



Northeast Missouri Ag Connection

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For more information
please contact your
MU Extension Center:

Adair
(660) 665-9866

Audrain
(573) 581-3231

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New Land App from USDA

A suite of mobile phone applications (or more commonly called apps) are being released, which can connect agricultural producers around the world and provide shared knowledge on ways to maximize land productivity while protecting resources for future generations. The project is called Land Potential Knowledge System (LandPKS). LandPKS is a global network of open-source databases and computer simulation models. Anyone with a mobile phone and a wireless or cell data connection can use the tools.

The first two apps, LandInfo and LandCover, were released in May. They will allow users to collect and share soil and land-cover information, as well as, gain access to global climate data. LandInfo and LandCover are currently available on Android and can be downloaded from the Google Play Store. An iPhone version should be released by the end of 2015.

LandInfo's primary objective is to make collecting soil data easier for non-soil scientists. The app provides some useful data farmers may find useful: amount of water the soil can store for plant use, average monthly temperature, precipitation, and the length of the growing season based on location.

LandCover simplifies collecting data for land-cover inventories and monitoring. The app allows documentation of trees, grass, bare ground and crop-residue cover. The app sends the data to servers, where it will be stored and accessible to other users and can be used with the other apps.

The project continues to work on an additional app called LandPotential. This app will use the data collected in the LandInfo app to identify the management systems which increase production while reducing soil erosion.

These phone apps use the latest in digital soil mapping, GPS-enabled camera functions and other cloud-computing technology and require no special training, by using picture-matching, drop-down menus, video explanations, and multiple-choice questions.

The USDA project LandPotential.org website has more information and also allows individuals to sign up for updates on the availability of new apps.

Source: *Mary Sobba, Ag Business Specialist*

Weather Plays Havoc with Fruits and Vegetables

Fruit tree diseases were prevalent this year due to the rainy spring. Diseases observed include: Fireblight, a bacterial disease on apples and pears; Cedar-apple rust, a fungal disease on apples and crabapples; and Black Rot, a fungal disease in grapes. Insect and disease control information can be found in MU guidesheet G6010 Fruit Spray Schedules for the Homeowner.

Black Rot in grapes can be a devastating disease. The disease is most destructive in warm, wet seasons and attacks all green parts of the vine-leaves, shoots, leaf and fruit stems, tendrils, and fruit. The most damaging effect is to the fruit. In late spring, reddish brown and circular to angular spots appear on the upper surface of the leaves. As spots merge, they form irregular, reddish brown blotches. Fruit infection occurs shortly after the petal fall. Most infections start when the fruit is half to almost full size. A small spot appears that becomes circular and whitish tan, often surrounded by a brown ring. This happens while the berry is still green. The spots grow rapidly and within a few days the entire berry becomes coal black, hard, and mummified. The black rot fungus overwinters in canes, tendrils, and leaves on the grape vine and on the ground. Mummified berries on the ground or those that are still clinging to the vines become the major infection source the following spring. Be sure to remove all mummified fruit.

Early to mid-summer tomatoes can start showing signs of stress or disease as well. Some of the first symptoms are yellowing of the leaves at lower end of the plant. Early Blight and Septoria Leaf Spot are the two most common diseases of tomatoes in home gardens.

Early Blight is caused by the fungus *Alternaria solani*. It survives in infected leaf or stem tissues on or in the soil. The first symptoms usually appear on the older, lower leaves of the plant and consist of small, irregular, dark brown to black, dead spots ranging in size from a pinpoint to 1/2 inch in diameter. As the spots enlarge, concentric rings may form as a result of irregular growth patterns by the organism in the leaf tissue. This gives the lesion a characteristic "target-spot" or "bull's eye" appearance. There is often a narrow, yellow halo around each spot and lesions are

usually bordered by veins. When spots are numerous, they may grow together, causing infected leaves to turn yellow and die. If not controlled, the leaves dry up and drop from the plant as the disease progresses up the main stem. To help control this disease, rotate crops whenever possible, mulch plants with straw, remove lower leaves that touch or are near the ground, and use a fungicide if necessary. Daconil, Maneb, and Mancozeb are recommended for control, or any product containing Chlorothalonil. Always read the label directions before applying any pesticide.

Septoria Leaf Spot is caused by the fungus *Septoria lycopersici*. It usually appears on the lower leaves after the first fruit sets. Spots are circular, about 1/16 to 1/4 inch in diameter with dark brown margins and tan to gray centers with small black fruiting structures. There are usually many spots per leaf. This disease spreads upwards from oldest to youngest growth. If leaf lesions are numerous, the leaves turn slightly yellow, then brown, and then wither. Fruit infection is rare. Septoria leaf spot is easily distinguished from early blight, by the uniform, small size of the spots and the lack of concentric rings in the spots. Preventative practices are the same as for Early Blight.

Additional information can be obtained from MU Guide 6202 Disease Prevention in Home Vegetable Gardens. control.

Source: *Jennifer Schutter, Horticulture Specialist*

KY-31 Fescue and How it Affects Bull Power

Beef producers in Missouri face challenges associated with ergot alkaloids from tall fescue (KY-31). Research has been conducted on cattle reproduction focusing on the female gender, with limited research on bulls. Researchers from USDA-ARS-Animal Production Research Unit and Clemson University in South Carolina recently conducted a KY-31 Fescue study with bulls. The project compared vasoconstrictive responses of the testicular and caudal arteries of bulls exposed to ergot alkaloids from tall fescue (KY-31) versus non-toxic novel endophyte fescue (Max Q II, Pennington Seed, Inc.).

