Ag Decision Maker

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Fully incorporating the derecho

By Chad Hart, extension economist, 515-294-9911, chart@iastate.edu

With the September 30, 2020 Grain Stocks report, usda.library.cornell.edu/concern/publications/xg94hp534, USDA provided a concluding piece of information on the impact the derecho had on the Iowa and national crop supply picture. The September update of the Crop Production report revealed the combined damage of the derecho and drought to the corn and soybean crops currently being harvested. The Grain Stocks report showed the amounts of last fall's crops that were forced to move or were lost due to the damage at grain storage and handling facilities. In total, hundreds of millions of bushels were lost. But those losses provided the spark in price recovery for corn and soybeans this harvest season.

Let's start with the damage to this year's crops. Figures 1 and 2 show USDA's September yield estimate maps for corn and soybeans.

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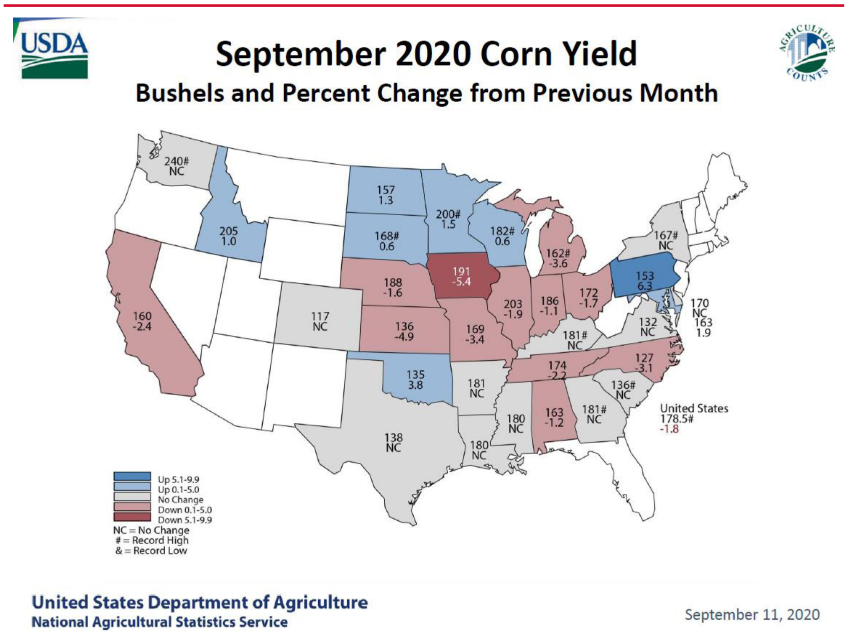
Figure 1. National corn yield estimates *(Source: USDA-NASS)*



Handbook updates

For those of you subscribing to the handbook, the following update is included.

Cash Corn and Soybean Prices
A2-11 (4 pages)

Farmland Value Survey, REALTORS® Land Institute
C2-75 (2 pages)

Please add this file to your handbook and remove the out-of-date material.

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Inside . . .

Iowa State University
Extension and Outreach

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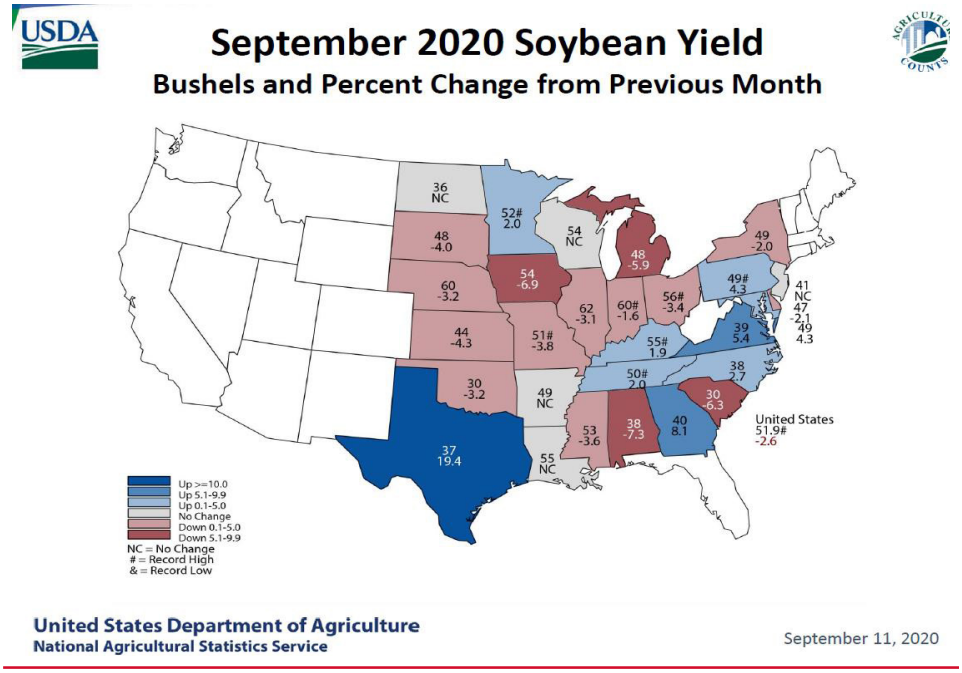
The impact from drought conditions can be seen from Kansas to Ohio, while the August 10, 2020 derecho was mainly an Iowa event (from an agricultural perspective). While the national corn yield estimate is still at a record level, USDA pulled the estimate down 3.3 bushels per acre to 178.5 bushels per acre. The drop in yield, combined with a reduction in expected harvested area, translates to a loss of 378 million bushels of corn nationwide. For Iowa, the yield drop was much more dramatic, falling by 11 bushels per acre. USDA reduced Iowa's projected harvested corn area by 550,000 acres, based on a resurvey of Iowa farmers. The combination resulted in a 254 million bushel decline in Iowa's expected corn production. So Iowa roughly accounts for two-thirds of the nation's corn losses.

