

The Forager

THE NORTH CAROLINA FORAGE AND GRASSLAND COUNCIL
IN COOPERATION WITH
THE GRAZING LANDS CONSERVATION INITIATIVE

FORAGE ID: SWITCHGRASS (*PANICUM VIRGATUM*)

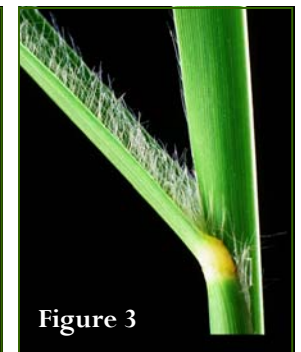


Switchgrass is a native warm season perennial forage that is well adapted to most soils including poor, flooded and drought affected soils. It is resistant to many pests and plant diseases and has the potential to produce high yields at relatively low fertilizer inputs. It propagates by seeds and short rhizomes and grows erect, sometimes reaching 6 feet in height. Leaves are rolled in the bud shoot, linear with a prominent mid vein and somewhat serrated leaf margins (Figure 1). The leaf is 30-40 times as long as it is wide.

The ligule is membranous (Figure 2) with a fringe of hairs and often has a dense mat of hair extending up the leaf blade (Figure 3). The leaf sheath is round and open. The inflorescence is panicle with spikelets. The IVDMD values below represent forage analysis if machine harvested. Under grazing conditions, animals will selectively graze more leaves than stems therefore intake of protein and energy may be higher than the canopy as a whole and forage eaten will be somewhat higher in IVDMD than shown.

Estimates of Nutritive Values of Switchgrass at Various Stages of Growth (whole plant)

	IVDMD (%)	Crude Protein (%)	Dry Matter (%)
Vegetative (12-20")	74+	15-17	18-22
Vegetative (25-35")	62-68	10-13	24-27
Boot Stage	56-60	6-8	28-32
Heading	43-49	3-5	34-40
Flowering	39-42	3-4	42-45



UPCOMING EVENTS

- ⇒ **MAY 9:** CEFS ALTERNATIVE SWINE UNIT DEDICATION: SEASONS OF SUSTAINABLE AGRICULTURE KICKOFF!
CEFS_INFO@NCSU.EDU
- ⇒ **JUNE 12:** GRAZING SYSTEMS FOR SMALL FARMS WORKSHOP, 9 AM TO NOON, GOLDSBORO 919-731-1527

IF YOU WOULD LIKE TO ANNOUNCE AN UPCOMING FIELD DAY OR EVENT, SEND AN EMAIL TO FORAGER@CROPSCI.NCSU.EDU

PASTURE EXPECTATIONS FOR MAY

May is shaping up to be a challenge on many farms, especially if soil moisture remains limited as it has thus far this spring. If it remains relatively dry one can expect the following observations:

- Higher proportion of stems and seed heads in fescue and orchardgrass fields.
- Less yield than in normal years, even where fertilizer or nutrients have been applied adequately.
- Slower regrowth following grazing or cutting.

- Quicker hay curing time than normal
- Higher energy content in the forage as compared to normal growth this time of year.
- More competition from summer grassy weeds because they seem to be more vigorous under such conditions.

In NC the amount of evaporation and transpiration from grass growing during the summer months averages about 0.15 inches per day. More than 80% of the roots for fescue are in the upper 10 inches of the soil surface. Loamy soils hold about 0.2 inches of water per inch of soil,

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QUESTIONS FROM THE FIELD

Q: Can forage farmers use MSMA on Bermudagrass?

A: MSMA (monosodium methanearsonate) is an effective and commonly used herbicide on turfgrasses, especially bermudagrass. It is recommended for post emergence control of bahiagrass, crabgrass, dallisgrass, goosegrass, nutsedge, annual sedges, and sandbur. MSMA is not labeled for use in forage crops. Because of this, and because there is no post-emergent herbicide labeled for bermudagrass forage crops, there has been a tendency for forage producers to use this product to control weeds in their pastures and hay fields; this practice is not legal and is against the label.

Why using MSMA is a problem in forages?

The "A" in MSMA stands for arsonate, which is a derivative of arsenic which is poisonous to humans and animals. The arsenic in MSMA is in the organic form, which is not as dangerous as inorganic arsenic, but still of concern. Horses are more sensitive to arsenicals than cattle, sheep, swine and birds. There are documented deaths of cattle in eastern NC due to arsenic based herbicide applications.

Clinical signs of arsenic poisoning include vomiting and intense abdominal pain, weakness, staggering, ataxia, shock, dehydration, diarrhea, and sudden death.

