



# The **Temperate Agroforester**

Volume 5, Number 3

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## **“Working” Buffer Strips Provide Both Profit and Protection**

By Miles Merwin

Oregon farmer Rob Miller planted his first buffer strip of native cottonwood 25 years ago along the riverbanks adjacent to his cropland. “Working” buffer strips have since then not only protected this valuable farmland from erosion, but have also provided a profitable wood crop. They are now an integral part of a diversified farming operation that includes row crops, a research and production nursery, and specialty crops.

Mt. Jefferson Farms, owned by second-generation farmer Rob Miller, produces a variety of row crops on about 200 acres of fertile alluvial soil along the North Santiam River in the Willamette Valley south of Salem. According to Miller, the farm originally had 600 acres of irrigated cropland along the river, but 400 acres were lost to erosion and siltation following periodic river flooding. The remaining acreage has been saved by the planting of riparian buffer strips.

Following his father’s interest in poplars, Rob Miller visited the Poplar Institute in Rome, Italy, in the mid-1960’s. There he procured cuttings of 100 hybrid clones for testing on the family farm. He planted the first buffer strips of native black cottonwood (*Populus trichocarpa*) and hybrid poplars in 1970. The original plantings have withstood several major floods along the river, and portions of it have since been harvested several times for high-value wood products. “My aim is to show landowners that buffer strips can be profitable,” Miller said, “or at least a break-even proposition.”

The original planting of native black cottonwood was commercially thinned in 1980 and 1994. The 1994 harvest yielded 10,000 board feet per acre, almost all of which was sold for veneer peeler logs at a

► **Riparian Buffers, p. 6**

## **Call for Nominations of Candidates for AFTA Offices and Board**

AFTA is seeking nominations of candidates for election to its officer positions and the Board of Directors. Officers to be elected by a membership vote in October are President-Elect, Secretary and Treasurer; they also sit on the Board. New members at large of the Board of Directors may also be elected (should the Board vote to increase the number of directors).

Although officers and directors normally serve two-year terms of office, those candidates elected in October 1997 will serve from January 1998 until the next North American Agroforestry Conference (NAAC) in 1999.

This shortened term is necessary to coordinate the election of officers and directors as prescribed in the new AFTA Bylaws. The current officers of AFTA began serving in January 1996 and will leave office in December 1997. In future, all officers and directors

will be elected in April of odd-numbered years, take office at the NAAC held that year, and serve two years until the next NAAC.

Any AFTA member in good standing may serve as an officer or director, and may nominate themselves or others. Ballots for the election will be mailed to members in good standing in October 1997.

Written nominations must be received no later than **September 1, 1997**. Nominations should be sent to H.E. Gene Garrett, AFTA President, School of Natural Resources, 1-30 Agriculture Bldg., University of Missouri, Columbia, MO 65211, Fax (573) 882-3647, E-mail [gene\\_garrett@muccmail.missouri.edu](mailto:gene_garrett@muccmail.missouri.edu). Nominations may also be made verbally during the forthcoming Annual Meeting of AFTA members, to be held on August 3 during the North American Agroforestry Conference. □

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[http://www.missouri.edu/~afta/afta\\_home.html](http://www.missouri.edu/~afta/afta_home.html)

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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.

### **AFTA Membership Dues**

Regular: 1 year \$25, 2 years \$45, 3 years \$60;  
Student \$10; Sustaining \$50; Lifetime \$300.

Non-voting: Institutions \$40, Nonprofits \$20.

Overseas Postage: Canada/Mexico, add \$5 per year;  
All other countries, add \$10 per year.

Send annual membership dues by check payable to  
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### ***The Temperate Agroforester***

*Editor:* Miles Merwin

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: Miles Merwin, The Temperate Agroforester, P.O. Box 266, Lake Oswego, OR 97034, Tel. (503) 697-3370, Fax (503) 697-1767, e-mail [mlmerwin@teleport.com](mailto:mlmerwin@teleport.com)

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### ***President's Corner***

## **Members Back Incorporation**

*By Gene Garrett, AFTA President*

Our fifth biennial agroforestry conference is rapidly approaching, and if you have not yet made plans to attend, you should do so soon. We anticipate an excellent turn-out and, as always, those attending will be rewarded with state-of-the-art information. Please plan to attend our Annual Meeting of AFTA members which will be held Sunday, August 3, following the welcoming reception.

I am pleased to announce that an overwhelming percentage of you favor incorporation of AFTA. Ballots were mailed to 138 members in good standing who were thus eligible to vote. Of the 67 ballots received, 65 supported incorporation under new Articles and Bylaws. In view of this mandate from the membership, I plan to file the Articles of Incorporation with the Missouri Secretary of State in the very near future. Coinciding with the date of filing, our organization will officially become AFTA Inc. and will take on new legal status as a nonprofit corporation.

However, of even greater importance, incorporation signifies a new beginning. In addition to changes in our Bylaws such as the provision for the membership to elect "Directors at large" to our Board, becoming incorporated suggests a "coming of age" for our organization. Our best and most productive years lie ahead and it is paramount that we be up to the challenge.

