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4R Plant Nutrition: A wide-ranging strategy for improving plant nutrition

Farmers are fundamentally charged with being stewards of the land. If they are not good stewards, they certainly will have challenges of remaining economically viable for any length of time. We currently live in a world where increased food demand coupled with environmental concerns create challenges not seen before.

In 2012, the International Plant Nutrition Institute (IPNI) released an educational resource manual titled 4R Plant Nutrition. The 4R Nutrient Stewardship concept helps producers to recognize and achieve Best Management Practice (BMP) cropping system goals such as increased production, increased farmer profitability, enhanced environmental protection and improved sustainability. While the principles are the same worldwide, implementation at a local level varies by site-specific characteristics such as soil, crop, climate, weather, economics, and social conditions.

The 4R “rights” concepts to achieve these cropping system goals include:

- ◆ Right Fertilizer Source: which matches fertilizer type to the crop needs
- ◆ Right Rate: which matches the amount of fertilizer type to crop needs
- ◆ Right Time: which makes nutrients available when crops need them
- ◆ Right Place: keeps nutrients where crops can use them

While the 4R nutrient management approach is essential to sustainable operation in the crop-soil-climate system, it also considers economic, social, and environmental goals. The selection and priority of the nutrient management approach depends on individual producer values balanced with performance indicators.

The performance indicators include farmland productivity, soil health, nutrient use efficiency, water quality, air quality, greenhouse gas emission, food and nutrition security, biodiversity, and economic value. Each of these indicators provides a layer of production complexity in the production decision-making process.

Science and technology continue to advance the understanding and improvement of BMPs. Good stewards of the land continually balance this advancement with practical and applied practices under site specific (local) conditions. The 4R approach to nutrient stewardship is another valuable source of information to refine and balance economic, social and environmental goals.

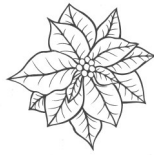
A copy of the IPNI manual and other resources supporting 4R Nutrient Stewardship is available at www.ipni.net/4R

Source: *Todd Lorenz, livestock specialist*

Traditions and Care of Holiday Plants

The holiday season is filled with traditions and customs involving plants. The mistletoe, commonly used in U.S. holiday decorations, is native to North America. It grows as a parasite on trees such as apple, poplar, linden and, rarely, oak. American mistletoe is commercially harvested in New Mexico, Texas and Oklahoma, where it is the state flower. Both American and European mistletoe are poisonous because of toxic proteins found in all parts of the plant, including the berries. If using real mistletoe for holiday decoration, keep it out of the reach of children and pets. Do not hang mistletoe where children can pick up fallen berries.

The Poinsettia was introduced into the United States by the first U.S. ambassador to Mexico, Joel Roberts Poinsett. He had some poinsettia plants sent to his home in Greenville, South Carolina in 1825 where he began propagating the plants in his greenhouses on his plantation, and sending them to friends and botanical gardens.



Poinsettias come in many colors and forms. New selections appear in the market every year. When selecting a poinsettia, choose a plant with small, tightly clustered yellow buds in the center. Look for brightly colored, undamaged bracts (leaves). Protect the plant from the elements on its way home from the store. Wrap the plant in layers of newspapers or a double brown paper bag. Place the plant in a room with plenty of bright, natural light. Keep it out of drafts and away from appliances that give off heat. Water it only when dry and discard excess water that runs through the pot's drainage holes. If wrapped in foil, make sure the pot does not sit in water inside the decorative wrap.

Some people believe the poinsettia is poisonous, but extensive laboratory testing and university research, have concluded poinsettias are not poisonous. However, this does not imply they are edible. Some people develop a dermal reaction (skin rash) if exposed to the white, milky sap of poinsettias. This substance called latex is made by the plant in special cells called laticifers.

Holly is prized in Christmas decorations, and adds visual interest to a landscape in winter months. Holly plants come in all sizes, ranging from spreading dwarf holly shrubs 6" in height to holly trees 70' tall. Their shapes vary from rounded to pyramidal



to columnar. English holly (*ilex aquifolium*) and American holly (*ilex opaca*) are the most familiar, due to their striking evergreen foliage used in Christmas displays. All holly trees and shrubs are dioecious, and need a male plant within 30'- 40' of females in order for it to produce berries.



For many families, the selection and purchase of a Christmas tree is an annual tradition. Bringing home the tree often signals the official start of the holiday season. Once the tree is home, its continued freshness depends upon the type of care provided. The tree should have a fresh cut across the bottom, about 1 inch above the old base. This removes any clogged wood that may not readily absorb water. Next, the tree should be placed in a stand with a large reservoir of water and located in a room. It is important that the tree always has water and does not dry out. If the tree does become dried out, it may not be able to adequately absorb moisture once it is re-watered, and will shed needles prematurely. Fresh, well-watered Christmas trees do not represent a fire hazard. Trees that are dried out, however, do. With the proper selection and care, you can enjoy a fresh tree throughout the holiday season.

