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UPCOMING EVENTS

Millin/Juniata Energy Information Night

March 22, 2011 07:00 PM to 08:30 PM

East/Waterford Tuscarora Crang

<http://extension.psu.edu/energy/events>

Stretching your Company/Organization Energy Dollars

March 29, 2011 at Penn State New Kensington.

<http://extension.psu.edu/energy/events>

Winter Crops for Bioenergy and More - Short Course

March 29, 2011 09:00 AM to 04:00 PM

Central Pennsylvania Convention and Visitors' Bureau, State College PA

<http://extension.psu.edu/energy/events>

Energy Efficiency for the Tree Fruit Industry - one day workshop.

May 2011 (day tba)

Penn State Fruit Research Station, Biglerville, PA

<http://extension.psu.edu/energy/events>

LINKS

[PSU Renewable & Alternative Energy](#)

[Coping with High Energy Prices](#)

[Biomass Energy Center](#)

WELCOME!

Spring is starting to show its face in the Keystone State, as bulbs begin to push out of the ground and birds return from their winter holiday. I don't know about you, but I am very happy to see things warming up again.

If you travel around the commonwealth right now, you may notice more fields with green cover crops like the photo at the top of this newsletter. If bioenergy opportunities continue to grow, we may see continued "Growth" of these crops in the coming years. Our winter crops short course on March 29th is a great chance to learn more about this exciting opportunity.

The alternative energy credit market is showing signs of emergence as well, and while it may not be connected to the return of spring, this month's newsletter features a fascinating analysis of the credit market in the Keystone State.

But wait - that's not all that's happening these days in the Renewable and Alternative Extension program. Penn State Extension is putting on a variety of short courses, webinars, workshops, and demonstrations that are designed to help the people of Pennsylvania take advantage of renewable and alternative energy in ways that make good sense and strengthen our economy.

If you're wondering about the photo of the wind turbine that is adjacent to this welcome note, I'm afraid we don't have an article on wind energy this month, but stay tuned for future info about the "wind for schools" program that is ramping up in Pennsylvania.

I hope you'll enjoy reading this month's newsletter; please visit us online (<http://energy.extension.psu.edu>) to find out more about upcoming events and activities.

Cheers!

Dan Ciolkosz
Newsletter Editor
Renewable and Alternative Energy
Penn State Extension



Winter Crops Short Course March 29th

New Opportunities for Bioenergy Production

Winter cover crops have the potential to be new bioenergy feedstocks, add diversity to our cropping systems, and help protect the soil over the winter. These winter cover crops will be featured at an upcoming short course that will be conducted on March 29 at the Visitors Center at Penn State from 9 am to 4 pm. The goal of this one day workshop is to discuss the potential of several cropping options and review the tactics for assessing their potential.



One of the crops to be discussed will be winter barley. A new market for winter barley is developing for ethanol in Virginia at the Osage Bioenergy. Representatives from Osage will discuss the market, its potential for Pennsylvania and the barley protein meal coproduct from the plant. Another crop is camelina. Penn State experts will discuss the culture of this crop and its potential in cropping systems around the state and the role it could play in layer rations. Another crop is winter canola and its potential use as an on farm vegetable oil or biodiesel feedstock. Penn State scientists will review the results of their on going demonstration in this area.

The workshop will also address how to estimate the erosion and conservation benefits of winter crops as well as how a life cycle analysis of the carbon footprint is estimated. A producer panel will round out the day sharing some experiences growing these crops in the field

This will be a great opportunity to build your knowledge base in the potential of winter crops for bioenergy and other value added purposes how it relates to practical management tactics. The conference registration is \$35 and includes lunch. Registration information is available via phone at 877-489-1398 or online at <http://www.bioenergy.psu.edu/>

Greg Roth, Department of Crop and Soil Sciences.

Wood Energy Webinars Gaining Momentum More Speakers Scheduled for Popular Webinar Series

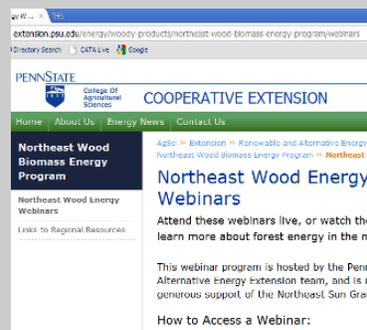
Interested in learning more about wood energy?

The monthly Northeast Wood Energy Webinar Series has some exciting upcoming webinars you don't want to miss. These presentations feature top experts in wood energy talking about the critical issues and opportunities that the industry is facing in the Northeast US.

In March, Brain Kittler, Project Director at the Pinchot Institute discusses Biomass Carbon Accounting: Implications for Policy and Climate. In April will feature Dean Current, University of Minnesota Department of Forest Resources talking about Woody Biomass in Minnesota; Opportunities for Income and Environmental Benefits. Paul Frederick, from the Vermont Department of Forestry speaks in May on Trends in Wood Chip and Pellet Supply. In June Tim Volk, State University of New York College of Environmental Science and Forestry discusses Short Rotation Woody Crops in the Northeast. July's speaker will be Charles Canham of the Cary Institute of Ecosystem Studies and Thomas Buchholz of University of Vermont discussing results from their recent report entitled, Forest Biomass and Bioenergy: Opportunities and Constraints in the Northeastern United States.