The strength of any organization is found in its membership and AFTA is no different. As you will recall, I identified 1997 as the year of membership. Our challenge is to *double* our membership this year. To achieve this goal, each of us must contribute. If you know someone who you feel would benefit from being a member of AFTA, please invite them to join us.

In view of the fact that agroforestry is rapidly becoming a "buzzword" and the USDA has endorsed and is providing national leadership on agroforestry, our organization has much to offer for many. We are the only Association for temperate agroforestry and, as such, we are the logical home for the thousands of individuals out there who are interested in this diverse and exciting field. Do your friends a big favor - invite them to become a member of AFTA. I'm betting they will be forever grateful.

As always, it is my pleasure to serve you and I look forward to seeing you at Ithaca.

# Master Tree Grower Program Trains Australian Agroforesters

The School of Forestry and Resource Conservation at the University of Melbourne has initiated a two year pilot program to develop regional short courses in agroforestry and farm forestry designed for leading landowners and regional extension agents.

The course has been developed with the principle aim of facilitating landowner involvement in the development of agroforestry and farm forestry within their regions. The program complements formal undergraduate and graduate courses provided by the school and, like the successful Graduate Certificate in Farm Forestry, will be tailored to suit regional circumstances.

It is hoped that by providing education, experience and support that landowners will be able to recognize the opportunities for commercial tree growing (not only timber), and critically evaluate and design appropriate projects for their own and other farms.

The first Master Treegrowers course was presented in partnership with the Otway Agroforestry Network and the state Department of Conservation and Natural Resources (DCNR). Eighteen participants from the Otway region in Victoria, Australia completed the 36 hour course last December, which was conducted over a six week period and included working with farmers in the area to help them develop appropriate agroforestry and farm forestry programs on their land. Participants were selected for the course as leading landholders with practical experience and a demonstrated commitment to agroforestry.

The Otway Agroforestry Network is developing an Agroforestry Adviser Program. Graduates of the Master Treegrower course will be employed by the network to undertake site visits and prepare option reports for landowners who join the network. Before final site plans are presented to landowners, they are reviewed by project managers to ensure certain standards are met. More than 70 landowners have already requested a site visit.

## Course Structure

The course involved 20 hours of workshops and presentations, and 16 hours of field inspections. Expert presenters were engaged from a number of organizations including the DCNR who provided 3 presenters for evening classes and 3 for field inspections. Support was also provided by members of the local timber industry, private consultants, landowners, and some of the participants of the course.

The following topics were studied: Opportunities for Landowners from Agroforestry and Farm Forestry, Timber Production and Processing, Native Forest Silviculture and Multiple Use Management; Blackwood (*Acacia melanoxylon*) Harvesting, Milling and Plantation Silviculture; Industrial and Farm Plantation Silviculture, Plantation Silviculture and Land Degradation in the Otways, Process and Design Criteria for Wildlife and Shelter, Exercise in Revegetation Design, and Presentations of Revegetation Designs.

Early in the course, each participant selected a landowner to work with toward the develop a revegetation design on a particular site on their property. Knowledge gained throughout the course was used to develop a final recommendation for the landowner. With this approach the Otway Agroforestry Network was able to quickly commence 18 site visits.

## Networking Increased

The high attendance rate and enthusiasm of course participants and the informed discussions and debates which eventuated on many topics, coupled with positive feedback, indicated that participants gained a great deal of knowledge and practical experience from the course.

A strength of the course was the informal networking which occurred between participants and between expert presenters and participants. As participants were selected on their experience, knowledge and demonstrated commitment to agroforestry, a powerful learning environment developed.

The course is very much a seeding process which has developed an appropriate structure for participants to take control of their own learning. The group will be targeted for occasional information sessions which will also facilitate information exchange between peer group members. The challenge for the Otway Agroforestry Network is to effectively manage the Agroforestry Adviser Program in order to deliver practical and effective advice to landowners throughout the Otways.

Following the success of the Otways Master Treegrowers Course, the University of Melbourne is planning to initiate further courses in the Benalla region of Victoria and at Tumut in New South Wales. □

*Reprinted from Agroforestry News, March 1997, Melbourne, Australia.*

# Midwest Agroforestry Workshop: Envisioning Future Directions

By Mel Baughman, University of Minnesota, and Mike Majeski, US Forest Service

Visioning, information, communication, understanding, challenging, dreaming are all terms that describe the Midwest Agroforestry Workshop. Nearly 80 people from Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin gathered June 11-13 at Purdue University in West Lafayette, Indiana. The participant's goals were to increase their level of understanding of the economic and environmental benefits of agroforestry, and to begin networking to facilitate agroforestry technology development and transfer in the Midwest.

The following highlights of the workshop presentations focus on five areas: Definition, Why We Are Interested, History, Current Examples, and Future Directions

## Definition

According to AFTA, agroforestry is an intensive land management system that optimizes benefits from the biological interactions created when trees and/or shrubs are deliberately combined with crops and/or livestock.

Gene Garrett, University of Missouri, stated that agroforestry is intentional, intensive, integrated, and interactive. As practiced in the U.S. today, agroforestry can be categorized into five practices: windbreaks, alley cropping, silvopasture, riparian buffers, and forest farming.

