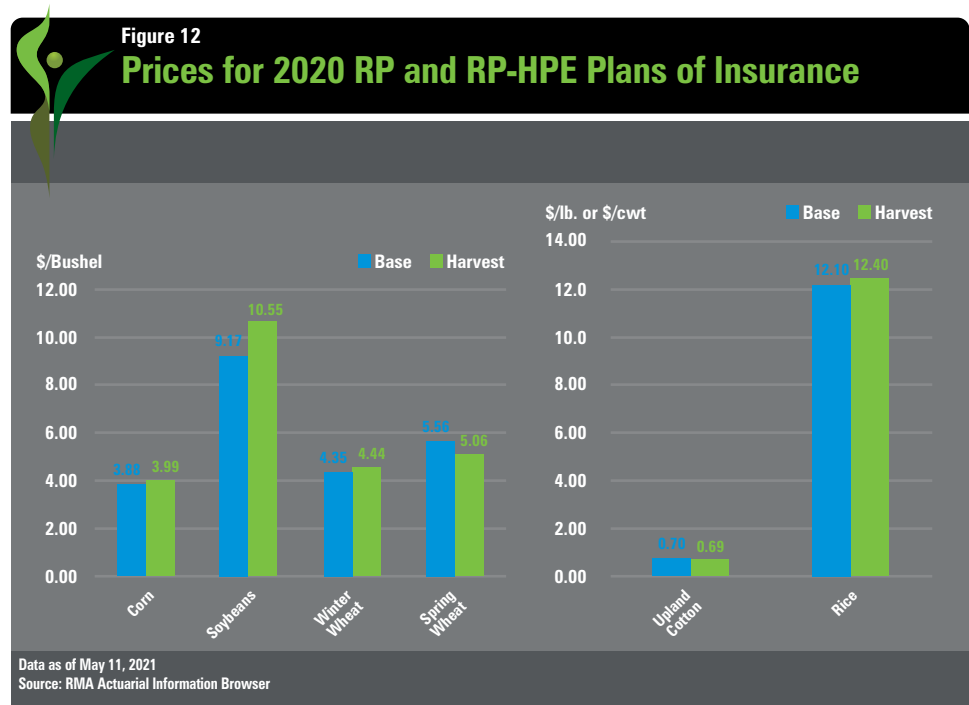
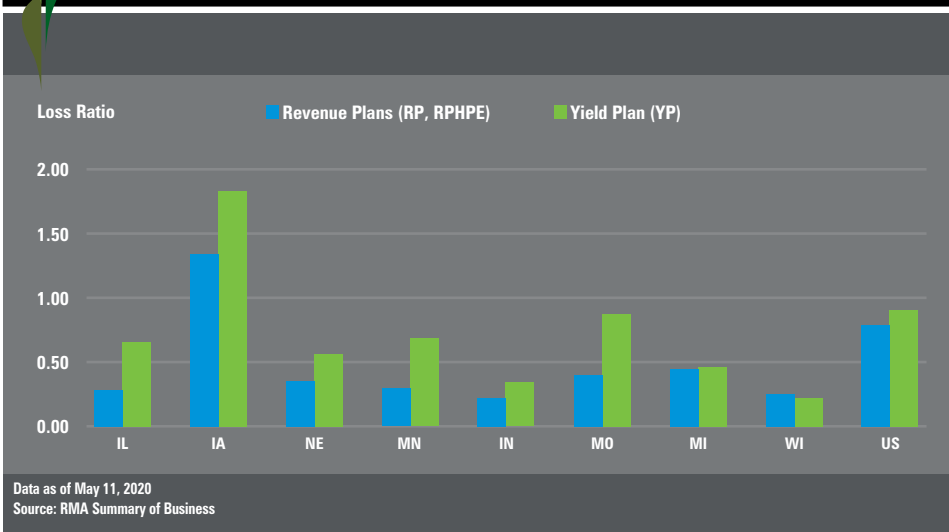


Figure 13

State Loss Ratios for 2020: Corn



Iowa results were driven by the derecho. Casual inspection of Figure 13 further reveals the importance of Iowa in the mix of Cornbelt states driving the national results well above a 50 percent loss ratio.

Figure 14 tells a somewhat different story for soybeans. At the national level, the loss ratio for soybean RP plans was approximately 50 percent, considerably less than the national results for corn RP plans. Remarkably, the individual state loss ratios for soybean plans were at or below 50 percent for 2020.

[Information sources for this section includes USDA, Foreign Agricultural Service, P, S & D database; Office of the Chief Economist; World Agricultural Supply and Demand Estimates Re-

port (WASDE), various issues; NASS Quick Stats; RMA Manager’s Bulletins, Price Discovery Application, and Actuarial Information Browser.]

Program and Policy Developments

Flexibility and Adaptability During Covid-19

Just as the Federal crop insurance program was finishing up response to a record number of 2019 crop year prevented planting acres, along with a late harvest due to the wet weather, it suddenly faced a crisis which few, if any, program participants had ever previously experienced.

