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Combine Considerations for a Variable Moisture Corn Harvest

Adjusted properly, a combine can handle corn between 20 and 30% moisture. However, as moistures exceed 30%, work may be needed to a balance between leaving unthreshed grain in the field and grain damage. The following tips will help serve as a guide with the variability in this year's harvest season.

Ground Speed

The first consideration when it comes to harvesting wet corn is ground speed. Be sure to select a ground speed that does not overload the machine, as the engine must be able to maintain its rated engine speed to keep separator and cleaning shoe at full speed. Adjust your hydrostatic transmission to maintain the engine near rated speed under varying crop conditions.

Header

The usual advice for minimizing trash input into the combine by operating the header as high as possible is even more critical in these wet conditions. Introducing tough, wet leaf and stalk material into the combine reduces its effectiveness to thresh and separate the grain. Wet stalks and leaves absorb threshing energy that would normally be used to separate grain from cobs. Additionally, this wet mat of material can overwhelm the separator, trapping both threshed and unthreshed grain. Consequently, consider operating the stripper (deck) plates wider to minimize leaf and stalk material entering the combine. However, be careful to avoid shelling the butt end of the ear with the stripper plates too wide.

Concave

Before changing concave clearance, first make sure it is level side-to-side (conventional combine) or front-to-back (rotary combine) so that the adjustment is uniform. The operator's manual will provide details for this process, but it normally involves adjusting the right and left or fore and aft sides of the concave to ensure they are uniformly spaced from the cylinder or rotor. This will ensure that in-cab adjustments are accurate across the width or length of the concave. A poorly leveled concave could damage grain on the high side while under-threshing grain on the low side. Consequently, it would be impossible to balance between grain loss and damage.

The operator's manual will give starting clearances for the combine, but generally set the concave approximately to the diameter of a shelled cob. A properly adjusted concave will break up some cob, but excessive broken cob is an indicator that the concave is set too close to the cylinder or rotor. Too many broken cobs can lead to high levels of cob in the clean grain tank or can overwhelm the cleaning shoe.

Cylinder or Rotor Speed

After the concave is adjusted properly, adjust the cylinder or rotor speed to maximize threshing in wet grain, but make sure this adjustment is balanced with

grain damage. If grain damage becomes excessive, slow the cylinder or rotor. Do not increase the concave clearance. Concave spacing has very little effect on grain damage in corn.

Cleaning Shoe

Always begin harvesting with the chaffer and sieve openings to the maximum specification in the operator's manual. Closing down the sieve will produce clean corn in the grain tank, but it will also increase tailings returned for rethreshing, which can increase grain damage. If there is too much cob in the grain tank, first try increasing airflow, then close the top chaffer sieve a little and finally the lower shoe sieve a little. Wet crop residue will require higher air speed compared to a dry crop.

Repair

As with any harvest conditions, a poorly maintained combine will lead to higher grain losses and increased grain damage. Typically, one will need to increase cylinder or rotor speed to compensate for worn parts. On a conventional combine, check the concave for wear and look for rounded edges on the crossbars. On a rotary combine, check the threshing elements for worn and rounded edges. Replace concaves and rasp bars if wear exceeds the tolerances stated by the manufacturer. Please consult the operator's manual or local dealer for allowable wear tolerances.

If using chromed rasp bars to take advantage of its wear properties, one may consider switching back to a hardened rasp bars as the "ever-sharp" edges of the chromed rasp bar may be too aggressive on the potential of this season's soft kernel.

Depending on your machine, there may be additional parts to improve threshing performance in wet crops. For example, some manufacturer's recommend rear concave inserts to improve threshing while others offer round bar concaves and separating grates to prevent crop hair pinning. Consult the operator's manual and/or your local dealer to determine what options are available for your combine.

Source: *Kent Shannon, natural resource engineer*

Food Dollars and Value

The Economic Research Service (ERS) part of USDA tracks food dollars and the percentages. There are multiple methods of collection, but two of the more interesting for farmers are marketing bill series and value added component series.

The marketing bill series is based on sales proceeds. The sales from each food dollar is divided into two categories: farm share and marketing share. The farm share measures proceeds of farm commodity sales tied to a food dollar expenditure and sold to non-farm establishments. It does not include sales of farm commodities incorporated into other commodities and resold to a domestic farm industry to avoid double counting. The marketing share is the market value added to farm commodities encompassed into a food dollar expenditure and measured as \$1 minus the food share. The current data shows food dollar split with 14.6¢ attributable to the farm share and 85.4¢ to the market share.

The value added component series method is based on establishments contributing to the U.S. food supply, which includes the proceeds from the sale of outputs minus the outlays for commodities purchased from other establishments. The sum of value added by all establishments contributing to the total food dollar purchases equals \$1. The breakdown is as follows: farm production 7.8¢, food processing 15¢, packaging 2.3¢, transportation 3.5¢, wholesale trade 9.1¢, retail trade 12.6¢, food services 36.7¢, energy 3.8¢, finance and insurance 3.2¢, advertising 2.6¢ and other 3.4¢.

In addition, ERS tracks some foods by farm percentages. A few of the crops reported recently includes butter (farm share \$2.15 per pound and 61% of total price), white all-purpose flour (farm share \$0.07 per pound and 14% of total price), soybean oil (farm share \$2.33 / gallon and 36% of total price), field-grown tomatoes (farm share \$0.37 per pound and 22% of total price).

The most recent data of corn and soybeans exported from Missouri totals over \$1.5 billion per year. There is opportunity for adding value and further processing, but the challenging part is determining and financing an idea. Value-added processing may not change the farm price, but the goal of value-added processing is to make profit and use farm commodities.

