The Forage Leader

SUMMER 2011

SPECIAL POINTS OF INTEREST:

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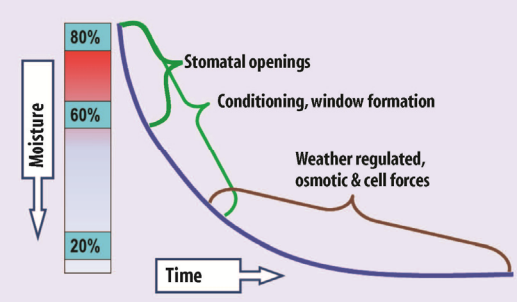
Practices to Speed Forage Drying

By: Dr. Dan Undersander, Professor of Agronomy

Rapid drying of hay and haylage shortens the harvest window, enhances forage quality, and reduces the chance for rain damage. Research-based methods are summarized in a new University of Wisconsin-Extension publication entitled; "Best Practices to Hasten Field Drying of Grasses and Alfalfa", A3927.

When drying forage we are trying to evaporate off up to 3 tons/acre water for haylage and 6 tons/acre water for hay. Approximately half the water comes from leaves, so they must be exposed to sunlight to keep the stomates open. Stomates are holes in the leaf for the plant to take up air and evaporate off water for cooling. If stomates close, the waxy layers on the top and bottom of leaves restrict water loss. Stomates stay open when exposed to sun (as in a wide swath) and close in the dark (as in a windrow). Conditioning is crucial for water loss from the stem but has no effect on water loss from the leaves (see figure 1 below).



After discussing the biology of drying, this publication shares the following four basic steps to enhance field drying: 1. mow to proper height, 2. condition properly, 3. lay hay in a wide swath and 4. well-timed raking/merging.

Step 1 (mow to proper height) recommends an alfalfa cutting height of between 2 and 4 inches. Grasses (except ryegrasses and bluegrasses) need a slightly higher cutting height, between 3 and 4 inches, because energy

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Incorporating Summer Annual Grasses into Grazing Systems

By: Chris Teutsch and Gordon Groover

Although cool-season grasses can provide ample and high quality forage for grazing livestock in the spring and fall, forage growth during the summer months is often restricted by high temperatures (Figure 1). In contrast warm-season annual grasses are most productive during the summer months and do not reach peak growth until temperatures approach 90 degrees Fahrenheit. Summer annual grasses such as forage sorghum (*Sorghum bicolor* (L.) Moench), sudangrass (*Sorghum bicolor* (L.) Moench), sorghum-sudangrass hybrids, and pearl millet (*Pennisetum americanum* (L.) Leeke) can provide high quality summer grazing for ruminant livestock in many regions of the United States.

Not all varieties created equal. In the past, recommendations for choosing a summer annual variety were to find a reasonably priced, locally available variety, and focus on management. While good management is absolutely critical for optimizing productivity and animal performance, recent data indicates that yield potential and digestibility should also be considered. Trials conducted at Virginia Tech's Southern Piedmont Agricultural Research and Extension Center (AREC) located near Blackstone, VA have shown that the yield and digestibility of summer annual varieties can vary greatly and are in many cases not well correlated.

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Gavel Exchange

Bob Hendershot AFGC President 2010-2011

It is the AFGC vision "To be recognized as the leader and voice of economically and environmentally sound forage agriculture".

There has been much discussion lately about excess soil nutrients entering surface waters. I have been promoting the use of forages in managing those excess soil nutrients and how forages improve many other natural resource concerns. Harvested forages can be used effectively to remove excess nutrients from fields and reduce the water pollution potential. Harvested forages are also very marketable, and should be considered as a way to transfer nutrients off of farms with excess soil nutrient levels. Forages are also excellent in improving soil conditions, reducing soil erosion and runoff that contributes to water quality concerns.

Forages can be used to draw down soil test phosphorus levels in fields with excessive soil test levels. Typically forages will remove 13 to 15 pounds of P2O5 per ton of harvested forage. Plants harvested earlier in their growth stage will have a higher concentration of phosphorus, but a lower yield per acre. Different forages remove different amounts of phosphorus. Oklahoma research shows orchardgrass removing 50% more P2O5 than the same yield of alfalfa, ryegrass or tall fescue; twice as much as red clover, and three times more than sorghum-sudangrass or pearl millet. Cornell research has ryelage with more P2O5 than oatlage, which has more than wheatlage.

The forage needs to be harvested and removed from the field to reduce the soil nutrient level in the field. Grazing systems do not effectively remove nutrients from the field since most of the nutrients are recycled back to the land by the animals during the grazing event. The animals will deposit the nutrients near watering points and loafing areas in fields that are continuously grazed. An improved rotational grazing system will have a more uniform distribution of the nutrients by the animals.