The caudal and testicular arteries thermoregulate bull testes, which is critical to maintaining fertility.

Constriction of blood flow through the testicular artery could affect production of viable sperm cells. The limited research shows bulls exposed to endophyte-infected tall fescue have elevated scrotal temperatures, smaller scrotal circumferences and lower percentages of motile and progressive sperm cells.

The project was comprised of a feeding experiment and a grazing experiment on separate groups of bulls. In the feeding experiment (seven Angus and six Hereford) bulls were fed toxic or nontoxic seed as the treatment. The feeding treatments consisted of concentrate containing either toxic (E+, n=6) or nontoxic (E-, n=7) seeds from April 6 to August 10, 2011. The E+ diet contained 0.8 µg of ergovaline in the diet.

The grazing experiment was conducted to compare bulls grazing either toxic or nontoxic novel endophyte infected tall fescue pastures. In the experiment, 11 Angus bulls were pastured on E+ pasture and ten Angus bulls were placed on E- pasture. The E+ and E- were both grazed from April to August 2012 for 155 days.

Both of the experiments concluded ergot alkaloids circulating in the vasculature of bulls can induce constriction of the testicular artery, hampering blood flow to the testes which may cause decreased fertility. Ineffective heat regulation and reduction in nutrient supply caused by ergot alkaloid from E+ fescue is a major contributor in affecting bull fertility. The researchers, however, concluded any effects of the ergot alkaloid on the thermoregulation of the testes are probably a combination of bull genetics, environment, and concentration of ergot alkaloid in the diet.

Reference: G.E. Aiken, M.G. Burns, H.M. Stowe, J.G. Adrae, and S.L. Pratt: Vasoconstrictive responses of the testicular and caudal arteries in bulls exposed to ergot alkaloids from tall fescue. *Professional Animal Scientist* 2015 31: 130-136. of Missouri.

Source: *Wendy Flatt, Livestock Specialist*

The Waters of the U.S. Rule

The EPA recently released a final Clean Water Rule, often referred to as the Waters of the U.S. (or WOTUS) rule. WOTUS seeks to define which waters are subject to EPA and Army Corp of Engineer authority.

A few definitions in the Rule may be helpful. Navigable waters are easily recognized, clearly protected and not a point of contention in the Rule. Tributaries to navigable waters, by definition, must show physical features of flowing water – a bed, bank and ordinary high water mark. WOTUS states “Tributary streams, including perennial, intermittent, and ephemeral streams, are chemically, physically, and biologically connected to downstream waters” and “are the dominant source of water in most rivers.” This means the perennial, intermittent and ephemeral streams are waters of the US and subject to Clean Water Act regulations.

Nearby waters covered by the WOTUS Rule are waters more difficult to define. Nearby waters include, but are not limited to, waters within a minimum of 100 feet of jurisdictional waters or within a 100-year floodplain. This definition of nearby waters expands the quantity of streams, ponds, wetlands, etc. beyond what most farmers previously recognized as regulated.

Trying to get a handle on whether water sitting on or flowing across a particular parcel of land is subject to EPA jurisdiction can be daunting. A tool found at <http://preview.tinyurl.com/parceltool> provides help. Using USGS Hydrography Data, the tool allows users to zoom to particular parcels of land and observe waters that may be subject to the WOTUS rule.

A cursory glance at Missouri farmland indicates that most parcels of land have perennial or intermittent streams flowing across or by them. Many of what the National Hydrograph Dataset lists as stream (and hence a tributary according the WOTUS rule) are named creeks or branches. Many of these creeks and branches have designated ponds or wetlands within 100 feet of them.

Despite the EPA’s stated objective of “providing greater clarity,” it is uncertain how well these databases provide quick information in knowing what water on individual parcels of land is covered by the WOTUS rule. Some contend that these databases overestimate the amount of water subject to WOTUS because such items as ponds identified in the maps may not actually be covered. Others contend that the databases underestimate the amount of water subject to WOTUS because they do not designate all areas showing “physical features of flowing water” which WOTUS defines as a regulated tributary.

Source: *Ray Massey, State Ag Economist*

Reduced-cost Farm Energy Audits Available through MU Extension

Are you thinking about replacing your grain dryer with a more energy-efficient model? Or installing an alternative-energy system? Having an energy audit conducted before making a big investment can help in determine the payback of potential energy upgrades.

Farms and rural small businesses can receive energy audits at a reduced rate through MU Extension. Ordinarily, audits cost \$450, but a grant from USDA Rural Development will cover 75 percent, lowering the price to \$112.50. An energy audit is also required if you intend to apply for incentives through USDA Rural Development's Rural Energy for America Program (REAP).

Grants are available for up to 25 percent of the cost of a renewable energy or energy efficiency project. REAP also provides loan guarantees for up to 75 percent of a project's cost. Eligible energy systems include solar, wind, geothermal, anaerobic digesters and renewable biomass. Energy efficiency improvements include grain drying and handling, lighting, refrigeration, heating and cooling upgrades, and motor replacements.

To be eligible, at least 50 percent of a farm's gross income must come from agricultural operations, and small businesses must be in an area with a population under 50,000.

For more information about MU Extension energy audits, contact your local University of Missouri Extension office. To learn more about REAP, go to <http://1.usa.gov/1FDL11W>.

Source: *Kent Shannon , Natural Resource Engineering Specialist*