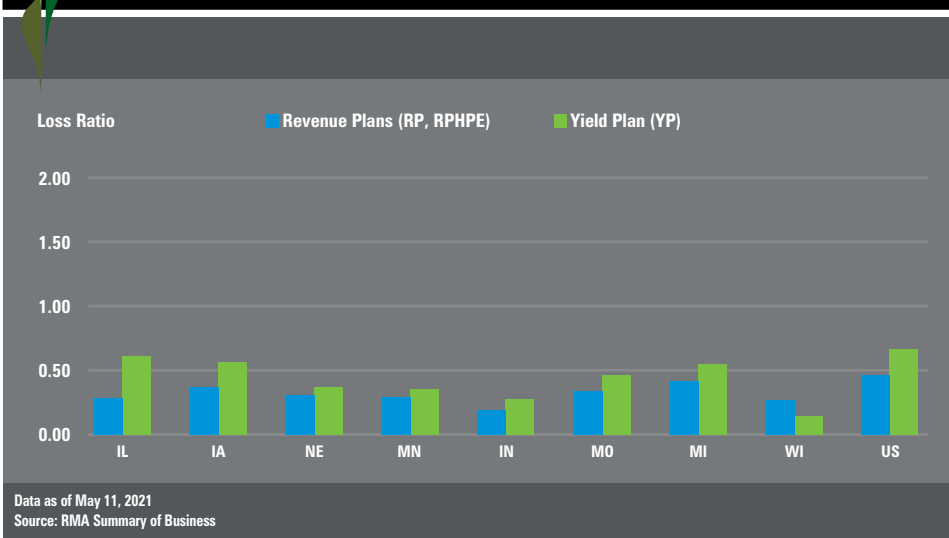
As March unfolded, Covid-19 began to spread rapidly across the United States. With it came new social distancing, quarantine, and “stay at home” orders handed down by Federal and State authorities. Most of these orders were foreign to farmers, ranchers, and most everyone across the agricultural landscape. Suddenly, customer service as most knew and had come to expect was quickly being challenged as there suddenly was no “business as usual.”

Almost immediately the crop insurance industry began to react, mobilize, and utilize previously developed business pandemic contingency plans, focusing on the health and safety of employees, agents, loss adjusters, and policyholders. The result was that most people began working from home full-time, agents and loss adjusters practiced social distancing, meetings and on-site field training activities were canceled suddenly, and a list of communication challenges began to grow. But because crop insurance is the primary safety net for farmer and rancher crop losses, the RMA and the crop insurance delivery system began to collaborate and take steps to ensure that a viable crop insurance program would continue to be available to rural America, helping protect the nation’s food and fiber supply.

As the realization and impacts of Covid-19 became increasingly apparent by late March, RMA and the crop insurance industry moved swiftly to establish weekly conference calls addressing numerous issues arising from a new way of life. This allowed for newly encountered challenges to be quickly identified and effective solutions implemented to avoid disruptions in delivery and loss adjustment services that were critical for farmers and ranchers. Suddenly there was a greater reliance on technology, which became more critical than ever. Virtual platforms became filled with meetings and included new ways of viewing and coordinating activities with work associates and partners. Within the first 60 days of the Covid-19 breakout, at least a dozen RMA Manager’s Bulletins were released addressing various matters and issues, which were often identified in large part by the leadership from NCIS Committees. The bulletins included waiving interest on producer premiums that came due during critical stay at home orders, extending time to file production reports and complete perennial crop inspections, and creating efficiencies in sending written agreements between RMA and approved insurance provid-

