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Volume 5, Number 8
August 2018

For more information please contact your MU Extension Center:

Adair
(660) 665-9866
Audrain
(573) 581-3231
Boone
(573) 445-9792
Callaway
(573) 642-0755
Chariton
(660) 288-3239
Clark
(660) 727-3339
Howard
(660) 248-2272
Knox
(660) 397-2179
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(573) 767-5273
Linn
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Tips Prior to Harvest for Collecting Yield Data

It is important to be ready to maximize the value of yield data, since harvest is approaching. Following are some tips to take prior to the combine and yield monitoring system entering the field:

- Back up yield data from the previous season, if not already completed.
  - ► Best practices:
    - ♦ Copy each season's data to a unique folder labeled as the year and yield data.
    - ♦ Maintain several backup copies of the display/raw data in different locations in case it is lost, stolen, damaged, or modified.
    - ♦ Delete old files from the memory card or USB drive.
    - ♦ Delete old files from display memory if close to full.
- Check any data cards or USB drives to be sure they work properly with your yield monitoring display.
- Contact your local dealer or manufacturer for the most recent software and firmware upgrades for your yield monitoring and mapping system, the display, DGPS receiver, and other components. One can obtain information about these upgrades through the manufacturer's website or by contacting technical support.
- Check all cables, connections, and sensors for wear or damage. Ensure that wiring and harness connections are tight.
- For clean grain elevator-mounted moisture sensor units:
  - ► Make sure the sensor is clean and not damaged.
  - ► Clear the clean grain elevator of old grain and debris.
  - ► Check to be sure the manual clean-out motor works on the moisture sensor.
- Inspect the yield sensor:
  - ► For combines with a mass flow sensor (normally located at the top of the clean grain elevator):
    - ♦ Look for wear on the flow sensor's impact or deflector plate and replace the plate if worn or damaged. There have been cases where a hole in the plate exists, greatly increasing the risk of inaccurate yield readings.
    - ♦ Look for any excessive wear on the grain elevator and missing or worn paddles.
    - ♦ Check to make sure the spacing between the paddles and the top of the elevator meets the manufacturer's requirements.
    - ♦ Ensure the clean grain elevator chain is tightened to manufacturer specifications.
  - ► For combines with an optical sensor (mounted on the side of the clean grain elevator):
    - ♦ Make sure the sensors are clean and not damaged.
    - ♦ Ensure the clean grain elevator paddles are not rubbing against sensors.
- If purchasing a new or used combine with an existing yield monitoring system installed, check to make sure it is properly installed. Especially check that the mass flow sensor is mounted securely.
- If using a grain cart with scales or a weigh wagon to weigh grain harvested for yield monitor calibration loads, check that they are producing accurate weight data. Check weigh wagon weights against certified scales each season to ensure the load estimates are within a few percent and use the same scales throughout calibration.

- The calibration operation will require accurate estimates of moisture content of the harvested grain. Portable moisture meters commonly used on the farm vary widely in terms of estimate accuracy. If you are not certain of the accuracy of your grain moisture meter, take it to a local grain elevator which has a federally approved moisture meter and compare estimates on grain samples, preferably samples representing a wide range of grain moisture, e.g., 13 to 28 percent grain moisture content.
  - Document differences between your meter and the meter known to be accurate. As an example:
    - Your meter estimates 25 percent; accurate meter estimates 28 percent.
    - Your meter estimates 20 percent; accurate meter estimates 22 percent.
    - Your meter estimates 15 percent; accurate meter estimates 16 percent.
  - During the yield monitor calibration operation, use the documented moisture estimate differences to adjust the estimates of moisture made on grain sampled from the harvested calibration loads.
  - It is recommended to always check moisture content estimates with a federally-approved moisture meter.

Additionally, the following items can be checked prior to calibrating the yield monitoring system:

- Start up combine and turn on the yield monitor display to check the following:
  - Yield monitor display indicates everything is functioning correctly or is properly connected.
  - Memory card or USB drive is installed properly, if required.
    - Make sure there is proper communication between the data card or USB drive and the in-cab display, for those displays requiring a memory card to collect data. Usually an error message will appear on the display indicating there is no communication with the data card or USB drive.
  - The GPS receiver is providing a position and has differential correction (WAAS, SF1, SF2, RTX, or RTK).
    - *Note:* If purchasing a differential correction service, make sure your subscription runs through harvest.
- Check and set header switch for starting and stopping of data collection.
  - Raise and lower the header to make sure the stop-height switch operates properly.
  - **Automatic On/Off** using the switch: Most yield monitors will step through the electronical setting of the start (header down position) and stop (header up position) positions for the switch during initial calibration.
  - **Manual On/Off:** Some yield monitors are equipped with a manual button that turns on and off data collection through the in-cab display. One may have to adjust the header height switch to accommodate the preferences of different operators during harvest.
- Set row width according to number of rows for a row crop header or the appropriate width of a cutting platform header.
  - Some yield monitors have the option to use automatic swath width detection to adjust the swath width when overlap is detected. This feature can be helpful when harvesting point rows or near field edges; however, be aware it may not function properly if your DGPS source has a potential for large positional error (e.g.,WAAS) or if there is signal interference or loss.
- Engage the separator and observe the elevator speed on the in-cab display to make sure the shaft sensor is operating correctly. The clean grain elevator speed (e.g., RPM) is used as feedback for computing the yield estimate since speed controls the frequency of which grain from the elevator paddles impact the mass flow sensor.