## Why We Are Interested

The benefits from agroforestry are: control of wind and water erosion, improved water quality, increased crop yields, control of drifting snow, increased long-term profits, protection of livestock, reduced energy costs, improved wildlife habitat, and production of wood and non-wood forest products.

While agroforestry is expected to be a sustainable farming system and to address conservation problems, it must be financially efficient from the landowner's perspective. The success of agroforestry is contingent on proving its profitability to the landowner.

As Jan Joannides, University of Minnesota's Center for Integrated Natural Resource and Agriculture Management, stated, "our interest is in families and communities, and improving the quality of life in rural areas."

## History

Agroforestry has been practiced for decades in countries around the world. Gene Garrett's work on alley cropping in Missouri, which began 20 years ago, may be the most notable early research and development efforts in the U.S. During the last seven years, agroforestry has grown tremendously. Larry Harper, reporter from the *Missouri Ruralist* and agroforestry practitioner, called agroforestry an "emerging revolution in American agriculture."

He believes that someday its impact may equal two other revolutions he has witnessed: the shift to no-till and management intensive grazing. It took 20 years each for those other revolutions to take hold, he said. Their success can be attributed to government intervention in the forms of research and education as well as cost-sharing. He also credits the agricultural press for its role as an advocate for no-till and management intensive grazing.

Bruce Wight, National Agroforestry Center, traced the history of agroforestry within USDA. After getting its start in 1990 as the Center for Semiarid Agroforestry, the NAC was formally established as a partnership of the Forest Service and NRCS in 1995.

## Current Examples

The agroforestry practitioner roundtable proved the practicality and illustrated the problems of selected agroforestry systems. We saw the successful establishment of an alley cropping demonstration in Illinois. In one case walnuts and oaks were planted at 40 by 6 foot spacing with corn and beans between tree rows. Another planting had chestnut, Chinese chestnut and walnut with beans between rows. They even had success converting a pasture to trees. Weed control and planting techniques were emphasized.

In Minnesota we saw a consulting forester convince potato farmers and a rendering plant to establish trees in riparian areas along the Long Prairie River. Landowners and businesses cooperated to benefit water quality and wildlife while improving their relations with the public and regulatory agencies.

Arrowhead Country RC&D described its turn-key windbreak program in Indiana. Geoff King, Wisconsin landowner, described his silvopasture practices. He planted rows of trees, hybrid poplar and red oaks,

in a pasture. Tree tubes protected the trees from sheep which grazed the pasture. He also thinned a hardwood stand, removed most of the understory, planted grass, and grazed it with sheep.

From Ohio we saw miles of windbreaks planted after several agencies collaborated to design better windbreaks and provide coordinated services to farmers. An Iowa farmer showed us hazelnuts growing in his windbreaks. He expects to harvest nuts while also providing wind and snow protection for livestock.

The concurrent sessions on the five agroforestry systems were very enlightening. Gene Garrett and Andy Gillespie, Purdue University, provided guidelines for selecting appropriate tree species, determining within row and between row spacing, and potential agricultural crops for alley cropping agroforestry systems.

They reported success with tree species including pine, oak, pecan, walnut, chestnut and silver maple. Agricultural crops include corn, soybeans and hay as forage crops, but specialty crops such as ginseng, and goldenseal may also be money makers. Gene suggested bio-terraces on sloping ground to protect water quality.

Deborah Hill, University of Kentucky, introduced us to forest farming - a practice in which agronomic crops are cultivated under an existing forest canopy. As examples she discussed the culture of honey bees and their products, basket and craft materials, maple syrup, medicinals such as ginseng and goldenseal, and mushrooms, including shiitake and morels.

Catalino Blanche, Agricultural Research Service, Terry Clason, Louisiana State University, and Bruce Cutter, University of Missouri, showed that an agroforestry practice involving trees and grass grazed by cattle was more financially efficient than either trees or grazing alone. They cautioned that such systems must be designed with an eye toward local environmental and economic conditions.

Tom Isenhardt, Iowa State University, and Jim Robinson, USDA-NRCS, described research proving the worth of riparian agroforestry systems to lower water temperature in streams, to contribute detritus and large woody debris to streams for fish habitat, and to reduce sediment and nutrients entering streams. They described how agricultural systems have changed the hydrology in upper parts of watersheds leading to more erosion and sedimentation. A buffer of trees, shrubs, and grass can stabilize soils and absorb sediment and nutrients.

Charles Baldwin, Ridgetown College, Ontario, and

Bruce Wight, USDA-NRCS, stated that windbreaks should have a density of 50-60% and that beneficial effects on crops extend from 5H upwind to about 12H-15H downwind, where H is the height of the windbreak. They hammered home the point that an agroforestry windbreak system has been shown over and over again to be a financially efficient investment.

## Future Directions

As we look to the future, what guidance can we derive from this conference?

Larry Harper advised participants to: (1) encourage the federal government to provide research, education, and cost sharing, (2) prove that agroforestry systems are at least as profitable as traditional agricultural systems, and (3) help the agricultural press understand and become an advocate of agroforestry. The best way to do that is to get the practices on the land in the hands of respectable farmers and to demonstrate that they are profitable.

