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Surviving and Thriving in Urban-Edge Agriculture

Growing Comes Naturally to Hmong; Finding and Keeping Land Comes Harder

Deb Stenberg, for the WSU Small Farms Team

Walk through any Western Washington farmers' market and look for the flower vendors offering bouquets in sizes that strain the confines of the average vase. When you finally lift your gaze up from the masses of Canterbury bells, delphinium, lilies, bachelor buttons, larkspur, and other seasonal flowers, you will often find a Hmong farmer, eyes twinkling, ready and waiting to help you.

The Hmong (the "h" is silent), members of a distinct culture consisting of extended families bound together in tribes or clans, inhabited the mountainous region of Laos for centuries. In Laos, Hmong grew crops at high elevations, often under the forest canopy. Their cropping skills, along with their very survival, were tested by larger forces throughout the 1960s and 1970s.

Before and during the Vietnam War, the Hmong gained a reputation as skilled and intelligent soldiers and were recruited to aid American and South Vietnamese armed forces. With many of their young men fighting the war in remote areas, those left behind struggled to survive. Moving frequently to avoid capture or death at the hands of opposing forces, they often abandoned crops before they were ready for harvest.

When American involvement in the war ended in 1973, circumstances grew more desperate for the Hmong. Despite promises of protection made years before, American transport planes took only the highest-ranking Hmong with them as they pulled out, leaving behind tens of thousands. In the months and years that followed, those left behind fled



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Washington State University
SMALL FARMS TEAM
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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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to refugee camps in neighboring Thailand to escape retribution for their assistance to American forces.

Throughout, they endured circumstances more difficult and traumatic than most of us could imagine. In time, those who survived the journey and the refugee camps obtained sanctuary in France or in the United States. Although the environment was safer, it also posed an extreme culture shock for the Hmong.

In addition to being ripped from a mostly rural environment, they experienced sudden changes to their social and family structures. Their extended family members, use to living in close proximity to each other, often splintered. Even work was different. In Laos, extended families of Hmong worked and lived together, mostly in farming pursuits. In America, they learned they were expected to apply for jobs apart from one another. As difficult as this was, most adapted and found jobs and homes. They proved themselves to be conscientious workers.

Sadly, many Hmong experience difficulty in adapting to their new



home. While those who arrived as children learned English readily, older Hmong often did not learn the language easily. In the economic slide following the 2001 terrorist attacks and the stock market drop, many Hmong immigrants found

themselves unemployed. Older Hmong immigrants faced the added difficulty of finding new jobs in a work environment filled with over-qualified, English-speaking workers applying for the same jobs.

Charlie Chang, hired by WSU as a Small Farms Adviser for Southeast Asian immigrant farmers, began adapting the Small Farms Program's popular *Cultivating Success* curriculum for Hmong farmers.

Chang feels an urgent mission to simply find land for Hmong displaced from non-farming jobs. He notes that with land as small as an acre or two, the Hmong can keep food on the table and potentially earn a small income, even after paying the lease. In King, Snohomish, and Pierce counties, Chang estimates 150 Hmong families currently farm one to five acre plots, while 12 families farm 10 to 20 acre parcels.

"They have agricultural backgrounds, they know how to farm, but first they need to find the land," Chang explains. In the Puget Sound region, that poses a challenge. In the area south of Seattle in King County, little suitable land remains. Near Duvall and Monroe to the north, Hmong have leased land for years, but have experienced difficulty obtaining longer-term leases. One bright spot is a recent agreement signed between the Van Ness farm in Duvall and a Hmong farmers' cooperative. This renewable ten-year lease for 100 acres on a former dairy farm provides the growers water rights so they can plan for their future.

WSU's Small Farms Program made a great start in reaching out to Hmong growers, Chang says. "The curriculum is very good," he says, "but translating it reaches only those who know how

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Farm Family: Ties That Bind

Like many other Hmong immigrants, Zong and Leema Cha transitioned to life in the United States successfully, but were troubled by the slow erosion of their cultural traditions. They found a house with a yard in Federal Way, Washington, for themselves and their five young children. Leema did what came naturally, she planted flowers and vegetables.



Zong Cha

Although the growing climate was different than her native mountains, Leema discovered what grew well in the Pacific Northwest climate, and brought her skills to bear on them. Passersby noticed her beautiful flowers and vegetables and raved about them. The family soon realized her pastime could contribute a second income.

With what she grew in her yard, Leema ventured into the farmers' market in a nearby town. Her lush bouquets were popular, leading to expanded plantings. Before long, her yard could no longer fill the demand. She and her family rented a few acres in Auburn, planting more flowers and vegetables, and expanding into additional markets. Today you'll find members of the Cha family in four markets. They also provide arrangements for weddings and other special events.

Although they hold full-time jobs outside of the farm, all Cha family sons and daughters participate, tilling and planting early in the spring, picking vegetables on Wednesdays and flowers on Fridays before the market.

Reflecting on their success, daughter-in-law Pam says that Leema set out to produce a little extra income, but had another goal as well. "She wanted to keep the family close through a common cause." In both cases, she proved successful.

Leema and Zong express no intentions of retiring although both are now approaching the age at which most Americans would be eager to walk away from their work. Pam says, "They come from a culture where you stay busy because if you don't, you won't have food on the table."

to read in Hmong." Unfortunately, many never learned to read or write their native language, so Chang is working with other members of WSU's Small Farms Team and local service providers to develop innovative training methods. Through farm walks and hands-on demonstrations, Chang helps Hmong growers achieve profitability and enhance their environmental management.

This approach incorporates a two-way learning process, since Hmong growers still use many of their traditional, low-input practices to conserve water and enhance soil quality. "WSU specialists have much to learn from the cultural practices of immigrant farmers," said David Muehleisen, an entomologist and research coordinator for the Small Farms Program.

In addition to his work at WSU, Chang continues to volunteer with the Hmong Association of Washington to locate land for the Hmong. He appeals to government agencies, cities, counties, and private landowners to consider leasing undeveloped land to Hmong. While private landowners might be able to have their land designated for agricultural use, small farms provide a tangible benefit to a neighborhood's quality of life.



The appeal of a new apartment complex or strip mall cannot compare to a garden full of flowers and fresh vegetables. "The Hmong have come here to live for good, and they have proven themselves to be good neighbors," Chang adds. "They only need a chance to grow."

The Small Farms Team expresses its appreciation to the USDA Risk Management Partnership for funding this project.



The USDA Disconnect: Nutritional Guidelines and Farm Subsidies

Melissa D. Ho, 2005 Congressional Science Fellow, Office of Senator Hillary Rodham Clinton

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The sixth edition of the USDA Dietary Guidelines released in January 2005 places stronger emphasis on reducing calorie consumption and increasing physical activity and describes a healthy diet that emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products; includes lean meats, poultry, fish, beans, eggs, and nuts; and is low in saturated fats, trans fats, cholesterol, salt, and added sugars.

