Extension
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Northeast Missouri
Ag Connection

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

Lime Pays

Soil pH is critical for crop growth and production whether considering lawns, gardens, pasture, hay, and row crops. A low pH could result in aluminum toxicity (water pH less than 5.5 or a salt pH of less than 5.0), limited phosphorous (P) availability, slower nitrogen (N) release, and reduced effectiveness of triazine herbicides. High pH (> 7.0) can result in carryover of atrazine, Peak ®, Canopy ®, and Classic ®, increased nematode populations, and reduced availability of P and micronutrients.

Soil test results from the University of Missouri are reported as salt pH. Most other states and private labs report water pH. Salt pH is closer to the pH that the plant experiences at the root interface and is more stable and quicker to measure than water pH. Water pH is about 0.5 units higher than salt pH.

Different soils have different critical values for pH. Depending on the soil type, the yields will begin to decline at different pH levels. Also, crops respond differently to soil pH levels. Forage grasses are the least sensitive to pH levels, followed by wheat, corn, clover, soybean, and alfalfa being the most sensitive. Soil pH will affect the nutrient availability to crops.

Where does acidity originate? The long-term factor is climate. Typically, humid areas have acidic soils while arid and semi-arid soils are neutral to alkaline. The short-term cause for acidity is nitrogen fertilizer. Acid is released by conversion of ammonium to nitrate. All N sources are equal in acid formation except for ammonium sulfate, which creates two times more acid. Each pound of N creates enough acidity to require 6 or 7 pounds of lime. For example, a corn-soybean rotation with an average of 150 pounds of nitrogen applied each corn production year, creates a total of 600 pounds of N applied over an 8-year period. It will take about 2 tons of lime to neutralize the acidity from the N fertilizer applied during that period.

Different soils with the same pH will require different amounts of lime. Clay soils need more lime than loam soils and loam soils need more lime than sandy soils at the same pH. Neutralizable acidity is the lab measurement used to consider this variability and determine the corresponding lime recommendation.

When ordering lime, certain terms are important to understand.

- Calcium Carbonate Equivalence (CCE) is measured on a lime sample by determining how much acidity it will neutralize per ton in comparison with pure calcium carbonate. The CCE for pure calcium carbonate is 100%. Lime with impurities would be less effective than 100%.
- Effective Neutralizing Material (ENM), in Missouri, is used to describe the impact of fineness on the effectiveness of the liming material for raising soil pH in the field. Fineness factor accounts for how much of the lime will react with

soil within 3-4 years.
- ENM = CCE x fineness factor x 800

Additional lime management considerations are needed as producers increase the use of minimum till and no-till. Surface applied N in no-till crop production can result in acidification of the top inch of soil. At low pH levels, atrazine is not as effective, resulting in a potential for weed escapes and increased risk of atrazine carryover. In contrast, surface applications of lime can result in high pH in the top inch of soil, and atrazine carryover risk is increased.

Lime management in no-till or minimum till requires smaller and more frequent applications of lime. The same total amount of lime is still needed. Keep track of soil pH in the top two inches. For a good comparison, sample at both two inches and six inches, keeping the samples separate.

Soil pH has the potential to impact the bottom line from both an economic and environmental standpoint. When considering utilizing fertility applications most efficiently, the research shows that most plants do well in a salt pH of 6.5. At this pH, the plant could maximize the uptake of all nutrients applied. As the pH drops one unit to 5.5, nitrogen utilization efficiency drops to 89% and even more dramatically, phosphorus utilization efficiency drops to 52%. If the plant is not utilizing the remaining nutrients, they are available for environmental losses.

Another way of looking at this scenario is to compare percentages to dollars invested. For every hundred dollars expended on nitrogen and phosphorus, return on investment is only $89 and $52 respectively. Knowing the level of soil pH and amending appropriately with lime applications has the potential to increase economic value in production.

