

2017: The Year in Review

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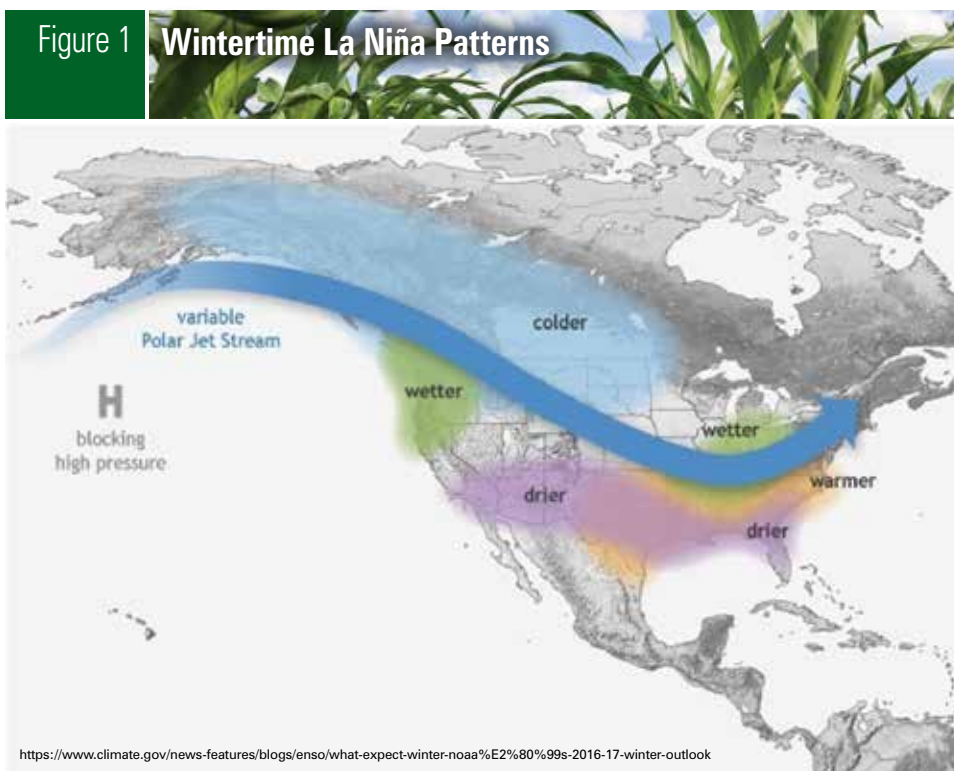
OVERVIEW

The risky nature of agriculture and the effectiveness of Federal crop insurance were both on full display again in 2017. While some areas experienced favorable growing conditions, there were areas of distress—severe drought in the Upper Plains, wildfires in and flooding in the West, and hurricanes along the Gulf Coast.

The year began with an unusually warm and wet winter for most of the country except for the northwest that experienced periods of extreme cold and parts of the Central and Southern Plains where below average precipitation resulted in continued drought conditions. The wet weather continued into the spring, with excess moisture in some areas experiencing flooding conditions that delayed planting. The slow start to plantings for major crops was short lived as warm April temperatures allowed plantings to recover to at or near their five-year average pace except for spring wheat. For the second year in a row by the end of the season the area planted to principle crops was just over 319 million acres.

The production of most major commodities was down from last year except for soybeans and cotton. Wheat production was significantly lower than in 2016 due to poor growing conditions and declining plantings. A combination of smaller acreage and reduced yields resulted in record low production of barley and the largest reductions in year-to-year sorghum production since 2006. Corn production fell below the previous year as increased yields failed to overcome the reduction in planted acres. In contrast, increased planted area of soybeans more than offset somewhat lower average yields resulting in 2017 production exceeding the previous year. Cotton production exceeded the previous year despite severe weather

Figure 1 Wintertime La Niña Patterns



challenges in some areas, as favorable growing conditions in major cotton production regions resulted in increased average yields on a greater number of planted acres.

The crop insurance industry continued to recover from the 2012-2013 period with a gross loss ratio of 0.50, though this value is expected to increase due to remaining open claims. The state with the largest dollar loss in 2017 was Texas in part due to extensive crop damage in the coastal areas of the state due to hurricane Harvey. North Dakota, South Dakota, Kansas, and California were the other states with the largest volumes of losses attributed to drought, hail, heat, and excess

moisture. There were five states with loss ratios above 1.0 accounting for \$561 million, 11 percent, of total loss payments for 2017.

As in the past, this annual review provides an accounting of the 2017 crop year that covers events that had an impact on the industry. A discussion of the year's weather and how it impacted crop production, an overview of commodity market developments and prices, a breakdown of the federal crop insurance program performance, highlights of developments in RMA policies and programs and a look at the crop-hail business in the U.S. and Canada are provided. In the face of continuing depressed farm income and an

increasingly uncertain future this review helps to demonstrate the important role played by an available, affordable, and viable crop insurance program for U.S. agriculture.

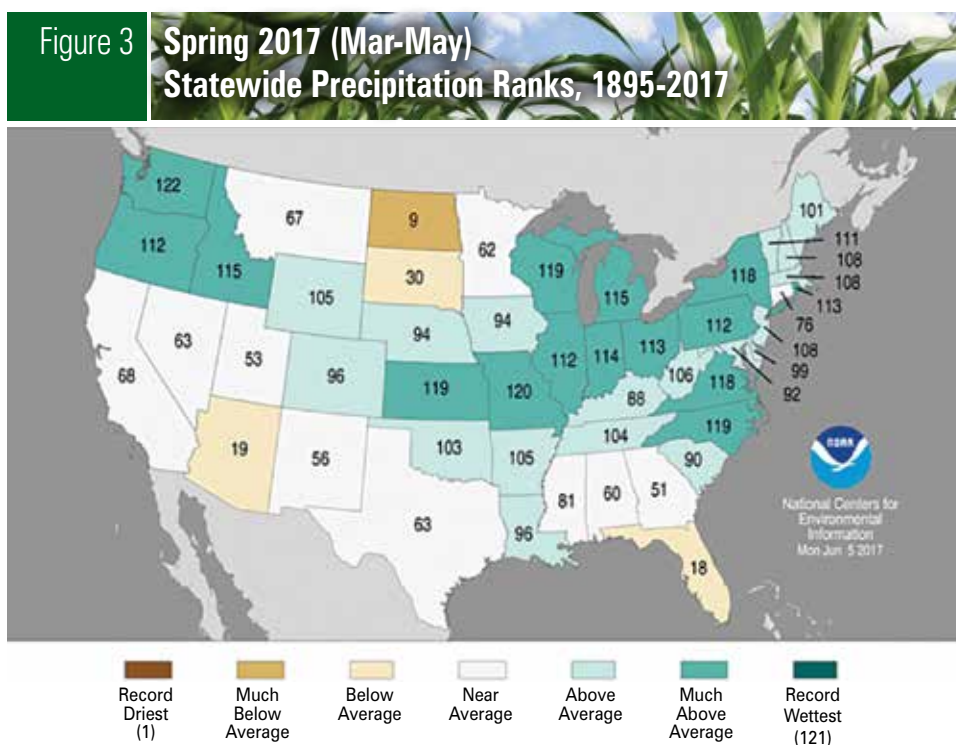
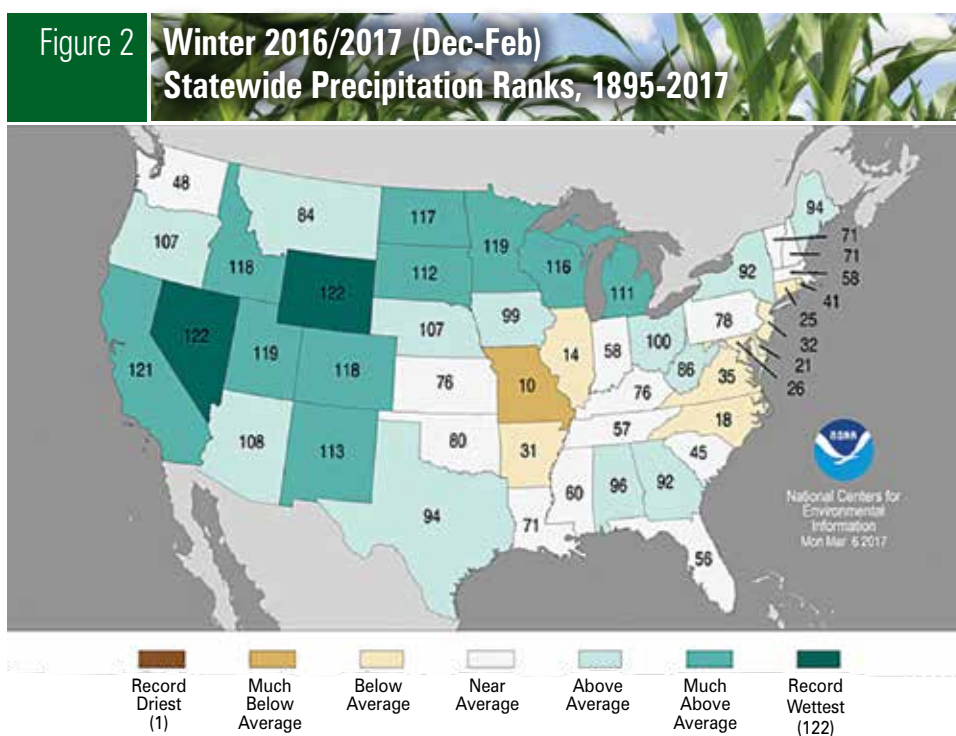
U.S. WEATHER AND PRODUCTION OF MAJOR CROPS

Winter 2016-17: Last year discussions about the weather were dominated by what was reported as one of the strongest El Niño episodes in history. El Niño and La Niña are part of a cycle that runs over the course of three to seven years and while La Niña don't always follow El Niño, it is more likely to do so after a strong El Niño. (Figure 1.) Accordingly, as the year began it was widely expected that the U.S. would experience weather conditions consistent with the impacts of a La Niña period. In general, such events have resulted in below-average precipitation and above average temperatures in the southern and southeastern parts of the U.S. with colder and wetter conditions in the northern parts of the nation. Roughly opposite of the effects linked to El Niño years.

However, predicting the weather can be tricky. The La Niña quickly faded, and by the end of the winter it had disappeared. A pool of cool water remained in the northeastern Pacific Ocean that may have resulted in an active Pacific jet stream that led to the Nation's wettest December-February period since 1997-98. The winter weather did have some similarities with what has been experienced in La Nina periods as, in general, warmer temperatures were experienced in all but the Nation's northwestern corner. In fact, it was the warmest February recorded in the U.S. since 1954.

There were some periods of extreme cold in mid-December and early January; however, for the most part colder weather was only experienced in the Northwest. The lower temperatures and precipitation caused difficulties for livestock and wildlife. Heavy snow was reported to have damaged some storage facilities in the region as well.

The Plains and Midwest had enough snow cover to limit damage to winter wheat during brief periods of extreme cold. As indicated on the precipitation map (Figure 2); some states in the Central and Southern Plains were more concerned with the potential effects of drought conditions, not cold weather relative to the wheat crop.

