

The FARMACY

Agriculture & Natural Resources Newsletter

February 2022

Farmers Helping Farmers – Tornado Relief Volunteer Trip to Muhlenberg County February 20-26, 2022



- **Projects** - Building fence will be a priority. Additional projects could include new building construction and cleaning up tornado debris in fields.
- **Fencing** - Supplies will be provided.
- **Tools** - Bring your own tools (hammer, pliers, etc.)
- **Housing/Meals** - Will be provided if needed.

If interested in volunteering for the week or specific day(s), please call the office at 859-572-2600 for information and to register so we can coordinate transportation and logistics.

Upcoming Dates:

Jan. 30 - Noon
NKHN Annual Meeting
Boone County Enrichment Center

Feb 1 - 8 p.m.
Master Finisher - Chris Teutsch
Environmental Education Center

Feb 9 - 6 p.m.
NKY Grain & Forage Update
Highland Heights Office (hybrid)

Feb 15 - 8 p.m.
Master Finisher - Paul Priyesh
Vijayakumar
Environmental Education Center

Feb 22 - 6 p.m.
**Farm Management Strategies
to Improve Decision Making**
Environmental Education Center

Mar 23 - 10 a.m. or 6 p.m.
BQCA Training
Environmental Education Center

Mar 30 - 10 a.m. or 6 p.m.
**Private Applicator Pesticide
Training**
Environmental Education Center

Farm Management Strategies to Improve Decision Making

Presenter: Dr. Jordan Shockley, UK Ag Economics Specialist



This presentation provides an overview of various topics including developing a business plan, assessing the financial performance on the farm, understanding costs of production, and resources currently available within the ag econ department. Also, mobile apps applicable to economics are discussed.

February 22, 2022 - 6:00 p.m. with meal
Call the extension office to register—859-572-2600

Environmental Education Center
1261 Race Track Road, Alexandria, KY 41001



Michelle Simon

Michelle Simon
Campbell County Extension Agent
for Agriculture and
Natural Resources

Pelletized Lime - How Quickly Does it React

– Lloyd W. Murdock, Extension Soils Specialist

method to calculate the neutralizing value can be found in publication AGR-106, University of Kentucky College of Agriculture. For example, a high quality pelletized lime source may have a neutralizing value of 85. If this is the case, the lime rate can be reduced to 78% of what would be recommended for bulk ag lime. This is calculated by dividing the average neutralizing value of ag lime by the neutralizing value of the pelletized lime being used ($67 \div 85 = 0.78$). In this case, 1560 lbs/ac of pelletized would be required to equal one ton of ag lime. If less than this amount of pelletized lime is used, the expected soil pH change will probably not be obtained. As can be seen from this example, the recommended rates of pelletized lime cannot be greatly reduced as compared to bulk ag lime. How Fast Will Pelletized Lime React? The speed of reaction (rate at which the lime will change the soil pH) is mainly a function of surface area of the lime particles and their contact with the soil. The finer the grind of lime, the more the surface area, and

the faster the reaction. Since pelletized lime is pelleted from finely ground lime, it is easy to assume that it will be faster reacting than bulk spread ag lime which has some larger, non-reactive particles as a part of its composition. However, this is not true. Based on research from several states, it appears that the pelletized lime reacts no faster to raise the soil pH than good quality ag lime applied at recommended rates. In fact, incubation studies at Michigan State University found the pelletized lime to have a slower rate of reaction. Field research from other states indicate the rate of reaction is about equal to ag lime. The slower than expected reaction of pelletized lime is probably due to two things: 1) the lignosulfonate binding, and 2) the distribution pattern. The lignosulfonate binding must break down by solubilization or microbial action before the lime is released to neutralize the soil acidity, which would delay the speed of reaction. When the pelletized lime is spread, it is distributed on the soil in pellets

and results in small concentrated zones (spots) of lime after the binder dissolves. The fine, reactive particles of ag lime, in contrast, are spread as more of a dust so that the lime is better distributed and not in concentrated spots. The bulk spreading method will allow the ag lime to contact a larger amount of the soil. Summary Pelletized lime is an excellent source of high quality lime. Its use in agriculture has been limited due to the price. The recommended rate of pelletized lime should be based on the neutralizing value of the lime and will probably be about 75 to 80% of that for average-quality bulk ag lime. Contrary to popular belief, the speed of reaction of pelletized lime is no faster than that of bulk ag lime. Thus, when comparing the two materials, less pelletized lime is needed to raise the soil pH to the desired level, but the increase in pH is no faster than with ag lime if both are applied on the basis of their neutralizing values.