Lane Ralph, Assistant State Director for Indiana U.S. Senator Richard Lugar, said "we need to let our Congressional representatives know about our agroforestry interests." As world population grows, demand for agriculture and natural resources will grow. He believes that agroforestry practices are part of the solution.

Gene Garrett told us that in 1975 no one listened to agroforestry concepts. It was like playing the "Stupid Song" trying to sell agroforestry to farmers. By 1997 we've progressed light years. He offered an example from Missouri where the state passed a law offering cost-share and annual payments to convert CRP land to alley cropping.

As we produce more research, we need to engage in technology transfer. Sandra Hodge, University of Missouri, encouraged us to form partnerships. Agroforestry development doesn't stop with knowing the practices, she said. We need technology transfer to get people to use them.

During the last day of the workshop, the representatives from each state met to discuss the current agroforestry activities in their state and their vision for the future of agroforestry. Every state delegation developed a list of actions to move the program forward in their state.

Agroforestry has the potential to revolutionize American agriculture. The Midwest Agroforestry Workshop was a step forward into a future that will change agriculture economically, environmentally, and socially. □



## ► Riparian Buffers

value of \$350 per thousand bd ft. The harvest produced a total gross return of \$70,000. Miller said that other sites on his farm planted with black cottonwood in the mid-1970's have yielded 20-25,000 bd ft per acre of veneer grade logs.

Rob Miller has also planted poplars and cottonwoods in upland areas of his farm where the soils are too poor to grow economic yields of row crops or grass seed. In a 10 year old test planting that includes native black cottonwood and several clones of hybrid poplar, the native cottonwood has grown about half as fast as the hybrid poplar. However, where Miller has planted native cottonwoods on better soils adjacent to the riverbank, they have attained merchantable size for veneer in as little as 12-15 years.

About 200 acres of riparian buffer strips are now managed on a sustainable basis at Mt. Jefferson Farms. The plantings range from 200 to 1000 feet wide along 2 miles of river frontage. Rob Miller's aim is to harvest and replant portions of the buffer strips every year to achieve an annual sustained yield of timber while maintaining their protective capacity.

He manages these multipurpose buffer strips as a profitable wood crop, to protect his farmland from erosion and flooding, and to prevent excess nutrients and agricultural chemicals from reaching the river. Miller sees the use of riparian buffer strips to protect water quality as a proactive step to meet expected future regulation which may mandate controls on farming operations near riparian areas.

In addition to the riparian buffer strips of cottonwood and poplar, Miller has effectively utilized several bioengineering practices to prevent streambank erosion. Both poplars and willows are densely planted as "live stakes," and cuttings are used to construct fascines and brush mattresses to help protect the river banks. Buffer strips, combined with bioengineering measures, have reduced erosion and siltation of Miller's farmland during recent floods while large

barriers of rock rip-rap installed in an effort to protect the neighboring farm on the opposite side of the river have not been successful for the landowner.

A zonal design is used to establish riparian buffer strips at Mt. Jefferson Farms. In the zone closest to the river, native cottonwood and native understory plants are established. In some areas with suitable soils, hybrid poplars are densely planted (1 X 1 foot spacing) near the riverbank, both to control erosion and as a stool bed for cuttings. In the next zone away from the river, a variety of trees are planted at wider (8 X 8 foot) spacing for timber. In addition to hybrid poplar, Rob Miller is also planting Knobcone-Monterey hybrid (KMX) pine and leyland cypress for wood production on a sustainable cycle of harvest and coppicing or replanting.

Mt. Jefferson Farms is also one of Oregon's first and largest hybrid poplar nurseries. The company has growing grounds and greenhouse facilities near Salem. Every year, the nursery supplies millions of dormant cuttings, from 8 inch "sticks" to 10 foot "whips" for landscaping, farmland plantings, and industrial fiber plantations.

The nursery also does selection, breeding and genetic improvement of hybrid poplars for private industry and public agencies. Many new poplar clones, obtained from Washington State University, University of Washington and other sources, have been screened in greenhouse and field trials.

Clones are tested not only for growth, but also for their capacity to uptake nutrients such as nitrogen and phosphorus. Clones which are highly efficient at absorbing excess nutrients will be used for "phytoremediation" treatment of wastewater. Embryos of trees selected through greenhouse and field screening are multiplied by tissue culture at Oregon State University in Corvallis, and the resulting plantlets are then grown out at the nursery to sufficient size for field planting.

In 1992, Rob Miller began selecting and custom-



*"Live stakes" of poplar planted last year in a bioengineering planting will stabilize this streambank and protect adjacent cropland at Mt. Jefferson Farms. Native cottonwoods from these original 1970 buffer plantings of were harvested for veneer.*

**Continued ►**

## Video Features Silvopasture Agroforestry in the Northwest

Oregon State University has released a new video to inform landowners in the Northwest about the potential for combining trees with livestock in silvopastoral agroforestry. *Branching Out with Agroforestry* provides a brief introduction to agroforestry in the US and overseas, followed by an overview of planning, site preparation, tree planting, and management in agroforests. Although it is targeted at landowners in the Pacific Northwest, the general principals discussed are relevant to other temperate climate zones.

