BEEF LINE

September 2020

Purdue University Extension Service-Fulton County

1009 W 3rd Street, Rochester, IN 46975

Below is an article from Ohio State University. There are tricks (for better management techniques) that can help us improve the bottom line. After all the investment and work, its time to ship the animals so lets not lose what we have worked so hard to gain.

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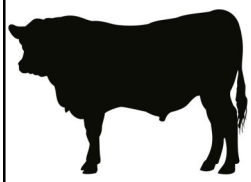

Transportation Shrink in Beef Cattle

– Steve Boyles, OSU Beef Extension Specialist

A better understanding of factors affecting shrink should help buyers and sellers of cattle to arrive at a fair pencil shrink under specific marketing conditions.

Types of Shrink. There are two types of shrink. One is excretory which is the loss of urine and feces. When ambient temperatures are low (below freezing, urine and fecal output can comprise 30-35% of shrink. When temperatures are hot, urine and fecal losses account for about 15-20% of shrink. Much of this loss is replaced when cattle are again allowed to eat and drink.

The second type is loss is tissue loss. It is the loss of fluid from the cells. Tissue shrinkage occurs after holding cattle off feed and water. It also occurs when cattle are subjected to stresses such as hauling. It becomes more important than excretory shrink the longer the shipping time. Since it is actual loss of tissue weight, it is harder to replace.

Easy handling during the loading process and minimizing quick starts and stops in the hauling process can reduce shrinkage. Most of the shrinkage occurs during loading and in the first part (25 miles) of a trip. Cattle may lose half as much in 25 miles as they do in 200 miles. As the time increases, so does shrinkage, but at a slower rate than the first few miles.

Professional cattle buyers may ask for a pencil shrink on cattle weighed on the farm, on a truck or after a very short haul from the farm to the scales. Pencil shrink is a percentage deduction from the weight of the cattle. This makes the weighing condition similar to cattle that were processed through a market. Pencil shrink is usually 2 to 3 percent for feeder cattle and 3 to 4 percent for finished cattle.

Difference in shrinkage between steers and heifers is variable but heifers shrink slightly more. Finished cattle shrink more than feeder cattle in the first eight to 10 hours. Feeder cattle shrink about 2 percent more on long hauls, up to 7 or 9 percent. An overnight stand of 12 hours without feed or water can cause 4 percent shrink in cattle on lush grass or silage. The same cattle on a high grain ration may lose only 2.5 to 3 percent.

Length of Shrink Period. Cattle begin to lose BW at the time they are moved; the greatest

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Assemble a Calf Crop Resilient to the Challenges of Disease

– Justin Kieffer, DVM, Clinical Veterinarian, Assistant Professor, Office of the Attending Veterinarian and Department of Animal Sciences, The Ohio State University

Completing a number of management techniques and vaccine protocols prior to the stress of weaning, commingling and transport will help assemble a calf crop more resilient to disease challenges.

Now that calving is completed, the days are longer, and the grass is growing (hopefully), it is time to start preparing for the weaning and eventual sale or feedlot finishing of your calf crop and development of your replacement females. Once the cow calf pairs have been kicked out to pasture in the spring, there is a tendency to put off or ignore the steps needed not only to set the feedlot calf up for success, but also to lay the groundwork for proper health for your new heifers.

Management techniques such as castration and dehorning should take place as soon as possible. Waiting too long to remove the testicles, either by banding or cutting, increases the risk of bleeding and infection, and knocks the calf off feed for an extended period of time. The smaller the calf, the less attached they are to their testicles. Removal of horns, if present, can be done at birth or shortly thereafter using caustic dehorning paste on the horn buds. If scooping of the horns is the method you employ, make sure to do this before the horns reach 2 inches in length to avoid having an open sinus cavity in the head, which is prone to infection and fly-strike. In both of these techniques, pain control for these procedures is highly recommended and easy to perform. This is critical both from a welfare perspective, and the added bonus of keeping the calf on feed during the healing process.