Ag Lime Resources

County	Quarry	Address	Phone Number	RNV	
Pendleton	Hilltop Basic Resources	1405 State Route 177 E, Butler, KY 41006	859-472-5591	44.4	*lime sand
Bourbon	Bourbon Limestone Co	2470 Fords Mill Road, Paris, KY 40361	859-987-4425	63.7	
Fleming	Hanson Aggregates Midwest	KY HWY 11, Flemingsburg, KY 41041	606-845-2411	44.7	
Scott	Nally & Gibson	1267 Main Street, Georgetown, KY 40324	502-863-1771	50.7	
Carroll	Phoenix Services Waylite Group	6870 HWY 42 E, Ghent, KY 41045		94.5	*aggregate
Gallatin	Sterling Materials	100 Sierra Drive, Verona, KY 41092	859-567-7300	44.6	
Mason	Eaton Asphalt Paving Co	9222 Springdale Drive, Maysville, KY 41056	859-547-5925	ND	
Trimble	Trimble Co Sand & Gravel	920 Wise Landing Road, Bedford, KY 40006	502-255-7996	ND	
Henry	Liter's Inc. Lockport Quarry	1058 River Road, Lockport, KY 40036	502-845-4537		

The Top Ten New Years' Resolutions for Cow/Calf Producers

Source: Dr. Michelle Arnold, UK Veterinary Diagnostic Laboratory

We have all heard this phrase, often attributed to Albert Einstein, and it certainly applies when it comes to the health and care of cattle. If you want to improve health and prevent as many problems as possible, think of adopting one or more of the following resolutions.

In 2022, I resolve to . . .

1. **Improve the water the cattle**

drink: Water is the cheapest and most readily available nutrient but it is often the most overlooked. Consumption varies with age, breed, temperature and humidity, stage of pregnancy or lactation, and level of production but can reach as high as 25-30 gallons per day during hot weather. Generally, cattle health problems are seldom directly due to what is in the water but rather the decrease in water consumption because of the poor taste and odor. Decreased consumption is just as harmful as not having enough water available. When cattle do not drink enough, feed intake and milk production drop, heat stress worsens, and overall immunity suffers. If cattle are allowed to stand in water sources such as ponds, fecal and urine contamination will decrease water quality and certain diseases (for example, leptospirosis) will spread through contaminated water.

2. **Check the mineral feeder regularly and keep trace mineral in front of the cattle at all times:**

This resolution can be challenging, especially in those times when the cattle seem to eat it as fast as it is put out. The keys to using a free-choice trace mineral product are to ensure

cattle have access to mineral 100% of the time, use a palatable, quality product and make sure they are consuming it at the expected level. Remember a 50-pound bag of mineral to be fed at 4 ounces per head per day will only last 4 days in a 50 cow herd. If the cows have calves that also eat mineral, a bag may only last 3 days. If cattle are consuming too much mineral, try moving the feeder farther from the water source or mixing in loose salt to slow the consumption rate. Mineral feeders should not be allowed to be empty for long or cattle will overeat salt or mineral when it is offered again. Provide adequate access for cows and calves, for example 1 mineral feeder per 15 cow/calf pairs. Do not offer additional loose salt, salt blocks, or sources of salt at the same time. Trace minerals, especially copper and selenium, are often far below acceptable levels in cattle without supplementation. The absence of these vital nutrients is a major factor in development of disease. Additionally, grass tetany/hypomagnesemia cases will occur in late winter and early spring if lactating beef cattle are not offered a free-choice, high magnesium trace mineral during that period of time.

3. **Test my hay before winter and figure out if I need to buy supplemental feed:**

If hay quality is poor, for example if cut very ripe (late stage of maturity), rained on while curing, and/or baled with enough moisture to support mold growth, supplementing cattle with adequate energy and protein sources will likely be required to

meet their basic nutritional needs until grass is available again. Many cows and calves presented for necropsy (an animal "autopsy") in late winter reveal a total absence of fat and death is due to starvation. This indicates that the hay feeding program did not provide the necessary nutrition for winter weather survival. It is often difficult for producers to realize that cattle can actually starve to death while consuming all the hay they can eat – especially if crude protein levels are in the 3-4% range, and TDN (energy) is <40% – as is common in some late-cut, overmature, rained-on hay. Many producers purchase "protein tubs" varying from 16-30% protein to make up for any potential protein deficiencies but fail to address the severe lack of energy in the diet.

4. **Keep my cows from losing weight, especially while pregnant:**

Learn to body condition score cows so you will know where on the cow to look for signs of early weight loss. Inadequate nutrition severely affects the developing fetus in a pregnant cow. "Fetal programming" of the immune system of the developing calf during pregnancy will not progress correctly without sufficient nutrients and trace minerals. A weak cow may experience dystocia (a slow, difficult birth) resulting in lack of oxygen to the calf during delivery, leading to a dead or weak calf. Calves born to deficient dams have less "brown fat" so they are less able to generate body heat and are slower to stand and nurse compared to calves whose dams received adequate nutrition during the last 100 days

of pregnancy. Poor colostrum quality and quantity from protein and energy-deficient dams will not support calf survival and performance. Thin cows will be the last ones to rebreed.

5. Work with a veterinarian to examine my herd vaccination program: Cattle herds are unique entities with different risks for disease on every farm so working with a veterinarian is your best bet to finding the right vaccines for the herd. The question of whether to use modified live or killed vaccine in adult cows is not an easy one to answer. Modified live vaccines (MLVs) offer better and more effective pregnancy protection but can impact conception rates if given too close to breeding season. In addition, MLV vaccines can cause abortions if given to pregnant cattle without strict adherence to label directions. Killed vaccines, on the other hand, are safer but are not nearly as effective at preventing infection. Another option is to administer two doses of MLV vaccine to open heifers (at weaning and a second dose 6 weeks prior to breeding) with annual revaccination using a killed vaccine. This combination stimulates excellent protection without the risk of MLVs although this protective response will diminish after several years.

