

# Biomass: Native Grasses in Tribal Agriculture Encourage Energy Sovereignty



## Purpose

For thousands of years, native prairie was an important feature on the landscape. Along with forests, *prairies are an essential ground cover protecting soil and water and providing habitat*. Humans have altered the landscape at a massive scale, destroying millions of acres of prairie. This resulted in erosion, habitat destruction, and water pollution. A well-known historical period, The Dust Bowl, was the result of prairies being replaced by agriculture. Locally, the agriculture industry contributes more than 250,000 pounds of phosphorus and 100,000 tons of sediment per year to the Bay of Green Bay, causing algae blooms, anoxic conditions, and fish kills. Reestablishment of prairies will bring back that important ground cover and keep the soil in place. In addition to preserving soil, grasses can provide another human need - energy! Native grasses and trees offer an opportunity for *Tribal energy sovereignty*.

## Environmental Services

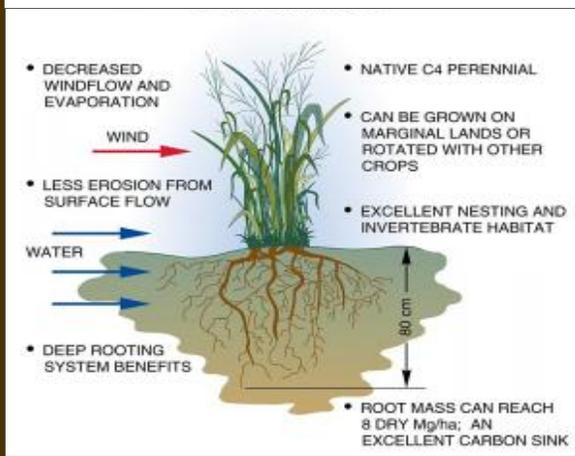
The thick root mass of grasses give stability to the soil while the stems above ground protect the surface from driving rains and flooding. These traits have a tremendous impact, minimizing soil erosion and nutrient pollution. Prairies also minimize stormwater impacts by slowing the water down and encouraging infiltration. Habitat for wildlife and songbirds also provides for biodiversity and beautiful



Switchgrass stand

landscapes. Another valuable trait of an energy crop is a greater tolerance for wet soils where corn and soybeans tend to fail. The occasional mowing or controlled burn will help to keep prairies healthy and vibrant. Native grass species are perennial, which means the prairie renews itself every year, eliminating the need to plant year after year. Refer to Figure 1.

Figure 1



## End-use Potential

In addition to the environmental services they provide, native grasses can also serve a purpose after they are harvested. Straw production can be used as bedding for cattle, as garden mulch, or in compost. Another overlooked opportunity is energy. The British thermal unit (Btu) is a measure of energy and is used to

determine space heating needs. Table 1 shows a comparison of different biomass materials; grass has comparable energy content to these other wood materials. This energy crop can be easily adapted to an agricultural field that is managed with the same equipment that any farmer would use on a food crop.

Table 1

<u>Fuel</u> (oven-dried)	<u>Energy content</u> (Btu/pound)
wood (oak)	9,500
wood (maple)	8,400
Green wood	4,300
Native grass	8,500

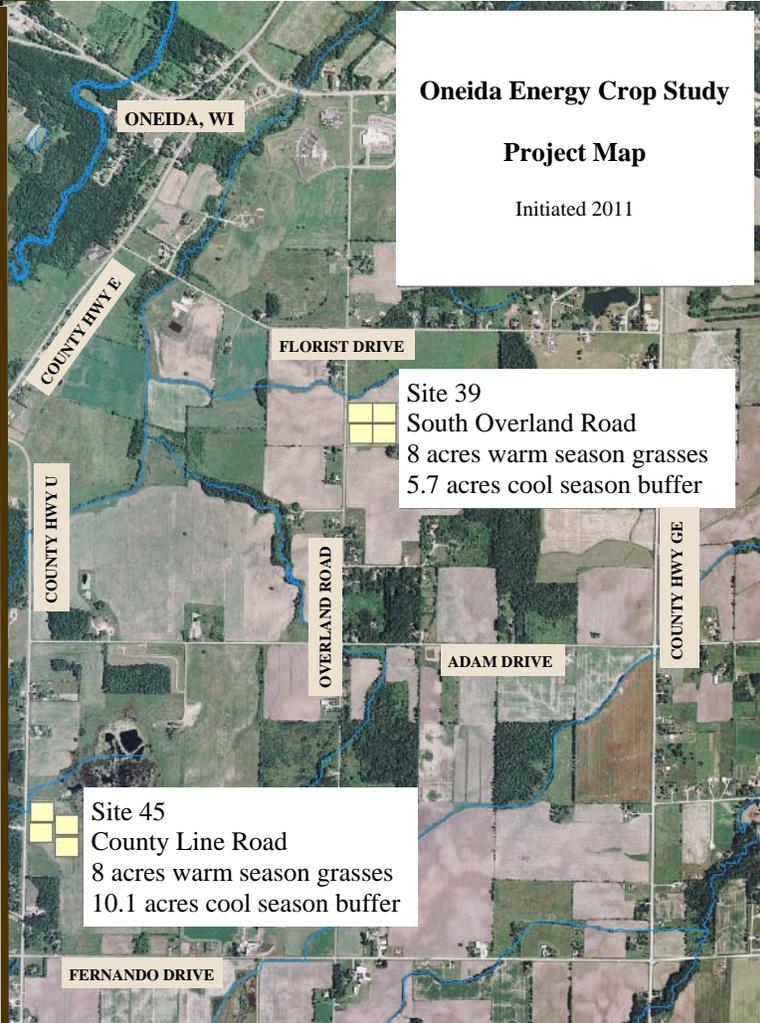
## Partners

Oneida Tribe Energy Team; Oneida Tribe Energy Development Program; University of Wisconsin Green Bay; U.S. Department of Energy; Oneida Land Commission; Land Office; Oneida Farm; Environmental Division; UWM, WDNR, USDA-NRCS



### Oneida's Energy Crop Study

In 2011, Oneida Tribe and UWGB partnered to initiate a ten-year energy crop study to make some determinations about growing characteristics, opportunities for bioenergy development, and environmental benefits. Working with the Land Commission, we were able to establish 16 acres on two different fields located on County Hwy U and on Overland Road. UWGB has been monitoring a variety of natural processes, including groundwater, soil chemistry, biodiversity, and carbon sequestration.



#### Oneida Energy Crop Study

#### Project Map

Initiated 2011

Site 39  
South Overland Road  
8 acres warm season grasses  
5.7 acres cool season buffer

Site 45  
County Line Road  
8 acres warm season grasses  
10.1 acres cool season buffer

2014 marks our 4th growing season. Establishing the grass has been challenging, but nonetheless successful - 75% of the site contains a healthy population of native grasses with new growth coming each year. We expect to have our first harvest in fall, 2014. At that time we will document production to forecast energy availability. Other end-use research includes:

- Moisture content,
- processing the material,
- appliances that can burn grasses,
- ash content.

Being a research and development project; we expected to be confronted by such questions. Native grasses are a local energy source that offer a wide variety of social, economic, and environmental benefits for the Tribe. We are investigating ways to harness this energy source.

#### References

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Oneida Environmental, Health & Safety Division

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June, 2014