Vaccinations are also a critical aspect of calf prep that are often misunderstood or under-utilized. As you may know, when a calf hits the ground they have no immune globulin proteins circulating in their blood stream to help fight infections. All of their initial immune globulins come from the colostrum at the first feeding, which needs to take place ideally within the first six hours after birth. The ability of the calf to absorb immune globulins past 24 hours of age is almost zero. These proteins are made by the dam, and concentrated in colostrum prior to birth, this is why vaccination of pregnant cows is essential in providing immunity for the calf. Once the calf is up and nursing, those immune globulins provide immediate resistance to disease.

As the calf ages, the colostral immune globulin levels start to drop off over time, and are mostly gone by around 3-4 months of age. This is an important concept to understand for two reasons: First, giving the calf an injectable vaccine before this time frame means that any antigens for diseases you are vaccinating for (IBR, BRSV, PI3, etc.) will be neutralized by the immune globulins delivered in the colostrum. Essentially, if you have vaccinated the pregnant cow for those same diseases, and the calf nursed properly, there is no need to deliver those same vaccines to the calf prior to 4 months of age.

The second reason not to give an injectable vaccine before this time frame is that the calf's immune system is not ready to see and react to the vaccine. It takes time for the white blood cells responsible for the development of a systemic immune response to learn their jobs and be able to react to invading bugs. One important exception to the use of vaccines in young calves is the use of intra-nasal vaccines. These vaccines provide a localized immunity in the nose very quickly, and are not interfered with by colostral immunity. This is why these vaccines can be given immediately after birth, and at any time in the production cycle safely and effectively.

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Assemble a Calf Crop Resilient to the Challenges of Disease Continued from page 2

Timing of vaccines is also imperative. For example, when the first round of a vaccine is given to a 5 month old steer calf, it takes time for the responsible white blood cells to find that vaccine and take it to the lymph nodes where antibodies can be produced. This process on average takes about 21 days. This is why most vaccines are labelled with directions indicating at least a one month wait before administering a booster shot. If we give the booster shot before the immune system has had time to create antibodies and a memory of the bug, we will not have that second strong immune response from the booster that provides superior protection.

Completion of these management techniques and vaccine protocols prior to the stress of weaning, comingling and transport will help you assemble a calf crop more resilient to disease challenges. Combined with a low stress weaning technique carried out 6 weeks prior to leaving the farm, this type of strategic planning for superior health provides a calf for which buyers will want to pay a premium. Consult with your herd veterinarian to design a vaccination and calf management plan that fits your type of operation.

A Tale of Two Weeds

Mark Kepler Ag/NR Purdue Extension

Along the edge of my cornfield grows two weeds of separate species side by side just like old buddies, but they are not buddies, they are weeds! They are competing with the corn and each other for sunlight, water and nutrients. Around them are other weeds of their species that also want what makes them grow.

Stunted giant ragweed, on the left, and on the right, pigweed growing in a corn field

One of these is giant ragweed or what we called horseweed. Given the right spot, they will grow taller than a horse. They like the rich moist organic soils in the bottomlands and that is where they can easily be tall enough to hide a tractor in a good year.

The seeds they produce are much larger than most weed seeds and they have a type of point on the top that resemble a crown. One fall, I was rabbit hunting through a patch of giant ragweed and quite a large covey of quails kicked out. The seed is preferred and very nutritious for quail. Cows will eat on the plant. They will not want the big thick stalks, but allow cattle to graze a recently combined field of corn and they will clean up the giant ragweed. One interesting fact about giant ragweed seed, is that it is not very persistent in the soil and in two years most of it will be destroyed.

So much for the virtues of ragweed because as a weed, one plant per 10 square feet can reduce soybean yield by 52% and corn yield by 55%. It can compete.

The other plant, touching the giant ragweed in my field was pigweed. The pigweed family of plants are some of the nastiest weeds in the area for crop farmers. They include redroot pigweed (our common weed), palmer amaranth, waterhemp and spiny pigweed. These can all produce a lot of seed that last for decades in the soil. One palmer amaranth plant can produce a million seeds. They also can be resistant to a variety of common herbicides.