Produced by the OSU Forestry Media Center, the 12-minute video draws on research conducted by OSU forestry and range scientists, and cooperative extension specialists. Much of the video was shot on private lands around Oregon whose owners have implemented silvopasture; two of them sum up their reasons for combining trees with livestock. Examples of agroforestry in New Zealand are included to illustrate what has been done in climates similar to the Northwest.

The steps in establishing an agroforest, either by planting trees in existing pasture or thinning an existing forest, are illustrated. Species selection, planting, thinning, and pruning of suitable timber trees are dis-

cussed. The video emphasizes that management of the interactions between trees, pasture and livestock is what differentiates agroforestry from forest grazing which is commonly practiced in the region. As the trees mature and understory pasture growth is reduced by shading, the video suggests the potential for forest farming production of foliage plants, mushrooms or medicinal plants.

*Branching Out with Agroforestry* (video tape #1087) is available for rental or purchase from the Forestry Media Center, 248 Peavy Hall, Oregon State University, Corvallis, OR 97331-5702, Tel. (541) 737-4702, Fax 737-2668. The rental fee by mail is \$25 for five days. The Media Center's policy is to ask renters to specify the starting date for the rental, and then to send it to them well in advance of their requested date. The rental period can be extended by paying \$10 for each additional 5-day increment. The purchase price is \$130.

A companion OSU Extension publication, *Agroforestry in Western Oregon*, is available for purchase from the Benton County Extension Service, 1849 NW 9<sup>th</sup> St., Corvallis, OR 97330-2144, Tel. (541) 757-6750, Fax 754-1603. □

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propagating a variety of other native tree and shrub species for ornamental and environmental purposes, e.g. wastewater treatment, filter strips, bioengineering, and watershed revegetation. Customers for contract propagation include both public agencies (e.g. USFS, BLM) and private companies.

The aim is to vegetatively propagate plant material for replanting in the same watershed or zone where it originated. By using locally-collected native plants rather than introducing off-site genetic material, Miller said that the survival rate for revegetation projects can be improved. Species which the nursery has propagated include western spiraea, alder, cottonwood, rose, berries, conifers, willow, cypress and grasses.

A three-phase process is used at Mt. Jefferson Farms for contract propagation. Phase 1 begins with the arrival of cuttings collected by the customer from plants already growing at the project site. Testing is performed to develop successful methodologies for vegetative propagation of each species. At the same time, greenhouse evaluations for nutrient absorption capacity are conducted in cooperation with the Oregon Graduate Institute of Science and Technology

and OSU.

In phase 2, mother blocks are established at the nursery as a source of cuttings for large-scale multiplication. In phase 3, the best plant materials developed through phases 1 and 2 are established in test plots to evaluate their suitability for buffer strips, phytoremediation, bioengineering, veneer production, pulpwood, etc.

Other farming enterprises at Mt. Jefferson Farms include essential oils (e.g. mint, marigold, parsley), seed (e.g. grass, sage, coriander), and specialty crops (e.g. tea, ornamental plants). Rob Miller and a partner are currently screening over 900 varieties of tea (*Camelia sinensis*) to select adaptable cultivars for a new perennial crop in Oregon.

The introduction of commercial tea cultivation in the US might also provide a new opportunity for agroforestry. Since tea bushes grow best under shade, Miller said that there would be the potential for alley cropping combinations of tea with hybrid poplar or other suitable tree species.

For more information, contact Rob Miller, Mt. Jefferson Farms, P.O. Box 12708, Salem, OR 97309, tel. 503-363-0467. □

# Alley Cropping of Paulownia Common in Northeast China

By Doug Shorey, Forestry International, Sparta, Georgia

China's land area covers about 9,602,700 km<sup>2</sup> of which 100 million ha are arable while another 115 million ha are forested. The country has a population of well over a billion people, 80% of whom are peasant farmers. Given the size of the population and the limitation of arable land, a villager in China has less than 0.13 ha of land for himself, and this availability shrinks further to less than 0.03 ha per person in densely populated areas. In terms of wood availability, the standing volume of timber is about 10.3 billion m<sup>3</sup> or about 10 m<sup>3</sup> per person.

## Paulownia Intercropping

Paulownia (*Paulownia elongata*) is one of the fastest growing trees species in China. In the Paulownia Crop Intercropping (PCI) system, 5 year old trees (four years after outplanting) can reach an average diameter at breast height (dbh) of 19.9 cm and 7.8 m average height with a volume of 0.12 m<sup>3</sup>/tree, which meets the standard for purlin lumber production. Eight year old trees (seven years after outplanting) have an average dbh of 29.5 cm and 10.35 meters in height with a volume accumulation of 0.37 m<sup>3</sup>/tree, which meets the requirements for the production of boards. Eleven year old trees reach 38.38 cm average dbh and 12.46 m in height with 0.54 m<sup>3</sup>/tree in volume accumulation and can be used for the production of plywood.

