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Drought Pasture Management and Alternative Forage Options

Drought conditions were pronounced during the forage growing season of 2018 in much of Missouri, which reduced the growth of cool-season grasses and legumes. Few counties in the area had extreme to exceptional (D3-D4) drought and many other counties had severe drought this year. Drought affects forage growth and production in different aspects resulting in pasture degradation. Some of the effects are:

- Reduced aboveground growth
- Reduced root growth
- Plants go into early dormancy
- Reduced growth of underground storage tissues such as rhizomes
- Reduced formation and growth of new buds and tillers
- Less carbohydrates (energy) reserve storage

Cattle producers can adopt some management options for minimizing the adverse effects and maintaining pasture health and productivity during and after a drought season.

Avoid overgrazing: Because of low supply of forage and hay during drought season, there is a high possibility of overgrazing pastures. Overgrazing may weaken the drought-stressed plants by reducing root growth, resulting in shallow root depth and less root biomass. This lengthens the recovery period of forages even after receiving rain. Removing leaves by either grazing or cutting affects the plant's belowground growth. There is a direct relationship between the aboveground plant biomass and belowground plant growth rate. If too many leaves are removed, all the stored energy is used up for producing new leaves and the roots stop growing. In general, "take half and leave half" helps maintain root growth. (Table 1.) If there is sufficient root growth and enough root biomass, the plants will grow faster in the spring because of sufficient energy storage belowground. This is one of the reasons, hayfields are often greener than pastures in a drought year. Therefore, it is recommended not to graze the pasture more than 60 percent of its carrying capacity. Rotational grazing using paddocks is always a better option to increase carrying capacity of land as well as maintaining pasture health. Producers can also fence pastures temporarily to control overgrazing.

Table 1. Relationship between percent leaf removed and percent root growth stopped.

Percent Leaf Removed	Percent Root Growth Stopped
10	0
20	0
30	0
40	0
50	2 to 4
60	50
70	78
80	100
90	100

Maintain stubble height: To restore a healthy forage stand, it is important to avoid grazing or cutting drought stressed forage plants too short. The optimum grazing or cutting height depends on forage species. In general, it is recommended to leave at least four inches stubble for grazing most of the cool-season perennial grasses and legumes and six inches minimum for warm season grasses. For more information on grazing and cutting height of forages, see *A guide to the common forages and weeds of pastures* published by University of Missouri Extension.

Test soil and apply fertilizers: Soil testing drought stressed pastures and hay fields provides information on nutrient status and other soil properties. Soil test reports also recommend the amount of nutrient/fertilizer required to apply to the pastures or hay fields. Applying

nitrogen fertilizer based on soil test report or 40-50 pounds N per acre helps to recover the drought stressed grasses faster and store more root carbohydrate (energy) reserves. If the soil is low in phosphorous and potassium, it is important to fertilize with these nutrients to ensure the drought stressed grasses survive through the winter. Applying sufficient amounts of phosphorus also helps to lower the risk of grass tetany by increasing magnesium uptake in the spring.

Alternative forage options

With the reduction in grass growth this year, producers may be looking for some alternative feeds.

Stockpiling tall fescue: It is one of the cheapest and easiest options for fall and winter grazing, if fescue stands are strong. Although it is getting too late for this year, keep this option in mind for future years. If plants are still alive and there is more than 75% fescue left, apply 40-50 pounds N per acre in late August to early September and close gates. Allow grass to grow until November. Then, begin cattle grazing. If using urea with a nitrogen stabilizer (e.g. Agrotain), a rain within 14 days helps to incorporate it and minimize volatilization. Ammonium nitrate and ammonium sulfate are less prone to volatilization loss compared to urea. Strip grazing or rotational grazing, using paddocks, is a better option to increase carrying capacity of land. Reports show rotational grazing would nearly double the utilization of forages. An early ice storm or foot traffic on these fields could deteriorate grass prematurely.

Utilizing drought stressed corn and soybean: Some producers may have harvested drought stressed corn by making silage in the summer. Typically, nitrate concentration of drought stressed corn drops 40-50% during the ensiling process, if the silage ferments well. Cattle can be grazed on corn and soybean stubble in the fall. Ammoniating corn and sorghum stover can also be other options for feeding cattle during fall. It is strongly recommended to test nitrate concentration levels before utilizing drought stressed feeds.

Planting cool-season annual forages: Pastures with poor stands of fescue or with no fall growth potential may be planted with winter annuals if there is good soil moisture to establish them. Planting winter annuals into a strong fescue stand is counter-productive and may not be cost-effective. There are some winter annual small grains, such as cereal rye, triticale, winter wheat, winter barley, which are well adapted and suited to graze in Missouri. Winter annuals may be planted in the row crop fields after harvesting corn and soybean as cover crops. These crops offer double benefits, cover the land and provide forage for cattle during fall, winter and spring months.

Planting oats in late winter to early spring is another option for supplementing forage to cattle during spring months. It is good for making hay and silage. Forage quality is good if harvested from booting to early heading stage for hay and from milking to dough stage for silage.

