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Alley Cropping with Hybrid Poplar May Profit UK Farmers

By Miles Merwin

Silvoarable agroforestry, or alley cropping, with hybrid poplar may be a viable alternative use for crop land in northern Europe idled due to surplus food production. Current trials in England suggest that poplar alley cropping could become as profitable as annual crop monocultures if government farm support programs are modified to include agroforestry.

Extensive poplar plantations were first established on farmland in England during the 1960's and 1970's for commercial match stick veneer production. Food crop surpluses in the 1980's led to a resurgence of interest in alley cropping, and the first large research trials were started in 1988 with poplar and several other high-value hardwood species.

The silvoarable trial at Cranfield University Silsoe College Farm in 1997 after six seasons of growth, showing 'Beaupré' poplar trees and the harvesting of winter wheat in a continuously-cropped alley. Photo: Dr. P. Burgess.

In 1992, trials were established to compare poplar and crop growth under different agronomic treatments at three sites in England (Burgess et al. 1998). Unrooted cuttings of four poplar clones, including interspecific hybrids (*P. deltoides* x *trichocarpa* and *P. deltoides* x *nigra*), were planted in rows 33 ft. (10 m) apart and 21 ft. (6.4 m) within the row. In the 26 ft. (8 m) wide alleys between the trees, three different cropping treatments were tested: continuous cropping, alternating cropping and fallow, and continuous fallow. Alley crops such as wheat, barley and beans were managed under normal farming practice. Weeds were controlled by plastic mulch along the tree row and by spraying. The poplars were pruned once, and the trials were not irrigated.

Results after 5 years showed the growth of the Beaupré clone (*P. deltoides* x *trichocarpa)*, averaged over all sites and treatments, to be significantly better than the other tested clones. Competition for water and nutrients reduced the height and diameter growth of the trees under the alternatively- and continuously-cropped treatments compared to the continuous fallow treatment. These results underscore the importance of locating poplar alley cropping on the best sites with adequate soil moisture available to support both trees and crops.

Compared to crop yields in open-field control plots, yields in the continuous alley cropping treatment were reduced by less than 10%. However, removing the 20% of the field occupied by trees, yield in this treatment was only 73% of control on a unit area basis.

The profitability of alley cropping depends on the net returns from the crop, discount rate and government subsidies. Trial results revealed that more cost-efficient weed control, particularly in the interface between the plastic mulch and the crop, could extend the length of profitable cropping.

Without any subsidies, the economic analysis indicated that poplar agroforestry would be more profitable than arable farming only at a discount rate of 0%. Depending on spacing and tree stocking, alley

➤ ***Poplar Alley Cropping, p. 5***

The Temperate Agroforester

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Mission Statement
The mission of AFTA is to advance the knowledge and application of agroforestry as an integrated land use approach to simultaneously meet economic, social and environmental needs. AFTA focuses on agroforestry in temperate zones, with an emphasis on North America. AFTA pursues its mission through networking, information exchange, public education, and policy development.

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The Temperate Agroforester

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Contributions related to agroforestry are welcome. Please submit items either on PC-formatted diskette, via e-mail, or typewritten. Deadlines for submissions are the 15th of March, June, September and December. Address all items to: The Temperate Agroforester, c/o Miles Merwin, P.O. Box 266, Lake Oswego, OR 97034, Tel.(503) 697-3370, Fax (503)697-1767,
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President's Message

Funding AFTA's Future

By Pete Schaefer

In the last issue of the newsletter, I suggested that the AFTA Board is taking steps to improve the financial base of our organization. The biggest step in this direction took place at our June meeting with the approval of the Fund Development Committee, consisting of president-elect Miles Merwin (chair), Jim Chamberlain, Gene Garrett, P.K. Nair and Henry Pearson.

While this committee will be instrumental in developing a funding strategy for AFTA, their work will be greatly enhanced through broader member involvement. Please forward any thoughts you have along these lines to Miles, and if you are asked for specific input please respond! My hat's off to this committee for taking on this important challenge.

Another project which received a kick-start at the June meeting is the development of a "Strategic Priorities For Agroforestry" white paper under contract with the National Agroforestry Center. My thanks to Greg Ruark for getting this off the shelf. AFTA board members will soon be receiving a draft template of the document to which they can respond.

A draft document will then be developed based on their responses, and according to Greg, should be ready toward the end of November. I will suggest to the board that we distribute the draft to the entire membership for review, comment and support prior to completion of the final document. It is our intent that this serves as a convincing marketing piece for agroforestry in North America.