If you have questions regarding pre-harvest inspection of a yield monitor system, contact Kent Shannon, University of Missouri Extension Natural Resource Engineer by email: shannond@missouri.edu or 573-445-9792.

Source: *Kent Shannon, natural resource engineer*

Alternative Forages for Winter Feed

Cool season grass hay production is below average this year due to very cool April temperatures followed by very warm May temperatures. A limited amount of hay was carried over from the previous year, resulting in a short hay supply for the 2018-2019 winter. Ammoniating wheat straw or other low quality roughages is an effective way to improve the nutritional value of these products for livestock feed. University of Missouri research also indicates ammoniation can reduce the toxicity of endophyte in tall fescue hay.

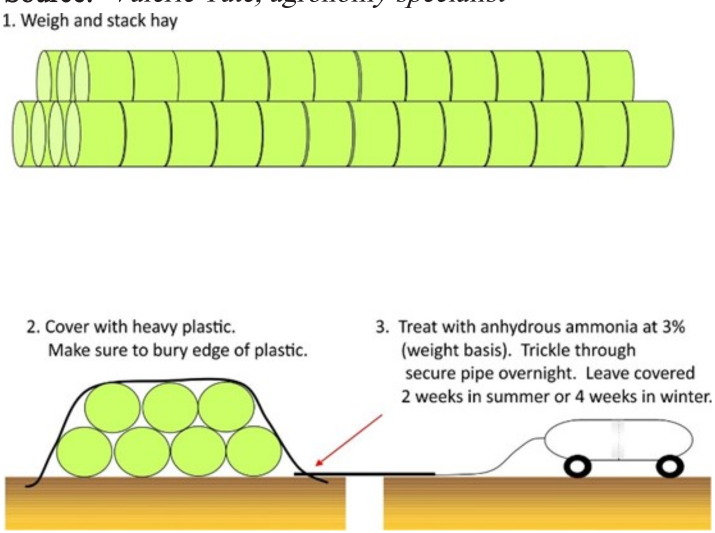
Only ammoniate low quality forages such as wheat straw, corn stover, or very mature cool or warm season grass hay. Suitable feeds for ammoniation are those with crude protein values less than five percent and Total Digestible Nutrients (TDN) below 45% on a dry matter basis. Treating medium quality forages has little effect on forage quality and can be toxic when fed to cattle.

Select a well-drained location for the stack. Weigh several bales to determine the average weight of the bales in the stack. Stack the bales in a pyramid two or three bales tall, leaving a few inches between sets of bales to allow maximum exposure of the anhydrous. The size of the bales and the plastic will dictate the size of the pyramid. A stack with four bales on the bottom and three bales on the second row usually fit under a standard 100 foot sheet of plastic (Diagram 1).

Cover the stack with six to eight mil UV resistant plastic (Diagram 2). Leave at least two feet of plastic on each side to secure the bottom. Place a one-inch pipe in the center of the stack or place pipes every 30 to 40 feet of a longer stack (Diagram 3). Seal the bottom of the stack tightly against the ground using soil, sand bags or waste lime. Test for leaks by turning on the gas slowly, allowing the plastic to balloon slightly and turn off the gas. If a hole or tear occurs, seal with duct tape.

Anhydrous ammonia is applied at a rate of 60 pounds per ton of straw or hay. Purchase only the amount of anhydrous ammonia needed, so the entire contents of the tank can be emptied into the sealed stack of bales. Slowly release the anhydrous ammonia into the pile at the rate of 60 pounds per hour. Leave the pile covered for two to three weeks during the summer, longer during the fall when air temperatures are cooler. Remove the plastic and allow the pile to air for a few days before feeding to livestock. For additional information, contact your local MU Extension Agronomy Specialist.

Source: *Valerie Tate, agronomy specialist*



Collecting Hay Samples for Testing

Forage testing is one of the cheapest and best investments a livestock producer can utilize when it comes to nutrition for livestock. The analysis will cost around $20 and will provide information needed to determine a supplement to meet livestock needs. Hay quality can vary greatly, even when harvested from the same field. Thus, providing an accurate sample is extremely important to get accurate forage test results. Typically, thousands of pounds of forage are represented by one gram that is actually analyzed demonstrating the importance of providing a representative sample.

