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VOLUME LXXXV
No. 3
Third Quarter 2021

STANDARD
U.S. POSTAGE
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64085

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Micronutrient Deficiency–

Tips to Know When and How to Add More

Micronutrients are getting more attention thanks to farmers doing more routine soil testing and plant analyses. Those tests show more micronutrient deficiencies even though farmers might not see foliar symptoms in the growing crop.

Applying micronutrients also is making more economic sense because today's higher yields remove more micronutrients from the soil and many of today's commercial fertilizers contain less residual micros.

The questions many farmers ask center on how to best determine a deficiency, and if found, whether to apply micronutrients on the seed, in the soil or to foliage. The best time, of course, is to apply before a deficiency occurs (seen or unseen).

There are eight nutrients that crop plants need in very small quantities; boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), nickel (Ni) and zinc (Zn). Soil and plant tests measure them in parts per million instead of a percent and constitute, in total, less than 1% of the dry weight of plant biomass. A soil application rate is typically less than 10 pounds per acre.

Most growers are already aware of the importance of adding zinc to corn and manganese to soybeans. Boron is now getting more attention as well.

Discovering the Level

It is easy to get soil micronutrients levels, it's just an additional measurement during standard N, P and K soil tests.

See "Micronutrients," cont. on pg. 5

A familiar face of Ray-Carroll dies at age 89

Jim Mayden leaves an extraordinary legacy

One of Ray-Carroll's best-known supporters passed away July 30 at Life Care Center in Carrollton, Missouri, with family by his side.

James Rogers Mayden farmed from 1951 to 2001 in Carrollton and was a lifelong Ray-Carroll member. He served on the Ray-Carroll Board from 1992 to 1998. Then, after he retired from farming in 2001, he came to work for the co-op as a driver and traveled between the Ray-Carroll locations daily, bringing his quick wit and his predictions as a self-proclaimed weather forecaster. He was fascinated by the weather and often made accurate predictions. Word of his weather accuracy traveled quickly, so many people called upon him for his weather forecasts.

He was an integral part of Ray-Carroll's success during his lifetime, but his connection to the co-op goes back even further. Jim's father, Russell Mayden, helped start Ray-Carroll in 1931 after the Agricultural Marketing Act of 1929 was passed to provide a revolving fund for farm organizations.

Jim was born in Carrollton, on December 19, 1931, the son of Russell Raymond and Anna Lyneta (Winfrey) Mayden. He attended grade school at a country school and graduated from Richmond High School in 1949. He went on to attend Central Missouri State University in Warrensburg. On February 3, 1952, Jim married Dorothy Beatrice (Bea) Minnick in Richmond, and they were later blessed with four children, Pam, Russ, Rob, and Perry.

Jim lived and taught by his faith, every day was an example to others of his profound trust in the Lord. He always had a smile, was soft-spoken, and never said an unkind word about anyone. Jim was a steward of the land, farming row crops, gardening, and taking care of his livestock.

Jim loved his family dearly and was very proud of who his children and grandchildren had become. Jim's life centered on Jesus, his church, family, and community. He rarely missed going to his children's or grandchildren's activities. When his children were young, he volunteered as a little league coach and a Leader for the NFD 4-H Club. Besides the Ray-Carroll Board, he served his community on the Extension Council Board, Jim was a member of the Wakenda Baptist Church, where he served as a Deacon, Sunday School Teacher, and Youth Group Leader, and other capacities.

Jim is survived by his beloved wife, Bea of the home; his children, Pam Stepp of Lee's Summit, Missouri, Russ Mayden and wife Cindy of Carrollton, and Rob Mayden of Carrollton; eight grandchildren, Joe Pollard (Leslie), Derek Mayden (Kaely), Jason Mayden (Rachel), Caitlin Miller (Anthony), Katherine Little (Andrew), Abbey Mayden, Hannah Harper (Jared), Ben Mayden (Lindsay); twelve great-grandchildren, Charlee, Anabelle, Rigley, Lincoln, Sterling, Rease, Rhett, Riley, Clint, Lane, Olivia, and Jorie.