The webinars are held the last Friday of every month at 11am eastern, and are free to the public. For more details visit: <http://extension.psu.edu/energy/woody-products/northeast-wood-biomass-energy-program/webinars>

Michael Jacobson, School of Forest Resources



The Penn State Biomass Harvester New Needs Foster Innovation

Equipment to harvest a research crop is generally not what you would call "typical". If that research involves harvesting biomass it adds additional complications because not many commercial harvesters are designed to handle grasses that are up to 14 feet tall. This was the dilemma that faced Penn State researchers as they became involved in biomass research. After experimenting with several harvesting units and various modifications to those units we decided to design and build a harvester that incorporates positive attributes from several harvesters into a single machine.

The College of Agricultural Sciences and individual researchers pooled resources and began building what we now called the Penn State Biomass Harvester. The base machine is a New Idea Uni-System forage harvester with a weigh system added and a modified cutter head to harvest tall grasses. The harvester removes an 8 ft wide swath of biomass, chops it and blows in into a weigh basket on the back of the unit.



The self propelled harvester, with a body width of 8 ft, drives only in the path where the biomass was removed. This feature of the harvester reduces the land area needed for a research project by enabling different research treatments to be grown adjacent to each other and harvested individually. Reducing the land area reduces the variability in the research and maximizes the ability to detect treatment differences.

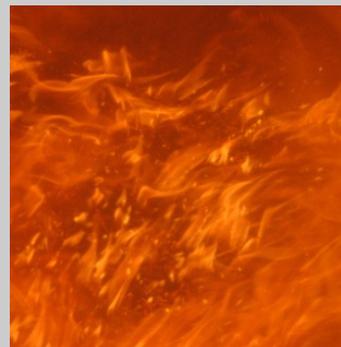
Having this harvester enhances Penn State's competitiveness in biobased energy research and our ability to provide Pennsylvanians with information about local potential of biobased energy plant species. In addition to that, the experiences gained with this device may lead to improved harvesting equipment for farmers in Pennsylvania.

Marvin Hall, Department of Crop and Soil Sciences.

How Cold Was it? Reflections on the Past Winter

Now that winter is officially over, it is a good time to look back at the heating season. Were your winter heating bills higher this year? If so, we probably can't blame the weather. According to data from the National Weather Service, the 2010-11 winter was only slightly colder than average in the keystone state.

The severity of a winter heating season can be measured by the number of "heating degree days" accumulated at a location over the course of a winter. The number of heating degree days for a location is equal to the number of days when the temperature is cooler than a "base temperature" (usually 65 degrees F) multiplied by the number of degrees cooler than the base. For example, if the average temperature on a day is 55 degrees, that day would have 10 degree days (65 minus 55 equals 10). If the average temperature on the next day is only 30, that day would have 35 degree days (65 minus 30 equals 35). To find the number of degree days for an entire heating season, simply sum up the degree days for each day over the course of the winter.



More heating degree days than average means a more severe winter, which usually means you'll be using more heating fuel to keep your home warm. Fewer heating degree days than average means that the winter has been milder than usual, and that you probably used less heating fuel than average. In Pennsylvania, the average annual number of heating degree days varies widely depending on location, from as low as 4,500 in the southeast to over 8,000 in the northern tier.

This past winter, heating degree days for the entire season have been a little above average. For example, Harrisburg has recorded 4,016 heating degree days in the 8 months since last July, just 2% more than average. Williamsport, by comparison, has seen a winter that is almost exactly the same as the long term average. In general, the heating degree days for locations in Pennsylvania were about 0 to 5% higher than average, which means that heating requirements were only slightly higher than normal.

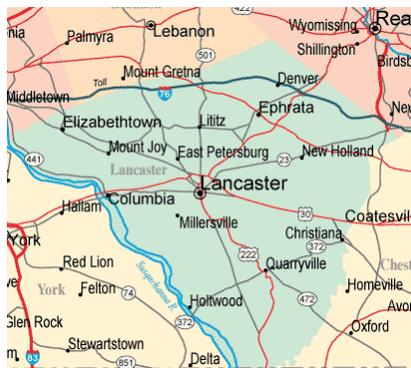
If you found yourself paying a lot more than usual for your heat this winter, it probably had more to do with rising fuel prices than with cold weather. For example, prices of home heating oil during the past six months (according to the New York Mercantile Exchange) have been steadily rising, with current prices about 1.5x higher than they were last summer. Prices of natural gas, however, have jumped around during the winter without showing a steady trend up or down. Will these trends continue? It's hard to say.

Now that outdoor temperatures are warming up nicely, it's easy to forget about winter heating, but this is actually the perfect time to start thinking about next winter and making plans for how to control your heating costs. Think about switching to a lower cost fuel, putting in a higher efficiency heating system, or increasing the insulation in your home now so that you can reap the benefits when things start to get cold again this fall. For more helpful hints on home energy efficiency, check out the article on this topic in the November 2010 issue of this newsletter (available online at <http://extension.psu.edu/energy/news/newsletters>).