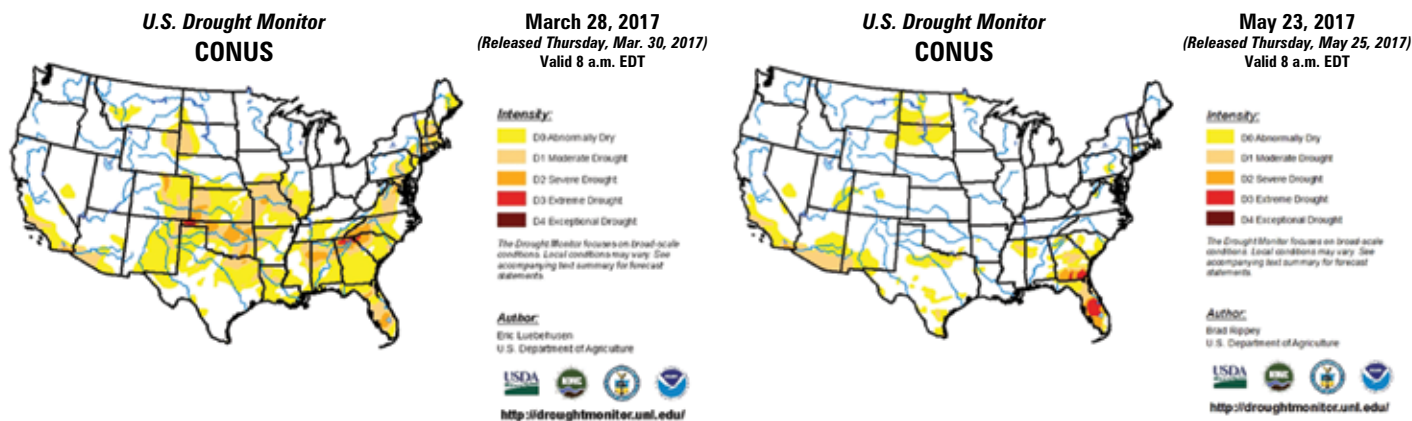


In other areas the winter was one of above average precipitation. Stormy weather in the northern and western U.S. was especially evident in the Intermountain West, as well as central and northern California., resulting in flooding and related problems.

The wet winter reduced overall drought conditions in the U.S. from a 31.5 percent reading at the end of November of 2016 to 14.1 percent at the end of February 2017 as measured by the Drought Monitor. However, not all areas of the country were equally affected. Below average

¹ <http://www.climatecentral.org/news/will-la-nina-follow-one-of-strongest-el-ninos-20223>

Figure 4 Record Drought Mitigation from Spring Moisture, 2017



precipitation from the southern Appalachians to southern New England, and pockets of the Central and Southern Plains into the middle Mississippi Valley created or continued persistent drought conditions in those areas.

Spring 2017: The spring saw widespread moisture across the United States. Few areas of the country did not receive above average levels of precipitation (Figure 3). Exceptions included the Northern Plains and lower Southeast. In some areas, too much rain resulted in lowland flooding and caused planting delays, especially the Mid-South and lower Midwest. In perhaps a glimpse of what was to come, the spring also included several extreme weather events. Early in March, wildfires plagued the Central and Southern Plains, while a blizzard hit the Northeast pushing freezing temperatures into the Southeast. These events were followed by a late season snow in the Central and Southern High Plains that caused damage to winter wheat and significant loss of livestock. Out West, a good year of snow accumulations resulted in much needed moisture as warm weather stimulated the annual snowmelt. In some areas excessive snowmelt, following a wet winter, resulted in flooding and contributed to delays in planting and crop development.

The wet spring and winter brought drought levels to record lows across the U.S. By the end of May, drought covered just 4.5 percent of the U.S., down from 16 percent in March (Figure 4). The drought coverage in May was the lowest recorded in the country during the modern Drought Monitor era, which began in 1999. While the moisture brought much comfort to most of the country, it did not bring relief to the drought conditions in the Northern Plains.

Crop Planting Progress and Crop Conditions

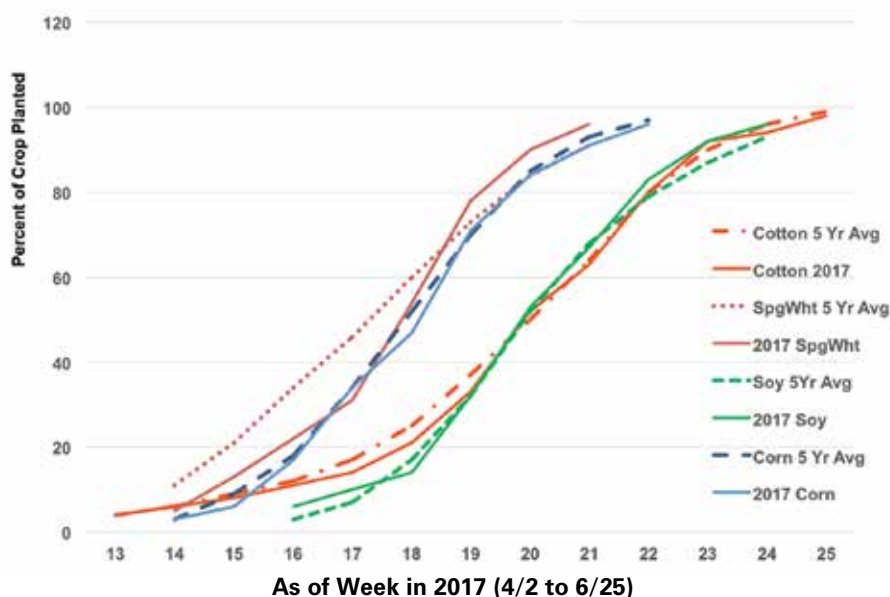
Planting season began with temperatures generally above normal for most of the U.S. The exception was continued cold weather in the Northwest. In addition, there was above average rainfall in most areas, and some excessive moisture in parts of the lower Mississippi Valley and Washington. Temperatures were above normal across most of the United States during the month of April. Plantings of major crops proceeded in line with their five-year average ex-

cept for spring wheat, which lagged due to excess moisture early in the planting season (Figure 5).

The generally favorable weather allowed for 3 percent of the corn crop to be planted by April 9, slightly behind the previous year but equal to the five-year average. By April 30, 34 percent of the 2017 corn crop was in the ground, about the same as the five-year average.

Cotton producers got off to a slow start in Texas, the largest cotton producing area and by April 30 all cotton plantings were only about 14 percent, lagging the five-year average by 3 percent.

Figure 5 Planting Progress: 2017 Acres Planted as a Percent of Previous 5 Year Average



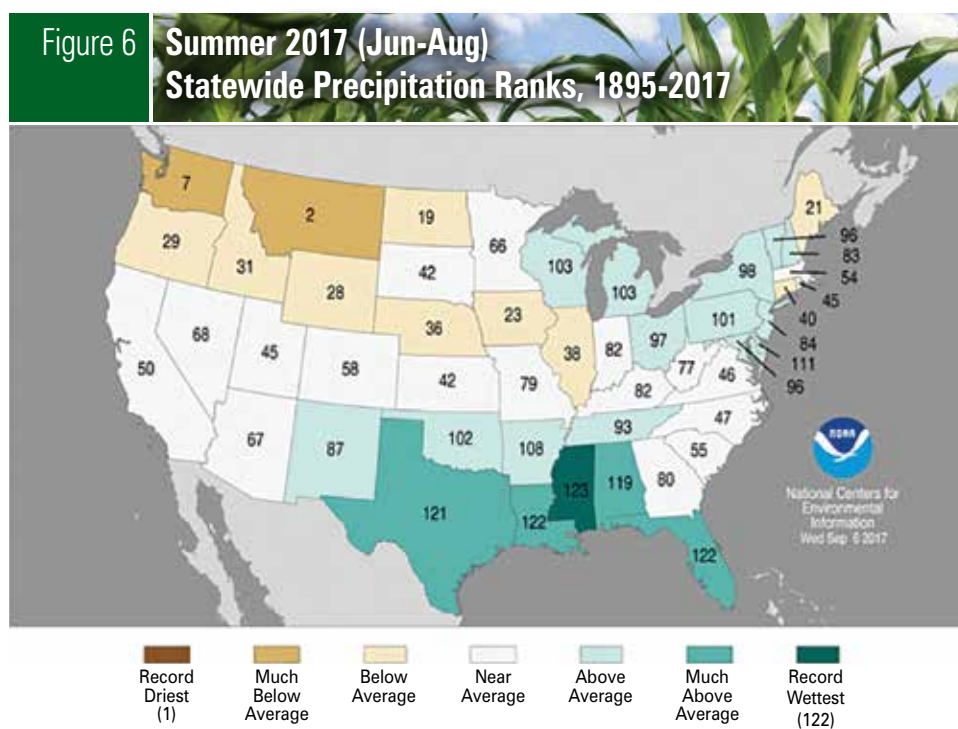
Source: USDA, National Agricultural Statistics Service, Crop Progress Report
https://www.nass.usda.gov/Quick_Stats/Lite

Cooler than normal temperatures and dry weather dominated in May for most of the Cornbelt. By the middle of the month, 71 percent of the corn crop had been planted, slightly ahead of the five-year average. Cotton plantings continued at a pace only slightly below the five-year average with 33 percent of the crop in the ground. By the end of the month (week 21), 67 percent of the soybean crop had been planted, only 1 percent behind the five-year average. At the same time, spring wheat plantings had accelerated from their slow start with 96 percent of the crop seeded, 5 percent ahead of the five-year average. By May 28, 67 percent of the Nation's soybean crop was planted, 4 percentage points behind the previous year and slightly behind the five-year average.

The planting of the Nation's corn crop was completed in early June, with 96 percent of the crop in place by June 4, only 1 percent behind the five-year average. Soybean plantings wrapped up by the middle of the month slightly ahead of the five-year average pace. And by the end of the month the Nation's cotton crop had been planted only 1 percent behind the five-year average for the end of June.

At the end of the planting season, the USDA reported 319.1 million acres planted to principal crops down slightly from 2016. Favorable soybean prices relative to corn and other grains contributed to record plantings of 90.1 million acres, up 8 percent from 2016. As soybeans compete with corn in many areas of the country, the planted area for corn declined 4 percent from 2016 to 90.2 million acres. Reduction in 2017 planted acreage for other feed grains was also noticeable. Sorghum plantings were down 16 percent from the previous year to 5.63 million acres and the area planted to barley was down 19 percent from last year to 2.48 million acres. This was the lowest acreage planted to barley since records began being kept in 1866. Oat planted acreage was down 8.5 percent from 2016.

For other oilseeds the change in year-to-year area planted was mixed. Peanuts continued to trend upward reaching its highest level since 1991, with 1.87 million acres planted, 12 percent above 2016. Record canola plantings of 2.08 million acres were 21 percent above last year's level. However, sunflower planted acres declined by 12 percent from 2016, down to 1.4 million acres. Safflower plantings increased only slightly, 1 per-



Source: <https://www.ncdc.noaa.gov/temp-and-precip/us-maps>

cent, to just over 143,000 acres while flaxseed plantings continued to decline, down 19 percent from the previous year to 303,000 acres.