He was preceded in death by his parents, Russell and Anna Mayden; his son, Perry; his sister, Evelyn Young; son-in-law, Pete Stepp; and his great-granddaughter, Sophie Kate Mayden.

Funeral Services were held on August 5 at Bittiker Funeral Home and burial was in Oak Hill Cemetery, Carrollton, Missouri. Memorial contributions can be mailed to Wakenda Baptist Church or St. Jude's Children's Hospital via Bittiker Funeral Home, P.O. Box 223, Carrollton, Missouri, 64633.

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Ray-Carroll News is a publication of Ray-Carroll County Grain Growers, Inc. To contribute story ideas, photos or comments, contact editor Laura Williams at laura@lwilliamscreative.com.

Cereal rye as a cover crop can reduce waterhemp

Cereal rye as a cover crop may reduce waterhemp populations without yield loss in soybean, according to a three-year study at the University of Missouri.

MU Extension weed specialist Mandy Bish and a team of researchers studied how planting soybean into living cereal rye—"planting green"—and then terminating the cereal rye affected biomass accumulation, soybean stand and yield, and early-season waterhemp emergence. The Missouri Soybean Merchandising Council funded the experiment.

High seeding rates do not increase biomass

The team seeded cereal rye at 30, 50, 70, 90 and 110 pounds per acre in late October and early November. At soybean planting, cereal rye ranged 40-43 inches. Bish found that higher seeding rates of cereal rye did not increase biomass. Regardless of seeding rates, biomass generated was about 14,500 pounds per acre.

Biomass does not affect yield or stand

Bish said accumulated biomass did not affect soybean stand compared to soybean planted into no cover. However, soybean planted into cereal rye grew taller than soybean planted into no-cover plots. Soybean yield was about the same, regardless of seeding rate.

Waterhemp reduced in 2 of 3 years

Biomass from cereal rye cover crop reduced waterhemp emergence for four weeks in 2018 experiments and six weeks in 2020 compared to plots without a cover crop. But this was not true in 2019, when waterhemp pressure at the study site was extremely high.

Bish says residual herbicides were not applied in this study, but the group continues to research integration of cereal rye cover crop with residual herbicides. In a USDA-funded study, MU's results show that early-season weed emergence was suppressed by about 97% when cereal rye was terminated before stem elongation was complete (about two weeks before soybean planting) and a residual herbicide was applied at soybean planting.

"We are currently evaluating combinations of soybean planting dates, cereal rye termination timings and residual herbicide applications in a collaborative project funded by the United Soybean Board," Bish said.

See "Cereal rye," cont. on pg. 6

Reap the benefits from harvest-time planning now

ali hostetter
grain originator

Summer is swiftly passing and as we get nearer to harvest, we encourage growers to develop a plan for harvest now. A few of the questions you will want to answer are: Which commodity will you store versus take to town? What percent of your crop is insured? When will you market bushels? What is your target price per bushel?

As it stands right now there's a small bit of carry in Cash corn with beans more of an inverse rather than a carry. This should and will likely influence your harvest decision-making as well as your marketing from now through harvest and into next year as you look to market bushels you plan to put in the bin. Take a look at this table and it will lend some insight into the structure of the cash market currently.

Corn	Beans
New Crop- out of the field $5.26	New Crop- out of the field $13.27
Dec. Delivery $5.26	Dec. Delivery $13.17
Jan. Delivery $5.29	Jan. Delivery $13.22
Feb. Delivery $5.32	Feb. Delivery $13.09
March Delivery $5.34	March Delivery $13.14

Here are a couple of things to consider as you begin to look to harvest and market bushels that you might not plan to have space for.

1. Treat on-farm grain storage as a marketing tool

Let on-farm grain storage pay for itself if you're able. The availability of on-farm storage is simply an alternative to marketing plans that allows a producer to capture carry in the market.

How do you capture carry in the market? Look at the carry on the board of trade — for instance, the spread between December 2021 corn and July 2022 corn is 13 cents currently. There is a carry in the corn market. However, if you look at soybeans, the spread between November and July is NEGATIVE, meaning it's inverted.