A *P. elongata* tree in a PCI system with planting spacing of 5 x 20 m has a crown cover area of 22.09, 27.0, and 35.53 m<sup>2</sup> respectively at ages five, six and eight years. The light penetration rate through the Paulownia crown is comparatively high even though the crown is big. Research on the light penetration rates of single trees of different ages in Minquan County of Henan Province indicated that the penetration rate through a Paulownia crown was 11%, 27%, and 37% higher than through the crowns of willow, tree of heaven (*Ailanthus* sp.), or poplar. Thus, the vegetation under a pure plantation of Paulownia can still grow and develop well. Paulownia is usually intercropped with species that are partially shade tolerant.

Most of the roots of *P. elongata* are distributed under the tillage layer. A 7 year old Paulownia tree, for example, had 33.5% of the roots distributed 0-40 cm from the soil surface, and only 1.8% of the roots in

the top layer. This vertical distribution pattern of Paulownia roots is suitable for the growth of wheat, millet and corn as intercrops since 80% to 97% of the roots of these grains are distributed in the tillage layer (0-40 cm). Concerning the horizontal distribution, most of the roots of Paulownia are located close to the tree. In three year old trees, most of the roots (70-90%) were distributed within 2 m, 10 to 20% were 2-4 m from the tree, and less than 10% were greater than 4 m from the tree. In view of these root characteristics, Paulownia could be considered as an ideal agroforestry tree species.

Paulownia trees have an influence on the microclimatic aspects of a PCI system. Both soil and air temperatures tend to be cooler in the day and warmer at night than in comparative fields without Paulownia trees. A reduction in wind speeds of as much as 30% was recorded. As a result of cooler temperatures and reduced winds, the evaporation rate is lessened and this reduces the water stress level for intercrops.

## Summary

Paulownia has been used and expanded in intercropping systems to approximately 3 million ha and has now become an important cultivation system in North China. The Paulownia Crop Intercropping system has increased the utilization of the land to provide for much needed timber and still allows for the production of grains, cotton, and other agriculture products that have historically been cultivated on the land.

Paulownia has the characteristics of fast growth, a deep root system, and a transparent crown which enhances the suitability of the microclimate for the production of agricultural crops. The tree has played a major role in ensuring high and stable production of crops, resulting in economic gains of 15 - 25% over crops alone.

About 63.5% of the Paulownia biomass can be used as timber and firewood. In Heze Prefecture of Shandong Province, there are more than 320 Paulownia timber processing plants which process 57,000 m<sup>3</sup> timber annually. □

*Excerpted from an article that appeared originally in the January 1997 newsletter of the American Paulownia Association.*





### Resource Management Planning

Agroforestry practices are most effective when they are designed and implemented as part of a comprehensive plan integrating all farm or ranch enterprises. While the NRCS has historically worked with landowners to prepare whole farm plans, a new report by an interagency team proposes a re-orientation of farm planning. Their report emphasizes a voluntary, producer-driven approach to farm planning in which the landowner has primary responsibility for the scope, development and maintenance of resource management plans. Elements of this new approach are public-private partnerships, sharing of technical information and services, and recognition of the inability of individual agencies to provide all the technical assistance required by landowners.

Included in this report is a comprehensive model for resource management planning to guide landowners in developing their own farm plans. It discusses the goals and objectives of the planning process, and includes several worksheets for landowners to use in developing their overall objectives, physical inventory, natural resource assessment, implementation plan, and evaluation process. Examples of plans for model farm and ranch properties are also included.

*Producers' Guide to Resource Management Planning*, \$9.95. To order, send a check to the National Association of State Departments of Agriculture (NASDA), 1156 15<sup>th</sup> Street NW, Ste. 1020, Washington, DC 20005.

### Honeylocust FACT Sheet

AFTA Past President Mike Gold has authored a new concise summary of information on honeylocust (*Gleditsia triacanthos*), a widely adapted temperate zone fodder tree. Along with botany, ecology and distribution of honeylocust, he discusses its use in silvopastoral agroforestry and windbreaks. The summary also includes honeylocust silviculture, establishment and management, along with a selection of important references.

FACT Sheet 97-04, *Gleditsia triacanthos*-Honeylocust, June 1997. Available from Winrock International, 38 Winrock Dr., Morrilton, AR 72110-9370, Tel. (501) 727-5435, Fax 727-5417, E-mail forestry@msmail.winrock.org.

### Riparian Forest Buffers Video

University of Maryland Cooperative Extension Service has produced a new video which illustrates the functions and values of riparian forest buffers to preserve water quality, improve wildlife habitat, and provide recreational areas. The video provides information on the "three-zone" riparian management system, and visits both urban and rural buffer projects.

*Riparian Forest Buffers: The Link Between Land and Water*, \$15. To order, send a check to Maryland Cooperative Extension Service, P.O. Box 169, Queenstown, MD 21658, Tel. (410) 827-8056.

### Non-Timber Products in Agroforestry

This new book is the proceedings of a conference on non-timber forest products (NTFP) in agroforestry held at ICRAF in Nairobi in February 1996. One of the purposes of the conference was to start dialogue between agricultural/forestry researchers and the food, pharmaceutical and other industries, so that the domestication processes for an array of NTFP could take into account the needs of industry, and also to stimulate new markets for the species being domesticated.

