

**Renewable  
and Alternative  
Energy**

**ENERGY UPDATE**

May, 2011

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**UPCOMING EVENTS**

- Energy Displays at Timber 2011 Show  
June 3-4, 2011  
Penn State Ag Progress Days Site, Pennsylvania Furnace, PA  
<http://agsci.psu.edu/events/timber>
- Bioenergy Life Cycle Analysis Short Course  
July 27-28, 2011 at Penn State Hotel and Conference Center  
<http://www.bioenergy.psu.edu>
- Energy Displays at Ag Progress Days  
August 16-18, 2011  
Penn State Ag Progress Days Site, Pennsylvania Furnace, PA  
<http://agsci.psu.edu/agd>

**LINKS**

- [PSU Renewable & Alternative Energy](#)

**WELCOME!**

Innovations often come from unexpected places, and while advanced study and laboratory research are vital to the growth of alternative energy, it's fun to see some of the clever work that is being done in barns and garages across Pennsylvania. Who knows - the crazy idea you've been toying with might be the next big thing.

One example of individual innovation is Tom Emero of Beaver Energy, who I met at this year's Pennsylvania Farm Show. Tom has been building and racing wood-fueled cars for several years. Yes, I said "wood fueled". He takes his machines out to the Bonneville Salt Flats in Utah to compete in annual races there, and recently set a "world record" for wood powered racing. Check out his web site (<http://www.beaverenergy.com>) to learn more - but not until you read over the informative and enjoyable articles in this month's newsletter. :)

Pennsylvania has a rich heritage of innovation and energy, including such diverse products as the Conestoga Wagon (real bio-fueled transport, some might say), the nation's first commercial atomic power plant in Beaver County, and the first commercial oil well in Titusville. Pennsylvania's wind power heritage reaches back to 1746, when the state's first windmill was built on an island in the Delaware River. What will the future bring?

If you have a unique renewable or alternative energy project that you've been working on, please let me know about it. I'd love to learn more about ongoing projects, and will try to feature some of them in upcoming newsletters.

Cheers!

Dan Ciolkosz  
Newsletter Editor

## Hybrid Willow at This Year's Bioenergy Crops Demo

The Penn State Energy Crops Display Area is in its third year, and will include a variety of new and familiar crops that we will be testing. The site, north of the Penn State campus on Fox Hollow Road, will include annual crops such as canola and camelina, and the continuation of our experiment with pesticide-free establishment of switchgrass. However, the most unique new addition this year will be the short rotation woody crop (SRWC) plots.

Hybrid willow, donated by AA Willow in Fredonia, New York, will be grown side by side with plots of native American chestnut and hybrid poplar. These three species are some of the most promising options for woody bioenergy production in Pennsylvania. People will be able to see firsthand how they look and grow in a field setting. The willow and poplar are started by planting live stakes, the chestnut from nuts that were started in pots in the greenhouse.

Extension Forester David Jackson is overseeing the establishment of the plots, along with Don Rill of Penn State's Farm Services Office.



With a little TLC, these willow cuttings will soon be a harvestable crop.

Hybrid willow has been receiving a great deal of attention lately because of its high growth rates and resistance to insect and disease problems. Chestnut is another good candidate. It has tremendous resprouting ability and also the benefit of producing nuts that are beneficial for wildlife. Poplar, another fast grower, was researched extensively at Penn State in past years and may be a valuable crop. "The ideal short rotation woody crop plantation may involve a mixture of several species" according to Jackson.

"We expect that they won't grow a great deal in this first year as it takes a year for them to establish a root system" says Jackson, "But within 4-5 years we should have a crop we can harvest."

The bioenergy crops display is open to the public during daylight hours - visit the display's web site at <http://extension.psu.edu/energy/field-crops/bioenergy-crops-demonstration-site> for more information.

Dan Ciolkosz, Department of Agricultural and Biological Engineering.