Dan Ciolkosz, Department of Agricultural and Biological Engineering

Renewable Energy Breakfast, Lancaster Style

Successful Event Begins its Second Year



Penn State Extension and the Lancaster County Center of Excellence in Renewable Energy are marking their second year of quarterly breakfast meetings with an outstanding slate of field tours to local renewable energy sites.

The event will start with a hearty breakfast and featured speaker Marcus Sheffer of the Energy & Environmental Consultant @ 7group. He is a nationally recognized expert on green buildings, and will be speaking on Energy Efficiency in Commercial Buildings.

After that, the group will board a motor coach at 8:15 a.m. and spend the morning touring the following sites:

- o **Armstrong World Industries** for a brief walking tour of the LEED-EB Platinum Certified Corporate Headquarters Building
- o **Wind Turbines** operated by the Lancaster County Solid Waste Management Authority (LCSWMA) in partnership with PPL Renewable Energy (PPLRE) and Turkey Hill Dairy.
- o **Frey Farm Landfill** to see how methane is extracted from the landfill and piped to area businesses.

Register early, because tour bus seating is limited. No carpooling will be permitted due to security measures at our tour sites. Cost is \$25 for the breakfast and/or tour. To register, contact Joyce Lenox at 717-735-0333 or jlenox@dejazzd.com.

Peggy Fogarty-Harnish, Penn State Extension, Lancaster County

Energy Credit Update

Growing Pains Raise Uncertainty in Energy Credit Markets

(For updates and program information, visit the AEC Program Website at <http://extension.psu.edu/energy/aec-program>)

Turn back the clock just five years and try and recall if you had ever heard of an Alternative Energy Credit (AEC), a Renewable Energy Credit, or a REC for that matter. These names all refer to a commodity representing the value of the attributes of Kilowatt-hours produced from Renewable, and in most cases Alternative Energy sources. Depending on your locale the nomenclature will change so players in this market have to be adept at juggling terms.

If this is starting to sound confusing hold onto your amp meter because it gets more complicated. In Pennsylvania, as in many states, there are three classes of AEC's. The preferred by design AEC is a Tier I credit of which there are two sub-classifications. The first is the Solar AEC (read gold standard) and the second being all other Tier I credits. This class includes generation sources like wind, biomass, and small scale hydro. Tier I credits other than Solar credits (because of a glut of pre-existing systems) are priced very low and the market as a whole isn't showing significant signs of life. Tier II credits on the other hand are a catch all classification far too complicated for this discussion.

Today the state of market development, or lack thereof, is focused on the Tier I market and in particular the Solar AEC. Rapid growth in solar generation capacity fueled by a 100 million dollar PA Sunshine grant program has added over 30 megawatts of capacity to the PA market in less than two years. That and an influx of credits from Solar generating systems located in other states that are registered to sell in PA has created a sort of Tsunami of credits looking for buyers. So at this point in time the installed capacity to produce Solar credits exceeds the demand from the buyers for these same credits, who are the electric distribution companies regulated by PA's Public Utility Commission. Striking a balance as the PA Sunshine Grant subsidy (a onetime payment) dries up and the Solar credit, the proceeds from the sale of which extend over the useful life of the project, picks up the slack is the challenge.

At risk during this transition period are the businesses and jobs that were created to meet the demand for new capacity that Pennsylvania Alternative Energy Portfolio Standard law of 2004 requires and the PA Sunshine Grant invigorated. Fortunately the credit market, as immature as it is, exists. Time for equilibrium to be struck is likely all that is needed. The short history of the PA market has already shown a one sided roller coaster price curve. Beginning with 2008 at a peak price of \$350 per Solar AEC as the first four electric distribution companies in the state reported their purchases in September of that year. In 2009 with the inclusion of PPL in the market for the first time the curve trend was still strongly upward as prices as high as \$690 per credit were reported. Sadly missing is the next section of the roller coaster curve since 2010 reporting year data has not been made public by the PUC. Experience from the sale of credits by the Penn State Extension in Westmoreland County Aggregation Group estimates the number is likely around \$325. The curve, though, continues a downward trend with recent reports of prices as low as \$150 per credit. 2011 brought the requirement that the remainder of the Utilities not yet in compliance join the parade. The First Energy Companies, including the re named West Penn Power Company, and Philadelphia Electric are now required to comply for the balance of the year ending May 31 2011 and thereafter.

Officially as of June 1, 2011 the total game is finally on after more than six years of phase in. Starting June 1, 2011 the Solar AEC market can finally gain real momentum to support the addition of added generating capacity needed to meet the mandates in the AEPS law of 2004. The next length of track will likely start prices back on an upward incline toward market preservation and reach sustained peaks in excess of \$400 per credit. By the way, there are signs of life in the rest of the Tier I market too. This is evidenced by sale of over 1,000 credits by the Penn State Extension Aggregation Group in recent weeks. So stand your ground, and don't lose hope since markets traditionally correct on their own and the credit market seems not to be an exception.

Ed Johnstonbaugh, Penn State Extension, Westmoreland County

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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