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Center for Sustainable Agricultural Systems Newsletter

May-June 1996

New CSAS Web Page

As anyone who has worked on a new World Wide Web home page knows, the anticipated activation date keeps getting pushed back until you wonder if it will ever be ready to announce. Well, we finally made it in May. Please visit our site at:

http://www.ianr.unl.edu/ianr/csas

We have included many links to other sites, so take some time to browse. There's lots of information available at your fingertips!

Exchange Program for Organic Farmers

Multinational Exchange for Sustainable Agriculture (MESA) is a non-profit organization dedicated to the global advancement of sustainable farming practices. It sponsors a farmer-to-farmer exchange program between the U.S. and participating countries, giving young farmers interested in organic agriculture opportunities for training in other parts of the world. Participants can: be host farmers, be exchange farmers, join MESA's advisory board, make tax-deductible donations, and/or help spread the word about MESA. For more information contact Lauren Augusta, MESA, 5337 College Ave, Suite 508, Oakland, CA 94618, 510-654-8858.

Field Day On Specialty Crops

A field day and tour on producing and marketing specialty crops will be held on August 24 in conjunction with the Lincoln Farmer's Market and local growers. The goals are to demonstrate how producers can focus on specialty items for sale both on farm and in local markets to maximize their return to labor and limited

land area, and to educate the general public about how food is produced with environmentally sound practices.
The field day includes a tour of the farmer's market, technical presentations and demonstrations by producers and researchers. There will be farm-related children's activities during the morning session in the Iron Horse Park adjacent to the program. The afternoon includes visits to three producers near Lincoln who are marketing specialty crop and animal products. In the late afternoon there will be a buffet of locally produced food and discussion of future marketing directions, held at the Lancaster County Extension Office, 444 Cherrycreek Road.
Marketing Specialty Crops is co-sponsored by the Nebraska Sustainable Agriculture Society, Lincoln Farmer's Market, Specialty Growers/OCIA-NE Chapter 3, Cooperative Extension Service, and the CSAS. There is no cost for the program, tour, and buffet. Participants will provide their own transportation for the field tours. The program will begin at 10 am at the Farmer's Market, Haymarket District in Lincoln, 8th & Q. For more information contact Pam Murray in the CSAS office.

Editor's Note: There are web sites dedicated to direct marketing, one of which is:

http://members.aol.com/marketfarm/farmers-market/

Windbreaks for Corn?

Establishing windbreaks, a practice that took root during the Dust Bowl days of the 1930s, is making somewhat of a comeback. One reason is that in addition to offering traditional conservation benefits, trees can help boost yields of corn and other crops.
Guy Ewald, who grows corn, soybeans, wheat, and alfalfa near Waldorf, Minn., says windbreaks can take some of the risk out of growing corn in his area, and can make a valuable contribution to corn yields.
"I've noticed that corn rows near tree lines often grow taller and tassel earlier than in the rest of the field," Ewald adds. "This can increase yields, especially in early planted fields. When we can, we select yield-contest acres near a grove or hedge to take advantage of any beneficial effects there might be." (The Ewalds, including Guy's brothers and father, have won many corn and soybean yield contests.)
A well-managed windbreak provides a wide range of benefits, according to Jim Brandle, a University of Nebraska forester. Brandle, an internationally known promoter of windbreaks, says they offer profit potential as well as resource conservation.
Brandle conducted an economic study analyzing how field windbreaks affect corn, soybeans, and wheat. He used single-row evergreen windbreaks on the north, east, and west sides of fields, plus varying numbers of equally spaced

windbreaks within fields. Depending on the specific windbreak arrangement he used, trees occupied 6.4 to 14.6 acres out of each quarter section.

A windbreak system using 8.7 acres per quarter section produced the best economic returns in Brandle's study. Yield increases were 15 percent for corn, 10 percent for soybeans, and 12 percent for winter wheat.

Brandle attributes the yield increases largely to improvement of the microclimates surrounding growing crops. The improvement comes from altering wind-flow patterns on the leeward side of windbreaks. Trees reduce the wind speed for a distance that's as much as 30 times the windbreak height, or up to 900 feet downwind from 30-foot trees.

