

SUSTAINING THE PACIFIC NORTHWEST

Food, Farm, & Natural Resource Systems

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New Farm Finder on Web

The Small Farm Team announces a new farm finder for Washington and Oregon at <http://smallfarms.wsu.edu/farms/BuyDirect.htm> dedicated to helping consumers find local farm products. While still a work in progress, the initial stages will concentrate on SW Washington and NW Oregon. The site already lists farms from Clark, Cowlitz, Multnomah, Washington, and Clackamas counties and more will be entered. Know a farm that should be listed? contact Doug and let him know. The site links to NW Washington's Puget Fresh farm finder site as well.

Sustaining the Pacific Northwest Newsletter Wins Award

The Sustaining the Pacific Northwest - Food, Farm, & Natural Resource Systems newsletter wins the 2005 Gold Award (best in nation) for Newsletters/Series of Articles from the Association of Natural Resource Extension Professionals.



Inventorying & Monitoring of Non Timber Forest Products on National Forests: An Explanatory Study

Rebecca J. McLain & Eric T. Jones, Institute for Culture & Ecology

Introduction

Across the United States, people from diverse income levels, age groups, and cultural backgrounds harvest many tree products other than timber, as well as a variety of forest understory plants. Nontimber forest products (NTFPs) include: (1) foods, such as wild edible mushrooms, fruits and nuts; (2) medicinal plants; (3) floral greens and transplants; (4) fiber and dye plants, lichens and fungi; (5) oils, resins, and sap; (6) fuelwood, and (7) small diameter wood used for poles, posts and carvings. The reasons people harvest NTFPs are as diverse as the people who gather them. Some people harvest NTFPs to earn money while others wish to supplement their diet with wild foods or obtain medicinal plants for home remedies. Some people gather berries, pick mushrooms, or tap sugar maples as a way to maintain cultural and family traditions. Still others participate in NTFP harvesting to maintain their physical and emotional well-being. The scales at which people gather and process NTFPs also

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Washington State University
SMALL FARMS TEAM
food&farm
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Sustaining the Pacific Northwest
Food, Farm, & Natural Resource Systems

This quarterly newsletter provides a discussion forum for people working towards community-based sustainable food, farm, and natural resource systems using interdisciplinary oriented research and practitioner knowledge.

This is a joint newsletter of the WSU [Center for Sustaining Agriculture & Natural Resources](#), the [WSU Small Farms Team](#), the [WSU Small Farms Program](#) and the [Water Quality Management Team](#).

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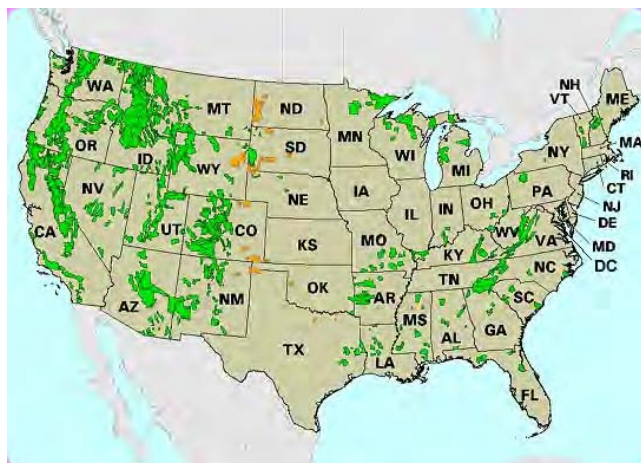
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vary; NTFPs serve as raw materials for large-scale floral greens suppliers and pharmaceutical companies to micro-enterprises centered on basket-weaving, woodcarving, and jam-making.

In the western United States, where national forests constitute a large percentage of the land base, national laws regulating the use of national forests significantly affect what, when, and where NTFP harvesting takes place. One law with the potential to significantly change NTFP harvesting on national forests is section 339 of Public Law 106-113, first passed in 1999 and extended in 2004, which requires the U.S. Forest Service to determine sustainable harvest levels for NTFPs. This requirement comes at a time when the Forest Service is experiencing massive budget cuts and reductions in field personnel. Moreover, the Forest Service historically invested few resources in developing internal expertise and knowledge of most NTFP species or products. NTFP harvesters, many of whom possess years of accumulated ecological knowledge about the products they harvest and the environments in which they work, thus constitute an important source of expertise for determining sustainable harvest levels for NTFPs.

In 2002, the National Commission on Science for Sustainable Forestry provided the Institute for Culture and Ecology (IFCAE), a non-profit research organization based in Portland, Oregon, with funds to conduct an exploratory study of NTFP management programs on national forests across the United States (Figure 1). IFCAE implemented the survey as part of a biodiversity conservation project examining the feasibility of developing participatory, multi-stakeholder NTFP inventory and monitoring programs. In 2003, IFCAE emailed questionnaires to all ranger districts in the United States

Figure 1: National Forests In Continental US



and received responses from 218 ranger districts distributed across 84 national forests. Since the results represent information obtained from a self-selected, rather than a random sample of ranger districts and national forests, the findings cannot be generalized to describe NTFP programs on all 109 of the nation's national forests. However, the survey data provide useful information about NTFP inventory and monitoring efforts taking place on the 84 national forests which responded.

Survey Results

The survey data indicate that NTFP harvesting takes place on national forests across the United States. Table 2 depicts the percentage of reporting national forests for which at least one respondent mentioned various types of NTFPs among the five most important NTFPs. Firewood, posts and poles, and Christmas trees figured among the five most important NTFPs on fifty percent or more of the reporting national forests. Transplants, boughs, and wild mushrooms appeared as important products on one-third to one-half of the reporting national forests.

Respondents from 36 percent of the reporting national forests indicated that NTFP inventories take place on their forests, while respondents from 60 percent of the respondent forests indicated NTFP monitoring occurred. Methods used to inventory NTFPs included biological studies, informal

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Table 1: Products Harvested on National Forests

	2003 (n=84)
Firewood	86%
Christmas trees	66%
Posts and poles	55%
Transplants	49%
Boughs	39%
Mushrooms	37%
Floral greens	25%
Miscellaneous plants	22%
Medicinal plants	21%
Cones	19%
Edible plants	17%
Craft wood	17%
Sand, rock and gravel	15%
Seeds	12%
Moss	12%
Construction wood	7%
Bark	6%
Saps and resins	5%
Needles	4%
Botanical specimens	4%

field checks, permit monitoring, and cultural resource surveys. The most commonly used monitoring methods consisted of permit compliance checks, informal visual checks, and biological studies (Figure 2). Respondents from the majority of reporting forests stated they believed harvesters could contribute to NTFP inventorying (58 percent) and monitoring (54 percent) by: providing labor, improving business and management (of NTFPs), sharing their knowledge, and assisting law enforcement with monitoring (Figure 3).

Managers who supported harvester involvement emphasized the knowledge harvesters have to offer, as well as the fact that harvesters are already out on the ground, as reasons for encouraging their participation. Some of their comments include:

“They could easily describe locations where they are harvesting and make sure it [harvesting] is done in a sustainable manner. They could also inform the FS on situations where over-harvesting by other gatherers is happening.”