*Domestication and Commercialization of Non-timber Forest Products in Agroforestry Systems*, edited by R.R.B. Leakey, A.T. Temu, M. Melnyk and P. VanTomme, FAO Non-Wood Forest Products, No.9, 297 p. Available from FAO of the United Nations, Distribution and Sales Section, Viale delle Terme di Caracalla, 00100 Rome, Italy.

### Guide to Trees and Forestry in Hawai'i

Friends of the Trees Society convener Michael Pilarski has written a new wide-ranging and up-to-date guide to tree-related organizations, people, projects and books in the Hawaiian Islands. The guide includes sections on timber and agroforestry plantings, forestry and environmental groups, woodworkers and millers, permaculture resources, ethnobotany, books, magazines, nurseries, and arboreta.

*Friends of the Trees' Guide to Hawai'i*, \$17.50 post-paid. Order from Friends of the Trees Society, P.O. Box 4469, Bellingham, WA 98227, Tel. (360) 738-4972. □



### Salmon-Safe Program

The Pacific Rivers Council, an environmental group based in Eugene, Oregon, has launched the "Salmon-Safe" Program as a cooperative marketing effort with Northwest farms, vineyards and retailers to help revive the Pacific Northwest's depleted populations of wild salmon. The aim is to create an economic incentive for agricultural producers to use conservation practices, including riparian buffers, that are beneficial to salmon.



PRC has created a set of guidelines by which farms are inspected for certification under the Salmon-Safe program. The guidelines establish a scoring system for evaluation of farming practices in four areas: (1) riparian and wetland management, (2) water use management, (3) chemical use management, and (4) erosion and sediment control. On-site inspections are conducted by PRC's staff agronomist.

To date, over a dozen producers have been certified under the program, including organic fruit packers, organic juice companies, Lundberg Family Farms (America's largest producer of organic rice), and Oregon vineyards. These companies may display the Salmon-Safe logo on their products, which are sold in natural foods and specialty retailers in Oregon and Washington. Participating retailers will cooperate in point-of-sale promotions, and PRC has enlisted the aid of advertising and public relations firms to increase public awareness. The hope is that given a choice between two equivalent products, consumers will choose the one with the Salmon-Safe logo, even if it means paying a premium.

PRC plans to expand the promotion and retail dis-

tribution of Salmon-Safe products on both regional and national levels. Efforts will be made to track how the certification affects sales for participating growers. PRC intends to expand the number of certified producers, including those using conventional as well as organic methods.

For more information about the Salmon-Safe program, contact Pacific Rivers Council, 921 SW Morrison St., Ste. 531, Portland, OR 97205, Tel (503) 294-0746, Fax 294-1066. Information is also available on the group's Web site: [www.pacrivers.org](http://www.pacrivers.org).

### National Woodland Owners Association

The National Woodland Owners Association is a nationwide organization of small woodland and forest owners. Members in all 50 states work to help each other promote good stewardship on non-industrial private woodlands. Founded in 1983, NWOA is affiliated with 178 state and local landowner associations throughout the US.

Members receive two publications: *Woodland Report* (8 issues per year), with news of legislation, court decisions and state activities of interest to private woodland owners; and *National Woodlands* (quarterly), written by woodland owners for woodland owners. NWOA members may also receive a free introductory consultation with a professional forester, in cooperation with the National Forestry Association (available in most states).

Membership dues are \$25/year, or \$45 for 2 years. For more information, contact National Woodland Owners Association, 374 Maple Ave. E., Ste. 210, Vienna, VA 22180, Tel. (703) 255-2700. □

## Volunteers Needed at NAAC

AFTA is seeking members willing to help during the North American Agroforestry Conference, August 3-6 at Ithaca, New York. Volunteers are needed for short periods to staff the AFTA information table and to sell publications, sign up new members, and answer questions about AFTA. If you are planning to attend the conference and can help out for an hour or two, please contact Gene Garrett, AFTA President, School of Natural Resources, 1-30 Agriculture Building, University of Missouri, Columbia, MO 65211, Tel. (573) 882-3647, Fax 882-1977, E-mail [gene\\_garrett@muccmail.missouri.edu](mailto:gene_garrett@muccmail.missouri.edu).



## Internet Resources

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### **NRCS Institute Insights**

[www.ftw.nrcs.usda.gov/consortium/consort.html](http://www.ftw.nrcs.usda.gov/consortium/consort.html)

NRCS operates 8 national Institutes within the National Science and Technology Consortium whose mandate is to develop "cutting edge" science and technology in support of resource conservation, and to transfer these products and services to NRCS staff and cooperators. News of the activities of individual Institutes appears every 4 months in *Institute Insights*; the newsletter can also be accessed on the Web at the address above.