A farmer who provided lime spreading services in the area for over 50 years had the logo "Lime Pays" painted on the spreaders. While it may have been a marketing campaign from the lime industry at the time, it certainly continues to be advantageous for producers to pay attention to soil pH values today.

For more information on soil testing or submitting soil samples, contact the local Extension office. Additional resources include *Soil Sampling Hay Fields and Row Crops* G9217 https://extension.missouri.edu/publications/g9217 and *Interpreting Missouri Soils Tests Results* G9112 https://extension.missouri.edu/publications/g9112.

Source: *Dr. Todd Lorenz, field specialist in agronomy*

All-America Selections Gardens

All-America Selection (AAS), an independent non-profit organization that tests new, never-before-sold varieties for the home gardener, is the only national, non-profit plant trialing organization in North America. After a full season of anonymous trialing by volunteer horticulture professionals, only the top garden performers are given the AAS Winner award designation for superior performance. All AAS proceeds go into conducting the trials and promoting AAS Winners, both old and new.

The Mission Statement of AAS is "To promote new garden varieties with superior garden performance judged in impartial trials in North America." The purpose is to test new, unsold cultivars; to inform gardeners about AAS winners; and to earn gardeners' trust in AAS winners.

All-America Selection was founded in 1932, and the first AAS Winners were announced a year later, after the results were tabulated from the first trial. AAS Winners have been introduced each year since 1933.

All-America Selection display gardens provide the public with an opportunity to view the newest AAS Winners in an attractive well-maintained setting. A typical display garden is a public botanic garden or arboretum, a municipality, a garden retailer, a university garden and many others. Display gardens may also provide educational programs about the AAS trialing and the award process during "open house" or "field day" events during peak growing seasons.

There are nine All-America Selection Gardens in Missouri, four of them are at University of Missouri Extension Centers or research farms. They include the MU Extension Center in Adair County (Kirksville), MU Extension Center in Cape Girardeau County (Jackson), MU Jefferson Farm and Garden (Columbia) and the MU Hundley-Whaley Farm (Albany).

Each site was mailed 28 packets of seed from 2025 winners or past AAS winners in December. Seeds were started January-March in greenhouses, under grow lights in MU Extension offices, and homes of Master Gardeners. The plants were hardened in April and planted in the gardens later that month through the end of May. Two species of plants, Petunia 'Dekko Maxx Pink', and Dianthus 'Interspecific Capitan Magnifica' were mailed to each site as plugs.

All-America flower varieties grown in MU Extension display gardens this spring and summer include: 'Doubleshot Yellow Red' Snapdragon, 'Doubleshot Orange Bicolor', 'Shake Raspberry' Petunia, Impatiens

'Pink Jewel', Celosia 'Burning Embers', Celosia 'Flamma Orange', 'Black Ruby' Dahlia, Marigold 'Mango Tango', Verbena 'Vanity', Verbena 'Sweetheart Kisses', 'Baby Red' Nasturtium, 'Baby Yellow' Nasturtium, 'Baby Gold' Nasturtium, Marigold 'Siam', 'Concert Bell' Sunflower, and Begonia 'Viking Explorer Rose on Green'.

Vegetable varieties include: 'Purple Zebra' Tomato, 'Pink Delicious' Tomato, 'Zenzei' Tomato (roma), 'Icicle' Eggplant, 'Red Impact' Sweet Pepper, 'Pick n' Pop' (sweet snack size) Pepper, 'Dragonfly' Sweet Pepper, 'Quickfire' Chili Pepper, 'San Joaquin' Jalapeno Pepper, 'Bauer' Lettuce, 'Purple Magic' Broccoli, 'Green Lightning' Summer Squash, and 'Kobacha Sweet Jade' Winter Squash.

An educational event and garden tour will be held at the University of Missouri Extension AAS display gardens this summer. Participants will see and learn about the different varieties of plants growing in the garden and what makes each of these plants superior All-America Selections. Event dates will be chosen based on bloom and harvest time. Contact the Adair County MU Extension Center in July for the date and time of the event and tour for the display garden in Kirksville at 660-665-9866.