Figure 2. National soybean yield estimates *(Source: USDA-NASS)*



The soybean estimates mimic the corn estimates. The drought affected soybeans from the Great Plains to Ohio, while the derecho centered on Iowa. The national soybean yield estimate was reduced by 1.4 bushels per acre to 51.9 bushels per acre. Again, it's still a record yield, just not quite as high as first thought. Projected soybean harvested area was held steady at 83.02 million acres. So the yield loss by itself translated into a 112 million bushel drop in projected national soybean production. The Iowa yield estimate fell from 58 bushels per acre in August to 54 bushels per acre in September, which translates to a 37 million decline in Iowa's projected soybean production. So once again, Iowa's losses make up a sizable portion of the national reductions.

Impact on storage capacity

New crop supplies felt the sting of the drought and derecho, but the damage was not limited to farm fields. The derecho also destroyed some crop handling and storage facilities. In fact, that damage is still being assessed as farmers, elevators, and terminal locations prepare to take in this year's crops. Early estimates for Iowa indicated roughly 120 million bushels of storage capacity was lost due to the derecho, with approximately half coming from on-farm storage and half from commercial operations. Losing storage capacity is not the same as losing bushels in storage. So it's an open question how much of the crops stored going into the derecho were lost in the storm and how many bushels had to be quickly moved into the market because of the storage damage. The Grain Stocks report provided the initial answers to those questions and traders were surprised by the answers.

Supplies and stocks

The 2019/20 ending stocks for corn were estimated at two billion bushels. That is 200 million to 300 million less than the trade expected. And smaller stocks tend to lead to higher prices. While corn usage for ethanol and export shipments were reduced over the June-August period, the derecho impact and livestock feed needs drove corn disappearance higher and stocks lower. While COVID-19 continues to shape corn usage, through the impacts of reduced travel on ethanol demand and increased feed needs as the livestock industry works to clear the animal backlog from processing plant closures, the derecho forced more corn out into the market as it busted

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Fully incorporating the derecho, continued from page 2

bins and raised quality concerns for the corn suddenly exposed by the storm. Based on historical patterns, Iowa corn stocks dropped by 50-100 million bushels more than usual for the June-August period, highlighting the storm's impact.

Soybean stocks revealed a similar story. The USDA found less soybeans in storage than the trade expected. The increased disappearance was a combination of increased feed use and storage crop losses. And Iowa's stocks dropped a bit more than usual due to the derecho's impact on storage facilities.

Before the derecho, national corn supplies for 2020/21 were estimated at 17.531 billion bushels. Now, the estimate currently stands at 16.92 billion bushels. That 611 million bushel drop is mainly due to the drought and derecho. Similarly, soybean supply estimates declined 204 million bushels over the same time period. Those supply reductions, along with a boost in export sales, have provided a contra-seasonal boost to prices. While USDA has season-average price estimates of $3.50 per bushel for corn and $9.25 per bushel for soybeans, the futures markets indicate season-average prices in the $3.70 per bushel range for corn and nearly $10.00 per bushel for soybeans, providing a late season opportunity to put in some price protection before the bulk of the harvest comes in.

