KANSAS STATE UNIVERSITY

Extension
Butler County

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In this Issue:

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The Grapevine

Mole Control

Moles are small mammals that spend most of their lives in underground burrows. They are similar in appearance and size to shrews and meadow mice and may occupy the same habitat. Only one species—the eastern mole—lives in Kansas. The most conspicuous features of the mole are the greatly enlarged, paddle-like forefeet and prominent toenails, which enable it to swim through the soil. The legs are strong, the neck short, and the head elongated. Moles lack external ears, and their eyes are so small that at first glance they appear to be missing. Considering they spend most of their time underground, it may seem surprising that moles cause damage above ground. As they forage for food, moles are known to make travel lanes that cause meandering paths of upheaved soil in home lawns and farmsteads. Moles do not feed on plant matter, but they can still cause damage by disturbing roots and uprooting small plants. Moles may not be on the move in your yard or area yet, but it's fairly common for them to start moving in early April, searching for their favorite food, the earthworm. While many home remedies have been passed around as methods to control moles, most of them are not very effective, and even poison baits often fail because they don't mimic the food the mole eats. While it may sound grim, if moles are becoming a nuisance in your yard, traps are likely your best bet for controlling them.

In a new video produced by K-State, Dr. Drew Ricketts shares about moles and the proven best method for eliminating them. Learn how to identify mole damage, locate the best runs for trapping, and how to set a variety of styles of mole traps. Watch the video here.

What is Biochar?

Biochar is gaining interest in the horticultural industry, even though its roots date back to ancient times. Traditional fertilizer use has long raised environmental concerns – increased nutrient inputs from fertilizers like poultry litter can boost plant size and yield, but excess phosphorus and nitrogen can run off into local waters, causing algal blooms and other problems. Biochar may offer a safer, more sustainable way to achieve the same results, while providing additional environmental benefits, such as carbon sequestration.

Biochar is a charcoal-like product. It is made by heating biomass such as herbaceous or woody crop residues, non-salvageable timber and slash, or animal manure, in a contained system. Biochar may also be used as a soil amendment for two purposes: improving plant health and storing carbon. It is predicted that at least 50% of the carbon in any piece of waste turned into biochar becomes stable, locking it away for several to hundreds of years, offsetting its contribution as a greenhouse gas in the form of carbon dioxide. Although biochar is currently a hot topic, especially in agriculture, it has ancient roots. In the Amazon, pockets of soil are widely believed to have been amended or mulched with charcoal waste from pre-Columbian Indian hearths thousands of years ago. Those soils, known as “terra preta” (dark earth), are dark, loamy, and fertile. It is important to note that not all biochars perform the same, and how they do depends on the biomass source, the temperature at which they are processed, and the size of the product.

Biochar is produced through a process called pyrolysis, a heat-driven reaction (480-1800 degrees F) that breaks down biomass containing carbon into various components. This biomass is often called “feedstock”. The pyrolysis reaction requires very little oxygen, so the material does not combust, and emissions are easy to contain. The feedstock then decomposes into smaller gas and solid molecules. When the gases are cooled, some condense into biofuel, while the remaining remain in gas form. The solids become what we know as biochar. More biofuel is created during “fast pyrolysis,” where the pyrolysis heating rate is high, and the starting feedstock is finely-ground. Conversely, during “slow pyrolysis,” which uses longer, slower heating rates and larger feedstock pieces, more biochar is produced.

The characteristics of biochar vary significantly depending on feedstock type and pyrolysis temperature. In general, biochar has an alkaline pH, is porous, contains fixed and available carbon, and may contain some nutrients. The nutrient content of chars for plant growth is negligible, but their high cation exchange capacity improves the effects of fertilizer applications. The most important characteristics for improving soil properties (such as adsorption capacity and water retention) are biochar porosity and surface area. The properties of biochar determine its applications in soil, and a particular biochar may not be suited to all soil types. Therefore, optimizing biochar for a specific application may require selecting specific feedstocks and a pyrolysis temperature.

- Manure: greater content of nutrients and cation exchange capacity; higher electrical conductivity (may increase soil salt concentration); low carbon content
- Crop and grass residue: higher potassium content; lower porosity; higher carbon content
- Wood waste: greater fixed carbon content and thus, more stable; greater porosity and thus higher water retention; biochar from conifer wood has a lower pH and would be better for alkaline soils
- Higher pyrolysis temperatures (500°C – 650°C): greater amount of micro-pores (better for absorption of toxic substances and soil rehabilitation); higher pH; greater mineral content; lower CEC
- Lower pyrolysis temperatures (350°C – 500°C): greater degradable carbon as source for soil micro-organisms; higher CEC

In agriculture, biochar has the potential to increase water-holding capacity, prevent nutrient losses from fertilizers, and provide structure for the build-up of beneficial soil microorganisms. These qualities, in turn, may improve plant growth or crop yield. Because of biochar's high pH and its ability to bind heavy metals and other organic pollutants, it is being investigated as a reclamation tool for old mining lands, contaminated water sources, dairy lagoons, and more. In greenhouse production, they are exploring biochar as a replacement for perlite or peat moss, which also reduces nutrient leaching (11% compared to traditional media). Foresters in Colorado, Idaho, and Utah are exploring biochar production to turn dead trees (largely beetle-killed) into a value-added product and as an alternative to slash-and-burn.

While we are still learning how to use biochar in horticultural settings and around our homes, research is underway to determine its usefulness for home gardeners. Biochar is worth watching as a useful soil amendment for raised beds, flower gardens, and even vegetable gardens in the future. While the market and availability are currently limited, that could change in the near future.