That's all for now. Please don't hesitate to contact a board member if you have questions, concerns or suggestions regarding AFTA. There is always room on the agenda for your input. ❐

Conference Celebrates Sustainable Agriculture in Year 2000

Logan, UT — "Farming and Ranching for Profit, Stewardship, and Community" is the theme of a major sustainable agriculture conference to be held in Portland, Oregon on March 7-9, 2000. Nationally-known speakers, producers, researchers, agricultural extension agents and others from around the nation (and particularly the Western U.S. and Pacific Islands) will share their sustainable agriculture successes, experiences and research results.

The event is sponsored by the USDA Western Sustainable Agriculture Research and Education (Western SARE) program, with major contributions from several land-grant universities and the federal sustainable agriculture effort.

"I'm convinced that sustainable agriculture can ensure the survival of American family farming, which is the bottom-line reason I'm committed to the effort," said Larry Thompson, a berry and vegetable grower from Boring, Oregon and the chair of Western SARE's governing Administrative Council.

According to Thompson, this event will showcase techniques, experts and successful operations that demonstrate why "sustainable agriculture will continue to grow" in the next century and be adopted by all types of producers and agricultural enterprises - large and small, corporate and owner-operated.

Featured Speakers

Among diverse sessions, confirmed keynote speakers include Virginia producer and author Joel Salatin, who will talk about how to increase farm and ranch profits through innovative livestock and ecological practices. Salatin, author of "Pastured Poultry Profits" and "Salad Bar Beef" will both speak and conduct a workshop at the event. In addition, Karla Chambers, co-owner and marketing director of Stahlbush Farms, will discuss her on-farm role and community involvement in building Oregon-wide support for sustainable agriculture. Stahlbush Farms is a 2,000-acre vegetable and fruit production and processing operation that markets its frozen pureed foods worldwide.

A day-long tour is also being orchestrated to give attendees on-the-ground experience with successful Portland-area farms, direct-marketing approaches, eco-labeling attempts, and youth and community efforts that relate to local agriculture. Issues about farming in the midst of urban sprawl and regulation will also be illustrated.

"Sustainable agriculture has come of age in the year 2000 as a means of operating a profitable farm or ranch, protecting natural resources, increasing quality of life and producing high quality food and fiber," said John Luna, conference planning committee member and integrated farming systems specialist at Oregon State University.

"We aim to bring about 500 farmers, ranchers, field advisors, scientists, policy-makers, agri-business representatives, educators and sustainable agriculture advocates from around the Western U.S. to Portland to mark the beginning of a new century by recognizing evolving sustainable agricultural practices," said Luna.

SARE Projects Highlighted

The conference will highlight the methods and outcomes of diverse research and education projects funded by the SARE effort - including university-based, on-farm and producer-directed work. Innovative marketing strategies and examples will be shared, and the role of non-profit organizations and public policy in promoting sustainable agriculture will also be discussed. The benefits of involving farmers and ranchers in agricultural research is another key element of the program.

"Sustainable agriculture focuses on increasing profits for farmers, reducing agriculture's impact on natural resources such as water quality and wildlife habitat, and raising quality of life for farm families and their communities," said national SARE Director Jill Auburn. "I look forward to this Western event, which will help build momentum for more sustainable agriculture successes in the year 2000 and beyond," said Auburn.

Specific program topics include: irrigated and dryland cropping systems; grazing and livestock operations; innovative marketing strategies, including eco-labeling and direct-marketing; soil quality; biological pest control; vegetable, tree fruit, wine grape and other crops; and more. The program will also offer a number of information-sharing opportunities.

For more information about the conference, or to register, contact Gina Hashagen, Oregon State University, (541) 737-5477, Email: hashageg@bcc.orst.edu. ❒

News release from Western SARE

Climate, Culture and Genetics Make Poplar Productive in PNW

By Miles Merwin

Since the mid-1980's, large plantations of hybrid poplar have become a common sight in the Pacific Northwest. A combination of favorable climate and soils, short rotation intensive culture (SRIC) and advanced breeding techniques have made these highly productive "fiber farms" an important source of hardwood fiber for paper manufacturing. The experience gained from large-scale plantations will also aid non-industrial private growers wanting to grow poplars for higher-value wood products.

During the recent annual convention of the Society of American Foresters in Portland, OR, participants had the opportunity to tour the Lower Columbia River Fiber Farm (LCRFF) operations of Fort James Corp. Representatives of Fort James and researchers from the University of Washington were on hand to show the entire process, from genetic selection, site preparation, tree management, to harvesting.

These 7 year-old hybrid poplars at the Fort James Corp. Lower Columbia River Fiber Farm near Clatskanie, OR are ready for harvest. Photo: M. Merwin.