To capture the carry in the corn market you could sell the grain for delivery against the July corn Futures by:

- Selling futures directly through your own trade account with your broker
- Selling a hedge-to-arrive contract through Ray-Carroll which costs 5 cents for corn. This method allows you to set the basis when you think it is at its highest, which is usually post-harvest anyway.

Selling the carry is a great way for grain bins to pay for themselves, simply putting grain in the bin without marketing it isn't a marketing plan as much as it is speculation.

2. Use basis and forwarding contracts in an inverted market.

While basis contracts aren't a good tool for keeping a long-term position in carry markets, in an inverted market they can be beneficial. With the hedge-to-arrive contracts mentioned above, you gain the carry when you roll them. However, if you roll a basis contract in a carry market, the spread between your current is taken off of the basis upon rolling. In an inverted market, the spread is added to your basis contract. Forward contracting is also a simple marketing tool that allows you to know your price upfront.

We've seen the grain markets put on serious gains in the last several months due to a grocery list of things — whether it be limited stocks, COVID-19 issues stemming from last year as it pertains to the world shutting down, China, etc.

The increase in price per bushel has brought on more pre-harvest selling than we typically see, which we are happy to see. But, if you're one that has been reluctant to sell hoping and praying for higher prices, I would caution you to do your best to keep emotion out of your marketing plan. You can become your own worst enemy if you allow yourself to get in your own way. Seasonally speaking, the markets will begin to move towards new crop values as we near the middle to the end of August.

Call the Grain Department to assist you in developing your harvest plan or answer any grain marketing questions you may have. And, as you prepare for harvest, please let the elevators know of any new splits you plan to have so that we can have that information ready and imported into the scale system beforehand. This makes for a much smoother process at the elevator.

Have You Been Starting Your Calves Off Right?

glen waters
Purina Animal Nutrition, LLC

"...the most up-to-date mineral technology offered in the cattle industry."

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CALF WEANING 101

No matter what you are involved in, the old adage "you never get over a good start" holds true. This is the case with your favorite sports team, racing team, corn and soybean crops, and especially this time of year, your calf crop.

Many of our local producers are contemplating what they should do with their spring-born 2021 calf crop. There are several things you can do to enhance the profit options of your calf crop this fall. The opportunity I want to address in this article is to wean your calves before you market them.

Traditionally, many producers have used a "creep" pellet to wean calves on if they have decided to retain ownership of the calves past weaning. Most of you that have followed this protocol will tell me that your calves have "done fine". From a visual standpoint, I'm sure those cattle did look like they were "doin' fine." However, in research conducted at our Purina Animal Nutrition Center near St. Louis, calves that are freshly weaned from their mother have special nutritional needs that a traditional creep feed pellet isn't capable of delivering.

I strongly recommend using a specific feed ration at the time that you wean and separate your calves from their mother for this phase of their life. In particular, I would ask you to consider using Purina's Stress Care 5, Precon Complete or Accuration Starter Complete lines of products to wean your calves on this fall and winter. A fair question would be why I make this recommendation? I make it based on the experience of weaning and weighing calves to evaluate their performance on these specific weaning diets for several years and seeing the difference.

The basic decision to make when determining which of these programs to use is how you want to feed your calves. If you prefer to hand feed your weaned calves, then Stress Care 5 or Precon Complete are your choices… trusted and proven options for cattlemen in many locations and situations. If you want to self-feed your calves at weaning to improve calf performance and reduce your labor requirements, then I would recommend you offer Accuration Starter Complete to your calves. This is a safe, high-performing program that we have actively marketed and promoted in the marketplace since 1997.

Stress Care 5 is a pelleted product that is designed to be hand-fed to your calves at 5#/head/day for 20 days post-weaning, with the goal of delivering 100# per calf of the product. There is no roughage in this pellet, so you need to provide the roughage to your calves in the form of grazing grass or free choice grass hay. This is a high-protein, high-energy pellet that is very palatable and easy to adapt calves over to. Your calves will perform at a very desirable level and have a head start toward staying healthy on this program.

We have included Diamond V Yeast Culture to keep the calves rumen active and Zinpro Availa-4 organic trace minerals to enhance the immune response from the vaccinations you give the calves. Reports and data collected on this product indicate calves will eat this readily, gain weight and stay healthy through the weaning phase.