Figure 3. Corn supplies and stocks *(Source: USDA-NASS)*

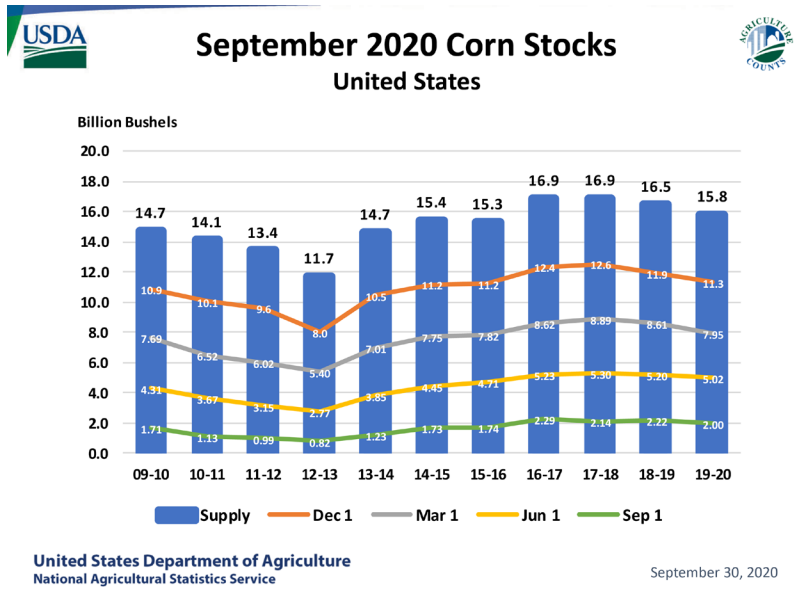
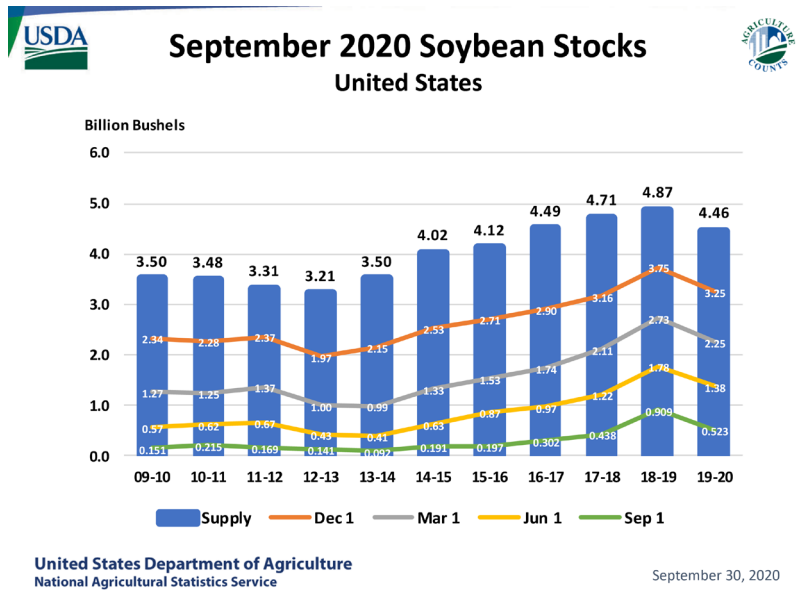


Figure 4. Soybean supplies and stocks *(Source: USDA-NASS)*



The price rallies are both good and bad news to Iowa crop producers. For those not dramatically impacted by the drought and derecho, the price rallies set up the potential for increased revenues this crop year. But for those who bore the brunt of weather conditions this year and are relying on crop insurance for a majority of their revenue, the price recovery is coming at an inopportune time. The harvest price for crop insurance is being set in October. Price rallies this time of year tend to lower crop insurance payments for those producers who bought revenue insurance. And that is what is happening for corn farmers right now. That will continue to be the case unless or until the rally pushes the harvest price above the spring insurance price of $3.88 per bushel. Current soybean prices have already rallied past the spring insurance price of $9.17 per bushel.

Understanding stats in USDA Hogs and Pigs reports

By Lee Schulz, extension livestock economist, 515-294-3356, lschulz@iastate.edu

Analysts spend a lot of time scrutinizing estimates in USDA's Hogs and Pigs reports, usda.library.cornell.edu/concern/publications/rj430453j. Amid our disagreement, or agreement, over a specific number, we can easily overlook the fact that every number is an estimate that falls within a statistical range.

A USDA point estimate is just one plausible value within a particular confidence interval. All estimates that are based on survey data have a statistical margin of error.