The Institute of Medicine recently issued a report evaluating the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), which currently serves millions of families. WIC has never been significantly reviewed or altered in its 30 years. In 2000, the WIC program served 54% of infants and 25% of children ages 1-4 years, along with many of their mothers. In FY2003, the cost of WIC program supplemental food was \$3.2 billion. The report recommended specific changes to meet the new Dietary Guidelines and of note, to improve fresh fruit and vegetable consumption, it recommends cash-value vouchers for fresh produce, which would also benefit farmers who sell produce at markets.

Farm Subsidies

While nutrition programs are being altered to be consistent with the Dietary Guidelines, the agricultural programs supported by the Farm Bill are not. Much of the \$15 billion in subsidies goes to the production of corn and soybeans, though these are barely mentioned in the new guidelines. Most of the corn and soybeans grown are used to fatten cows, pigs and chickens, while the Guidelines recommend that consumers eat more fish and beans. Corn and soybeans are also used to make artificial sweeteners and partially hydrogenated oils that the Guidelines urge Americans to avoid. Such oils also are derived from cotton, another subsidized crop. Fruits and vegetables receive no government subsidies, though they should make up the largest share of Americans' diets. Thus, there is a disconnect between what the USDA urges people to eat to remain healthy and what it pays farmers to grow. This disparity is justification for resetting priorities in the upcoming Farm Bill (2007). The challenge will be to balance the needs of a diversity of producers with the needs of diverse consumers. I see two possible approaches for making the connection between the Dietary Guidelines and the agriculture/nutrition programs:

1. Expanding nutrition programs to promote the consumption of

fresh fruits and vegetables, particularly for children and those on low and fixed incomes (WIC and seniors). This could include expanding farm-to-cafeteria programs and WIC food coupons for produce at farmers' markets and/or to purchase shares from community supported agriculture farms (CSAs).

2. Supporting funding and incorporation into the next Farm Bill of agricultural programs promoting healthy foods, particularly for fresh market consumption. This could include expanding specialty crops legislation and/or promoting rural and community development projects that emphasize value-added commodities and improving regional distribution networks and farmers' market infrastructure.

These ideas are, of course, just the tip of the iceberg. As Farm Bill discussions get under way, there will undoubtedly be many more good ideas to come.



Using Leguminous Cover Crops as a Nitrogen Source for Organic Grape Production

Joan R. Davenport, Associate Soil Scientist, **Robert G. Stevens**, Extension Soil Scientist and Interim Director, and **Kyle Bair**, Graduate Student, WSU-Prosser Research and Extension Center

Washington State leads the world in producing Concord grapes and the very low insect and disease pressure on these grapes in Central Washington makes organic production in this area very appealing. Compared to the wine grape, the Concord grape requires higher nitrogen (N) to sustain production due to its large canopy and high yield (8 – 16 tons/acre).

Using funding from the Northwest Center for Small Fruits Research, we are conducting a study to evaluate the use of leguminous cover crops to supply N in organic Concord production systems. Leguminous crops work in symbiosis with root bacteria to fix atmospheric N into plant available N, thus providing a sustainable N source.

Study Design

The research includes two concurrent, replicated plot studies of two legume cover crops (yellow sweet clover and hairy vetch)

and a fertilizer nitrogen source as a comparison of N source. Cover crops were first planted between grape rows in early autumn 2003 or in late spring 2004. Fertilizer N was applied in May. One study was planted on-farm with a grower collaborator, OB Vineyard, in a certified organic field and the fertilizer N source was blood meal applied at a 100 lbs/acre N rate. The second study was planted at the research vineyard at the WSU-Prosser Roza farm (R vineyard). At this site, fertilizer N source was conventional urea applied at 100 lbs/acre N. In addition, this site included a control plot where no cover crop or N was applied, while fall planted yellow sweet clover served as the control at the OB vineyard on the non-research portion of the field. All plots without legumes (bloodmeal, 0, and 100 lbs/acre N treatments) were seeded with winter wheat at the same time legumes were seeded in the autumn.



Difference in canopy sizes for Yakima Valley Concord grape (left) and wine grape (right) vineyards in August.

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Seed sizes, left to right, yellow sweet clover, vetch, wheat.



Cover crop stands in May 2004 at R vineyard. Left to right: yellow sweet clover, vetch, and wheat.



Left to right, vetch in early spring, prior to mowing, and soil-surface post incorporation.

The initial cover crop plot planting occurred on August 27, 2003. In both vineyards, plots were seeded with either yellow sweet clover or common vetch. All other areas in the R vineyard were seeded with wheat for winter ground protection. Each year, prior to June (pre-bloom) mowing, a one square meter area of cover crop was collected from each plot to determine above-ground biomass. The cover crop was ground and will be analyzed for total N. Cover crops were mowed and incorporated between June 30 and July 13, 2004 and replanted between August 18 – 30, 2004.

With the exception of biomass samples, the same procedures have been followed in the 2005 growing season. For cover crop biomass, tissue from the entire plant was sampled, weighed, a subsample collected for tissue analysis, then the remaining dry matter returned to the plot. Cover crop material was tilled in after August mowing.

Evaluation

In addition to sustaining economically viable production (i.e., yield and Brix targets), these trials will increase our understanding of plant available N and how the availability coincides with Concord N demand. In spring 2004, we began monitoring soil temperature, soil moisture, and soil N supply. We collected biweekly soil samples and used commercially available anion and cation ion exchange membranes (PRSTM probes) to monitor N supply. We also sampled cover crop residue after mowing to determine biomass and N contribution when the material was incorporated.

Grapes were harvested in each plot in the autumn and were weighed to determine yield. A subsample was analysed for Brix. The same procedure is currently underway for the 2005 growing season.

Results

While yields and Brix varied between sites in 2004, treatment did not influence yields (Table 1). This suggests that leguminous cover crops potentially supply sufficient N for grape production once sustainable levels of organic matter has been reached.

Seed size did make a difference in plant emergence and establishment. At the R vineyard, irrigation post cover crop planting was modified to supply extra water to enhance crop emergence whereas OB vineyard irrigation was directed strictly at Concord crop need. The larger seeded vetch had a slightly greater emergence advantage at the R vineyard, but a much greater emergence advantage at the OB vineyard, an important consideration for biomass production and weed competition.