Fort James is one of several forestry companies that are growing hybrid poplar for pulp chip production. Approximately 65-70,000 acres of poplar plantations are currently in production in the Northwest. Most of this acreage is located on the drier east side of the Cascade range within 100 miles of the Columbia River. However, Fort James has developed its plantations, totaling over 11,000 acres planted since 1985, west of the Cascades on the fertile flood plain of the lower Columbia River northwest of Portland.

Through its Landowner Assistance Program, the company has lease agreements on an additional 2500 acres of private farmland, providing technical assistance and an assured market to private growers. The entire acreage is currently devoted to furnishing chips to its mill in Wauna, OR for the production of intermediate-grade printing paper.

Fort James operates its own proprietary poplar breeding program, centered at the Westport Research Station. Interspecific hybrids are bred through controlled crosses between three *Populus* species: *P. trichocarpa*, *P. deltoides* and *P. maximowiczii*. The aim is to develop disease-resistant, fast-growing clones for deployment in the company plantations.

In contrast to the drier east side, diseases of poplar are a major problem on the wetter west side, particularly *Melampsora* poplar rust and *Venturia* shoot blight. While these diseases rarely kill trees outright, they do lower productivity. Disease resistance of new clones may only last 8-14 years since new rust strains that can attack them soon evolve. Thus the company must try to keep one step ahead of the rust by continually breeding newer clones.

Of the 3000-5000 seedlings from controlled crosses that are introduced annually to the company's tree improvement process, only 6-8 clones will be operationally deployed at the end of a four-step selection process that lasts up to 15 years. Clones are selected on the basis of disease-resistance, size and form, growth rate, and wood qualities. The objective is to provide chips to the paper mill with desirable fiber characteristics at the lowest possible cost.

In addition to Fort James' own breeding program, researchers at the University of Washington are pursuing both basic and applied research on poplar with other public and private organizations through the Poplar Molecular Genetics Cooperative (PMGC) and the Tree Genetic Engineering Research Cooperative (TGERC). Major projects include the development of over 15,000 new hybrid clones, identification of DNA markers for clonal "fingerprinting", and breeding of transgenic clones that are resistant to either herbicide or insect attack. Experimental clones that are resistant to glyphosate herbicide or cottonwood leaf beetle (incorporating a form of Bt) are currently being tested in cooperation with Fort James and other co-op members.

The LCRFF is located on land that has near-ideal

climate and soil conditions for poplar, with a watertable that averages only 2-5 feet deep. The plantations are harvested and replanted on a 7-year rotation; most of the company's acreage is currently in its second rotation. Rather than allowing coppice regrowth, the land is re-planted with the latest clones developed through the breeding program. After site preparation to remove stumps and prepare raised planting beds, unrooted 12 inch cuttings are planted by hand at 7 X 10 foot spacing. The raised beds provide warmer and better-drained soil conditions and thus help speed growth in early spring.

Since hybrid poplar is very sensitive to moisture competition from weeds, intensive weed control measures are employed during the first 2-3 years of establishment. A combination of cultivation and both pre- and post-emergence herbicides are used. Clones are selected for rapid development of wide crowns that shade out weeds and shorten the need for weed control. Another management priority is animal damage control to reduce depredation by voles, deer, beaver and other mammals. Clonal differences have been observed in browsing preference by deer; "feed tree" clones may be interplanted to divert deer away from other clones. No fertilizer or irrigation are applied on the LCRFF.

Harvesting operations are highly mechanized and closely coordinated with the paper mill to maintain a constant supply of chips. Poplars are transformed from standing trees to paper products in three days or less. Trees are cut with feller-bunchers, logs are carried by skidders to a flail debarker on site, and are then processed by a chipper which feeds chips into enclosed vans for transport to the mill. Average yields on the LCRFF have increased by 31% over the last ten years due to improved clones and cultural practices. As much as 2500 bone dry tons per month are harvested to meet demand year-round. About 70% of the total harvested biomass is recovered as clean chips.

In response to a dip in pulp chip prices, Fort James and other companies are also investigating the feasibility of growing poplars on a longer rotation for higher-value wood products. A small sawlog trial started 10 years ago on a portion of the LCRFF. Trees are planted at 10 X 12 foot spacing in anticipation of harvesting logs with an average 10 inch DBH and a 6 inch top on a 10 year rotation for both solid wood and chips. All trees are pruned to increase the volume of knot-free clearwood that could be used for millwork (e.g. molding). Poplar may also be used for plywood cores and composite panels (e.g. oriented strand board), but markets for these products are still in their infancy in the Northwest. ❐

➤ *Poplar Alley Cropping*

cropping systems could qualify for government subsidies in England that encourage either agriculture or forestry. If forestry grant schemes were modified to include the lower stocking rates in agroforestry, then alley cropping could be more profitable than farming at a 5% discount rate.