University of Missouri Extension is working to keep more of the food dollars within Missouri and one way to accomplish this is by adding value to existing production through further processing. Ag business specialists across the state are putting emphasis on value-added projects. If a group of farmers or an individual is working on a project/idea and needs some help or information please call your county extension office.

Source: *Mary Sobba, ag business specialist*

Ammoniation Improves Low Quality Forages

This year, spring was wet in Missouri and pushed many producers harvesting hay much later in the season than normal. Late harvested grass hay has produced lot of seed heads with matured stems. The hay with higher ratio of stem to leaf is lower in nutritive value and digestibility. This is because grass seed heads and stems are lower in protein and energy than leaves. In wet years, forages tend to grow more rapidly and mature quickly, which may also have further decreased overall hay quality in Missouri this year. Cattle producers might need to either provide additional feed supplement to their cattle along with low quality hay or treat the hay to improve its quality.

Ammoniation is an effective option to improve the nutritional value of low quality hay. Besides hay, crop residues such as wheat straw, grain sorghum stover and corn stover are other potential sources of low quality roughages that are not often utilized in beef cattle diets because of their low nutritive value. Sometimes, producers might harvest low quality roughage from conservation reserve program (CRP) land that is either coming out of the CRP program or haying that has been allowed to relive drought situations. Treating with anhydrous ammonia provides an opportunity to improve the nutrient characteristics of these low quality roughages, which might be a valuable feed source to cattle especially during hay shortage season.

Ammoniation improves roughage nutritive value by increasing roughage digestibility, crude protein content and intake by animal. Research shows ammoniation also reduces the toxicity of endophyte-infected tall fescue as toxics break down during ammoniation. University of Missouri research shows that ammoniated tall fescue hay is about five times less toxic than pastures. Forage scientists call ammoniation a 'secret weapon' for improving nutritional value of hay, straw and cornstalk, up to double, at a reasonable price.

Hay should be tested before ammoniation. Ammoniation of high-quality hay increases levels of a toxic compound that causes crazy cow syndrome when fed. Use a maximum of 50 pounds of anhydrous ammonia per ton of hay or straw to avoid nitrate toxicity issue. Ammoniation costs \$20-\$30 per ton depending on cost of plastic sheet and ammonia.

In general, a stack of roughage is covered with black plastic sheet to create a tight seal. Anhydrous ammonia is injected into the stack and allowed to

react with the roughage for one to four weeks, depending on air temperature. If the temperature is 85 degrees or higher, one week is sufficient. If temperature is mild, the process can take two to three weeks and up to four weeks if temperatures are lower than normal.

For ammoniation, select a well-drained location for the haystack. Determine the average weight of the bales in the stack by weighing a few bales. Stack round bales in a pyramid two or three bales tall, so the covering will shed rainfall. Leave a few inches between sets of bales so the anhydrous ammonia can move between bales. Cover the stack completely to the ground all sides with 6 mil black plastic and ensure there is sufficient length to cover edges with soil. Tamp soil down to create an airtight seal. Fill the tank with only enough ammonia for the stack being treated. This helps to avoid over-treating. Wear proper safety equipment when working with anhydrous ammonia. Make sure anhydrous ammonia gas has dissipated from the bales before feeding to cattle. Normally, it is recommended to wait for three days before feeding.

For more information, contact your University of Missouri Extension agronomy or livestock specialist.

Source: [*Drhuba Dhakal*](#), agronomy specialist

2019 Fall Calving Show-Me-Select Heifer Sale

The Northeast Missouri Show-Me-Select Replacement heifer program held a fall calving heifer sale on, June 1 at F & T Livestock Auction. Eighty-seven heifers were sold with an average price of \$1,857.

Seven producers were enrolled in the University of Missouri Extension's educational heifer management program. The heifers were bred to sires with both calving-ease and growth genetics. The top selling lot was consigned by Twin Hill Stock Farm and brought \$2,100.

Highest consigner average was \$1,941 on 14 head from Randy Baker, LaPlata, Mo. Other high averaging consignors were Prairie View Farms, Monroe City, Mo. \$1,910 on ten head; Twin Hill Stock Farm, Silex, Mo. \$1,866 on thirty-eight head; McCutchan Angus, Monticello, Mo. \$1,831 on four head.

Seventeen buyers purchased bred heifers with a value of over \$161,600. Calving surveys were also completed and returned to buyers providing important information to consignors.

The Show-Me-Select heifer development program takes nearly a year to complete. Pre-breeding exams are completed 4 to 8 weeks before being bred. These exams include a pelvic measurement, reproductive tract score, and weight record. Heifers may be bred artificially or be exposed to natural service. However, the service sires must meet specific calving ease EPD requirements based on breed. This year 50 head, or 57 percent, of the heifers in the sale were synchronized and bred AI. In this sale, the choice to AI, showed a \$98 price advantage over those bred naturally.

All heifers must be pregnancy tested within 90 days of breeding by a veterinarian to determine expected calving date. The use of ultrasound has helped veterinarians improve their accuracies on calving dates. During the development period, the heifers undergo an extensive health program. This includes vaccinated at weaning, pre-breeding, pregnancy examination, treating for internal and external

parasites. Heifers are also screened for blemishes, condition, muscling and structural soundness by MU Extension livestock specialists and Missouri Department of Agriculture graders.

This is the 23rd year for the Show-Me-Select heifer sale in Palmyra, Mo., over 45,000 heifers have been through the program, and 6,635 head have been sold. If you are interested contact your local MU Extension Livestock Specialist.

Source: *Daniel Mallory, livestock specialist*

Area Upcoming MU Field Days

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| Aug. 6th - | Greenley Research Center
Novelty, MO
8 a.m. to noon |
| Sept. 10 - | Forage Systems Research Center
Linneus, MO |
| Sept. 24 - | Thompson Research Center
Spickard, MO |