

NOFA Holds Its 25th Annual Summer Conference and Celebration of Rural Life

by Julie Rawson

It is somehow auspicious when one of the worst droughts of the century takes a break and lets the heaven flow forth on the weekend of the NOFA Conference. And we were all happy, even those who slept outside in it and had very wet tents! This is the second time in the past 8 or so years when a drought period ended on the weekend of the conference. The last time, folks were elated also.

Almost 1200 people attended this year's conference, 532 from Massachusetts (378 of whom were NOFA members), 164 from NY (145 members), 113 from CT (97 members), 83 from VT (70 members), 55 from NH (43 members), 43 from NJ (35 members), and 24 from RI (all members). In addition we got 16 from Maine, 13 from Pennsylvania, and scattered attendees from Michigan, Kentucky, Florida, the Virgin Islands, and one farm intern from Sweden.

Though it did rain for large parts of the weekend, it cleared off and was beautiful for this year's very spirited fair. The dunk tank was definitely a popular activity as one NOFA big wig after another got dumped in the water. Dale Perkins' horse show started things this year, instead of ending them, which gave the fair a great flavor. Lucky winners of the cow plop were Janet Wile and Pat Grenier. Christina McGlew won the quilt and Nadine Smith won CT's basket. As if there were a timer on somewhere, at exactly 6:00 PM a huge sheet of water came roaring across the field and ended the fair on time as we got some torrential rain for a time.

Inger Källander, an activist in The Swedish Ecological Farmers' Association, was our keynote speaker. Not only active in her own country's organic movement, Inger is a spokesperson in Europe and spends time in third world countries as well, supporting the cause of organic agriculture. Also a farmer and language teacher, this busy woman didn't give any indication of her immense schedule in her very calm and serene demeanor. Available throughout the entire conference and quite educational during the keynote address about how Sweden has moved to 10% organic agriculture nationwide, she was a wonderful addition to our conference this year.

I attended a few more workshops than usual this year, in large part because our very strong and competent committee had everything under control almost all of the time. I really enjoyed Peter Young's lacto-fermented vegetable, Terry Gips' Possibilities for Personal Empowerment and Eugene Zampieron's Men's Health for the Millenium workshops.

I would like to thank by name the NOFA Conference Committee. Though Jack and I are paid a reasonable salary for our efforts as coordinators, the rest of the committee is working largely on devotion to the cause. They are our marvelously calm and competent registration coordinator: Elaine Peterson, Rita Horsey, the queen of food donations with the most positive attitude of anyone I have ever known, Kofi Ingersoll, our



photo by Jack Kittredge

Pam and Rob Flory present NJ's Emily Brown Rosen NOFA's Person of the Year Award self-named "Exhibitionist", Charmaine Dupont-Getman: the teen coordinator who doubles as a teen, Dre Rawlings who didn't let up on the press until they all wrote articles and came in person to do interviews at the conference, Lynn Klein, our long term Children's Conference Coordinator who will be retiring and be missed very much, Mary Lou Conna, the beautiful banner artist and sign maker, Richard Murphy who kept us entertained all weekend, Janice Sanford who worked tirelessly for four days to give us a low cost alternative to Hampshire food, Audrey Cronin, the softspoken and competent Helping Hands Coordinator, Dennis Cronin, who deals with all our electrical, AV, sound and accessory needs, and never loses his cool, Beth Ingham who did all that great research on the presidents and presented it so attractively in the dining hall, Dave Getman who ran our best fair ever, Penny Pitts who handles all our Amherst details and Ted Conna who was always available to help whoever needed it. Of course there is Jack who cranks out the publications each year, runs the video project, is the conference photographer, bookkeeper and best friend of mine. Thanks everyone.

So what is up for next year? The dates will be August 11-13, the place will be Hampshire College. The theme, keynoter, logo, are up to us. If you would like to take a crack at an all expenses paid trip to the conference next year, submit a theme and logo to me by October 5. One or the other qualifies for half the trip. Keep those evaluations coming in also. There are forms in the back of the program book. If you have a favorite keynote idea, a little bio on them or selling job will go a long way for them to be selected. We pour through the ideas every year and try to find the best person available.

I am always looking for new workshop ideas. Get your ideas to me by December 31. Workshop presenters receive free registration, 2 meals and a \$25 stipend for each workshop presented (\$15 for

individuals on panels). Here is a list of workshops that folks have asked for already. Can anyone help me out on these? - More farming with kids, homesteading, international farm community, sustainable farming practices, children science education thru farming, who buys organic food, potential markets, marketing on the internet,

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The Importance of Good Tools

It may seem silly to write to an audience of people who work with their hands about the importance of tools. But many NOFA members are living without very much extra money and all too often let their enthusiasm and energy take the place of appropriate implements. As anyone who has studied repetitive motion and ergonomic design will tell you, that can lead to needless aches and pains later. As anyone who has studied the business of farming will tell you, it can also lead to inefficiencies which will quickly eat away your slim profit margin.

