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Ag Decision Maker

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A Business Newsletter for Agriculture

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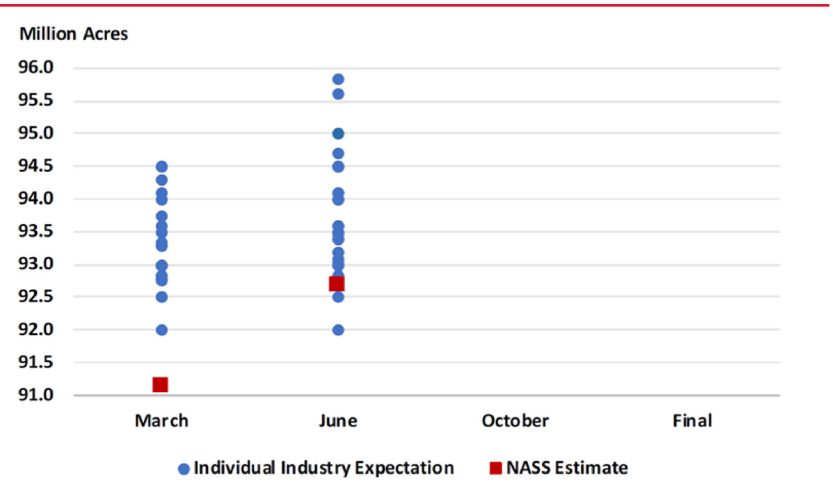
Lower acreage and more usage

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

The crop markets received some price increasing news to conclude the month of June. USDA's surveys showed a smaller than expected crop base this summer, along with continued strong usage both domestically and internationally. The Energy Information Administration found that the ethanol industry is producing at roughly pre-COVID levels. And drought conditions remain firmly locked in place across the western half of the country, including throughout the Northern Plains and into Iowa.

The big market movers for the end of the month were the acreage estimates. The markets had been preparing for substantial increases for both corn and soybeans, based on the drier conditions and the quick pace of fieldwork during the first third of the growing season. Figures 1 and 2 show the range of trader estimates for acreage and

Figure 1. US corn planted acreage estimates



Source: USDA NASS

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Handbook updates

For subscribers of the handbook, the following updates are included.

Improving Your Farm Lease Contract – C2-01 (10 pages)

Your Net Worth Statement – C3-20 (8 pages)

Your Farm Income Statement – C3-25 (8 pages)

Farm Financial Statements – C3-56 (8 pages)

Please add these files to your handbook and remove the out-of-date material.

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Inside . . .

IOWA STATE UNIVERSITY
Extension and Outreach

Ag Decision Maker is compiled by extension ag economists
Ann Johanns, aholste@iastate.edu
extension program specialist

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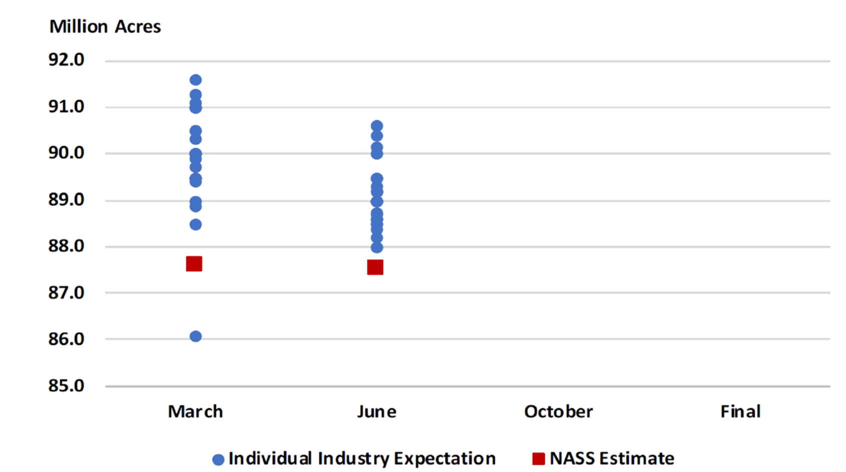
the USDA estimates from the Prospective Plantings (March) and Acreage (June) reports. For corn, the trade has consistently expected a larger acreage number than farmers have indicated in the USDA surveys. In March, USDA's estimate was well below trade expectations. With the June report, most traders anticipated that USDA's new estimate would rise above 93 million acres. And while USDA's new acreage number was higher, it fell short of those trade expectations. That relative shift in acreage pulled 100-200 million bushels out of the trade's production estimates and provided the spark for a limit-up day after the report release.