6. Improve biosecurity: Purchasing bulls, cows, or calves, and bringing them home to the farm is likely the single most dangerous time for introduction of new diseases into a herd. Even show animals returning to the farm from events should be isolated to prevent introduction of disease when they re-enter the

herd. Any newly purchased animals should be isolated either off the farm or in a well-segregated area for at least 2 weeks (3-4 weeks is better) and observed for any signs of illness. During the period of isolation, a veterinarian should be consulted to appropriately test and vaccinate new arrivals. The best practice is to purchase animals from herds of known health status that will provide a vaccination and health history. Introduction of an animal with a disease such as Johne's or a BVD persistently infected (PI) animal could have devastating, long-term effects on the health of the cow herd.

"Insanity is doing the same thing over and over and expecting different results."

7. Be better prepared to handle problems during labor and delivery: Checking on cows and heifers close to calving allows early detection of difficulty and intervention if needed during calving. If a cow or heifer is in active labor for 1-1.5 hours and making no progress, calving intervention is indicated. Assist or call for assistance with calving as early as possible, especially with heifers. Make sure calves start nursing after calving, keeping in mind that calves should stand within 30 minutes of delivery and nurse within 30 minutes of standing. If in doubt that the calf will be able to stand and nurse within an hour, make sure the calf is warm and then feed a good quality colostrum replacer, at least

1-2 quarts, within an hour of birth and again before 6 hours old.

8. Improve my forages: It is often said that beef producers need to think of themselves as grass farmers because they sell pounds of calf produced by a cow that eats grass and makes milk. The UK Forages website: <http://forages.ca.uky.edu/> is full of easy-to-find, useful information to make pastures more productive. Check out their instructional videos at <https://www.youtube.com/c/KYForages>

9. Keep better records: It is hard to make well-informed decisions without information. At the very least, every animal should have a readable ID tag and calving dates should be recorded. Other parameters such as calf birth and weaning weights, sex, and dam information help differentiate the poor performing cows from the great ones. Vaccination records should include date administered, vaccine name, lot and serial numbers and expiration dates at a minimum.

10. Listen to a trusted source for information and stop believing everything you read on Dr. Google: This is true in much more than beef cattle production. There is a lot of misinformation available and discernment is becoming a lost art. Veterinarians, Extension agents, and University Extension specialists, among others, can help answer or point you in the right direction when it comes to questions about the health and care of cattle.

Hope you have a prosperous 2022.

Estate planning: Time to Act

Source: Steve Isaacs, UK Agricultural Economist

Getting the ball rolling on your estate plan or farm transition is one of the hardest things to do. Hopefully by now you have had meaningful conversations about your estate with your heir(s) and have assembled a team of professionals to help you with the transition. If not, you should do so before putting a plan into motion.

Work with your attorney to develop a will that reflects your wishes. Wills are the only way to guarantee a successful transfer of assets to your heir(s). Keep the will in a safe place and make sure your heir(s) know its location. After all the hard work you have put into developing a will, you do not want it somewhere that no one knows about and as a result, cannot produce it after you are gone.

Once your will is in place, now is the time to start incorporating your heir(s) into your business, if you have not already done so. Remember that leaders and managers are trained, not born. Now is the time to share your business' financial records and status. If you work with the Kentucky Farm Business Management program, now is the time to introduce your heir(s) to your farm



analyst. It is also a good time to start dividing your farm responsibilities with your heir(s) and fully bringing them into the operation. You may also encourage your heir(s) to take leadership and/or management classes. The University of Kentucky offers great professional

development opportunities and resources for young farm managers including the Kentucky Agricultural Leadership Program, MarketReady Program, Center for Crop Diversification and

the Kentucky Small Business Development Center. Kentucky commodity groups also offer ample opportunities for professional development.

It may be a good idea to start using a calendar or multiyear timeline to set specific goals and completion dates for action items in your farm transition. This can help keep you on track and will create an overall smoother transition.

Remember just because you have a will or farm transition plan in place, it is not final until you die. People and circumstances change. Revisit the plan every few years to make sure it continues to align with your and your heir(s) goals.

Shiitake Mushroom Production



University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service



**Saturday, March 5, 2022
12:00 p.m. (Noon)**

Shiitake mushrooms, native to eastern Asia, can be grown locally for their gourmet and medicinal value. Participants will learn how to select trees to utilize for shiitake mushroom production, how to grow them, and about their nutritional value. Households will take home a log capable of producing shiitakes.

**Campbell County
Environmental Education Center**

1261 Race Track Road (Rt. 824)
1 mile east of US 27
Alexandria, KY 41001

The instructor has been recognized with a national environmental education award for the program developed to turn small trees into revenue producers while upgrading the quality of forests and educating producers in the value, both nutritionally and financially, of shiitake mushroom production.

DJ. Scully

Instructor:

DJ. Scully, Campbell County Extension
Agent for Natural Resources and
Environmental Management

Call by Wednesday, March 2 to sign up for this workshop. Registration is limited.

Please wear old clothes; bring a drill and bits; and a hammer if possible.

