33rd Annual

February 28, 2017

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Welcome to the 33rd Annual Southwest Missouri Spring Forage Conference!

Thank you for attending the Spring Forage Conference, offering a tradition of providing informative forage production recommendations for the past 33 years. We have a great day scheduled. The planning committee has worked tirelessly over the past twelve months to bring together some of the best minds in forage production to help you take the next step toward meeting your forage goals. We are striving to bring professionals together to convey the latest research and developments or simply expand on time-proven principles. This year will be no exception.

We are delighted this year to have Allen Williams as our keynote speaker. Allen is a founding partner of Grass Fed Beef, LLC, Grass Fed Insights, LLC and a partner in Joyce Farms, Inc. Based in Starkville, Mississippi, Allen has consulted with more than 4,300 farmers and ranchers in the U.S., Canada, Mexico and South America. He is well known nationally and internationally for his talent and skills in understanding the relationship of the soil and the animal products that we eat and improved grazing management techniques. In addition to the keynote address, we are also giving Allen more time during the breakout session following the luncheon.

Carefully planned breakout sessions are designed to give a deeper exposure of ideas for the participants. With four sessions offered for each time-slot, you are sure to find a variety of presentations to choose from throughout the day. This is a day that is packed with presenters who have experience, talent and are eager to share their innovative knowledge to improve the efficiency of your forage production.

Our room of vendors and exhibiters is another highlight of the conference each year. I appreciate their support of this conference to make this a premier experience for all. Take some time to visit the many booths that we have. I guarantee that you will make some invaluable contacts today and will reacquaint yourself with other producers whom you have gotten to know over the years.

You will notice today that all of the committee members are wearing identical tan shirts. If you have questions about the sessions or need more information, it will be their pleasure to assist you. Committee members represent the USDA Natural Resources Conservation Service, Soil and Water Conservation Districts of southwest Missouri, University of Missouri Extension, USDA Farm Service Agency, Missouri State University Darr College of Agriculture, and the Missouri Department of Conservation. The strong partnership that we share makes this conference possible. Another strength is the cooperative relationship with the Missouri Forage and Grassland Council / Grazing Land Conservation Initiative.

Let me commend you for joining this community of livestock producers who will for sure leave today with new information to take back to their own operations. As always, we welcome your ideas and comments on ways to improve on the conference for 2018, so be sure to fill out the questionnaire provided during the last session. On behalf of the planning committee, I wish you an informative day and thank you for your attendance.

Sincerely,

Tim Schnakenberg

2017 Southwest Missouri Spring Forage Conference Committee Chairman

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33rd ANNUAL SW MISSOURI SPRING FORAGE CONFERENCE
Tuesday, February 28, 2017

AGENDA & ROOM ASSIGNMENTS

8:00-8:45 am REGISTRATION & VISIT TRADE SHOW -- CONVENTION CENTER/NEBRASKA ROOM

SESSION A (8:45 AM - 9:30 AM)	ROOM	SPEAKER
(A1) Advanced Grazing 201: Building the Optimum Forage System and Mix **REPEATED AT 2:45 PM**	COLORADO	Dr. John Jennings, University of Arkansas Extension Forage Specialist, Little Rock, Arkansas
(A2) Electric Fencing Tips, 35 years of Stealing Ideas **REPEATED AT 2:45 PM**	ILLINOIS	Mark Green, NRCS Lead Resource Conservationist Springfield, Missouri
(A3) Holistic Grazing Management	OKLAHOMA	Ben Bartlett, Producer, Holistic Management Traunik, Michigan
(A4) Managing Multi-Species Grazing	KANSAS	Greg Brann, NRCS Grazing & Soil Health Specialist Nashville, Tennessee

9:30-10:15 am – BREAK & VISIT TRADE SHOW -- CONVENTION CENTER/NEBRASKA ROOM

SESSION B (10:15 AM - 11:00 AM)	ROOM	SPEAKER
(B1) Changing Plant Community by Changing Management	COLORADO	Mark Brownlee, Producer Lowry City, Missouri
(B2) Weed Management Considerations for Pastures in Missouri	ILLINOIS	Zach Trower, MU Graduate Research Assistant, Weed Sciences Columbia, Missouri
(B3) Research Update: Novel Endophyte Tall Fescue **REPEATED AT 2:45 PM**	OKLAHOMA	Dr. Craig Roberts, MU Extension State Forage Specialist Columbia, Missouri
(B4) Calculating Cost of Production **REPEATED AT 2:45 PM**	KANSAS	Wesley Tucker, MU Extension Ag Business Specialist Bolivar, Missouri

11:00-11:30 am – BREAK & VISIT TRADE SHOW -- CONVENTION CENTER/NEBRASKA ROOM

11:30 AM - LUNCHEON AND KEYNOTE ADDRESS -- CONVENTION CENTER

Welcome -- Dr. Rob Kallenbach, Assistant Dean of Agriculture and Natural Resources Extension, University of Missouri, Columbia, MO

The Facts of Adaptive Grazing and Relationship to Soil Health

Dr. Allen Williams

Chief Ranching Officer, Joyce Farms, Starkville, Mississippi

1:15 - 1:45 pm -- BREAK & VISIT TRADE SHOW -- CONVENTION CENTER/NEBRASKA ROOM

SESSION C (1:45 PM - 2:30 PM)	ROOM	SPEAKER
(C1) The Future of Grassfed: Laying Out the Promise and Challenges	COLORADO	Dr. Allen Williams, Chief Ranching Officer Joyce Farms, Starkville, Mississippi
(C2) Livestock Watering Systems	ILLINOIS	Jamie Kurtz, NRCS Resource Conservationist West Plains, Missouri
(C3) Nitrogen Sources for Pasture	OKLAHOMA	Peter Scharf, MU Extension State Fertility Specialist Columbia, Missouri
(C4) Round Bale Silage Compared to Dry Hay Harvest	KANSAS	Gene Kinslow, Livestock Producer, Windmill Cattle Co Fordland, Missouri Jason Wacha, Forage Producer, Wacha Farms LLC Ozark, Missouri

2:30 - 2:45 pm – BREAK

SESSION D (2:45 PM - 3:30 PM)	ROOM	SPEAKER
(D1) Advanced Grazing 201: Building the Optimum Forage System and Mix	COLORADO	Dr. John Jennings, University of Arkansas Extension Forage Specialist, Little Rock, Arkansas
(D2) Electric Fencing Tips, 35 years of Stealing Ideas	ILLINOIS	Mark Green, NRCS Lead Resource Conservationist Springfield, Missouri
(D3) Research Update: Novel Endophyte Tall Fescue	OKLAHOMA	Dr. Craig Roberts, MU Extension State Forage Specialist Columbia, Missouri
(D4) Calculating Cost of Production	KANSAS	Wesley Tucker, MU Extension Ag Business Specialist Bolivar, Missouri

3:30 pm ADJOURN

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MFGC/GLCI is the voice of Missouri's Forage Industry
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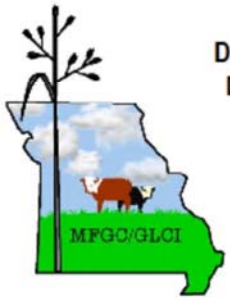

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The Southwest Missouri Spring Forage Conference Planning Committee would like to thank all sponsors, vendors, partners, and attendees for their help in making this conference a successful experience.

We welcome your suggestions and feedback.

Please come back next year!

The Southwest Missouri Spring Forage Conference is brought to you by the planning committee representing these agencies and universities:

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USDA Natural Resources Conservation Service

DR. ROB KALLENBACH—MASTER OF CEREMONIES

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Robert Kallenbach has an extension/research appointment in forages.

His program emphasizes forage-livestock systems with an emphasis on winter feeding. Specific projects include optimizing the use of stockpiled tall fescue, understanding residual feed intake in beef cattle, and performance of stocker cattle in season-long systems.

As assistant dean, Kallenbach is responsible for the day-to-day leadership including development, implementation, coordination and evaluation of the campus and statewide agriculture and natural resources extension programs for Missouri.

Kallenbach also serves as the director of the Commercial Ag Program.

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DR. ALLEN WILLIAMS—KEYNOTE SPEAKER

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Allen Williams is a 6th generation family farmer and founding partner of Grass Fed Beef, LLC, Grass Fed Insights, LLC, Standard Soil, and a partner in Joyce Farms, Inc.

He has consulted with more than 4300 farmers and ranchers in the U.S., Canada, Mexico, and South America on operations ranging from a few acres to over 1 million acres. Allen pioneered many of the early adaptive grazing and grass fed protocols and forage finishing techniques and has spent the last 15 years refining those. He is a "recovering academic", having served 15 years on the faculty at Louisiana Tech University and Mississippi State University. He holds a B.S. and M.S. in Animal Science from Clemson University and a Ph.D. in Genetics & Reproductive Physiology from LSU. He has authored more than 400 scientific and popular press articles, and is an invited speaker at regional, national, and international conferences and symposia. Major areas of research and business focus include soil health, adaptive forage & grazing management, integration of cover crops and grazing, high attribute pasture-based meat production, and alternative marketing systems.

Allen and his colleagues specialize in whole farm & ranch planning based on the concept of regenerative agriculture. Their approach creates significant "value add" and prepares the landowner for multiple enterprise/revenue stream opportunities that stack enterprises and acres. This approach allows for enhanced profitability and/or investment value.