The soybean market experienced similar action, as the trade has consistently projected more plantings than USDA found. It was true in March and again in June. The main difference between corn and soybean acreage shifts turned out to be that USDA found slightly lower soybean plantings in June than was first indicated in March, but the end result is very similar with expected soybean production lowered by 50-75 million bushels.

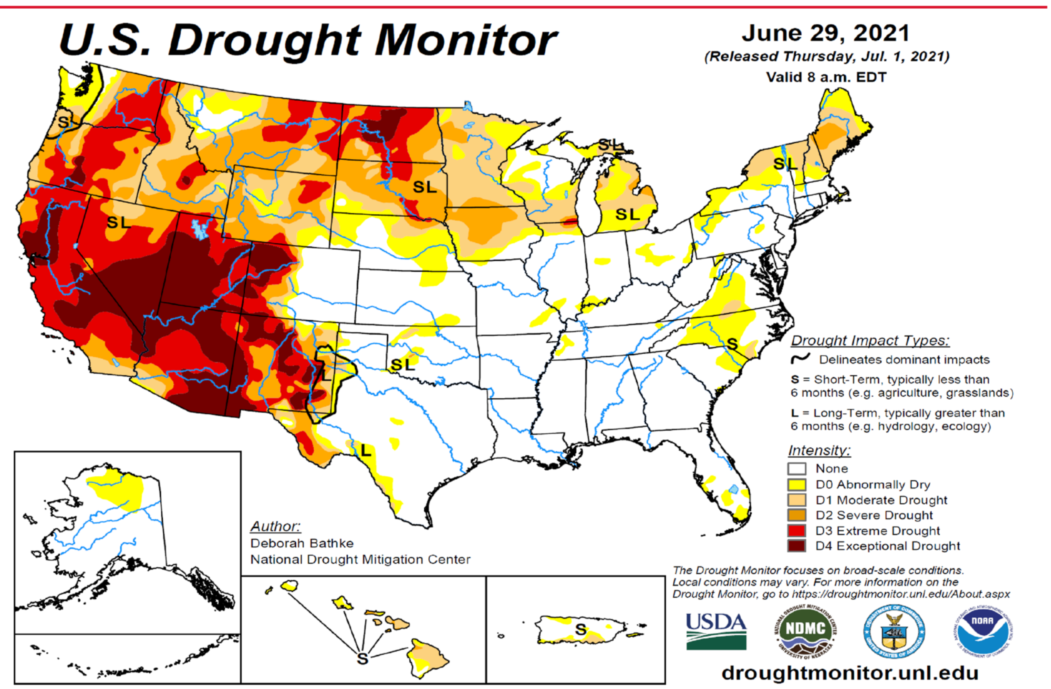
So now with the acreage totals firmly embedded in the market, the emphasis is once again settling in on the national yield projections. Through the May and June WASDE reports, USDA has held firm with their yield estimates at their weather-adjusted trendline yields. That also means that the drought conditions have not been worked into the yield estimates yet. Based on previous years, we can expect USDA to begin to incorporate any impacts from the drought on crop yields with the July WASDE report. Figure 3 displays the national drought monitor at the end of June. As we have discussed over the past couple

Figure 2. US soybean planted acreage estimates



Source: USDA NASS

Figure 3. US drought monitor



Sources: USDA, NDMC, NOAA

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of months, it's the northern and western Corn Belt facing the largest impacts for corn and soybean production. The trade will be trying to assess the potential for the good to excellent crops in the eastern Corn Belt (Illinois and east) to offset drought losses to the west (Iowa and northwest). While the weather patterns did shift in June to provide some moisture to drought-stricken areas, it may have been just enough to meet crop needs and did not alleviate soil moisture issues. With the critical pollination stage coming up this month, additional precipitation in the droughty areas will be needed. So we should expect some additional price swings, depending on the July precipitation forecasts.