To register call 859-572-2600

Dealing with fertilizer costs and shortages: “No Silver Bullets”

Source: Victor Shelton, Retired NRCS State Agronomist/Grazing Specialist

This might be a good year to only apply fertilizer if you really need it – when soil tests indicate below moderate levels.

One of the bigger challenges for this season is going to be fertilizer costs. If you have “stockpiled” some soil fertility in your pastures and hay fields, then you certainly look pretty smart right now.

Banking some fertility is easier to do on pastures than it is on hay fields. The majority of nutrients on pastures are returned to the soil for new plant growth with good grazing management. If hay is removed from a site, those nutrients in the forage leave the field – mechanical harvest of forages does deplete nutrients over time if not replaced.

Dr. Chris Teutsch of UK Research and Education Center recently released a short YouTube video with John Grove – “Ten Tips to Help Livestock Producers Weather High Fertilizer Prices.” Chris had ten really good points on the topic. I’ll provide a quick synopsis of those bullets and a few of my own thoughts. Ironically, I had already been thinking about concerns with increased fertilizer prices before I saw the video and, after watching it, decided to not to completely reinvent the wheel but just run with it.



the pH. The pH indicates how sweet or sour the soil is. Most grasses prefer to be in the range of 6.0 to 6.4. A few legumes, like alfalfa for example, prefer a sweeter soil between 6.5 to 7.0. Lime is usually the best money first spent because if the pH is off too much, critical macro nutrients like

There are no silver bullets:

There are a lot of products out there now that promise a lot of things, and some allude to no fertilizer required. It is certainly possible to improve soil health with the microbial life of the soil to where some unobtainable nutrients are made more available, but it doesn’t happen overnight, and it isn’t a given. Good management of the forages is always key. Maintain good live cover, adequate rest between grazing events, and appropriate stop grazing heights.

Soil sample pasture and hay fields:

Though some may argue that soil tests are not that beneficial, I disagree. A soil test provides a baseline to work from. If you don’t know where you are presently, then it is harder to figure out what direction you need to go!

Add lime first: The first priority item to address from your soil test is

phosphorus won’t be as available. If the pH is below 5.8, I’d recommend correcting the pH first and retesting after at least six months to assess everything else.

Don’t apply P & K if in

medium soil test range: At moderate levels, you can maintain sufficient levels for a long time if only grazing. If you are taking hay off, especially multiple harvests during the growing season, then levels will reflect that and decline accordingly. If phosphorus and potassium are below the medium test range, then additional nutrients are beneficial for nutrition and yield.

Rotate stocking: The more livestock are rotated, or more precisely managed in such a way to get even distribution of manure and urine across the entire pasture, the better the redistribution of nutrients back into the soil and plants from where they came. Livestock that are

allowed to roam bigger areas are much more likely to move nutrients from one part of the field to another. This is particularly true if water and mineral are a long walking distance. When this is the case, animals will tend to graze those distant locations for shorter periods and will then tend to ruminate and return nutrients closer to the water source, thus moving nutrients and creating low and hot spots in the process.

Capitalize on nutrients in hay: There are a lot of nutrients in a bale of hay, especially good quality hay. If we can feed some of this hay where nutrients are needed, then we can save on replacement nutrients. Feeding it where it is needed also reduces the amount of manure that needs to be hauled, saving time and fuel. Manure can be a very good source of nutrients for both pastures and hay fields. If using manure from confinement buildings or lagoons, treat it like you are putting on commercial fertilizer, get the manure tested and apply according to soil tests and yield goals. If you are buying hay, then you are not only buying feed for the livestock, but you are also buying nutrients for the farm that should be taken advantage of.

Add legumes: The addition of legumes to both pastures and hay fields has several economic benefits. They add additional digestible protein and nutrients, and when mixed with grasses, provide valuable nitrogen to the system that boosts both yield and overall quality. The addition of legumes is

usually the second-best dollar spent after lime. Legumes fix nitrogen in root nodules. Rhizobia bacteria in the soil enter the root. The correct rhizobium bacteria must be present for the species, thus the reason for making sure that you inoculate seed prior to planting legumes. Most legumes are fairly pH sensitive, therefore, the pH needs to be corrected prior to planting for best results.

**Remember,
it's not about
maximizing a
grazing event,
but maximizing
a grazing season!
Keep on grazing!**

Frost seed clover: Frost seeding is one of the least expensive ways to enhance the stand of legumes in your pastures. It is basically the process of broadcasting the legume seed onto the soil's surface during the winter dormant months. I usually say the ideal time is somewhere between Christmas and Valentine's Day. When I really have my choosing, I'll wait until there is a light snow on the ground and then do the sowing. The snow serves two good purposes. One, it helps "catch" the seed and transport it to the ground and two, it serves as a great marker for the tractor or ATV.

Manage Nitrogen applications: When nitrogen

fertilizer prices are high, we need to be as efficient as possible with applications. Early applications of nitrogen can boost the yield of the first cutting of hay, but with long wet springs, it can also throw fuel on the fire and create stands of forages that are not only hard to dry if you are wanting dry hay, but also may be too competitive with legumes we want to maintain. Nitrogen applications are sometimes better utilized for secondary cuttings to boost yield and quality and or for stockpiled forage for fall and winter grazing. Apply any nitrogen when it can be utilized the most efficiently. If you have high amounts of legumes in the sward, then you may not need much or any additional nitrogen depending on your goals.

