

FREQUENTLY ASKED QUESTIONS REGARDING NAWG'S MANDATE EXPANSION TO COVER BIOMASS ENERGY CROPS

Updated as of Dec. 12, 2006

Why are you doing this?

There will soon be an incredible demand for feedstock to supply an emerging cellulosic ethanol industry. While a portion of this feedstock can be met with existing agricultural residue such as wheat, rice and barley straw, corn stover and sugarcane bagasse, a larger portion is expected to be supplied through dedicated energy crops such as switchgrass. While switchgrass once grew as a native grass across much of North America, very little is currently under cultivation. And although there are many voices supporting other parts of the cellulosic biofuels value chain, there are few focused on growing the feedstock. This is one reason why other industry partners have asked NAWG to step up and provide strong, coordinated leadership and issue advocacy on a local and national basis for those who will produce the critical feedstock needed for this 21st century industry.

What is cellulosic ethanol anyway?

Cellulose is the fiber contained in agriculture residue such as wheat straw, corn stalks, rice and barley straw, cotton trash wood chips, other grasses like switchgrass and even municipal solid waste. The cellulose fiber is broken down by enzymes into sugars which are then fermented and distilled into ethanol.

Are you going to change your name?

This will depend on whether the NAWG Board feels this is an appropriate step when by-law changes to conform to the Board's October direction are made in January. Even if the NAWG name is modified, wheat will remain prominent in both our name and our mission.

Are your states doing this? How many? In what way?

The NAWG Board of Directors is comprised of two representatives from each member state. Currently, 19 states participate as dues paying members. Each state association is governed by state-specific bylaws and articles of incorporation.

Every state association, under the direction of its governing body, is likely to evaluate the recent action taken by the NAWG Board of Directors of incorporating a biomass initiative. As growers begin to examine the opportunities available to them for the harvesting of crops for energy production, they will no doubt raise questions within their respective state association to determine whether or not opportunities exist locally. The active engagement of producers at the grass roots level will determine the interest and direction taken by each state association.

What does this mean to wheat?

Wheat will continue to be grown and harvested and efforts to achieve yield, quality and variety improvements will continue, just as has been done for the past 10,000 years. However, NAWG represents the grower not the plant. Any action that can be taken to expand grower opportunity and add value to growers' operations will continue to be pursued aggressively.

How do you grow switchgrass? Where can you grow it? What does it require?

Switchgrass (*Panicum virgatum*) is a prairie grass native to the United States and known for its hardiness and rapid growth. Switchgrass is a perennial grass that can be grown in 10-year rotations and harvested annually in the late fall. Because it is native, switchgrass is resistant to many pests and plant diseases and is capable of producing high yields with relatively low inputs of fertilizer or crop protection chemicals. The switchgrass root system, as large or larger than the above ground growth, stores a large amount of atmospheric carbon, improves soil quality and limits erosion. It is naturally tolerant of poor soils, flooding and drought and these natural traits are expected to be enhanced through genetic improvements. Switchgrass can be harvested with presently-available equipment, which wheat growers may currently own.

How are the economics?

At this point, the best view of the economics of the cellulosic ethanol industry come from our industry partners like Ceres and Iogen. Ceres estimates that biomass crops baled and delivered would fetch about \$40 a ton. Iogen, on the other hand, looks at biomass prices in the windrow and expects to pay about \$15 a ton for straw behind the combine on the ground. When you account for baling and transportation costs – which are not included in the Iogen figure but are in the Ceres figure – these numbers are more consistent than they at first appear.

It is important to remember that the cellulosic ethanol industry is in its early stages. The economics of this equation will change and shift depending on factors that traditionally affect agriculture – region, cultivars, cost of inputs and ag-market forces – in addition to other, non-traditional factors like close proximity to a cellulosic ethanol plant, advanced technology in dedicated energy crops and non-agricultural market forces like the price of oil.

The equipment used would generally be the same as that for harvesting hay and would include a hay swather or sickle bar mower.

Can I do this on CRP?

This is an approved use under the 2002 Farm Bill. Section 1232 of the Farm Security and Rural Investment Act of 2002 provides: “...the Secretary may permit, consistent with the conservation of soil, water quality, and wildlife habitat (including habitat during nesting seasons for birds in the area) - (A) managed harvesting and grazing (*including the managed harvesting of biomass*)...” (emphasis provided). Pursuant to this authority, switchgrass has been recognized as an approved cover crop for land protected under the Conservation Reserve Program. Utilizing CRP land to assist in establishing stands of energy biomass crops is just one option, not the only option. For those areas where CRP cannot sustain an energy biomass cover crop, or for those areas where not much land is enrolled in CRP, we believe a transition assistance program should be made available as needed or requested to help establish stands of biomass energy crops.

How does wheat straw supplemented by switchgrass compare to corn stover?

A biorefinery can process different feedstocks and when more than one feedstock is used, wheat straw and switchgrass are an ideal combination. In wheat growing areas with limited available straw, the inclusion of switchgrass can make a marginally attractive location very appealing to biorefinery investors.