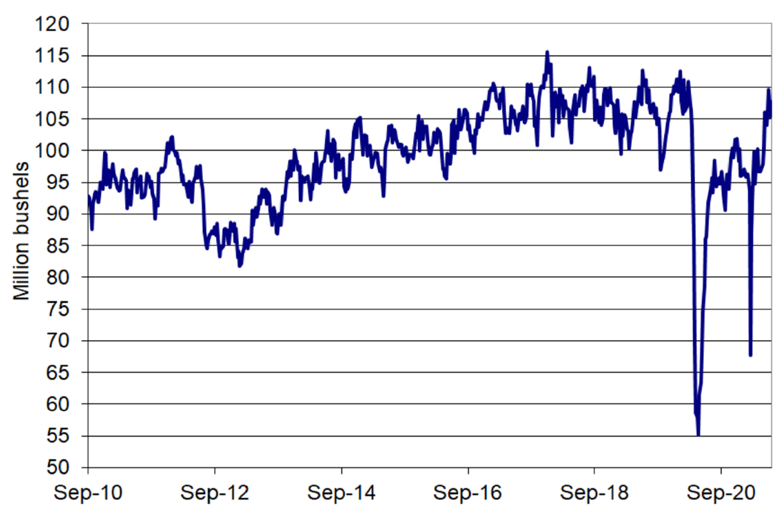
To summarize the supply situation for both crops, while the potential is still there for large crops, the production outlook seems to get smaller every time we look. Currently, USDA still has the corn crop projected to be around 15 billion bushels, but again that is before working in the drought impacts. Soybeans are projected at 4.4 billion bushels, which would not be a record crop, but it's close. However, again the drought looms large, especially since much of the increase in planted area is in the drought areas. So supply concerns continue to support higher prices.

The same can be said as we switch to the usage/demand side of the markets. In spite of the higher prices we have seen throughout this year, crop users have continued to purchase existing supplies and make plans for the upcoming crops. The Grain Stocks report showed crop disappearance during March-May was strong as feed, fuel, and export demand continued to chew through existing supplies. Advance export sales for both corn and soybeans have easily exceeded the sales pace over the past few years. As we enter July, roughly 350 million bushels of soybeans and 600 million bushels of corn are already spoken for from the upcoming harvests by international buyers. Domestically, the most encouraging sign has come from the ethanol industry as corn usage for ethanol production has returned to pre-COVID levels. Prior to the economic slowdown due to the coronavirus, the US ethanol industry would process 105-110 million bushels of corn per week. This provided the corn market a relatively stable flow of usage over the course of a year. The COVID crisis temporarily cut that usage in half and the deep freeze the country experienced in the late winter took another bite out of the industry. However, as the COVID restrictions have lifted and travel has rebounded, the need for fuel has risen. More gasoline usage translates to more ethanol usage and more corn processing. And the data for June (Figure 4) show a return to pre-COVID levels for the ethanol industry.

The price swings over the past couple of months have been dramatic, but throughout the summer, prices have remained well above projected production costs. For May, June, and now, early July, prices have tended to spike high early in the month, then fall back as we move through the month. We will likely see that seesaw pattern continue as the drought impacts are brought into the market. Traders will also continue to look for signs of weakening demand under these higher prices. While the advance export sales have been strong and biofuels have rebounded, will those patterns hold up as we move into the fall?

Current futures suggest traders do expect usage to hold up and the drought to pull some bushels out of the national yield. December corn futures have

Figure 4. US corn grind for ethanol



Source: EIA

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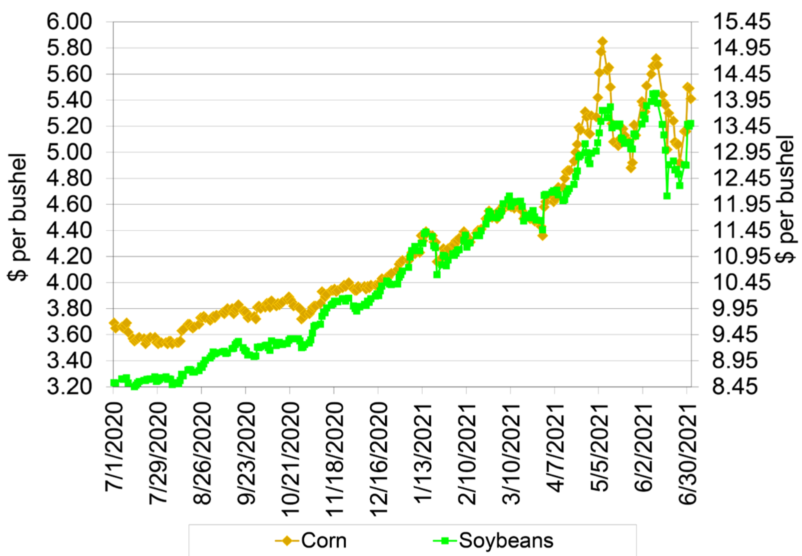
bounced around the $5.75-6.00 range. November soybean futures are floating around $14 per bushel. These would be the best harvest-time prices since 2012. Traders continue to maintain weather premiums in the markets, but we should also expect that the trade will pull some of those premiums away when the weather forecast shows greater potential for precipitation in the Corn Belt.