Monitor Hayfields

Closely: Like mentioned already, hay removes a lot of nutrients that will have to be replaced eventually to maintain future yields. When nutrients fall into the low category, forage yield and quality both suffer and there can also be a shift in the sward to plants that are more adaptable to low levels of some nutrients. Broomsedge, yellow bluestem, is a good example of a low nutrient soil increaser. Fields used only for hay should be treated like a regular crop field and fertilized as needed to maintain at least a moderate fertility level.

May the rains sweep gently across your fields, may the sun warm the land, may every good seed you have planted grow abundantly and by late summer find you standing in fields of plenty – Happy New Year!

WHEN TO APPLY LIME AND FERTILIZER

Source: Kenneth Wells Department of Agronomy

Nearly half of all the fertilizer used in Kentucky each year is bought by farmers during the rush of the spring

planting season. As a result, it is often difficult for the fertilizer industry to meet customer demands during this 6 to 8 week period.

Much of the fertilizer now used during the spring rush season could be applied during other seasons of the year. If farmers scheduled fertilizer applications more evenly throughout the year, dealers would be in a much better position to provide them with the kinds and amounts of fertilizer they desire. Custom application services could be improved. In many instances, off-season discounts could be obtained. Other services provided by dealers could be provided more efficiently because the dealers would not be in such a rush.

In addition, more even applications throughout the year would mean that much of the fertilizer necessary for spring planting would already be on the field. This would save valuable time during spring planting and eliminate the risk of not being able to apply fertilizer because of wet land in the spring. Fertilizing in the fall would also ease problems of soil compaction caused by spreading equipment since the soil would have time to mellow over winter.

Chemical Reactions of Lime and Fertilizer in Soil

When lime and fertilizers are applied to soils, many chemical reactions take place — some immediately, and some over long periods of time. These reactions have a great influence on when lime and fertilizer can be applied and how efficiently fertilizer is taken up by growing

crops, and this influences the economic returns from lime and fertilizer use.

To better understand the nature of the chemical reactions taking place between soils and lime and fertilizer, we should first examine the soil.

The amount of surface area exposed in soil with which lime and fertilizer come in contact is extremely important. This factor is related to the amount of clay present in the soil, since most of the soil's potentially reactive surface area is made of clay particles and since, per given volume, there is more surface area in clay than in sand or silt.

The mineral form of individual soil particles and the extent to which these mineral soil particles have been coated with layers of oxides and organic materials also affect the total soil reaction.

All clay particles in soil have a net negative (-) electrical charge. Because of this negative charge, clay particles will react with components of lime and fertilizer which dissolve as positively (+) charged particles (cations) when added to soil. Lime materials dissolve to release positively charged calcium (Ca^{++}) and/or magnesium (Mg^{++}) particles, and some fertilizers dissolve to form positively charged particles (ammonium nitrogen (NH_4^+) and potassium (K^+)). Such positively charged particles (cations) are attracted to the negatively charged components of soils.

Lime

Materials commonly used as lime are either ground-up limestone rock, ground-up marl or products of limestone which have been altered by burning to make them more

water soluble than the ground-up rock itself. By far the most common liming material in Kentucky is ground limestone (aglime), most of which is calcium carbonate. In some instances, there is enough magnesium carbonate present for the lime to be termed "dolomitic."

When applied to soil, the liming material reacts with soil moisture to release particles of calcium or, in the case of dolomitic lime, magnesium. The rate at which the lime material dissolves to release these particles is largely controlled by how finely it is ground and the chemical form of the material (carbonate, oxide or hydroxide). The finer the material, the more rapidly it dissolves. Oxides (burned lime) and hydroxides (hydrated lime) are more soluble in water and react much more quickly than carbonate forms of lime (calcitic aglime or dolomitic aglime).

Calcium or magnesium particles are attracted to and are held by clay particles in soils after the liming material dissolves. This neutralizes soil acidity, increasing soil pH readings. It also means that lime does not move very fast downward through soil. With the exception of extremely sandy soils, there is no concern in Kentucky over leaching losses of lime. For this reason, lime can be applied whenever practical, although it should be applied far enough before planting to allow time for adequately reacting with the soil and neutralizing acidity.

Nitrogen (N)

It is important to have enough available nitrogen in the soil at the time when the crop's growth is most rapid.

Basically, we use two types of nitrogen: 1) ammonium or

ammonium formers (urea, anhydrous ammonia); and 2) nitrate forms. In aerated soils, ammonium nitrogen is changed in the soil to the nitrate form. The nitrate form is completely soluble in soil water and therefore moves in the direction of soil water movement.

Soil temperature influences the rate at which ammonium nitrogen is changed to nitrate. It is generally considered that the rate at which this change takes place is negligible at freezing or below, while at soil temperatures above 50°F, the conversion rate is rapid. In Kentucky, soil temperatures during the winter generally do not stay cold enough to completely prevent conversion of ammonium nitrogen to nitrate nitrogen. This means that fall or winter application of anhydrous ammonia, urea, or other ammonium forms of nitrogen fertilizers to fallow land is not a sound practice.