According to Brandle, cutting the wind velocity lowers evaporation rates and increases water-use efficiency and photosynthesis in crops. It also reduces abrasion of plants caused by windblown soil.

"During hot summer days, when the wind is from the south, an east-west-oriented windbreak will benefit crops the most on the north side of the trees," Brandle says. "But during early spring, when prevailing winds are northerly, young corn seedlings south of the same windbreak will benefit from warmer growing conditions and the extra moisture from snowmelt that's soaked in."

What about competition from trees? In general, Brandle says, trees that are up to 40 feet tall won't over-compete with crops from sunlight and nutrients. "The degree to which trees compete with adjacent crops depends more on the tree species," he adds. "Shallow-rooted species normally compete more than deep-rooted species do."

Other researchers also are looking into the benefits of growing trees and field crops next to each other. Ohio State University agronomists have planted 40-row strips of corn between rows of walnut trees on sloping land. The scientists say interim income from corn makes this a cost-effective way to establish what will someday be high-value trees.

Research at the Forest Resource Center, Lanesboro, Minn., includes studies of how to use trees bordering fields, pastures, and farmsteads. Native trees and shrubs growing in fencerows are being managed as windbreaks, and woody growth is being evaluated as wildlife habitat and as a source of fuel.

To study the effect of windbreaks on crop growth, Iowa State University researchers planted hybrid cottonwoods on the Dennis Morgan farm near Ogden, Iowa. The trees, now three years old, are adjacent to a field in which strips of corn, soybeans, and oats are rotated.

"One of our goals is to demonstrate the feasibility of including trees in long-term rotations," says Carl Mize, an Iowa State University forestry specialist. "We're measuring the impact of shelterbelts on crop yields at various distances from the trees. So far, corn yield increases have been small, but that may change as the trees get taller. We have found that trees reduce drifting of vapors from pesticides and fertilizers to off-target areas."

Research shows that a variety of crops benefit from having windbreaks nearby. In one experiment, German scientists found that the sugar content of sugarbeets grown near a windbreak was 19.7 percent higher than it was in unsheltered beets. In other experiments, they found that adjacent trees and shrubs improved the

germination and quality of green beans and tomatoes, and that windbreaks reduced tip burn in lettuce and squash.
In recent University of Nebraska studies, windbreaks increased yields of cantaloupes, snap beans, and asparagus. Sheltered melons also matured a week to two weeks earlier than melons in unsheltered fields.
Windbreaks can even be a part of biological-control programs. "In addition to crops and soils, trees shelter natural predators of crop pests," Brandle says. As examples of borer-eating birds, he mentions flickers and downy woodpeckers. Species that consume cutworms, grasshoppers, and beetles include longspurs and horned larks. Populations of these and other birds that prey on insects tend to be higher around windbreaks.
"Including windbreaks in a pest-control program can help reduce pesticide use," Brandle says. "So in addition to helping conserve soil and water, and in many cases increasing crop yields, windbreaks can reduce production costs."

Source: This article by John J. Regan was reprinted with permission from the Spring 1996 issue of *The Furrow*, published by Deere & Co.

Windbreak Evaluation Software

CSAS Faculty Associate Jim Brandle and John Kort from the PFRA Shelterbelt Centre in Canada have released a new version of their windbreak evaluation program, WBECON. It evaluates field windbreak plantings for any rectangular shaped field with dimensions greater than 500' by 500'. The user can select from a number of tree species and designs for local growing conditions. The program considers 27 common crops and allows additional crops to be added. It considers all input costs such as establishment and maintenance, crop production, land and interest. Results include annual economic return, total return on investment, and net present value based on the life of the windbreak investment.
To receive a free copy, send a disk to Jim Brandle, U. of Nebraska, PO Box 830814, Lincoln, NE 68583-0814, or to John Kort, Shelterbelt Centre, PFRA, Indian Head, Saskatchewan, Canada S0G 2K0. For more information contact Jim at 402-472-6626, e-mail: fofw084@unlvm.unl.edu.