It is recommended to sort samples by lots, a "lot" refers to a similar forage. Examples of a lot include; same field, forage type, cutting schedule, forage maturity. Sampling should occur as near to the time of feeding or sale as possible. Allow enough time for the test results to be returned for inspection by a buyer or for diet formulation (~7 to 10 days). Use a hay probe to take core samples. The probe should be 3/8" to ¾" diameter and 12-24" in length. The core sample should be taken from the round side of a round bale or the end of a square bale, going straight toward the center, to provide a good representation of the entire bale. Most probes can be operated by a hand brace or electric drill. It is recommended to probe between 10 and 20 bales at random to get a good representative sample of the lot. For example, walk 5 steps, sample, 10 steps, sample, representing all areas of the stack. Do not avoid bales that look good or bad. After each core use a plunging rod to clear the probe to avoid compacting samples in the probe. When all cores have been collected from a lot combine all cores in a clean plastic bucket and mix.

When submitting a forage sample use the quartering method to reduce the size of the sample to a more manageable size. Pour the entire sample onto a clean, flat surface and level the pile. Use a yard stick or similar item to split the pile into 4 equal parts like cutting a pie. Select and save two opposite quarters including the fines, repeat until you reach approximately one quart. Place the sample in a plastic bag, remove excess air and deliver to a lab as soon as possible. Do not allow samples to be exposed to excess sun or heat. Refrigeration is not necessary for dry hay samples; however, fresh hay or silage samples can be refrigerated or frozen to maintain moisture.

A typical hay test will analyze for moisture, protein, fiber and various minerals. Results returned from the lab will be reported in two columns: wet, "As Fed" and dry, "Dry matter". The as fed column is how it will be fed to the livestock and the dry matter column shows values with all moisture removed. When developing a ration dry matter is used because moisture is out of the equation and wetter feeds can be compared to drier feeds. Nutrients are listed in columns with percent crude protein typically near the top. Crude protein is a calculated value based off of how much nitrogen is present in the sample. The amount of nitrogen is multiplied by the conversion factor 6.25 to determine the protein level in the hay tested. Acid Detergent Fiber (ADF) and Neutral Detergent Fiber (NDF) usually follow and are used to determine the digestibility of forages and how much an animal will be able to consume. ADF is used to determine the digestibility of the forage; good quality legumes will generally run in the low 20's and mid 30's and grasses will be in the low 30's and mid 40's. NDF is an indicator of forage intake. NDF levels should range in the 30's and 40's for legumes and 50's and 60's for grasses. Levels above 70% will generally not work well without a great deal of supplement. Total Digestible Nutrients (TDN) represents the total of all digestible protein, carbohydrates and fats in the sample. TDN is commonly used in beef rations to represent the energy content of the feed. Levels as high as the mid 60's can be seen on early cut alfalfa where late cut grasses can be as low as the high 30's or low 40's. Most classes of livestock require levels above 50% to meet their energy requirements. The final component of most hay tests is a mineral analysis. Usually calcium (Ca) and phosphorus (P) are included, other minerals can be measured for additional fees.

The next step is to evaluate the information from the results compared to the requirements of the animals being fed. Stage in the production (lactation, dry) and maturity are the two most important factors for the cow herd. Desired rate of gain will determine the needs of growing cattle. Work with a nutritionist or local extension livestock specialist to determine animal nutrient requirements.

Source: *Daniel Mallory, livestock specialist*

Japanese Beetles in the Landscape

Japanese beetles have been reported throughout most of Missouri this year. They have been feeding on various horticulture plants. The beetles also feed on field crops.

Adult Japanese beetles are 7/16-inch long and are metallic green in color, with copper-brown wing covers. A row of white tufts (spots) of hair project from under the wing covers on each side of the body. Adults emerge from the ground and begin feeding on plants in June. Activity is most intense over a 4 to 6 week period beginning in late June, after which the beetles gradually die off. Individual beetles live about 30 to 45 days.

Japanese beetles feed on about 300 species of plants, devouring leaves, flowers, and overripe or wounded fruit. They usually feed in groups, starting at the top of a plant and working downward. The beetles are most active on warm, sunny days, and prefer plants in direct sunlight. Adults feed on the upper surface of foliage, chewing out tissue between the veins. This gives the leaf a lacelike or skeletonized appearance. Pheromones emitted from the beetles seem to attract more beetles into the garden or onto certain plants, therefore do not crush the beetles. Instead, drop them into a bucket of soapy water.

Many insecticides are labeled for use against adult Japanese beetles. It is best to use a liquid formulation that dries quickly. Apply it in the evening when bees are less active. Liquid Sevin® and Spectracide Triazide® Insect Killer work well to kill Japanese beetles and not bees, if applied correctly and at the right time.

For those seeking a botanical alternative, Neem products such as Azatrol or Neem-Away (Gardens Alive), or Pyola (pyrethrins in canola oil) provide about 3-4 days deterrence of Japanese beetle feeding. Insecticidal soap, extracts of garlic, hot pepper, or orange peels, and companion planting, however, are generally ineffective.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS FOR SAFE USE OF ANY PESTICIDE!

Information obtained from University of Kentucky, https://entomology.ca.uky.edu/ef451

Source: *Jennifer Schutter, horticulture specialist*