Figure 5. 2021/22 projected season-average prices (Derived from futures)



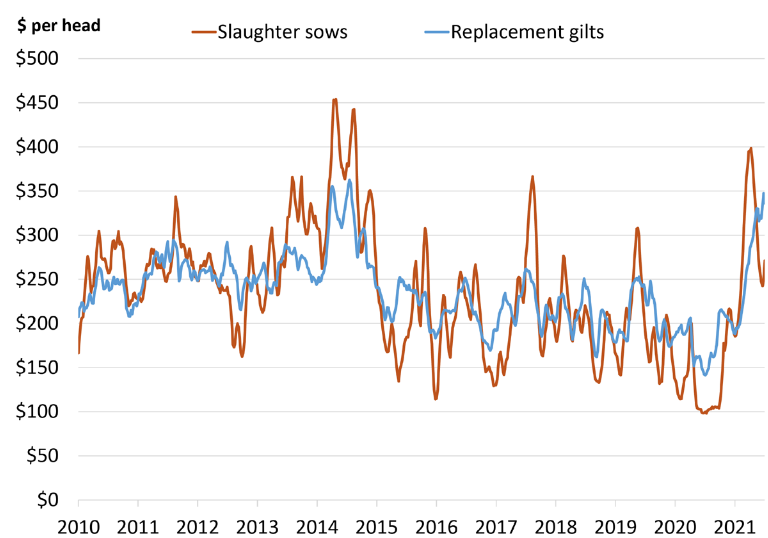
Producers freshen the swine breeding herd

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

An old proverb says, "You can't make a silk purse out of a sow's ear." Forget the silk purse. Many producers would rather have the sow right now–or better yet a replacement gilt.

Early 2021 slaughter sow values ran in the mid-$190s per head according to the Daily Direct Prior Day Sow and Boar Report (LM_HG234), published by USDA Agricultural Marketing Service (AMS) (Figure 1). This is a value based on the average price per hundred weight across all weight categories multiplied by the average live weight. Weight ranges include 300-399, 400-449, 450-499, 500-549, and 550 pounds and up. Price per pound, or hundredweight, for cull sows typically rises as market body weight becomes heavier. By March and April prices had surged, with culls averaging almost $400 per head, the highest since August 2014. Summer sow values cooled to around $250 per head. This is still 2.5 times a year ago and 15% above the 2015-2019 average for this time of year.

Figure 1. US slaughter sow and replacement gilt values



Source: USDA AMS. Notes: Replacement gilt value assumes an $85 per head genetic premium.

Solid sow income goes a long way toward paying production costs, or buying replacement gilts. Breeding gilt prices have soared to almost $350

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per head. With a little more momentum they could surpass the levels seen in 2014. The price of replacement gilts can be estimated using a negotiated price for barrows and gilts from sources such as the National Daily Direct Hog Prior Day Report-Slaughtered Swine (LM_HG201) published by the USDA Agricultural Marketing Service. An adjustment is typically added for a genetic premium—in this case we use $85 per head.

Trend is toward steady

The pork market uses these price signals to help operate efficiently. Not stopping and starting abruptly. Instead gently tapping the brakes or the accelerator as conditions change. In fact, the US breeding herd has become more and more stable over time with both expansions and contractions being smaller in percentage magnitude. The hog cycle is not dead, but calling peaks and troughs in the breeding herd is much harder.