Source: *Dhruba Dhakal, agronomy specialist*

Emerald Ash Borer Now Confirmed in 53 Missouri Counties

The Missouri Department of Conservation (MDC), in conjunction with the Missouri and U.S. departments of agriculture, have confirmed the presence of Emerald Ash Borer (EAB) in 11 new counties across Missouri. New detections have been confirmed in Adair (in the city of Kirksville), Callaway, Cape Girardeau, Cole, Greene, Jefferson, Lewis, Lincoln, Pike, Polk, and Warren counties. Since EAB was first detected in Missouri, the exotic, tree-killing pest has spread to a total of 53 Missouri counties and the City of St. Louis. Emerald Ash Borer was first identified in southeast Michigan in 2002. It most likely traveled in ash wood used for stabilizing cargo in ships or for packing consumer products. EAB was first discovered in Missouri near Lake Wappapello in the U.S. Army Corps of Engineers' Greenville Recreation Area in Wayne County in July of 2008.

Emerald ash borer (*Agilus planipennis*) is an exotic, wood-boring, metallic green, bullet-shaped beetle about 1/2 inch long and 1/8 inch wide. The body is narrow and elongated. The head is flat with black eyes. EAB larvae are white and flat, have distinctive bell shaped segments and can grow up to 1 1/4 inches long. This insect is invasive and infests and kills native North American ash trees, both in forests and landscape plantings. Just like Dutch elm disease that killed native American elm trees, EAB is capable of eliminating all ash trees from forests and cities. The adult beetle does very little damage. In its larval stage, however, EAB bores into the vascular layer of ash trees, creating distinct S-shaped galleries that slowly cut off the trees' flow of water and nutrients and eventually cause the trees to die. Unfortunately, EAB kills more than 99 percent of the ash trees within 3-4 years of infestation. This makes it one of the most serious environmental threats now facing North American forests.

It is expected EAB will diminish ash trees in Missouri's forests to a very low level. Although ash trees account for just three percent of Missouri's native forest, the fast-growing shade tree is popular for landscaping. On average, about 14 percent of trees lining streets in urban settings are ash. In some neighborhoods and parks, the figure reaches as high as 30 or 40 percent. Once EAB has infested an area, standing dead trees will be a serious threat to public safety and the cost of removing dead trees will be very high for both homeowners and communities. All ash species found naturally in Missouri, green, white, pumpkin and blue ash, as well as horticultural cultivars (e.g. Autumn Purple white ash or Marshall Seedless green ash) have been killed by EAB. EAB can infest trees ranging in size from saplings to fully mature trees. While most native borers kill only severely weakened trees, EAB can also kill healthy trees, making it especially devastating.

MDC Forest Entomologist, Robbie Doerhoff, urges people who own ash trees in areas where EAB has been found to make a plan now to either treat or remove those trees. "If

you have a healthy, high-value ash tree in your yard, it can be treated with insecticides that will protect it from EAB. However, these treatments must be applied every year or two to guarantee protection,” said Doerhoff. “For some ash trees, especially those that have already lost more than 50 percent of their leaves and branches, the best option is removal, followed by replanting with a different species, such as an oak native to Missouri.” Several insecticide treatment options are available, including some do-it-yourself methods. However, it is important to note that insecticides available at home improvement stores work best on trees smaller than 20 inches in trunk diameter (measured 4.5 feet from the ground). Trees larger than 20 inches in trunk diameter require insecticides available only to licensed applicators in order to provide adequate protection from EAB. “If you decide to treat your ash tree, make sure you use a pesticide labeled to kill EAB and that you apply it at the right time of year,” said Doerhoff. “Chemical treatments are most effective in early spring when a tree’s vascular system is better able to take up the insecticide. In late summer, and especially during drought conditions like we’re currently experiencing across most of Missouri, treatments may not work properly.”

Dying ash trees are not always an indication of EAB. Ash trees are affected by several diseases and insects. Ash trees throughout the state may exhibit dying branches and/or decline and some may show signs of heavy woodpecker damage. This may or may not be due to EAB. Signs to look for are 1/8 inch diameter D-shaped holes in the bark where the beetles have exited and short (3-5 inches) vertical splits in the bark that reveal S-shaped “trails” (tunnels) under the bark. If EAB is discovered in trees, please call the Missouri Department of Conservation toll-free at 1-866-716-9974. Stop the spread of EAB by not spreading the pests. Burn firewood at the location it was harvested. Avoid planting ash trees. Instead, choose other large shade trees for landscaping. Stay vigilant and be on the lookout for potential EAB infestations.

For more information see www.eab.missouri.edu

Source: <http://extension.missouri.edu/treepests/emeraldashborer.aspx> and the Missouri Department of Conservation press release from August 17, 2018.

Source: *Jennifer Schutter, horticulture specialist*

Energy Assistance Program for Producers and Small Businesses

The USDA Rural Development administers an energy assistance program to help producers and business owners install or upgrade equipment and processes. The program is called Rural Energy for America Program (REAP). The REAP program was most recently authorized through the 2014 Farm Bill. This program provides guaranteed loan financing and grant funding to agriculture producers and rural small businesses to purchase or install renewable energy systems or make energy efficiency improvements.