Computing the root mean square error, 90% confidence interval and difference between the first and last estimate can help evaluate the reliability of current estimates. USDA publishes these reliability metrics for the all hogs and pigs inventory, pig crop, and expected sows farrowing estimates in every report.

Why this interest in statistical analysis?

USDA's estimates of the two heaviest weight categories on Sept. 1, 2020 came in well above the average trade guess in advance of the report. The 180-pounds and over inventory was up 9.8%. Analysts pegged it up between 1.0% and 6.6% from a year ago with an average of up 2.6%. Market hogs weighing 120 to 179 pounds were up 6.1% compared to an average of pre-report expectations of up 1.5%. All market hogs, at 72.766 million head, were up 0.8% from last year, which was closer to the average trade guess of up 0.1% (Table 1).

Declines in the lightweight hog inventories restrained growth in the all market hog number. The under 50-pounds category was down 3.5% from Sept. 1, 2019, which was one and one-half percentage points lower than expected. Inventories of hogs weighing

Table 1. USDA Quarterly Hogs and Pigs Report Summary

	United States				Iowa		
	2019	2020	2020 as % of '19		2019	2020	2020 as % of '19
Sept 1 inventory *							
All hogs and pigs	78,583	79,099	100.7		25,000	25,100	100.4
Kept for breeding	6,431	6,333	98.5		1,010	980	97.0
Market	72,153	72,766	100.8		23,990	24,120	100.5
Under 50 pounds	23,376	22,559	96.5		6,360	6,290	98.9
50-119 pounds	21,224	20,490	96.5		8,010	7,630	95.3
120-179 pounds	14,654	15,547	106.1		5,520	5,730	103.8
180 pounds and over	12,899	14,169	109.8		4,100	4,470	109.0
Sows farrowing **							
Mar – May	3,133	3,172	101.2		530	510	96.2
Jun – Aug	3,275	3,180	97.1		550	530	96.4
Sep – Nov [1]	3,265	3,118	95.5		540	520	96.3
Dec – Feb [2]	3,158	3,111	98.5		520	520	100.0
Jun – Aug pigs per litter	11.11	11.04	99.4		11.35	11.30	99.6
Jun – Aug pig crop *	36,369	35,115	96.6		6,243	5,989	95.9

Full report: https://downloads.usda.library.cornell.edu/usda-esmis/files/rj430453j/gt54mb17j/1j92gz287/hgpg0920.pdf

** 1,000 head; **1,000 litters;*
[1] Intentions for 2020.
[2] December preceding year, intentions for 2020/21.

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Understanding stats in USDA Hogs and Pigs reports, continued from page 4

50 to 119 pounds were down 3.5% instead of the expected 0.3% decrease.

Those differences raise the question as to just how many market hogs are on farms and at what weights. Those numbers obviously have implications for market prices.

USDA makes its first estimate in the quarter when data are collected. As more information, such as final slaughter data, becomes available, USDA may revise the estimate each quarter, until one-year post data-collection, which is the final estimate. The largest changes, if any, usually occur in the first revision. The second and third reviews usually result in minimal revisions.

A measure of accuracy, or margin of error, is then the consistency between the first and final estimate. Differences for the all hogs and pigs estimates during the last 20 quarters have averaged 573,000 head, ranging from zero head to 1.710 million head. The first all hogs and pigs inventory estimate has been below the final estimate 10 times and above eight times and unchanged twice. No bias is obvious. Estimates are not consistently different in any direction. If they were, the market would build this pattern into its expectations.

What do these statistical measures mean?

The root mean square error for the all hogs and pigs inventory estimate over the past 20 quarters is 1.0%. This means the chances are two out of three that the final estimate will not be above or below the Sept. 1, 2020 estimate of 79.099 million head by more than 1.0%. This equates to 790,990 head. The 90% confidence interval is another view. It says chances are 9 out of 10 that the difference will not exceed 1.7%, which equates to 1.345 million head.

Determining implications for the market hog inventory requires some extrapolation beyond the detail provided in the report.

Suppose, for illustration purposes, that the statistical measures for the market hog inventory match the all hogs and pigs measures. The root mean square error of 1.0% means there is a 67% chance the market hog inventory will not fluctuate by more than 727,660 head when comparing it to the final estimate. The 90% confidence interval of 1.7% over the last 20 quarters suggests we can be 90% sure that the current estimate of the market hog inventory will not vary by more than 1.237 million head.

The 72.766 million head September 1 market hog inventory estimate was above pre-report expectations. Suppose the market hog inventory would have come in at the bottom of the 90% confidence interval. That would have been 1.237 million head lower at 71.529 million head, which would have been down 0.9% from last year. Would there be any more agreement or disagreement with this estimate? That's hard to say.