Soil NO₃-N availability. Based on one year of data, fertilizer treatments (regardless of source) produced early high levels of soil NO₃-N available, whereas the cover crop treatments showed a greater N availability later in the season (Figure 1). However, when measured with PRS, vetch at the OB vineyard showed a strong early season NO₃-N availability

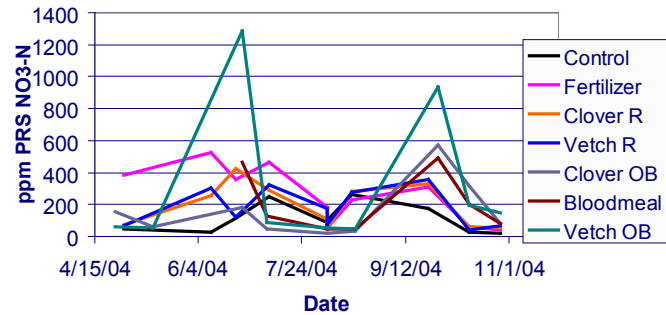
Table 1: Average 2004 grape yield and Brix *
(+/- standard deviation)

Treatment	Yield (tons/acre)	Brix
Control R (0 lbs N) ± 33	8.71 ± 1.40	17.88 ± 0.36
Fertilizer R (100 lbs N)	8.68 ± 0.74	17.20 ± 0.57
Bloodmeal OB (100 lbs N)	5.00 ± 2.99	18.65 ± 0.76
Spring Clover OB	5.44 ± 3.11	18.82 ± 0.91
Spring Vetch OB	3.62 ± 1.74	19.35 ± 0.93
Fall Clover OB	5.52 ± 2.98	18.68 ± 0.53
Fall Clover R	8.80 ± 1.39	17.5 ± 0.36
Fall Vetch OB	4.03 ± 1.25	18.22 ± 2.07
Fall Vetch R	10.13 ± 1.38	16.95 ± 1.03
Hairy Vetch OB	4.41 ± 3.00	18.72 ± 0.72

* Includes plots with legume cover crops established in 2004 at commercial (OB) and research (R) farms.

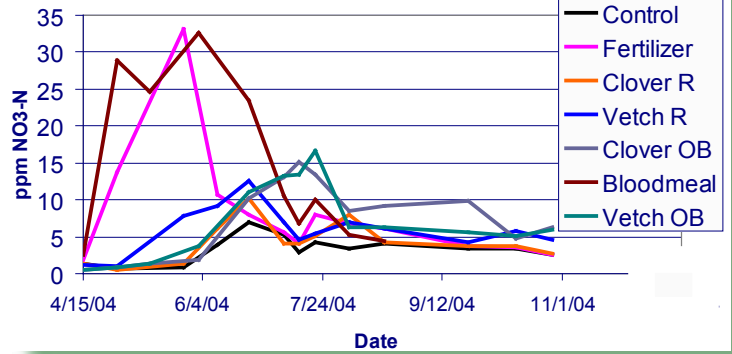
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Figure 2: Average Seasonal PRS* NO3-N levels (2005)



* Two week accumulated values do not represent solution concentration at one point in time.

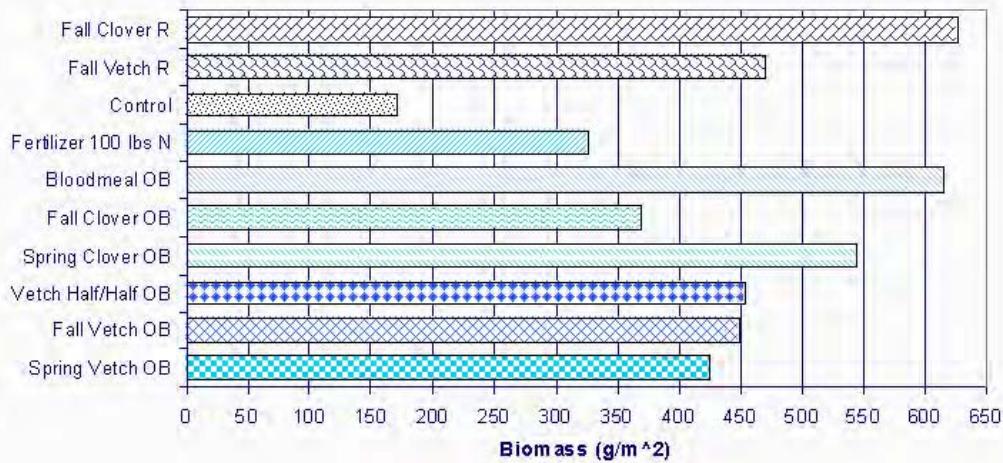
Figure 1: Average Seasonal Soil Test NO3-N levels (2004)



which coincided with the bloom period (Figure 2). Additional data from the 2005 growing season will help elucidate any trends or significance.

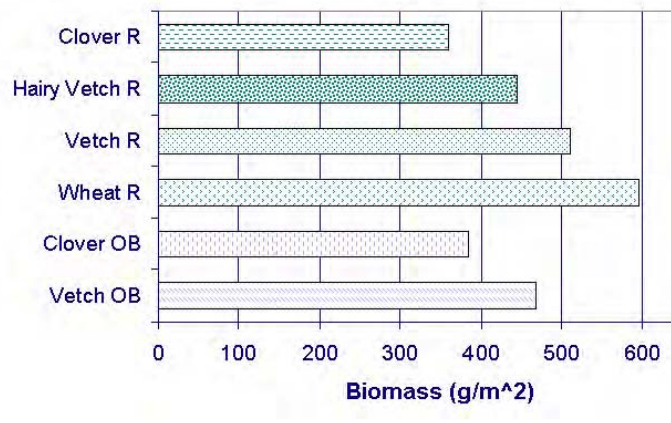
Cover crop biomass varied depending on the time of planting and material planted (Figure 3 and 4). In 2004, vetch produced greater biomass than clover. However, in 2005, spring clover at the OB location and fall clover at the R location produced greater biomass than vetch. Nevertheless, time of planting influenced biomass production of vetch less than clover.

Figure 3: Average Cover Crop Biomass (May 2004)



Data on cover crop N concentration, soil moisture, and soil temperature is still being collected. Upon completion of the 2005 growing season, data from both seasons will be used to develop a model of N availability under each N management system.

Figure 4: Average Cover Crop Biomass (May 2005)



WSU CSANR Organic Agriculture Program Is On the Move

[David Granatstein](#), WSU Wenatchee TFREC, and [Carol Miles](#), WSU Vancouver REU

Over the past several years, the Washington State University Center for Sustaining Agriculture and Natural Resources (WSU CSANR) developed an Organic Agriculture Program to support the vibrant and expanding organic agriculture sector in the state. The program serves both large and small-scale growers and the many types of agricultural products they grow or process. A number of WSU faculty have worked on organic agriculture issues for many years, but until recently, limited coordination and networking made the researchers and their results difficult to access.

WSU Organic Program goals include better connecting these research and educational activities with those who can benefit from them through workshops, publications, web sites, and other means. The CSANR already organized statewide meetings to acquaint faculty with each other, to share numerous on-going projects, and to form partnerships and collaborations for new projects. CSANR also organized organic agriculture symposia and workshops to enable researchers to deliver their results directly to organic farmers, processors, and food handlers. CSANR is currently



developing an on-line database of organic agriculture projects in the state that catalogues past, present, and future work in this area to facilitate the availability of information.