Harvested forages do not just need to come from hay fields. Cover crops harvested as forages can help manage nutrients on livestock farms. Conservation planners for many years have recommended the use of cover crops after corn silage and soybeans to reduce soil erosion. This Best Management Practice has many other benefits including forage production, nutrient management, soil health, and weed and disease management. Cereal crops like rye, wheat, triticale, barley and oats used as a cover crop can produce substantial forage dry matter yields. They can produce 2 to 3 tons dry matter per acre with a Relative Forage Quality index of 180; removing 25 to 45 pounds of P2O5 per acre reducing soil test values by 2 to 4 pounds. They are also excellent at scavenging excess soluble nitrogen and phosphorus from the soil before it enters any water body. The cover crop is doing this outside the growing season for corn and soybeans.

We in AFGC need to be looking for ways to promote forages as a solution to economic and environmental problems. It is the AFGC vision "To be recognized as the leader and voice of economically and environmentally sound forage agriculture". Hope to see you all in French Lick.

Best regards,
Bob Hendershot
2010-2011 AFGC President

Workshops Offered at 2011 AFGC Annual Conference

Workshop: How To Facilitate a Forage Study Group
Monday, June 13, 7:00-11:30 am
For the first time – a workshop to train the trainers! A Forage Study Group is one of the most powerful and effective ways of educating farmers and improving profits. The key is a good facilitator. This workshop will teach practical skills for becoming a good facilitator, including strategies for developing long-term self-sustaining Forage Groups that can pay their facilitators.

Workshop: Cool Season
Thursday, June 16, 7:00 am-5:30 pm
Participants will learn the fundamentals of forage plant structure, growth, development, physiology, management, nutritional value, and contributions to agricultural sustainability. Through lab and field exercises, participants will gain understanding of the concepts and nature of scientific investigation. The course stresses principles and relationships, which can later be applied to specific cases in the design and management of sustainable forage-livestock systems.

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Always read and follow label directions.

AFGC UPDATES

AFGC is working to finalize plans for the 2011 AFGC Annual Conference hosted by the Indiana Forage Council.

Following this conference AFGC will be working on the 2012 Conference to be held January 9-12, 2012. If you have a presentation or poster you would like to present be watching for the release of the submission forms shortly after the 2011 conference. To volunteer for a committee please contact Tina Bowling or Ray Smith.

AFGC is also working on the Certified Forage and Grassland Professional certification program to make participation more streamlined and efficient. Attendance at the 2011 AFGC Conference will automatically provide CEU credits for the CFGP program unlike previous years.

As always, we welcome your feedback so please send your thoughts to help AFGC move forward to info@afgc.org.

AFGC Events

- June 12-15, 2011—AFGC Annual Conference in French Lick, IN
- July 20, 2011—Affiliate Council Conference Call
- January 9-11, 2012—AFGC Annual Conference in Louisville, KY
- May 2012—AFGC Annual Tour hosted by the Arkansas Forage and Grassland Council

PLEASE VISIT WWW.AFGC.ORG FOR MORE DETAILS ON UPCOMING EVENTS.

Producer Member Spotlight

Recipient of 2011 Master Farmer Award by *Prairie Farmer*...
Mr. Ron Tombaugh

While still working on his ag degree at the University of Illinois, Ron and his father opened a New Holland dealership in the Streator area. Graduating in 1977, Ron returned to farm full-time with his father. In 1983, he found his true calling – custom baling.

"We started with a 9-foot mower, tandem rake, one bale wagon and a small, square baler," Ron remembers. "Everything was cash hay."

Ron's knack for vertical integration continued early on when he bought a semi-tractor and drop-deck trailer in 1985. Over the years, Ron expanded the trucking business to its current size of three semi-tractors, three hopper trailers and two flatbeds. To date, he's hauled loads as far as New Jersey, Texas, Alabama and Georgia, though most of his trucking deliveries are in Illinois and neighboring states.

In 2003, a friend came up short on a wheat straw contract for an Illinois mushroom farm. Ron stepped in and filled it, establishing a new business enterprise in the process. Today, Ron has settled in at around 4,000 acres of straw each year, plus 1,700 acres of hay and grain

Twelve years ago, Ron met his current wife, Sandy, on the internet. Though she's always lived in the Chicago suburbs, Sandy's grandparents were farmers. Plus, her dad previously worked on a Wisconsin dairy farm.