Q: Due to the warm and dry winter, grass has not grown like it has in the past. I have an orchardgrass stand that is 4-6 inches tall with a good number of shoots springing up. I figure there will be a lot of seedheads in another week or two and would like to mow the grass and get a nice 2nd cutting. Should I wait a little longer? If I wait, how will it affect my regrowth?

A: Once orchardgrass seedheads emerge and the seeds begin to form, the growth rate in dry matter slows significantly. Do not mow the elongating stems until after the boot stage (when seedhead is elevated in the shoot). It sounds like it is sporadically heading right now and if it isn't growing now, this is most likely due to moisture stress or lack of nutrients (especially nitrogen). Don't cut the stand below 3-4 inches if you want the most rapid regrowth. Use your best judgement (in combination with good weather) to determine when to cut.

Q: Can I use tobacco waste / byproduct as a fertilizer in my pastures and will it adversely affect my animals?

(continued on page 3)

If you would like to send a question for this section, please email your question to forager@cropsci.ncsu.edu. Names will not be used.

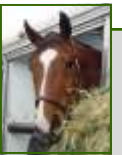
PASTURE EXPECTATIONS CONT'D

therefore after a rain that provides field capacity in a loamy soil it would take about 13 days for all of the moisture to be evaporated from the upper 10 inches of the soil. It is important that one manages to prevent as much of the runoff from rains as possible. Maintaining 2-4 inches of stubble following mowing or grazing can have a significant impact on the moisture relationships on every farm. Effective fencing to control the degree of grazing can play a role in drought management. Native grasses like switchgrass, gamagrass, indiagrass and bluestems are usually more drought tolerant than other grasses, but they take a full season to become established and will not help much in 2006. These grasses should be considered for field borders or steep and shallow soils where production of other species is limited.



Closely grazed pastures reduce water collection, plant growth rates and animal performance.

Effect of High Nitrate Feed on Mature Idle Horses



A recent study by the Alberta Agriculture, Food and Rural Development organization fed six non-pregnant mares high nitrate (1.74-1.85%) oat hay for 13 days. Blood nitrate/nitrite levels increased significantly within 3 hours of commencement of consumption of high nitrate feed and remained significantly elevated until 51 hours after withdrawal of feeding high nitrate oat hay. Results suggest that nitrate is absorbed in the small intestine and does not reach the cecum where it can be converted to nitrite by the microbes since methemoglobin levels did not increase. From a practical point, owners of idle horses **need not worry** about nitrate toxicosis in feeding forages containing up to 2% nitrate and likely much higher.

"CAN FORAGE FARMERS USE MSMA ON BERMUDAGRASS?"

UNDERSTANDING SEED DORMANCY IN SWITCHGRASS

Frequently 20 to 40% of switchgrass seeds are dormant in the first 6 to 9 months after harvest. Reports from a standard germination test, which includes a wet-pre-chill treatment that breaks dormancy, includes dormant seed as part of the “germination %” on the seed tag. While the dormant seeds are viable and good, they may not germinate the first season unless planted early enough (early to mid winter) to allow natural scarification from cool soil conditions to occur. In the western US competition from summer grasses, seed decay, consumption by animals and invertebrates are not usually as prevalent as it is here in the humid east. Therefore, dormant seeds may survive and germinate the year following planting. In this environment the seeds that do not germinate and develop into seedlings the first year usually do not make it into the second year.

Breaking dormancy can be accomplished by storing the seed at room temperature for 12 to 18 months after harvest. For this reason, it is often best to order seeds one year before planting is to occur. Since native grasses, like switchgrass, are sold on a PLS (pure live seed) basis [$\% \text{ germination} \times \% \text{ purity} / 100$] one will always know the viability of the seeds, regardless of the age. Storing seeds in a freezer preserves the viability, but it also preserves the dormancy.

See the publication “Forage Seed Selection and Quality” at: <http://www.cals.ncsu.edu/agcomm/forage/>

Switchgrass seeds are smooth and flow easily through a drill. In this picture the black marks are **1 mm** apart. A single plant can produce as much as 400,00 seeds/lb depending on variety.



RESEARCH HIGHLIGHTS: SWITCHGRASS AS A BIOFUEL

“We will ... fund additional research in cutting-edge methods of producing ethanol, not just from corn but from wood chips and ... switchgrass”.

George Bush, State of the Union Address 2006.