Slaughter provides some confirmation

Hog slaughter since September 1 suggests USDA might revise the September 1 heavy weight market hog inventory estimate downward in the December report. Most of the 180-pounds and over hogs have already come to market. Since September 1, weekly federally inspected hog slaughter is down 1.2% compared to the same period in 2019. That is far below the 9.8% rise implied by the report.

A downward revision in the heaviest-weight market hog inventories, within the 90% confidence interval, would roughly explain the difference in the estimates with the average of pre-report expectations and the actual slaughter numbers.

Blurred lines between weaning and marketing

Obviously, 2020 has unusual dynamics. Slower growth rates could mean hogs are more evenly spread across market weight categories than front-end loaded as the report implies. USDA tallied the 180-pounds and over category up 9.8% from a year ago, 120 to 179 pounds up 6.1%, and 50 to 119 pounds and under 50 pounds both down 3.5%. Consequently, slaughter rates could change by 3.8 percentage points and then by 9.6 percentage points in a matter of weeks. The 13.3 percentage point change between market weight categories is the largest in the history of the current weight category data back to 2008.

The market eventually provides truth on value. Futures market prices are the collective opinion of everyone who is in the market as to what the price should be. So far, during the time the heaviest weight hogs were going to slaughter, prices have risen. In fact, nearby contracts have surged. On September 1, October CME lean hog futures traded at $55.025

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Understanding stats in USDA Hogs and Pigs reports, continued from page 5

per cwt. On October 8, that contract was at $77.350 per cwt. That's a 41% gain in just over a month. December 2020 futures rose 20% over that time. Contracts for 2021 are up about 10%.

Are finishing facilities looking for feeders?

Factors such as expected market hog prices, feed prices, pig supply, availability of nursery and finishing space and interest rates drive variation in feeder pig values over time. The cash or spot market can be thought of as a residual market and will often react preemptively to many of these factors. As such, cash prices tend to lead formula prices in both rising and falling markets. Prices derived or determined from the futures market or from a formula based on the cost of production show less variability than is observed in cash prices.

USDA's weekly National Direct Delivered Feeder Pig report (NW_LS255, www.ams.usda.gov/mnreports/nw_ls255.txt) provides prices quoted on a per head basis delivered to the buyer's farm and include freight and fees. The cash price for 10- to 12-pound pigs, fell to about $6 per head on average in April and held there until late July. The lower end of the price range was $1.00 per head for several sales. Cash 40-pound feeders averaged $16 per head over that same time period. Formula prices averaged $28 per head for 10- to 12-pound pigs. Formula trade for 40-pound pigs is rarely reported.

For the week ending October 2, cash 10- to 12-pound pigs averaged $29.75 per head and 40-pound pigs were $40.82 per head. Those are 373% and 157% increases, respectively, from this spring and summer. Prices are about 5% lower than the same time in 2019.

Commercial slaughter and price forecasts

Table 2 contains the Iowa State University price forecasts for the next four quarters. Prices are for the Iowa-Minnesota producer sold weighted average carcass base price for all purchase types. Basis forecasts along with lean hog futures prices are used to make cash price projections. The table also contains the projected year-over-year changes in commercial hog slaughter.

Table 2. Commercial Hog Slaughter Projections and Price Forecasts, 2020-2021

	Year-over-Year Change In Commercial Hog Slaughter	ISU Model Price Forecast, Negotiated IA/So MN	CME Futures (9/24/20) Adjusted for IA-MN Producer Sold Weighted Average Carcass Base Price for All Purchase Types Historical Basis
	(percent)	($/cwt)	($/cwt)
Oct-Dec 2020	0.26	62-66	64.34
Jan-Mar 2021	-4.02	66-70	68.55
Apr-Jun 2021	7.45	72-76	73.73
Jul-Sep 2021	0.10	71-75	73.12

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Internet Updates

The following have been updated on www.extension.iastate.edu/agdm.

2018 Farm Bill Payment Estimator by County for ARC-CO and PLC – A1-33 (Decision Tool)

Getting Started in Farming: On the Home Farm – C4-08 (16 pages)

Current Profitability

The following tools have been updated on www.extension.iastate.edu/agdm/info/outlook.html.

Corn Profitability – A1-85

Soybean Profitability – A1-86

Iowa Cash Corn and Soybean Prices – A2-11

Season Average Price Calculator – A2-15

Ethanol Profitability – D1-10

Biodiesel Profitability – D1-15