Agroforestry For Farms, Ranches, and Communities

Agroforestry--the international integration of agriculture and forestry practices to attain more productive, profitable, and sustainable ecosystems.
This is how we describe agroforestry today. It's a holistic concept that supports sustainable agriculture, sustainable forestry, and sustainable communities. Agroforestry is pragmatically marketed as "working trees for agriculture" and "working trees for communities"planting the right tree in the right place for a

specific purpose. Agroforestry puts trees and shrubs to work in both rural areas and communities to meet people's economic and social needs.
Agroforestry practices include alley cropping, windbreaks, riparian buffers, streambank bioengineering, tree/pasture systems, living terraces, living snowfences, tree/specialty crop systems, and wildlife habitat. Benefits are: increased crop production, alternative crops and diversified rural economies, improved water quality, soil erosion/sediment control, filtering, sequestering, and processing excess nutrients and chemicals, reduced flooding, microclimate moderation, and diversified habitats for wildlife and humans.

Source: "Inside Agroforestry," Winter/Spring 1996

Editor's Note: To be on the mailing list for "Inside Agroforestry," contact the publisher, National Agroforestry Center, East Campus-UNL, Lincoln, NE 68583-0822, 402-437-5178. The NAC is a partnership of the USDA Forest Service and Natural Resources Conservation Service.

Integrated Farm

Update: Cover Crop Research

Farmers use cover crops in Nebraska for erosion control, weed suppression, forage for livestock, and nitrogen contributions to subsequent crops. Field experiments in the Integrated Farm at the UNL Agricultural Research and Development Center from 1993 to 1995 explored the potentials of several species for their productivity and contributions to the next crops in rotation. Among the cover crops tested were spring wheat, oats, spring barley, and annual ryegrass (non-winter hardy), and winter wheat, triticale, and rye (winter hardy) seeded into maturing soybeans at different times in the late summer and early fall. Results suggest that some of these have promise as components of an integrated production system.
In late summer 1993 four non-winter hardy grasses were over-seeded at a rate of 100 pounds/acre into two soybean varieties on three different dates from August 25 to September 13. There was adequate rain for germination and establishment of the grasses before and after soybean harvest. The highest forage production was from oats and annual ryegrass, but these only reached 545 pounds/acre dry matter before all the grasses were winter killed. Forage production would not justify this practice, although there was undoubtedly some potential for erosion control through the winter and spring.
In 1994 a similar trial was planted with three winter-hardy grasses over-seeded at the same rate on two planting dates into two soybean varieties. By the following spring (harvested on May 11), these forages produced from 1.0 to 2.2 tons of dry

matter/acre. This was a level of production that could provide grazing, nutrient uptake and `trapping,' and stabilizing influence on the cropping system to justify planting the cover crops. However, the growth of cover crops used moisture that was needed by the 1995 crop; corn yields were reduced by 63% and grain sorghum yields by 27% due to the hot, dry conditions that season and the delayed summer cereal planting due to management of the cover crops. This would not be a recommended practice.

The same cover crops were seeded into corn fields after silage harvest on September 7, 1994. Forage growth was limited in the fall but excellent in the next spring. Forage dry matter yields were 2.8 to 3.2 tons/acre when evaluated on June 5, 1995. Soybean yields were 29 to 32 bu/acre following the several cover crops, whether the plots were irrigated or not, in the difficult growing season of 1995.

There is need for more research on cover crops under a wide range of conditions. It is likely that they will play an integral role in the integrated farming systems of the future, once more is known about their performance and interactions with subsequent crops.

Submitted by Gary Lesoing and Chuck Francis

Editor's Note: *Managing Cover Crops Profitably*, a SARE publication, is available for $9.95 from Sustainable Ag Publications, Hills Building, Room 12, U. of Vermont, Burlington, VT 05405-0082.

Teaching Sustainability at a Distance

What is unique about teaching sustainable systems? Why do we need to approach this on a regional level? And how can distance education techniques be used to contribute to creating efficient and effective learning environments? These issues were explored during a national satellite program on April 12, sponsored by the newly created North Central Institute for Sustainable Systems, which is funded in part by a USDA challenge grant.