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A Tale of Two Weeds

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Pigweed can be deadly to livestock. They contain two poisons. The first, always present, is called oxalates. They can cause kidney damage and death of the animal. It generally takes a quantity of weeds over time to be deadly. So, a few weeds in a pasture is not alarming, but a hog lot full of them can be deadly to their namesake. I remember the first time I went to the Purdue Animal Disease and Diagnostic Lab, there lying on the table was a large pig, dead from pigweed poisoning.

The second problem is nitrate poisoning. Nitrate poisoning can occur from many crops but it is usually precipitated by drought conditions that allow soil nitrogen to accumulate in the plant especially after a rain. It is hard to predict when it will occur and is generally an issue in cattle, sheep and goats. Low levels of nitrogen fertilizer and keeping things watered will help prevent this problem. Unfortunately, we don't always have the irrigation option.

There is a third issues with pigweeds and it is some that is now coming to light as we now talk more about soil health. Mycorrhizal fungi can be found living on plant roots. These fungi help plants grow by serving as little straws that pipe nutrients into plant roots. Its like having a network of specialized roots that help feed the plants. When we talk of cover crops and how they improve the soil health, for many of them the production of mycorrhizal fungi is a big part of the positive effects. About 90% of the plant species participate in the natural phenomena. The pigweeds do not. As pigweed numbers increase there is less biologically positive actions going on in the soil and the crop suffers even more from the competition. Tilling of the soil breaks up the mycorrhizal mass and Mr. pigweed comes on strong in that environment. Once I plowed up a lot that had never been tilled in my lifetime and the pigweed in that lot, set for grazing, was thick. Frankly I have a hard time sleeping when I know there is a potential problem, but I don't know, if there are "too many" pigweed present to cause animal death. Giant ragweed and pigweed growing side by side are robbing my corn yield, but one has an even greater potential to take my animals away from me. Just because it is named pigweed, does not mean it is good for pigs or any other animal.

Call for Steers

New Entry & Delivery Deadline

IBEEF

Opportunity To…

- ✓ *Evaluate herd genetics for feedlot and carcass performance and value*
- ✓ *Determine if breeding and management programs produce cattle that fit current industry needs*
- ✓ *Market cattle through retained ownership*
- ✓ *Capture valuable information for future marketing's*

Detailed Guidelines can be found at
https://ag.purdue.edu/ansc/ibeef/Pages/default.aspx

Feedlot Location: **Purdue University ASREC Beef Unit**

Contacts:

Matt Claeys: 765-427-9078 ◦ Brian DeFreese: 765-491-7421 ◦ Nick Minton: 812-797-7944

ENTRY DEADLINE OCTOBER 26, 2020

Animal Handling

Mark Kepler Ag/NR Extension Educator

It was a race I knew I could win. The participants were a doe deer and me, driving my pickup truck. As I drove slowly down the gravel road with a new goat feeder in the bed, along my passenger side the deer running full speed in a corn stubble field was determined to out run me. As I slowly gained on the parallel running deer in that eighth of a mile stretch I kept wondering when it would decide to veer left in front of me. I was ready for that to happen and I had enough distance to react since I really did not want to test out my grill guard. As I neared the field bordering high tinsel fence, the deer was still parallel as she cleared the fence and ran into some brush just as I passed on by.

For me, it was not the chase but the chance to see a wild animal exhibit the characteristic behavior we teach in our animal management classes called "Point of Balance." There is a spot on an animal where you can make the animal move forward or backwards. That point is generally near the shoulder. If you walk towards an animal and you are in front of the shoulder they will turn away from you. If you are behind the shoulder, they will continue to move forward.

Several years ago, we produced a video used in programs to teach law enforcement officers how to handle escaped animals. In that video Purdue Beef Specialist, Ron Lemenager takes a step in front of the shoulder of a beef animal, at this point the animal stops. He then takes a step back and the animal goes ahead. He does this about five times before letting the animal proceed by stepping back.