He is featured in the Carbon Nation films, "Soil Carbon Cowboys" (http://vimeo.com/80518559) and "Soil Carbon Curious" (https://vimeo.com/130721684) and has a recently released book co-authored with Teddy Gentry, "Before You Have A Cow". Allen is a regular contributor to "GRAZE" and has written articles for the "Organic Broadcaster", "Stockman GrassFarmer", and many other publications. He currently serves on the Board of Directors of the Grass Fed Exchange and the Mississippi Sustainable Agriculture Network, Core Team Member of the Pasture Project at the Winrock Foundation, and Co-Investigator for Team SoilCarbon. He also serves as an officer in the Starkville Civitan Club and is active in his local church.

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DR. ALLEN WILLIAMS

The Future of Grassfed:
Laying Out the Promise and Challenges

The U.S. grassfed market has grown significantly over the past 15 years. According to data compiled by the Wallace Center of the Winrock Foundation, retail sales of domestically produced grassfed beef were less than $5 million in 1998, with only about 100 beef producers actively involved in grassfed beef production. By 2012, domestic retail sales of grassfed beef had topped $400 million, with more than $1.5 billion in combined domestic and imported product sales.

That amounts to exponential growth for grassfed beef by any measure. Certainly grassfed production and marketing have come a long way in the U.S. over the past decade or so, with continued growth projected.

Consumer awareness of, and consumer demand for, grassfed have grown steadily since 2003. In the past 10 years, grassfed beef demand has grown at an annual rate of 25-30 percent. Recent consumer research indicates that this pace will not slow significantly anytime in the near future.

The annual Mintel Red Meat Report provides valuable insight into consumer purchase habits. The 2012 Mintel report showed that 43 percent of all consumers surveyed had purchased “Grass Fed” or “Locally Raised” beef within the past year. When asked to rate the terms Grass Fed, Environmental Impact, Hormone/antibiotic free, and Taste on a scale of 1 to 10, with 10 being the most important, consumers rated Grass Fed at 7.2, Environmental Impact 7.5, Hormone/antibiotic free 7.9, and Taste at 8.7.

Grassfed beef production typically encompasses favorable environmental impact and is generally hormone and antibiotic free. However, there can be wide variations in the taste of grassfed beef. Since taste was the most highly rated of the four attributes, it is important that grassfed producers pay particular attention to factors that can create off-flavors.

A recent study conducted by Wellspring Management determined that grassfed beef demand in several major U.S. markets ranged from 3.0 percent to slightly more than 6.0 percent of the total beef markets in these metropolitan areas. The same study revealed that the top 15 grassfed branded beef programs in the U.S. were harvesting almost 1,700 head of grass-finished cattle weekly and more than 87,000 annually. Some of these branded programs have experienced growth rates of more than 50 percent over the past two years. These programs are marketing grassfed beef to more than 5,000 retail locations, including stores such as Super Target, Kroger, Hy-Vee and Costco.

This rapid growth in grassfed beef demand in the U.S. has not gone unnoticed by other major branded beef programs, packers and investors. There are a number of major branded beef programs that are actively sourcing and marketing grassfed, and many more that are examining how to do so.

DR. ALLEN WILLIAMS continued...

They include long-established branded beef programs such as Meyer Natural, Maverick Ranch, Nolan Ryan and Country Natural. Cargill, one of the "Big Four" packers in the U.S., recently announced they will begin marketing an Australian-produced grassfed beef in the U.S in partnership with Teys Australia, a 67-year old beef processor. For years the two companies have partnered in marketing grassfed in Asia, and soon they will begin doing so in the U.S.

Big challenges, too

But the rapid growth does not mean there are no problems in the grassfed beef sector. As a matter of fact, the more rapidly you grow, the more problems you introduce and encounter. Even though we have come a long way over the past 10 years, we still need to deal with some significant challenges and problems.

Yet the challenges and problems provide opportunity to strengthen the grassfed sector and build market share. Over the next several months I will discuss these challenges and opportunities, and present possible solutions based on many years of trial and error.

Many of the challenges are not unique to the grassfed sector of the beef industry. These include ongoing drought in many areas of the U.S., unstable weather patterns throughout the country and globally, ever-rising input costs, record-high live cattle prices, record-high retail beef prices, an ever-diminishing national beef cow herd, more grassland being converted to corn and soybean production, high land prices and decreasing consumer demand for beef, resulting in market share being lost to other proteins.

At the 2013 Grass Fed Exchange Conference in Bismarck, North Dakota, Bill Helming, former NCBA Chief Economist and Founder of CattleFax, presented data showing the national cow herd inventory declined 36 percent over the past 39 years, from 45.7 million head in 1975 to 29.3 million in 2013. After peaking at 84.4 lbs. per person in 1970, per-capita beef consumption fell to just 56.6 lbs. in 2012 — a 33 percent decline. With retail commodity prices for USDA Choice now at a record-high $5.39/lb., beef market share in the U.S. will continue to shrink in the near future as consumers choose cheaper protein sources.

Of increasing interest and importance is the fact that ground beef's share of the total beef market continues to grow. In 2012, more than 56 percent of all beef consumed in the U.S. was in the form of ground beef. This will certainly affect the future direction of the beef industry.

Grassfed's special challenges

There are also challenges that are either unique to, or have a greater effect upon, the grassfed sector in particular. These range from farm and ranch production issues to processing, further processing, cost control, dealing with USDA rules and regulations, cold storage, distribution and marketing.

On the production side of things, we still have significant issues with proper animal genetics, forage and grazing management, optimum and cost-effective forage finishing, economies of scale and 365-day forage finishing.

DR. ALLEN WILLIAMS continued...

With genetics, just like with mathematical equations, bad data (genetics) in equals bad data (genetics) out. The old saying that you can't make a silk purse out of a sow's ear is very true in this case. While it is true we can take lower-quality stocker calves and "add value" to them, we cannot take bad genetics and expect to have an animal that will finish well on grass and produce a high-quality carcass that results in a favorable eating experience.

Genetics only part of it

On the other hand, we can have the best grass-based genetics available and still produce a poor end-product due to the manager's inability to properly finish them on forage. Many producers who have done a great job of grazing cow/calf pairs and even stocker calves have failed miserably when they tried to actually finish cattle on grass. Cost of production and economies of scale are vitally important to the overall profitability of a grass-finishing operation. As producers, we must determine how to effectively control costs so that we can determine adequate margin.

In addition, with the popularity of grassfed beef, retailers and restaurants are demanding fresh (not frozen) beef 365 days a year. This requires a year-round strategy that allows cattle to achieve a high degree of finish from forages. Other important challenges include providing a consistent, uniform end product throughout the year, and ensuring that product is free of "off" flavors.

Processing, further processing, cold storage and distribution are all critical factors in delivering a quality product at an effective price range. We must be able to identify, locate and secure cost-effective processing and further processing. That processing must meet cutting, packaging, portion control and shelf life specifications that will satisfy retail, restaurant and institutional food service customers, as well as direct market customers.

In most cases the processor will need to be USDA-inspected. Crucial items such as USDA retail label approval, adequate and affordable cold storage and effective packaging must be addressed, including boxed beef transport needs. Once product is processed and packaged, we must be able to get it to our customer cheaply and efficiently. This is where distribution comes in. We must identify and partner with distributors who effectively market and deliver our products.

Finally, sales and marketing are probably the most important aspects of what we do. We can get everything right in the genetics, management, finishing, processing and distribution, and still fail miserably simply because we failed to do a good job of marketing our product. How we price the product, how we package, how we promote, product claims, marketing materials (brochures, pamphlets, web sites, posters, etc.) determine how effective we will be in securing adequate market share and achieving a reasonable return on investment.

Starting the journey

Over the next several months, I will attempt to address each of these challenges on an individual basis. We will journey through the worlds of production, processing, and marketing to discover potential solutions to the real problems we face.

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He received an Associate in Arts degree from Crowder Junior College, BS degree from Southwest Missouri State University, MS degree from the University of Arkansas, and PhD from the University of Missouri.

His forage extension program emphasizes grazing management, soil fertility, establishing legumes, the 4H Grassland Evaluation Contest, and the Arkansas 300 Days Grazing program.

Building The Optimum Forage System And Mix

The title of this paper "Building the optimum forage system and mix" implies that such a system or mix has been established and standardized. Unfortunately that is not the case. Forage systems that evolve in certain geographic regions are usually the result of the ability of the base forage to withstand the extremes of climate and management. In south Missouri and north Arkansas, that base forage is endophyte-infected Ky-31 fescue. That forage fits the extremes, but is not the optimum for animal performance. It has been argued that the toxic Ky-31 fescue you have is better than the non-toxic novel-endophyte fescue you don't have. I recently toured farms in New Zealand where that same debate was occurring over endophyte-infected perennial ryegrass. Some farmers liked the toxic version because they had fields persisting since WWII while others grew novel-endophyte ryegrass due to its greater benefits to animal performance despite its perceived lower persistence. So the optimum forage system or mix is like choosing the best brand of pickup or breed of cattle. Lots of them work well, but choosing one depends on how the options and costs fit personal preferences. Perhaps this presentation will offer some key points to consider when making those choices.

DR. JOHN JENNINGS continued...

Planning the forage system

A good pasture program includes plans to ensure adequate forage quantity and quality to match the animal requirements during each season. Pasture management involves more than just grazing grass so good cattle farmers must also be good grass farmers. Optimum pasture growth seldom occurs naturally over an entire growing season so advance planning and management are required. A good pasture manager must always plan at least one season ahead to increase the chances of producing adequate forage for his herd. That planning involves not only what forages can be available, but what are the animal requirements projected to be each season? The climate and forage species options in SW Missouri are adequate to make long grazing seasons possible. By combining different forage species and pasture management practices, grazing seasons can extend to nearly year-round. A reasonable forage management goal for a cow/calf operation is to plan for a 300-day grazing season and to feed hay for 65 days or less.

