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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
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Your local link to MU for ag extension and research information
http://agebb.missouri.edu/agconnection

Calibration - A Necessary Step Even with Variable-Rate Technology

One item often overlooked when using variable–rate technology (VRT) is the calibration of application equipment. Currently, no standard procedures exist for calibrating VRT. While calibration of spreaders, planters, and sprayers is needed for uniform application, it is even more critical to calibrate VRT controlled equipment. In a few cases, traditional calibration procedures will work but do not ensure proper operation over the expected range of varying application rates. The goal of calibration is to minimize application errors so target rates can be achieved with a certain level of confidence. The following suggestions cover how one should approach the calibration of equipment utilizing VRT.

VRT usually relies on either ground speed radar (GSR) or a global positioning system (GPS) receiver as input for actual ground speed. If a GSR is used, yearly calibration of this sensor is important so the variable-rate controller will properly adjust application rates with ground speed variations. An improperly calibrated GSR will lead to application errors. Follow either equipment or GSR manufacturers' recommendation for the proper calibration procedure.

Prior to calibration of equipment with VRT, one must determine the range of planned application rates for the product(s) to be used during a variable rate application. This range will be used to ensure that the software and hardware setup will properly operate over the expected range of rates once an acceptable setup is determined during calibration. For example, one might decide to vary corn seeding rates from 24,000 to 36,000 seeds/acre. Knowing this information, select the median rate (30,000) to start calibrating the planter equipped with VRT.

Pre-Calibration Checks

Make sure all hardware and software are in proper operating condition. Replace any worn hardware, especially those controlling metering and distribution of material.

If rates of inputs are going to be varied over a wide range, especially for lime application, check the distribution pattern at the median rate followed by a check at the minimum and maximum application rates. This procedure will ensure proper distribution over the range of desired application rates. If a distribution issue exists, the rate variation should be limited to a smaller range.

Specific equipment checks include:

- Granular / Dry Applicators:
  - For spinner spreaders, this includes the divider, spinner-discs, and especially the spinner fins.
  - For pneumatic applicators, check the metering mechanism, fan, tubes, and deflectors. Worn tubes can have an impact on material transportation to the deflectors while worn deflectors can impact distribution.

- ♦ Sprayers - select a nozzle that is capable of handling the expected application rates, spray pattern, ground speed, and pressure.
- ♦ Planters – check all drives and individual metering element(s) on each row unit.

Specific Calibration Items to Consider

- Follow manufacturers' recommendations.
- Calibrate annually.
- Watch for pattern shifts especially for spinner spreaders.
- Dry Product Density: If the intentions are to use variable-rate blended products, then make sure the products have similar density and particle size. It is not advisable to blend products if these differences exist since pattern uniformity will be greatly affected over the range of application rates. This issue is more important for spinner spreaders than pneumatic applicators.
    - * Perform individual distribution tests for different granular products especially if they have different density and particle sizes. For example, potash will require a different calibration than lime.
- Sprayers:
    - * Take any pressure readings at the boom.
    - * Ensure nozzles are within 5% of the manufacturers operating specifications.
    - * If the spray mixture is significantly altered by the addition of adjuvants, it is recommended to compare the output mixed rate to water and ensure that the values are within 5%. If 5% is exceeded, calibration must be conducted utilizing the spray mixture.
- Planters:
    - * Ensure proper seed drop and that the planter settings/configuration can cover the range of expected seeding rates.

Source: *Kent Shannon, natural resource engineer*

Monitoring Soil Temperatures with Horizon Point Site-Specific Weather

It is beneficial to know soil temperature when deciding how early to begin field operations such as anhydrous application and planting. University of Missouri Extension hosts a network of weather stations in Missouri, several of which monitor soil temperature. Monitoring the weather station nearest your location provides a convenient option for monitoring soil temperature. Visit climate.missouri.edu and select Missouri Mesonet to see the list of University of Missouri weather stations.

In addition, the University of Missouri Commercial Agriculture program offers an email-based weather data service designed to make local weather information available to Missouri farmers in a way that assists daily decision making. Site-specific weather reports and advisories are emailed to participating farmers. New subscribers to Horizon Point provide an email address where reports are periodically sent based on the location of their farm provided in latitude and longitude format. Farmers also choose what advisories to receive and the frequency of emailed reports. There is no fee to subscribe to Horizon Point.

Weather information comes from the National Weather Service and the Missouri Commercial Agriculture Automated Weather Station Network. Site-specific weather information contained in Horizon Point reports include historic and forecast information on precipitation, temperature, and wind. Advisories use research-based information provided by plant and animal scientists and agricultural engineers.

Chosen advisories are sent only in the seasons when appropriate. For example, soil temperatures are important in the spring for planting and the fall for fall applied fertilizer management. Soil temperature advisories are not sent during the summer when they are not critical to management decisions.

Current advisories available include: planting depth soil temperature, weed emergence prediction based on growing degrees, stored grain management moisture table, design storm report for managing open lagoons, pasture range and forage (PRF) insurance rainfall index monitor, insect scouting aids, fall nitrogen application chart, rainfall runoff estimator, and animal comfort indices. The emailed reports also contain hyperlinks to management information, such as weed seedling pictures and how to use equilibrium moisture content to maintain stored grain quality.