A 22 percent increase in cotton acreage in Texas in 2017 contributed to the increase in upland planted area overall, at 12.4 million acres, up 25 percent from 2016. This continues the upward trend in cotton plantings since the low point of 8.6 million acres in 2015. American Pima cotton acreage also continued to increase, up 29 percent from the previous season at 251,500 acres driven by a rebound in California planted acres.

All wheat planted acreage in 2017 was just over 46 million acres, down over 8 percent from 2016. Winter wheat plantings, which account for around 71 percent of all wheat acreage, declined by more than 9 percent, spring wheat by almost five percent, and durum by over 4 percent.

Summer 2017: The summer of 2017 will go down as one of extremes, from hurricanes to wildfires to continued and worsening drought. Summer began with higher than average temperatures in the western U.S. For example, in the Southwest, temperatures were 4°F above normal for the month of June. Below average temperatures were prevalent in the Delta and along the lower Atlantic Coast. Precipitation varied from drier than normal west of the Mississippi

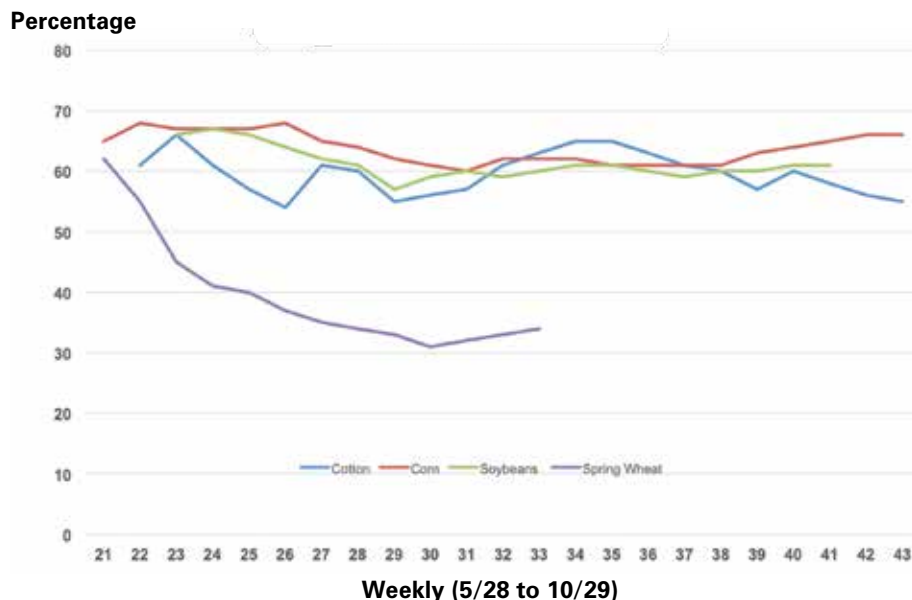
contributing to expanding drought levels in the Great Plains and causing stress for pastures in Montana, North Dakota, and South Dakota. In contrast the remnants of Tropical Storm Cindy resulted in excess moisture delaying field work in Alabama, Louisiana, and Mississippi. Areas along the Gulf Coast recorded more than 15 inches of rain for the month of June (Figure 6).

Warmer weather continued into July across most of the United States. The only exception was cooler temperatures in portions of the Great Lakes and New England. Rainfall continued to be plentiful in the Eastern Corn Belt and Mid-Atlantic region while drought conditions continued to prevail in the upper Missouri Valley and created additional stress on crops in Montana and the Dakotas.

The warmer conditions began to moderate in some areas in August. The central and northeastern parts of the country experienced below average monthly temperatures. Similar below average temperatures were recorded in the Great Plains and Mississippi Valley. However, the Western part of the country continued to suffer from extreme heat. The warmer conditions continued as well with the western Corn Belt, southern Plains, and lower Mississippi Valley receiving above normal rainfall.

² USDA, National Agricultural Statistics Service, 2017 Summary of Production, January 2018. "Weekly Outlook: Implications of the Prospective Planting Acreage and Grain Stocks for Corn and Soybeans." *farmdoc* daily (7):60, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign April 3, 2017.

**Figure 7 U.S. Crop Conditions, 2017
Share of Crop Rated Good or Excellent**

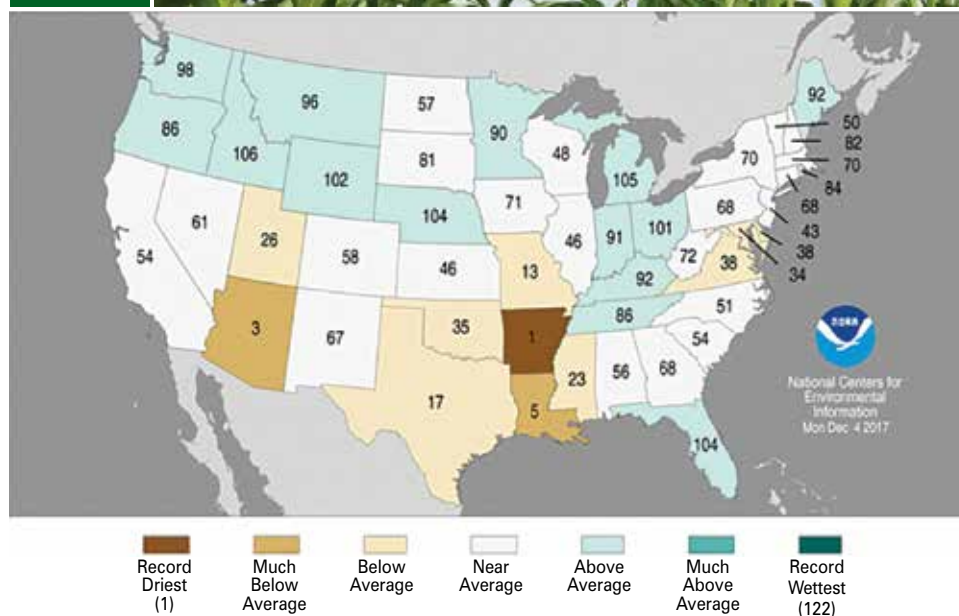


Source: USDA, National Agricultural Statistics Service, Crop Progress Report
https://www.nass.usda.gov/Quick_Stats/Lite

Abundant moisture resulted in ideal conditions for growth of grasses and brush throughout the Western region. The continued hot weather in the West led to drying and transformed the lush grass and brush into an ideal fuel source in

addition to what forest service estimates placed at 6.3 billion dead trees. These conditions contributed to the outbreak of many wildfires that spread from the Southwest to California and to the Northwest throughout the summer months.

**Figure 8 Fall 2017 (Sept-Nov)
Statewide Precipitation Ranks, 1895-2017**



Source: <https://www.ncdc.noaa.gov/temp-and-precip/us-maps>

Western wildfires were reported to have resulted in \$11.9 billion in damage. At the same time the drought in the Northern Plains continued to worsen resulting in deterioration of pastures and rangeland as well as the spring wheat crop. By the end of summer, the conditions in Montana and the western Dakotas was reportedly the worst since the drought of 1988.

The end of summer was marked by one of the worst weather events since 2004 when Hurricane Harvey, a category 4 Hurricane made landfall near Rockport, Texas, on August 25. The storm resulted in record levels of rain and catastrophic flooding in Houston, eastern Texas, and western Louisiana. Remnants of the storm continue to dump damaging levels of precipitation as it played out across the Mississippi Delta and the Ohio Valley damaging crops along the way. Unfortunately, Mother Nature was not done yet as there was more disturbing weather on its way.

Crop Conditions

After a promising start the U.S. corn crop condition weakened and by early July, 65 percent of the 2017 U.S. corn crop was rated good to excellent, 11 percent behind the previous year (Figure 7). The corn crop improved somewhat throughout the season and ended with 66 percent of the crop rated good to excellent, 8 percent below the 2016 crop. Despite these ratings late season weather patterns provided favorable growing conditions that would help to boost the overall average yield for the season.

The condition of the Nation's soybean crop was much less robust than the previous year and continued to decline until late July. In early June, 66 percent of the crop was rated good to excellent, 6 percent below 2016 ratings; by late July only 57 percent of the crop was in good to excellent condition, 14 percent below last year's crop. While temperatures were generally favorable erratic rainfall with wet conditions in the northern areas and dry in the south may have resulted in the poorer overall crop conditions. More favorable weather in August and September allowed the crop to recover, but overall conditions in the good to excellent range never achieved the level of the 2016 crop and was the lowest level since the 2013 crop.

The U.S. upland cotton crop, in contrast, for most of the year was rated at levels of good to excellent above those of the past four seasons. Early

³ NOAA, Ball State University Center for Business and Economic Research and CoreLogic <https://www.vox.com/energy-and-environment/2017/12/28/16795490/natural-disasters-2017-hurricanes-wildfires-heat-climate-change-cost-deaths>

in the growing season, conditions were ideal for growing cotton in Kansas, Oklahoma and the high plains of Texas due to early rains followed by warmer temperatures and dry conditions. Except for the effects of Hurricane Harvey on the coastal regions, Texas continued to have relatively ideal growing conditions. In the Southeast, rainfall and warmer than normal temperatures created some pest and diseases issues, but drier weather later in the year provided favorable growing conditions.

The spring wheat crop recorded the poorest performance of the year. Drought conditions throughout the growing season led to one of the worst crops in recent memory. The crop is grown primarily in the High Plains and Pacific Northwest, with the largest production in North Dakota. As of mid-July, 35 percent of North Dakota's 5.3 million acres (48 percent of the total) was ranked in poor to very poor condition. By the end of the season, only 34 percent of the crop was ranked in good to excellent condition, compared to the previous five-year average of 66 percent.

Fall 2017: The fall saw a resurgence of the influence of La Niña and it became more so as the season progressed. Ironically a La Niña related weather pattern included a drying trend in coastal Texas and southern Florida, an area that had been devastated by hurricane-related flooding a short time before.

The fall season began as the summer season ended, with a major hurricane making landfall and resulting in catastrophic damage. Hurricane Irma was the most powerful hurricane in recorded history, a Category 5 storm that made landfall on Barbuda on September 6, 2017 with 85 miles per hour winds lasting for 37 hours. After leaving a path of disaster across the Caribbean, Hurricane Irma had been downgraded to a Category 4 by the time it hit Florida, making landfall in Cudjo Key, 20 miles north of Key West and then moved on to Naples. A much lesser storm continued up the state to Tampa and remnants continued to Georgia. The second major hurricane to hit the U.S. in 2017 resulted in massive flooding, power outages, and crop damage particularly to the Florida citrus crop.

In contrast to the hurricane experience, continued drought conditions in the Northern Plains and dryness in the Central and Southern Plains, along with warm temperatures, resulted in poor growing conditions for the winter wheat crop. Wet conditions characterized the fall season in the Northwest while in the Midwest wet conditions contributed to delays in final corn harvest.

