

Keeping Grain in Condition

Management is required to keep grain in good condition once it is placed in storage. Because of differences in temperature between the grain in the bin and the outside air, air inside the bin migrates.

With cold outside air, the air inside the bin moves downward along the outside wall and then upward toward the center of the bin. The air that comes up through the center of the bin will carry some moisture as it contacts the cool grain in the center of the bin. Moisture will then condense and cause the grain in this area to go out of condition and crust over. The crusting will keep air from flowing through the mass of grain and making it impossible to keep the grain in condition. To prevent this problem, grain should be cooled to about 40 degrees F in the fall and warmed to about 60 degrees F in the spring. This will minimize migration of air through the bin.

Check grain weekly. Use a grain probe and a thermometer to check the temperature by probing below the surface of the grain in several places. Record these temperatures to monitor changes. Moving air through the grain can help in determining grain condition. If a musty odor is detected, problems may exist not detected by inspecting the grain or checking the temperature. If problems do occur, fans may need to be run to dry the grain. In some cases, grain may need to be removed from the bin.

Covering the fan intake when it is not in use can prevent air from moving through it and minimize insect and rodent problems.

Should air be pushed or pulled through the bin? There is no right or wrong answer — it depends. If air is pushed through the grain, moisture is most likely to condense on the cold roof. This can cause some moisture problems with grain at the top of the bin. An advantage of pushing the air is if grain spoilage does occur, it will most likely be at the top of the bin and is easier to detect.

When air is pulled through the bin, the moist air coming off the grain can condense on floors and on grain near the floor. This can block ducts and plug the aeration system. If air is pulled air through the grain, one should wait until several feet of grain has been placed in the bin to avoid pulling fines into the duct.

Leave the fan on long enough. Anytime a drying or cooling front is started through the grain, make sure the fan runs long enough to move the front completely through the grain. When the temperature of the air coming through the grain is equal to the outside air, drying or cooling is complete.

Source: *Kent Shannon, Ag Engineering Specialist*

What are safe storage moistures?	
Grain	Maximum Safe Moisture Content (percent)
Shelled Corn or Grain Sorghum	
Sold by spring	15.5
Stored up to one year	14.0
Stored more than one year	13.0
Soybeans	
Sold by spring	14.0
Stored up to one year	12.0

Plant Nutrition Basics

As we often go through our daily routines, we can sometimes take for granted the finer scientific reasons behind our ability as producers to grow the best crop possible. Our previous article discussed fall as an ideal time for soil sampling. As you get your soil test results back this fall, this article will provide some of the basics of the chemical side of plant growth and development and why it is important for you to prioritize meeting the nutrient needs of your plants.

There are 17 essential nutrients for plant growth and development. While plant growth is a product of those chemical elements, 96% of the dry weight is due to carbon, hydrogen and oxygen. These non-mineral elements are supplied through water and carbon dioxide exchanges. By utilizing photosynthesis, the plant converts these elements into sugar which develop further into starch, proteins and fats. The remaining 4% of the plant dry weight is supplied from the nutrients in the soil.

Nitrogen, phosphorous, and potassium (N, P and K, respectively) are required in relatively large amounts and are considered our primary macronutrients. These major nutrients are most likely to become deficient in a highly productive system where plant material is harvested and removed from the field.

Nitrogen is the main component of chlorophyll which is needed to utilize sunlight energy to produce sugars from water and carbon dioxide. Thus, N deficiencies are visible as pale yellowing and stunted plants.

Phosphorus is also known for capturing and converting the sun's energy but is vital to genetics and likely more commonly understood as a root growth stimulator. Deficiencies in P typically show up in early growth as the roots have not expanded enough to find adequate amounts. Potassium is essential for sustaining plant growth. Deficiencies of K result in less resistance to drought, temperature variations, pests, disease and nematodes.

The remainder of the nutrients supplied by the soil are required in much smaller

amounts and less likely to become deficient unless you have a pH imbalance, excessive nutrients competing for plant uptake or other "poor" soil conditions such as a textural class imbalance of sand or clay. The results of a soil test can help to differentiate the condition of individual fields.

One of the most critical soil measurements is pH. The soil pH is a relative measure of soil acidity. That relative acidity affects plant growth by limiting the availability of nutrients to be taken up by plant roots. Acidity can also affect the activity of microorganisms in the soil. The microorganisms are responsible for the breakdown of organic matter to release nutrients into a more readily useable form for root absorption. In general, the majority of plants produce most effectively in a soil pH range of 6.0-7.0.

The imbalance of soil acidity is likely the most hidden deficiency in production agriculture. While the macronutrients are affected by pH differently, overall fertilizer use efficiency can be greatly diminished by even a slight decrease in pH. The following table shows that a pH of 5.5 will ultimately result in 33% loss in fertilizer applied. In a relative scale scenario, for every \$100 spent on fertilizer, you are only getting \$67 worth of good or \$33 loss in applied fertilizer. So, as the old advertisement indicated, "Liming Pays" is quite true when your soils are acidic. Your soil test report will resolve that question for you.