We also did this with a hog and a person carrying a hurdle board beside it. That person was in a hurry and every time the hurdle got in front of the shoulder the hog stopped.

The animal characteristic that leads to this is the eye placement. Our farm animals are considered prey species. In the wild they would be eaten by predators and so cattle have developed an eye set that allows them to see a little more than 300 degrees around them. Think of it as panoramic vision. They can easily detect movement behind their shoulders but not as far back as behind their tail. Conversely, they cannot see horizontally as good as we can. Humans can see about 140 degrees up and down and cattle can only see around 60 degrees. This is why cattle must lower their heads to focus on something on the ground. This is also why deer hunters use tree stands to escape the view of their quarry.

Binocular vision is what humans have where we use both eyes to focus on an object, allowing the perception of depth, speed and distance. Cattle have binocular vision up to the 50-degree range in front of them. Along their sides, they know something is there but they cannot focus and tell exactly what it is.

Part of animal husbandry is knowing how to use their biological makeup to our advantage. Walking directly behind an animal will put you in their blind spot. To effectively get them to move walking in a zigzag pattern will allow you to be see out of both of their eyes and will get them to move straight ahead. If the handler is walking on one side they will eventually curve away.

In a group of cattle, the point of balance is the shoulder of the lead cow. Someone zigzagging behind the group and other people walking along side can get the herd to move. The people walking on the side should never get ahead of the shoulder of the lead cow.

The running deer is in panic mode and it sees the truck in its monocular vision so it views itself as being chased. In this mode my truck is well past the point of its shoulder and its mind is focusing on what is ahead of it. This illustrates another principle that we teach in livestock classes and that is, animals can only process one thought at a time. That animal is only concerned about the fence and brush that lie ahead it will have to navigate. It is in flight or fight mode and some of our animal handling knowledge and technique no longer work. I will never forget the day-old calf that I tried to catch and tag. It took off on a dead run though the high tinsel fence and across a twenty-acre field before it was stopped by a short span of woven wire fence. When I finally caught up to it, it put its head down and charged me. It didn't care where its mom was, it was in panic mode with only one though on its mind. That was one of many experiences where I learned that calving pastures need to have woven wire fences.

Cow Paths

Mark Kepler, Ag/NR Extension Educator

A cow path in my rotational grazing field leads to the gate and to the future beyond

If I had to do it all over again I think I would have become an animal psychologist. The animal sciences were more about physical science than mental in the 1970's when I was going to college. But that was soon to change, I remember going to the Midwest Association of Animal Scientist meetings as a graduate student in the early 80's and listening to another graduate student, Temple Grandin give a presentation on animal behavior. Today Temple is a well renown professor of animal behavior.

Just by chance, at one of the social gatherings there, I began a conversation with a person that was her major professor at the University of Illinois, Stanley Curtis. He, as it turned out, is a Culver High School graduate and farm boy, just like me. He was the valedictorian but I didn't fair that well. Stan researched farm-animal environmental physiology, behavior and care. At one time he did work in the Dairy area.

As a boy growing up on a dairy farm, I had every dairy farm child's job of bringing the cattle in from the pasture for milking. It was never a difficult job, those cows knew there was grain awaiting them in the barn and relief from their tightening udders. After getting the cows started, their trip eventually would lead to the well-worn cow path that meandered its way to the barn. Just like a river where small streams would eventually join to make the main channel; cow paths would form at various spots in the field and converge onto the main path. Eventually the cows, one by one would follow each other down that path. That path was a part of their "creature of habit" mentality, just as the fact is that the cows would also go right into their own stalls in the barn.

The cows grazed in a pasture field of grass. What kind? As a small boy I did not know of orchardgrass and bluegrass and that field was never renovated, fertilized or improved, so it was just grass. Dairy cows in the 1960's produced an average of 35 pounds of milk a day. The forages at that time were good enough to support that performance. Today our genetically improved milk cows have doubled that average and many individual cows have far exceeded 70 pounds per day.