The following list summarizes the primary accomplishments and products of WSU CSANR's Organic Agriculture Program:

Organic Cropping Research in the Northwest. With support from the organic sector in the state, CSANR receives USDA funding for research on organic crop production in our region. Research projects include organic seed treatments, variety testing in organic systems, organic wheat breeding and production, understory management in organic orchards, cover crops and rotations for organic vegetable systems in Western Washington, alternatives to plastic mulch, and statistics on the organic sector. View the [progress reports online](#).



WSU Organic Working Group. Over 50 faculty and staff attended two statewide biannual meetings in Ellensburg, Washington and a third meeting will occur in spring 2006. An e-mail listserve for organic agriculture at WSU keeps interested parties informed of relevant events and research.

Web Site. CSANR created pages on its [web site](#) specifically for [organic agriculture](#).

Organic Agriculture Statistics. WSU CSANR summarized statistics on the state's organic agriculture sector for the past several years in collaboration with the WSDA Organic Food Program and others. Access the 2004 reports for Washington and Oregon, along with the [annual update on organic tree fruit production](#).

Research Symposia. CSANR has hosted two research symposia during the past year: 1) Biological Control in Organic Agriculture at the annual Tilth meeting in Portland, Oregon, November 12, 2004; and 2) Third National Organic Tree Fruit Research Symposium in Chelan, Washington,

June 6-8, 2005. Proceedings from these two events and two earlier organic research symposia can be viewed [online](#).

Organic Livestock. WSU hosted a national broadcast on organic livestock production featuring a panel with producers, a veterinarian, a certifier, a food marketer, and an extension livestock specialist. View the [2.5-hour videostream](#).

Organic Seeds. CSANR supports two graduate students studying breeding for organic systems and organic seed treatments. The page at <http://csanr.wsu.edu/Organic/OrganicSeed.htm> lists available organic seeds by crop and variety

Organic Farming Compliance Handbook. WSU CSANR partnered on a western SARE project to develop materials for agricultural professionals serving the organic sector. The [handbook](#) developed covers the fundamentals of organic farming, national organic standards, organic system plans and practice standards, materials, and resources.

Organic Agricultural Systems Major. The College of Agricultural, Human and Natural Resource Sciences (CAHNRS) submitted a formal proposal for the new [Organic Agriculture Systems \(OAS\) major](#) at WSU with final approval expected from the WSU central administration and Board of Regents late fall 2005. This major comprises one of five in the proposed Agriculture and Food Systems (AFS) degree program. These AFS majors (including organic agriculture) will develop students' ability to work with systems across disciplines. In addition to introductory and advanced classes specifically in organic agriculture, other courses will be offered in general agriculture, systems, and a discipline

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of a student's choice. For information, contact Cathy Perillo at cperillo@wsu.edu or 509-335-2851.

Graduate Students. Fifteen graduate students currently conduct MS or PhD thesis research in organic agriculture at WSU. Their projects include organic wheat breeding, cover crops as organic nutrient sources, compost development and use, biological control in organic orchards, quality of organic strawberry production systems, organic orchard productivity, weed management in organic systems, soil quality in organic systems, and organic seed treatments.

Certified Organic WSU Research Land. Four WSU locations at Vancouver, Pullman, Puyallup, and Mt. Vernon established approximately 25 acres of certified organic research land. Researchers conduct additional trials on organic farms as well. For more information, see our [web site](#).



Livelihood Strategies of Mushroom Pickers and Buyers in Western Montana: An Exploratory Case Study

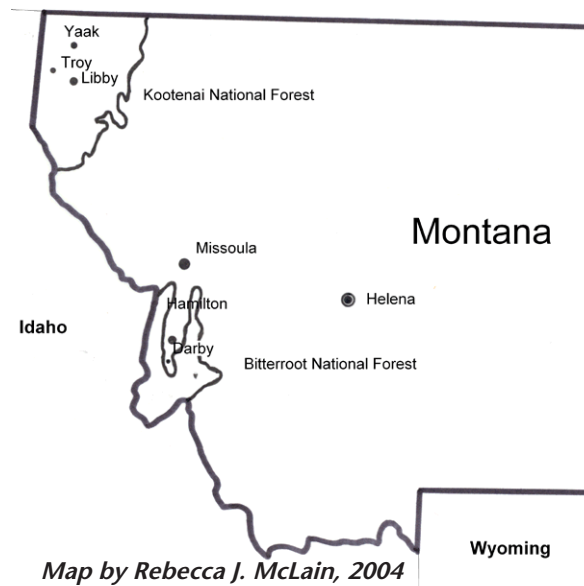
Rebecca J. McLain, Policy Analyst, [Institute for Culture & Ecology](#), **Erika Mark McFarlane**, Private Consultant, and **Susan J. Alexander**, Regional Economist, USDA Forest Service, Alaska

Introduction

In summer 2000, wildfires burned more than a million acres of national forest land in the northern Rockies (USDA FS 2001). Morel mushrooms often fruit abundantly in the year following a forest fire, leading forest managers in Montana to anticipate the presence of an unusually large number of morel harvesters during summer 2001. At the request of Forest Service managers in Missoula, we conducted this exploratory study during summer 2001 to provide a better understanding of how wild morel harvesting fits within the livelihood strategies of pickers and buyers. We gathered information

from key informants among pickers, buyers, and Forest Service employees located in the Bitterroot and Kootenai Valleys in Western Montana (Figure 1). We talked with four groups of buyers (three in the Bitterroot and one in the Kootenai), 11 harvesters

Figure 1: Study Area Map



(seven in the Bitterroot and four in the Kootenai), and 10 Forest Service employees. Due to the small sample size, the work is exploratory and thus most useful for identifying promising questions for applied research aimed at developing scientific knowledge of how rural peoples construct viable livelihood strategies.

Socio-Ecological Context

The Kootenai and Bitterroot valleys are located in the far western corners of Montana, with the Kootenai occupying the northwestern corner and the Bitterroot situated 200 miles south in the southwestern corner (Figure 1). Historically, both areas depended heavily on wood production and processing, as well as mining, to support economic growth. As timber production in Western Montana tapered off during the past two decades, the Bitterroot and Kootenai have turned increasingly toward tourism and service-based industries as major drivers of economic development. The Bitterroot fared much better in

this economic transition, due in part to its proximity to Missoula, one of Montana's larger cities, and a much larger base of privately held land.