Figure 14

State Loss Ratios for 2019: Soybeans

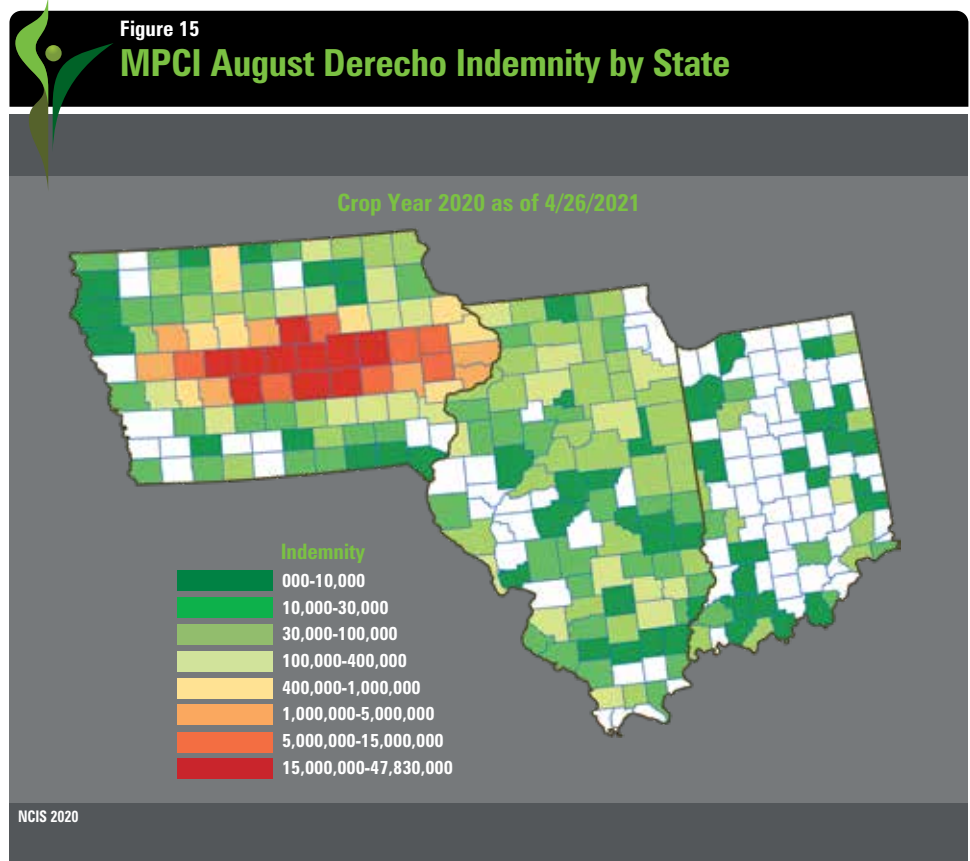


ers (AIPs). RMA also allowed greater flexibility for executing business transactions by utilizing digital signatures, phone confirmation of business transactions with written follow-up, and increased self-certification for replant claims, among many other detailed oriented changes. This allowed the program to be flexible and adaptive for what became a constant changing Covid-19 environment.

By the end of 2020, RMA had issued 16 Manager’s Bulletins and approximately 39 Frequently Asked Questions addressing the myriad of Covid-19 challenges, ultimately extending Covid-19-related flexibilities into July 2021. The industry’s past investment and greater reliance on technology, infrastructure, and its human capital that created today’s efficient and highly flexible delivery system was critical in successfully navigating this historic period. Just as important was the fact that RMA itself was going through many of the same challenges as the industry, along with growing expectations from stakeholders to meet new and emerging issues daily. It was more than a “Teams” meeting, but a “Team Effort” by the industry and RMA to navigate what hopefully will be a once in a lifetime pandemic occurrence for all of us.

Amid Pandemic, A Derecho, More Prevented Planting, Hurricanes, and Other Loss Events

Although Covid-19 was continuously raising issues and concerns throughout the year, extreme weather events did not stop and brought their own challenges. Unfortunately, many people had to learn how to pronounce “derecho” before the year was over as the extremely damaging windstorm tore across the Midwest leaving incredible destruction. Especially hard hit were major corn and soybean producing areas of Iowa. In addition to the considerable structural and infrastructure damage, both the Federal



crop insurance and Crop-Hail insurance programs saw significant damage and losses. The timing of the event brought new loss adjustment challenges in determining the extent of damage as a near mature corn crop lay flattened across key areas of the Corn Belt. But a resilient crop insurance program and professional and experienced private industry loss adjusters again rose to the occasion making timely and accurate inspections while delivering on the safety net farmers have come to expect. The derecho was responsible for approximately \$336 million of Iowa’s \$603 million in total indemnities, with corn losses from the derecho accounting for about \$323 million (Figure 15).

While 2019 was known as the year of prevented planting with nearly 20 million acres indemnified at approximately \$4.25 billion,

the 2020 crop year saw another significant amount of acreage qualify for prevented planting. Approximately 10.2 million acres received a prevented planting payment with indemnities totaling just short of \$2.1 billion. Not surprisingly, corn accounted for about 1.2 million of the acres. And the hardest hit areas of North and South Dakota received indemnities of approximately \$736 and \$418 million, respectively. By and large, from a national perspective in comparison to the 2019 crop year, this loss event flew under the radar. Again, the program and the crop insurance industry delivery system accomplished its primary mission of protecting farmers against extreme weather events without the need for any outside ad-hoc disaster assistance program or with any great fanfare. The program is working as designed.



Wildfires in the Western part of the United States began in earnest earlier than usual and continued to rage throughout the latter part of the growing season, charring a record number of acres, especially in many of the prime grape-growing areas. Over \$207 million in fire-related indemnities were paid, making it the highest single loss event for grapes in at least the last seven years. Smoke taint was a major issue, impacting the quality of grapes near the fires and requiring certified laboratory testing of more samples than the industry had previously witnessed. Compounding loss adjustment was the lack of set standards for determining the number of volatile compounds from the smoke that could result in a measurable loss of quality in the grapes. However, NCIS Committee members and staff worked diligently in response to grower needs as AIPs provided timely inspections and indemnity payments all while maintaining program integrity within prescribed policy limits.