Gina McAndrews and Ricardo Salvador, Iowa State University, introduced the concept of the regional center and how it is being organized. The NCISS faculty consists of academics, farmers, agriculture industry and government agency specialists, and people from non-profit groups in the agricultural sector. A minor for undergraduates will consist of courses that originate in any of the universities in the region, and there will be a practical, experiential field activity for hands-on learning about systems.

Distance education techniques are useful for the NCISS program because the faculty is dispersed. Chuck Francis (UNL) described how video segments and live interviews can be used to efficiently establish context for learning. Using distance education techniques, it is possible to bring the field and the farmer to the classroom, and to interact in real time with students in multiple locations as well as with resource people where they are located.

Allan Schmidt (ISU), Jim King (UNL) and Salvador discussed and demonstrated the potentials of several types of communication. Teaching at a distance is different than working in the conventional classroom. Much prior preparation is needed to have appropriate materials and a pacing that is right for the medium. Alternatives to real-time broadcast by satellite include taped lectures and discussions, written learning and self-study materials, and local discussion groups that can deal with topics in greater depth than is possible at a distance. These can all be combined with fax, phone, and e-mail communication to promote regular interchange among instructors and students.
A tape of the broadcast is available for $10 from the CSAS office. Also check out the NCISS web page:
http://www.ag.iastate.edu/departments/agronomy/nciss/nciss1.html

Submitted by Chuck Francis and Jim King

President's Task Force Says U.S. Ag Must Be Sustainable

"U.S. agriculture must be sustainable if the national goal of sustainable development is to be achieved," and should be supported with research that integrates "agricultural productivity and profitability with environmental stewardship," according to the report of the Sustainable Agriculture Task Force of the President's Council on Sustainable Development. Chartered by the President's Council in 1994, the Task Force was charged with "articulating the key social, economic, and environmental challenges to be met in achieving a sustainable U.S. agriculture."
In its report released last month (April), the Task Force defines four goals for sustainable agriculture, and nine recommendations on how to achieve those goals.

The goals are:

- Management of agricultural activities to protect air, soil, and water quality, and to conserve wildlife habitat and biodiversity, thereby increasing agriculture's longterm productivity and profitability, as well as enhancing human health and wellbeing.
- Achievement of viable farmers and farm communities.
- Production of a safe, highquality, and affordable supply of food and fiber in a manner that protects and conserves natural resources.
- Creation of institutional incentives and funding arrangements that focus public and private research, education, and technology development on integrating agricultural productivity and profitability with environmental stewardship.

The recommendations are:

- Harmonize the pollution prevention and natural resource conservation policies of
- various federal, state, and local agencies to minimize conflicts among the policies that could undermine environmental protection.
- Increase the flexibility for participants in commodity programs to respond to market signals and adopt environmentally sound production practices and systems, thereby increasing profitability and enhancing environmental quality.
- Expand agricultural markets to increase demand for agricultural products, returns for farmers, investments in environmental protection, and conservation of natural resources.
- Move the pricing of public natural resources and their use toward market pricing.
- Keep prime farmlands in agricultural production by implementing rational landuse policies such as easement, zoning, taxation, financial incentives, transportation, and land development policies that reduce the encroachment of urban sprawl on prime farmlands.
- Help rural communities to capitalize on the economic benefits of sustainable agriculture by giving priority in rural business development and marketing programs to investments in enterprises associated with the products of sustainable agriculture.
- Continue improvements in food safety and quality.
- Develop institutional incentives and funding arrangements to promote research that shows how to integrate agricultural productivity and profitability with environmental stewardship.
- Pursue international harmonization of intellectual property rights in order to provide incentives for the development of new agricultural technologies.

For a copy of the Sustainable Agriculture Task Force Report, contact Adelia Bakiel at the USDA, 202-7202456.

Source: "Alternative Agriculture News," May 1996, Henry A. Wallace Institute for Alternative Agriculture.