Humankind has been defined as the tool-using species. We first used stone tools over one million years ago, adding handles to increase their range and force at least 35,000 years ago. As we went from food gathering to food production to manufacturing activities, our tools have changed and diversified (a 1953 study found 12,000 different styles of shovels in Germany). Habit and cultural inertia still determine many tool design features, however (although used for the same purposes, American and European hand saws cut on the push stroke, Oriental ones on the pull stroke.)

Major efficiencies are achieved by simple tool redesign. Traditional wheelbarrows are not well balanced and the user has to exert extra effort both to lift the load and then to balance it from side to side because the center of gravity is so high. A

1953 study found that simple design changes resulted in a 20% saving of energy expenditure. The hoe design Eliot Coleman mentions in the feature article on Four Seasons Farm was found to be 58% more efficient than an alternative hoe in retrieving potatoes and 72% more efficient in hoeing a given area. The shallow blade and more ergonomic angle of blade to handle allow it to be used in a pulling action, instead of a chopping one.

Many tools have been designed for men, but are being used more and more by women. Female grip strength averages from 50 - 67% that of males. Women generally have smaller grip spans than men. Tools such as wire strippers and crimpers have been designed for men in both aspects and can be practically impossible for some women to

operate. Handedness is also an issue. Various studies have found preferred hands to be from 7 - 20% stronger than non-preferred ones. Workers are from 9% (electric drilling) to 48% (cutting with scissors) slower when forced to use their non-preferred hand because of tool design.

During my travels to NOFA farms for this journal I have noted again and again the cleverness which our members have put into improving and creating tools to make their work easier. This issue of the paper is an attempt to feature some of those devices which I saw but couldn't fit into the focus of the original article. I have also delved a little into our agricultural past to see what implements folks doing our work used to use. I hope you find this topic as thought-provoking as I did!

The Natural Farmer Needs You!

The Natural Farmer is the newspaper of the Northeast Organic Farming Association (NOFA). All members receive a subscription as part of their dues, and others may subscribe for \$10 (in the US or \$14 outside the US). It is published four times a year at 411 Sheldon Rd., Barre, MA 01005. The editors are Jack Kittredge and Julie Rawson, (assisted by their kids), but most of the material is either written by members or summarized by us from information people send us.

Upcoming Issue Topics - We plan a year in advance so that folks who want to write on a topic can have a lot of lead time. The next 3 issues will be:

Autumn 1999 - Clever Implements
 Winter 1999-00 - Food Safety
 Spring 2000 - Flowers for Market
 Summer 22000 - Bees

Moving or missed an issue? The Natural Farmer will not be forwarded by the post office, so you need to make sure your address is up-to-date if you move. You get your subscription to this paper in one of two ways. Direct subscribers who send us \$10 are put on our data base here. These folks should send address changes to us. Most of you, however, get this paper as a NOFA member benefit for paying your chapter dues. Each quarter every NOFA chapter sends us address labels for their paid members, which we use to mail out the issue. We don't keep copies of these, and if you moved or didn't get the paper, your beef is with your state chapter, not us. Every issue we print an updated list of "NOFA Contacts" on the last page, for a handy reference to all the chapter names and addresses.

As a membership paper, we count on you for articles, art and graphics, news and interviews, photos on rural or organic themes, ads, letters, etc. Almost everybody has a special talent or knows someone who does. If you can't write, find someone who can to interview you. We'd like to keep the paper lively and interesting to members, and we need your help to do it.

We appreciate a submission in any form, but are less likely to make mistakes with something typed than hand-written. To be a real gem, send it via electronic mail (JACKKITT@AOL.com) or enclose a computer disk (3 1/2 inch size). We use a Macintosh G3 with Microsoft Word but can with only modest difficulty convert IBM disks as well. Also, any graphics, photos, charts, etc. you can enclose will almost certainly make your submission more readable and informative. If you have any ideas or questions, one of us is usually near the phone - (978) 355-2853, fax: (978) 355-4046

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Northeast Organic Farming Association

Advertise in The Natural Farmer

Advertisements not only bring in TNF revenue, which means less must come from membership dues, they also make a paper interesting and helpful to those looking for specific goods or services. We carry 2 kinds of ads:

The NOFA Exchange - this is a free bulletin board service for NOFA members. Send in up to 100 words (business or personal) and we'll print it free in the next issue. Include a price (if selling) and an address or phone number so readers can contact you directly. If you're not a NOFA member, you can still send in an ad - just send \$5 along too!