This heritage, plus the fact that Ron and Sandy have both volunteered to help disaster victims, enjoy ballroom dancing and the farm business meant the two had a lot in common. After marrying in 2003, the couple adopted Sandy's grandson, Tyler. Sandy still works as a CPA for McMaster-Carr Supply Company in Elmhurst, nearly 100 miles northeast of Streator. She and Tyler spend weekends with Ron. After a couple more years, Sandy will retire and move to the farm.

Continued from Page 1...

Practices to Speed Forage Drying

stored at the base of the stem is used for re-growth. Cutting below 3 inches will shorten the life of a grass.

Step 2 (condition properly) points out that mechanical conditioning can nearly double the drying rate. If conditioned properly, stems of legumes are scrapped or broken every 2-4 inches with less than 5% of the leaves being bruised. Research has demonstrated that no matter how wide the crop is laid in the swath (step 3), conditioning will increase the drying rate most of the time. Proper conditioner adjustment is crucial and is described in the publication. Note that roller conditioners are recommended for alfalfa (due to reduced leaf loss) and flail conditions for grass.

Step 3 (lay hay in a wide swath) emphasizes the importance of laying the crop out in a wide swath that covers at least 60% of the cut area. Wide swaths reduce swath density, increase the crop's exposure to the sun, and increase the crop's surface temperature; all factors important to the rapid drying of hay. Note that research has shown that laying a wide swath is more important than putting hay into a windrow to let the ground dry. We want the hay to dry – not the ground and slowing respiration by making a wide swath is more important than drying the soil when hay is first cut. Note also that driving (with at least one wheel) over a wide swath causes less loss than making the swath narrow enough to fit between the wheels.

Step 4 (well-timed raking/merging) emphasizes the importance of raking/merging to match the capacity of your harvester or baler. Harvesting less than harvester capacity reduces energy efficiency, increases labor costs, and damages the stand due to extra wheel traffic. To minimize leaf loss and soil contamination: merge/rake dry hay when moisture is above 40% for alfalfa and 25% for grass; merge/rake haylage just ahead of the harvester to avoid rain on a windrow. Also rake with little or no tines touching the ground (possible if with wide swath which stays on top of stubble) to reduce soil contamination of the hay or haylage. A general practice for haylage is to mow & condition putting forage into a wide swath (>60 % of cut area) and rake/merge just ahead of chopping or baleage making. The recommendation for hay is to cut one morning (or as late as hay will dry to 60% moisture by nightfall), rake the next and bale when ready (grass may require an extra tedding which is not recommended for alfalfa due to increased leaf loss). For commercial hay makers – note that little bleaching will occur in the first 24 hours because rapid water loss prevents heating and bleaching.

To purchase, view, or download the full publication go to: http://learningstore.uwex.edu/.

Figure 2. *Roll conditioning (top) bends and cracks the stem and impeller conditioning (bottom) scrapes the stem. Both provide an exit route for moisture.*

Continued from Page 1

Incorporating Summer Annual Grasses into Grazing Systems

In fact, some of the highest yielding varieties in these trials were also some of the most digestible. When the difference from average for the yield and digestibility are graphed and the graph is divided into four quadrants, varieties with above average yield and digestibility are shown in the upper hand quadrant (Figure 2). Varieties that possessed above average yield and digestibility in both the 2009 and 2010 growing seasons are listed in Table 1.

Yield impacts production costs. The cost of utilizing summer annual grasses in grazing systems can vary greatly. According to Southern Forages (2007), the expected yield of summer annual grasses can range from 2 to 6 ton/acre. While most advertisements like to talk about 6 or 7 ton/acre yields, a summary of yield data from trials conducted at Virginia Tech's Southern Piedmont AREC indicate that a more realistic yield expectation would be 3 ton/acre (Figure 3). Increasing or decreasing the yield of summer annual grasses significantly impacts the cost of production (Figure 4). As the number of grazing days/acre increases, the cost per grazing day decreases from $1.63/day at 80 grazing days/acre to $0.96/day at 240 grazing days/acre. In an "average" year the cost of utilizing a summer annual grass would be in the range of $1.20/grazing day. In this example we have made the following assumptions: 1) a grazing day is equal to the amount of forage required by one mature cow/day (28 lb DM/day), 2) nitrogen fertilization increases as grazing days increase, 3) phosphorous, potassium and lime are adequate, and 4) yields of 2, 3, 4, 5, and 6 ton/acre roughly correspond to 80, 120, 160, 200, and 240 grazing days/acre.

