

# SWITCHGRASS

## The Next Ethanol Source

By Paul D. Ohlenbusch

Switchgrass (*Panicum virgatum*) is a warm season native bunchgrass (Figure 1). Upland forms are 3-5 feet in height with lowland and deep soil forms as tall as 10 feet. It is a highly productive grass adapted to all of the United States except California, Oregon and Washington. In native prairies, switchgrass is one of the first to begin growth in the spring, usually about 10 days before big bluestem and Indiangrass.

Switchgrass can be planted in pure stands and used for grazing, hay and biomass. Harvested seed is used for range reseeding, pastureland, hay production, wildlife food and cover revegetation, shoreline stabilization and erosion control. Twenty cultivars (varieties) are recognized nationwide. Of these, only Alamo, Blackwell, Caddo, Kanlow and local harvested seed are recommended in Texas.

Opinions about grazing switchgrass are a mixed bag. In native prairie, switchgrass often has a bad reputation since it is the earliest to green and is less palatable when species such as big bluestem, Indiangrass and sideoats grama begin growth. The reason is the old seed stalks are stiff and form a barrier to grazing. Grazing as the switchgrass begins growth can reduce the problem. Also, with the periodic use of prescribed fire, this can be reduced.

Haying switchgrass has a mixed reputation also. The best hay from switchgrass and most grass hays are made before the boot stage. Hay quality goes down during seed stalk production. Once the seed stalk elongates, nutrients are sent to the seed head and can even be translocated from the leaves. After all, hay should be judged on quality (nutrients), not tonnage. Actual crude protein

available to animals goes down and digestibility also declines during seed production.

From a wildlife perspective, switchgrass can provide shelter and food. Deer have moved into Conservation Reserve Program (CRP) switchgrass and tallgrass mixtures for protection and travel. A number of birds use the seed for food nesting and brood rearing. It provides a good cover for hunting some game bird species. In many areas, when managed, CRP has improved wildlife habitat and has provided grazing and hay, as well.

The latest use for switchgrass is for bioenergy. Research by Oak Ridge National Laboratories (ONRL) has been ongoing since the 1980s. Funding has been provided for research to develop direct firing when blended with coal for

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## MANAGEMENT NOTES FOR JULY-AUGUST




- Evaluate the status of desirable vegetation to ensure overgrazing is not happening. July to killing frost is the most critical period for most perennial plants.

- Monitor broadleaf and woody plants to determine if control is needed.

- Evaluate rainfall history and current soil moisture status. If soil moisture is short, mid- to late-season plant growth may be limited. Limited or no soil moisture usually means little or no plant growth.

- If plant growth has been excellent, avoid the urge to add animals to harvest the forage. This is the best time for plants to store food for next year, so stockpile forage for fall and winter use, and look to the future.

- Continue to monitor water sources to ensure availability. Develop options if sources appear to be less than optimal.

- Review and adjust grazing and economic management plans for 2008, adjust for current and past weather conditions, and changing economic factors to begin planning for 2009. 

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electric generation and for alcohol production.

Iowa State University has been researching switchgrass and biomass fuel potential. Their findings show that harvesting dormant or dead biomass can produce the following benefits:

- Can be used for electricity, heating, cooking or transportation (ethanol).
- Is renewable energy that can produce no net increase in global warming. (Carbon dioxide produced when fuel is burned can be removed from the atmosphere by another plant.)
- May store large amounts of carbon in plant roots, pulling further carbon from the atmosphere.
- Produces smaller amounts of nitrogen and sulfur oxides (both sources of acid rain) when burned for electricity.
- Reduce erosion.
- Could be a profitable farm crop.


Recent information from ONRL suggests producing ethanol from switchgrass and biomass can produce over 200 percent more ethanol than from corn. The conversion of biomass to ethanol is being improved. Using biomass for ethanol would mean we could produce both food and fuel.

Another benefit of using switchgrass and other grasses for biofuels is carbon sequestration, the process of removing carbon dioxide from the air to be converted into plant tissues and storing

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the excess carbon in the roots and soil. Grass has been shown to be the most efficient group of plants for carbon sequestration. This means using grass for biomass has a high potential to improve the environment, as well.

Wouldn't it be nice if there were an organization to promote grasses and biomass for environmental purposes?

For more on switchgrass and biomass, see Oak Ridge National Laboratories (<http://bioenergy.ornl.gov/>) and additional information at the Grass By Design [www.grassbydesign.com/TDA/tda.htm](http://www.grassbydesign.com/TDA/tda.htm). 

Next time, a look at the official native grass of Texas: sideoats grama.

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Photo by Mike Haddock



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Figure 1. Switchgrass in late summer (right) and in the winter.