The Forest Service's emphasis on managing the Western United States' national forests primarily for timber production between the late 1940s and the late 1980s masked the role of those forests as sources of a wide variety of nontimber forest products (NTFP), such as huckleberries, moss, floral greens, seed cones, medicinal plants, and wild edible mushrooms (Antypas et al. 2002). Though harvesting these products tended to pay less than many of the jobs associated with the wood products industry, NTFP harvesting, processing, and buying provided rural and urban people alike with access to income-generating opportunities that occasionally supported an entire livelihood, but

more often served as important sources of supplemental income, particularly during economic downturns (Emery 1998, Emery et al. 2002, Lynch and McLain 2003).

In a survey of wild-mushroom buyers conducted in 1992, economists Schlosser and Blatner (1995) estimated



Burn morel

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the economic contribution of wild mushroom markets to the regional economy of Washington, Oregon, and Idaho at \$41.1 million in 1992. They identified more than 10 types of mushrooms, including morels, harvested commercially in the three states. Although commercial wild mushroom species fruit less consistently in Montana than in Washington and Oregon, over the past 20 years, pickers learned they can find large quantities of morels in Montana forests in years following major forest fires.

The northern Rockies constitute just one potential set of the many geographically dispersed sites available to mushroom pickers in the Western United States and Canada. Pickers following the morel circuit typically begin harvesting in Northern California and Southwestern Oregon in late February to early March. As the air and soil temperatures rise and mountain snows begin to melt, usually between mid-March to mid-May, circuit pickers move north and east to morel grounds located along the east side of the Cascade Range in Washington and Oregon. Depending on the season, and the location of large fires in the previous years, around mid to late May circuit pickers shift to the mountains of Eastern Oregon and Southern Oregon and to low-elevation harvest sites in Idaho and Montana. A few pickers follow the circuit up into Canada and Alaska during July and August. Others remain in the Rockies, Cascades, and the northern Sierras, moving upward in elevation as the summer advances. Most circuit pickers start picking matsutake or chanterelles in Canada, Oregon, or Washington by mid-September. Many ethnic groups participate in the morel harvest, including Native Americans, immigrants, and native-born Americans of European, Laotian, Khmer, Mien, Hmong, Vietnamese descent, Mexican, and Central American descent.

Harvesters classified the two major types of commercial morels collected in Montana during 2001 as burn and gray morels. Both categories

fruit in greatest abundance the spring or summer following a forest fire. Harvesters also picked a few varieties of morels not always associated with fires, including the types harvesters refer to as naturals and blondes. Mycologists have yet to arrive at a definitive classification of morels in the northern Rockies. However, they agree that at least two distinct morel groups exist: dark morels (the Elata clade) and yellow morels (the Esculenta clade) (Pilz et al. 2004). They have identified 13 potential species of yellow morels and 9 potential species of dark morels in North America (Pilz et al. 2004).

Morels occur on the landscape in discontinuous concentrations, known by pickers as “patches,” which typically fruit in a series of flushes (McLain 2000). Although it is difficult to predict exactly which patches will fruit and when a flush will start, pickers and buyers who have worked an area for many years possess highly detailed mental maps of patch locations and a highly developed understanding for the combination of climatic, soil moisture, and vegetation conditions that indicate that patches in a given area are likely to begin or continue fruiting (McLain 2000).

Buyer Livelihood Strategies

The seven individuals who made up the four buying groups we interviewed shared in common a long history and near full-time involvement in the wild mushroom industry (Table 1). The buyers averaged nearly nine years of experience each, ranging from three years to 14 years. In each buying group, at least one individual had 10 or more years of experience in the wild mushroom business.

Although two of the buyers had stations located in towns they called “home,” all seven individuals spent several months each year away from home to buy wild mushrooms. Nonetheless, the buyers differed in their mobility strategies with some (B1, B3a, B3b, and B4) limiting their participation to the morel and matsutake harvests, primarily in Oregon, Idaho, and Montana, whereas others (B2a, B2b, and B2c) followed a year-long mushroom circuit encompassing a range of mushroom species and bioregions, including Northern California, all of Oregon, parts of British Columbia and Washington, and the Northern Rockies.

Mushroom buying constituted the primary income-generating activity

Table 1: NTFP Buyer Profile in Western Montana

Buyer name	Main residence	Ethnic group	Lives in field site	Years as buyer	Months per year buying	Other income sources or subsistence activities
B1	Montana	Caucasian	Yes	14	~7-8	Roofing, matsutake buying, *mushroom picking, *beargrass harvesting,
B2a	Oregon	Caucasian	No	3	12	Mushroom packing, fall and winter mushroom buying
B2b	Oregon	Caucasian	No	10	12	Fall and winter mushroom buying
B2c	California	Southeast Asian	No	4	12	Interpreter, fall and winter mushroom buying
B3a	Oregon	Caucasian	No	5	~7-8	Field buying station coordinator for matsutake harvest, mushroom processing and packing, (fishing)
B3b	Oregon	Caucasian	No	10	~7-8	Field buying station coordinator for matsutake harvest, mushroom processing and packing, (fishing),
B4	Montana	Caucasian	Yes	14	~7-8	Collecting antlers for making dream catchers, jewelry, and lamps, matsutake buying,

* = past occupation () = subsistence activities

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Table 2: Picker Livelihood Strategies in the Kootenai Valley, 2001

Picker	Residence	Ethnic group	Lives in field site	Years picking morels	Full-time picker?	Other income sources or subsistence activities
K1	Montana	Caucasian	Yes	3+	No	Seed collector, *FS employee-20 years, *logger-12 years
K2	Oregon	Caucasian	No	8+	No	Matsutake picker, landscape laborer, *ski area employee
K3	Montana	Caucasian	Yes	Several years	No	Gold panning, huckleberry picking
K4	Montana	Caucasian	Yes	First year	No	Huckleberry picking, gold panning, making jewelry and knife handles from antlers, Navy veteran with disability payments, *postal worker, (fishing, hunting)

* = past occupation () = subsistence activities

of all seven individuals in the four buying groups. Only two of the buyers (B1 and B4) supplemented their buying income through other activities. B1 and B4 were also the only buyers who mentioned gathering or buying other nontimber forest products as important in their lives: B4 gathered and sold huckleberries and B1 spent one season harvesting beargrass. In addition, B4 collected antlers to make into jewelry, lamps, and dream catchers for sale.

Picker Livelihood Strategies

Of the four pickers interviewed in the Kootenai (Table 2), three lived nearby, and one, a friend of the woman running buying station 4, lived in Western Oregon. Only one, a local resident, had never picked mushrooms before. The other three pickers had picked mushrooms commercially for several years, and two of the four pickers picked mushrooms other

than morels (matsutake and coral) for sale. All four pickers participated in other income-generating activities. Activities listed included landscaping, seed collecting, huckleberry picking, gold panning, and jewelry making. In addition, two of the four pickers, both locals, received retirement income. Of the four pickers, three (all local residents) gathered nontimber forest products other than mushrooms to supplement their incomes.