“Commercial harvesters have knowledge of what species and products are available in the district and the amounts available. This information is valuable for inventorying products. They can provide valuable information on the effectiveness of harvest amounts

and methods of promoting long-term viability of species.”

“Native seed collectors are knowledgeable and [already] do provide appropriate inventory and monitoring of the species they collect.”

Several respondents included examples of how harvesters are already involved in NTFP inventory and monitoring, as well as other aspects of NTFP management:

“A local non-profit group... has a very strong working relationship with NTFP harvesters. In conversations with this group, they encourage the active

Figure 2: Methods of NTFP inventory and Monitoring
(Forests with at least one response)

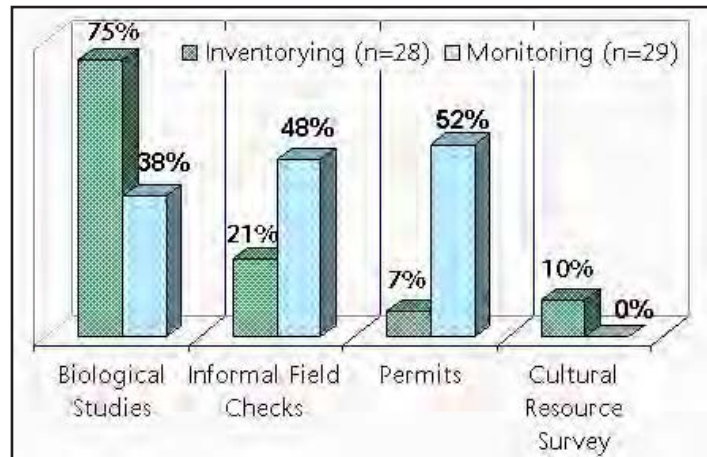
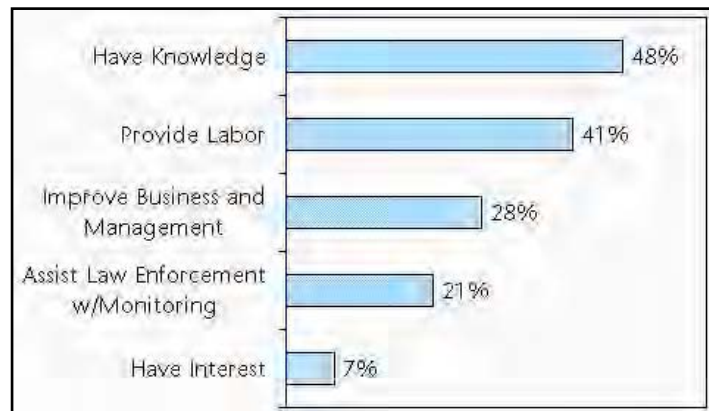


Figure 3: Reasons for Including Harvesters in Inventory and Monitoring
(Forests with at least one response; n=29)



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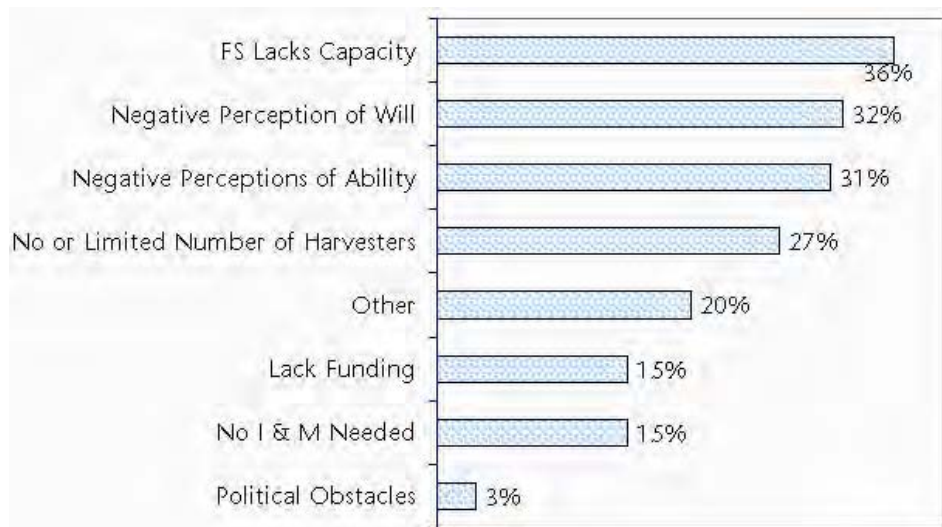
participation of harvesters in the monitoring of NTFP populations.”

“Sassafras harvesters are able to track area supplies. Fuelwood harvesters already help clean up timber sale areas and reduce fuel hazards.”

Respondents on 56 percent of the reporting national forests stated that harvesters already contributed knowledge toward NTFP management, while respondents on 38 percent of the reporting forests indicated that Forest Service employees currently collaborate with harvesters. Comments provided on open-ended questions suggest that, at a minimum, collaboration consists of harvesters informing forest employees about resource conditions, quantities of NTFPs gathered, and incidents of unpermitted harvesting.

Although many respondents expressed positive views about harvester involvement in NTFP inventory and monitoring, a number of respondents had reservations about involving harvesters (Figure 4). Many such respondents believed that the Forest Service lacked the capacity to involve harvesters in such activities and that harvesters lacked the ability or willingness to do such work. The sidebar quotes illustrate some of these reservations.

Figure 4: Reasons for Not Involving Harvesters in Inventory and Monitoring
(Forests with at least one response; n=59)



Survey respondents mentioned a variety of barriers to implementing NTFP inventory and monitoring, ranging from lack of funding to limited commercial demand for NTFPs to the low priority of such efforts within the agencies (Figure 5). Lack of funding (85 percent of the reporting forests) and lack of staff (74 percent of responding forests) constituted the two most commonly listed barriers to NTFP inventory and monitoring.

Conclusion

The survey results indicate that while the Forest Service already has some capacity to acquire the scientific data needed to manage NTFPs, agencies' capacity to conduct NTFP inventory and monitoring varies. Although monitoring of NTFP harvesting activities occurs on more than half the reporting national forests, most of the forests relied upon non-systematic monitoring, such as informal site checks and permit compliance checks. Inadequate funding and internal capacity constitute the primary barriers listed to more widespread use of NTFP inventory and monitoring. Respondents from the majority of reporting national forests indicated that they believed harvesters could contribute to NTFP inventory and monitoring, with knowledge of NTFPs and labor being considered

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Forest Managers' Reservations About Harvester Involvement

“Commercial harvesters in this area typically do not have the means or the knowledge to conduct proper inventories. They could contribute to monitoring by providing accurate collection data.”

“[Data] needs to be collected in a scientifically useful manner. They could provide input and information to the design team and therefore contribute, but I don't see them collecting data.”

Concerns About Harvester Bias

“Commercial harvesters would only be of limited value in inventorying since they tend to focus on the best areas with the highest value product. Harvesters also are reluctant to share any information about areas where they traditionally harvest products. Monitoring would be biased as the harvesters may not identify areas where their operations could be having an adverse effect.”