Different livestock operations require different seasonal pasture strategies for optimum animal production. Spring-calving herds have different seasonal forage requirements than fall-calving herds. Stocker calf operations have different forage needs than cow/calf operations. The peak seasonal requirement for forage quality and quantity for a cow/calf operation occurs between calving and rebreeding. For spring-calving herds, calving in February/March, the best quality pasture should be available March through July. For fall-calving herds, calving in September/October, the best quality pasture should be available October through February. Dry, nonlactating cows have lower nutrient requirements after the calf is weaned and can maintain good body condition on lower quality forage. Delaying spring calving into April and May also delays the breeding season deeper into hot summer weather. Research has shown increased impact of fescue-related heat stress on fertility and breeding success for bulls and cows. In stocker calf operations, about 200 to 300 pounds of weight can be added to weaned calves before they are ready for the feedlot. Several forage systems work well in stocker or backgrounding programs, but high forage quality is required at all times to support good calf weight gains. Weight gains will be low for calves grazing low quality pastures without supplementation. Some producers prefer to utilize existing low or moderate quality pasture and provide supplemental feed and others prefer to manage for very high quality forages with less feed supplementation. Cost of feed supplements or establishing high quality pastures must be considered for profitability of stocker operations.

For sustained forage production over the growing season, a basic forage system should include a cool-season forage species and a warm-season forage species. A very simplistic example using two forage species to fill a grazing season would be fescue for spring, bermudagrass for summer, fescue and stockpiled bermudagrass for fall, and stockpiled fescue for winter. Adding additional forages improves the reliability and nutritive quality of the grazing system.

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DR. JOHN JENNINGS continued...

How much cool-season vs. warm-season forages is needed? In north Arkansas, where fescue is dominant, we use a starting point of about 2/3 of pastures as cool-season forage species and 1/3 of pastures as warm-season species. In south Arkansas, where perennial warm-season grasses like bermudagrass is dominant, this proportion may range from 50:50 to 2/3 warm-season forages and 1/3 cool-season forages. Where did this proportion come from? Probably it is loosely based on the growing season. In northern areas, fescue provides active growth for grazing in April, May, June, September, October and November. Bermudagrass provides active growth for grazing in June, July, and August. Of course there is some overlap in May and September. But the cool-season grass covers roughly twice as much of the growing season as the warm-season grass, hence the 2/3 cool-season to 1/3 warm-season rule. However, rules-of-thumb and averages never provide an exact fit so the default answer is "it depends". For example, if 2/3 of pastures consist of Ky-31 fescue then the animals are exposed to fescue toxicity at least 2/3 of the grazing season – maybe more if fescue hay is fed in winter. Based on research, the impact of fescue toxicity is amplified by warm weather. So it could be argued systems including a high percentage Ky-31 fescue should have more warm-season forage pasture acreage to provide relief from fescue-related heat stress than systems with lower percentage of Ky-31.

Some operators use higher management on certain forages so a producer that just established an excellent stand of bermudagrass may fertilize for higher production than was ever done for fescue so a lower amount of bermudagrass acres may replace the production formerly harvested from many more acres of fescue. So management matters when determining what the optimum mix should be on a particular farm.

Fescue has proven to be the most resilient forage for south Missouri and north Arkansas, but it is definitely not the best forage for top animal performance. It is expensive to replace, but can also be costly to keep. It will continue to be part of most forage programs. Research-based strategies will be discussed that may help mitigate its negative effects while considering the optimum forage system.

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MARK GREEN

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Mark Green, Lead Resource Conservationist, USDA Natural Resources Conservation Service (NRCS), Springfield, MO. Mark was born in Scottsbluff, Nebraska, and was raised on a ranch in the mountains southwest of Denver, CO. He received his Bachelor of Science Degree in Agronomy from Southwest Missouri State University in 1983.

Mark has worked for the SCS/NRCS since 1981. During that time, Mark has worked as a Soil Conservationist, Area Resource Conservationist, District Conservationist and Lead Resource Conservationist for SCS/NRCS. For the past 20 years, Mark has conducted electric fence field days and workshops for producers in Missouri, Kansas and Oklahoma.

He has primarily worked in southwest Missouri during his career with SCS/NRCS. Prior to working for NRCS Mark worked for Haubien Farms at Lockwood, Missouri. Other jobs prior to college included Beechwood Ranch, Joplin, MO; Corder Ranch, Avilla, MO and Limon, CO; Deer Creek Valley Ranch and Hidden Valley Ranch, Pine, CO. Mark grew up in a ranching family in Colorado. Currently Mark serves as an instructor and regional coordinator for SW Missouri Regional Management-Intensive Grazing Schools.

Mark is a member of American Forage and Grassland Council and is a Board Member for Missouri Forage and Grassland Council. He also is a committee member for the Missouri High School Grassland Evaluation Contests in which he selects contest sites for the National Mid-America Contest and the local district contest. Mark has worked with grazing management in SW Missouri for the past 35 years. Most importantly, he has been married to Jill for 38 years and has three grown children and six grandkids!

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MARK GREEN

Electric Fencing Tips – 30 Years of Stealing Ideas

I have had the opportunity to work with producers in southwest Missouri for the last 35 years on grazing management and electric fencing. During that time I have "borrowed" many ideas, tips and how-to's from all around. A few years ago, I decided to put this list together for a reference for folks who are interested. This by no means has all the answers and some may not agree with some of my comments. These are just some things I've learned that work or some things to avoid. This is an ongoing project that I will add things to as they come up. I hope they can help you in some areas.

Wire:

Minimum 12½ gauge, smooth wire, Type III galvanizing

Recommend 170,000-180,000 psi breaking strength.

Avoid 200,000-210,000 psi wire. It is way too stiff to work with.

ALWAYS, put the wire roll on a SPINNING JENNY before cutting the bands on a new roll.

Find both ends of the wire roll before cutting the bands.

Bend a curl on INSIDE end to be able to always identify that end in the future. The roll will not unroll from the inside out, so you don't want to accidentally grab that end in the future.

Find OUTSIDE end and secure it before cutting bands so it's not lost in the roll once you cut the bands.

Wire does NOT need to be tight.

If wire droops a little between posts, it will help when deer hit the wire, if a limb falls on the fence, expansion/contraction from summer to winter.

DO NOT ELECTRIFY BARBED WIRE

Safety – person can get hooked in the barbs and not be able to get away from 8,000 to 10,000 volts

Reliable -- Every barb throws off electricity, curl in barbed wire throws off electricity

Galvanized is usually not Type III, therefore shorter lifespan

Cost - 12 ½ gauge smooth wire averages $0.024 per foot

High quality barbed wire averages $0.049 per foot

Wire Tying, Crimping, Splicing:

Loose connected wires will reduce voltage because of increased resistance.

All splices, ties, crimps must be tight.

Twist tying reduces the strength of the wire considerably.

Best electric connections are crimped, a loose tie can create arcing and a hard, round wire wrapped around its self has very little surface area contact.

Make sure crimping sleeves are also class III galvanized.

A few poor or inadequate electrical connections won't be a problem with the modern charger. Several poor connections will become a problem in a hurry. Quality installation the first time.

Leave 1" – 1 ½" end past the crimp when crimping to curl back just in case the sleeves weren't crimped tight enough and slip.

Maybe have a spray can of zinc paint to recoat sleeves, etc, where the galvanized may have been scuffed in installing.

MARK GREEN continued...

Electric Fencing Tips – 30 Years of Stealing Ideas

Insulated Wire:

Always use Double-insulated 12½ gauge hi-tensile galvanized wire.

Use for: Lead-out wires from charger to fence and to ground rods.
Induction coil (choke) for lightning protection
Crossing under gates
Connections around corner posts.

Any time you bury this line, place it in plastic conduit or pipe for added protection and insulation.

Do not allow water to get into conduit. Freezing and thawing will eventually pull insulation away from the wire, causing a ground out.

Energizers (Chargers):

Installed according to manufacturer's recommendations. High voltage, low impedance.

Short pulse, less than 300 mAmps intensity, finished within 0.0003 of a second and a rate of 35-65 pulses/ minute.

Minimum 5,000 volt peak output, when under a load. Energizer should be rated 8,000 – 10,000 volts.

Minimum of one output joule of energy for each mile of fence. Never go less than 2-5 joule.

Plan for expansion.

Charger Ground:

90 percent of electric fence problems are caused by poor grounding of charger.

Minimum -- three 6' ground rods (minimum ½ inch diameter. 5/8" is better.)

Spacing -- minimum 10' apart

All ground rod clamps and connecting wire shall be left above ground

Do not mix types of metal.

Galvanized rods-galvanized clamps-galvanized wire

Copper rods - copper wire

Energizer terminals need to be stainless steel

When installing ground wire through buildings use double insulated wire.

Minimum 65' Spacing from other grounding systems (power poles, well casing, house ground, etc.)

Do not tie charger into existing grounding systems such as, power poles, breaker boxes or milk barns.

Put in plenty of ground rods. If fence crosses a wet area put a lightning arrestor and ground there.

Lightning Protection:

Lightning arrestors, choke and lightning ground system should be installed. See Manufacturer's Instructions. Lightning arrestor ground rods should be minimum 65' from charger ground system

At least 1 more ground rod than the charger grounding system.

In lightning prone areas, on a multi-wire fence make the top wire a ground.

You can build a homemade lightning arrestor that will last longer than most purchased types.