The seven pickers interviewed in the Bitterroot were ethnically more diverse than the pickers in the Kootenai (Table 3) and comprised four Caucasians, one Cambodian, one Laotian, and one Latino. None of the pickers interviewed in the Bitterroot lived in Montana. Six of the seven pickers came from Oregon, and one came from Northern California. All seven harvested fall mushrooms commercially, and five of the seven got started in the mushroom industry

Table 3: Picker Livelihood Strategies in the Bitterroot Valley, 2001

Picker	Residence	Ethnic group	Lives in field site	Years picking morels	Full-time picker?	Other income sources or subsistence activities
B1	Oregon	Caucasian	No	<1	No	Woodworking [lamps from juniper wood], several years picking matsutake, *logging
B2	Oregon	Caucasian	No	<1	No	Military veteran with disability payments, several years picking matsutake, *logger-25 years
B3	Oregon	Caucasian	No	2	No	Professional guitar player, bolete picking, (hunting and fishing)
B4	Oregon	Latino	No	7+	No	Cone collecting, fall and winter mushroom picking, *forest firefighter
B5	Oregon		No	9	No	Salal and beargrass harvesting, fall mushroom picking, *furniture seller/fabric cutter
B6	California	Laotian	No	2	Yes	Several years picking matsutake,
B7	Oregon	Caucasian	Yes	5+	No	Construction, fall mushroom picking

* = past occupation () = subsistence activities

by picking matsutake in Oregon. All seven pickers had picked mushrooms commercially in previous years, although 2001 was the first year that two of the pickers had picked morels. Only one picker said he received retirement or disability payments. However, five of the other pickers participated in income-generating activities outside the mushroom industry. Their other occupations included woodworking, cone collecting, floral greens collecting, professional music, and construction. Two of the seven pickers also harvested nontimber forest products other than mushrooms.

Views on Livelihood Choices

Many people involved with the commercial wild morel industry are willing to give up some degree of certainty in their work life in exchange for being able to make money doing work that they enjoy and spending time in the outdoors. The following quotes and field note excerpts illustrate this way of viewing wild mushroom work:

“The difficulty of the mushroom harvesting industry is that there is never any guarantee that you will get mushrooms. And some years are just plain bad for making money, but you have to love what you are doing....” (Buyer B1)

“Some days are great, others are crappy but that is the tradeoff for being able to spend your days outside, working for subsistence, picking enough to buy gas to get home.” (Picker K2)

“They like the seasonality of the work, and the fact that they can enjoy other aspects of life. Some years are great (one year they built a home with the money they made buying) and other years are poor, but they still enjoy what they do.” (Field notes on B3a and B3b)

[Picker B6] is happy with the lifestyle that he leads, picking mushrooms...He says that the

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work is “100 percent harsh” and that he works extremely hard for sometimes as little as two or three pounds of mushrooms. He will buy his permit by the week as opposed to an all-season pass. The cost of gas and food add up, he says, and sometimes at the end of the day, he has only saved up \$30. But, the work has its benefits, including no boss and when you are tired, you can sit down. (*Field notes on Picker B6*)

[For Picker B5] the best part of his lifestyle is the freedom that picking provides. He, like others, expressed how difficult it is to work in the woods, though. The most difficult part of gathering is the heavy physical labor and working in foul weather -- in cold and snow (*Field notes on Picker B5*).

Although most of the pickers and buyers we talked with expressed satisfaction with their work, as indicated by the following field note excerpt, not everyone would remain in the wild mushroom world if they had better choices:

“In [buying station 3], there are two Lao people from Portland who brought in about 100 pounds of morels. They pick matsutakes as well. One of the men says that he would like to quit but that he can’t because he would not be able to find any other job with his limited skills and mastery of the English language. Also, he is afraid that he will be discriminated against because of his age (around 50 something).”

Discussion

Wild morel pickers interviewed during this study tended to construct livelihoods based on at least two, and often more, income-generating activities. For some people, mushroom picking supplemented fixed-income payments, such as disability or retirement pay. Others, however, relied primarily upon income from mushroom picking. The latter participated in both the spring and fall

mushroom seasons, and spent from 6 to 10 months of the year harvesting mushrooms. They filled in the gaps between seasons with other activities, such as gathering other nontimber forest products, gold panning, or doing construction work.

In contrast, the buyers we interviewed tended to construct livelihoods around buying, selling, or processing wild mushrooms; only two of the seven supplemented their incomes through other income-generating activities during seasonal gaps. This behavior contrasted sharply with the pickers we talked with, all of whom either engaged in other income-earning activities or receive disability or retirement pay. One possible explanation for this

resins, oils, etc.), a buyer has to know how that product moves through a particular market, how the prices fluctuate, how to market products of different qualities, how to conserve the product to minimize spoilage, who the key players in the market are, and who can be trusted and who cannot. As with any social system, it takes time for buyers to learn the culture and to develop relationships of trust in the market(s) they operate within. In contrast to buyers, most pickers intersect only with the edges of the NTFP markets they are involved with in that they typically sell their product to a field buyer who then takes on the task and risks of moving the product further along the commodity chain.



Basket of Morels (“Naturals”)

difference is that buyers, particularly those in the matsutake business, make sufficiently more money than pickers so they can afford to not work during some parts of the year. An alternative explanation is that buyers are more likely to follow the full mushroom circuit than are pickers.

Another difference in livelihood strategies between the buyers and pickers interviewed during this study is that, as a group, the pickers were more likely than the buyers to earn money through participating in other nontimber forest products industries, such as floral greens or seed collection. One likely explanation is that the barriers to entry into other NTFP markets are greater for buyers than for pickers. To compete effectively in any given NTFP market (i.e., floral greens, wild mushrooms, medicinal plants,

Conclusion

The study illustrates that commercial pickers and buyers employ diverse strategies to derive livelihoods that include participating in wild morel harvests. Pickers and buyers ranged from people who participated on a limited and occasional basis to those who engaged year after year in the harvests. When developing wild morel management policies and regulations, managers thus need to take into consideration this diversity and recognize that forest management policies will affect various pickers and buyers differently, depending on the extent to which wild morels are a critical part of their economic livelihood.

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Research for this project was carried out through a joint venture agreement between the USDA-Forest Service, PNW Research Station and the Institute for Culture and Ecology. A more detailed version of this report, Commercial Morel Harvesters and Buyers in Western Montana: An Exploratory Study of the 2001 Harvesting Season (GTR 643), can be downloaded or ordered from <http://www.fs.fed.us/pnw/publications/gtrs.shtml>.



Anaerobic Digesters and Water Quality: Helping Hood Canal

Kirsten Workman, Small Farms Educator, WSU Mason County Extension

A new project will look at adapting anaerobic digesters for use on smaller farms in the Skokomish Watershed in Mason County, Washington. Hood Canal is noted for low levels of dissolved oxygen and recent shellfish harvest closures, usually attributed to agricultural runoff (along with malfunctioning septic systems and fishery carcass disposal). The Skokomish River contributes over 40 percent of the freshwater that enters Hood Canal.