Lack of Trust and Incentives for Harvesters

“The limited availability [of product] has reduced the interest expressed by contractors to provide inventory and monitoring information.”

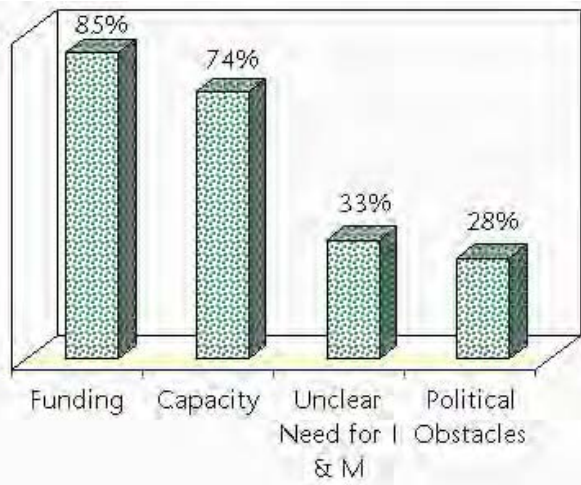
“It is doubtful that they would because collectors tend to be secretive of their source locations due to competition, especially with regards to ginseng.”

Lack of Capacity Within the Forest Service

“Information is welcome, but we first need to develop a system to make such information useful.”

“No inventory protocols exist, and no personnel to develop them. The only commercial NTFP permits issued are for boughs. It would take some additional involvement to coordinate with permittees. With no support or money, it does not happen now. There is an opportunity to increase the NTFP program, both for personal use and commercial use on the forest, but it has not been funded.”

Figure 5: Barriers to Inventory and Monitoring NTFPs (Forests with at least one response; n=80)



the most important inputs harvesters could provide. However, support for involving harvesters is tempered by concerns whether the agency has the capacity to manage collaborative inventory and monitoring efforts, doubts about the ability of harvesters to perform work in a scientific manner, and skepticism about harvester willingness to be involved in such efforts.

Agency-harvester inventory and monitoring partnerships are emerging in many parts of the United States to overcome the difficulties of inadequate funding and staffing for monitoring and inventorying NTFP species. A companion piece to this survey, "Nontimber Forest Product Inventorying and Monitoring in the United States: Rationale and Recommendations for a Participatory Approach" <http://www.ifcae.org/projects/ncssf1/index.html> (Lynch and others 2004), discusses in more detail examples of on-going efforts to develop agency-harvester inventory and monitoring partnerships. For agency-harvester collaborations to work, inventory and monitoring programs must simultaneously address the needs of harvesters (e.g., safeguards to protect information about site locations and the provision of access guarantees) and the needs of forest management agencies (e.g., data quality control). Effective collaborative

NTFP inventory and monitoring systems also require the development of suitable training materials for both harvesters and forest managers, as well as a long-term commitment on the part of upper-level agency administrators to invest resources in such systems.

Copies of the final report for this survey will be available free of charge from the PNW Research Station's publication website in fall 2005: <http://www.fs.fed.us/pnw/publications/index.shtml>

Acknowledgements

We thank the National Commission on Science for Sustainable Forestry and the U.S.D.A.-Forest Service, PNW Research Station for providing funding to implement this study.



Alternatives to Plastic Mulch for Organic Vegetable Production

Carol Miles, Gail Becker, Kathryn Kolker, Carolyn Adams, Jodee Nickel and Martin Nicholson, Washington State University Vancouver Research and Extension Unit

Introduction. Weed control remains one of the primary concerns in organic farming since it is labor intensive, expensive, and time consuming. Since its introduction in the 1950s, plastic mulch has become a standard practice for many farmers to control weeds, increase plant growth, and shorten time to harvest, and has contributed significantly to the economic viability of farmers worldwide (Lamont, 1991). Though very effective and affordable, plastic mulch poses an environmental management concern as most growers dispose of plastics in landfills. In 1999, plastic mulch covered almost 30 million acres worldwide, with over

185,000 of those acres in the United States (Takakura and Fang, 2001). Essentially all this plastic entered the waste stream. An effective, affordable, degradable alternative to the now-standard plastic mulch would contribute the same production benefits as plastic mulch while also reducing non-recyclable and non-renewable waste.

Previous work. In 2003, we conducted a preliminary study at Washington State University Vancouver Research and Extension Unit (WSU VREU) to evaluate paper and cornstarch mulches as alternatives to plastic mulch. We tested 81-lb Kraft paper with and without oil application, utilizing three oils (soybean, linseed and tung) applied before and after laying the paper. Previous work by other researchers found that Kraft paper treated with a combination of epoxidized soybean oil and citric acid held up for 13 weeks in the field and withstood wind and rain better than untreated Kraft paper (Shogren, 2003; Hochmuth, 2001). In our preliminary study, paper mulch with and without oil proved as high in quality as plastic mulch (Miles et al., 2003). Though promising, further studies were needed to test different quality papers, additional mulch products and a diversity of vegetable crops.

Objectives. We tested alternative mulches in a certified organic vegetable production system to evaluate their durability and effect on weed control, soil temperature, and crop yield. The goal is to identify degradable mulch products that are effective and affordable alternatives to standard plastic mulch and to inform growers of these findings.

Methods. In 2004 we evaluated black plastic and five alternative mulches for durability and effect on weed control, soil temperature, and crop yield. The mulch products included: 81-lb Kraft brown paper, 42-lb Kraft brown paper with polyethylene coating, Garden BioFilm (cornstarch film), Envirocare 1 (XP-4611W), Envirocare 2 (XP-4611J), and 1 ml black plastic (control) (Table 1). The experimental design was a

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Table 1: Mulch Product Specifications

Mulch Product	Composition	Degradability	Approved for use in organic systems?
Black Plastic	1.0 mil embossed film composed of high density polyethylene. Colored with carbon black pigment.	Not degradable.	Yes. Must be removed from the soil.
Envirocare 1, XP-4611W	Low-density and linear low density polyethylene, with Ciba Envirocare TDPA (Totally Degradable Plastic Additive). Contains no vinyl and no heavy metals. Colored with carbon black pigment.	Completely degradable. Thermal and photo triggers for degradation, beginning at 75 days. End products are CO ₂ , H ₂ O, and microbial biomass.	Yes. Must be removed from the soil.
Envirocare 2, XP-4611J	Low-density and linear low density polyethylene, with Ciba Envirocare TDPA (Totally Degradable Plastic Additive). Contains no vinyl and no heavy metals. Colored with carbon black pigment.	Completely degradable. Thermal and photo triggers for degradation, beginning at 140 days. End products are CO ₂ , H ₂ O, and microbial biomass.	Yes. Must be removed from the soil.
Garden BioFilm	Biodegradable black plastic film produced from cornstarch and other earth friendly resources. Contains no polyethylene.	Completely degradable. Begins degrading at 50-60 days, and is 95% degraded within 90 days.	Yes. Can remain in the soil.
42-lb Coated Kraft Paper	Brown paper coated with transparent polyethylene. (Commonly used for food packaging.)	Not completely degradable.	Yes. Can remain in the soil.
81-lb Kraft Paper	Brown paper bonded with cement.	Completely degradable.	Yes. Can remain in the soil.