Keep lightning protection grounding systems as far from barns and lots as possible, you don't want a lightning strike going to ground in the middle of a bunch of cows.

MARK GREEN continued...

Electric Fencing Tips – 30 Years of Stealing Ideas

Surge Protector:
Surge protector should be installed between energizer and 110 power supply.

Shutoff Switches:
Use plenty of shutoff switches, makes trouble shooting and maintenance much easier.

Insulation:
High density porcelain (gray) that withstands 10,000 volts or more
Do NOT use white porcelain insulators. Low density and will crack and cause ground outs.
High-density polyethylene or Polypropylene with ultra-violet stabilizer
Do not use red insulators. For plastic insulators, dark colors, such as black, hold up best to sunlight.
Some problems with insultube holding moisture and wire deteriorating (rusting) has occurred.
There are several grades of insultube, some are very light. Avoid this.
Most good insulators are black but not all black insulators are good. Some high quality white insulators are now on the market.
Polypropylene insulators may become brittle when cold.

Offset Brackets:
Type -- High-tensile spring wire type with a high-density polyethylene pinlock or porcelain insulator
Spacing -- minimum 50' apart (25' recommended)
Height -- 2/3 the height of the animal to be controlled.
Shorter, plastic offset brackets are not adequate. Can bend and cause problems

Gates:
3/32" or 1/8 " galvanized cable. Not electrified when the gate is open.
Underground or overhead transmission lines carry electricity past gate

Corners Post:
Putting a post 6" deeper doubles the strength.
Floating Angle Brace system is 10-15% stronger than the H-Brace System and one less post, one less post hole to dig!

Line Posts:
Many options -- composite, wood, plastic, fiber glass or steel T-posts.
Consider one of the options made from nonconductive material. Avoids ground outs, hold up to deer hitting wire to limbs falling on fence better. Spacing and stays depends upon terrain and number of wires. An average spacing of 50 ft. works well.

Live Trees as Line, Bracing and Corner Posts:
Diameter – diameter breast height minimum 5"
Protection should be used between tree and insulator.

Study fencing catalogs and manuals. New products and ideas are in every one of them.

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BEN BARTLETT DVM

Holistic Grazing Management

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Ben is trained as a HMI Holistic Educator and is a HM practitioner. He has 30+ years as a distinguished Michigan State University livestock extension educator, conducted SARE grant supported grazing and soil health trials and has over 45 years of cattle and sheep grazing experience.

Ben and his wife Denise have a May lambing commercial flock of 400 sheep and summer graze about 175 head of stocker cattle on their farm in the Upper Peninsula of Michigan. The tool of Holistic Management has been a huge factor in the success of their grazing program, the profitability of their livestock operation, and the quality of life that Denise and Ben enjoy.

Holistic Grazing Management

To understand Holistic Planned Grazing, you must first know what Holistic Management is. Holistic Management is an "outcome focused, decision making tool" or in plain English – *something to help you get what you want out of life.* The unique thing about Holistic Management is that it has a triple bottom line – quality of life, profitability, and your legacy. Holistic Management is 6 logical steps: getting the right people involved, identifying what you/they want, understanding the 4 ecosystems, considering all the options, testing for the best and then most importantly, monitor and make changes as needed. It is only a "tool" and like any tool, only works when used and as is often the case, practice improves outcomes. Too often we look for the what's most profitable OR maybe this idealistic "life in the country", etc. But for a balanced life, we need to make decisions that lead us toward a life with the profit levels we need, the kind of life we desire and leave a world behind us we would be proud of. "The world moves into the future as the result of decisions, not as the result of plans" (Boulding) Are your decisions taking you toward the life you want?

BEN BARTLETT continued...

Holistic Grazing Management

Holistic Grazing Management is meeting the needs of the livestock, the plant-soil community and people in a system that is powered by solar energy. There is "not one right way" to graze but different grazing management practices will have different impacts on animal performance, soil heath, and levels of grazing management (work). Your job is to sort out the best way to manage your grazing to achieve your goals. (heard that before?)

What grows grass? Sunshine, water, fertility and diversity.
Sunshine or solar energy is critical because it is the free energy that drives the plant growth, soil life health and the nutrient availability. To capture more sunshine, we need more green growing leaves achieved by more plants, bigger leaves, plants actively growing, and more days of green leaves.

Water. Is your soil catching and holding all the rain that falls? The soil needs to be covered to break up the rain drops and protect the soil. Good soil health will provide aggregates and pores spaces to keep the rain from running off and then you need soil organic matter to "hold" that moisture for future plant use.

Fertility for plant growth does not just come from fertilizer. Dr. Christine Jones says that 85 percent of plant nutrients are "microbially mediated". Eighty percent of added P is tied up and only about 50 percent of nitrogen fertilizer is captured by plants. Up to 40 percent of the sugars produced by photosynthesis is "leaked" via the roots to soil life and those bacteria, fungi, etc. in turn provide nitrogen, phosphorus, etc. to the plants. The actual grazing activity also stimulates a plant response and soil life activity.

Diversity is that element that provides resilience by supporting different kinds of soil life, different kinds of plants, different variety of solar collectors, and a wider variety of plant and animal nutrition.

What management practices are important to optimize grazing? There are 3 critical practices: 1. Put more animals in smaller spaces for less time, 2. Leave more residue, and 3. Provide adequate recovery time periods between grazing. More grazing animal density and less time per paddock will increase harvest efficiency, provide more uniform grazing, allow less re-grazing of re-growth, and more provide more "herd" effect. More residue is critical because grass grows grass and grazing grass grows more grass. In addition, soil cover protects from rain and heat and feeds soil life. Adequate recovery allows re-growth of roots, feeds the life in the soil, allows rebuilding of plant reserves, and allows the plant to be a more balanced source of animal nutrition.

There is no one "right" way to graze. How you manage your grazing needs to be driven by what you want to achieve. Grazing very short in the fall maybe just the right practice if you want to over- seed red clover next spring and harvesting less than 50 percent of the available forage maybe just the right practice if you want to optimize animal gains per head. Mob grazing is a powerful grazing tool to achieve herd effect but it sure can have a negative impact on one's quality of life.

Holistic Planned Grazing is:
1 — Goal driven – balancing people, livestock, and plant-soil needs
2 — Has a long term (3 year +) monitoring system in place
3 — Has a yearly working plan to achieve 1 & 2

Holistic Grazing takes work and practice but can yield significant advantages, give it a try.

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MARK BROWNLEE

Changing Plant Community by Changing Management

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Alan Newport Article Excerpt:
Mark Brownlee says the more he moved into tall grazing, the easier and better life became on his Missouri cow-calf operation.

The term "tall grazing" is used by some people to describe the sward of grass that develops when they use highstock-density grazing with full recovery of plants. The forage becomes tall and dense. An increase in forage species and an improvement in the quality and type of forages present also are normal.

Brownlee says it wasn't until he adopted this type of grazing in 2008 that everything began to change for the better.

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GREG BRANN

Managing Multi-Species Grazing

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B. S. Degree in Plant Science,
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38 years experience with Natural Resources Conservation Service (NRCS)

Certified Crop Advisor through 2013,
National Grazing Conservationist 2014

Publications: Water Points, Fencing for Serious Grazers, Co-author of "Meat Goats: Reproduction, Nutrition and Health" Alabama Cooperative Extension, Annual Management Calendar "Planners" Cattle and Small Ruminants, Soil Health Card, Indicator Plants

Fact Sheets: Targeted grazing, prescribed grazing, cover crops, nutrient management, pest management, various species of cover

Presentations: Numerous presentations on Grazing and Soil Management with emphasis on plant and animal diversity

Farms: 320-acre pasture, beef cows, stockers, goats, hair sheep, and Christmas trees

GREG BRANN continued...

Managing Multi-Species Grazing: Goats, Sheep, Cattle, Guardian Animals, and Other Livestock

Beauty is in the eye of the beholder, so it is important for every producer to know what their vision is. Consider your vision with every decision. Every time you make a purchase or pursue an activity ask is this leading me closer to my vision. I am going to ask a series of questions for you to consider when stocking your land.

Why should you consider adding multi-species of livestock to your operation?
Different species have different preferences for forage, most species are not susceptible to the same internal parasites so they reduce the threat of infection, the University of Idaho did a study and found by adding sheep to a cattle operation you increase meat production by 24 percent but adding cattle to a sheep operation only increased meat production by 9 percent, shorter gestation of small ruminants allows producers to increase herd numbers faster and improve genetics faster.

What is the existing vegetation/forage on your property?
Different species of livestock have different vegetative preferences so it is important to inventory the forage you have before deciding what species of livestock your property is best suited for. Goats are the best browsers, so if you have briars, privet and multiflora rose you predominately need goats. Sheep prefer clover and other herbaceous broadleaf forbs. Cattle prefer grass and clover. Horses prefer grass. In the end they will all eat some of whatever is present but could be happier and perform better on preferred forage. Proportions of livestock will likely need to change overtime. Goats are the most likely species to browse out their preferred vegetation especially where a lax rotation is practiced.

What kind of fence is present/needed?
The type of fence needed is very dependent on the amount of pressure placed on the fence. Small ruminants especially goats require a more substantial fence. If you graze close or push your animals in a tight area a stronger fence is needed. If the existing fence is woven wire you can run most any livestock. Six inch mesh woven wire is also called goat killer wire, the horns go in but don't come out easily, an offset electric wire about 10" above the ground can reduce or eliminate this problem. If it is old woven wire placing an offset electric fence wire or two on it can increase the life of the fence, offset electric will increase the life of any fence. If barbed wire is present you could add more barbed wire and make sure it is real tight. Spacing of the bottom wires is especially important. A spacing of 3" between tight wires with post on 8' or closer spacing can work.