Most of the Institutes also have their own web sites: Soil Quality Institute, [www.statlab.iastate.edu/survey/SQI/sqihome.html](http://www.statlab.iastate.edu/survey/SQI/sqihome.html); Watershed Science Institute, [www.geology.washington.edu/~nrcs-wsi/](http://www.geology.washington.edu/~nrcs-wsi/); Water Science and Technology Team, [www.wcc.nrcs.usda.gov/wcc.html](http://www.wcc.nrcs.usda.gov/wcc.html); Wetlands Science Institute, [159.189.24.10/wetsci.htm](http://159.189.24.10/wetsci.htm); Grazing Lands Technology Institute, [www.ftw.nrcs.usda.gov/glti/homepage.html](http://www.ftw.nrcs.usda.gov/glti/homepage.html); Natural Resources Inventory and Analysis Institute, [www.statlab.iastate.edu/survey/NRIAI/nriai.html](http://www.statlab.iastate.edu/survey/NRIAI/nriai.html); Social Sciences Institute, [people.nrcs.wisc.edu/](http://people.nrcs.wisc.edu/)

[SocSciInstitute/default.htm](http://SocSciInstitute/default.htm).

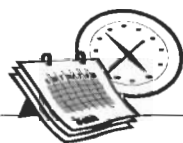
### **Directory of Water and Wildland Experts**

[www2.nceas.ucsb.edu:8502/exp/db/intro](http://www2.nceas.ucsb.edu:8502/exp/db/intro)

A new online directory from the University of California lists more than 1,000 faculty, specialists and staff members from 8 UC campuses who have expertise in the management and conservation of natural resources.

Areas of research covered by the database include, for example, agriculture, agroforestry (a recent search on this term yielded 17 "hits"), acid rain, cloud seeding, drainage, endangered species, hazardous waste, irrigation management, marine resources, pest management, riparian vegetation, salinity, solar energy, water banking, wetlands and wildlife.

A user-directed search produces a list of scientists with contact details and links to more detailed information about their areas of expertise. In coming months, scientists from the California State University system and state and federal agencies will be added to the directory. □



## Mark Your Calendar

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**Soil and Water Conservation Society**, July 23-26, Toronto, Ontario. The theme of this year's annual conference will be "Managing Ecosystems on a Watershed Basis." For information, contact Nancy Herselius, SWCS Meetings Coordinator, Tel 515-289-2331, ext. 18, or see the Web page at [www.swcs.org](http://www.swcs.org).

**Fifth North American Agroforestry Conference**, August 3-6, Ithaca, NY. Co-sponsored by AFTA and hosted by Cornell University, the theme will be "Challenges for Agroforestry in Changing Rural Landscapes." For information, contact Dept. of Natural Resources, 118 Fernow Hall, Cornell University, Ithaca, NY 14853, Tel (607) 255-2810, or visit the AFTA web site: [www.missouri.edu/~afta/afta\\_home.html](http://www.missouri.edu/~afta/afta_home.html).

**AFTA Meetings at Fifth NAAC**: AFTA Member's Annual Meeting, August 3; AFTA Board of Directors, August 4 (see conference registration packet for details).

**Edible Forest Gardens**, Sept. 26-28, Deerfield, MA. Weekend workshop on design and installation of multipurpose forest gardens. For information, contact Dave Jacke, Native Harvest Designs, PO Box 148, Leverett, MA 01054, Tel 413-548-8899, e-mail: [DjackeNHD@aol.com](mailto:DjackeNHD@aol.com).

**Agroforestry: Driving Forces, Forging Solutions**, October 4-8, Memphis, TN. Seminar organized by Agroforestry Working Group during Society of American Foresters national convention. For information, contact Richard Schultz, Dept of Forestry, Iowa State University, Ames, IA 50011, Tel 515-294-7602, Fax 294-2995, e-mail: [rschultz@iastate.edu](mailto:rschultz@iastate.edu).

**First Light-First Forest, Fourth Annual Tree Farmer Convention**, November 6-9, Ogunquit, Maine. Members of the American Tree Farm System will gather for their annual meeting. For information, contact American Forest Foundation, 1111 19<sup>th</sup> St. NW, Ste. 780, Washington, DC 20036, Tel. (202) 463-2462. □



Association for Temperate Agroforestry  
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## Calling All Agroforesters!

Register now for the Fifth North American Agroforestry Conference, Cornell University, August 3-6. Hear the latest scientific information, see agroforestry practices in the field, and enjoy camaraderie with an international assemblage of temperate agroforesters. Plan to attend the AFTA members' Annual Meeting on August 3. See page 11 for contact details.



## Membership Application and Renewal

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 Dues:** Individuals and Families: 1 year \$25, 2 years \$45, 3 years \$60; Student \$10; Sustaining \$50; Lifetime \$300; Corporate and Institutions (non-voting) \$40; Nonprofit Organizations (non-voting) \$20

**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.

**Check one:**  New  Renewal

**Name** (Please print) \_\_\_\_\_

**Address** \_\_\_\_\_

**Telephone** \_\_\_\_\_ **Fax** \_\_\_\_\_ **E-mail** \_\_\_\_\_

**Main Agroforestry Interests** \_\_\_\_\_

**Recruited by** (new members): \_\_\_\_\_

Please make your check (U.S. dollars) payable to AFTA, and send along with your application and dues to AFTA, c/o Dr. Deborah Hill, Treasurer, Forestry Dept., University of Kentucky, Lexington, KY 40546-0073, USA.