Table 1 Crop Yields and Production

CROPS	2016 YIELD	2017 YIELD	2016 PRODUCTION	2017 PRODUCTION	% CHANGE
	Bu./Harv. Ac.	Bu./Harv. Ac.	Mill. Bu.	Mill. Bu.	
Corn	174.6	176.6	15,148	14,604	-3.6%
Barley	77.9	72.6	200	142	-29.0%
Grain Sorghum	77.9	72.1	480	364	-24.2%
Soybeans	52	49	4,296	4,391	2.2%
All Wheat	52.7	46.3	2,309	1,741	-24.6%
Winter Wheat	55.3	50.2	1,673	1,269	-24.1%
Other Spring	47.3	41	532	416	-21.8%
Upland Cotton	Lbs./Harv. Ac.	Lbs./Harv. Ac.	1,000 Bales	1,000 Bales	
	855	889	16,601	20,570	23.9%
Rice	Lbs./Harv. Ac.	Lbs./Harv. Ac.	1,000 Cwt.	1,000 Cwt.	
	7,237	7,507	224,145	178,228	-20.5%

Source: NASS Crop Production Annual Summary, January 2018
<http://usda.mannlib.cornell.edu/usda/current/CropProdSu/CropProdSu-01-12-2018.pdf>

La Niña's influence was credited with generally dry conditions in the Southwest and Southern U.S. Wildfires again ravaged California beginning in the north, and just after the end of the fall, other fires broke out in the south. As a testament to the wide swing in weather patterns in 2017, six months after drought conditions were reported to be a record low of 4.5 percent for the lower 48, were, by the end of November, 21.1 percent due to a drying out of the southern U.S. and continued dryness in the Northern plains. (Figure 8.)

[The information sources for this section were: National Agricultural Statistics Service, ISSN: 1057-7823, Crop Production 2017 Summary, January 2018]

2017 Crop Production Summary

Overall production of major commodities was down from the 2016 levels except for soybeans and cotton (Table 1). Despite a record year for corn yields, 176.6 bushels per acre, production declined by almost 4 percent in line with the reduction in acres planted and harvested. By comparison, production declines for other feed grains such as barley and grain sorghum were much more significant. The back-to-back high barley prices in 2012-13 stimulated production and resulted in burdensome stock accumulation and prices have continued to decline since 2014. Farmers have reacted by planting the least amount of barley in the U.S. since 1866; 2.48 million acres, down 19 percent from 2016. Combined with a 7 percent decline in yield, 2017 barley production declined to 142 million bush-

els, 29 percent below the previous year. The production of grain sorghum also declined in 2017, albeit somewhat less than barley. The U.S. grain sorghum crop was reported to be 364 million bushels, down more than 24 percent from 2016. The decrease in production was attributable to a decrease in planted acres to 5.63 million, down 16 percent from last year, combined with lower yields, 72.1 bushels per acre, down almost 6 percent from the previous year.

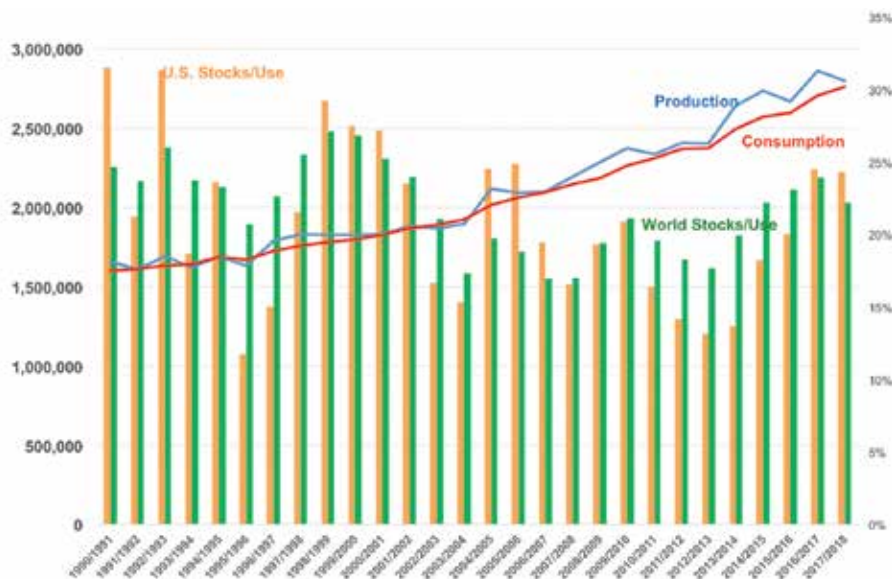
In 2017, U.S. soybean crop conditions did not measure up to 2016 and yields declined to an average of 49 bushels per acre, almost 3 percent below the 2016 record yield of 52 bushels per acre. However, with a record of 90.1 million planted acres, an 8 percent increase from the previous year, overall production increased by more than 2 percent to a record 4.391 billion bushels.

As mentioned earlier, 2017 was a dismal year for U.S. wheat production. All wheat production declined by almost 25 percent to 1.741 billion bushels. A combination of poor crop conditions contributing to lower yields and a decrease in planted acres resulted in declines in production in winter wheat and other spring wheat of 24.1 percent and 21.8 percent respectively.

U.S. rice production also declined in 2017, down more than 20 percent from 2016 to just over 224 thousand hundred weights. The decrease in production came despite increased yields in all states but Texas and California as the prices of alternative commodities attracted acreage away from rice production. A reduction in planted acres of 2.46 million acres, down 22 percent from 2016, combined with flood-related

⁴ <https://www.thebalance.com/hurricane-irma-facts-timeline-damage-costs-4150395>

Figure 9 World Grain & Oilseeds Production, Use & Stocks



Source: USDA, FAS, Markets and Trade Data, April 11, 2018
<https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery>

abandoned acres in parts of Arkansas, contributed to the decline in production in 2017.

In contrast, U.S. cotton producers in Texas, Oklahoma, and Kansas experienced excellent growing conditions outside of the hurricane affected areas of the southern Gulf Coast. Weather problems related to hurricanes Harvey and Irma in the Southeastern producing regions were mitigated somewhat by late-season drier conditions.

Cotton production in the Delta benefited from favorable growing conditions in the early summer. Overall upland cotton production increased by about 24 percent resulting from increased yields recorded on a 25 percent larger planted acreage base.

Dry edible bean production also increased substantially from the previous year. A substantial increase in area, up by almost 26 percent

from 2016, particularly in Montana and North Dakota, offset a 3 percent decline in yield per acre. Production of dry edible peas on the other hand declined 49 percent, to 14.2 million hundred weights in 2016. The dramatic decline was linked to a decline in planted and harvested acres accompanied by the lowest average yield since 1996 attributable to drought conditions in many areas.

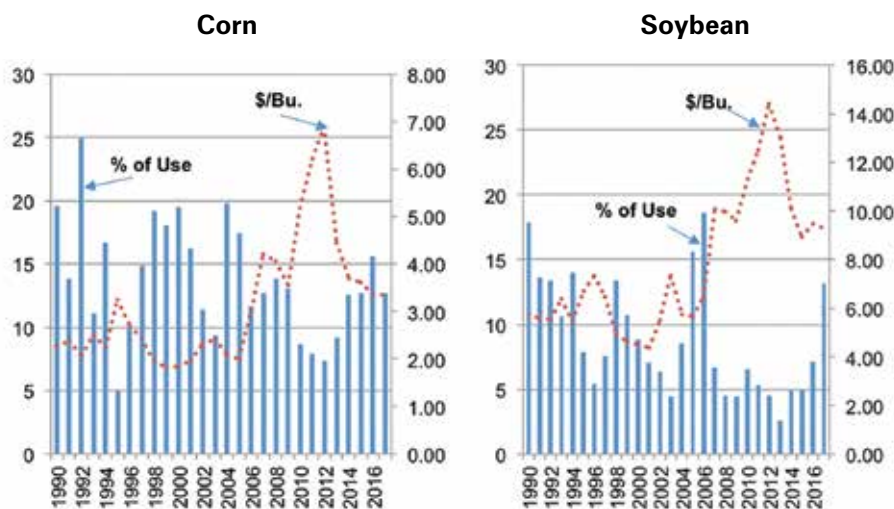
Hay crop production came in below 2016 levels. All dry hay production of 131 million tons was 3 percent lower than the previous year. A slight increase in acreage, up 1 percent, was offset by a modest reduction in average yield, 3.3 percent at 2.44 tons per acre. Production of alfalfa and alfalfa mixtures was also down from last year. A 2 percent reduction in harvested acreage, combined with a 3.9 percent decline in average yield to 3.32 tons per acre, resulted in a 5 percent decline in overall production of 55.1 million tons.

Weather-related shortfalls in production of certain crops contributed to a decline in U.S. overall production of vegetables and melons in 2017. The production of the 26 products reported by USDA/NASS declined 6 percent from the previous year, to 738 million hundred weights. The area devoted to production in 2017, 2.48 million acres, was 4 percent below 2016. However, revenue was up, with the value of utilized production up 6 percent to \$13.8 billion, led by the value of tomatoes, head lettuce and romaine lettuce. The leading vegetable crops, tomatoes, sweet corn, and onions combine for 54 percent of the total reported U.S. vegetable production. California, Florida and Minnesota were the three leading states in terms of production and value, accounting for 76 percent of the total.

The utilized production of citrus in the U.S. declined by 11 percent in the 2016-17 season from the previous year totaling 7.77 million tons. Citrus production has declined by 56 percent from the record level of 17.8 million tons in the 1997-98 season. The continued decline in bearing acreage contributed to the decline, led by reductions in Florida and to a lesser degree in California and Arizona. The value of production increased very modestly from the previous season to \$3.44 billion (packing house door equivalent). Higher prices for lemons, tangerines, and mandarins contributed to the increase in overall value of production.

[Information sources for this section include: NOAA National Climatic Data Center; USDA NASS, Quick Stats available at <http://www.nass>.

Figure 10 U.S. Prices and Carryover Stocks as a Share of Total Use 1990-2017



Sources: <https://www.usda.gov/oce/commodity/wasde>; <http://www.fas.usda.gov/psdonline/psdQuery.aspx>
 USDA, National Agricultural Statistics Service, Agricultural Prices, 3/5/2018 midpoint of annual price estimate.

usda.gov/Quick_Stats/index.php and the following annual reports: *Crop Production 2017 Summary*, January 2018; *Vegetables 2017 Summary*, February, 2108; *Citrus Fruits 2017 Summary*, August, 2017 from FarmDoc Daily]

Commodity Market Developments

The overall gap between global production and consumption of grains and oilseeds is projected to narrow in 2017-18, down 2 percent from the previous year (Figure 9). However, that difference is closing more rapidly for coarse grains than oilseeds and is driving market conditions for the big three commodities; wheat, corn, and soybeans. World oilseed ending stocks are expected to decline by 4.5 percent, led by notable reductions in Brazil and Argentina, a modest decline in global production, coupled with an increase in crush. Global soybean prices are expected to trend upward in reaction to the lower production in Brazil and crop losses in Argentina.