Since nitrate nitrogen moves with soil water, it is subject to loss from the plant rooting zone by leaching during periods of high rainfall which results in a net percolation of water through the soil profile. If percolating water moves deeply enough to reach the water table, nitrate is then lost through groundwater to streams. An excess of water usually occurs in Kentucky during the months of December to April. On the other hand, if moisture percolating downward through soil does not reach the water table, nitrate nitrogen may move upward again as net movement of soil water shifts upward toward the surface because of evaporation and transpiration.

Since nitrate contains oxygen in its structure, losses of nitrogen fertilizer

from water-logged soils can also be quite severe for another reason. Soil bacteria that require air will rob nitrate nitrogen of its oxygen if there is not enough free oxygen in the soil to meet their demands. In this process, nitrate nitrogen is converted to gaseous forms of nitrogen, which then escape from the soil surface. The presence of undecomposed organic residues intensifies such losses in water-logged soils simply because such residues cause soil bacteria to be more active and use more oxygen.

In regard to these nitrogen reactions, two points need emphasizing: 1) Although the first reaction of ammonium nitrogen is to

be adsorbed onto the surface of clay and organic matter, it does not remain in the ammonium form very long under Kentucky's climatic conditions. It is transformed to nitrate nitrogen. 2) Nitrate nitrogen is subject to rapid loss from soil, either from leaching or from loss as a gas. However, there is some indication that leaching of nitrate nitrogen is not as rapid in red soils as it is in browner soils.

These reactions show that nitrogen can be used most efficiently by a crop if it is applied either while the crop is growing or just before it starts to grow. Even with these precautions, there will be occasions

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Strawberry Production

What Strawberry Production System Is Right For You?

Are you interested in growing strawberries for markets or you-pick? Are you already growing strawberries and have production questions?

Join as Dr. Shawn Wright, UK Horticulture Specialist, shares the pros and cons on plasticulture strawberries vs. matted row production.



Contact your local extension office with any questions.

February 21
6:30pm

This class will be offered via Zoom.

Use the link below to join:

<https://uky.zoom.us/j/87964544556>

 **University of Kentucky**
College of Agriculture,
Food and Environment
Cooperative Extension Service

WHEN TO APPLY LIME AND FERTILIZER

(continued from page 11)

when split applications of nitrogen should be helpful. For example, heavy rains following applications of N can result in leaching losses from permeable soils or in denitrification losses in soils which tend to waterlog.

Phosphorus (P)

Phosphate fertilizer, when applied to soil, reacts very rapidly to form compounds that are less soluble than the form in which the fertilizer was added. This is due largely to the iron and aluminum oxides in the soil which rapidly react with applied phosphate, making it less soluble. For this reason, phosphates are not mobile in soil, and leaching losses of phosphate are insignificant in Kentucky soils.

Erosion of surface soil containing applied phosphates is the most likely way in which phosphates would be lost from soils.

Since phosphates are relatively immobile in soil, it is not important that phosphate fertilizer be applied during the crop's growth cycle. The long residual value of phosphates in soil will make them available to crops over long periods of time. It is rare that more than 25 percent of phosphates applied to a crop is used in the first year after application.

Potassium (K)

Potassium dissolves from fertilizer in the soil, is attracted to clay particles, and is then held tightly enough that leaching losses are negligible. In sandy soils which have very little clay,

leaching losses of potassium can be a problem. This is not of general concern in Kentucky, however, since only a small portion of agricultural land in Kentucky is of sandy texture. In most Kentucky soils, potassium is not likely to leach, and there should be no great practical concern over when it is applied to the soil. The most likely losses of potassium would be through sediment losses from erosion. It is unlikely that more than 40 percent of potassium applied in a given year would be used by crops during that year.

Fertilizer Requirements of Crops

There always should be enough available nitrogen, phosphorus and potassium present in soil during a crop's growth cycle so as not to limit growth. This can be accomplished by: 1) applying enough P and K to raise soil test levels to at least the "high-medium" level, and then making annual applications to maintain soil test values at that level, and by 2) applying N to match the growth cycle of the crop as closely as is practical. Remember that using lime to achieve acceptable soil pH levels is necessary for best fertilizer utilization by your crops.

Sod Crops (Hay and Pasture) Legumes or Grass-Legume Mixtures

For establishment of a new stand, apply lime at least 6 months in advance of seeding. Then apply a small amount of N to stimulate initial

seedling growth along with the necessary P and K at seeding.

Apply topdressings of P and K when convenient, preferably after herbage has recently been clipped or grazed. Nitrogen is not necessary where more than 25 percent of the stand is made up of a perennial legume. Apply boron (B) each year on all alfalfa fields and on clover fields to be harvested for seed.

Straight Grass

For new seedings of straight grasses, apply a moderate amount of N along with the necessary lime, P, and K at time of seeding.

For topdressing cool-season grasses, apply N in at least two split applications (late winter or early spring, and late summer). For warm season grasses, you can achieve greater efficiency by splitting applications to coincide with clippings or rotational grazing. Apply P and K anytime when convenient, preferably after herbage has been recently clipped or grazed.