We have collected many sets of proof on these products from producers like yourself and can show you what to expect for performance if you utilize these programs. Please drop by your nearest Ray-Carroll location to get more details on the calf weaning programs from Purina Animal Nutrition.

Summer brings excitement, volatility for grain markets

john graverson
grain merchandising

The summer of 2021 has certainly brought us exciting, volatile grain markets. Just in the last few months, we have seen a daily range, comparing high to low price, of 75 cents per bushel on corn and a whopping $1.25 per bushel on soybeans. Let me repeat for emphasis; this price spread was within one trading day on the Chicago futures!

We have seen these price moves almost weekly this summer as the markets are dealing with the hot dry upper Midwest, big export and domestic demand, COVID concerns, ever-tightening ending stocks projections, and production concerns for new crop.

With such volatility, what are Ray-Carroll farmers to do in these markets? We have seen commodity prices run up sharply, very quickly, only to retreat even faster. This is where the use of a solid marketing plan, with follow thru execution would have helped smooth out many of the difficulties in trying to forecast price movement this summer.

I should also point out that, while it is likely the highs are in and markets are trending towards new crop levels, we still see higher values for old crop stocks versus new crop supplies. These inverses are quite large yet. As of the time this article is being written, the old crop premium for corn is well over $1 per bushel and $1.20 per bushel for soybeans. It is truly hard to fathom why we are still carrying such a large quantity of farmer-owned corn and beans still in-store in our elevators.

> ***“Don’t be left with any remaining unsold old crop bushels when the old crop premium is gone.”***

And we also see a consistent, daily influx from the farm as space is being made for the impending new crop. This current, inverted market is demanding that the market move as much remaining stock into commercial channels just as fast as can be accomplished.

Don’t be left with any remaining unsold old crop bushels when the old crop premium is gone. One can price these old crop bushels outright, or set basis contracts. If you don’t want the income from a tax standpoint this year, defer the income. Remember, you raised these crops to sell them to the market at some point. Now is that time for remaining old crop stocks.

“Micronutrients,” cont. from front cover

However, micronutrient soil tests aren’t reliable predictors of a crop response especially when test levels are low to medium. In those cases an actual crop response to micronutrients depends on the crop grown (corn responds to zinc, soybeans more to manganese) as well as soil characteristics that affect nutrient availability including pH, organic matter, soil texture, and soil phosphorus levels.

Plant tissue testing uncovers unseen deficiencies, nutrient imbalances and even toxicities. Tissue testing is easy and measures the concentrations of nutrients taken up to date and scores the values as deficient, sufficient or excess. Since crop deficiencies can exist without visible symptoms, tissue tests are a good check on whether soil resources and your fertility program are providing enough nutrients to the crop.

Combining soil and tissue tests can help answer the question of how and when to apply micronutrients.

Zinc deficient corn shows yellow stripes on the leaves.

Soil applied: Historically the most common method has been soil application. It’s a natural next step when soil tests show overall deficiencies. Micronutrients can be blended with commercial fertilizer at a retail plant, manufactured with other nutrients (such as with Mosaic’s MicroEssentials) or offered as a granule coating (such as the WolfTrax EvenCoat line). Micros can be added to either granular or fluid fertilizers, and applied either broadcast or banded (including pop-ups.) Including micronutrients with fertilizers is convenient, enables uniform distribution and reduces application cost.

Seed-applied: Seed treatments are an attractive way to deliver small amounts of micronutrients. Any micronutrient seed treatment can improve stand establishment, speed up early growth and development and overcome short-term spring nutrient deficiencies. The limitation is that seed companies today are loading the seed with so many pesticides, inoculants and biologicals that adding the necessary amounts of micronutrients may not be practical.

Foliar applied: It’s become more popular to apply some type of foliar spray, which might include micronutrients, growth regulators and carbon. Most of the foliar micronutrients are soluble and chelated inorganic salts and easily taken up across leaf surfaces. Foliar sprays are uniform, applied at lower rates than soil application and can be combined with pesticide passes. Crops respond immediately by taking up and banking these nutrients in their tissue rather than relying on roots to access them. There is a risk of some leaf burn and the plants are limited in how much they can absorb, so foliar applications can’t overcome soil deficiencies of macronutrients.