The industry, and particularly the NCIS MPCPI Policy Procedure and Loss Adjustment Committee, dealt with numerous loss adjust-

ment issues as the year went on all while working around Covid-19 restrictions. The issues included work on finding greater efficiency in handling self-certification replant claims, addressing questions stemming from quality adjustment changes in tobacco, making several recommendations for changes to improve quality adjustment factors in various crops, and focusing on the details and requirements for implementing the new Quality Loss Option. Stemming from a record number of prevented planting acres in 2019, RMA formed a Prevented Planting Work group to consider several potential coverage improvements. After receiving input from stakeholders, ultimately RMA decided to expand the “1 in 4” requirement for land to be eligible for prevented planting coverage nationwide, extend the use of an intended acreage report for establishing eligible acres in a new county, made exceptions for receiving a prevented planting payment on a different crop if the farmer could prove their planting intentions, and not requiring uninsured crop acreage following a failed first crop from being subtracted from prevented planting eligible acreage.

Continued Improvement and Expansion of Crop Insurance Coverage

Although 2020 kept bringing Covid-19 challenges, the continued commitment towards program improvements and expansion never wavered. RMA continued its willingness to work with growers and the industry by addressing needed program improvements, holding virtual listening sessions, and sharing draft proposals for comment and feedback. Work on development of new and improved policy coverage for hurricane wind, nursery, strawberries, citrus coverage, prevented planting, and numerous other crops also continued. In total, RMA updated, revised, or issued new policies for approximately 36 different crop programs impacting any one of the crop years 2020 through 2022, depending on the particular crop. Additionally, there were two different changes to the Area Risk Protection Insurance and Common Crop Insurance Policy Basic Provisions applicable to the June 30 and November 30 contract change dates making various program revisions requiring NCIS and the AIPs to diligently train and educate the delivery system workforce and farmers so they could be fully aware of the enhanced coverage options.

After the FCIC Board of Directors (Board) acted late in 2019 to approve a new hemp individual crop insurance policy for 2020, RMA moved rapidly to implement the new policy for the 2020 crop year in a number of states. While first year results were mixed given concerns with initial rules for hemp production, subsequent policy modifications were made along with additional expansion to more states for the 2021 crop year. Given the expectations that were created upon authorization in the 2018 Farm Bill, only time will tell where and what becomes of this crop in the future.

One of the major new programs RMA introduced for the 2020 season was the Hurricane Insurance Protection-Wind Index Endorsement (HIP-WI). The new program was the result of a 2018 Farm Bill requirement to research and develop a policy to insure crops (including tomatoes, peppers, and citrus) against losses due to tropical storm or hurricane. RMA offered the first year HIP-WI program in 22 states on approximately 70 different crops generating liability in excess of \$648 million (Figure 16). North Carolina led all states with the highest liability



with more than \$207 million, followed by Florida (\$141.1), Georgia (\$107.4), Texas (\$77.8), and South Carolina (\$63.4). Mother Nature did not disappoint when it came to the 2020 hurricane season. There were seven named hurricanes impacting the United States that triggered over \$149 million in HIP-WI indemnity payments resulting in a loss ratio of 1.39 (Figure 17). More than 4,000 policies received an indemnity with the most losses paid in North Carolina (\$45.3 million?) followed by Louisiana (\$28.6 million?), Texas (\$24.8 million?), and South Carolina (\$20.8 million?). This new program shows considerable promise for addressing hurricane losses in the Southeast and South and appears positioned to grow in the future.

Through ongoing Board oversight, RMA and private developer efforts, targeted development of policies for various tree crops including California citrus trees, Florida fruit trees, and apple trees. In addition, the Board approved a new Production Revenue History program for Florida strawberries with a goal to eventually replace the Dollar Plan of insurance. Coverage improvements were also made to the pecan policy for optional unit flexibility tied to orchards on contiguous land, offering different coverage levels by type, and updating premium rates. The Board also moved to make several enhancements to the Livestock Risk Protection, Livestock Gross Margin, and the Dairy Revenue Protection programs to encourage greater participation and make the policies more flexible and responsive to livestock producers.

RMA also continued making improvements to the Whole Farm Revenue Protection (WFRP) policy by allowing direct marketers to combine expected revenue from multiple commodities and report the combined expected revenue under a single commodity code, while also maintaining a diversification factor equivalent to two commodities to qualify for an 80 percent coverage level. Current year premiums were also disallowed from being offset from any previous years' indemnity due, along with several other changes enhancing the coverage for producers. The WFRP policy continues to account for over \$2.2 billion of the program's overall liability, the sixth largest plan of insurance in the crop insurance portfolio.