Based on the overall results of the 1992 and earlier trials, researchers in England have made some general recommendations for alley cropping with poplar (Beaton et al. 1999). Tree row spacing should be designed to accommodate the widest machinery used in normal farming operations. In England, recommended spacing for the tree rows is 66 ft. (20 m), leaving 59 ft. (18 m) wide alleys between them. Optimum in-row spacing depends on the anticipated rotation length (30 years for hybrid poplar timber) and size at harvest. To reduce the effects of shading, the tree rows are best oriented on a north-south axis. Combine-harvested crops such as cereal grains, legumes and oil seeds are easily adaptable to alley cropping with poplars.

Trees in an alley cropping system will require intensive management, including weed control and pruning. A combination of mulching, cultivation and herbicides are recommended for weed control. Pruning of poplars should start three years after planting and continue to a height of 26 ft. (8 m) by the tenth year. Timely pruning is important not only to increase the volume of valuable clearwood timber, but also to reduce shading of crops grown in the alleys.

Once shading makes the production of annual crops in the alleys unprofitable, the agroforestry system could be converted to silvopastoral management through the sowing of more shade-tolerant forage species. Since the trees are already mature, the problems of livestock damage to trees normally associated with young silvopastoral systems are eliminated. ❐

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UMCA Adopts Team Approach to Agroforestry Training

By Sandra Hodge, University of Missouri Center for Agroforestry

Temperate agroforestry is concerned with both protection of the natural resource base and income production. An emerging technology, it is neither totally agriculture nor forestry, but a union of the two. This provides a challenge, since part of the requirement for agroforestry to be established as a sustainable farming practice will be effective teamwork among experts from disciplines that have been traditionally compartmentalized by their own science, such as forestry, horticulture, and agriculture. There is a need for a cadre of resource professionals specifically trained to bridge the gap between the new technologies and their eventual users. Interagency and inter-organizational cooperation is necessary.

To facilitate this, the University of Missouri Center for Agroforestry (UMCA) established a technology transfer program to foster the adoption of agroforestry in Missouri. Through the technology transfer program at UMCA, interagency partnerships have been established in the form of regional agroforestry teams which facilitate the cooperative effort. At present, there are six teams throughout the state of Missouri representing different ecological zones.

The purpose of the participatory agroforestry teams are to:

- Develop partnerships among agencies and organizations to maximize resources;
- Contribute their respective professional expertise in the design of agroforestry practices
- Share information on available incentives;
- Identify training needs for natural resource professionals and to train "trainers" to extend agroforestry;
- Implement field demonstrations of agroforestry practices in collaboration landowners and farmers; and,
- Create templates for the five temperate agroforestry practices so that each template is specific to the identified ecological zone.

The teams are anchored primarily by staff from the University of Missouri Outreach and Extension (U/OE), the Missouri Department of Conservation, Forestry Division (MDC) and the Natural Resource Conservation Service (NRCS), although other participation varies by team. Some teams have farmers, others have community development specialists, members of conservation/environmental groups or agricultural lenders. To date, there are over 100 members of the participatory agroforestry teams in Missouri.

An additional advantage to the team-training approach is that each of the natural resource professionals has their own client base. Because of this, they will reach more farmers and landowners than if only forestry professionals were trained, or only agricultural extension specialists.

Training Programs

Training is conducted in the classroom, on public demonstration sites and on private property with landowner participation. The basic agroforestry classroom session is designed to introduce the five temperate agroforestry practices and usually lasts a half-day. The more advanced classroom sessions offer training in the design and establishment of the practices and are held for two days. On site-demonstrations afford the resource professional an opportunity to see how sites are assessed for their agroforestry potential and to participate as a team member to designing a practice in the field. These last half a day or a full day depending on the context.

When training sessions are held on a landowner's property, it is at the request of the landowner who has heard about agroforestry and wants to know if it can be applied on his/her property. Faculty at the University of Missouri Center for Agroforestry take the lead in each training session although local natural resource professionals also participate.

Participatory agroforestry training has been an important technology transfer activity of the UMCA. In 1996, six basic one-day courses were attended by staff from UO/E, MDC and NRCS. With input from the three original agroforestry teams established in mid-1997 who had taken the basic course, a second course was designed: the Advanced Agroforestry Course held in Columbia, Missouri in February of 1998. Taught by invited faculty from Iowa State (riparian buffers), the University of Nebraska at Lincoln (windbreaks and shelterbelts), University of Kentucky (forest farming) and the University of Missouri-Columbia (alley-cropping and silvopasture), the in-depth course used case studies to cover the design of the five temperate practices.