Richard Geiger, NRCS District Engineer, and Shannon Kirby, Environmental Specialist for Mason Conservation District, conducted a feasibility study in 2005 which prompted an allocation by the legislature in the 2005-2007 state budget to construct an anaerobic digester in the Skokomish Watershed. With assistance from Dr. Shulin Chen, WSU biological systems engineering department, and Chris Feise, WSU Center for Sustaining Agriculture and Natural Resources, Geiger and Kirby will try to adapt the current technology to fit the needs of Skokomish Valley farmers. In addition to livestock waste, the digester will utilize fish carcasses from the local tribal fishery, food waste from the nearby Washington

Correctional Facility, and possibly residential yard waste.

This project will focus less on power generation than on byproducts, such as a pathogen-free liquid fertilizer for use on croplands as well as pastures. More readily absorbed by plants, the fertilizer would be less likely to enter the storm water as excess nutrients. The digester will also produce a solid, peat-moss like material that is suitable for animal bedding and soil amendment. Construction will be completed by October 2006.



Events

Stormwater Management from a Watershed Perspective

The Pacific Northwest Regional Water Quality Program's Watershed Issues Series hosted a satellite conference on October 11, 2005, focused on strategies used by municipalities and homeowners to manage stormwater. Case studies presented reflected the use of low-impact development techniques to manage runoff on site and minimize pollution loading to waterways. This program can be viewed through the internet at the following website: <http://caheinfo.wsu.edu/video/stream.html>.

Every year, billions of gallons of untreated stormwater flow into streams and rivers across the nation. The Environmental Protection Agency calls it the "number one water quality problem." At the southern end of the Appalachian Mountains on the Watauga River around Boone, North Carolina, constructed wetlands and restored streamside riparian vegetation slow and filter the rain event runoff. Outside of Cleveland, Ohio, 33 villages, townships, and suburban cities collaborate on stormwater strategies to quell the rush of polluted water to Lake Erie. Portland, Oregon, plans sustainable growth using Low-Impact Development techniques. Community involvement through self-guided biking tours and neighborhood walks demonstrating techniques and results serve to inform

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and intrigue the public. Civic-minded businesses and homeowners have joined city departments in planning “green” construction. For more information check out [Washington’s Water](#) website.

Climate Change Conference

This conference, titled, [The Future Ain’t What It Used to Be - Planning for Climate Disruption](#), occurs October 27 at the Quest Field Conference Center in Seattle, WA. The conference will explore the degree of climate change predicted in 20, 50, and 100 years in Washington State and look at climate change adaptation work already being done. In addition, the conference will identify resource and information needs for impacted sectors, approaches for improving sector-specific plans to adapt to climate change and initiate an ongoing dialogue about climate change, adaptation, and risk management. Featured speakers include Christine Todd Whitman (former EPA Administrator and New Jersey Governor) and John Cox (author of [Climate Crash: Abrupt Climate Change and What it Means for Our Future](#)).



Tidbits

Farmland Preservation

Snohomish County, WA, recently purchased the development rights to a dairy farm in the Tualco Valley near Monroe, WA. This purchase ensures that the land will remain in agricultural use. Funding for the purchase of \$542,000 came equally from a federal conservation grant and from the county’s conservation futures fund. For a more detailed account, see the [article](#).

Purchase of Agricultural Conservation Easements

AFT Newsletter. Texas is the 25th state to create a purchase of

agricultural conservation easements (PACE) program. The [Texas Farm and Ranch Lands Conservation Program](#) awaits the Governor’s signature and allows willing landowners to sell conservation easements, or the rights to develop their land, protecting the state’s dwindling working agricultural and ranch lands, wildlife habitat, water quality and native areas. The [American Farmland Trust led initiative](#) was supported by a diverse coalition. [PACE: The Status of State Programs](#), a newly updated fact sheet from American Farmland Trust’s Farmland Information Center, provides information about other state PACE programs.

Salmon Safe Certification

A small, but growing number of farms and wineries have been certified as “salmon safe”. For information on what that means and where they are, visit <http://www.salmonsafe.org/index.cfm>.

Small and Mid-size Farms Play Role in Food Security

ATTRA Newsletter. Strong small and mid-size farms may be the key to preventing food supply disruptions, according to conference proceedings that were covered by a story in the [Poughkeepsie Journal](#). The nonprofit Glynwood Center hosted a conference in November called *New Perspectives on Food Security*, and placed the [proceedings online](#). The proceedings report that a dispersed system with more food grown locally is less vulnerable to contamination than big farms with concentrated production facilities, where diseases can spread rapidly. The report encourages the development and support of stronger regional and local food production and food systems.



New Report Looks at Health Implications of Aquaculture

ATTRA Newsletter. A new report by the *Center for Food Safety* examines the relationship between human

health and aquaculture. As fish and seafood consumption increases, more consumers are eating farm-raised products, such as shrimp, salmon, and tilapia. Antibiotics, pesticides, and hormones are routinely used in aquaculture, and the report documents specific drugs or chemicals used in the industry and the associated health risks for humans. Titled [The Catch with Seafood](#) (PDF / 3.9 mb), the report offers several recommendations for improving regulation of the aquaculture industry and protecting human health.

Report Examines Impact of Nanotechnology on Agriculture

ATTRA Newsletter. A report by the Action Group on Erosion, Technology and Concentration (ETC) discusses the way in which nanotechnology, the manipulation of matter at the scale of atoms and molecules, is rapidly converging with biotech and information technology to radically change food and agricultural systems. Download this 74-page publication titled [Down on the Farm: The Impact of Nano-scale Technologies on Food and Agriculture](#).

Blackberry Rust Found in Oregon

ATTRA Newsletter. A fungus deadly to blackberries has shown up for the first time in the United States, reports Associated Press on [Environmental News Network](#). The fungus has spread to seven Oregon counties, and apparently also into Washington State. In Oregon the fungus affects commercial fields of evergreen blackberry, the second most popular blackberry grown in the state, and responsible for 9% of Oregon’s \$30 million blackberry industry. So far damage from the fungus has been limited, even on infected fields, though one grower reported losing his entire crop. The fungus has been used as a biocontrol to prevent the spread of wild blackberries abroad.

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Pesticide-free Method to Kill Insects in Stored Fruit

A new technology developed by entomologist Lisa Neven and colleagues at the U.S. Department of Agriculture's Agricultural Research Service (ARS) may provide a pesticide-free way to kill insects infesting apples, peaches, cherries, or nectarines in fruit destined for international markets. [Called Controlled Atmosphere/Temperature Treatment System \(CATTS\)](#), the technology combines rising temperature and mixtures of low oxygen and high carbon dioxide to kill codling moths, oriental fruit moths, and other insect pests found in stored fruit. Neven completed confirmatory tests on CATTS ability to kill codling moths in organic apples, and ARS will now present the results to the Animal and Plant Health Inspection Service and seek CATTS approval as a quarantine pest-control measure.