As part of their annual efforts, RMA continued to expand several county crop programs for fruit, vegetable, and specialty crops addressing farmer requests for wider availability of cover-

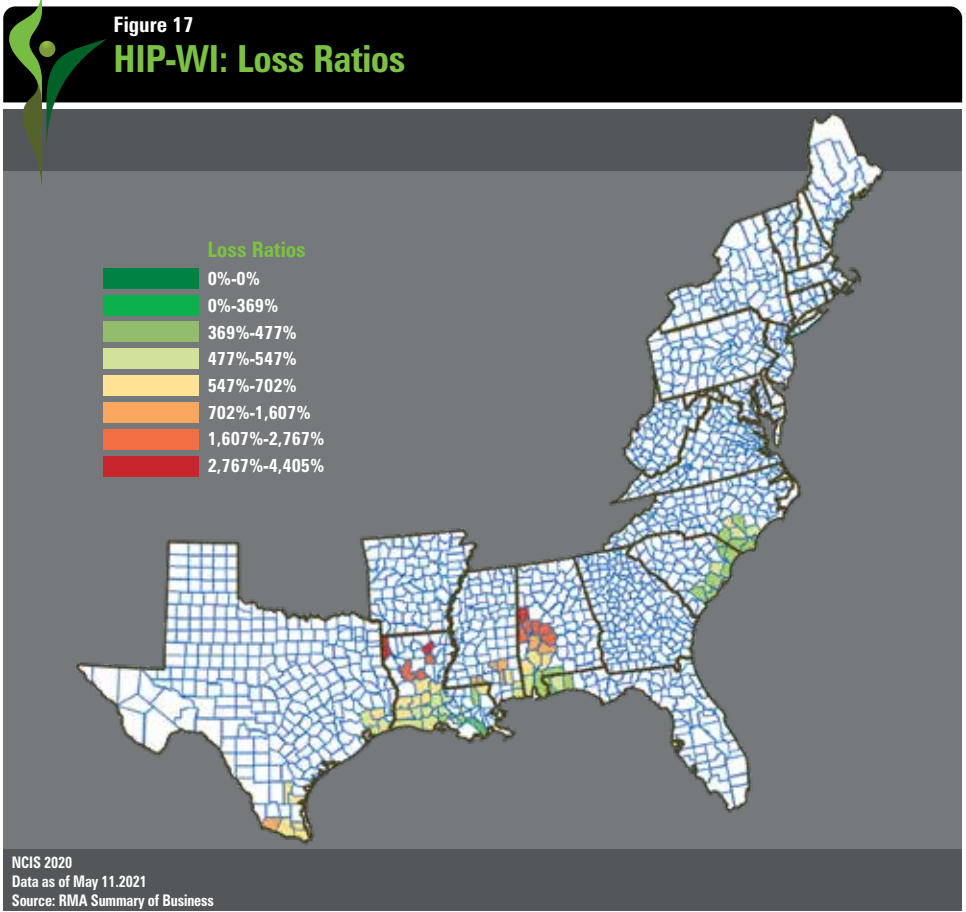
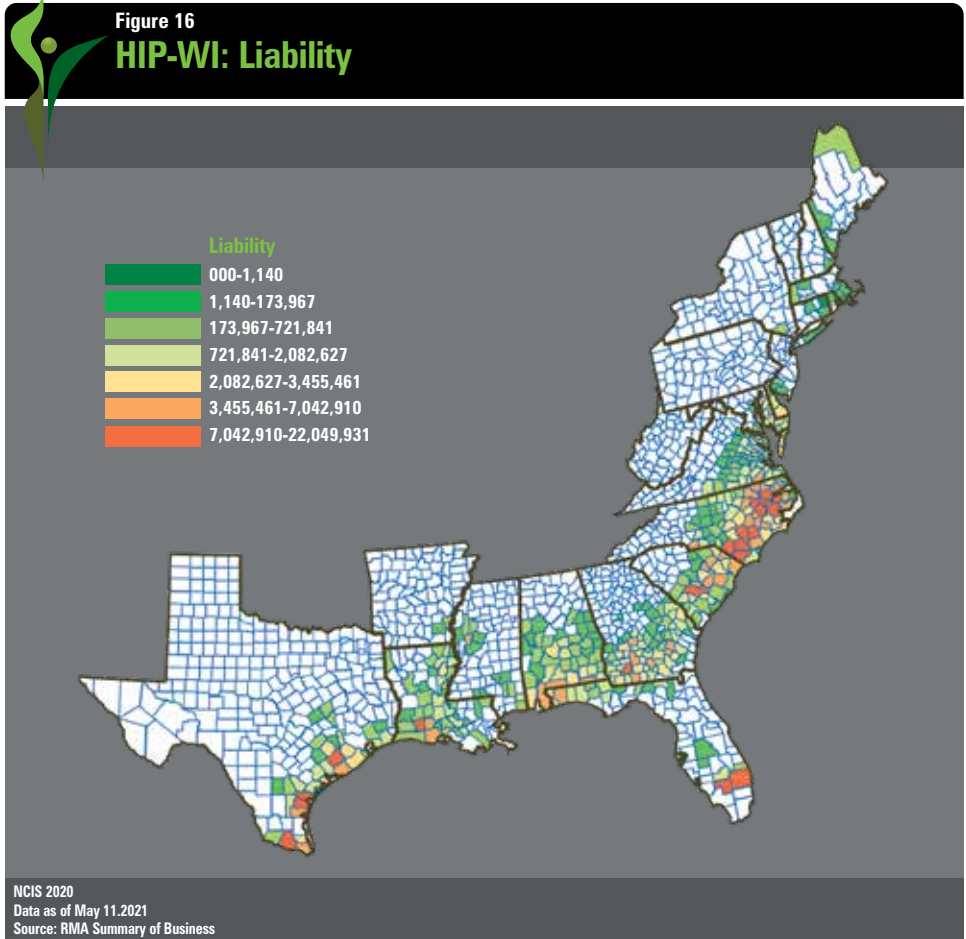