During the course, natural resource professionals were organized into regional teams so they could design practices with species appropriate to their re-

spective regions. As a result of this course, and to facilitate communication among trained natural resource professionals in the state, an agroforestry listserve has been established. On-site field training has also been held covering alley cropping, silvopastoral, riparian buffers and windbreak design.

Most of the funding for the advanced course was organized through the UO/E professional development program at the University of Missouri-Columbia and a small fee was charged to all other agency participants outside of UO/E. This is a good example of the inter-agency commitment to agroforestry training in the state of Missouri. Beyond sponsoring the course, UO/E has integrated agroforestry into its state program for agriculture and natural resources. The MDC has committed funds to the UMCA to support research in tree improvement for agroforestry as well as providing support for technology transfer activities. The NRCS works closely with the UMCA in the design of forested riparian buffers and windbreak design.

Future training will be done using a new agroforestry training manual developed at the UMCA. The manual has three sections. The first is a general "how to" design each of the five temperate agroforestry practices. The second section lists trees, crops, grasses, forages and legumes suitable for each county in Missouri. Natural resources professionals throughout the state have participated in supplying county-by-county information for part two. The third section is a series of "templates" or suggested designs for the practice, using the species suited to the region.

Information dissemination

Information dissemination activities include the production of a five-part agroforestry video series and workbook for use in training natural resource professionals and farmers, as well as publication of a series of "guide" sheets which elaborate on the practices in Missouri. A Missouri Agroforestry Resource Directory was published in 1998 and will be updated in 2000. It has a county-by-county listing of all the agroforestry resource team members and their areas of expertise. Landowners practicing agroforestry are also listed with the type of agroforestry practice they have implemented and whether they are willing to host field days. Through the resource directory, natural resource professionals and landowners are able to contact others who are familiar with, or practicing, agroforestry in the state.

UMCA has a website (www.missouri.edu/UMCA) under construction. In the near future, the site will list the Center's mission, personnel, research activities, references to temperate agroforestry and other agroforestry links. A special section will be devoted to landowners who are practicing agroforestry. An interactive map of the state of Missouri will show a landowner's location and when clicked, the site will provide a photo of the type of agroforestry being practiced and information on how to contact that particular landowner.

Landowner participation

It is estimated that well over 100 landowners are practicing agroforestry in the state of Missour, with all five temperate agroforestry practices represented. More traditional alley cropping practices vary from black walnut (*Juglans nigra* L.), grown for nuts or timber and intercropped with soybeans, corn, forage or wheat, to oak (*Quercus* spp.) intercropped with hay. Less typical systems include medicinal plants such as ginseng (*Panax quinquefolium* L.) intercropped between the walnuts trees in the row with the alleys providing an additional crop; ginko (*Ginkgo biloba* L.) intercropped with purple coneflower (*Echinacea purpurea* (L.) Moench); and pecans (*Carya* spp.) intercropped with wildflowers which are grown for wildflower seed or eastern gamma grass (*Tripsacum dactyloides*). Silvopastoral practices include grazing cattle in a walnut-forage alley configuration, to a native pecan plantation sewn with legumes. Most silvopastoral practices are grazed using a management intensive grazing system. Riparian buffers, some of which are managed for wildlife and produce income from lease-hunting, have been planted with a variety of trees including hazelnut (*Corylus* spp.), tulip poplar (*Liriodendron tulipifera* L.), pecans or other flood tolerant species. Windbreaks are popular in the more northern areas of the state and have been established to protect cattle from harsh winter winds. Forest farming is also well establish primarily with herbaceous specialty crops such as ginseng and goldenseal (*Hydrastis canadensis* L.). Many landowners are willing to host field tours to demonstrate their agroforestry practices. ❒

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Invention Prototype Makes Quick Work of Tree Pruning

By Miles Merwin

An inventor in Oregon is developing a new, self-propelled tree pruning machine that, if successful, could make pruning trees more economical for woodland owners. While pruning of commercial species like Douglas fir in fully-stocked stands is starting to catch on, it is of particular importance in silvopastoral and alley cropping regimes where trees are initially planted at wide spacing. Timely pruning increases the volume of knot-free clearwood and improves the market price that agroforest owners can realize at harvest.