Forage quality impacts production costs. Along with grazing days/acre, how animals perform on a given variety can also impact production costs. In a trial conducted at Texas A and M's Agricultural Experiment Station, Amarillo, steers grazing two different varieties or sorghum-sudangrasses, one a BMR and one a non-BMR, showed a difference in average daily gains of 0.75 lb/day (Vasconcelos et al., 2003). Using the average daily gains from this study, grazing two different varieties or sorghum-sudangrasses, one a BMR and one a non-BMR, showed a difference in average daily gains of 0.75 lb/day (Vasconcelos et al., 2003). Using the average daily gains from this study, the calculated cost of production at 160 grazing days/acre was $0.52 and 0.39/lb gain for the non-BMR and BMR variety, respectively (Figure 5). For a steer gaining 2.5 lb/day, the cost savings of selecting the variety with higher digestibility and animal performance would be $0.33/day/steer. This example clearly illustrates the importance of considering not only yield, but also digestibility when selecting summer annual varieties for your summer forage program.

Assessing least cost options for the summer months. Once you have determined the costs associated with incorporating summer annual grasses into your grazing system, it is important to evaluate if they are the least cost option that will meet your needs. For example, summer annual grasses are an excellent fit for livestock classes with high nutritional requirements such as grazing dairy cows, weaned calves, and stockers. On the other hand, more cost effective alternatives may be available for livestock classes with lower nutritional needs. It is important to consider all feed alternatives and determine which one will best meet production your goals and at the same time help to control costs.

It is important to remember that adding summer annuals to a farm's grazing system will change the entire forage management system. Additional time will be required to rework existing forage and animal management. Additional resources on summer annual grasses can be found at the AFGC's website. They include interactive budgets for summer annuals, variety trial summaries, and a link to the TAMU study used in this article. For more information on selecting and utilizing summer annual grasses in your area, contact your local cooperative extension office.

Chris Teutsch is an Associate Professor at Virginia Tech's Southern Piedmont AREC located near Blackstone, VA and resides with his wife and four children on a small farm in Dinwiddie County.

Gordon Groover is an Associate Professor in Virginia Tech's Department of Agricultural and Applied Economics and serves as an educational advisor to the Virginia Forage and Grassland Council.

Table 1. Varieties that had above average yield and digestibility in both the 2009 and 2010 Summer Annual Variety Trials held at Virginia Tech's Southern Piedmont Agricultural Research and Extension Center, Blackstone, VA.

Variety	BMR-Gene	Seed Company	Phone
Xtra-graze	BMR-6	Evergreen Seed, Rice, VA	1-877-804-7333
SS2	BMR-6	Advanta, Hereford, TX	1-800-333-9084
22503	BMR-6	Advanta, Hereford, TX	1-800-333-9084
22050	BMR-6	Advanta, Hereford, TX	1-800-333-9084

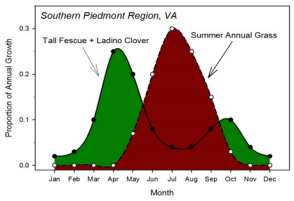

Figure 1. Growth curves for tall fescue and white clover and a summer annual such as pearl millet or sorghum-sudangrass.

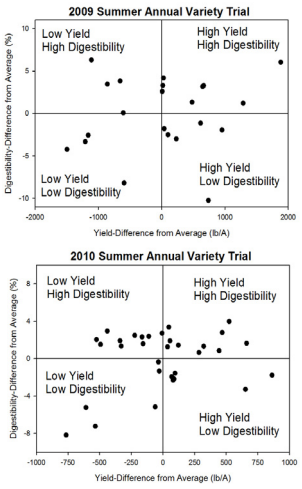

Figure 2. In this graph yield and in vitro digestibility are expressed as a difference from the average value. The value of zero represents the average value for the trial. Negative values represent a value that is below average, while positive values represent a value that is above average. Producers should try to select varieties that are above average for both yield and digestibility.

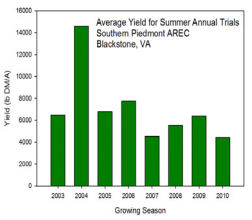

Figure 3. Summer annual varieties can yield between 2 and 6 ton DM/acre. Data from the Southern Piedmont AREC, Blackstone, VA indicates that realistic yield expectations would be around 3 ton DM/acre.

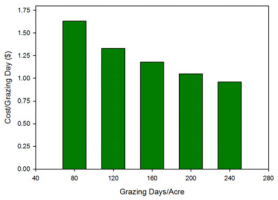

Figure 4. The cost/grazing day can be significantly impacted by factors that restrict plant growth and yield, such as drought. As the number of grazing days/acre decrease, the cost per grazing day increases.

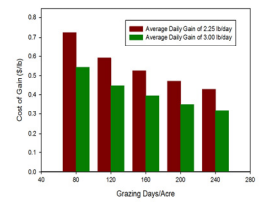

Figure 5. The cost of gain can be impacted by digestibility and animal performance of summer annual varieties. As animal performance increases, the cost of gain decreases.

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