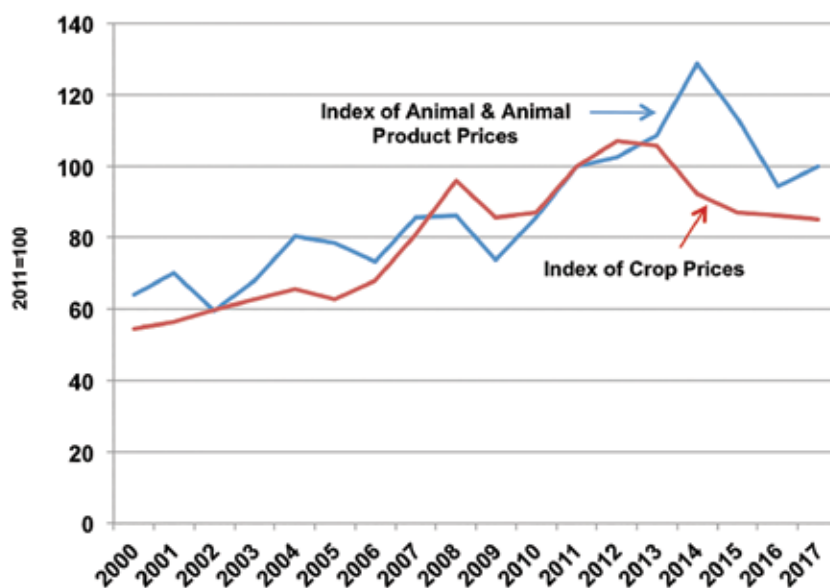
The decline in world coarse grain ending stocks is estimated to be more substantial down; 14.7 percent from the previous year. The reduction is largely due to a decline in corn stocks, estimated to be down more than 14 percent from 2016-17. The reduction in global corn stocks is associated with lower production in both Argentina and Brazil along with a significant draw-down of stocks in China. The tighter supplies are expected to contribute to some upward movement in world corn prices.

In contrast, world wheat stocks continued to build, increasing by almost 7 percent, around 17 million metric tons, from the previous year attributable to a new world record wheat crop of 759.8 million metric tons and only a slight increase in global consumption. The record crop was led by increased production in Russia, India and the EU. This was the fifth year of overall production increase. The increased stock levels are expected to continue to dampen price expectations. Quality remains the key to buyer's willingness to offer premium, above-average market prices.

In the U.S., hard red winter wheat is most affected by the plentiful global supplies. In addition, abundant corn stocks work to displace wheat in the feed use category, reducing overall demand. Significant reduction in 2017-18 production offset a decline in overall use to help reduce ending stocks from their 2016-17 levels. However, ending stocks of wheat remain above

Figure 11

U.S. Farm Prices for Crops & Animals (2000 to 2017)



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

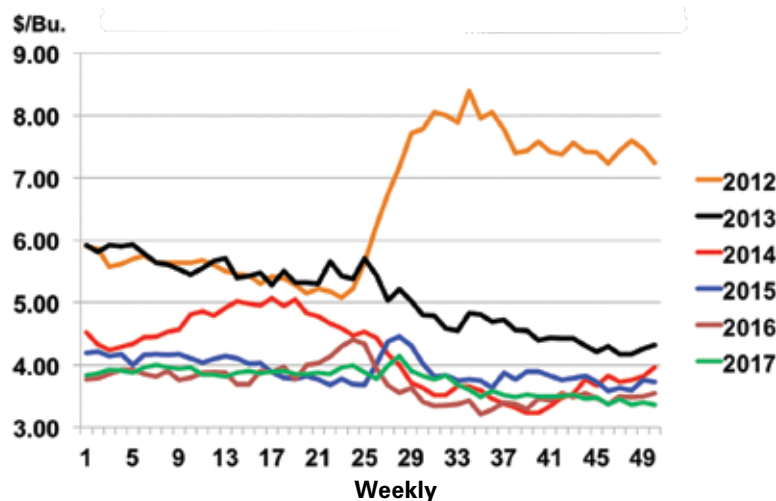
their five-year average and represent a burdensome stocks-to-use-ratio of nearly 53 percent.

Early estimates of the 2017-18 global cotton market forecast a second year of increase in production of 13 percent from the previous year, to just over 122 million bales. Favorable growing conditions in Texas, higher yields and area in China, increased area in India, and expanded planting in Southern Hemisphere pro-

ducing-countries all contributed to the upward production. Estimates for increased use in China, India, Vietnam, and Bangladesh contributed to a forecast of a 5 percent higher consumption level, to 120.4 million bales, from last year. Revisions to beginning stocks estimates resulted in an increase in global ending stocks forecast to be only about 1.7 percent, at 88.3 million bales, despite the gap between higher production estimates rel-

Figure 12

Weekly Corn Futures Prices, December Contract, 2012-2017



Data as of April 16, 2018
Source: Barchart.com

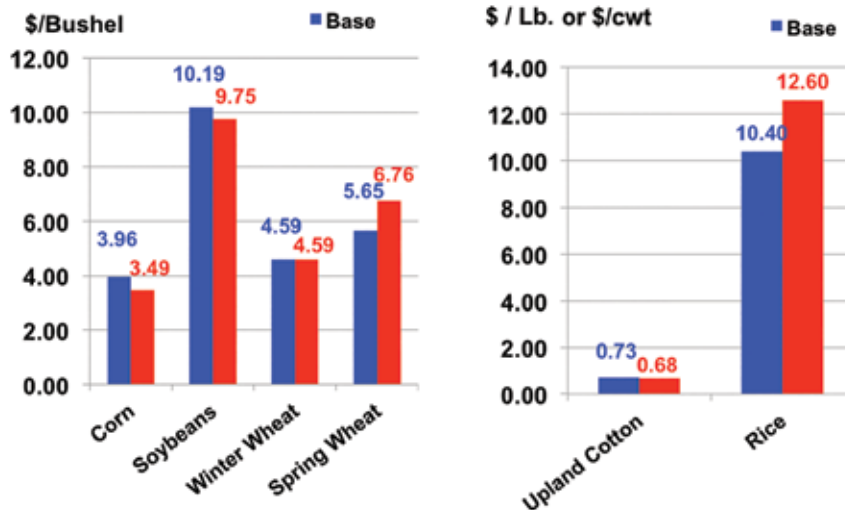
ative to lower increases in consumption.

In the U.S. however, increased cotton production of more than 18 percent coupled with around a 1 percent increase in total consumption, resulted in almost a doubling of ending stocks forecast. Most recent estimates place U.S. ending stocks up from 2.75 million bales in 2016-17 to 5.3 million bales in 2017-18 for a 29 percent stocks-to-use-ratio, up from 15 percent in the previous year. Despite the downward pressure generated by larger stocks, U.S. cotton prices are expected to remain above the previous year, based on strong global demand.

In the U.S., the overall crop price index reflects a continued horizontal slide in prices, down from the high levels seen in 2012-14 (Figure 10). Market prices for crops continue to face headwinds from burdensome stock levels and lack luster demand, particularly in the grains and oilseeds sector. At the same time animal product prices, while up slightly from the previous year, continue to be in much lower territory than the high levels of the 2012 to 2014 period.

In 2017, U.S. soybean ending stocks were expected to continue to increase for the second year in row (Figure 10). Corn ending stocks were expected to decline from the previous year's level, consistent with a falloff in production and modest gains in total use for the year. Ending stocks of soybeans swelled and were placed at 550 million bushels, almost double the 2016 level of 302 million bushels. The current estimate for soybean ending stocks is the highest since 2006. At the present level the stocks-to-use-ratio for U.S. soybeans would be more than 13 percent, up more than 70 percent from the 2016 level of 7.1 percent. Increased domestic use, up 4 percent from the previous year to 2.103 billion bushels, was offset by an estimated 5 percent decline in exports to 2.065 billion bushels, in a year when production increased for

Figure 13 Prices for 2017 RP and RP-HPE Plans of Insurance



Data as of April 16, 2018
Source: RMA Actuarial Information Browser

the third consecutive year to 4.392 billion bushels. Concerns over production shortfalls in other producing countries appear to mitigate what would be a burdensome stock accumulation, as the estimated season average price remains pegged at \$9.30 per cwt.

The 2017-18 corn supply demand picture included a decline in production, increased total domestic use, and increased exports. In combination, these factors contribute to an estimated reduction in ending stocks of about 2.6 percent and a decline in the stocks-to-use ratio of more than 5 percent from 15.7 percent in 2016-17 to 14.8 percent for 2017-18. Despite the decline in ending stocks, the most recent mid-point price projection remains at \$3.35, slightly below the level of the previous year. Developments in the Southern Hemisphere crop, particularly in Argentina, could provide some late season price support and boost expectations for the coming

year.

While down from the peak in 2014, the animal and animal products index of product prices reflects an improvement in 2017 (Figure 11). On the livestock side, U.S. beef cattle herd continue to expand for the third straight year, up 3.5 percent from 2016. Beef production increased by around 5 percent from 2016, and the average annual price for choice steers remained stable, up only slightly from the previous period to \$121 per cwt. Feeder steers prices increased almost 2 percent from 2016 and with an annual average of \$145 per cwt. The market for pork improved in 2017 with higher production and higher prices, with pork production up by 2.5 percent and hog prices up by an annual average of 8 percent from \$50 per cwt. in 2016 to almost \$54 in 2017. The improved market is attributed to strong pork demand around the world, increased retail demand in the U.S., and a 7 per-

Table 2 Major Revenue Policy Base Prices¹

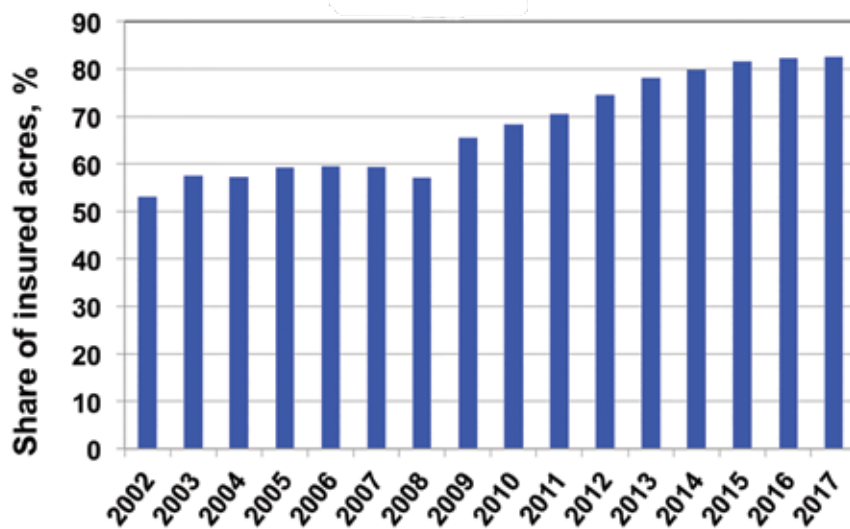
CROPS	2011	2012	2013	2014	2015	2016	2017	2018	% CHANGE	
									2016-17	2017-18
Wheat, Winter (\$/bu) (KS)	7.14	8.62	8.78	7.02	6.30	5.20	4.59	4.87	-11.7	6.1
Wheat, Spring (\$/bu) (ND)	9.89	7.84	8.44	6.51	5.85	5.13	5.65	6.31	10.1	11.7
Corn (\$/bu) (IL)	6.01	5.68	5.65	4.62	4.15	3.86	3.96	3.96	2.6	0.0
Soybeans (\$/bu) (IL)	13.49	12.55	12.87	11.36	9.73	8.85	10.19	10.16	15.1	-0.3
Upland Cotton (\$/lb) (MS)	1.15	0.94	0.81	0.78	0.63	0.62	0.73	0.75	17.7	2.7
RICE (\$/cwt)	16.10	14.70	15.70	13.90	²	11.90	10.40	11.90	-12.6	14.4

¹Revenue Protection for 2011-18 as of April 16, 2018.

