Administrative Sponsors
Electric Power Research Institute
National Council of the Paper Industry for Air & Stream Improvement
Oak Ridge National Laboratory
USDA Forest Service

Short-Rotation Woody Crops Operations Working Group NEWSLETTER

Sustaining Sponsors
American Cyanamid Company
B. B. Hobbs Company
Boise Cascade Corporation
Drip-In Irrigation Company
Morbark Industries Corporation

Number four **February 1999**

IN THIS ISSUE

STEERING COMMITTEE MINUTES
MONDAY AUG 24, 1998
VANCOUVER, WA

Administrative discussions

Dues: Suggestion made to charge membership fee for the proceedings. In other words, the proceedings from the meetings are available free to members. Since we need to make membership a worthwhile venture, we should not put the proceedings on the Web Site, until shortly before the next meetings. The proceedings would be used as an advertising tool.

Tax ID number: Some institutions could not write a membership check without having one. Jim Shepard said that he would look into getting a not-for-profit recognition for the group.

Web Site: The Steering committee agreed that a simpler more direct Web Site location would be desirable. Lynn and Bob agreed to work on getting a more directly accessible Web site address. The address will be advertised in the next newsletter and on other related Web Sites. It was suggested that we have a counter on the web site.

Ed. Note: The new web address will be called WoodyCrops.org. It should be available soon.

Forest Service support: Bryce Stokes indicated that he was trying to drum up more Forest Service support of the SRWC-ORG. He was encouraging several different Forest Service Research Stations to contribute funds to the group.

Activity suggestions from Steering Committee

Maintain the web site: Web site should provide quick reference to who is doing what , such as irrigation studies, references to other relevant information and special reports. Web site should have a counter to monitor it's usage rate.

Keep a mailing list: Some debate about whether the mailing list should be on our web site for anyone to access or whether access should somehow be restricted. It was suggested that members be queried as to whether they felt comfortable about having their names openly available on the web site.

Produce a Newsletter: Frequency of at least 2 times per year. Keep newsletter on the web site and send out paper copies. A suggestion was made that we get some information from Brazil and Europe into the newsletter. Gail Simonds mentioned that Bill Hannon of Westvaco had just come back from Brazil and could be a good source of information.

Produce short executive summaries of research studies of interest to SRWC operations and publish in the newsletter.

Persuade companies and researchers to share anecdotal results of new methods in newsletter.

Organize technical committees around specific topics. Possible committee topics are: pesticide & herbicide regulations, nutrition, irrigation, harvesting, cultural practices. It was agreed that the Steering Committee would look for a champion for each area to form topical working groups, to accumulate information and to put notes in the newsletter. Volunteers for leadership of specific areas included Bruce Hartsough for harvesting, Harry Quick for egetation/pest control, Roy Merritt and Burt Aronoff for irigation, and Jon Johnson and Mark Coleman for Fertilization/Nutrition.

Ed. Note: Burt Aronoff volunteered to put a set of irrigation guidelines in the newsletter. This is part one. Part two part will be in the next newsletter.

Organize regional working groups to stimulate more frequent contact on areas of shared interest within a region.

Create chat rooms or bulletin boards for people to share information on operations topics.

Continue holding meetings every other year. The idea of holding the next worksship in New York with a focus on willow was well accepted. People enjoyed having the visitor from South Africa. It was suggested that we bring over 1 to 2 people from Europe to share their experiences with willow. Lynn Wright agreed to make that happen for the year 2000 meeting.

Persuade Morbark or other equipment manufacturers to provide demonstrations. Either use e-mail to inform SRWC-OWG members or provide list to manufacturers to use in advertising demos.

As a result of the Steering committee discussions, a long list of possible activities was provided to the members in attendance and they were asked to establish priorities. The results were as follows:

• Top priority (21 of 36 responses) – Publish timely summaries in newsletter.
• Second Priority (20 of 36 responses) - Establish technical committees.
• Third Priority (5 of 36 responses) – Focus on environmental issues.
• Other areas of interest included – genetics, utilization issues, publicity and promotion activities

From the responses and comments, it could be discerned that the members wanted to see the Web Site provide the following types of information:
• References to new publications
• International Links
• Information on upcoming meetings or demonstrations of interest.

IRRIGATION START UP, MAINTENANCE AND SHUT DOWN GUIDE LINES

by
Burt Aronoff: Drip In Irrigation Company

The following is part 1 of a guideline to irrigation Spring start up, general maintenance and fall shut down procedures. It is meant to be used as a help guide and not intended to be an all-inclusive manual which would be well beyond the scope of the newsletter.