Fertilizer Use Efficiency In Relation To Acidity

pH	Nitrogen	Phosphorus	Potassium	Lost Fertilizer
(salt)	%	%	%	%
4.0	30	23	33	71
4.5	53	34	52	54
5.0	77	48	77	33
5.5	89	52	100	20
6.5	100	100	100	0

When considering environmental stewardship, soil health parameters, feeding an ever growing world population and your economic bottom line, understanding plant nutrition basics can provide you the clues to enhance your production capabilities. So, as you get your soil test results back this fall, reflect on going back to the basics of plant growth and development and why it is important for you to cultivate a plan for your crops' nutritional needs in 2017.

Source: *Todd Lorenz, Agronomy Specialist*

Top Bred Heifers to Sell Nov. 26 in Kingsville

The West Central Missouri Show-Me-Select Bred Replacement Heifer sale will be held at 11 a.m., Saturday, Nov. 26 at the Kingsville Livestock Auction, Kingsville, Mo., reports David Hoffman, University of Missouri Extension livestock specialist.

The sale features 200 plus head of crossbred and purebred heifers – many of which are artificially inseminated -- that will calve from February through April, 2017. The heifers are Angus, Angus cross, Gelbvieh cross, Red Angus cross, and Simmental cross.



Hoffman says that 90 percent of the heifers are black or black baldies with most bred to Angus bulls with approved calving ease EPDs (expected progeny difference) that put them in the “calving ease” category. There will be a few elite groups of registered Angus heifers,

Simmental heifers and Balancer heifers. Many of the heifers are from producers that have participated in the Missouri Show-Me-Select heifer program for many years and are producing multi generation Show-Me-Select heifers.

The sale heifers were selected, managed, and screened to minimize the risk involved with bringing replacement females into production in your herd. All heifers are reproductively sound, and are bred to reduce the incidence and severity of calving problems. The bred heifers will be sorted into sale lots according to breed type, size, and expected calving dates (calve within a 45-day period). All heifers have undergone a comprehensive health and parasite program and screened for structural and physical soundness. All heifers in the sale have been vaccinated with a one-shot scour vaccine.

“In addition to the screening process, we encourage the local consignors to provide genetic background information on the heifers like breed makeup, sire information, and carcass data,” said Hoffman.

The heifers will be sorted into uniform lots with expected calving dates no greater than 45 days apart and will be available for viewing by 3:00 p.m. on Friday, day before the sale.

More information (including sale catalogs) may be obtained at the Extension Centers nearest you or online at <http://extension.missouri.edu/cass>. If you have any question, please contact David Hoffman, Livestock Specialist headquartered in Cass County at 816-380-8460 or hoffmand@missouri.edu.

Hunting Leases - Wildlife Recreation is Big Business



Landowners have realized the opportunities for added income through recreational leasing. In fact, leasing land for hunting has contributed to the substantial increase in value of nonagricultural land in the state.

For many landowners with this interest, leasing land for hunting may provide an opportunity to sustain the natural resource base, maintain quality of life and increase annual income.

Hunting leases are an example of the broader concept of a recreational lease - an agreement between the person(s) who controls access to property and the person(s) who wishes to use the property for recreation. A hunting lease is an agreement between the landowner (lessor) and hunters (lessees) to grant access to land to hunt game (and conduct other specified activities) for a certain period of time. Hunters usually pay an agreed-upon dollar amount per acre or per hunter.

Hunting leases differ in time, effort, and investment. Categories include:

- **Year round lease:** requires the least investment of time, effort and money, but also returns less. An example lease situation would be a landowner leasing eighty acres for \$20/acre/year including all species.
- **Limited duration lease:** may be for a season, a few weeks, or a few days. A landowner may have multiple leases concurrently for different species or throughout the year. More marketing is required, but income potential is greater.
- **Day-hunting lease:** demands more landowner time than the previous two types. For example, if deer stands are leased on a day-to-day basis, the landowner must retain adequate control over the movement of hunters. This may require taking each hunter to and from a stand. Daily leases and "package" hunts are also common for hunting waterfowl, small game and doves.
- **Guided hunts:** may be the primary enterprise for a few landowners. Leases may provide for lodging, meals, guides, transportation during the hunt, hunting blinds, dogs and dog handlers, guns and ammunition, game dressing and cleaning, game butchering and packaging, cold storage, additional recreational facilities, refreshments after the hunt and pictures of the hunt. These operations require intensive management of wildlife habitat, population inventories, harvest management and advertising.

General recreational lease: short-term lease providing experiences such as camping, hiking, fishing, and swimming. Many are family oriented.

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Hunting Leases cont..

All recreational or hunting leases need to be written agreements. The written agreement delineates the rules of the lease and helps protect the interests of both the landowner(s) and the hunter(s). A well-written lease agreement helps avoid misunderstandings.

Every lease should include:

- Description of the recreational rights, services and facilities being leased
- Names of lessors and lessees involved
- Description of the property being leased, including legal descriptions and a map
- Species to be hunted
- Terms of payment
- Duration of the lease
- Definition of who has recreational rights
- Any special rules and regulations concerning restrictions or responsibilities of either party
- Signatures of all parties involved

Any special concerns of the landowner(s) or hunter(s) should be addressed in the lease. These may include references to abiding by all state and federal hunting regulations, hunter personal liability insurance, shooting or trespassing across boundaries of the lease, location of hunting blinds, collection of harvest data, game harvest quotas, use of alcoholic beverages, littering, subleasing recreational rights, guest privileges, camping location, responsibility to pay for damages, and ownership of any structures left on the property at end of the lease.

Source: *Darla Campbell, Ag Business Specialist*