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

Source: RMA Actuarial Information Browser

Figure 14 Share of Insured Acres Covered at 70% or Higher



Data as of April 17, 2018
Source: RMA Summary of Business

cent increase in exports.

U.S. milk production was up 1.5 percent from 2016 to 215,466 million lbs., and all milk price increased from \$16.30 per cwt. to \$17.60 per cwt., up almost 8 percent. Domestic disappearance of all products remained at about 2016 levels; however, exports grew more than 5 percent from the previous year. Based on 2017 U.S. average all feed cost of \$10.50 per cwt., the calculated price above total feed cost margin was \$7.10 per cwt., an increase of \$1.30 from the previous year. While prices increased, they remain well below the 2017 national average total cost of production estimated to be \$22.27 per cwt., up modestly from 2016.

Crop Insurance

Market Developments

The projected base prices used to establish the value of the crop and the insured liability for the Revenue Protection and Yield Protection forms of insurance policies are shown in Table 2, starting from 2011 and ending with the 2018 crop. Projected base prices are the average of futures prices during the discovery month that precedes the sales closing date for the policy.

Base prices are influenced by various factors, including remaining stocks for the crop, planting intentions in the U.S., increasing yields, changes in demand for the crop, the availability of alternatives, and growing conditions in other countries. Base prices in 2016 were at or near the low end of the price range seen in recent years. Prices

rebounded in 2017 for spring and winter wheat, cotton, and rice but are still close to the lower end of the recent price range, while the soybean price is down from 2016 and corn is unchanged.

Corn is responsible for roughly one-third of the value of all crop production and has a strong influence on the prices of other crops. Figure 12 provides corn futures prices for the contract for December delivery for each crop season starting with 2012 and continuing through 2017.

The base price of \$5.68 per bushel in 2012 was down marginally from the price level observed at the end of 2011. As the 2012 drought set in, prices ran up to more than \$8.00 per bushel by late August. With the decline in demand at the higher price level, in combination with an increase in foreign production, prices began to moderate, ending the year above \$7.00. Corn prices started the 2013 year sharply lower due to an end to the drought and an expectation for a recovery in corn production, resulting in a base price of \$5.65. Prices continued to fall throughout 2013, ending the year at around \$4.25. The slide in prices continued into 2014, with futures prices finishing the year at \$3.96 per bushel. With no support on the demand side and accumulating stocks, the 2015 futures price hovered above the \$4.00 level before retreating toward the end of the year. Futures prices remained weak in the early part of 2016 and, other than a brief surge in June, weakened further throughout the remainder of the year. The base price in 2017 recovered from the prior year's ending price to just under the \$4.00 level, but future prices followed a similar path as in 2016, ending the year below \$3.40.

The implied volatility factor (IV) derived from futures market information serves as a measure of riskiness of expected prices. Each year

Table 3 Volatility Factors

CROPS	Historical Price Volatility¹	Volatility Factor²										
		1968-2017	2011	2012	2013	2014	2015	2016	2017	2018	% CHANGE	
											2016-17	2017-18
Wheat, Winter (\$/bu)	0.19	0.33	0.26	0.24	0.19	0.17	0.22	0.18	0.16	-18.2%	-11.1%	
Wheat, Spring (\$/bu)	0.23	0.25	0.19	0.15	0.14	0.15	0.15	0.13	0.13	-13.3%	0.0%	
Corn (\$/bu)	0.20	0.29	0.22	0.20	0.19	0.21	0.17	0.19	0.15	11.8%	-21.1%	
Soybeans (\$/bu)	0.18	0.23	0.18	0.17	0.13	0.16	0.12	0.16	0.14	33.3%	-12.5%	
Upland Cotton (\$/lb)	0.24	0.37	0.19	0.17	0.15	0.16	0.14	0.15	0.14	7.1%	-6.7%	
RICE (\$/cwt)	0.23	0.22	0.14	0.11	0.10	³	0.15	0.17	0.12	13.3%	-29.4%	

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 2017. 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 April 10, 2018.

³Due to insufficient futures price data, revenue insurance was not available in 2015

Source: Various RMA Manager's Bulletins

Table 4 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>	
2008	1,149	3,023	89,897	9,851	4,160	8,680	1,171	272	0.88
2009	1,172	2,729	79,548	8,951	3,524	5,222	3,729	264	0.58
2010	1,140	2,572	78,085	7,595	2,883	4,254	3,341	256	0.56
2011	1,152	3,322	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	109,879	10,072	3,858	9,133	939	294	0.91
2015	1,205	2,547	102,532	9,767	3,678	6,311	3,456	296	0.65
2016	1,160	2,441	100,584	9,326	3,461	3,906	5,420	290	0.42
2017	1,125	2,368	106,076	10,070	3,716	5,145	4,925	311	0.51

¹Data as of May 18, 2018
Source: RMA Summary of Business

RMA calculates the implied volatility factor for an insured commodity by averaging the implied volatility of near 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 in the determination of the IV factor in the major corn producing states. The IV factor is used by RMA to simulate the expected price distribution for the crop, which is utilized to establish the price risk component of the premium rate for revenue plans for the crop. A high IV indicates a greater likelihood for large price movements while a 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 insuring the farmer's revenue, while lower IV factors result in lower premiums.

Historical values for IVs for selected major crops are shown in Table 3. In 2016, the IV factors for corn, soybeans, and cotton dropped sharply, indicating that the market was expecting more stable prices. Consistent with this expectation, corn prices traded within a narrow band throughout the year as indicated in Figure 12. While the IV factors for these three crops increased in 2017, corn prices again traded within a narrow band throughout the year. In 2018, the IV factors for these crops, along with those for rice and winter wheat, have decreased once again, with the corn IV factor for the coming year below the level set in 2016. Over the course of the coming year we shall see if prices remain more stable than the previous year as the lower IV factors imply.

Figure 13 shows the change between the base prices established early in 2017 to the harvest prices established close to the end of the growing season. The harvest prices shown 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 important in that they are used to calculate the producer's actual revenue, which is used to establish the amount of indemnity for Revenue Protection (RP) policies. The harvest price for spring wheat rose to \$6.76 from a base price of \$5.65 at the start of the year, an increase of almost 20 percent.

Rice also experienced a large increase of 21 percent throughout the year, while the price for winter wheat was unchanged. The price for corn declined by roughly 12 percent over the year, while soybeans and cotton decreased by 4 percent and 7 percent, respectively.

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

Federal Crop Insurance Program Experience

The Federal Crop Insurance Program continued to perform well in 2017 thanks to another year of excellent growing conditions and stable crop prices during the year. After experiencing two years of gross underwriting losses (defined as gross indemnities exceeding gross premiums) in 2012 and 2013, the program saw a modest recovery in 2014, followed by three years with solid

gains. The amount of liability insured increased several percentage points in 2017 over 2016 thanks to higher prices for soybeans, cotton, spring wheat, and corn, while prices for winter wheat and rice declined. Premium crossed the \$10 billion barrier, a level last reached in the years 2011 through 2014. On a percentage basis, premium increased slightly faster than liability, partly due to increases in the price volatility factors for corn, soybeans, cotton, and rice. In addition, acres insured surged to 311 million due to growth in the Rain Insurance product under the Pasture, Rangeland, and Forage program. Farmers continued to purchase high coverage levels in 2017, with the share of acres covered at 70 percent or higher having stabilized around the 82 percent level over the past three years (Figure 14).

The public cost of the crop insurance program can be calculated using program outlays and revenues. These are equal to gross indemnities, less farmer-paid premiums, plus administrative and operating expense (A&O) payments made on farmers' behalf to the companies, plus company underwriting gains. While final costs for 2017 are still uncertain, the total cost is estimated to be \$4.439 billion, well below the long-run annual average of \$7.9 billion as reported in the January 2015 projections of the Congressional Budget Office (CBO) for the life of the 2014 Farm Bill.

Table 4 provides the standard measures summarizing the performance of the crop insurance program. While liability, premium, and the number of acres insured increased in 2017, policy counts and unit counts decreased in comparison to the prior year. Indemnity payments continue to be at a low level, particularly in comparison

Table 5 **MPCI Insured Acres by Major Crop¹**

CROPS	2015	2016	2017	CHANGE	% CHANGE
Wheat	46,805	42,817	37,080	-5,737	-13.4%
Corn	78,371	82,145	78,858	-3,287	-4.0%
Sorghum	6,782	5,372	4,140	-1,232	-22.9%
Soybeans	74,519	73,260	79,832	6,572	9.0%
Upland Cotton	8,585	9,452	11,725	2,273	24.0%
Pasture, Range and Forage	54,655	51,790	74,931	23,142	44.7%
Total above crops	269,719	264,836	286,567	21,731	8.2%
Total all crops	295,953	290,107	311,445	21,338	7.4%
NASS Planted Acres (Field Crops)	318,975	319,238	319,147	-91	0.0%

¹Data as of May 18, 2018
Source: RMA Summary of Business, NASS Quick Stats

to the large payouts in 2011 through 2014. Gross underwriting gains, the difference between premiums and indemnities, fell below the record level set in 2016 but are still strong. The gross loss ratio, defined as the ratio of indemnities to premiums, is the traditional metric used for comparing the performance of the program over time. From an underwriting perspective, the breakeven point is a loss ratio of 1.00, with values below 1.00 indicating a year with underwriting gains and values above 1.00 indicating a year with an underwriting loss. On this basis, the program had an excellent year in 2017 with a gross loss ratio of 0.50, though this value is expected to increase as any remaining open claims are settled. In comparison, the 2016 year, the best in the history of the program, had a loss ratio of 0.42, while the four earlier years had loss ratios of 0.65, 0.91, 1.02, and 1.57.

Net underwriting gains differ from gross underwriting gains in that any gains or losses

on a gross basis are shared between FCIC and the participating insurance companies as established under the terms of the Standard Reinsurance Agreement (SRA). After reinsurance, more than half of the gross underwriting gains in 2016 were ceded to FCIC. For 2017, one would expect a similar outcome. One point that needs to be kept in mind is that having three consecutive years with solid underwriting gains is not a guarantee that future years will continue to be profitable. For example, the seven-year period from 2004 through 2010 also achieved excellent underwriting results, but these were immediately followed by four years with modest to severely unprofitable results. It is important to recognize that underwriting gains are only one component of a company's pre-tax income. After accounting for all revenues and expenses, company pretax net income is estimated to have averaged slightly more than 6 percent of retained premium for the seven years under the current SRA.

The number of insured acres for the major crops from 2015 through 2017 are shown in Table 5. Wheat, corn, and sorghum acres declined in 2017, but were offset by increases in soybean and cotton acreage. The overall increase in acres insured was driven by the expansion of the Rainfall Insurance program under Pasture, Rangeland, and Forage. In comparison, NASS reports that the total number of acres planted to principal field crops, excluding land used for cattle grazing, were essentially unchanged for the year.