randomized complete block with four replications. Plots measured 50 feet long by three feet wide, each with four subplots. Subplots were four vegetable crops: short season cool lettuce (variety “Pirat”), long season cool broccoli (mixed varieties “Gypsy” and “Green Goliath”), and short season warm bell peppers (variety “California Wonder”), and long season warm icebox watermelon (variety “Smile”). Lettuce, broccoli and peppers were planted in double 10-foot rows, while watermelons were planted in single 20-foot rows. The plots were drip irrigated with drip tape laid beneath the mulch prior to planting. Each plot was rated bi-weekly for mulch quality. Vegetables harvested at weekly intervals were measured to determine marketable

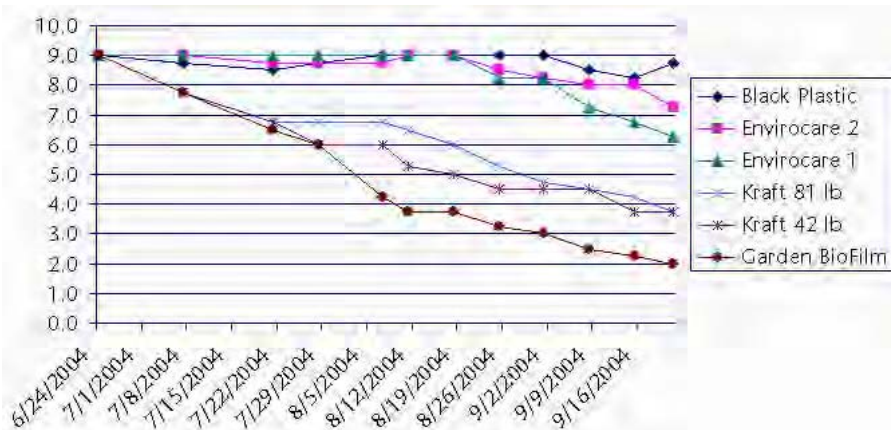
yield, number of fruits or heads, plant biomass, and number of days to harvest. We measured soil-surface temperatures beneath each mulch product throughout the research using Hobo field temperature monitors. The findings of this study are being disseminated to farmers and industry representatives through meetings, conferences, field days, newsletters, and our web site.

Durability. The mulch products evaluated in this study showed significant differences in durability over time (P value=0.0000). Standard black plastic outlasted other mulches in this study, with quality declining only slightly over the course of the growing season (Figure 1). Only Envirocare mulches approached black plastic’s durability. Envirocare 2 remained in very good condition at the end of the

growing season and showed slightly better durability than Envirocare 1. Both Kraft paper mulches exhibited fair quality at the end of the season, but were significantly less durable than black plastic and Envirocare mulches. Garden BioFilm proved the least durable, with a steadily declining quality throughout the season and was almost completely degraded at the end of the growing season. At the end of the season, we removed the black plastic and 42-lb Kraft brown paper with polyethylene coating and we tilled the other mulches into the field. We evaluated mulch degradation over the winter and found that paper and cornstarch mulches appeared to fully degrade in the field while Envirocare mulches did not. It is important to note that Envirocare mulches

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Figure 1: Average Mulch Quality Rating of All Replications (Scale of 0-9, 0 = worst, 9 = best; P Value = 0.0000)



are designed to degrade during composting. Although composting would reduce waste disposal costs, it would not eliminate field removal costs.

Days to first harvest. Crops were planted as seedlings on June 24th, 2004. Only broccoli demonstrated a significant difference among mulch treatments in the number of days to harvest and was harvested earliest from Garden BioFilm plots and latest from black plastic plots (Table 2). Lettuce was ready for harvest between 32 days (Envirocare 1) and 39 days (Envirocare 2) from transplanting. Peppers were ready for harvest between 85 days (BioFilm) and 91 days (black plastic), and watermelons were ready from 80 days (Envirocare 1) to 88 days (Kraft 42).

Crop Yields. Different mulch products significantly affected broccoli and watermelon yields, but not yields of lettuce and pepper (see <http://agsyst.wsu.edu/AltMulch.htm> for data).

Broccoli: Broccoli produced significantly greater yields (kg) and number of heads in the black plastic mulch plots. Garden BioFilm and Kraft 81-lb paper produced large yields as well, while Envirocare 2 proved least productive in both yield and number of heads. There was no significant difference in average head weight.

Watermelon: Watermelon yields (kg) differed significantly among the different mulch treatments. Envirocare 1 produced the largest yields and number of fruit while Kraft 81-lb produced the lowest.

Table 2: Mean Number of Days From Transplant to Harvest

Mulch	Lettuce	Broccoli	Peppers	Watermelon
Black Plastic	33.9	75.9	91.2	84.5
Envirocare 1	32.5	67.4	89.2	80.4
Envirocare 2	35.4	70.8	89.4	82.6
Garden BioFilm	33.5	66.9	85.2	83.2
Kraft 42-lb	33.7	67.6	86.5	83.3
Kraft 81-lb	33	67.6	85.8	88.1
Mean	33.7	69.4	87.9	83.7
P Value	0.587	0.068	0.353	0.541

Differences in overall yields were due to differences in fruit number and average fruit weight.

Pepper: There were no significant differences in pepper yield (kg), number of fruit and average pepper weight due to the different mulches. However, Garden BioFilm tended to produce the greatest yield (kg) followed by black plastic, while Kraft 81-lb paper tended to produce the lowest yield. The number of fruit tended to be highest with Envirocare 1 and lowest with Kraft 3 42-lb paper.

Lettuce: Although lettuce yield did not differ significantly among mulch treatments, Envirocare 1 tended to produce the highest lettuce yield (kg) while Kraft 81-lb paper mulch produced the lowest yield. These slight differences in yield were due to head size and not the number of heads.

Underlying Soil Temperature. Black Plastic mulch showed an insulating effect on underlying soil. That is, temperature highs and lows beneath the mulch were less extreme than above it. Temperatures under each mulch treatment in this trial were compared to temperatures under the black plastic (see <http://agsyst.wsu.edu/AltMulch.htm> for data). All of the mulches lessened temperature fluctuations similarly to Black Plastic, except for the Kraft 81-lb paper, which showed greater extremes of both high and low temperatures, probably due to the porosity of the Kraft paper. However, further studies would be needed to verify this.

Affordability. Based on 80% mulch cover per acre, black plastic costs \$252 - \$281 per acre, Envirocare films range from \$215 to \$243, coated Kraft 42-lb paper costs \$235, Bio-Film ranges from \$695 to \$1087, and the 81-lb Kraft Paper cost varies considerably depending on the source. These costs may vary depending on the source of the mulch, and shipping costs for paper mulches will run higher due to their heavier weight.

Conclusions. While these results are preliminary, they indicate that

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alternatives to standard plastic mulch produce comparable results in crop productivity, soil temperature, and affordability. Fully degradable mulches also decrease labor and disposal costs since the mulches need not be removed from the field. Envirocare mulches did not fully degrade in the field, thus, it would need to be removed at the end of the season. Cornstarch and paper mulches appear to be fully degradable, however, when sourcing paper it is essential that it does not have any prohibited additives. Garden BioFilm has been approved for use in organic agriculture and can be tilled into the soil. It produced good results in this study, though its quick degradation makes it most suitable for short-season crops. Paper mulches proved generally less effective than other mulches, and the Kraft 42-lb coated paper must be removed and this requires more labor than the removal of black plastic.