Conference on Ag Production and Nutrition

Tufts University School of Nutrition Science and Policy and the Henry A. Wallace Institute for Alternative Agriculture are organizing the International Conference of Agricultural Production and Nutrition in Boston, MA, March 1921, 1997. Papers are invited on how the nutritional value and safety of food is affected by the methods used to raise it. Abstracts (200-300 words) are due September 18. For more information and a list of topics, contact William

Lockeretz, School of Nutrition Science and Policy, Tufts University, Medford, MA 02155, 617-627-3222, email: wlockeretz@infonet.tufts.edu.

Resources

Colleges of Agriculture at the Land Grant Universities: Public Service and Public Policy. New report by the Board on Agriculture of the National Research Council (part of the National Academy of Sciences) addresses the "adaptation of the land grant colleges to the public's changing needs and priorities" and makes 20 recommendations on "public policy and institutional change that could enhance the colleges' role in serving the national interest." republication copies are $35 plus $4 shipping/handling from National Academy Press, 2101 Constitution Ave., NW, Lockbox #285, Washington, D.C. 20005; 1-800-624-6242; final copies, available in August, will be $29.95 plus $4 shipping/handling. Orders can be placed at http://www.nas.edu

The Industrial Reorganization of U.S. Agriculture: An Overview and Background Report. $5.50. Examines the industrial reorganization of U.S. agriculture, and how that reorganization affects elements of sustainability. Wallace Institute, 9200 Edmonston Road, #117, Greenbelt, MD 20770, 301-441-8777.

Farmers for the Future. $23.95. Dan Looker shares his interest in helping young people find a realistic, practical way to get started in farming. Iowa State U. Press, 2121 South State Ave., Ames, IA 50014-8300, 1-800-862-6657.

The Ecological Risks of Engineered Crops, 1996. $16.95. Jane Rissler and Margaret Mellon review biotechnology research in plants. Proposes framework for assessing ecological risks from transgenic crops and recommends incorporating assessment into regulatory system. MIT Press, Massachusetts Institute of Technology, Cambridge, MA 02142, 617-625-8569.

Risky Business: Biotechnology and Agriculture, 1996 (Video). $35. An introduction to agricultural biotechnology examines its risks and purported benefits. Interviews scientists, business-people and activists who discuss concerns about biotechnology's impacts on health, environment and sustainable agriculture. Moving Images Video Project, 2408 East Valley Street, Seattle, WA 98112, movingimages@igc.apc.org.

COMING EVENTS

Contact CSAS office for more information:

- July 7-10 Soil and Water Conservation Society Annual Conference, Keystone Resort, CO

- July 1718 Soil Quality: A Guide for Conservation, Ames, IA
- July 23-26 American Society of Animal Science Annual Meeting, Rapid City, SD
- July 27 Ranching Seminar and Tour, Branch Creek Ranch, Atkinson, NE
- Aug. 24 Marketing Specialty Crops Field Day, Lincoln, NE
- Sep. 7 Festival of Color (featuring native plants and grasses), Ithaca, NE
- Sep. 15-19 7th National Bioenergy Conference, Nashville, TN
- Oct. 7-11 International Conference on Ecological Engineering, Beijing
- Oct. 20-21 Groundwater Foundation annual water festival workshop, Nebraska City, NE
- Nov. 1-2 Profit from Diversity, Small Farm Trade Show & Seminars, Columbia, MO
- Nov. 3-8 American Society of Agronomy Annual Meeting, Indianapolis, IN
- Nov. 11-1614th International Symposium on Sustainable Farming Systems, Colombo, Sri Lanka

The Center for Sustainable Agricultural Systems bimonthly newsletter is currently available free in hard copy to U.S. addresses, and electronically via: SANET, PENPages, and the internal IANRNEWS. Current and back issues, along with other sustainable agriculture information is also available on the Internet:

http://www.ianr.unl.edu/ianr/csas/

For comments or questions, or to be added to the mailing list for hard copy, contact the editor at the masthead address, or e-mail csas001@unlvm.unl.edu.

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