Off set electric wires can be used, likely 3 offset wires will be needed. NRCS doesn't recommend mixing electric fencing with barbed wire because if an animal gets entangled it they can thrash themselves to death. Electric fencing you will need the bottom wire 6 to 8" above the ground and the spacing of other wires is dependent on how many wires you run. If you rotate often and have a good charge on the fence you can use 3 or less strands of wire with a spacing from the ground of 8", 8", and 12". If it is a perimeter fence 5 strands would be preferred with a spacing from the ground of 7", 7", 8", 10", and 10". It's a case of cost now or later. The woven is the most expensive but least maintenance, the high tensile electric is the least expensive yet you need to keep vegetation controlled so the charge is 3,500 volts or more. Fixed knot woven wire is the latest and greatest fence cost is reduced since post can be spaced 25' apart.

GREG BRANN continued...

Managing Multi-Species Grazing: Goats, Sheep, Cattle, Guardian Animals, and Other Livestock

If a producer is presently running cattle they may want to consider just improving the property line or border fences so they can add sheep or goats. This may be the most cost effective way to add sheep or goats but don't stock more than 2 goats for every cow or 1 ewe for every 2 cows. The small ruminants will perform very well and you won't have much extra cost in infrastructure yet will benefit from some weed control.

How should you introduce new animals to the herd or flock?
Introduce new animals by running them beside the existing herd or flock. I like to place the new species in a corral or secure area for a few days adjacent to the existing herd then when mixing them turn into a big paddock so they have room to segregate if desired. Some folks like to put a few of the existing herd into the pen with the new stock. Guardian animals are the most likely to cause issues when combining species. Watch the stock closely for the first few hours and days. When new animals arrive if you use electric fencing initiate the new stock to electric fence in the corral or another secure area.

What if you have limited resources like shade and water?
Cattle are the most dominant and will demand their share and possibly more if shade is limited. Goats are next in the pecking order and sheep are lowest of the three species. An example of sheep being knocked away from a limited resource is when we bring rolls of hay to the field sheep would flock to it but within 30 minutes only cows would be around the hay. Now we unroll enough hay for stock to clean up in 12 hours and all species have room to eat.

How do you manage different mineral requirements for different species?
Cattle mineral with high copper can be fed in hanging cut out barrels and sheep mineral fed behind an electric fence wire about 34" above the ground or access mineral through a small cut out in a welded wire panel.

How do you provide shelter for the small ruminants?
Shelter is important for small ruminants especially goats if birthing date is in real cold weather but if birthing date is April or later shelter can be a break of woods. Too little shelter can cause more issues than no shelter. Goat kids can pile up in shelter and smother each other, lambs sometimes do that too. Drafty shelter is not good either. A south facing slope is good in late winter.

GREG BRANN continued...

Managing Multi-Species Grazing: Goats, Sheep, Cattle, Guardian Animals, and Other Livestock

Is it best to run all the species together or separate?
I like one herd for the simplicity of management it also takes less paddocks and the grass recovery (regrowth) period is longer so you can grow more grass. If you run stock separate forward grazing would be ideal. Allowing the calves and sheep to graze in front of the cows this would provide the best forage for the growing and most nutritionally demanding livestock. The ideal rotation would be for both herds to move every one or two days. If they grazed longer the grass would be overgrazed and of lower production.

How do you separate the sheep and or goats from the cattle when you need to work them in a corral?
In general they naturally segregate some but you can hold the cattle back with a high wire or board and if some get mixed give them a few minutes to settle then you can separate them easily. A spring gate or bungee wire work well for me.

How is best to manage the guardian animals?
I like two or more guardian dogs for all flocks and another dog for every 50 ewes so for a flock of 200 I like to run eight dogs but it is very variable depending on terrain, number of herds and predator pressure. I now feed dogs with self-feeders on the opposite side of a gate. The dogs are more nimble and can crawl through a gate. If you have multiple dogs some will be dominant so multiple feeders will likely be needed. Donkeys can be good too but I only want one donkey for every flock.

What about running poultry on the same land?
Poultry would definitely benefit a multi-species grazing operation, the biggest benefit would be breaking the fly and worm cycle by moving the poultry on three days after the ruminants move off. It would take a lot of poultry to cover the land grazed by ruminants. The manure from the poultry would also benefit grass production. Labor and feed cost need to be considered before adding poultry.

In summary always keep your overall goal in mind, keep the operation simple and manageable.

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ZACH TROWER

Weed Management Considerations for Pastures in Missouri

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Zach has a B.S., Crop and Soil Science, University of Wisconsin-Platteville.

He is studying weeds that are common to Missouri pastures.

His research focuses on surveying pastures throughout the state to identify and quantify the weeds present and to identify any correlations that may exist between the presence of specific weed species and properties of the soils.

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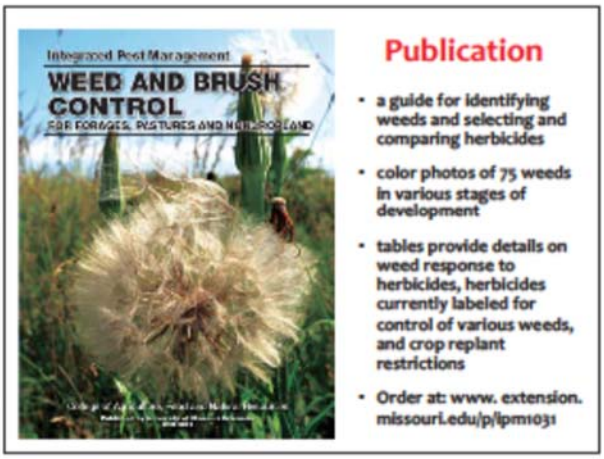
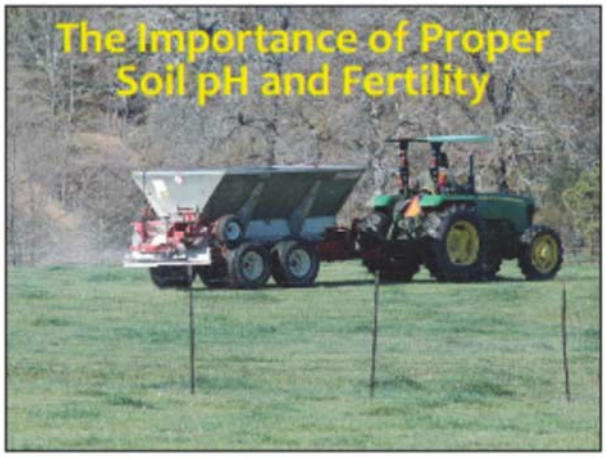
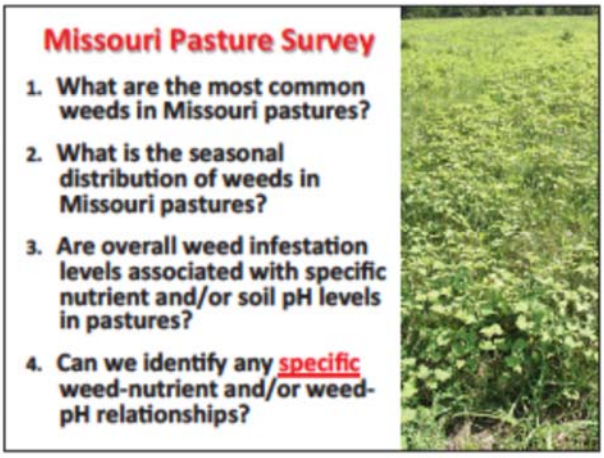
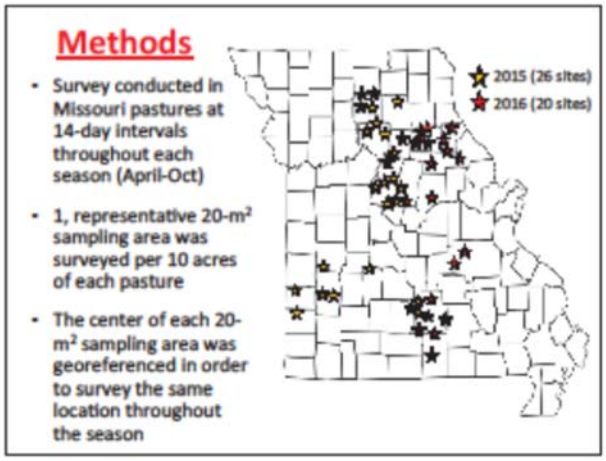
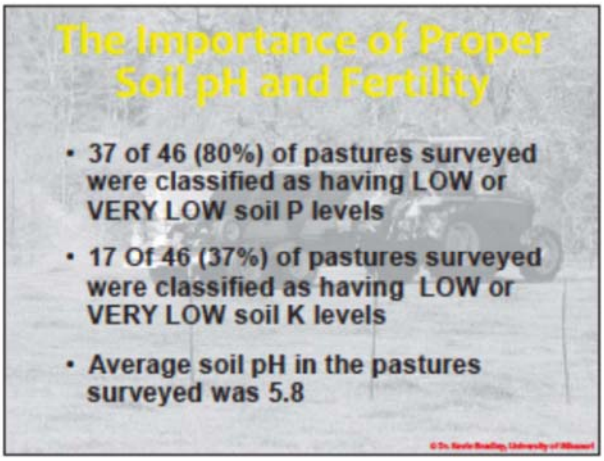
Weed Management Considerations for Pastures in Missouri