With the President of the United States showing support for switchgrass and plans being drawn up for a new ethanol plants in Beaufort, Hoke, and Martin counties, you may be considering planting several acres of this tall, fibrous forage to get a head start on the new energy crops industry. Switchgrass (*Panicum virgatum*) is a North Carolina native, can produce as much as 7 tons/acre of dry matter with as little as 50 lbs N/acre. It is adapted to almost any soil type, moisture regime, climate, or elevation found in our region. The primary drawback is that it is slow to establish when grassy weeds are competitive during the seedling stage.

Kim Tungate, Amber Moore and Jim Green, (NCSU) are studying the effects of row spacing and till vs. no-till on stand establishment in Clayton and Goldsboro. Row spacing may reduce weed competition with dense stands, and no-till methods provide residue cover that may protect switchgrass seedlings and inhibit weed

growth. **Fred Yelverton** will be testing a variety of herbicides during the establishment phase in an effort to reduce the risk of stand failures.

If switchgrass does not become successful as a biofuel feedstock, it can still play a significant role on farms with livestock and wildlife.

Switchgrass is also a very persistent plant for buffers, field borders and low maintenance areas, can be used ornamental planting around home gardens, and was the only plant that survived the flooding of the Upper Mississippi river in the early 1990's.



This stand of switchgrass is 12 years of age and has not been fertilized since planting. It is growing on a very coarse textured soil (deep sand?) in Edgecombe Co.

QUESTIONS FROM THE FIELD CONT'D

A: Cattle will eat very little of it because it's too bitter. Tobacco waste is a very fine material composed of tobacco dust and sand. Thus, when it's spread on the fields, it will come into contact with the soil particles. Soil microbes will degrade the organic portion quickly so it's unlikely that the animals will consume enough to affect them. Tobacco waste did a fine job of ameliorating the soil in garden plots and the earthworms seemed to thrive in it. It seems to be a good soil conditioner due to the rich carbon content.

Q: Is founder related to pasture fertilization?

A: Founder (or laminitis) is an inflammation of the space between the hoof wall and the bone where the blood supply to the foot is located. While many conditions can result in laminitis, it sound like you're referring to “grass founder” which is associated with over-eating. Large changes in a horse's nutrition disrupts the energy balance in the horse's diet and often leads to laminitis. Fertilization is essential for the growing of forages; fencing and access time to the forage can vary. Managing your horse's grazing time so that if he isn't over-eating is the best way to reduce risks of founder.



THE FORAGER

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If you would like to receive The Forager via email or postal mail contact us at forager@cropsci.ncsu.edu or 919-515-3492.

N.C. Forage & Grassland Council Membership Form

Name _____ Name of Operation _____
Address _____ City _____ State _____ Zip _____
Phone _____ Occupation: Farmer ___ Industry ___ Agency ___ Other _____

- _____ **Individual** — \$25.00 (open to producers, professional agricultural and industry personnel, etc.)
- _____ **Individual** — \$75.00 (membership for 3 years)
- _____ **Associate** — \$100.00 (open to farm supply dealers, formulators, distributors)
- _____ **Supporting** — \$300.00 (open to basic suppliers of chemicals, equipment, plant food, seed, etc.)

Make check payable to: N.C. Forage and Grassland Council
Mail to: 2228 N. Main St., Fuquay-Varina, NC 27526

WEB RESOURCES: TURFFILES

NC STATE UNIVERSITY



"For years I have wanted to know more about the plants in my pastures, and how to manage them but I can identify only a limited number of the plants by name. I often have no visual image of the species I read about!"

This concern is echoed by many producers that would like help in identifying undesirable plants so that they can provide a more high quality forage. North Carolina State University and the Center for Turfgrass Environmental Research & Education have developed a web application called [TurfFiles](http://www.turffiles.ncsu.edu/turfid/) that contains an excellent plant identification decision aid. Many grass and weed species found in turf habitats are also found in pastures.

The first step in controlling weeds is correct identification. The TurfFiles Turf & Weed ID Decision Aid Program helps users to narrow down the potential weed list by using a series of questions about the weed characteristics. Currently, hundreds of detailed pictures are available on the website (free of charge) to help identify your weed problems.

<http://www.turffiles.ncsu.edu/turfid/>

Is this henbit or purple deadnettle? If you have narrowed down your unknown species to a couple choices you can select specific plant species and see detailed photographs from both a natural field perspective as well as close up views of leaves and root systems.

How do I get rid of it? Correct weed identification is important; as it is the first step in knowing what herbicide(s) to apply. Improper herbicide application is simply a waste of time and money, as well as unnecessary chemical application to your land. Once you've identified your weed you may contact your local extension agent, reference the NC Agricultural Chemicals Manual, or consult a representative from your local chemical dealer for specific herbicide recommendations.

Quiz: What is the name of the weed pictured above?

Answer: Henbit!