Resources

[Handbook of Regulations for Direct Farm Marketing](#)

This popular handbook from the Washington State Department of Agriculture, called the *Green Book*, explains the basics of what growers need to know about food safety, health, business, labor and tax issues. Sections cover selling specific products, such as eggs, fish and shellfish, fruits and vegetables, honey, milk and dairy, as well as information on food stamps, nutrition programs, signage and labeling. The handbook explores direct marketing strategies farmers can use to sell their products, such as selling to restaurants, at farmers markets, on-farm sales, Internet sales, and Community Supported Agriculture programs. An extensive

list of publications and organizations related to the topics is included.

Order a free copy by sending your address via e-mail to smallfarms@agr.wa.gov, or phone Kelli Sanger at



(360) 902-2057. The handbook is also available to download, or download it from the [WSDA website](#).

Resources for Instructors in Sustainable Agriculture

The Center for Agroecology and Sustainable Food Systems offers two comprehensive resource guides: *Teaching Organic Farming & Gardening: Resources for Instructors and Teaching Direct Marketing and Small Farm Viability: Resources for Instructors*. Guides may be downloaded or purchased [online](#).

Organic Producer E-zine

Organic Producer Magazine focuses on the needs of the organic producer. Subscribe to free regional E-zine at the [Organic Producer website](#).

Food Entrepreneur eZine

News from Specialty Food Resource, LLC puts out a [electronic newsletter](#) that explores the issues faced by food entrepreneurs.

SARE Publications

Sustainable Agriculture Research and Education (SARE) program offers online publications to help producers, researchers, and educators quickly and easily order [publications](#) featuring cutting-edge SARE research.

Research Shows Organic Soil Management Enhances Water Infiltration

ATTRA Newsletter. [Research](#) by scientists of the Institute of Plant Nutrition and Soil Science and the Institute of Organic Farming at the Federal Agricultural Research Centre (FAL) in Germany investigated water infiltration capacity of soils. While conservation tillage is known to promote better water infiltration capacity than conventional tillage, the FAL found that organically managed soils performed even better. They showed approximately seven times more earthworms and infiltration rates twice as high as conventionally managed soils, indicating that organic soil management could be an aid in preventing flooding.

USDA Announces Web Soil Survey

The U.S. Department of Agriculture has launched a [new site](#) providing public access to the national soils information system. The site allows viewers to define a particular geographic area and print, save, or download soils information for that area. Users can also explore the designated location for specific information on soil suitability in relationship to usage. A customized report can then be



Web Soil Survey

delivered to users via print, CD, DVD, or other media. With the launch of this Web site, traditional printed and bound soil survey maps will slowly be phased out.

Can the Way We Eat Change Metropolitan Agriculture: The Portland Example

Check out this [article](#).

Rural Entrepreneurship News

Check out this [monthly newsletter](#) of the Center for Rural Entrepreneurship.

Article Explores Reasons for High Organic Food Cost

ATTRA Newsletter. [Grist](#) explores some of the reasons behind the high costs of organic food. Though demand for organic food is growing rapidly, that hasn't driven costs down the way some expected it would. For some products, demand outstrips the supply, driving prices up. In addition, organic products do not reach an economy of scale because many organic producers are small operations committed to staying small. However, prices on processed organic food, which are markedly higher than those for conventional foods, could come down if economies of scale are reached. In Europe, governments have offered incentives to organic producers to help build a market that would reach an economy of scale. The article also notes that conventional

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food prices are artificially cheap due to government subsidies and externalities.

Two Groups Collaborate for Conservation of Medicinal Plants

Association for Temperate Agroforestry newsletter. [The Medicinal Plant Working Group](#) (MPWG) aims to balance the biological and commercial needs of medicinal plants native to the United States, so as to promote both sustainable utilization and long-term conservation. MPWG is part of the [Plant Conservation Alliance](#) (PCA), a consortium of US federal agencies and private cooperators working collectively on issues associated with native plant extinction and native habitat restoration. The MPWG site has profiles of individual medicinal plants and links to publications and other groups involved in medicinal plant conservation. You can also join an email discussion group on native medicinal plants.

EPA Releases Watershed Protection Handbook

ATTRA Newsletter. A new Environmental Protection Agency handbook released at the White House Conference on Cooperative Conservation in St. Louis addresses questions about managing pollution runoff, increasing wildlife habitat, and controlling invasive species in the nation's estuaries. The 98-page handbook, [Community-Based Watershed Management: Lessons from the National Estuary Program](#), focuses on estuaries, but EPA says its principles and examples are relevant to any organization involved in watershed management.

Ikerd Essay Outlines Benefits of Eating Locally

ATTRA Newsletter. In June 2005, John Ikerd, Professor Emeritus of Agricultural Economics at the University of Missouri-Columbia, presented the keynote talk at *The Eat Local Challenge* event in Portland Oregon. The full text of his comments titled, [Eating Locally: A Matter of Integrity](#), can be found online. Other articles can be found on [Ikerd's website](#).

Food Miles as an Indicator of Sustainable Development

View this [new report](#) by the UK Department for Environment, Food, and Rural Affairs (DEFRA).

Symposium Proceedings on Organic Biological Control Available

[Symposium proceedings](#) from a November 2004 conference on biological controls in Portland, Oregon, can now be viewed on the CSANR website. The symposium was sponsored by Washington State University's Center for Sustaining Agriculture and Natural Resources and titled *Getting the Bugs to Work for You: Biological Control in Organic Agriculture*. Oral and poster presentation topics covered mycoattractants and mycopesticides, successful farmscaping, designing pest resistant systems using living mulch, orchard floor management and soil quality, markets for small farms, and a host of other material, much of which is devoted to combating specific crop pests.



Renegotiating the Commons

This book by Graham Marshall explores and explains the economics of managing the commons and provides a broad framework applicable in various situations and jurisdictions. It draws on cases from the USA, Canada, Southern and West Africa, Bolivia, Philippines, and Australia. The book looks at the "weaknesses of mainstream economics in analyzing collaborative and other decentralized approaches to environmental management, and presents an alternative approach capable of identifying the conditions under which pursuit of the collaborative

vision has a reasonable prospect of promoting voluntary cooperation in management of the commons." See purchase details on the [Earthscan website](#).

Wood Quality Implications of Forest Management

A new Oregon State University publication looks at the basics of conifer tree growth, characteristics that define wood quality, and the effects of silvicultural management practices on wood quality. Download [Tree Growth, Forest Management and Their Implications for Wood Quality](#) (PNW 576) online.



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