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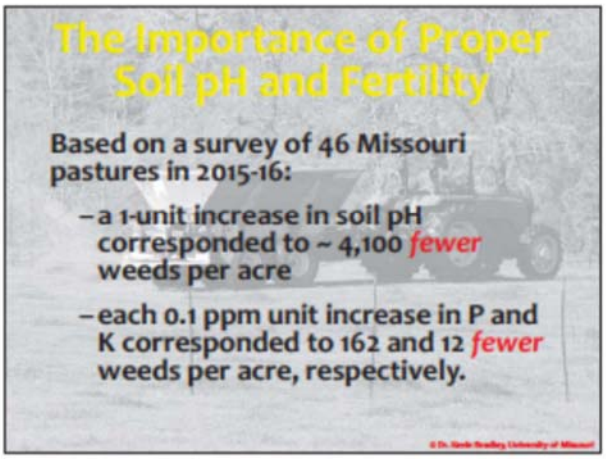
Weed Management Considerations for Pastures in Missouri



Influence of Select Soil and Forage Properties on Weed Density in Missouri Pastures

Parameters	Change in Total Weed Density per acre for each unit increase in Selected Parameter
Soil pH	- 4,168
Forage Groundcover	- 283
Manganese	243
Sulfur	182
Phosphorus	- 182
Zinc	- 182
Potassium	- 12
Magnesium	- 8
Calcium	- 4

*O.M. and forage groundcover represented as %, soil pH in 1.0-unit increments, and Ca, K, Mg, Mn, P, S, and Zn as 1-ppm.

Influence of Select Soil and Forage Properties on Weed Density in Missouri Pastures

Change in Density per Acre for each 1-unit increase in Selected Parameter

Parameter*	Common Ragweed	Horsenettle	Ironweed Species	Vervain Species	Annual Fleabane	Lanceleaf Ragweed	Yellow Foxtail
Phosphorus	-59	71	-36	----	-55	-176	----
Potassium	----	4	-8	8	-6	-28	----
Magnesium	----	-4	----	----	2	12	4
Calcium	----	-0.6	0.4	----	0.4	----	2
pH	-2454	----	----	----	834	-1993	-864
Sulfur	150	----	----	----	----	----	-326
Zinc	-257	----	-83	----	-83	----	----
Manganese	91	30	-63	28	-49	----	-65
Forage Grndcover	----	----	-26	-20	----	-158	-26

*O.M. and forage groundcover represented as %, soil pH in 1.0-unit increments, and Ca, K, Mg, Mn, P, S, and Zn as ppm.

What are the factors you should consider before you spray a herbicide on a grass pasture or hay field?

Herbicide	Price per Unit	"Standard" Rate per Acre	Cost per Acre
2,4-D	$16/gal	1 qt	$ 4.00
Chaparral	$99/lb	2 ozs	$12.38
Cimarron Max	$180/pkg	0.25 oz + 1 pt	$ 9.00
Crossbow	$59/gal	2 qts	$29.50
Graslan L	$53/gal	2 2/3 pts	$17.62
GrazonNext	$51/gal	2 pts	$12.75
Grazon P+D/Others	$39/gal	2 pts	$ 9.75
Hi-Dep	$34/gal	1 qt	$ 8.50
Metsulfuron (Plotter, others)	$9/oz	0.3 oz	$ 2.70
Milestone	$95/qt	4 fl ozs	$11.88
PastureGard HL	$129/gal	1.5 pts	$24.19
Pastora (bermudagrass only)	$18/oz	1.5 ozs	$27.00
Permit	$22/oz	1 oz	$22.00
Remedy Ultra	$77/gal	2 pts	$19.25
Surmount	$64/gal	2 pts	$16.00
Weedmaster/Rangestar	$27/gal	2.75 pts	$ 9.28
Yukon	$3.50/oz	6 ozs	$21.00

*Prices listed are suggested retail prices as of Jan 2016

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Weed Management Considerations for Pastures in Missouri

What are the factors you should consider before you spray a herbicide on a grass pasture or hay field?

Spring applications of metsulfuron-containing herbicides (Cimarron products, Chaparral, etc.) can have good and bad consequences.

What are the factors you should consider before you spray a herbicide on a grass pasture or hay field?

1. Spring applications of most metsulfuron-containing herbicides can reduce tall fescue seed heads.

14 to 61% tall fescue seed head reduction when applied to 6-inch vegetative tall fescue (early to mid April); 53 to 88% reduction when applied to 12-inch boot stage tall fescue (early May).

Sather, Roberts, and Bradley. 2013. Weed Technology 27:594-601.

What are the factors you should consider before you spray a herbicide on a grass pasture or hay field?

2. Spring applications of most metsulfuron-containing herbicides will likely cause tall fescue yield reductions!

careful application timing (boot stage or later) can minimize this

Principles of Pasture and Hayland Weed Control with Herbicides

1. Weed Identification

We Have an App for that!

Most Common Weeds in Missouri Pastures

(results based on 46 Missouri pastures surveyed in the 2015 and 2016 growing seasons)

Weed	Scientific Name	Frequency of Occurrence	Avg. Density per Acre	Grazing Preference
Horsenettle	*Solanum carolinense*	100%	2,873	Avoided
Common Ragweed	*Ambrosia artemisiifolia*	96%	5,059	Grazed
Nutsedge spp.	*Cyperus spp.*	93%	1,862	Avoided
Annual Fleabane	*Erigeron annuus*	93%	1,740	Avoided
Vervain spp.	*Verbena spp.*	80%	1,174	Avoided
Yellow Foxtail	*Setaria pumila*	80%	3,440	Grazed
Broadleaf Plantain	*Plantago major*	80%	931	Grazed
Virginia Copperleaf	*Acalypha virginica*	80%	971	Avoided
Dandelion	*Taraxacum officinale*	78%	1,619	Grazed
Tall Ironweed	*Vernonia gigantea*	72%	1,781	Avoided

Principles of Pasture and Hayland Weed Control with Herbicides

1. Weed Identification
2. Growth Habit Identification
3. Timing of Application

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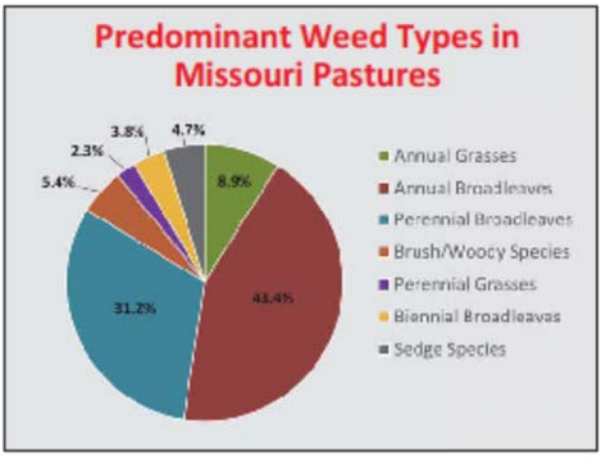
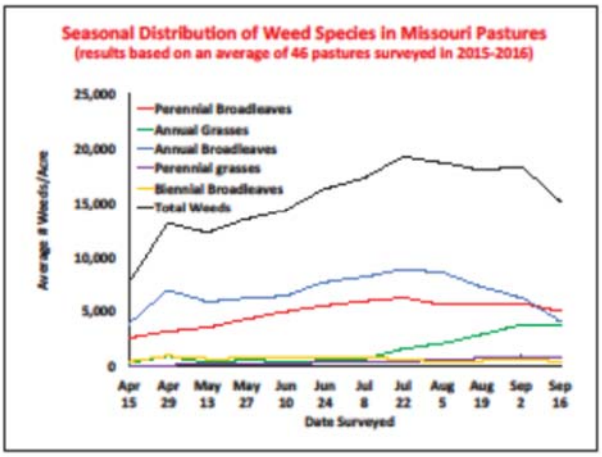
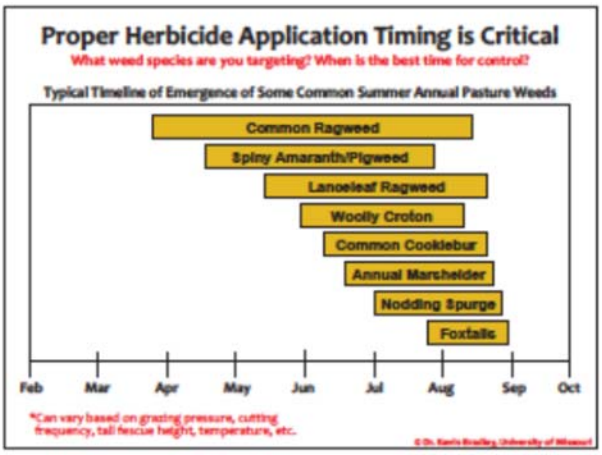
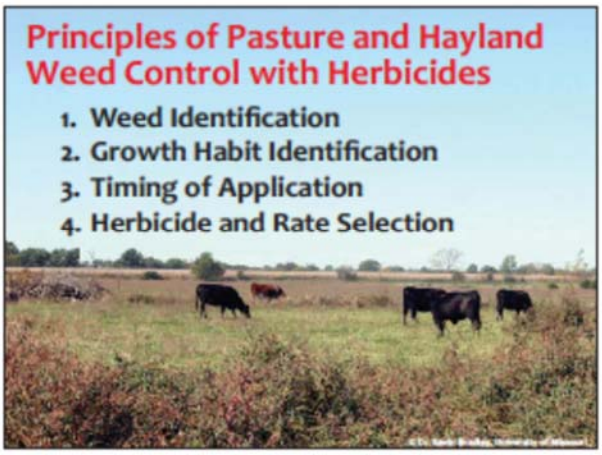
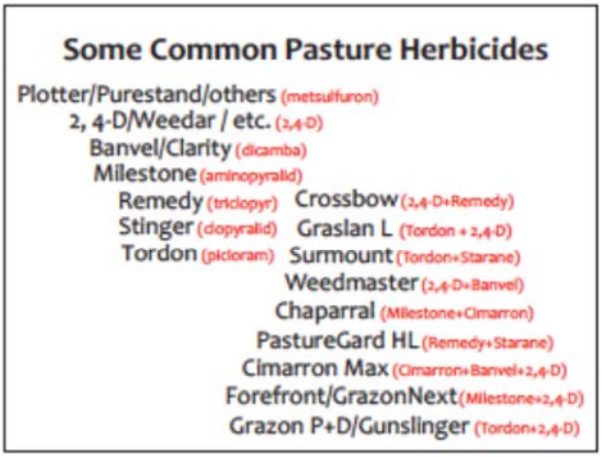
Weed Management Considerations for Pastures in Missouri