## Bioenergy Crop Short Course a Success

### Standing Room Only at Winter Crops Event

The Winter Crops for Bioenergy and More short course held on the Penn State campus on March 29, brought together entrepreneurs, scientists, students and government agency personnel to discuss the exciting potential of several emerging bioenergy crop opportunities in the region. A common theme apparent in all of the presentations was the need to develop bioenergy crops that contribute to low carbon fuel production, reduced environmental impact from agriculture, value added co-products, diversified rural energy production and economic development opportunities.

The focus of this course was the potential of winter crops and double crops that could increase the potential biomass production from the landscape while reducing impacts such as soil erosion, and nutrient leaching and runoff. Tom Richard, Director of Penn States PSIEE, and I both gave examples of how this could occur with crops like winter rye and barley in the region. The next presentation in the program described the OSAGE Bio Energy barley based ethanol plant in Virginia, which is nearing completion and their vision which includes a \$170 million investment in a 65 million gallon ethanol plant. In addition to the ethanol, the project will encourage the planting of winter barley cover crops throughout the region, will produce 250 thousand tons of barley protein meal animal feed and 65 thousand tons of barley pellets annually. In addition the plant will capture 170 thousand tons of carbon dioxide. This was a great example of a potential cover crop based bioenergy system that is coming to fruition in our region.



Our next presentations focused on the production and use of winter canola on the Penn State campus. In this system, Penn State scientists have been growing a winter canola cover crop, using it as a straight vegetable oil fuel, and producing a value

added protein meal for livestock feed. In addition the project has developed the opportunity to pursue use of cold pressed canola oil for food use- a potential alternative enterprise. Another interesting oilseed featured in the program was camelina, evaluated by a group of Penn State extension educators and faculty. Camelina is an oilseed that produces an oil that is high in omega-3 fatty acids. The oil is being used as a feedstock for jet fuel in some applications, and can also be a biodiesel feedstock. Camelina meal has value as a feed for chickens that produce heart healthy, high omega-3 eggs or meat. Dr. Paul Patterson described his research with poultry in feeding camelina meal and it's potential. If adopted, the meal could have significant value and camelina could become a significant crop in Pennsylvania, especially if it could be double cropped following wheat in some areas of the state.

The program included three crop producers who described some of the value added opportunities they were involved in with these crops, canola as a cover crop, camelina as an oilseed and barley as a feed crop. The final two presentations of the day focused on methods of quantifying and monetizing the benefits of cover crops and low carbon biofuels. Dan Dostie from NRCS reviewed how cover crops can reduce the erosion associated with current cropping systems. Dan showed that adding barley to a no-till corn/soybean rotation could reduce erosion by over 1.5 tons per acre. Our final presentation focused on a Life Cycle Analysis of an example winter crop bioenergy system. In this presentation, Dr. Sabrina Spataro from Drexel University reviewed the LCA process and shared her preliminary conclusion that barley based ethanol would have a 69% reduction compared to gasoline and that it could potentially qualify as an advanced biofuel.

The event showcased some exciting opportunities for sustainable biofuel production in the region, each with value added feed or fuel co-products. Presentations for the event are located on our short course website: <http://bioenergy.psu.edu/shortcourses/wintercrops.asp>

Greg Roth, Department of Crop and Soil Sciences

## Timber 2011 to Include Energy Display

### New Feature for Popular Show

Timber 2011 will be held on June 3d and 4th this year at Penn State's Rock Springs Agricultural Research Center. Thousands of foresters, land owners, and the general public are expected for this combined educational and trade show.

If you are planning to attend, be sure to stop by the "College of Agriculture" building to see the Renewable and Alternative Energy display. Experts will be on hand to answer your questions about renewable energy and point you to some of the outstanding resources available from Penn State Extension. Given the show's focus, much of the energy display will be devoted to wood-based energy, but people will still be on hand to answer questions about energy efficiency, energy crops, and other energy topics. For more information on the Timber 2011 show, visit the event website at <http://agsci.psu.edu/timber>

Hope to see you there!

Dan Ciolkosz, Department of Agricultural and Biological Engineering.