Table 7

U.S. Crop-Hail Results, All Perils

CROP YEAR	LIABILITY Mil. \$	PREMIUM Mil. \$	LOSSES Mil. \$	LOSS RATIO
2011	36,691	843.2	974.5	1.16
2012	39,407	955.8	704.3	0.74
2013	39,773	953.2	646.2	0.68
2014	39,652	991.7	1,209.9	1.22
2015	36,805	979.7	740.3	0.76
2016	36,178	983.3	880.1	0.90
2017	35,775	958.8	882.0	0.92
2018	36,084	987.3	937.4	0.95
2019	35,359	1,019.6	996.5	0.98
2020	35,802	1,010.0	1,154.4	1.14

¹Data as of May 11, 2021

Source: Adjusted Verified Totals, US only, for NCIS member companies combined with the data from non-members.

age. Additionally, program changes were also made to allow greater flexibility for producers who elected multi-county enterprise units for both irrigated and non-irrigated practices but later failed to qualify at time of acreage reporting. Changes were also introduced to allow units by summer fallow and continuous cropping practices. These new options added to the choices farmers could have in tailoring coverage to their own unique farm operations, and yet avoid unintended consequences occurring from changes in planting intentions.

As the year progressed, RMA initiated discussions with industry committees to evaluate proposed improvements to the apple fruit policy, and better articulate definitions and program administration around direct marketing and vertically integrated producers while proposing other perennial crop procedure adjustments. These discussions continue today. By late summer, RMA published a contracted evaluation

of the Pasture, Rangeland and Forage program, seeking comment on several proposed changes. RMA is evaluating the comments received and indicates additional research and follow up is likely to be conducted. And lastly, RMA continued to address 2018 Farm Bill guidance by initiating contracted research and development for potential coverage of greenhouses and locally grown foods.

As fall began and the United States headed for a Presidential election, the topic of climate change became an emerging topic for the agricultural industry. The crop insurance industry joined with other major agribusiness and farmer-led organizations to begin discussions and collaboration on how agriculture could better position itself to incentivize farmers to keep pursuing appropriate measures to reduce its carbon footprint, help in greenhouse gas reductions, and further conservation and soil health initiatives. RMA and the industry continued

its support of published cover crop guidelines along with other conservation efforts, all considered good farming practices to help crop farmers improve yields and see resulting premium rate reductions.

The 2020 crop year brought RMA, AIPs, and farmers an unprecedented number of agronomic and operational challenges on various fronts all compounded by Covid-19. Combined with ongoing trade issues, extreme weather events, and any remaining challenges from the coronavirus, the Federal crop insurance program and its stakeholders will continue to confront new and complex agricultural issues as they emerge. Along with assistance and support from NCIS, and all of the program partners who work together to make the Federal crop insurance program successful, these efforts will continue to reinforce the program mission of promoting the national welfare by improving the economic stability of agriculture through a sound, efficient, and effective system of crop insurance.

U.S. Crop-Hail Experience

Crop-Hail insurance policies insure direct damage from hail as the primary cause of loss. In addition to hail damage, many policy forms carry endorsements for additional perils such wind, fire, vandalism, and theft. This section reports the results for all losses on hail policies, including the experience of NCIS non-member companies not included in NCIS' Annual Statistical Summary reports.