This program helps increase American energy independence by increasing the private sector supply of renewable energy and decreasing the demand for energy through energy efficiency improvements. Over time, these investments can help lower energy costs for small businesses and agricultural producers.

To be eligible for this program, agricultural producers must have at least 50% of gross income from agricultural operations and small businesses must be in rural, eligible areas (primarily in communities of 50,000 people or less). Participants must also have no outstanding delinquent federal taxes, debt, judgment or debarment.

Grant and loan funds may be used for renewable energy systems, such as:

- Biomass (biodiesel and ethanol, anaerobic digesters, and solid fuels)
- Geothermal for electric generation or direct use
- Hydropower below 30 megawatts
- Hydrogen
- Small and large wind generation
- Small and large solar generation

Funds may also be used for the purchase, installation and construction of energy efficiency improvements, such as:

- High efficiency heating, ventilation and air conditioning systems (HVAC)
- Insulation
- Lighting
- Cooling or refrigeration units
- Doors and windows

Electric, solar or gravity pumps for sprinkler pivots
Switching from a diesel to electric irrigation motor
Replacement of energy-inefficient equipment, such as grain drying equipment

Available funds are implemented as loan guarantees on loans up to 75% of total eligible project costs, grants for up to 25% of total eligible project costs, and combined grant and loan guarantee funding up to 75% of total eligible project costs. Specific terms for the loans and grants are \$5,000 minimum loan amount and up to \$25 million maximum. Rates and terms are negotiated with the lender and subject to USDA approval. There is a maximum term of 30 years for real estate, a maximum term of 15 years for machinery and equipment, a maximum term of 7 years for capital loans, and a maximum term of 30 years for combined real estate and equipment loans.

Renewable Energy System Grant terms: \$2,500 minimum and \$500,000 maximum.

Energy Efficiency Grants: \$1,500 minimum and \$250,000 maximum.

There are some additional requirements for the REAP. Applicants must provide at least 75% of the project cost if applying for a grant only. Applicants must provide at least 25% of the project cost if applying for a loan, or a loan and grant combination. Projects greater than \$200,000 require a

technical report. Energy efficiency projects require an energy audit or assessment.

To complete an application for this program, you must be pre-registered with the System for Award Management (SAM) and have a Data Universal Number System (DUNS) number. Neither of these applications cost money, but they can take time so be sure to get this taken care of early in the process. If the applicant is already registered with these systems, one would not need to register again.

Even though applications are accepted year-round, there are different deadlines for specific sources of funds under the overall program.

Application deadlines are as follows:

- Grants of \$20,000 or less and loan/grant of \$20,000 or less combo is October 31, 2018 or April 1, 2019.
- Unrestricted grants and loan/unrestricted grant combo is April 1, 2019.
- Energy audit and renewable energy development assistance grants are January 31, 2019.

- Guaranteed loan applications are taken on a continuous basis.

For specific questions, contact Matt Moore, Business Program Director for USDA Rural Development at (573) 876-9321. Visit the website for eligible locations and to download application forms at <https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency/mo>

Source: *Darla Campbell, ag business specialist*

October is:

National Apple Month
National Pizza Month
National Popcorn Month
National Pork Month

Oct 12th – National Farmer's Day

A day recognize all American farmers. Thank you for your hard work to continue raising the highest quality and safest food in the world!

Improving Missouri Farm Labor Management Workshops

Does your farm or agribusiness have or want to add employees? If so, this may be an opportunity for you. Labor has a major influence on the productivity, costs and risk of your agricultural business enterprise. This one-day workshop was developed by University of Missouri Extension to help you to improve your labor management, your finances and protect your business.

What You Will Learn:

- How to Be a Good Supervisor
- Onboarding, Training & Mentoring Employees
- Recruiting the Employee You Want
- Being Competitive in Compensation
- Proper Hiring Practices
- Improving your Time Management
- How to Retain Good Employees
- Termination – Letting Someone Go
- Record Keeping Requirements
- How to Manage Human and Legal Risks
- Knowing Your Labor Workforce
- Manage Payroll, Withholdings and Deposits



Workshop Details:

Four workshops will be held throughout Missouri. Each Thursday's event registration will open at 8:30 a.m. with the program beginning at 9 a.m. The day will conclude at 4 p.m. Lunch is provided and the cost for attending the program is \$20/person.

November 15 – Kirksville

Missouri Dept. of Conservation Regional Office
3500 S Baltimore St, Kirksville, MO 63501
Local Extension Contact: Darla Campbell

November 29 – Marshall

Martin Community Center
1985 S Odell Ave, Marshall, MO 65340
Local Extension Contact: Katie Neuner

December 6 – Springfield

Oasis Hotel and Convention Center
2546 N Glenstone Ave, Springfield, MO 65803
Local Extension Contact: Wesley Tucker

December 13 – Sikeston

City of Miner Convention Center
2610 E Malone Ave, Sikeston, MO 63801
Local Extension Contact: David Reinbott

Registration:

Contact Darla Campbell at 660-457-3469 or email her at campbelld@missouri.edu.



United States Department of Agriculture
National Institute of Food and Agriculture

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