The massive losses of 1998 and 1999 drove December-to-December breeding herd reductions of 4.0% and 6.7%, respectively. More indicative of a measured response is the 2.7% and 3.5% decreases in 2008 and 2009 and the 3.2% and 1.1% increases in 2014 and 2015. The December 1, 2020 breeding herd was down 3.0% from year earlier levels after the tribulations experienced in 2020. Concurrently, high feed prices, labor shortages, and more incidence of PRRS are a few dampers on current expansion plans. Producers rarely expand immediately when hog returns become favorable. Normally three to six months of favorable profits are needed before general expansion of the breeding herd occurs.

The latest USDA National Agricultural Statistics Service survey of hogs and pigs farms pegs the US breeding herd at 6.230 million head on June 1, 2021 (Table 1). This is down 1.5% from a year ago but actually up 15,000 head, or 0.2%, from the March 1, 2021 estimate of 6.215 million head.

Table 1. USDA Quarterly Hogs and Pigs Report Summary

	United States			Iowa		
	2020	2021	2021 as % of '20	2020	2021	2021 as % of '20
Jun 1 inventory *						
All hogs and pigs	77,364	75,653	97.8	24,300	24,200	99.6
Kept for breeding	6,326	6,230	98.5	960	920	95.8
Market	71,038	69,423	97.7	23,340	23,280	99.7
Under 50 pounds	22,110	21,474	97.1	5,780	6,000	103.8
50-119 pounds	19,890	19,349	97.3	7,520	7,280	96.8
120-179 pounds	15,240	15,010	98.5	5,500	5,610	102.0
180 pounds and over	13,797	13,589	98.5	4,540	4,390	96.7
Sows farrowing **						
Dec – Feb [1]	3,068	3,041	99.1	500	530	106.0
Mar – May	3,149	3,067	97.4	500	510	102.0
Jun – Aug [2]	3,260	3,115	95.6	560	500	89.3
Sep – Nov [2]	3,142	3,084	98.2	550	500	90.9
Mar – May pigs per litter	11.00	10.95	99.5	11.40	11.40	100.0
Mar – May pig crop *	34,644	33,584	96.9	5,700	5,814	102.0

Full report: https://downloads.usda.library.cornell.edu/usda-esmis/files/rj430453j/w0893814g/g732f676c/hgpg0621.pdf

* 1,000 head; **1,000 litters;
[1] December preceding year.
[2] Intentions for 2021.

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Spring sow slaughter big again

The ability to somewhat maintain the size of the breeding herd is more amazing than the numbers show. Sow and boar slaughter in March, April and May was 897,500 head, only 34,200 head or 3.7% lower than the big cull in 2020. For the quarter, the ratio of slaughter to the March 1 breeding herd inventory was 14.4%. This was only fractionally lower than the same quarter in 2020. Before that, the last time this ratio was this high was during 2013's short feed crop situation.

Agreed, part of the higher cull number reflects higher imports of slaughter sows and boars from Canada. Through the first six months of 2021 slaughter sow and boar imports jumped 19,186 head or 9.1% compared to the same period last year. Most of that rise came in the first quarter when sow prices were their strongest, but breeding hog imports from Canada are also up 4,371 head or 7.2% for the year. Most of that surge came in the second quarter of 2021.

Gilt retention remains robust

Producers were able to curb breeding herd contraction despite a high sow cull rate. This implies producers are retaining gilts at a high rate to back fill sow sales. If lower cull values add to the incentive to keep older sows, then higher cull values can contribute to refreshing the herd, conditions willing. Some of this could be health-related depops-repops. Some could be upgrading genetics now while cash is available. Replacing sows with younger gilts can also ease the feed cost squeeze. Sows need more maintenance feed due to their mature size.

Ultimately, the decision to re-up with gilts is based on the relationship between current and expected future hog prices, as well as on the projected stream of production costs. Futures are giving producers a positive margin for the next six months, six months after that, and maybe longer. Salvage value can help too: cull sow sales normally represent a relatively small percentage of total annual gross income for farrowing operations. It is higher in 2021.