Question of the Week- Pet Safe Plants

Pets and plants are an important part of many people's lives. While they are important parts of people's lives, not all plants and pets get along well. If you have pets or small children, it's important to know which plants you have and whether they pose a risk to your household members. Plants have several natural defenses against pests, including physical and chemical barriers. Physical barriers might include fine hairs on okra, prickles on cucumbers, thorns on roses, and spines on cacti. Chemical barriers are phytochemicals that can cause various issues depending on exposure and toxicity, such as irritation or illness. Bitterness is an example of a chemical barrier.

There are plants of concern to humans, and another list for pets. One example of a plant that is safe for human use but can make dogs and cats sick is aloe. Whether you have existing house plants or are bringing plants inside, there are ways to limit exposure and keep your plants and pets safe. Labeling plants is key, especially when making room for all your plants as you bring them in for winter. Below are some tips to help keep your pets safe around houseplants.

- Keep non-pet-friendly plants in a room out of reach.
- Discard plant debris and clippings into an outdoor receptacle or one away from pets.
- Hang plants out of reach of pets.
- Label plants and use a sticker or label on unsafe plants.
- Use metal cages or terrariums for added protection if you are unable to separate by room.

The following list from University of Nebraska Extension covers plants that are poisonous to pets including: Amaryllis, Andromeda, apple seeds, apricot, arrowgrass, avocado, bittersweet, boxwood, buttercup, caladium, castor beans, cherry pits, chokecherry, crown of thorns, daffodil, daphne, delphinium, dieffenbachia, elephant ear, English ivy, elderberry, foxglove, glory lily, hemlock, hemp, holly, hyacinth, hydrangea, iris, jasmine, Jimson weed, Kalanchoe species, laburnum, larkspur, laurel, locoweed, marigold, mistletoe, monkshood, mushrooms, narcissus, nightshade, oleander, peach, philodendron, Poinsettia, poison ivy, privet, rhododendron, rhubarb, stinging nettle, tobacco, tulip, walnut, wisteria, and yew. It should be noted that just because a plant is listed as "not toxic" does not imply that it is edible. For example, spider plant (*Chlorophytum comosum*) is generally considered "non-toxic," but if consumed in high quantities, it can cause vomiting and diarrhea in some individuals. Instead of thinking of a non-toxic plant as safe, think of it as "safer," and still monitor your pets and restrict their access if they show any signs of digestive upset after consumption.

Upcoming Events

Garden Hour Webinars:

April 1st- April Showers, Rain Garden Flowers

May 6th- Natives vs. Cultivars--Making Informed Choices for Your Landscape

June 3rd- Maximizing Success with Extension Resources

Upcoming Events:

March 26th-Simple Morea Classes on Kokedama and Planted Wall Hanging

March 28th at 9:30 am- Rain Barrel Clinic at the Whitewater Library

April 8th at 12:15 pm- Companion Vegetable Planting at the Andover Public Library

Myth or Misconception of the Month

Adding Compost to the Garden is always helpful.

As an extension agent, I always encourage people to add compost or organic matter to their gardens. It offers many benefits in the garden, including improving clay soils, adding nutrients as an organic fertilizer, and composting, which reduces our carbon footprint by reducing the amount of waste we put into landfills. As gardeners, we should always add compost to our gardens every year, right? Well, the answer is not always that simple.

Composting is a process during which naturally occurring fungi, insects, and other microorganisms break down organic materials, such as certain kitchen scraps, grass clippings, and leaves, into a soil-like product called compost. It is a form of recycling, a natural way of returning nutrients to the soil. Unfortunately, as with any form of fertilizer, too much of a good thing can be a bad thing. Organic matter is an important component of soil in the vegetable garden. When your organic matter levels rise above 8% in the garden, it can create nutrient imbalances that can affect how plants grow. Gardeners with organic matter levels above this amount report that their plants remain stunted and shorter than they would be under normal conditions. Soils with excessive compost applications, particularly manure, tend to develop high concentrations of nutrients such as ammonium, calcium, magnesium, potassium, and sodium. These soils can also develop high concentrations of bicarbonate, carbonate, and hydroxyl ions.

Too much of any nutrient can inhibit the uptake of other nutrients, resulting in deficiencies.

- High ammonium can inhibit the uptake of calcium, magnesium, and potassium.
- High concentrations of base cations like calcium, magnesium, potassium, and sodium are associated with increased soil alkalinity.
- Highly alkaline soils tend to have a high pH (a measure of acidity), and many nutrients become less available in high pH soils. As a result, your plants may exhibit nutrient deficiency symptoms, despite an excess of nutrients in the soil.

Another issue with soils that receive excessive compost is the potential for increased soluble salts to levels that would cause salt toxicity. Composted manure is generally higher in salts than composted vegetative matter. Raw manure can be very high in salts and ammonium and is not recommended for use in high tunnels. So while adding compost or composted manure to your garden can be beneficial, regular soil testing is needed to ensure it doesn't add too many nutrients, which can lead to issues. After all, too much of a good thing isn't always a good thing.

ANNUAL BUTLER COUNTY Lawn & Garden Show

GROW & BLOOM IN BUTLER

Master Gardeners of Butler Co., KS

FREE Admission

- Children's activities
- Concessions
- Exhibits & vendors
- Plants for sale!
- Professional presentations
- Seed swap
- Soil test service available!
- & More!

DOOR PRIZES!

Event Details

Saturday, April 11th, 9 AM - 5 PM
Sunday, April 12th, 11 AM - 4 PM

Butler County Community/4-H Building
200 N. Griffith, El Dorado

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