Rely on soil and tissue tests to guide application to get a return on your investment.

Source: Daniel Davidson, AgFax

See "Cereal rye," cont. From pg. 2

No silver bullets in weed control

"Cereal rye, nor any cover crop, should be viewed as a silver bullet for weed control," Bish said. Understanding the soil seed bank is extremely important when making decisions about integrating cover crops and chemicals for weed control, she adds.

"In studies where waterhemp seed in the soil seed bank was extremely high (corresponding to roughly 500 or more plants per square meter), we have not seen cereal rye consistently suppress waterhemp from emerging," Bish said. "However, when waterhemp densities are around 100 to 200 plants per square meter, we can see the effects of cereal rye on waterhemp suppression."

For more information

• "To terminate or not to terminate? What we've learned about cereal rye, planting green, and seeding rates," MU Integrated Pest & Crop Management newsletter, March 2021: ipm.missouri.edu/IPCM/2021/3/cerealRye-MB.

• In "Cover Crops for Weed Management," part of the War Against Weeds podcast series (waragainstweeds.libsyn.com, Bish discusses cover crops and weed management with MU Extension state weed specialist Kevin Bradley.

2021 Crop Insurance Dates

Sept. 30 .....Last day to add, change, or cancel coverage on wheat

Oct. 1 ..... Interest added to unpaid premiums

Oct. 31 .....Insurance ends on wheat

Nov. 14 ..Production reports due for wheat

Nov. 15 ..... Last date to make changes & sign up for Pasture, Rangeland, Forage (PRF) coverage

Nov. 30 .....Acreage reports due for wheat

Dec. 10 ..Insurance ends on spring planted crops

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Grow now and graze later to get the most out of tall fescue pastures

Winter stockpiling cool-season grasses carries cow-calf operations through the winter, the costliest time to feed cattle, said University of Missouri Extension state forage specialist Craig Roberts.

"If we don't stockpile, we'll find ourselves feeding hay or other concentrates just to get through the winter," Roberts said.

Fescue's long growing season and persistence make it Missouri's No. 1 forage. Its waxy leaves make it the cool-season grass best adapted for stockpiling for use in fall and winter in Missouri. The waxy surface keeps it from getting soggy over winter.

Producers should remove cows from fescue pastures before applying nitrogen, the nutrient that most increases yield in grasses. August-applied nitrogen helps grasses grow until after frost, when grazing can resume.

Timing nitrogen application before fall rains is vital for growth, Roberts says. In northern Missouri, this is generally the first week of August. For the rest of the state, it is during the second week of August.

Application amounts vary

The amount of nitrogen to apply to Kentucky 31 and novel-endophyte fescues differs, Roberts said. Too much nitrogen on K-31 increases toxins, hurting herd health and profitability.

"We want to do everything we can to reduce those toxins and make money on these animals," he said.

Toxins in fescue spike in spring and fall in Missouri, with the fall peak occurring around early November.

Fall toxins harder to control

There are fewer ways to manage toxins in fall than spring. These controls must be carried out on multiple levels, and all increase input costs. A single practice can offer partial relief but will not be enough to prevent health problems in animals.

"There is no such thing as THE solution for Kentucky 31 fescue," Roberts said. Nitrogen application is just one, but a critical one.

Roberts said the best way to reduce toxins in fescue is to renovate pastures from K-31 to novel-endophyte fescues. For information, visit the Alliance for Grassland Renewal website at www.GrasslandRenewal.org.

"Stockpiling is where novel-endophyte fescues show off," Roberts said. Novel-endophyte stockpiles are highly nutritional, with high protein and energy content because they have no stems or seed heads.

Guidelines for nitrogen fertilizer amounts

Roberts recommends the following when applying nitrogen:

- Toxins vary year to year, so nitrogen rates may vary.
- Use 40 pounds of nitrogen per acre or less on toxic fescue varieties such as Kentucky 31. Rates higher than this increase toxins.
- Use 60-100 pounds per acre for novel-endophyte fescues.