In order to accomplish those kinds of numbers, it is the feed and especially the forages that can be the limiting factor in milk production. Dairy farm children now need to do more than run the hay bine and bale hay. They need to learn about alfalfa, clover, ADF and NDF and a lot more of the science behind cattle raising.

They also need to know what their cows are thinking. In the book "Cow Talk" by John Moran and Rebecca Doyle, they state, "cows responded best to confident introverts (in other words people with the following set of traits: self-reliant, considerate, patient, but difficult to get on with, forceful, suspicious of change, not easygoing and not talkative). People with these traits were more stable and had an air of confidence, which enabled them to develop positive relationships with their cows that benefited their performance… fear of humans can account for 20% of the variation in herd milk yield."

I cannot imagine my life if I had not grown up on a farm. Just like Stan Curtis it has led to my life's pursuits. Every once in a while, those old cow paths would split into two and eventually reconverge. In Robert Frost insightful poem, he writes "Two roads diverged in a wood, and I—I took the one less traveled by, And that has made all the difference." For me it would be, two paths diverge in a green pasture and I, well I just followed the cow. And in the long run, it too made a difference.

Epitaph

I wrote this column on May 20. On the following Sunday during the Memorial Day weekend I visited my father's grave in Popular Grove Cemetery. As I walked towards his resting place, I passed the headstone of Stanley Evan Curtis who passed away in 2010. Unbeknownst to me, written on that marker were those famous lines of Robert Frost's poem.

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proportion of BW loss occurs during the early hours of feed and water deprivation. Coffey et al. (4) reported that steers that were gathered at daybreak from pasture and placed in holding pens without feed or water shrank at a rate of 1.25% of BW/h during the first 2 to 2.5 h, 0.61% of BW/h during the next 2.5 to 3 h, and only 0.16% of BW/h during the next 2-h period. In that study, steers shrank a total of 6.2% during a 9-h period, of which almost one-half (48%) of the BW loss occurred during the first 2 to 2.5 h. Therefore, shrink is generally greater early in the feed and water deprivation period and appears to range from about 0.75 to 1.25% of BW/h during the first 3 to 4 h.

Environmental Conditions. Self and Gay (11) reported a tendency for stocker calves to shrink more when shipped in the summer compared with those shipped in the fall or spring if the calves were shipped directly from the farm to the feedlot. Feedlot cattle have also been reported to have a tendency to shrink more during the summer and fall compared with those shipped during the winter and spring (6). Both fecal and urine outputs (kg and % of initial BW) were actually lower when ambient temperature was higher. Therefore, the increased BW lost during higher ambient temperatures is a result of a greater proportion of respiratory loss, presumably at the expense of fluid from body tissue (11). It is concluded that shrink under higher ambient temperatures is therefore much more serious and also costly to the cattlemen receiving the cattle.

The composition of the BW loss and the impact of the stresses on long-term animal health and performance are as critical as the actual BW losses themselves. Cole et al. (5) reported greater nitrogen loss from both the urine and feces in transported calves compared with nontransported fasted calves.

Effect of Handling Procedures. Self and Gay (11) indicated that cattle shrank less when they were handled as quietly as possible upon removal from pasture. A typical research practice is to weigh pasture cattle on 2 consecutive d to arrive at a beginning and ending BW for studies. Cattle that are hard to remove from pasture (i.e., more excited during pasture removal) typically weigh less on the second day than cattle that are easily removed from their pasture and handled more calmly. It is believed that handling procedures that create more stress on cattle will have a negative impact on cattle BW, shrink, and recovery time.

Effect of Previous Diet. Many producers feed grain prior to shipment to help cattle retain BW and reduce shrink. However, definitive research evaluating preshipment diets and management has produced variable results. Based on the summary information in the article, it is questionable whether feeding concentrate prior to shipment will reduce shrink.