John Clouston, owner of Clouston Hydraulics in Junction City, OR, demonstrated a prototype of the "Tree Shaver" during a field day at the Melcher Tree Farm near Sweet Home, OR. (Mike and Glenda Melcher were recognized as the 1998 Oregon State Tree Farmers of the Year by the American Tree Farm System). John's son Leroy Clouston, company sales manager, helped demonstrate the machine.

John Clouston and sons demonstrated the "Tree Shaver" self-propelled pruning machine at the Oregon Tree Farm System summer tour near Sweet Home, OR (Photo: M. Merwin.

Currently in its second prototype, John plans to make more improvements before the machine will be commercially available. He has received patents on the basic design. John already holds a patent on a hydraulic machine he invented that is used in plywood manufacturing. He said that he started thinking about developing a tree pruning machine over six years ago, and created the first prototype in 1997.

The "Tree Shaver" appears to be an improvement over other self-propelled pruning machines that are now on the market, such as the "Tree Monkey" or "Tree Witch.". According to John, it will prune a tree up to 27 feet above ground and return in 2 minutes or less. That represents a significant speed advantage over manual methods that rely on ladders and saws.

The unit is powered by a chainsaw engine driving four small rubber tires that rapidly propel the machine as it spirals up the tree. Instead of a flat cutting blade that can bind, the "Tree Shaver" uses a round mill end (side-cutting) bit to quickly cut limbs up to several inches thick. An on-board air compressor powers the pneumatic gripping system which maintains a constant grip on the tree as the machine ascends along the decreasing diameter of the stem. The engine throttle and grip strength can be adjusted by radio remote control, allowing the operator to control pruning on each tree, compensate for heavy branches or wet bark, and stand clear of falling limbs. Stub length can be manually adjusted.

The current design of "Tree Shaver" can prune trees 3.5 to 11.5 inches in diameter, John said. This would make it useful for the second and third pruning "lifts" after initial training and pruning is accomplished from the ground by manual means. As many as 30 trees can be pruned up to 27 feet above ground on one tank of gas, he said. A two-person team is required to move and operate the machine which consists of two halves, weighing a total of 100 pounds, that are fitted together around the base of the tree. John said that he hopes to increase the horsepower and reduce the weight of the next prototype, so that only one operator is required.

The "Tree Shaver" has so far been tested on Douglas fir and hybrid poplar, and John said he would like to test it on black walnut and other commercial species. He said that the current model works best on straight-stemmed trees without large forks or bulges at branch nodes, e.g. not like radiata pine.

For more information, contact Clouston Hydraulics Inc., 92966 Hwy. 99 South, Junction City, OR 97448, Tel. 800-600-6704. ❒

New Canadian Book Explores North American Medicinal Crops

The explosive interest in herbal products that provide medicinal or health benefits has made information on this topic vitally important to the public and crucial to farmers, merchants, economists, teachers, the pharmaceutical industry, and the medical arts professions.

Canada has the potential to capitalize on tremendous global agribusiness opportunities and is in an excellent position to take advantage of the rapidly expanding market for "nutraceutical crops." Many of these are native to Canada and grow well there. This comprehensive reference guide to important indigenous medicinal plants meets the need for an overview of available information.

American growers will also find this book useful since most of the species covered are either native or adapted to the US.

Chapters feature species that either are now, or have the potential to be, commercially profitable, such as ginseng, echinacea, Pacific yew, goldenseal, cascara, witch hazel, and kelp. The reader can quickly find details on a particular topic by examining the categories of information, which include: names (scientific, English and French), description and classification, medicinal uses, non-medicinal uses, toxicity, chemistry, importance, ecology, agricultural and commercial aspects, human interest information, selected key literature, and web links.

All species are attractively illustrated and distribution maps for all of North America are included. Additional chapters address: the business of growing medicinal plants; the regulatory and legal framework in Canada for producing and marketing; hazards associated with medicinal plants; and medicinal plant research in Canada. Also provided are: a guide to resources helpful to the farmer and marketer interested in growing medicinal crops in Canada; a guide to experts who can be consulted on various aspects of medicinal plants; a glossary of medicinal and pharmacological terms; a general list of books, review articles and research articles related to Canadian medicinal plants; and an extensive set of general World Wide Web links.