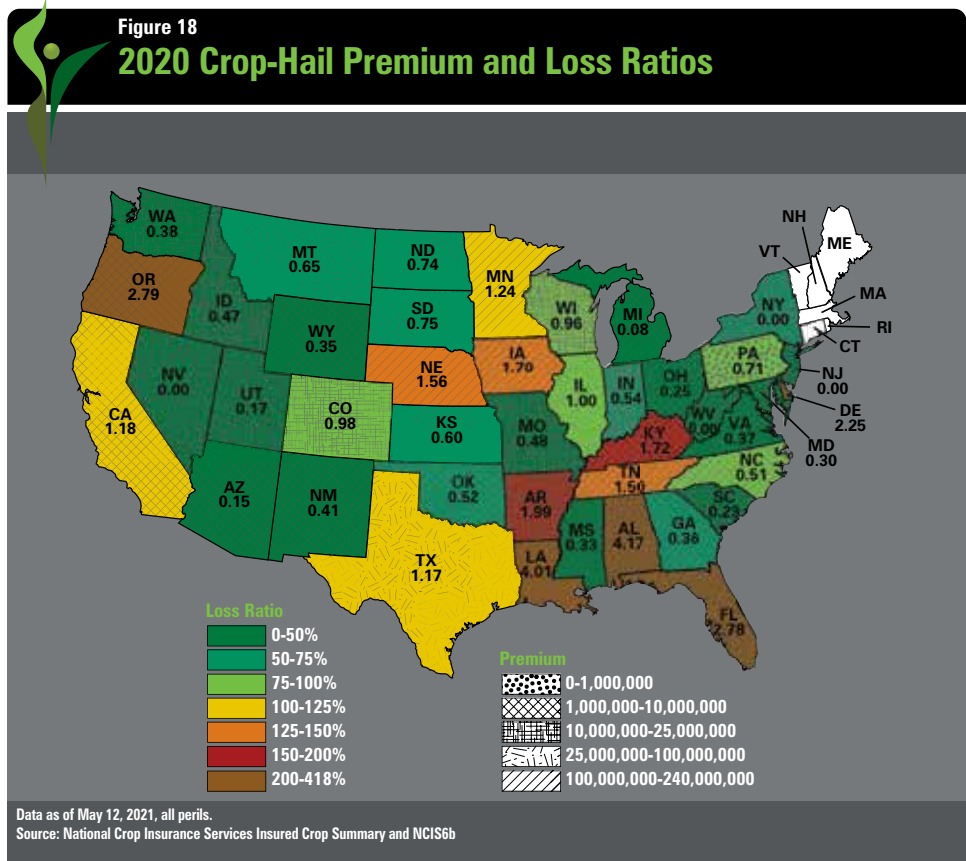
Crop-Hail premium had risen gradually over the past 10 years but was down slightly in 2020 at \$1.010 billion. This is a decrease of \$9.6 million in premium, down from \$1.019 billion in 2019. Crop-Hail provided \$35.8 billion in private insurance protection to U.S. farmers in 2020, and



losses paid out were \$1.2 billion (Table 7).

The industry loss ratio, defined as paid losses divided by premium written, was significantly higher in 2020 at 1.14, up from 0.98 in 2019 and 0.95 in 2018. Seven of the past 10 years have seen loss ratios of 0.90 or more with the record being the 2014 loss ratio of 1.22.

There were ten storm days that exceeded \$20 million of loss in 2020. The most significant storm occurred on August 10, when a derecho hit the Midwest damaging crops, homes, and businesses in Iowa and Illinois. The derecho caused nearly \$133 million in Crop-Hail losses with \$101.6 million of that occurring in Iowa alone. Five days during July each experienced damage of more than \$30 million for a combined total of \$345 million. July 8 accounted for the most daily damage during the month with \$114.4 million of crop damage in Nebraska (\$97.6 million), Minnesota (\$8.6 million), North Dakota (\$4.3 million), and Illinois (\$1.3 million), while on July 9 damage of \$83 million was caused in Nebraska (\$49 million), Illinois (\$13 million), Iowa (\$11.3 million), Minnesota (\$4.2 million), Wisconsin (\$2.4 million), and Kansas (1.6 million). This was followed by a storm on July 10 with \$42 million of total damage concentrated in Nebraska (\$37 million), Iowa (\$1.6 million), Montana (\$1.55 million), and South Dakota (\$1.4 million). The next day, July 11, experienced a further \$75 million of widespread loss in Illinois (\$23 million), Iowa (\$19.4 million), Minnesota (\$18 million), Indiana (\$6.7 million), Nebraska (\$5.7 million), and Texas (\$1.0 million). And on July 8, a single storm caused almost \$47 million in damage in Nebraska alone and a day later another storm damaged more than \$17 million



in crops in that state again. July 6 saw damage of \$30 million with Nebraska (\$25.3 million) and Minnesota (\$1.12 million) accounting for the majority.

In total, the losses from the top 10 storm days amounted to \$570 million, up significantly from \$206 million in 2019, even exceeding the \$420 million paid out in 2014. Four states took the brunt of the major storms, with Nebraska absorbing \$244 million of loss, Iowa \$145 million, Illinois \$59 million, and Minnesota \$37 million.

Crop-Hail loss ratios by state are shown in Figure 18. Colors identify states with similar

loss ratios, while shading is used to identify states with similar premium volume. Crop-Hail insurance was purchased in 42 states in 2020. Of these, 13 had loss ratios greater than 1.00 and are shown in red, gold, and brown on the map. Alabama had the highest loss ratio of 4.17, followed closely by Louisiana at 4.01.

The top five states by premium volume—Nebraska, Iowa, Minnesota, North Dakota, and Illinois—experienced loss ratios of 1.56, 1.70, 1.24, 0.74, and 1.00, respectively. Overall, 18 of the 42 states with premium had loss ratios of 0.50 or less, shown in dark green on the map.



Eight states, shown in medium green, had loss ratios between 0.50 and 0.75, and three states, shown in light green, had loss ratios falling between 0.75 and 1.00.

[Information sources for this section include: NCIS' Insured Crop Summary and claim files.]