Effect of Preconditioning. Preconditioning has been used in an attempt to provide better quality cattle at the livestock auction through reduced sickness and subsequent medical expenses (39); however, a consistent reduction in shrink should not always be expected based on available data.

Effect of Feed Additives. Certain feed additives may have an impact on feed intake, fill, and mineral status, and these factors may also impact shrink. Suckling calves shrank over 45% less during transport when lasalocid was included in a creep feed compared with calves fed a creep feed without a feed additive (2) Stocker heifers shrank 8.3% less during a transport when they were fed lasalocid in a mineral mixture before shipment compared with feeding either a control mineral or one with oxytetracycline (1). Heifers that fasted in a drylot for 10 h tended to shrink less when they were fed monensin before fasting compared with either a control supplement or supplements containing chlortetracycline or lasalocid. Steers offered lasalocid in a mineral mixture before a 6- to 9-h fasting period had a slight (7.5%) reduction in total shrink and rate of shrink compared with those offered a mineral mixture without an ionophore (4). Therefore, feeding ionophores for extended periods before shipment may help reduce shrink.

Forage Effects. The time of the morning that cattle are removed from pasture before weighing can have an impact on both their BW and the amount of shrink they incur. Heitschmidt (7) reported that cows grazing native range were 2.5% heavier in late morning than in early morning. In another grazing study, steers were removed from pasture at different times of the morning during the fall (4). Steers that were allowed to graze

Transportation Shrink in Beef Cattle

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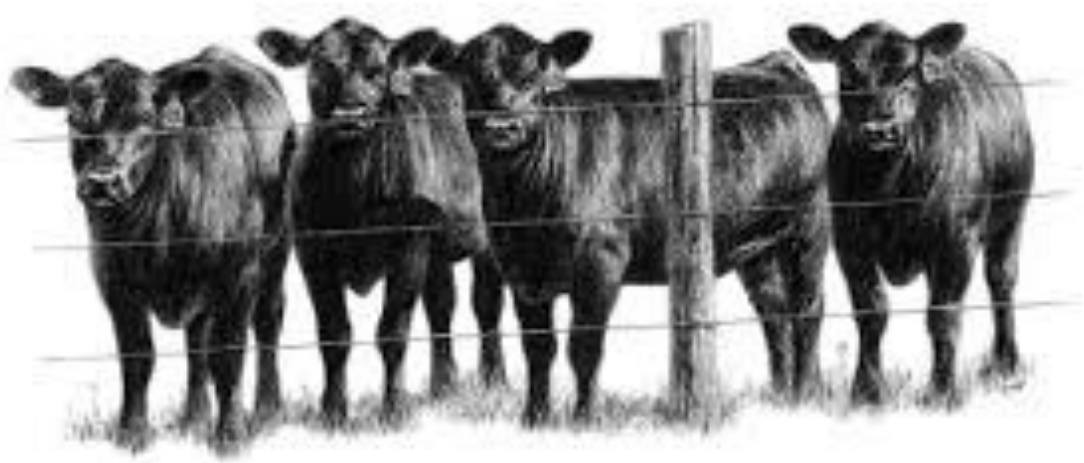
3 h before gathering were 1.9% heavier than those gathered at daybreak. Rate of cattle shrink throughout the day was also affected by length of morning grazing before removal from pasture (4). Steers allowed to graze for 3 h before removal from pasture shrank at a rate of 0.86%/h less during the first 2.2 to 2.6 h following removal from pasture than those steers removed as grazing began at daybreak. Cumulative rate of shrink at any length of time following pasture removal, as well as total shrink and cumulative rate of shrink at 1500 h, was lowest from steers allowed to graze for 3 h before being gathered from pasture. Therefore, allowing cattle to graze for an extended period before shipping not only allows them to gain additional BW, but also reduces their rate of shrink during the early shrink period.