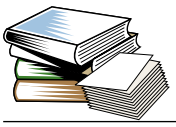
Canadian Medicinal Crops, Ernest Small and Paul Catling, 1999, 240 pp. Available for US$29.95 from NRC Research Press, National Research Council, Ottawa, ON K1A 0R6, Canada, Tel. 613-990-2254, Email: research.journals@nrc.ca. ❒

AFT Steward Award Nominations Now Open

American Farmland Trust is seeking nominations for the $10,000 Steward of the Land Award. The award goes to a farmer, or farm family, who demonstrates the strongest commitment to protecting agricultural land. Nominees must live and farm in the United States. Preference will be given to individuals who use farming practices that lead to a productive farm in a healthy environment, work to develop policies and programs for farmland protection at the local, State, or national levels, and demonstrate leadership by protecting their own farm from development. Nominations are due no later than November 1, 1999. Send them to Steward of the Land Award, American Farmland Trust, 1200 18th Street NW, Suite 800, Washington, D.C. 20036. For more information, call (202) 331-7300 x3044. ❒

FACT Net to Cease Operations

Winrock International has announced that FACT Net (Forest, Farm and Community Tree Network) will close down at the end of 1999. According to Mark Powell, FACT Net Coordinator, the group has not been able to generate sufficient revenue to cover the cost of producing and mailing FACT Net publications. Although the number of participants in non-industrialized countries has significantly increased, this has meant a decline in revenue since less than have the subscribers, i.e. those in industrialized countries, support the organization through participant fees. FACT Net was created when Winrock took over the former Nitrogen Fixing Tree Association. For more information, contact Winrock International, 38 Winrock Drive, Morrilton, AR 72110, Tel. 501-727-5435, Email forestry@winrock.org. ❒



Agroforestry Conference Proceedings

The proceedings of the 5th North American Agroforestry Conference, held at Cornell University in 1997, are now available. Copies of the proceedings may be purchased for $20 (postpaid in USA). To order, send a check or money order payable to Cornell University to: Dr. Louise Buck, Natural Resources Dept., Fernow Hall, Cornell University, Ithaca, NY 14853.

Tree Seed Directory

ICRAF has published the third edition of its directory of tree seed suppliers which lists sources for over 4,500 species. Information about seed collection, pretreatments, microsymbionts and ordering seed from overseas is included. The directory will be available in three forms: 412-page book, CD-ROM and on the Internet (www.cgiar.org/icraf/treessd).

Tree Seed Suppliers Directory - Source of seeds and microsymbionts, 1997. For information, contact Roeland Kindt, ICRAF, PO Box 30677, Nairobi, Kenya, Fax 254-2-521001.

Tropical Agroforestry

Tropical Agroforestry, by Peter Huxley, is the first book to provide a comprehensive, analytical account of the principles, as well as the practical implications of agroforestry. The focus is on understanding how agroforestry systems function while taking into account the conflicts and compromises that arise because of farmers requirements and the biological potentials and restraints of growing woody plants with crops. Divided into six sections, this book presents information in such a way that it will be of use to students, researchers and development project personnel from many different backgrounds. For information, contact Blackwell Science Inc., 350 Main Street, Malden, MA 02148, Tel. 800-215-1000, Fax 781-388-8270, Email: csbooks@blacksci.com.

Conservation Buffers in Australia

In April 1998, a team of scientists from the USDA Natural Resources Conservation Service traveled to Australia to exchange information on conservation buffers and agroforestry. NRCS has published their trip report which contains details of case studies in Western Australia, Queensland and New South Wales related to riparian areas, biodiversity, eutrophication control, salinity control, silvopastoral management and municipal waste water utilization. To request copies of the *US-Australia Exchange Report, Conservation Buffers and Agroforestry* (NRCS, Feb. 1999, 24 pp.), contact the National Agroforestry Center, East Campus UNL, Lincoln, NE 68583, Tel. 402-437-5178.

Special Forest Products

University of Idaho Cooperative Extension has published a new 3-page bulletin on special forest products. It provides an overview of harvesting and marketing SFP's from native forests on public and private lands and suggests some ways to improve returns for the collector. To order copies of *Special Forest Products* (CIS 952), send 50 cents each to Agricultural Publications, Idaho Street, University of Idaho, Moscow, ID 83843-4196.

Forestry Green Book

This directory contains useful information on over 24,000 forestry and forestry related companies, as well as educational institutions. Visit the website www.forestryunlimited.com/ or email forestry@total.net for more details.

Black Walnut Resources

The Minnesota Extension Service has two information resources to help woodland owners manage black walnut in natural stands or plantations. The information in *Growing Black Walnut* (FO-0505-S) is general enough to be useful anywhere the tree can be grown. It's soil and climatic requirements are given to aid in the siting of new plantations. Spacing recommendations are provided for nut and timber production and alley cropping, plus details on planting nuts or seedlings. Advice on training, pruning and thinning will help growers maximize the value of harvested timber. To illustrate the printed bulletin, a slide set on *Black Walnut Management* (SS-6713-GO) is available.