For more information, visit your county MU Extension center or see the MU Extension Integrated Pest Management video "Fall Forage Stockpiling" at youtu.be/oxs8pOFPwg4.

AUGUST

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Norbonre

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Hardin

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Farm safety tips to protect

Tractor Safety Tips

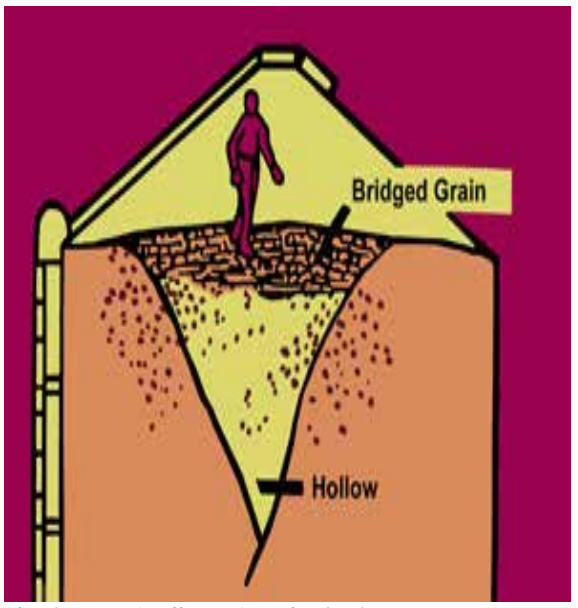
One of the greatest threats to an operator from the tractor itself is rollover. New tractors must have rollover protective structures (ROPS), and many older tractors have been retrofitted. A serious danger from rollover of open cab tractors exists, however, when a seat belt is not being worn. The ROPS provides a protective space to prevent you from being crushed by the tractor. Without your safety belt, you can easily fall out of the seat and still get crushed by the tractor. You may even be crushed by the ROPS — the very piece of safety equipment provided to save you in a rollover. The following are general guidelines to ensure safe operation of your equipment:

- Always hitch to the rear hitch points on a tractor and be extremely careful on inclined surfaces. The most common causes of rollover are operating on a steep incline and hitching to the rear of the tractor at the wrong hitch point.
- DO NOT allow extra riders. Children and adults have been killed falling off tractors.
- Make sure everyone has had proper training when operating a piece of machinery. Many people are afraid to ask for training, even when they need it. As a precaution, give new employees training and a period of observation to help them if needed. Also, realize that teenagers do not have the judgment skills gained from experience adults have. Although they may be able to operate farm machinery, they should not go unsupervised for long periods of time.
- Do not by-pass start a tractor or other piece of equipment. When you bypass start a tractor, you are bypassing all the safety-start and neutral-start switches.
- Read all the operator manuals and become familiar with the equipment before operating.
- Always wear your safety belt in equipment that has a ROPS structure. Do not wear a safety belt if the equipment does not have a ROPS structure.
- Never dismount the tractor while the engine is running.
- Lower hydraulic equipment before dismounting or finishing for the day.
- Be aware of your surroundings. Watch for holes, ditches, narrow bridges, and for others that may be working around the equipment.
- Conduct a pre-operational safety check each time the equipment is used. Check fluids, tire pressure, brakes and lights. Make sure gauges are at their proper readings.

Grain Bin Safety Tips

Several hazards are associated with handling grain in grain bins and you need to take precautions:

- Keep protective screens or covers on all grain augers. Also, do not reach into a grain auger while it is running.
- When moving a portable auger, look up to see if it is close to a power line. Many people are electrocuted by portable augers when they get entangled in power lines.
- Do not enter a grain bin when the grain is being removed.
- Do not enter a grain bin where grain has been removed. If a crust must be broken, do so from the roof with an extended pole.
- If you must enter a grain bin, make sure the unloading auger is shut off and locked out and that you have a reliable method of communication with someone on the outside of the bin. Use a rope and safety harness to avoid risking suffocation from collapsed grain. Never enter a grain bin alone.



The danger of collapse from bridged grain.