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Weed Management Considerations for Pastures in Missouri

Some of the Most Common Poisonous Weeds in Missouri

- Black Cherry
- Black Locust
- Black Nightshade
- Jimsonweed
- Johnsongrass
- Milkweed Species
- Perilla Mint
- Poison Hemlock
- Pokeweed
- Snow-on-the-Mountain
- White Snakeroot
- Nodding Spurge
- Woolly Croton

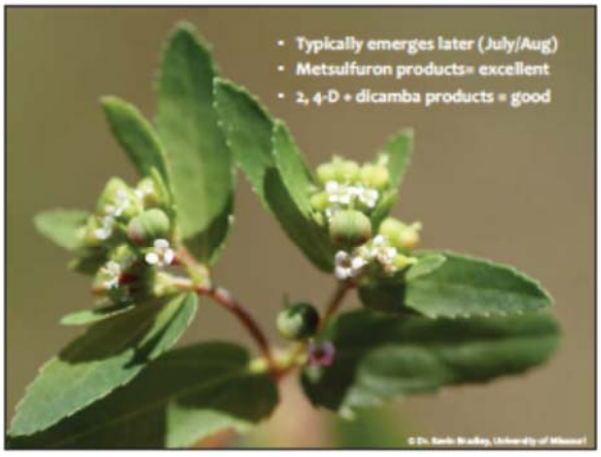
Missouri weed science

Perilla Mint

Poisonous weed that primarily occurs in shady environments around pastures and hay fields.

Control: Timing is the key! Most pasture herbicides will provide excellent control if applied to small plants that are young and actively growing.

Missouri weed science



Weed Management Considerations for Pastures in Missouri

Poison Hemlock

- Fresh poison hemlock tissue has been reported to be lethal at amounts ranging from 2 to 6 grams of plant material per pound of body weight in cattle, sheep, and pigs (Keeler and Balls 1978; Panter et al. 1988)
- Rosette applications of Grazon P+D, GrazonNext, or mixes of either with Remedy are very effective as a broadcast spray
- Many options for spot treatment

Woolly Croton

- Plant covered with short, dense hair
- Toxic only in large quantities; usually avoided by grazing animals
- Common pasture herbicide premixes will provide good control

Wild Indigo:

Spot treatment of picloram-containing products Grazon P+D, Tordon, etc) will provide good control of these species

Horsenettle Control Recommendations

Herbicides: Grazon P+D, Grazon Next, Weedmaster (or any 2,4-D + dicamba combination), Cimarron Max, and Chaparral all provide similar control 1 year after treatment. Choose based on price, legume replant interval, etc.

Timing: pre-bloom to bloom stage (can occur several times during the year).

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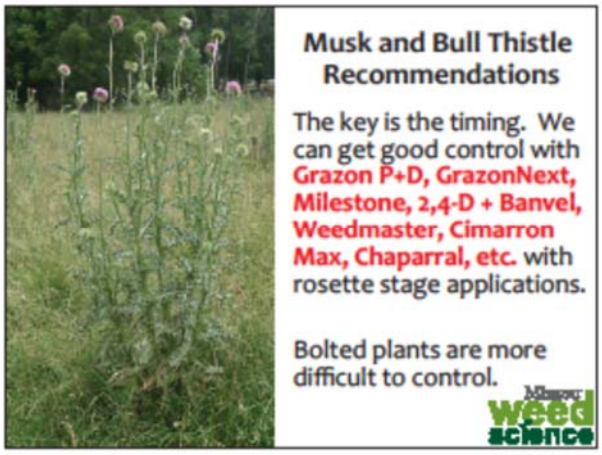
Weed Management Considerations for Pastures in Missouri



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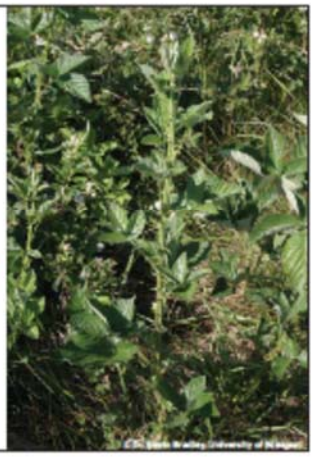
Weed Management Considerations for Pastures in Missouri

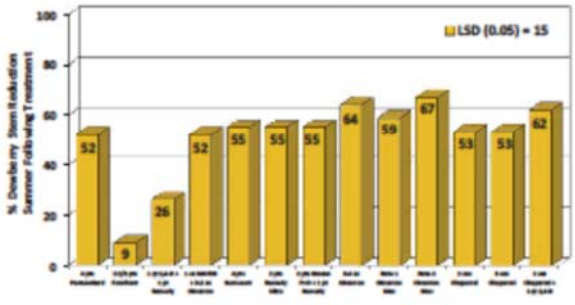
Upright Blackberry Recommendations

- Do not mow the season of treatment; mowing stems the year before treatment is OK
- Early fall is the better application timing; ~ 2-3 weeks before 1st frost
- Metsulfuron alone seems to provide best control at 0.4-0.5 oz/A; similar but slightly lower control achieved with PastureGard or with mixes of Remedy (2,4-D + Remedy, Grazon P+D + Remedy)
- Spot-spraying will provide better results and is more economical



Recommendations for the Control of Dewberry Species in Missouri

Northern Dewberry Control with Selected Herbicide Treatments (Salem, MO 2008-2011)



Some weeds cattle are unlikely to eat because of bitter taste and/or poor palatability...

Sericea Lespedeza Recommendations

- In MO research, application timing does not usually influence Sericea lespedeza control 1 yr after treatment. When it does, it is typically with metsulfuron-containing products.
- **1.5 pts PastureGard HL per acre** has been the most consistent treatment across many years of our research, regardless of application timing.
- Triclopyr alone (**Remedy Ultra**) can also provide good control but generally not as good as PastureGard.
- Metsulfuron-containing products can also provide good control but are typically best later in the season in the pre-bloom to post-bloom timeframe.

Ironweed Species

Very common perennial weed of pastures and hay fields in Missouri.

Chemical: Triclopyr (Remedy Ultra, PastureGard) is the key! Grazon P+D, Grazon Next, Cimarron Max will provide high levels of suppression, but addition of Remedy will improve control dramatically.

Mowing: 3 times per year for 2 years provided 80-90% control.

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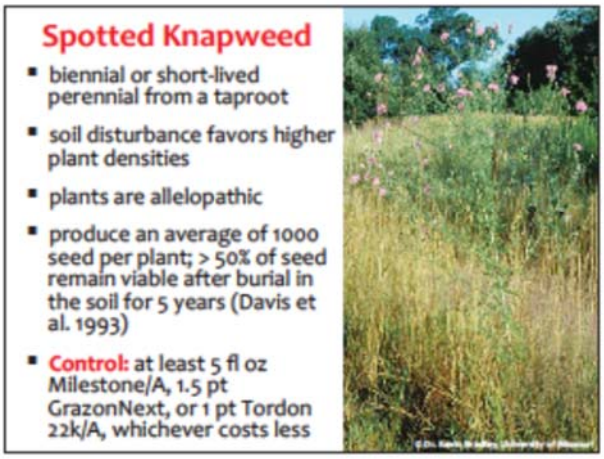
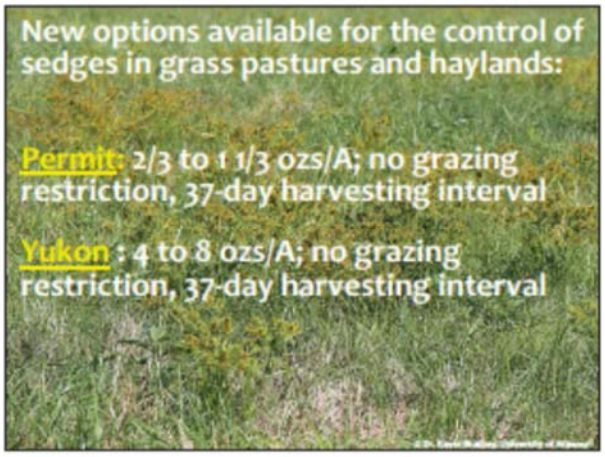
Weed Management Considerations for Pastures in Missouri





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DR. CRAIG ROBERTS

RESEARCH UPDATE: NOVEL ENDOPHYTE TALL FESCUE

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Dr. Roberts is Professor of Plant Sciences at the University of Missouri and State Forage Crop Specialist in University Extension.