Corn stover works as well as wheat when dry and delivered to the biorefinery. However it is somewhat challenged because it is not possible to consistently harvest it dry enough for storage (20 percent moisture content and preferably 18 percent or less) in most corn growing regions given the late harvest and large stalks. Wet storage works but the moisture content must be around 60 percent so a lot of water will be transported, increasing the delivered cost over wheat straw, which is generally much easier to harvest and store.

Corn stover is by far the most abundant crop residue and will someday be in extremely important biomass. However, it is the industry's expectation that wheat straw supplemented with switchgrass will be the early combined feedstocks of choice.

Aren't the enzymes needed for the production of cellulosic ethanol very expensive?

Enzyme costs are now much lower than a few years ago. Novozymes says their enzymes cost less than 20 cents per gallon of ethanol produced. Iogen's demonstration plant feedstock to date is run only on wheat straw and some barley straw, hence their most advanced enzymes are for wheat straw.

There are no enzymes that are specifically designed for corn that have been tested in a demonstration facility the scale of Iogen's. Corn stover specific enzymes are not ahead technically and are probably a bit behind those designed for wheat straw.

What kind of farm supports will there be for biomass growers?

Since switchgrass or other biomass crops may take several years from the time of initial planting until a commercial harvest, some type of transition program may be needed to cover whatever loss of revenue may occur in the initial years. This is one reason the utilization of Conservation Reserve Program (CRP) land is being considered as an opportunity to establish stands while continuing to receive CRP rental payments to make up for lost revenue. As revenue is realized from the harvest and sale of the biomass crop, the CRP rental payment would be reduced commensurately.

In the medium to long term, it is hoped that the marketplace will provide sufficient economic incentives to make direct farm support programs unnecessary, although those who grow biomass crops should still be eligible to participate in applicable conservation programs and have access to crop insurance products.

When are they building plants? Where?

Iogen has secured under 10-year contracts sufficient straw to meet the requirements of their planned commercial biorefinery. The planned location is just south of Idaho Falls where they hold an option on land for the plant. Construction is expected to be underway in late 2007.

Feedstock availability plus community push to attract investors will determine where plants will be built. It should also be pointed out that because biomass is very freight sensitive, each plant will only draw material from a radius of about 60 miles.

What if they don't build the plant?

As a general rule, the owner/operator of a potential cellulose ethanol facility will want to have a secure supply of feedstock identified and perhaps placed under pre-production

contract prior to construction of a refinery. This is one reason why initial refining facilities will look at existing agriculture residues such as wheat straw and, where existing feedstock resources aren't sufficient, will want to supplement existing feedstock with additional biomass crops.

For a dedicated crop such as switchgrass, the two year establishment period nicely coincides with the time it takes to construct a biorefinery. Thus growers can seed their switchgrass once they see that the plant is actually under construction.

What about those loan programs?

The Energy Policy Act of 2005 contained authorization for the Department of Energy to offer guaranteed loans for the construction of cellulosic ethanol refining facilities. This is widely seen as one policy action that could kick start the commercial development of a cellulose ethanol refining industry in the United States. DOE has issued solicitations for the loan guarantees for submissions to be received in late 2006. There is also a grant program offered that can be used in conjunction with the loan guarantee. NAWG, Iogen and others are working with key Members of Congress to make sure funds are appropriated for this program.

Who are the other major players besides Iogen and Ceres?

There are several other players in biorefinery technology. Companies including Abengoa and Celunol have demonstration facilities under construction similar in scale to the one Iogen has been operating for more than two years.

Is this just another passing fad that will go nowhere?

A commercialized cellulosic ethanol industry will be developed for a number of reasons. First, the United States is currently facing a crisis of energy security, acknowledged even by President George W. Bush in his 2006 State of the Union address. Cellulosic ethanol will also have significant benefits to the agriculture industry and the environment. There is also very strong, bipartisan support to make this industry happen. Finally, with players like Shell and Goldman Sachs heavily committed financially there is every reason to believe that cellulosic ethanol is a go.

How do you lobby for a group of people who don't yet exist?

The people exist. The crops on a commercial scale may not yet exist, but this is again another reason NAWG has taken the direction to expand its advocacy mandate to include growers of biomass energy crops. We intend to provide the information, education, policy and other real world tools our present and future members need to make informed and economically sound choices about biomass growing.

What resolutions are you lobbying for?

Without precluding any specific recommendations that the NAWG Board of Directors may yet take in this regard, the following is the original policy statement the National Association of Wheat Growers adopted at their initial organizing meeting in April 1950, with the new advocacy mandate for biomass energy crops added in brackets:

“It shall be the policy of the National Association of Wheat Growers to promote the production, marketing, and utilization of wheat [and biomass energy crops] in the United

States to the end that producers may maintain a permanent and stable wheat [and biomass energy crop] production...”

We will support all resolutions in the advancement of this broad goal.

How will you organize growers in states where wheat doesn't have a big presence?

Our current wheat state executives and staff may be able to serve as mentors to interested, non-wheat states by assisting with the technical and other logistical steps necessary to form a state association. As mentioned above, it would then be up to the NAWG Board to approve and accept any charter and by-laws for a new NAWG member state.