Grass Seed

You can increase seed yields from grass fields to be harvested for seed by late fall and early spring topdressings with N. For bluegrass seed production, apply N between November 15 and December 15, and again between February 15 and March 15. For fescue seed production, an application of N between November 15 and December 15 is sufficient. For orchardgrass and timothy seed

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fields, apply N between February 15 and March 15.

Small Grains

Small grain crops usually are part of a cropping rotation system which includes another crop. Lime, P, and K can be applied anytime. It often is convenient to apply when seeding the small grain. Apply half the N at the time of seeding to stimulate fall growth of the small grain.

Additional N should be top-dressed on the small grain between February 15 and March 15 for top production. When small grains are grown in a rotation or in a double cropping system, the P and K requirements for both crops (forage legumes, soybeans, corn, forage, or grain sorghum) can be applied at seeding of the small grain.

Corn or Grain Sorghum (single crop)

For single crops of corn or grain sorghum, apply lime, P, and K when convenient. This would usually be sometime between harvest in the fall and seeding the following spring. N should not be applied until planting or shortly after. On sandy soils where leaching during the growing season can be great, or on soils which tend to be water-logged, more efficient use of N can be obtained by applying only a small portion at planting time and then side-dressing the remainder at about the knee-high stage of growth. Applying nitrogen in the fall on land to be fallow during the winter and planted to corn in the spring is not a sound practice. Under Kentucky climatic conditions, overwinter N losses from both leaching and denitrification are great. Research at the University of Kentucky indicates, however, that overwinter N losses from the red-

colored soils are not as great as those from yellow and brown soils.

Soybeans

Apply lime, P, and K to soybeans when convenient, being sure that the lime is applied far enough in advance of the crop to adequately adjust pH. When double-cropping soybeans with small grain, you can apply the required P and K for both crops at seeding of the small grain in the fall.

Tobacco

For tobacco, apply lime, P, and K when convenient, preferably soon after harvest. If pH needs adjusting apply lime in the early fall. Apply N at the beginning of field preparation or just ahead of setting.

Supplemental N applications after planting may be necessary if leaching or denitrification losses occur.

Summary

It is quite evident that much of the fertilizer added to Kentucky soils does not have to be applied during the spring planting season to be effective in soil improvement. Much of the fertilizer needed for profitable crop production can be applied during other seasons of the year without sacrificing yields. A shift away from traditional spring applications of fertilizer can help save valuable time and assure better service from the fertilizer industry.



TOBACCO GAP TRAINING

Tobacco GAP has gone Regional

To register, call the corresponding extension office.

Don't forget to take your GAP Connections Card to the meeting.

DATE February 10, 2022 | 6 PM
LOCATION Maysville Community College
REGISTRATION 606-564-6808

DATE March 9, 2022 | 6 PM
LOCATION Harrison County Fairgrounds
REGISTRATION 859-234-5510



University of Kentucky
College of Agriculture,
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Join us...

COOPERATIVE EXTENSION



Beef Cattle

Master Finisher Program



A comprehensive webinar series focused on finishing beef cattle for processing.



Programs are held in-person at the Environmental Education Center or via ZOOM. They will be recorded for later viewing as well.

Call the extension office for link to recording(s)

All programs start at 6:30 p.m.

1261 Race Track Road, Alexandria, KY 41001

- January 18, 2022 Gregg Rentfrow - Working with processors, what to expect.
- **February 1, 2022** Chris Teustch - Forages for pasture-based finishing.
- February 15, 2022 Paul Priyesh Vijayakumar - Food safety considerations for selling beef.
- March 1, 2022 Kenny Burdine - Marketing considerations for freezer beef.
- March 15, 2022 - Morgan Hayes- Confinement facilities.
- April 5, 2022 at Asa Phillips Farm - Nutrition and Management Part 1
2225 Hwy 127 N, Glencoe, KY 41046
- April 19, 2022 Steve Higgins - Environmental compliance/waste management.
- May 5, 2022 at Alan Ahrman Farm - Nutrition and Management Part 2
708 Kenton Station Rd., Alexandria, KY 41001

Registration is required

Call 859-572-2600 or online at <https://campbell.ca.uky.edu>

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Disabilities accommodated with prior notification.



Broccoli and Beef Stir-Fry

Servings: Makes 8 servings Serving Size: 1 cup



Ingredients:

- 1 pound lean beef steak, sliced diagonally across the grain into thin strips
- 1 tablespoon plus ½ cup stir-fry sauce
- 1 clove minced garlic
- 4 tablespoons canola oil, divided
- 1 medium red onion, cut into ½ inch dice
- 1 sweet red pepper, cut into ½ inch dice
- 1 medium yellow squash, cut into ¼ inch slices
- 2 cups fresh broccoli florets
- 1 cup cauliflower florets
- ½ teaspoon crushed red pepper flakes

Directions:

1. Combine 1 tablespoon stir-fry sauce and minced garlic in a bowl. Add the beef strips. Let stand 15 minutes.
2. Heat 1 tablespoon canola oil in a large skillet or wok.
3. Add beef and stir fry for one minute. Remove beef from skillet.
4. Heat the remaining 3 tablespoons canola oil in the skillet or wok. Add vegetables. Stir-fry for four minutes or until vegetables are crisp-tender.
5. Return beef to skillet.
6. Add the remaining ½ cup stir-fry sauce and red pepper flakes. Cook and stir 1 to 2 minutes longer, until heated through.