Canadian Crop-Hail Experience

This section of the report was prepared by the Canadian Crop-Hail Association. It can be found on their website: www.CropInsuranceInCanada.org.

Canadian Prairie farmers continued to insure their crops for hail damage at near record levels in 2020. 2020 was a below the five-year average for claims but endured higher than average claim payments. Overall, the industry recorded a near break-even type of year. Claims produced insurance payouts of more than C\$192 million on over 12,100 claims in Western Canada. Farmer premiums totaled just over C\$300 million for an industry loss ratio of 64 percent.

Timely rains and good seeding conditions gave farmers some early hope after a poor fall harvest. For some areas, the weather dried out quickly. Reserve moisture helped many producers across the prairies. Some crops did suffer from insufficient moisture and excess heat. With industry premiums decreasing an average of 15 percent over the past five years, producers welcomed one of the few declining agricultural input costs.

Some parts of the prairies received less than average storm days throughout the summer, but storm severity made up for the decrease. July storms caused havoc across Alberta and Saskatchewan. But a single-day late August event in Saskatchewan was costly to ripe crops. Manitoba was spared after two years of higher-than-average losses. Activity was widespread around the prairies (Table 8).

Hardest hit was Alberta with an industry loss ratio of 83 percent, similar to 2019. Saskatchewan followed with a 65 percent loss ratio, down from 95 percent a year earlier. Manitoba saw limited hail activity and posted a 29

percent loss ratio after suffering a 93 percent loss ratio in 2019.

After a year of contrasts and challenges, producers welcomed the ideal seeding conditions. 2019 poor harvest conditions provided much needed sub soil moisture to help get the 2020 seeding year off to a great start. Summer's timely rains for many provided what looked to be above average crop conditions. A warm dry fall provided many straight days of harvest allowing producers to reap the benefits of the growing season. The summer was mostly average for the number of storm days. The storm season was spread mostly through June to August. September was spared, allowing producers to finish up harvest. Claim frequency (Claim to Policy) was down four percent from the five-year average. Storm severity (Average per Claim) was up 10 percent from the average.

Alberta hail claims result in second straight year of negative results

Alberta's storm activity resulted in similar activity to 2019 for the industry. An early se-



vere storm that pummeled the city of Calgary also caused crop damage; however, early crop recovery helped lessen industry losses. Claim activity was up over 26 percent compared to the five-year average, while claim severity at more than C\$20,000 per claim was higher by more than 20 percent compared to the average. Total hail payments for 2020 were reported at just over C\$69 million. The overall reported loss ratio was 83 percent. Total sums insured increased for 2020, with rates appearing to stabilize.

Saskatchewan reported average loss year

Saskatchewan saw a decrease in storm activity compared to 2019. A late August storm dampened what was looking to be a light hail season for industry insurers. The late storm on harvest ready crops was the most expensive of the year. Claim activity was down one percent compared to the five-year average, while claim severity at C\$13,000 per claim was a decrease of about 15 percent compared to average. Total hail payments for 2020 were reported at just over C\$163 million. The overall reported loss ratio was 65 percent. Total sums insured increased for 2020, with average rates continuing to soften.

Manitoba records light hail activity for 2020

Manitoba recorded a decrease in storm activity compared to 2019. Little storm activity resulted in positive results for the province. Claim activity was down 59 percent compared to the five-year average, while claim severity at C\$9,900 per claim was down 22 percent compared to the average. Total hail payments for 2020 were reported at more than C\$15 million. The overall reported loss ratio was 29 percent. Total sums insured decreased slightly for 2020, with average rates decreasing slightly as well.

Again, we appreciate the contribution of the Canadian Crop-Hail Association in preparation for this section of the article.

Conclusion

Upon review, 2020 was yet another exceptional year, one that called for the crop insurance industry to respond with the flexibility and adaptive capacity required to address multiple disasters within the context of a global pandemic with effects that were, and

Table 8
Canadian Crop-Hail Results, All Perils

CROP YEAR	PREMIUM Mil. C\$	LOSSES Mil. C\$	NUMBER OF CLAIMS	LOSS RATIO ¹
2011 ²	269	164	15,000	0.61
2012	341	280	21,600	0.82
2013	344	172	13,321	0.50
2014	316	249	13,372	0.79
2015	274	167	13,222	0.61
2016	302	269	20,325	0.89
2017	286	97	8,633	0.34
2018	270	171	11,709	0.63
2019	264	247	16,367	0.94
2020	301	193	12,137	0.64

¹Loss ratios do not reflect loss adjustment costs
²Number of claims exceeded value indicated
Data as of November 30, 2020 Source: The Canadian Hail Association

remain, global in scale.

Challenges were many: service delivery during the pandemic; the implementation of the Hurricane Insurance Protection Wind Index endorsement in a year characterized by record storm landfalls; and working through the severe crop damage resulting from the

August 10 derecho. In the 2021 crop year, the pandemic is still with us and surely there will be no shortages of crises to address. Delivering risk management is what we do, and the events of the past year demonstrate that the crop insurance industry stands ready to respond when needed.

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