Start up: Try to do all your irrigation checking at least a week or two before the first scheduled irrigation or fertilization program begins. Irrigation should be an aid to production not an irritation! A well maintained system should provide years of usage.

1. Pump station: First check all gauges and wires for winter and critter damage. Oil levels should be checked and oil and grease added if needed. It is also wise to check around the radiator of power units and any disconnected piping especially telescopic pipe for possible squirrel and other critter nests. Of course, be careful for hornet and other nests in all electrical control boxes etc. Show no mercy to critters in your pump house. They can damage wires and short circuit control panels etc.

Filter screen or sand media should be checked, cleaned or changed if necessary. Also, check the level of sand and or gravel in media filters. Irrigation media should be added, if needed, that is pointed with sharp edges and not rounded. It might be wise to pour several quarts or more of chlorine bleach in your media filter and let it sit for several hours.

Close any drainage valves on filters and check to be sure the gauges are in working order and visible. An automatic filter should back flush at a ± 7 PSI differential between the inlet and outlet. A manual filter should be cleaned at a 5 - 7 PSI differential. Sand separators normally work on a 5 - 7 PSI differential and this normally corresponds to flow.

If you are using a sand separator and do not have a pressure sustaining valve downstream of the filter and you know your well or water source is sandy or has other particle contaminates it may be wise to place a butterfly valve just after the filter to maintain pressure on the filter until the system is fully pressurized.

2. Close drain valves: Any drain valves that were left opened either on underground piping, drain-cocks for filters, back flow prevention devices, risers etc. should be closed, and if you closed valves on air release valves these should be opened.

3. Fertilizer injector: Check plumbing to injector especially if it is permanent. You do not want the injector to begin operation at the initial start up. When you do start it for checking, place clean water in a bucket and purge air out of system. There are 3 types of injectors and a myriad of manufacturers. Check the maintenance manual on your model for specific start up information.

4. Solenoid valves and control systems: Most controllers will indicate if there is a short in the system either with a digital read out or a blown fuse. You can make a dry run quickly through the control panel to ensure that current to and solenoids are all in working order. Isolate any problem and either repair solenoid or run the zone manually until you make the repair. Check the battery back up on your controller and if you have a Motorola system consult your manual. Sometimes a solenoid valve will appear to operate electrically but will not either open or close (diaphragm appears "frozen"). If there is a flow control knob on the valve open and close it. Then turn the knob all the way open and one full revolution back. Never leave the flow control valve open to the maximum.

If the end of your dripper lines are manifolded together it would be OK to keep the flush valves open.

5. Manual system: Keep as many valves in the on position as your pump will allow for the initial start up. Then you will need to begin isolating zones and cleaning or "scouring" drip lines.

6. Drip lines both in-line and on-line and micro sprinklers: If at all possible, the ends of all drip hose lines should be opened and cleaned. This can be done either sequentially or in sections. Water should pass through at a higher velocity, then the system will ordinarily operate. This will "scour" the inner wall of the drip tubing. This usually occurs when water travels at a speed of at least 2.5 feet per second in the dripper line. Scouring helps to get rid of various calcium, magnesium etc. deposits that attach to the walls of the tubing and also rids the line of organic material that was left in the line and died after the first frost. If the ends of your dripper lines were manifolded together then it would be a good idea to open a zone and then turn the flush valves open and increase pressure temporarily in the zone. In some conditions scouring can be helpful on a regular basis throughout the entire irrigation season.

7. Turn system on: After you are certain all drain valves are shut, gauges, oil level on pump checked, all grease points serviced, at least 1 valve capable of relieving water to atmosphere and or excess pressure is open, filter is on (if it is electric flush) or plumbed correctly if it is of the pressure differential type you are ready to turn pump on. Allow water to enter the mainline slowly at first and as you hear the water in pipe slow in speed open valve or throttle more and more until you have reached a fully on position.

It is good procedure, when possible, to first flush the main line then lateral lines and finally dripper lines. Some designers will recommend flushing the lines at start up by injecting muriatic or other acids to rid PVC walls of particle matter.

8. Purge air from system: Purging air from the irrigation line is very important. System should, if possible, be allowed to fill slowly as compressed air increases pressure on main line and laterals, Surging water also increases chance of water hammer. Air should be purged from main as well as lateral lines. Air release valves are normally placed after the pump and filter assemblies, all riser or altitude changes along the main and lateral lines and usually at the end of lines.