Copies of *Growing Black Walnut* are $2.00 each plus postage. The *Black Walnut Management* slide set may be rented for $10.00 or purchased for $85.00. To order, contact Minnesota Extension Service, University of Minnesota, Room 20, Coffey Hall, 1420 Eckles Ave., St. Paul, MN 55108, Tel. 800-876-8636, or www.extension.umn.edu. ❐

Internet Resources

New Email Address for AFTA

afta@missouri.edu

AFTA now has an email address for all general correspondence. Questions related to AFTA membership, meetings, projects, etc. can be directed there.

Western Canada Conference

www.agr.gov.sk.ca/agroforestry/

In August 1999, a group of landowners, woodlot managers, extension agents and policy makers gathered in Prince Albert, Saskatchewan for a meeting entitled "Agroforestry: Taking Root in the West." Abstracts of papers, keynote addresses and contact info can be found at this web site.

UK Agroforestry Forum

www.sylvan.demon.co.uk/forum2.htm
safswww.bangor.ac.uk/afforum/bul_frames.htm

The UK Agroforestry Forum serves as an informational network for researchers, farmers, foresters, advisers and representatives of conservation agencies who are interested in agroforestry in the UK. The first site contains some general information about agroforestry practices in the UK, news about the group's activities and related links. The second site is the web page for the group's publication, *Agroforestry Forum*. An informal publication that allows contributors scope to share and explore new ideas and data, the bulletin exists to facilitate rapid exchange of information and opinion among researchers active in the agroforestry domain.

Forestry Index

www.forestryindex.net

Sponsored by the USDA Forest Service - Southern Region and the Cooperative Extension Service - Southern Region, this site was developed to organize on-line publications and resources into easily discernable categories. Whether you are a forestry professional, a forest landowner or a student, you should be able to find what you need after just a few short mouse clicks. Users can find information by browsing categories or with the "Forestry Finder" search engine. A trial search on the term "agroforestry" yielded 88 documents among the thousands indexed on this site. ❒

Mark Your Calendar

Profitable Alternatives for Family Farms, 7th National Small Farms Show and Conference, Nov. 5-6, 1999, Columbia, MO. A short course on agroforestry will be offered as part of the proram. Information: (800) 633-2535 or www.smallfarmtoday.com/tradeshow/.

Farming and Ranching for Profit, Stewardship and Community, March 7-9, 2000, Portland, Oregon. Information: Gina Hashagen, Dept of Horticulture, Oregon State University, Corvallis, OR 97339, (541) 737--5477, Email: hashageg@bcc.orst.edu, or Web: wsare.usu.edu/cfe/sare2000/.

Gateway to the Future - Conserving Private Land, Soil and Water Conservation Society Annual Conference, July 8-12, 2000, St, Louis, MO. Information: Pat Mulligan, Conference Manager, SWCS, Tel. 515-289-2331, ext. 17, email patm@swcs.org, or www.swcs.org.

Riparian Ecology and Management in Multi-Land Use Watersheds, August 27-31, 2000, Portland, OR. Complete conference information, including the call for abstracts, is available at the conference website: www.awra.org/meetings/Portland/Portland.html. The deadline for submitting abstracts is December 6, 1999.

FAO International Poplar Commission, 21st session, Sept. 24-30, 2000, Portland, Oregon. "Poplar and willow culture: meeting the needs of society and the environment." For information, contact Jud Isebrands, USFS Forestry Sciences Lab, 5985 Hwy. K, Rhinelander, WI 54501, Tel. 715-362-1116, Fax 715-362-1166, email jisebran@newnorth.net.

Seventh Conference on Agroforestry in North America, August 16-18, 2001, Regina, Saskatchewan, Canada. Watch for more information on the AFTA website and in the newsletter. ❒

Association for Temperate Agroforestry Inc.
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Membership in the Association for Temperate Agroforestry includes a subscription to our quarterly newsletter, discounts on AFTA publications, and reduced registration fees for meetings sponsored by AFTA.

Annual Membership Dues: Individuals and Families: 1 year $25, 2 years $45, 3 years $60; Student $10; Sustaining $50; Lifetime $300.

Annual Newsletter Subscriptions: Businesses, agencies & institutions, $50; Nonprofits and libraries, $25.

Overseas Postage: For all addresses outside the US, add the following amounts to the above membership/subscription rates: Canada/Mexico, $5 per year; All Other Countries $10 per year.

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Recruited by (new members): _____

Please make your check (U.S. dollars) payable to AFTA, and send your application and dues to AFTA, c/o Sandra Hodge, University of Missouri, 203 ABNR Bldg., Columbia, MO 65211.