Source: Plate it up! Kentucky Proud Project.
www.fruitsandveggiesmatter.gov

Nutrition facts per serving:

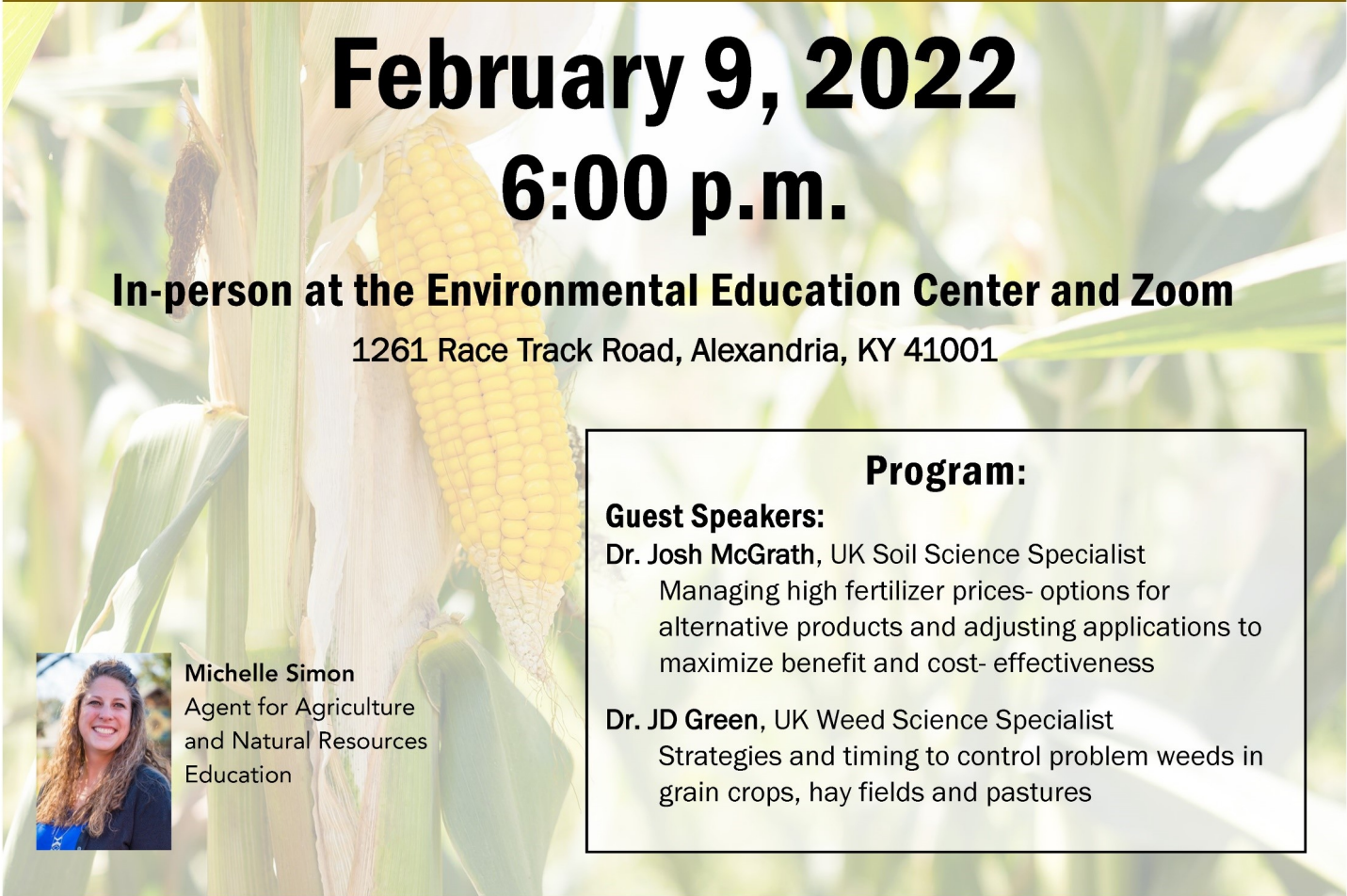
180 calories; 10g fat; 1.5g saturated fat; 0g trans fat; 25 g cholesterol; 630 mg sodium; 9g carbohydrate; 2g fiber; 3g sugar; 15g protein.



University of Kentucky
College of Agriculture,
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NKY Grain & Forage Update



February 9, 2022
6:00 p.m.

In-person at the Environmental Education Center and Zoom
1261 Race Track Road, Alexandria, KY 41001



Michelle Simon
Agent for Agriculture
and Natural Resources
Education

Program:

Guest Speakers:

Dr. Josh McGrath, UK Soil Science Specialist
Managing high fertilizer prices- options for
alternative products and adjusting applications to
maximize benefit and cost- effectiveness

Dr. JD Green, UK Weed Science Specialist
Strategies and timing to control problem weeds in
grain crops, hay fields and pastures

RSVP for Dinner

To register, call the Campbell County Cooperative Extension Office at
859-572-2600

or online at: <https://campbell.ca.uky.edu>



***If attending via Zoom, an e-mail address is
required so we can send you the zoom link.***

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Disabilities
accommodated
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