9. Continue flushing dripper lines: As you close the end of one section of dripper lines continue the procedure until all lines are flushed. Afterwards leave at least one zone or section pressurized and walk or drive close to the main line and check for any leaks that may have occurred from winter ground heaving or a left open drain valve etc. Flow meters or pressure gauges can also be used to indicate leaks or an excess of opened valves.

Leaks down stream of a filtration devises must be repaired with caution to prevent as little dirt entering the line as possible. It is imperative to flush all dripper lines with clean water after making repairs. Give lines time to flush, remember water traveling through the main line is moving at around 5 - 6 feet per second and less through the drip lines. It takes some time to completely flush a system.

10. Coyote and other wild life damage: Repair damaged lines with spare tubing and couplers and flush lines before closing end of lines. People have many solutions to animal problems. One of the best is taking used axle grease and smearing it on the last 50 or so feet of the irrigation line KEEPING SURE NOT TO COVER THE HOLES OF THE EMITTFRS. There are many different scents on the market of predators to the animal you are trying to discourage but these could discourage other wild life as well. As coyote damage is widespread throughout the U.S., I would be interested in hearing from you of any solutions you might have. For example, there is a well-known apple orchard on the East Coast that suffers from deer damage. They have placed an invisible fence and blocked off the farm in 10-acre plots with a trained dog to chase off the deer in each section. An SCS agent I know has trained Australian sheep dogs to jump over his bell pepper plants to control ground hog damage.

Your system is now operating. In the next newsletter I will outline some general maintenance procedures and try to answer some of the often-asked questions. Such as "Why is this happening to me and not to him?"

The Center of Irrigation Technology and the Irrigation Association both have excellent books and manuals on all subjects of irrigation and fertigation. Their phone numbers are as follows:
Center of Irrigation Technology 209-278-2066
Irrigation Association 703-573-3551

Burt Aronoff can be reached by email at burt@dripin.com or by phone at 215-806-5845

Woody Crops for Energy Will Soon Become a Reality in Minnesota

by
Lynn Wright

A Biomass Energy Achievement: EPS and R.W. Beck which recently joined forces to form EPS/Beck Power, have successfully acquired a power purchase agreement from Northern States Power Company. The 20 year agreement calls for building a new 25MW Whole Tree Energy™ facility to produce electric power from closed-loop biomass (hybrid poplars) supplied from 27,000 acres of Minnesota farmland.

Background: Whole Tree Energy™ is a new technology for generating clean, low-cost electricity which incorporates an integrated systems for planting, growing, and harvesting whole trees, then drying and burning them to make power on a large scale. The technology can be applied at scales from 25 MW up

to 200 MW. Engineer David Ostlie, with extensive coal combustion experience, invented the biomass technology and formed Energy Performance Systems in 1988. The patented technology has been under evaluation by EPS since the mid-1980's. A partnership between the Department of Energy's Oak Ridge National Laboratory (ORNL), David Ostlie, and the U.S. Forest Service was first formed in early 1986 when ORNL contracted with Northern States Power (NSP) to test the concept of growing hybrid poplars for energy on farmland in Minnesota. The Forest Service planted and maintained the trials. Though NSP, chose to withdraw from the contract in late 1987, the hybrid poplar trials were continued with DOE and Forest Service support and power industry cost-share through the Electric Power Research Institute and the newly formed EPS company. While the Whole Tree Energy™ technology can use forest residues and thinnings, the technology will use plantation grown woody crops in order to incorporate the biomass closed-loop concept. EPS has not only designed a highly efficient wood combustion system, but has also independently developed hybrid poplar nursery production equipment, and innovative harvesting technology.

Benefits: The 25MW facility will create about 25 jobs in the facility and up to 100 jobs including those associated with growing, tending, harvesting, and transporting the biomass. The closed-loop biomass electricity will be CO_2 neutral and will result in sequestering the equivalent of about 60,000 tons of carbon annually in untapped coal reserves, plus add to soil carbon storage on previously depleted farmland. The project will demonstrate the costs and feasibility of using dedicated woody crops to supply most of the biomass requirement for a new biomass facility.

What's next: EPS/Beck Power has an aggressive schedule for leasing farmland, establishing up to 5,000 acres of hybrid poplars per year starting in spring 2000, and initiating contracts to build the facility. Rapid scale-up of hybrid poplar cutting production must be achieved in order to have the more than 7 million cuttings that will be needed by spring 2000 to meet the proposed establishment schedule. Completion and testing of the Whole Tree Energy™ harvester prototype is needed to assure biomass feedstock supplies remain within the cost assumptions of EPS/Beck Power.