Future Work. We are continuing to identify and test degradable mulch products in organic vegetable production at WSUV REU in 2005. Finding degradable products approved to leave in certified organic systems soils poses the greatest constraint in this research. New mulch products we will test include: 1) Raisin Natural Paper, 2) Raisin Regular Paper, 3) Kraft Natural Paper, 4) Converted Natural Paper, 5) Bio-ground Cover 1, and 6) Bio-ground Cover 2.

This research supported by a CSANR Organic Research Grant.

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Takakura, T. and W. Fang. 2001. [Climate under cover](#). Kluwer Academic Publishers, p 1-10.

Mulch Sources:

Envirocare 1 and 2: [Pliant Corporation](#); 1475 Woodfield Road, Suite 700, Schaumburg, IL, 60173; 866-878-6188.

Garden Bio-Film: [BIOgroupUSA](#), Inc., 107 Regents Pl., Ponte Vedra Beach, FL 32082; 904-280-5094.

Kraft 81-lb Paper: [Newark Paperboard Products](#); 620 11th Ave., Longview, WA, 98632; 360-423-3420; (No longer available from this source)

Kraft 42-lb Polyethylene-coated Paper: [Graphic Packaging](#); 814 Livingston Court, Marietta, GA, 30067; 770-644-3000.

Black Plastic: from [Peaceful Valley Farm Supply](#) P.O. Box 2209, Grass Valley, CA 95945; (530) 272-4769.

SEED SOURCES:

"Pirat" Lettuce from [Wild Garden Seed](#).

"California Wonder" Peppers from [Peaceful Valley Farm Supply](#).

"Smile" Watermelon from [America Takii Seeds](#).

"Gypsy" and "Green Goliath" Broccoli, from [Burpee](#).



Organic Teaching Farm at Tukey Orchard

Deb Stenberg, Washington State University

Barely a postage stamp amid the miles of grain, legumes and forage of the Palouse, the WSU Organic Farm at the Tukey Horticulture Orchard, a three-acre farm within an established orchard, serves as the hands-on learning component of the first organic agriculture major to be offered by any public or private U.S. university.

The program promises to help both established and aspiring organic farmers. "I've talked to many organic farmers who are struggling to find experienced workers," notes Brad Jaeckel, the WSU Organic Farm's manager and instructor. Farmers whose livelihood and family well-being depend on a successful crop too often depend on well-meaning, but unskilled workers. In an operation where small mistakes can cause big losses, an untrained workforce can be costly at any wage.



Historically, those who wanted to learn how to grow organically have had few education options: knowledge and techniques passed from one grower to another, or through a few alternative magazines, such as Mother Earth News. Even the Rodale

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Institute in Pennsylvania, the organic industry's "mothership", offers only intermittent workshops and a few paid internships on their research farm. While some universities have added individual classes, none developed a comprehensive major in organic agriculture.

John Reganold, the WSU professor who led the development of the Organic Agriculture major, says organic agriculture appeals to many students who would not otherwise consider a degree in agriculture. Enrollment in WSU's traditional agriculture programs declined in the past 10 years, but Reganold says he gets "a call at least once a week from someone who wants information about the organic ag major." Many of those calls come from people living and working on the West side of the Cascades.

It remains to be seen whether the program will draw aspiring organic farmers from around the state and country. Reganold cautions that many new enrollees could find the chemistry and other science classes more difficult than anticipated. Working with fellow soil scientist Cathy Perillo and others, Reganold developed a challenging curriculum currently in the university approval process.

As the organic industry grows, Perillo points out the increasing need for knowledgeable people in community partnership development and marketing.

The field-based class at the farm, called the Practicum in Organic

Agriculture, can be taken for credit by WSU students or on a continuing education basis for others who want the experience in integrated organic growing techniques.

The first year of farm operation in 2004



started late with little time to promote the class, resulting in a smaller than anticipated class. This handful of

A \$25,000 grant from Small Planet Foods, a Sedro-Woolley, Washington, organic food company, supplemented the Soil Science Department's start-up funding for the farm. Soil Science graduate student Kathi Colen-Peck served as manager, assisted by Brad Jaeckel. After Colen-Peck left the project, Jaeckel became manager and instructor.

With more lead-time this year, Jaeckel enrolled more students and CSA subscribers through increased business partnerships on campus and in the community. He plans to provide produce to the culinary arts school for teaching and catering events, as well as to the campus dining service, which, until now, has purchased produce only through large suppliers. The farm will continue growing dye plants, such as indigo and madder, for the textile school, a service started in 2004.

"WSU has a strong track record in organic agriculture research work", says John Reganold. He points to Bob Papendick, a USDA soil scientist at WSU, who co-authored a 1980 seminal publication on organic agriculture and to Dave Bezdicsek, the lead author in a 1981 publication on organic farming.

Reganold joined WSU in 1983 in part because of Papendick and Bezdicsek. He also contributed to the university's collection of organic research over the years, including an article in Nature magazine which according to a colleague "signaled fellow researchers that organic farming research was scientifically legitimate and acceptable to the leading peer-reviewed journals." While a minority at WSU, organic researchers nevertheless built their department into "one of the leading, if not the leading university, in organic agriculture," asserts Reganold.

David Granatstein, sustainable agriculture specialist and area extension agent in Wenatchee, notes that consumer demand for organic products has grown the number of acres devoted to organic crops, as well as an increase in corporate interest. "Companies are looking for research on organic agriculture and are willing to support it," he explained. WSU, with its history of organic agriculture research, should be well positioned to obtain increased research funding. Indeed, federal grants to WSU for organic research topped \$700,000 in the past three years.

students gained in-depth experience in running an organic farm during the height of the growing season. The experience included selling produce and flowers through a Community Supported Agriculture (CSA) in which customers buy a share and receive weekly deliveries of produce.

Students in 2005 can expect to devote 20 hours each week of physically strenuous work from May 9 through July 29, growing certified organic vegetables, fruit, herbs and flowers for sale through the CSA. This teaches them the skills necessary to manage an organic market garden, farm, or greenhouse, including experience in harvesting, marketing, and packaging for a CSA. Participants will also gain insight into the ecological interactions between plants, soils, microclimate, insects and pests, and how to assess and deal with those pests, as well as weeds and disease management.

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"I want this to be a very realistic experience for our participants," Jaeckel emphasizes. "Students should walk away with a real understanding of practical organic farming, and the experience to go to work for another farm or even start their own."

Students will gain a broader understanding of the value and importance of local food systems, food security, and how organic agriculture provides a viable alternative to conventional agriculture. "Every week it seems I have a conversation with someone who says, 'we aren't connected with where our food comes from anymore,' Perillo notes. Perillo already teaches classes on sustainable food systems encouraging participants to look at their food supply system differently and seek out local growers when making their personal food choices.