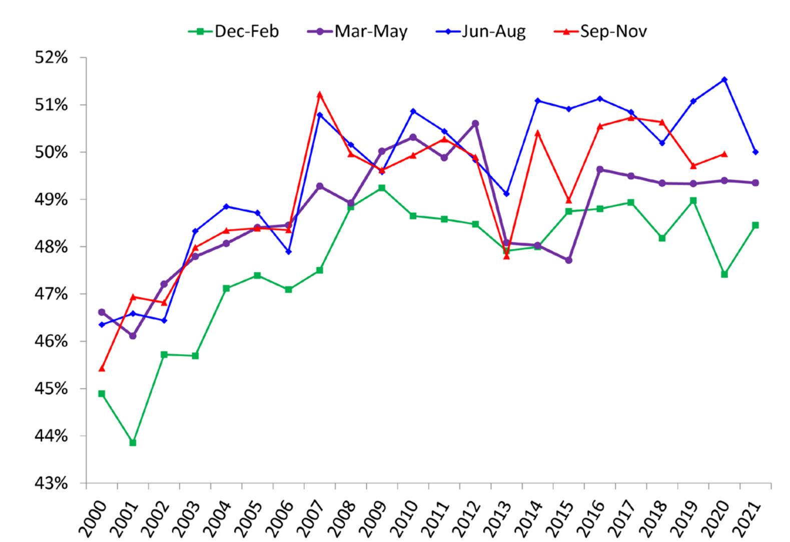
Pig crop, litter rates ease

The March-May 2021 pig crop, at 33.584 million head, was down 3.1% from 2020. Sows farrowing during this period totaled 3.067 million head, down 2.6% from 2020 and 2.1% from 2019. The average pigs saved per litter was 10.95 for the March-May period, compared to 11 last year. Each extra pig is worth much more this year than last year at this time. While lower litter rates could have come from higher disease incidence and labor challenges, the makeup of the breeding herd is also a likely culprit. Litter size is usually smallest in the first litter, rises to a maximum between the third and fifth litter, and then remains constant or declines slightly with older parities. Smaller litters help support the notion of a higher sow replacement rate and an overall younger national breeding herd.

Hog producers say they intend to farrow 3.115 million sows during the June-August 2021 quarter, down 4.4% from June-August 2020 actual sows farrowing and down 4.9% from the same period in 2019.

The Hogs and Pigs survey asks producers about "hogs kept for breeding" without specifying their age. While some gilts are selected from the population of market hogs, many are produced by specialized female lines and may be "kept for breeding" from a very early age. Inclusion of more of these younger animals than usual would inflate the breeding herd number. A subtle aspect that holds this together is the breeding herd utilization rate. The June-August

Figure 2. US breeding herd utilization by quarter



Source: USDA NASS

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Producers freshen the swine breeding herd, continued from page 6

2021 farrowing intentions as a percent of the June 1, 2021 breeding hog inventory would be down to 50%, much smaller than the last several years when producers were holding sows longer (Figure 2).

Watch whether producers maintain the breeding herd, or trim it, into the fall and winter. We do not know what they will do but the wave of gilts likely coming and typical within year inventory dynamics are on the side of holding numbers.

Notwithstanding 2020, for obvious reasons, the September and December breeding herds have been the largest inventories within a year since 2014. December has been the largest all but one of those years. In 2018, the September breeding herd was the largest. So while 2021 year-end breeding herd inventories could be marginally down from 2020, next year's change may not be negative at all. The 2021 feed crop surely will have something to say about that.

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, 2021-2022

	Year-over-Year Change In Commercial Hog Slaughter	ISU Model Price Forecast, IA-MN Base Price, All Purchase Types	CME Futures (6/24/21) Adjusted for IA-MN Producer Sold Weighted Average Carcass Base Price for All Purchase Types Historical Basis
	(percent)	($/cwt.)	($/cwt.)
Jul-Sep 2021	-2.91	90-94	91.56
Oct-Dec 2021	-1.39	76-80	77.81
Jan-Mar 2022	-1.97	77-81	79.11
Apr-Jun 2022	-0.32	85-89	86.65

A look back at death loss in 2020

How much did COVID-19 related supply chain disruptions contribute to pig death loss? Was 2020 worse than other years that had major challenges?

The USDA-National Agricultural Statistics Service combines survey-based estimators and administrative information to construct balance sheets to estimate supply. Commercial slaughter, imports, and exports information are from administrative sources. Pig crop, deaths, and home slaughter data come from USDA-NASS surveys. For example, the most recent Hogs and Pigs survey asked, "How many weaned pigs and older hogs owned by this operation died during March, April, and May 2021?"