Source: Jennifer Schutter, horticulture specialist

Vertical Integration: The Ever Changing Cattle Industry

Missouri beef production and cattle numbers have been rebounding from their lowest point since 1951. This comes at a time when both pork and poultry production are high. The pressure placed on the beef sector has skewed the average ten-year market cycle price index. With regards to record high prices for beef products just five years ago, the impacts of inverted placements within both the poultry and pork industry have allowed for cheaper consumer options. This continues to drive market demand for poultry and pork. Due to vertical integration, poultry and pork prices provide a lower priced substitute for beef. Thus, focus on making beef production more efficient is a constant need. For beef producers to compete for market share against pork and poultry production, beef producers need to utilize effective strategies.

Missouri beef producers face a hardship when competing with both the poultry and swine industry. Since 1995, beef producers have had to contend with changes in the broiler and pork industries as both sectors changed structures. As vertical integration

provided more efficiency in production, the beef industry was not able to compete on the same level. This change has been noted through the increased size of poultry and hog operations in the meat industry. Additionally, it correlates to the differentiation in the ability to enter or depart from each industry. As a result, Missouri beef producers must consider capitalization to increase market share.

While the demand for beef remains strong, cow-calf operators and backgrounding operations face stiff competition from corporations controlling the pork and poultry industries. Another challenge beef producers are faced with is the global supply and demand. This places additional pressure on the cattle market. The demand for quality beef as well as exports impact current market prices with the export market applying the most pressure. As foreign markets open and close, this creates a constant change in demand and market prices for beef producers. This equates to Missouri cattle operations having to compete not only against vertically integrated pork and poultry companies but also on the global cattle market.

Vertical integration for beef does not exist in the same form as poultry and pork. However, there are options for beef producers to maximize both market share and price. Contracting the sale of beef offers advantages that are similar to the other sectors. However, there exists many variants of contracts and beef producers need to evaluate which ones provide the most benefit. Contracting feed prices as well as acreage can also benefit Missouri beef producers. The futures market can also aid producers in hedging cattle prices. As cattle production continues to evolve, specialized cattle operations have an additional concern. Confined Animal Feeding Operations (CAFO's) have strict regulations concerning the environment. As cattle continue to be fed in higher concentrations of numbers on smaller land areas to compete with vertically integrated industries, producers and agribusinesses will need to be aware of rules and regulations.

Source: *Jason Morris, ag business specialist*

Gardening Tips for December

Houseplants

- On cold nights, move houseplants back from icy windows to prevent chilling injury.
- Over-wintering geraniums like bright light and cool temperatures. Keep soils on the dry side.
- Water houseplants with tepid water. Cold tap water

may shock plants.

- Holiday poinsettia basics: bright light for at least half the day; keep away from drafts, registers and radiators; night temperatures in 50's or low 60's, day temperature at 70 degrees are best; the soil should dry slightly between waterings; discard the drainage; be sure to punch holes in decorative foil wraps to prevent soggy soil conditions.

Ornamentals

- Be sure the root zones of azaleas and rhododendrons are thoroughly mulched. Any organic material will do, but mulches made from oak leaves, shredded oak bark, or pine needles are preferred.
- Living Christmas tree basics: dig the planting hole before the ground freezes; mulch and cover the backfill soil and the planting hole to keep them dry and unfrozen; do not allow the tree's roots to become dry; spray with an anti-transpirant to reduce needle moisture loss; store the tree outdoors in a cool, shady, windless area until the last minute. Mulch the roots to prevent cold injury; set the tree up in your coolest room; do not keep the tree indoors for more than one week. Plant outdoors promptly.
- Hollies may be trimmed now and the prunings used in holiday decorations.
- Only female holly trees bear the colorful berries. There must be a male tree growing nearby for pollination, if fruits are desired.

Miscellaneous

- If you feed rabbits corn or alfalfa, they may leave fruit tree bark unharmed.
- Clean and oil all garden hand tools before storing for winter.
- All power equipment should be winterized before storage. Change the oil and lubricate moving parts. Either drain fuel systems or mix a gas stabilizing additive into the tank.
- Apply mulches to bulbs, perennials and other small plants once the ground freezes.

Source: Missouri Botanical Garden

Source: *Jennifer Schutter, horticulture specialist*

Missouri Livestock Symposium

Dec. 6 & 7

<http://www.missourilivestock.com>

Featured speaker: *Dr. Temple Grandin*

For more information: 660-665-9866

Welcome New Ag Specialist



Agriculture Economics from the University of

New Linn County Engagement Specialist in Agriculture and Environment Jason Morris comes to Missouri from both the University of Tennessee Extension and Mississippi State Extension Service. Morris received his B.S. degree in Agriculture Science with an additional concentration in

Tennessee at Martin where he was a founding member of the UTM chapter of the National Agriculture Marketing Association. He received his M.S. from the University of Tennessee where he researched Extensions role in the use of Beef Alliances in Tennessee. He is a PhD candidate at Mississippi State University. His doctoral research has included the Mississippi Master Beef Producers program, Vertical Integration, Volunteer Management, administration and supervision and the Need for Program Leaders in Mississippi Extension.

Wishing you a Merry Christmas and
Happy New Year!

from the Northeast Missouri Ag Staff



Return Service Requested



**Northeast Missouri
Ag Connection**
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