Source: *Jennifer Schutter, field specialist in horticulture*

Reference: All-America Selections - Missouri display gardens many of which are at University of Missouri Extension Centers can be found https://all-americaselections.org/

Leasing Farm Buildings

Farm buildings or livestock facilities not needed by the owner, may be of value to neighboring farmers. Developing a farm lease may be a beneficial solution for both parties. A lease benefits a landowner by receiving a return on an asset which would either not be used at all, or under-utilized. The tenant benefits by not having to invest in building expensive assets.

The most difficult part of a rental agreement is determining fair compensation. There are many ways to calculate a rental value. Two popular methods are owner's cost and commercial rates.

Owner's Cost takes into account the costs incurred by using the building or variable costs. Variable costs include utilities, repairs and maintenance. At a minimum, the rent should cover all variable costs. Fixed costs, the majority of expenses, are incurred whether the asset is used or not. These include depreciation, property taxes, interest, and insurance. Total costs (variable plus fixed) can be calculated and may be helpful to determine a rental rate.

Commercial Rate is another method. Some assets, such as grain bins, have a comparable commercial rate (local elevators). Commonly, on-farm grain bin rental rates are lower than commercial rates. Renting grain bins requires more labor and more risk for the tenant. The tenant must keep the grain in condition. Often, rented facilities take more work getting the grain into the bin and taking the grain out of the bin. If this method is chosen, typically a percent of the commercial rate is used to calculate rent.

Both methods provide a starting point for negotiating. Generally, the rate will not be the lowest price, nor the highest and will be somewhere in the middle.

Rental agreements for buildings and facilities should include how to handle items related to using the facility. The agreement should specify who pays for repairs and how repairs are to be accomplished. If the agreement is for a livestock facility, then water issues need to be stated in the agreement. Livestock facility agreements may need to state how animal wastes will be handled. Insurance should be defined in the agreement. Ordinarily each party insures their own property.

These items and much more are discussed in a publication, *Rental Agreements for Farm Buildings and Livestock Facilities*, written by the Extension North Central Farm Management Extension Committee (12 states, including Missouri). A sample agreement is available online at https://aglease101.org/wp-content/uploads/2020/10/NCFMEC-04A.pdf or from Extension ag business specialists.

Source: *Mary Sobba, field specialist in ag business*

Trivia Question:
The first secretary of the U.S. Dept. of Ag, Norman Jay Coleman, was appointed during the first of the two nonconsecutive terms of which U.S. President?

Answer on the back page

MU Field Days

Research, Extension and Education Centers Field Days
July 31 - Greenley Farm, near Novelty, MO
Aug. 6 - Fisher Delta, Portageville, MO
Sept. 18 - Southwest, Mount Vernon, MO
Sept. 20 - South Farm, Columbia, MO

For more details on the Greenley Field Day go to https://tinyurl.com/Greenley-25

Pearls of Production (education designed for women in livestock production) has upcoming events July 22, Sept,. 23, Oct. 28 and Nov. 8.
More details https://tinyurl.com/MU-Pearl25

Trivia Answer: *Grover Cleveland, prior to 1889 there was a Commissioner of Agriculture. In 1889 the position was elevated to a cabinet position -U.S. Secretary of Agriculture. Norman Coleman, from Missouri, was a Commissioner of Ag, then the first U.S. Secretary of Ag.*

Area Grazing Schools 2025

Warren County (Warrenton, MO) - Aug. 20-22
For details call 636-456-3434 ext. 3

Morgan County (Versailles, MO) - Sept. 4-6
For details call 573-378-5822 ext. 3

Linn County (Linneus, MO) - Sept. 30 - Oct. 2
For details call 660-895-5123
Or email tatev@missouri.edu