## Using the New Social Networking Technologies for Energy Extension

### What does the Future Hold?

Facebook, Twitter, Blogger...we know they're out there, and many people use the technologies for this new thing called "social networking"...but does it really have anything to do with Extension?

In the long run, we're not sure, but current efforts give us a least a hint that the potential of these networking technologies is big, even for dissemination of professional information. For instance, the Nature Conservancy has a Facebook page that currently has 291,182 "fans". That means that every time the Nature Conservancy posts something on their Facebook page, that many people see it on their Facebook "News Feed" page, which is the first thing most people see when they check their Facebook. Penn State Ag Sciences, in fact, has a Facebook page with 2,554 fans...are you one of them? We thought we'd give it a try...so Penn State Renewable and Alternative Energy now has its own Facebook page at <http://www.facebook.com/pages/Penn-State-Extension-Renewable-and-Alternative-Energy/118021388281114?ref=ts>. As of press time, we have 5 fans! It's a start.

But the real power of Facebook is the way it ties folks together.

For example, you can invite your Facebook friends to become "fans" of the site, and they can invite their friends, and on and on. With all the interesting things we're working on these days, this could become one of our primary vehicles for publicizing the "value proposition" of our work for PennState Extension. And we can extend that even further with the other tools. By joining Twitter, we can begin to "Tweet" our interesting thoughts and observations to others in real time, such as Greg Roth does at <http://twitter.com/#!/gregroth1>. All of us who "follow" Greg's tweets know in real time where he is and what he's up to (if he wants us to know...). Twitter

THURSDAY, APRIL 28, 2011

#### Woody Biomass for Renewable Energy



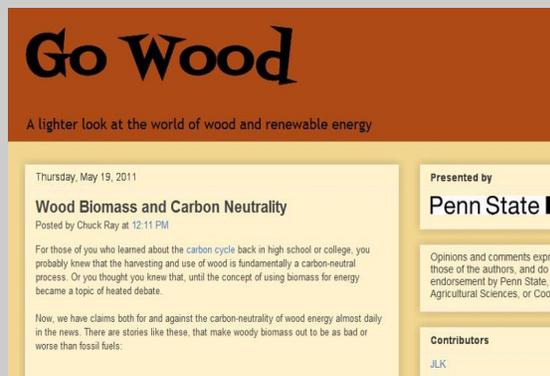
Came across a couple of stories related to using wood for energy. I thought I would share them with my readers. Pennsylvania has tremendous potential in this area not only to provide low grade wood from our forests but also to grow more short rotation woody crops on marginal crop land. Essentially we are looking at using woody biomass to produce heat and power through direct combustion. This is a great option for small businesses, hospitals, schools and government buildings.

#### Is Woody Biomass an Economic Elixer?

(Beaverton Valley Times, April 21, 2011)

To hear some tell it, using woody biomass to make energy represents a

and Facebook also give us a way to publicize our more rigorous information efforts, such as papers, fact sheets, blog postings, conferences and short courses, and web pages.



Dave Jackson has been blogging on forestry issues for several years now at <http://centralpaforest.blogspot.com/>, and I recently started blogging at <http://gowood.blogspot.com/>. By combining emails, tweets, and Facebook postings about each blog posting, Go Wood has received 32,391 views in just 4 ½ months. For some of you that's not a big deal, but for a wood products extension specialist used to toiling in anonymity for most of my life, I feel like an American Idol!

Now, everytime we post something on our Extension blogs, or on the R&AE website at <http://extension.psu.edu/energy>, or on our individual PSU web pages...or want to advertise our upcoming programming, we can advertise it for free courtesy of Facebook and Twitter, or any of the other networking technologies.

As social media continue to develop, I suspect that these efforts will really increase your access to practical, valuable real time information that can help you do more with your renewable and alternative energy efforts.

[Chuck Ray, School of Forest Resources](#)

## About Renewable & Alternative Energy Extension

For more information on Cooperative Extension's Renewable and Alternative Energy Resources at Penn State visit our home page at <http://energy.extension.psu.edu/>

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