The USDA-NASS Meat Animals Production, Disposition, and Income Annual Summary publishes the annual balance sheet for hogs. The disposition report includes estimates of beginning and ending inventories, births, deaths, in-shipments, marketings, and ending inventories. Death loss refers to pigs that die after weaning and cannot be counted in any inventory category.

Operations had 13,631,200 post weaning mortalities in 2020 (Figure 3). That is an increase of 1,674,400 head or up 14.0% from 2019. It was a record level for the data series.

Still, that number is modest relative to height of the pandemic expectations (anticipations) due to a variety of factors.

From 1988 through 2020 death loss is almost perfectly positively correlated with slaughter with a correlation coefficient of 0.96, which makes sense given USDA's balance sheet approach and death loss serving as the residual that helps balance pigs crops and slaughter. The year 2019 had a record large pig crop. Many of those pigs were marketed in 2020. The year 2020 had a record large slaughter level.

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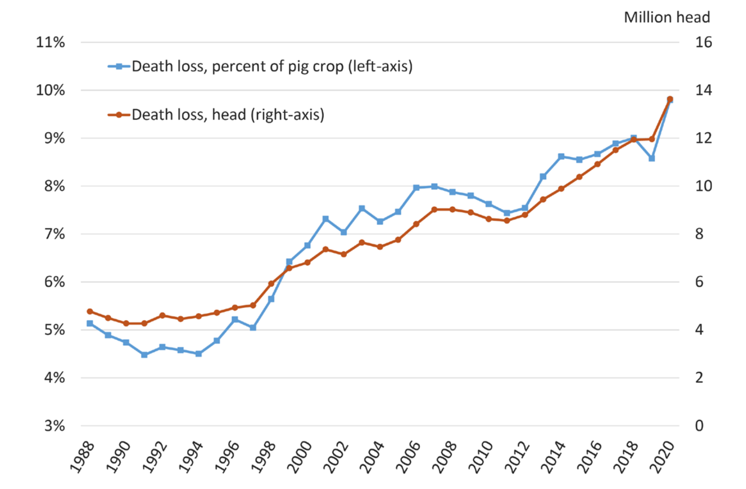
Because inventories were record-large and by association larger slaughter levels, death loss in units was expected to be higher in 2020 irrespective of any disruptions.

Analysts can use USDA data to calculate annual death loss percentage in several ways. One is simply dividing deaths by the total annual pig crop, which was 139,157,900 pigs in 2020. By this measure, death loss was 9.8%. That is up from 9.0% in 2018 and 8.6% in 2019.

Figure 3. US pig death loss



Source: USDA NASS

The slaughter capacity crisis in 1998 that created a liquidity crisis for pork producers, and a business crisis for US pork production that spilled into 1999 saw an uptick in death loss. The 5,023,200 head death loss in 1997 saw an uptick to 5,924,800 in 1998 and 6,575,000 in 1999. This equated to year over year increases of 17.9% and 11.0%, respectively. Annual death loss percentage (deaths divided by pig crops) was 5.0% in 1997, 5.6% in 1998, and 6.4% in 1999. It is important to remember that the industry slaughtered over 30 million more hogs in 2020 than in the late 1990s.

Operations suffered a notable rise in death loss in 2013 and 2014 due to the health challenge with PEDV. Pig deaths climbed 7.3% from 2012 to 2013 and another 4.7% from 2013 to 2014. The annual mortality rate was 7.5% in 2012, 8.2% in 2013, and 8.6% in 2014. Even with much larger pig crops, the industry was able to remain in the 8.5% to 9.0% mortality rate range over the 2015-2019 period.

The Greenhouse Effect is proven science

By Don Hofstrand, retired extension value-added agriculture specialist
Reviewed by Eugene Takle, retired professor emeritus Iowa State University

This article is the fifth in a series focused on the causes and consequences of a warming planet

The greenhouse effect, and its ability to influence the temperature of the planet, is not some new scientific fad. The discoveries supporting this effect began almost 200 years ago, have stood the test of time, and have been widely accepted by the scientific community.

In 1859, John Tyndall discovered that carbon dioxide is a greenhouse gas. By that he meant that carbon dioxide can absorb and hold heat.