As was the case in 2016, Texas once again had the largest premium and largest indemnities of any state, with premium of \$970.9 million and loss payments of \$734.7 million (Table 6), corresponding to a loss ratio of 76 percent. Hurricane Harvey alone caused \$36.6 million in crop damages in Texas. North Dakota was second in both premium and indemnities, with an overall loss ratio of 61 percent. South Dakota came in third in terms of indemnities, but had a loss ratio of only 52 percent. California, with excess moisture and heat, was the fourth in total indemnities with a loss ratio of 71 percent. Drought, hail, wildfires, and excess moisture were the most significant causes of loss in all four states. Among crops, corn led with \$1,260.9 million in indemnities, as compared to \$920 million in 2016. Soybeans, wheat, cotton, and the Pasture, Rangeland, and Forage program followed corn in total loss payments.

The map in Figure 15 shows the state loss ratios and premium volumes for 2017. Colors are used to identify states with similar loss ratios, and shading is used to identify states with similar premium volumes. Four states, Montana, Utah, Vermont, and Rhode Island, had



Table 6 **Top 10 MPCl Premiums & Indemnities by State and Crop, 2017¹**

PREMIUMS BY STATE

STATE	PREMIUMS (MIL.\$)
TX	970.9
ND	929.6
IL	697.2
LA	695.7
SD	667.8
MN	633.9
KS	619.2
NE	550.5
CA	411.3
MO	384.5
Total	6,561.0
U.S. Share	65%

INDEMNITIES BY STATE

STATE	INDEMNITIES (MIL.\$)
TX	734.7
ND	571.4
SD	350.2
CA	293.7
KS	284.0
MT	240.8
IL	178.3
NE	165.3
IA	163.8
AR	148.9
Total	3,131.1
U.S. Share	61%

PREMIUMS BY CROP

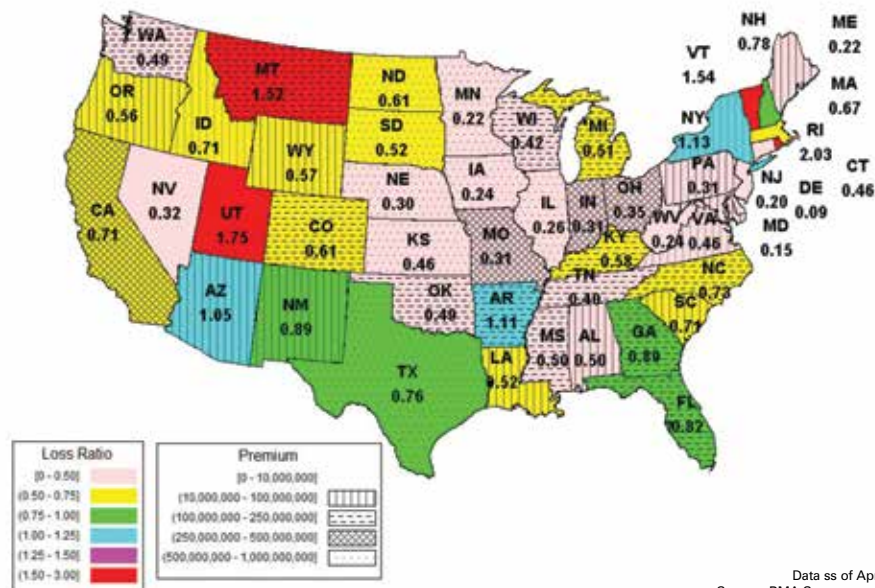
CROP	PREMIUMS (MIL.\$)
Corn	3,453.7
Soybeans	2,555.8
Cotton	934.7
Wheat	889.1
PRF	380.4
Grain Sorghum	150.6
Whole Farm Revenue	145.5
Apples	120.3
Almonds	95.5
Dry Peas	85.7
Total	8,811.2
U.S. Share	87%

INDEMNITIES BY CROP

CROP	INDEMNITIES (MIL.\$)
Corn	1,260.9
Soybeans	765.2
Wheat	744.0
Cotton	568.1
PRF	341.2
Rice	180.7
Dry Peas	128.5
Flue Cured Tobacco	93.3
Burley Tobacco	77.3
Peanuts	66.6
Total	4,225.8
U.S. Share	82%

¹Data as of May 18, 2018
Source: RMA Summary of Business

Figure 15 **2017 MPCl Premium and Loss Ratios All Plans Combined**



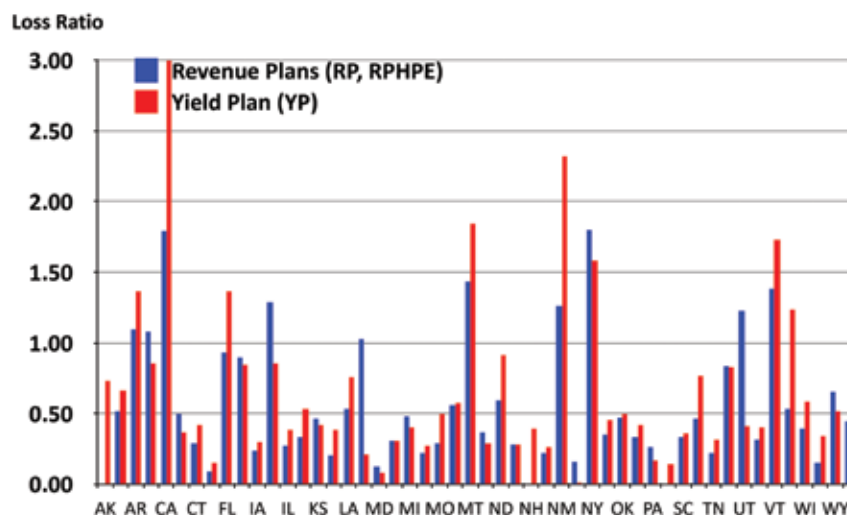
Data as of April 17, 2018
Source: RMA Summary of Business

loss ratios exceeding 1.50. The three other states with loss ratios above 1.00 included Arkansas, New York, and Arizona. Of these, only Montana and Arkansas had premiums of \$100 million or more. Total indemnities for these states added up to \$567 million, 11 percent of the total U.S. payout. The five states with the lowest loss ratio states were Delaware at 0.09, Maryland at 0.15, New Jersey at 0.20, Alaska at 0.19, and Maine at 0.22. Of the 25 crops having the largest premium

volume, the highest loss ratios were for rice, 2.39; burley tobacco, 2.19; flue cured tobacco, 1.51; dry peas, 1.50, and annual forage, 1.21.

Figure 16 shows loss ratios by state for the revenue plans (RP and RP-HPE combined), and the yield plan (YP). Revenue plan loss ratios tended to be smaller than those for the yield plan in most states. Of the 49 states with premiums in 2017, the revenue plan loss ratio exceeded the yield plan loss ratio in only 17 states. States

Figure 16 **State MPCl Loss Ratios for 2017**



Data as of April 17, 2018
Source: RMA Summary of Business

where the difference exceeded 0.20 points were Arizona, Idaho, Massachusetts, New York, and Utah, which jointly contributed only \$70 million in premium to the program. In comparison, the yield plan loss ratio exceeded the revenue plan loss ratio in 32 states, 13 of which had a difference of 20 points or more. On a countrywide basis, both plans had underwriting gains, with a loss ratio of 0.45 for the revenue plans and 0.92 for the yield plan. The primary states for yield protection business include Texas, Montana, Georgia, North Dakota, and Arkansas. Other plans of insurance also had good results in 2017, with the highest loss ratio being 0.94 for the Rainfall Index program.

Figure 17 shows the major causes of crop losses for 2017. Drought was responsible for 31 percent of all losses, while excess precipitation was responsible for another 27 percent, followed by “other” perils with 12 and hail at 9 percent. Price changes were responsible for only 3 percent of all losses due to the stability of crop prices throughout the year. Area plans, along with SCO, STAX, and Margin Protection contributed 8 percent of all losses, while heat was responsible for only 4 percent.

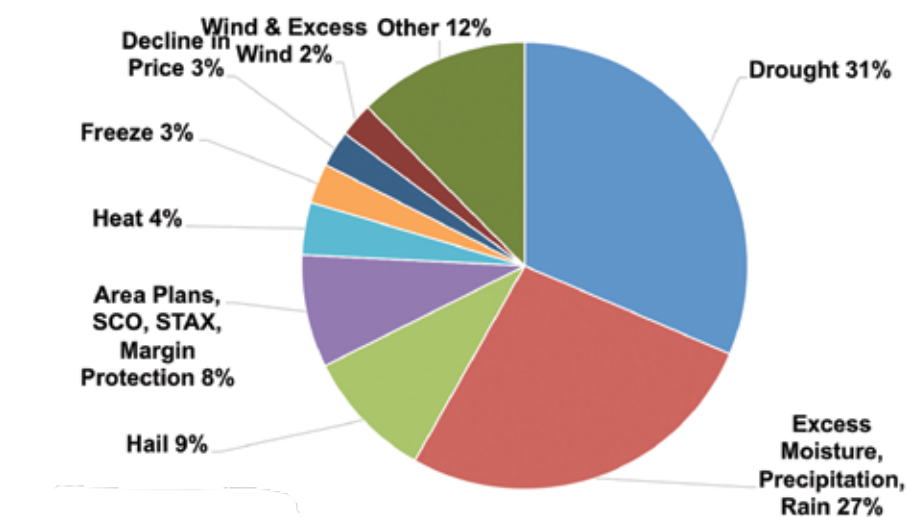
[The information sources for this section were RMA Summary of Business, Cause of Loss, and Reinsurance Runs and NASS Quick Stats.]

Program and Policy Developments

Much of the RMA 2017 work program involved response to the widespread and severe weather events that took place during the year. Beginning in March the agency responded to an outbreak of fires in Colorado, Southwest Kansas, Oklahoma, and Texas to allow additional time for policyholders to report their acreage for short rate eligibility. Later in the month the agency urged swift action by farmers and their AIPs in appraisal of damage in response to severe freeze events in the Southeast, especially blueberry and peach growers in Georgia and South Carolina.

By mid-April attention was directed to wet weather conditions in Southwest Oklahoma and Northern Texas that prevented farmers from terminating crops used for winter grazing. Farmers were allowed additional time to terminate those crops thus preventing possible loss of insurance on spring planted crops due to depletion of moisture that occurs if the crop reaches the headed or budded stage.

Figure 17 2017 Causes of Loss



Data as of April 17, 2018
Source: RMA Cause of Loss

Later in the year attention turned to problems stemming from severe drought conditions in Montana, North Dakota, and South Dakota. Lack of adequate food or forage by mid-July resulted in ranchers bringing their livestock to market sooner than usual. Such early sales may result in violation of the ownership in last 30 days of the insurance period provision of the Livestock Risk Protection coverage. In response, RMA allowed for AIPs to use their discretion to grant a waiver of the 30-day ownership provision subject to proof of ownership.

As drought damaged livestock operations in Montana and the Dakotas, RMA acted in a proactive fashion in anticipation of damage from an impending hurricane in the Texas Gulf coast area. Tropical Storm Harvey was expected to make landfall in late August and cotton producers were in the process of harvesting a record cotton crop that exceeded gins ability to accommodate modules for storage. As a result, some farmers needed to relocate modules in danger of flood damage to higher ground, which may have resulted in removal from the field. Removing cotton modules from the field would end insurance coverage at a time when farmers were trying to prevent flood damage and needed coverage to continue for potential wind damage. In reaction, RMA provided guidance to AIPs in the areas expected to be impacted by the storm so modules could be removed from the field without affecting insurability.