Jaeckel and Perillo actively recruit volunteers who can donate a few hours to the farm or trade their time for a CSA share. "I really need volunteers in the early and late parts of the growing season, when the class is not in session," Jaeckel says. With sufficient volunteer help, the farm will donate part of its crop to the Pullman Food Bank.

While the CSA is full for 2005, those interested in the practicum can contact [Brad Jaeckel](#) at 208-892-0655.



Direct Marketing Farms Benefit from WSDA Grants

Kelli Sanger, WSDA Small Farm Direct Marketing Program

In October 2001, the Washington State Department of Agriculture (WSDA) allocated \$500,000 to its Small Farm Direct Marketing Grant Program with monies from a one-time USDA Specialty Crop Assistance Fund.

Local government organizations, private non-profits, and farmers markets across the state worked together to maximize the impact on small farm direct marketing. Funded projects increased farmers

markets customer base and sales, created processing facilities for meat and poultry, and hosted harvest celebrations, tours, and festivals. While some projects enhanced direct sales for local farms, others developed new local markets. Of the 26 projects



funded, 20 completed projects generated \$5.5 million dollars in sales for Washington farms, more than 10 times the value of the grants.

The following examples detail some of the successful results for the WSDA Grants.

Farmers Markets

Bellingham Farmers Market (\$10,900). The Bellingham Farmers Market created an "Experience the Market and Meet the Producers" promotion campaign that completely revolutionized how they advertised and helped generate the market's second highest sales year on record, grossing \$513,000 in 2002. Changing the market's marketing strategy and design of the



promotional materials, the campaign increased total farm sales nine percent over 2001, to \$290,000. Market sales subsequently grew 20% each year.

Robin Crowder, market manager, feels the 2002 grant helped accomplish these achievements.

The campaign also attracted higher numbers of new visitors to the market. "The new posters, advertisements and promotions that we created reached out to a larger audience in the local community," states Crowder. "People who never felt part of the market before felt welcomed, and we brought in a large amount of new customers as a result. Now they feel like the market is their market too."

Magnolia Farmers Market (\$16,000). In 2003, with the help of WSDA grant, the Seattle Neighborhood Farmers Market Association opened a new farmers market in Seattle's Magnolia neighborhood. The market generated an impressive \$155,490 in sales in the first year from 27 Washington farmer and processor vendors selling locally produced fruits, vegetables, meats, breads, processed foods, and flowers from June-November. Like other markets managed by the Seattle Neighborhood Farmers Markets Association, the Magnolia Farmers Market does not allow craft vendors, which the Association credits as one of the reasons for their success.

Jefferson County Farmers Market Association (\$20,000). In 2003, the Jefferson County Farmers Market Association used its grant to create an overall market enhancement campaign. Market manager Harvinder Singh used the funds for print advertising, developing a new website, conducting marketing trainings for farmer vendors, and recruiting new farmers to provide diverse food offerings for customers. As a result, the market increased total revenue by \$300,000 (63%) and increased farm sales 77% to \$166,000.

Value-Added Production

Mobile Poultry Processing Facility (\$29,570). The Community Agricultural Development Center engineered, built, and now operates the first state approved Mobile Poultry Processing Unit in Washington. This

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unit allows producers to sell poultry through retail sales, capturing full market value for their product. Each \$27,000 unit will process 30,000 birds per year and generate up to \$240,000 in gross annual sales for producers. It is available for use in Northeastern Washington, and serves as a model for other communities across the state.



Mobile Poultry Processing Unit licensed by WSDA. Photo credit: Mary Emberton

USDA Mobile Livestock Processing Unit (\$30,000). The Lopez Community Land Trust finalized the development of the first USDA-inspected mobile meat-processing unit in Washington state in 2003. This unit allows ranchers to slaughter animals on-farm, under USDA-inspection, enabling sales of meat by the pound to consumers. In the first eight months of operation, the slaughter unit generated \$130,000 in sales, twice as much as would have been received at live auction. Operators expect the unit to generate over \$1.2 million annually.

Enhanced Direct Sales to Local Farms

Klickitat Wine Alliance (\$10,000). In 2002, the Klickitat Wine Alliance brought over 87,000 visitors to Klickitat wine country with their *From Grape to Glass* marketing campaign and doubled direct sales at wineries to \$1,094,000. The alliance now partners with the county economic development council to enhance the successful agricultural-tourism industry in rural South Central Washington.

More Funds in the Future?

These funds provided significant benefits to the local food system of Washington State and there may be

opportunities for more funding in the future. Last year, U.S. Congress created a federal Specialty Crops Block Grant Program to provide grant funding of \$44.5 million to states that produce specialty crops. However, the program awaits funding appropriation. WSDA would receive a portion of those funds and could use them for more grants to enhance the local food system.

Contact Kelli Sanger at 360-902-2057 for complete results of the projects funded by the Small Farm Direct Marketing Grant Program.



Thinking about Bioenergy

Dave Sjoding, WSU Bioenergy Team Leader, WSU Extension Energy Program

Rich in renewable resources, rural Washington's potential to produce energy includes solar, wind, bioenergy, low-temperature geothermal, and low-impact hydropower. Each of



these renewable resources is unique and has their own developing story. Developing these resources for the maximum economic benefit of rural Washington will not happen automatically. Tracing Washington's current energy dollar demonstrates that most value leaves the local community and the state economies. What if the majority stayed local or within the state? That is the opportunity and the challenge.

The example of solar electric renewable resource shows what can be done. The entire value chain for solar electricity will soon be within the state

economy (from silicon purification to installation). Of five key steps, the state only misses the manufacturing of the solar modules and that may soon occur in Republic, WA. State Senate Bill 5101 (Senator Paulson was prime sponsor) and ESSB 5111 (Senator Morton was prime sponsor) accelerated solar development by a decade.

Some interesting progress shows this same approach can be applied to bioenergy. However, both biopower and biofuels need co-products for business success at each step from grower to final product. For that reason, the WSU Center for Bioproducts and Bioenergy (CBB) targets the development of new products that can be sold along with the production of bioenergy.

For example, Washington's first biodiesel production facility, Seattle Biodiesel, has a 5 million gallon annual capacity and now plans to purchase in-state feedstock, such as winter rapeseed, mustard, and canola.

Biopower comprises the second largest renewable resource in our state (370.75 MWh, or one-third of a nuclear power plant). The first dairy biopower system now operates on the Vander Haak dairy, north of Lynden, WA. Because multiple revenue streams and products will be necessary to make bioenergy economically successful, the Vander Haak dairy is developing at least four additional products to complement their biopower production.



Chris Eide Presents Governor Gregoire a newly released book on Washington farms

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In an era of high and uncertain fossil energy prices, organic farms possess a strategic advantage since they rely less on fossil energy.

WSU and others are increasingly focusing on developing and maximizing this value chain core goal of “making it happen”. CSANR, CBB, and the WSU Extension Energy Program are heavily involved in this effort.

A future longer article will develop more fully the bioenergy steps that need to be taken.