In 1896, Svante Arrhenius, a Swedish scientist claimed that burning coal, oil and natural gas releases carbon dioxide into the atmosphere and will eventually warm the planet. He made the first calculations of how much the earth would warm from burning increasing amounts of fossil fuels. His predictions were surprisingly accurate.

Guy Callendar, in 1938, made the first actual linkage between rising carbon dioxide levels and the increase in the Earth's temperature.

In 1958, Charles David Keeling began to measure atmospheric levels of carbon dioxide in Mauna Loa, Hawaii. This measurement showed a carbon dioxide concentration of less than 320 parts per million (ppm) when it was started in 1958, compared to today's concentration of 416 ppm and rising.

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The Greenhouse Effect is proven science, continued from page 8

In the 1960s, Syukruo Manabe found that Earth's lower atmosphere (troposphere) is warming but the upper atmosphere (stratosphere) is cooling. This shows that global warming is not caused by an increase in heat coming into our atmosphere from space, which would warm both lower and upper atmospheres. Rather, it shows that it is caused by heat being trapped next to Earth by the greenhouse effect and not letting the heat move into the upper atmosphere.

Scientists have known about the greenhouse effect for a long time. It just been in recent decades that the greenhouse gas concentration in the atmosphere has gotten to the level where significant warming is occurring.

See the Ag Decision Maker website for more from this series, www.extension.iastate.edu/agdm/energy.html#climate.

Carbon as a third cash crop?

By Alejandro Plastina, extension economist, 515-294-6160, plastina@iastate.edu; and Oranuch Wongpiyabovorn, graduate research assistant

If you have already been approached by promoters of private initiatives offering compensation for the generation of agriculture carbon credits, you may have already noticed that requirements vary widely across initiatives, and carbon prices are -at best- fixed only for the duration of pilot programs.

The complexities involved in the comparison of agriculture carbon initiatives might discourage agricultural producers from properly evaluating relevant alternatives, resulting in a protracted adoption process, and even an accelerated disadoption process if initiatives fail to satisfy producers' expectations.

In an attempt to help farmers and agricultural stakeholders navigate the complexities associated with carbon and ecosystem services programs, Iowa State University Extension and Outreach compared 26 characteristics across 11 private voluntary programs using publicly available online information, and briefly discusses some of the risks from participating in voluntary carbon markets. The programs include two carbon and ecosystem services credit entities (Ecosystem Services Market Consortium-ESMC and Soil and Water Outcomes Fund), two carbon credit entities (Indigo and Nori), four input suppliers (Agoro Carbon Alliance, Bayer, Corteva, and Nutrien), and three data platforms (CIBO Impact, Gradable, and TruCarbon).

While all programs require **additionality** to generate a credit, not all programs require that farmers change their production practices. **Additionality** means that farmers must do something **different** to reduce carbon and increase ecosystem services. However, programs use a wide array of benchmarks to determine what is **different**. Some programs require a change of practices with respect to past practices on the same field, while some others require that practices in the field be different from common practices in the area (even if the same practices have been implemented for many years in the field under consideration).

According to the report, the emerging agriculture credits market can be currently characterized as an unarticulated patch of coexisting programs with different rules, incentives, and penalties. In its formative stage, the market is very dynamic, focused on testing protocols through small-scale pilot programs, and lacks transparency and liquidity.

An advantage of the emerging agriculture credits market over the failed carbon credit exchange from the late 2000s is that the expected farm size to participate in the carbon market is much smaller than before, likely resulting in fewer intermediaries between farmers and credit buyers.

Major systemic risks include potential bankruptcies among the least successful initiatives, carbon credit reversals, changes in the protocols to generate credits over time, and the unknown volume and stability of the demand for credits generated in the agricultural sector.

The full report is available on the Ag Decision Maker website, AgDM File A1-76, How to Grow and Sell Carbon Credits in US Agriculture, www.extension.iastate.edu/agdm/crops/pdf/a1-76.pdf.

Updates, continued from page 1

Internet Updates

The following Information Files and Decision Tools have been updated on www.extension.iastate.edu/agdm:

How to Grow and Sell Carbon Credits in US Agriculture – A1-76 (11 pages)

Fewer Iowa Farms Struggling with Liquidity in 2021 – C1-12 (5 pages)

Converting Cash to Accrual Net Farm Income – C3-26 (5 pages)

Current Profitability

The following profitability 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