Tropical Storm Harvey became Hurricane

Harvey and was the first Category 4 hurricane to make landfall in the U.S. since 2004. The storm made landfall near Rockport, Texas, on the night of August 25 resulting in a prolonged period of torrential rainfall, which caused flooding in Southwest Louisiana and Southeast Texas. The storm caused catastrophic damage in the Texas Gulf Coast area and Louisiana. The governor of Texas declared 54 counties in his disaster declaration with crop liability totaling more than \$840 million. The entire state of Louisiana was declared as disaster area with a total crop liability of \$133 million (2016) in the nine major producing parishes. The mitigation of damage from Hurricane Harvey required an extensive effort by RMA and was a dominate part of the workload for the remainder of the year.

Unfortunately, nature was not done with 2017. On the evening of September 10, Hurricane Irma made landfall in the Florida Keys, another Category 4 storm that had downgraded from a Category 5 storm after causing catastrophic damage to Puerto Rico, other Caribbean Islands, and finally Cuba. Hurricane Irma resulted in catastrophic damage in affected areas of Alabama, Florida, Georgia, and South Carolina. The RMA and AIPs reacted as quickly as possible to begin authorization of emergency procedures to designed to streamline adjustment of losses and indemnity payments to crop insurance policy holders.

In a final weather-related action, the RMA provided AIPs the authorization to allowed in-

Table 7 Crop-Hail Results, All Perils

CROP YEAR	LIABILITY	PREMIUM	LOSSES	LOSS RATIO
	Mil. \$	Mil. \$	Mil. \$	
2008	27,540	669.4	555.1	0.83
2009	25,493	621.3	565.9	0.91
2010	27,170	682.2	460.4	0.67
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

Data as of April 20, 2018

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

sured apple producers in the Pacific Northwest additional time to harvest due to late development and maturity of the fruit resulting from cool spring temperatures.

In addition to the activities related to dealing with weather disasters RMA continued to work on multiple policy goals. Important among those is the expansion of coverage in terms of area covered and commodities included. For example, in January 2017 RMA expanded the area included in existing spring crops coverage. Additional counties became eligible for coverage of cabbage in New York; corn in Louisiana and Texas; peanuts in Arkansas, Florida and Mississippi; soybeans in Florida, Louisiana, Nebraska and North Dakota; popcorn in Illinois and Kentucky and processing beans in New York. In July, expansion of area for existing fall crops programs was announced. Additional counties were included in coverage for alfalfa seed in Idaho and Oregon; onions in California; and wheat in Wisconsin. In September the coverage area for grapes was expanded to additional counties in California, Connecticut, Maryland, Massachusetts, New Jersey, Pennsylvania and Virginia. Blueberry coverage was expanded in Oregon and for pecans in California.

Work toward product coverage expansion was reflected in the conversion of the clam pilot program to a permanent program. Intent to begin research on new product coverage was also announced for California citrus trees and for hybrid canola seed. Research to evaluate the actual revenue history pilot programs for sweet and tart cherries was also announced. In some cases, research conducted resulted in a new product pilot not being continued or coverage

offered to a new commodity, such as the case in 2017 with proposed garlic coverage.

Risk management education also continues to be an important focus for RMA. In May, RMA announced it would award up to \$4.85 million to deliver crop insurance education to producers in 17 states where there is a low level of Federal crop insurance participation and availability. In addition, the agency announced it would award up to \$4 million to provide farmers nationwide general training and informational opportunities on crop insurance and other risk management tools. The RMA received 140 applications for program funding, up from last year's 129. In September the agency entered into 76 risk management education cooperative agreements totaling \$9.8 million.

Federal crop insurance policy is dynamic and will continue to evolve. For example, late in the year RMA announced that it would change the prevented planting coverage option. In coming years farmers would no longer be able to purchase a 10 percent additional prevented planting coverage option; however, they would still be allowed the option to continue to purchase 5 percent additional coverage. Changes in programs, policy and coverage options will remain both an opportunity and challenge for the partnership between farmers, RMA, and the industry going forward.

U.S. Crop-Hail Experience

Crop-Hail insurance are policies which 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 article 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 has risen substantially over the past ten years. Premium for 2017 was \$958.8 million, a reduction of \$25 million, or 2.5 percent, from \$983.3 million in 2016. Crop-Hail provided \$35.8 billion in private insurance protection to U.S. farmers in 2017, while losses paid out were \$882 million (Table 7), a small increase over 2016.

The program loss ratio, defined as paid losses divided by premium written, increased to 0.92, up from 0.90 in 2016 and 0.76 in 2015. While the 2017 loss ratio was much better than the record loss ratio of 1.22 in 2014, five out of the past ten years have had loss ratios of 0.90 or more.

Large storms were not as severe in 2017 as in 2016, with only two days exceeding \$25 million in losses, down from five in the prior year. Eight of the top ten storm dates occurred between June 9 through July 11. The single worst day was June 11, when a storm caused damages of more than \$27 million, primarily in Minnesota, but also caused heavy losses in South Dakota and Wisconsin. Two days later, July 13, saw total damages of almost \$26 million, \$14 million of which occurred in Nebraska and another \$6 million in South Dakota. The only other day with more than \$20 million in damages was July 4, with losses of \$7 million in North Dakota and Texas, \$4 million in Minnesota, and more than \$2 million in Nebraska. In total, the losses from the top ten storm days amounted to \$198 million, down from \$240 million in 2016, and well below the \$420 million paid out in 2014. Five states took the brunt of the major storms, with North Dakota absorbing \$45 million of loss, Minnesota with \$38 million, Nebraska with \$29 million, followed by Iowa and South Dakota with \$22 million each. Texas came in well behind with only \$10 million in loss from major storm events.

Crop-Hail loss ratios by state are shown in Figure 18. Colors identify states with similar loss ratios, and shading is used to identify states with similar premium volume. Crop-Hail insurance was purchased in 42 states in 2017. Of these, 14 had a loss ratio greater than 1.00; these are shown in purple and red on the map. Louisiana again had the highest loss ratio of 2.07, but on a premium volume of less than \$3 million.

The top five premium volume states, Nebraska, Iowa, Minnesota, Illinois, and North Dakota, had loss ratios of 1.24, 0.59, 1.09, 0.54, and 1.05, respectively. Overall, 22 of the 42 states had loss ratios of 0.50 or less, shown in pink and yellow on the map. Six additional states, shown in green, had loss ratios between 0.50 and 0.75, while no states had loss ranges falling between 0.75 and 1.00.

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

Canadian Crop-Hail Experience

Crop-Hail business in Canada is primarily written in the prairie provinces of Alberta, Manitoba and Saskatchewan. Denoting Canadian dollars with C\$, Table 8 presents the totals by year. Overall premiums for Canada declined from C\$302 million in 2016 to C\$286 million in 2017, some of which might be attributed to the 9 percent reduction in the number of policies written for the year. Loss experience improved enormously, with losses paid to farmers declining to C\$97 million in 2017 from C\$269 in 2016. The number of claims dropped precipitously to 8,633 from 20,325 in the prior year, while the average claim size declined to C\$11,209 from C\$13,325 in 2016. Overall, the loss ratio for the three Canadian provinces was 0.34, second only to the loss ratio of 0.29 in 2009, and a significant improvement over the loss ratio of 0.85 in 2016.

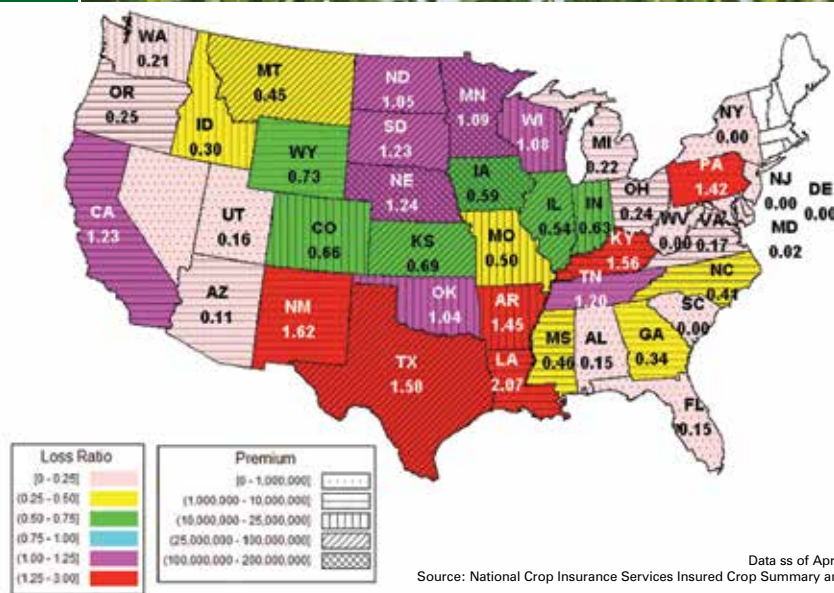
For the individual provinces, Manitoba saw an increase in premium of 7 percent, to C\$50 million, while Saskatchewan and Alberta saw reductions of nine and 4 percent, respectively. Policy counts were down in all three provinces, with reductions of 2 percent in Manitoba, 9 percent in Saskatchewan, and 15 percent in Alberta.

Total payouts for the year in Manitoba were C\$23 million, roughly one-third of the C\$74 million paid in 2016. The loss ratio fell to 0.46 from 1.59 percent a year ago. Losses for Saskatchewan decreased from C\$129 million in 2016 to C\$48 million in 2017, resulting in an improvement in the loss ratio from 0.73 to 0.30. Payouts also fell substantially in Alberta, from C\$65 million in 2016 to C\$25 million this year, with the loss ratio falling from 0.84 to 0.34.

[The information source for this section was the Canadian Crop Hail Association.]

Figure 18

2017 Crop-Hail Premium and Loss Ratios All Crop, Perils, Plans Combined



CONCLUSION

In 2017 Federal crop insurance provided a much-needed risk management tool to American farmers and ranchers in a year of highlighted by localized catastrophic weather events that remind us what a risky business farming and ranching is. Farmers paid more than \$3.7 billion to buy 1.125 million policies. The companies assessed losses and paid claims on more than 302,000 policies. The low level of farm income continues and weighs heavily on all of agriculture, and while cases of severe or catastrophic loss were limited, for those areas

where disaster struck, Federal crop insurance provided much needed assistance, helping with their journey to recovery. The crop insurance industry continues to provide an effective and affordable risk management tool for U.S. agriculture, but it will face challenges in the coming year as policy makers craft a new farm bill. Hopefully the partnership between the Federal government and the private insurance companies will be able to remain the solid foundation for financial stability that is needed for farmers and ranchers across the diverse landscape that is U.S. agriculture.

Table 8

Canadian Crop-Hail Results, All Perils

CROP YEAR	PREMIUM	LOSSES	NUMBER OF CLAIMS	LOSS RATIO ¹
	Mil. C\$	Mil. C\$		
2008	289	341	29,000	1.18
2009	262	76	4,075	0.29
2010 ²	263	155	16,000	0.59
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

¹Loss ratios do not reflect loss adjustment costs.

²Number of claims exceeded value indicated.

Data as of November 20, 2017

Source: The Canadian Hail Association