CSANR Climate Friendly Farming™ Project Updates

Chad Kruger, Director of Outreach and Communication, Climate Friendly Farming™

The National Association of State Universities and Land Grant Colleges (NASULGC) Food and Ag Science Exhibition featured the *Climate*

Friendly Farming™ Project on Capital Hill in March 2005. More than 800 people, including members of Congress and their staff, visited the Exhibition.

More than 90 people, including 30 dairy farmers, packed the Snipes Mountain Brewery for a one-day workshop on dairy anaerobic digestion in Sunnyside in late February 2005. Three of the top technology providers in the country (Phil Lusk of Agri-Clean, Mark Moser of RCM Digesters, and Steve Dvorak of GHD, Inc.) presented their approach to anaerobic digestion. The workshop was co-sponsored by Washington State University's Center for Sustaining Agriculture & Natural Resources (CSANR) and the Climate Friendly Farming™ Project, Yakima Valley Dairy Federation, Washington State Dairy Federation, Yakima Regional Clean Air Authority, Yakima County Extension, WSU Biological Systems Engineering, WSU Puyallup, South Yakima Conservation District, Northwest Ag Plastics, Inc., Washington Department of Ecology,

Energy Northwest, the Institute for Washington's Future, Northwest SEED – Sustainable Energy for Economic Development, Harvest Clean Energy Program (Climate Solutions).

Darryl and Judy Vander Haak were recently named “Environmental Heroes” by ReSources for constructing the first commercial dairy anaerobic digester in the State of Washington. The Vander Haak digester processes manure from 1,100 cows and generates 300 KW of electricity, while also producing economical by-products (heat, fiber, and nutrient water). Over 150 people visited the Vander Haak Dairy for the *Digester Open House and Tour* in March 2005.

Governor Christine Gregoire visited the dairy's anaerobic digester on May 19th. Governor Gregoire observed first hand how dairy producers can mitigate the negative effects of dairy waste while also producing energy for the farm as well as other potentially high value products to create additional revenue streams. During

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Washington State Grange

“The cost of litigation of farm labor disputes can quickly reach into the tens of thousands of dollars. Our members need an alternative to litigation that can deliver fair outcomes, ensure compliance with applicable laws, and minimize the risk of the extraordinary expense of protracted litigation. We believe that a collaborative alternative dispute resolution system will help achieve these ends.” Mike Gempler, Executive Director, Washington Growers League

“Our clients seek a prompt and fair resolution of disputes that arise in the course of their employment.... successful development and implementation of this system would be of tremendous benefit to all affected parties—farmers, farm workers and advocates.” Patrick McIntyre, Executive Director, Northwest Justice Project

“Often times the legal system is not an efficient mechanism for farm workers to achieve a just outcome of their employment related disputes. This program is an important addition to the legal system, and can provide a more prompt resolution of these disputes.” Erik Nicholson, Regional Director, United Farm Workers of America AFL-CIO

Have an agricultural employment dispute? The Washington State Grange administers a free mediation service as an initial alternative to judicial resolution. Mediation is effective with a high success rate where parties more often abide by agreements they help create. Mediation takes less time than litigation and it is confidential. The ADRS program provides attorney-mediators free of charge.

“The Grange has a long history of bringing fresh perspectives and new ideas to problems facing farmers and those involved in the agricultural industry. Legal problems regularly arise in the labor-intensive fruit industry. We have a responsibility to find ways to identify disputes early on and get them resolved in a fair and efficient manner.” Terry Hunt, State Master,

the visit Chris Feise, CSANR Director, presented the Governor with a copy of the newly released book, *Renewing the Countryside: Washington*, a collection of forty-three stories about individuals who sustain and revitalize rural Washington.

The Dryland Agroecosystem Field Day at the Cunningham Agronomy Farm in Pullman was held on June 23rd, 2005. Speakers talked about direct seeding for carbon sequestration and precision nitrogen management to reduce greenhouse gas emissions and improve nitrogen use efficiency. For more information, contact [Dave Huggins](mailto:Dave.Huggins@ARS.USDA.gov) (USDA ARS, 509-335-3379).



Water Quality Education Workshop a Grand Success

Bob Simmons, WSU

New federal definitions for confined animal feeding operations (CAFO) and animal feeding operations (AFO) served as the impetus for a new water quality education program developed in 2004. Partners included Washington State University, Washington State Department of Agriculture, Washington State Department of Ecology, Natural Resources Conservation Service-WA, Washington State Conservation Commission, Environmental Protection Agency, and Conservation Districts state-wide.



As the first portion of this education program, a three day workshop occurred in late March 2005 in

Leavenworth, WA. Entitled "Animal Feeding Operations and Water Quality Resources and Livestock in Balance", the workshop drew 90 staff from conservation districts and environmental agencies. The keynote speaker provided insight into changing behaviors and emphasized an understanding of people's values and goals is necessary in addition to education materials.

Participants learned about Federal and State water quality rules, best management practices for protecting water quality, and the use of a water quality risk assessment tool as they applied to AFOs and CAFOs. The workshop also covered how animal feeding operations may maintain non-Concentrated Animal Feeding Operation designation and compliance according to the federal CAFO rule and an expected state permit. The program combined presentations on technical topics with ten real-farm case studies. Participants also received a water quality risk assessment tool for producers and a technical water quality risk assessment tool for conservation planners. An evening panel discussion focused on riparian water rights and Washington's water quality law and riparian water access law.

This program was funded by the Washington State Department of Ecology and the Washington State Conservation Commission and organized by Joe Harrison, WSU-Puyallup Nutrient Management Specialist, and Tip Hudson, WSU Rangeland and Livestock Management Specialist, Kittitas County.

EVENTS

Stormwater Management from a Watershed Perspective

Satellite Conference, October 4, 2005, 9:00 am – 11:30 am (PDT). Every year, billions of gallons of untreated stormwater discharge into streams and rivers across the nation. The Environmental Protection Agency calls it the "number one water quality problem." A camera crew will visit and film the stormwater management

strategies used in three watersheds across the nation.

At the southern end of the Appalachian Mountains on the Watauga River around Boone, North Carolina constructed wetlands and restored streamside riparian vegetation which slows and filters the rain event runoff. The camera will capture volunteers and 'Kids in the Creek' monitoring the success of the stormwater strategies.

Willoughby is on the Chagrin River outside of Cleveland, Ohio. Thirty-three villages, townships, and suburban cities collaborate on stormwater strategies to quell the rush of polluted water to Lake Erie. The program will visit the installation of Low Impact Development strategies throughout the suburbs and speak to some of the local officials and citizens who have collaborated on the project.

Portland, Oregon is planning for sustainable growth using Low Impact Development techniques. Involving the public through self-guided biking tours and neighborhood walks demonstrating techniques and results. Civic-minded business owners have joined city departments in planning 'green' construction pleasant to the eye, and ecologically prudent. Join the camera crew and interviewer touring progressive Portland and Multnomah County.

The satellite/videostream program, made available through an USDA-CSREES Section 406 water quality grant, will be broadcast to Extension offices across the nation. Call your local county Extension office and request to reserve the satellite facilities for October 4, 2005. Further information is available at <http://wawater.wsu.edu> or by calling 509-574-1584.