Horizon Point subscribers are given a secure account page where they can manage such selections as email frequency and which advisories are received. Subscribers can also access archives of site-specific daily reports for the last month. To find the Horizon Point web page do a web search for University of Missouri Horizon Point, or navigate directly to the page at http://agebb.missouri.edu/horizonpoint/.

Source: *Max Glover, agronomy specialist*

Recruiting Farm Labor

Finding qualified farm or agribusiness labor is a growing problem. Once an employer recognizes the need to hire, they must create a fair, effective process to attract job candidates, hire employees, support the human resources function and ensure employees are contributing to the business. Recruitment is the first step of this process and a job description is necessary to find the best-fit worker.

Written job descriptions usually have six parts: title, job summary, job duties, job qualifications, work relationships, work schedule and environment. The position description can be given out with the job application. An application allows the employer to collect basic information and to compare applicants on the same basis. Applicants can also submit resumes to provide additional information.

Title: should concisely summarize the position and indicate its level of seniority, which could be described with terms such as "manager" or "trainee".

Job Summary: should explain a position's duties, responsibilities, expected qualifications and physical demands. Because the summary reflects information included throughout a job description, consider writing it after finishing the other sections. Employers may use the summary for promotional purposes.

Job duties: Typically, jobs involve a set of duties and tasks. In this section, list all required duties for a position. For each responsibility, estimate the percentage of total work time that it will take, and list duties in order of those taking the most time. Because job positions may evolve, employers may state that a position could involve "other duties as assigned." It should help job-searchers understand what the job is and if it fits their ability and interest.

Job Qualifications: Another part of the job description is listing qualifications needed and helpful. These include skills, knowledge, experience, education, certifications, characteristics and required licenses essential to do the job. If physical labor is part of the job, the requirement should be stated. An example would be "Employee must be able to routinely lift up to 50 pounds."

Work Relationships: The job description should state if the employee will be working with others or alone.

Work Schedule and environment: The job description should plainly state work hours, overtime needs, time of day or evening, days of week, holidays and irregular times. The more detail listed, the more helpful it is. Environment involves whether work is inside or outside and whether it is team-oriented. It should also explain the job location and expected work conditions. Work environment also includes the type of interactions an employee may have with coworkers, managers, customers and vendors. Also, it includes whether an employee would supervise others.

Once hired, employers may look for differences between the job description and the new hire's background and skills to identify areas for training. On a routine basis, a job description may help employers to review worker performance. Comparing duties and responsibilities listed in a job description with actual performance can help in determining areas of excellence, improvement and additional help needed.

When writing the job description seek help if needed. If you have performed in the job capacity you are hiring for then you understand the demands of the position. If you have not performed the job, talk with current employees. Technology, regulations, or other factors may have created the need for new skills.

Finally, the task of recruiting begins – finding appropriate candidates. This is both stressful and exciting. This takes persistent and targeted marketing. It is important to understand the community you are recruiting in. Consider traditional methods such as newspapers, radio, and flyers. Never underestimate word of mouth advertising. Explore social media, community events, social and industry networking. Connect with schools, FFA, 4-H programs or current employees. If appropriate, utilize career websites specifically for agriculture including AgCareers.com, agriCAREERS and AgGrad. Other services that can help to match employers with job candidates include Ag1 Source and AGRI-SEARCH. Employers may also consider posting job descriptions to more general career websites, including Indeed, Monster and CareerBuilder.

Source: *Darla Campbell, ag business specialist*

Paying Attention to Herbicide Labels

Herbicide labels are legal documents providing important information about the herbicide, its appropriate use, and the precautions needed to avoid off-target movement and to protect environmental quality. The herbicide label answers the "what, where, when," and "how" questions about the product. Finding answers to these important questions is indispensable for achieving the economical use and optimum results from a product, and obligatory to avoid violation of state or federal law.

Specific attention should be paid to the rotational restriction before deciding the crop rotation plan. In addition, it is important to make sure the most recent herbicide label is consulted because they are frequently updated.

Consider these questions when reading the label:

- What is the active ingredient in the product?
- What is the herbicide site of action/group number (s) of the active ingredient(s)?

(See the Herbicide Classification Poster - https://weedscience.missouri.edu/publications/2017_Updated_ClassificationPoster.pdf for groups.)

- What is the allowed use rate of the product?
- What adjuvants are needed?
- What weather conditions or soil requirements affect product use?
- What is appropriate time of day to apply the product?
- What application equipment (e.g., nozzle type) is best for this product?
- What safety measures are needed while using or disposing of the product?
- How should the product be stored (e.g., temperature)?
- Where can the given product be used?
- What products can be tank-mixed?
- Where can the containers or left-over herbicide be disposed?
- Who should be called in case of emergency?
- What is the best time or crop stage to use this product?
- When should product use be avoided?
- How should it be mixed and how much should be mixed?
- How much and how many times can this product be applied in a year?

Source: *Kent Shannon, ag engineer*

Century Farm Applications

Due May 15, 2018

For details call your local MU Extension Center or look online at http://extension.missouri.edu/centuryfarm