He serves as a State Coordinator of the Missouri Grazing Schools.

He is also Chairman of the Alliance for Grassland Renewal, a nonprofit group that teaches how to convert toxic fescue to novel fescue.

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WESLEY TUCKER

CALCULATING COST OF PRODUCTION

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Wesley Tucker is an Agriculture Business Specialist for University of Missouri Extension.

He specializes in financial management, livestock marketing, farm lease agreements, budgeting, fence law, forage & beef production, rotational grazing, as well as farm succession and estate planning.

A Southwest Missouri native, Wesley grew up on the family beef operation where he continues to farm today. He and his wife, Heather, a local veterinarian, and their daughter, Jordan, operate a crossbred cow–calf operation in Dallas County.

As a University of Missouri Extension specialist, Wesley's primary educational role is helping producers become better managers and improve the profitability of their farming operations.

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JAMIE KURTZ

LIVESTOCK WATERING SYSTEMS

Jamie Kurtz
Resource Conservationist
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Jamie received his BS degree in Agronomy from Southwest Missouri State University in 2003. Since then he has worked for the Natural Resources Conservation Service starting in Cassville, Missouri, and later the West Plains Field Office where he is currently located.

Jamie and his father Ian operate a 360-acre cow–calf operation in Howell County. On their operation they utilize a mixture of native and introduced warm season grass, cool season grass/legumes, and both warm and cool season annuals to extend their grazing season. Both he and his father are strong proponents of Management Intensive Grazing and implement it on their operation using a mixture of high tensile electric fence and portable electric fence, as well as both permanent and portable watering facilities.

Jamie is married to his wife, Michelle, and together they try to keep up with their two boys, Ian and Kelby.

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PETER SCHARF

NITROGEN SOURCES FOR PASTURES

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Peter Scharf has an extension appointment in nutrient management.

He is interested in developing and promoting methods to optimize nutrient application rates and to minimize nutrient movement to surface and ground water.

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JASON WACHA

DRY HAY HARVEST

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Jason Wacha is an alfalfa farmer from Ozark, MO. He comes from many generations of farmers before him, being born in Central Iowa and brought up in his younger years on a grain and livestock farm. The family's printing business moved them to Southwest Missouri in 1994, and he grew up as a young entrepreneur having small businesses himself while also helping out in the family business and learning several trades in the printing industry. After graduating high school he attended Drury University in Springfield MO for a degree in business, planning on following in his father's footsteps to help run the company.

Then, in 2007, his family bought a farm and he was put in charge of maintaining it by haying and mowing. After the initial investment in all of the equipment, he knew he could also bale some of the neighbors hay to help them out, and better justify the ownership of the equipment. He picked up many custom haying jobs, more than he had ever expected, and what went from taking care of his own farm turned into a full time business. He also began leasing ground and improving it with high quality grasses to grow and sell for dairies and beef producers. One day a customer asked Jason to grow him some alfalfa for the following year, so he planted his first 50 acres that next spring and had three great cuttings, and that one customer bought every bale. He then saw the potential for this market and educated himself on every aspect of growing alfalfa for over two years by attending national seminars, studying with university experts, doing days of independent research, running larger test plots, and seeking out potential customers across the area. After gaining the knowledge, much work was to be done in preparation to grow the alfalfa such as liming, fertilizing, and clearing land, not to mention investing in more equipment, hired hands, and land. The need for local alfalfa was high, and many people were facing much trouble trying to buy out of state, especially in times of drought. This prompted Jason to plant several hundred acres to alleviate the need, and supply the surrounding area with high quality forages.

Today he farms over 2,500 acres, 1,500 of which is alfalfa that is cut 5 times per year, and 1,000 of high quality grasses cut 3-4 times per year to market and sell locally. The farm has 4 full time employees and 3 part time helpers in the summer. They utilize a full line of modern equipment to effectively harvest consistent crop. They have also integrated the process of making baleage as well as dry hay to combat the ever-changing weather. They deliver all of the forage they make themselves with their own fleet of semi trucks. Jason lives in Ozark with his fiancé Aftyn, and their two girls, Halle and Sofia. He can be reached at 417-844-2076 or you can visit the farms website at www.WachaFarms.com.

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GENE KINSLOW

TIPS FOR SUCCESSFUL ROUND BALE SILAGE

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Gene Kinslow is a retired high school science teacher and has been raising cattle since 1971.

He purchased an inline bale wrapper in 2003 to be able to consistently produce high-quality forage.

He has exclusively utilized round-bale silage since that time which allows he and his family to be "in and out" of the hay field in 24 hours.

Since 2003, he has never had a rained-on or ruined hay crop. Gene is quick to point out that, "Round-bale silage is the best thing we have ever done for our cattle."

Tips For Successful Round-Bale Silage

1. Never cut down more hay than can be easily baled and wrapped the next day. For most situations, that is about 10 to 15 acres of hay. Keep in mind that you must haul all the hay in and wrap the hay as soon as possible after it is baled. As you become more experienced with round-bale silage, you might cut a little more. Remember that you must not allow the hay to get below 40 percent moisture or it won't silage properly.

2. Set the mower conditioner for a narrow windrow. It will allow you to have some control of the moisture content of the hay as it dries. Keep in mind that a mower conditioner is designed to damage the protective cuticle around the stem and leaves of the plant and moisture will usually be lost overnight even when the hay is in a narrow windrow.

3. Vary the time of day when the hay is mowed and conditioned according to the expected weather conditions the next day when the hay is baled. If the drying conditions for baling are predicted to be favorable (i.e. windy, warm, low humidity) cut the hay later in the day.

GENE KINSLOW continued...

TIPS FOR SUCCESSFUL ROUND BALE SILAGE

4. The next morning, start running successive moisture tests about every 30 minutes or so with the microwave oven to make a determination as to how fast the moisture level of the hay is dropping. When the moisture in the hay gets down to 60 percent, start raking and baling and never get the rake very far ahead of the baler. Keep in mind that if the sun is shining, the wind is blowing, and the humidity is low, the hay will keep drying and you must stay in the 60 percent to 40 percent moisture content to make good silage.

5. When baling silage, there will always be bales that contain more moisture than other bales. For example, usually the first bales that are baled or bales along the edge of the field that might be shaded. Make a point to intermingle these higher moisture content bales with lower moisture bales when using an inline bale wrapper because it will allow the moisture content to equalize between the bales as the silage process takes place.

6. Net wrap is the best baler tie material to use for silage bales because it prevents expansion of the bale when it is released from the baler. This will insure the maximum density of the silage bale.

7. When starting a new line of bales with an inline bale wrapper, make sure that the wrapped bales coming off the wrapper have a stationary object (a post, a tree, or a tractor holding an unwrapped bale in place) for the bale wrapper to push back against. Otherwise, the wrapped bales will be pushed forward damaging the wrap and the bales will not be pushed together tight enough. Keep in mind that with an inline bale wrapper, you must set a hydraulic brake on the wrapper and it will push a lot of bales forward before it starts moving backwards if you don't have a stationary object to push against.

8. Because it is impossible for an inline bale wrapper to go back and rewrap a place in a line of silage bales, wrapping must be done correctly the first time. It is always a good idea to have someone near the emergency stop button on the wrapper control panel. Although an inline bale wrapper will automatically stop operating if the stretch wrap breaks, that person can constantly monitor several other things while wrapping is occurring including the joining of adjacent bales, hoop speed, hydraulic brake pressure, and the occasional slight turning (hydraulically) of the rear wheels to steer the wrapper in a straight line as it slowly moves backwards while wrapping. When picking a location for the wrapping of bales, choose a place where the wrapper will be level from side to side. Otherwise, the first bales wrapped may try to move to the lower side of the slope while moving down the off loading rollers of the wrapper.

9. When setting bales on an inline bale wrapper, always make sure the bales are placed on the wrapper in a way so that the top of the bale touches the bale already on the wrapper. Keep in mind that the wrapper's push bar (because of its location) pushes on the lower portion of the bale and this will help insure that adjacent bales get jammed tightly against each other as they are wrapped.

GENE KINSLOW continued...

TIPS FOR SUCCESSFUL ROUND BALE SILAGE

10. Put about six layers of wrap on the bales. To accomplish this the seams of wrap need to have about a four inch spacing. Raccoons and other animals will get up on a line of bales and six layers of wrap will insure the integrity of the bales. Don't skimp on wrap.

11. Be proactive about making sure equipment breakdowns are minimized. On a regular basis, during the off season, have your equipment dealer inspect, adjust or repair the baler as necessary. For round-bale silage everything has to function without delays, otherwise the moisture level of the hay may drop below 40 percent and the hay won't silage properly.

12. Remember that round-bale silage is in and out of the hay field in 24 hours hay baling and it is largely made successful by the current highly accurate next day weather forecasts. The most important part of that forecast should be a sunny day for the baling. The temperature, the amount of wind, and the humidity will determine when you start baling.

NOTES

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NOTES

Southwest Missouri RC&D

Resource Conservation and Development

RC&D SCHOLARSHIPS

Open to high school seniors planning to major in agriculture/natural resources

Southwest Missouri Resource Conservation and Development Scholarship Fund (open to students in 15-county area)

Missouri Association of RC&D Councils Scholarship Fund (open to students in Missouri)

Please encourage students in your communities to apply through the Community Foundation of the Ozarks, www.cfozarks.org

— Save the Date —

34th Annual

Southwest Missouri Spring Forage Conference

February 27, 2018

We thank our attendees, sponsors, vendors, speakers, supporting agencies, and universities for making this conference possible and for making it successful.

We look forward to seeing you in 2018!