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Irrigated Agroecosystem Field Day

The Irrigated Agroecosystem Field Day will be held on July 15th, 2005, at the Paterson Research Farm south of Prosser. Key topics include reduced tillage potatoes, greenhouse gas emissions from irrigated cropping systems, nematodes, and the biofuel variety trial. For more information, contact [Hal Collins](mailto:Hal.Collins@USDAARS.gov) (USDA ARS, 509-786-9250). A brochure can be found at <http://cff.wsu.edu/News/index.html#events>.

The Harvesting Clean Energy Conference

The *Harvesting Clean Energy Conference* is scheduled for February 27 – March 1, 2006, in Spokane, Washington. Members of the Climate Friendly Farming Team of CSANR will facilitate a session on anaerobic digestion.

TIDBITS

Proceedings – Making the Bugs Work for You: Biological Control in Organic Agriculture

The [proceedings](#) for the symposium, *Making the Bugs Work for You: Biological Control in Organic Agriculture*, part of the Tilth 30th Anniversary Conference in Portland, Oregon, November 2004, are now available on the CSANR website. The proceedings include papers on all oral presentations, plus summary papers of all poster presentations. Also included are more than 30 poster papers that highlight organic pest management research projects, extension programs, college or high school classes, farming techniques, and other organic agricultural activities.

Healthy Food at Corner Shops

Scottish Executive News. A six-month [pilot study](#) to introduce healthy food to local convenience stores has been a great success, according to Scotland's Health Minister, Andy Kerr, speaking ahead of a visit to a local store in Fife which now provides a range of healthier foods for its customers.

Grass-Based Dairy Increases Profit and Adds Creamery

ATTRA. South Carolina dairy farmer Tom Trantham, who switched from a conventional confinement operation to having cows on pasture year-round, found having his cows on forage kept them healthier and reduced costs. He reduced the size of his herd, yet increased the size of his profits. A logical next step for someone producing high-quality milk was to open a creamery to sell bottled milk. The Happy Cow Creamery offers dairy products and locally grown organic produce. According to the [article](#), this small-scale creamery is part of a revival of interest in small-scale creameries.

South Dakota Seeks to Create Luxury Niche for Beef

South Dakota legislators passed a new law they hope will help create a market premium for state-grown beef, increase rural profits, and provide a reason for more young people to stay on the farm. According to a Washington Post [article reprinted in The Detroit News](#), the goal is to sell South Dakota Certified Beef as an upscale brand and market it to people who care about where their meat comes from and how it was raised. Any beef sold under the label will come from an animal that has been tracked by a computer from birth, raised and butchered inside state borders, fed a diet with specific nutritional standards, and raised humanely. One possible glitch in the plan: state processors only have the capacity to slaughter about 15 percent of animals sent to slaughter each year.

Study Shows Antibiotic Use in Chickens Contributes to Resistance

A new study indicates the use of antibiotics in the poultry industry contributes to antibiotic resistance in strains of foodborne bacteria that infect humans, such as *Campylobacter*, a bacterium that causes food poisoning from eating undercooked contaminated chicken. A May 2005 study, reported in *Environmental Health Perspectives*,

looked at *Campylobacter* isolates in chicken products from four companies: two that had once used the antibiotic fluoroquinolone for flock-wide treatment and two that never had. Researchers found antibiotic-free products were not more likely to carry *Campylobacter*, that a high percentage of conventional brands were contaminated with fluoroquinolone-resistant bacteria, and that conventional brands had significantly higher odds of carrying resistant strains of *Campylobacter* compared with antibiotic-free products. The [abstract](#) and full [article](#) are available online.

Shiitake Mushroom Farm Showcases Sustainable Practices

The [Columbia Missourian](#) recently featured Ozark Forest Mushrooms, highlighting the sustainable practices used by growers Nicola Macpherson and Dan Hellmuth. Ozark Forest Mushrooms produce shiitake mushrooms on oak wood harvested from their own land. Some trees are cut each year on the property, as part of an agroforestry plan. Logs are sold and the branch wood is used to grow mushrooms. When the logs can no longer grow mushrooms, they are used as fuel to heat a greenhouse that helps extend the farm's mushroom-producing season. The farm is certified organic.

RESOURCES

Agriculture

Farmers Get a New Tool to Help Sell Via Internet

From the Pacific Northwest to Martha's Vineyard, producers use the Internet to sell their goods. Last month, the [National Farmers Union \(NFU\)](#) unveiled its new e-cooperatives.com Web site. This portal allows farmers



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to make direct connections with consumers across the country to sell their goods. Although just getting started, the site should help producers and their co-ops develop new markets and consumers find the farm-produced products they are looking to buy. Let your favorite local farmer know about this great new tool

[Washington Tilth Directory](#) On-Line

Check out Tilth's *Washington Guide to Organic and Sustainable Growers, Food and Farm Suppliers, and Resources*. The directory is searchable by crops, location, type of operation, among others.

Organic Seeds Becoming More Available

[Mother Earth News](#) reports organic and heirloom variety garden seeds are becoming more widely available due to an increase in the number of specialty companies. Even large, mainstream seed companies are now adding some of these products to their offerings. The article features some seed company veterans and newcomers, discussing their offerings and operations, and offers an "honor roll" of sustainable seed companies.

New Farm Posts "Farming for Credit" Page

The New Farm Web site launched a ["Farming for Credit"](#) page focusing on sustainable agriculture on campus. The new pages house a directory that



offers information on 54 student farm programs. It profiles the best sustainable and organic ag programs at community colleges, universities, and high schools across the country. The page also includes links to a discussion forum for students and faculty, a place where they can share stories, ask questions, talk about challenges, and network with other student farmers and faculty advisors.

Forage-fed Appalachian Beef Shows Less Fat, More Omega-3

ATTRA, June 2005. A three-year research project on forage-fed Appalachian beef shows that it may be a hit with health-conscious shoppers, reports Georgia FACES. The University of Georgia analyzed beef raised solely on forages in Virginia and West Virginia and found 40 percent lower fat content in forage-finished steaks compared to grain-finished steaks. In addition, forage-fed beef contained higher concentrations of omega-3 fatty acid, and a better ratio of omega-6-to-omega-3, as well as being higher in fat-soluble vitamins like Vitamin E and beta carotene. It also had double concentrations of conjugated linoleic acid. According to [the story](#), the project will continue this fall, as researchers begin taste-panel studies and start comparing three types of forage feeding systems.

Forestry

Millennium Ecosystem Assessment Synthesis

Thirteen-hundred experts from 95 countries spent four years conducting a global inventory of the state of the world's major ecosystems. The Millennium Ecosystem Assessment (MA) quantifies the effect that human activities have on ecosystems and makes suggestions for the future. Ecosystems provide services, e.g. clean water, climate stabilization, natural resources, critical to human health and livelihood, and should not be taken for granted, according to the [MA Synthesis Report](#) report (6.6 MB PDF). The synthesis report recognizes agroforestry as an example of positive synergy that can be achieved in balancing conservation with production: "Agroforestry can meet human needs for food and fuel, restore soils, and contribute to biodiversity conservation. Intercropping can increase yields, increase biocontrol, reduce soil erosion, and reduce weed invasion in fields." (page 78)



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