Dietary Manipulation of Shrink. Hutcheson et al. (8) reported a positive response to supplemental potassium in the receiving diet and recommended that potassium levels of diets for receiving calves be increased 20% to offset potassium loss during transport. Cattle given either an electrolyte solution or glucose solution in the drinking water before slaughter had improved meat quality traits and carcass yield compared with those given no water or water only (9). Electrolyte supplementation before slaughter also reduced urine concentrations of sodium and potassium and increased urine chloride concentration, indicating that electrolyte supplementation during this time reduced the normal response of electrolyte elimination into the urine during transportation and fasting. In another study, cattle provided an electrolyte solution during holding for slaughter retained a greater percentage of live BW as carcass weight (10). Others have reported a response to supplemental chromium (3) in receiving diets, indicating that the body may be eliminating this element during transportation as well. Therefore, it appears possible to provide animals with a diet balanced for energy, protein, and electrolytes before transport that would help reduce shrink by providing storage of essential nutrients. However, this hypothesis needs to be evaluated because the body tends to reject and eliminate nutrients provided in excess.



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Visit us online @ https://extension.purdue.edu/Fulton/pages/default.aspx

There are many articles and opportunities that may interest you in your agricultural endeavors, I've listed a few below.

Listen to the Fall 2020 Crop Outlook by visiting this website:

https://extension.purdue.edu/Fulton/article/39145

Fall Corn & Soybean Outlook Following USDA's September 2020 Reports

Sarah Zahn September 14, 2020

Purdue agricultural economists Michael Langemeier and James Mintert discussed USDA's September *Crop Production* and *World Agricultural Supply and Demand Estimates* (WASDE) reports on September 11 during Purdue Center for Commercial Agriculture's Fall Crop Outlook webinar. The reports provided USDA's first objective yield estimates for the 2020 corn and soybean crops. The webinar includes an overview of the information on the two reports along with a discussion regarding implications of the changes for the corn and soybean outlook in addition to a review of the likely changes in corn and soybean profitability and what that portends for 2021 cash rental rates.

The recorded version of the program is available for **viewing on the Center's website**, where a copy of the slides presented during the webinar are available also, or on the Center's **YouTube channel** (don't forget to subscribe). A **companion podcast episode** on the *Purdue Commercial AgCast* is also available on the website or any platform where you access your podcasts.

The Purdue Agricultural Economics Report (PAER) is available online by visiting this link:

https://ag.purdue.edu/commercialag/home/resource/2020/07/2020-07-purdue-agricultural-economics-report-paer/

The 2020 Purdue Farmland Value and Cash Rents Survey suggests that farmland prices across Indiana improved since the June 2019 survey; however, many of those gains occurred between June and December 2019. Since then farmland prices have declined modestly.

The strongest year-to-year statewide increase was for poor quality land, which was up 6.3%, top quality land was up 4.5%, and average quality land was up 3.2%. Between June and December 2019, top, average, and poor quality farmland values increased by 5.5%, 5.0%, and 8.7%, respectively; yet, between December 2019 and June 2020, top, average, and poor quality farmland values posted modest declines of 1.0%, 1.7%, and 2.2%.

Statewide cash rental rates also increased across all land quality classes in 2020. The largest increase was in low quality land which increased by 5.4%, average quality increased 4.8%, and top quality land increased 4%.

For more in depth analysis on the survey, the Purdue Center for Commercial Agriculture will host a free webinar Friday, August 7, 2020 from 3:30 – 4:30 P.M. EDT. Join Purdue agricultural economists Todd Kuethe, James Mintert and Michael Langemeier as they breakdown the Purdue Farmland Values Survey and USDA Land Values report, discuss marketing strategies for 2020 corn and soybean crops, and make projections for 2021 corn and soybean returns.

The Purdue Farmland Value and Cash Rent Survey is conducted each June by the department of agricultural economics and published in the Purdue Agricultural Economics Report. The survey is produced through the cooperation of numerous professionals knowledgeable of Indiana's farmland market. These professionals provided an estimate of the market value for bare poor, average, and top quality farmland in December 2019, June 2020, and a forecast value for December 2020.