In addition to Energy Performance Systems and R.W. Beck, other collaborators include the Oak Ridge National Laboratory, the USDA Forest Service (North Central Station), WesMin Resource Development and Conservation District, and the Minnesota State Department of Natural Resources.

More about the hybrid poplar operations associated with this project will be discussed in future newsletters.

IEA BIOENERGY/IUFRO WORKSHOP ANNOUNCEMENTS

The International Energy Agency Bioenergy Task on Conventional Forestry Systems for Bioenergy will hold its 2nd Annual Workshop in Charlestown, South Carolina September, 19-25 1999. The title of the Workshop is *Integrating Production of Energy in Sustainable Forestry: Guiding Principles and Best Management Practices*. The Workshop will be hosted by the Center for Forested Wetlands Research, USDA Forest Service. More information on the Workshop can be found at:
http:www.forestresearch.cri.nz/ieabioenergy/home.htm

A Short Rotation Forestry workshop will be held at the University of the Phillippines, Los Banos, near Manila on March 3-7, 1999. This is a joint meeting of the IUFRO Group 1.09 and IEA Bioenergy Task 17 on Short Rotation Crops. For more information, contact:
Lucrecio Rebugio at llreb@laguna.net or
Lars Christersson at Lars.Christersson@lto.slu.se

IUFRO group 3.09.00 will hold a workshop on Economics and Harvesting of Thinnings May 4-7th, 1999 in Ennis, Ireland. Deadline for papers is March 15 and registration is due April 15.
For more information, contact:
Pieter Kofman at PDK@FSL.DK.

SUSTAINING SPONSORS

The following companies listed below were sustaining sponsors of the SRWC-OWG last year. Their contribution to the Working Group is most appreciated. We look forward to their support this year.

American Cyanamid Company
B. B. Hobbs Company
Boise Cascade Corporation
Drip-In Irrigation Company
Morbark Sales Corporation

Additional industry sponsors are sought. Your company can become a sustaining sponsor of the Working Group with a annual contribution of $500. These funds will be used to collect and distribute information, to enhance home-page activities, and to sponsor the biennial workshops and topical conferences. Each company that becomes a Sustaining Sponsor will be recognized on the letterhead of the Working Group, and on all publications including workshop proceedings and newsletters. In addition, complimentary annual memberships will be provided to up to five individuals within the company. If your company would like to become a Sustaining Sponsor, please contact Bruce Hartsough, Biological & Agricultural Engineering, University of California, Davis, CA 95616. Phone: (530) 752-8331, Fax: (530) 752-2640, *brhartsough@ucdavis.edu.*

SRWC - OWG WEB PAGE

The web page for the Working Group is listed below:
http://www.woodycrops.org

If you have articles, publications, announcements, and other information that would be of interest to other members, please send to Bob Perlack (Fax: (423) 574-8884, *perlackrd@ornl.gov*) so they can be placed on the web page.

REMINDER ON MEMBERSHIP DUES

Since the inception of the Working Group, administering sponsors have provided financial sponsorship of the Group. The current mailing list includes well-over 300 recipients. To help defray costs, nominal membership dues are $20 per year. Membership services will include a newsletter, access to the membership list, and development of conferences and workshops. Members will also receive the proceedings of the biennial conferences and reduced registration at these conferences.

For membership services:

Bob Perlack
Oak Ridge National Laboratory
Post Office Box 2008
Oak Ridge, TN 37831-6205
(423) 574-5186, (Fax) 574-8884
perlackrd@ornl.gov

For dues information :

Jim Shepard
NCASI
Post Office Box 141020
Gainesville, FL 32614-1020
(352) 377-4708 Ext. 227, (Fax) 371-6557
jshepard@ncasi.org

For all other inquires:

1998 & 1999 Chairperson
Dr. Bruce Hartsough
Biological & Agricultural Engineering
University of California
One Shields Avenue
Davis, CA 95616
(530) 752-8331, (Fax) 752-2640
brhartsough@ucdavis.edu

MEMBERSHIP REQUEST FORM

Name _____

Position _____

Company/Organization _____

Address _____

_____

Phone _____

Fax _____

e-mail _____

Areas of Responsibility _____

_____

_____

_____

_____

SRWC Interests _____

_____

_____

_____

G Will **G** Will not allow this information to be published/placed on homepage.

Please complete and return to:

Jim Shepard
NCASI
P.O. Box 14120
Gainesville, FL 32614-1020

Please make your check payable to NCASI (memo: SRWC Working Group).