Display Ads - this is for those offering products or services on a regular basis! You can get real attention with display ads. Send us camera ready copy and enclose a check for the appropriate size:

Full page (15" tall by 10" wide)	\$240
Half page (7 1/2" tall by 10" wide)	\$125
One-third page (7 1/2" tall by 6 1/2" wide)	\$85
One-quarter page (7 1/2" tall by 4 7/8" wide)	\$65
One-sixth page (7 1/2" tall by 3 1/8" wide), or (3 3/4" tall by 6 1/2" wide)	\$45
Business card size (1 1/2" tall by 3 1/8" wide)	\$12

note: These prices are for camera ready copy. If you want any changes we will be glad to make them - or to type set a display ad for you - for \$10 extra. Just send us the text, any graphics, and a sketch of how you want it to look. Include a check for the space charge plus \$10..

Frequency discounts: if you buy space in several issues you can qualify for substantial discounts off these rates. Pay for two consecutive issues and get 10% off each, pay for 3 and get 20% off, or pay for 4 and get 25% off. An ad in the NOFA Summer Conference Program Book counts as a TNF ad for purposes of this discount.

Deadlines: We should receive your ad copy one month before the publication date of each issue. The deadlines are:

January 31 for the Spring issue
 April 30 for the Summer issue
 July 31 for the Fall issue
 October 31 for the Winter issue

Contact: If you have questions, or want to reserve space, contact our advertising manager, Justine Johnson, at (413) 527-1920.

Disclaimer: The Natural Farmer cannot investigate the claims of advertisers and we don't vouch for anything advertised here. Readers are expected to exercise due caution when inquiring about any product or service. Different NOFA chapters have different standards for fertilizers, for instance, and a product acceptable in one state may be prohibited in another. Please check with your chapter when in doubt. Remember, however, that advertisers are helping support the paper and, when appropriate, please support them.

October is NOFA Month at Bread & Circus and Fresh Fields Stores!

Throughout October, 1999, customers at the below stores will have the opportunity to purchase coupons in amounts of \$1, \$2, and \$5. A coupon purchase is essentially a contribution to the cause listed on the coupon. In October, the cause will be NOFA's work to educate, encourage, and facilitate northeast farmers making the transition to organic production. Last year a similar promotion earned over \$25,000 for NOFA programs!

As last year, individual stores will have displays about NOFA and its work, and to the extent possible NOFA chapters will staff the displays and answer questions. We hope to be able to have farmers entering transition at stores on occasion, to explain the difficulties involved.

Each NOFA chapter will have the chance to staff a store, even if it has to be in an adjoining state

(there are no Bread & Circus or Fresh Fields stores in Vermont or New Hampshire). Funds from the promotion will be divided up among the chapters and the Interstate NOFA Council according to a formula voted by the Council at the Summer Conference in August.

Current plans call for CT to staff 2 stores, MA to staff 3 or 4, NH to staff 2, NJ to staff 2, NY to staff 1, RI to staff 1 or 2, and VT to staff 4.

If you have any time during the month that you could volunteer to staff a display for an hour or two, please call your local chapter. Tell your friends, libraries, church groups, etc. to support local organic agriculture by buying a coupon in October. Put an article in your local newspaper explaining the value of farming in the northeast and letting people know that this is a simple and direct way to demonstrate their support for it. The

fall is a busy time for all of us, but a little time by each can result in major opportunities for NOFA to encourage local transitions!

Chapter contacts are:

Connecticut - John van Achterberg, 203-261-2156, Email vanachj@concentric.net

Massachusetts - Richard Murphy, 508-867-5735, Email rmurphy@star.net

New Hampshire - Suzanne Clements, 603-736-8075, Email clements@totalnetnh.net

New Jersey - Karen Anderson, 609-737-6848, Email nofanj@aol.com

New York - Sarah Johnson, 518-828-2511, Email sjds@wizmax.net

Rhode Island - Jeanne Chapman, 401-828-3229, Email nofari@ids.net

Vermont - Enid Wonnacott, 802-434-4122, Email Enid_Wonnacott@together.net

<p>Bedford 170 Great Road Bedford, MA 01703 781-275-8264</p>	<p>Cambridge 115 Prospect Street Cambridge, MA 02139 617-492-0070</p>	<p>Fresh Pond 200 Alewife Brook Pkwy. Cambridge, MA 02138 617-491-0040</p>	<p>Symphony 15 Westland Ave Boston, MA 02115 617-375-1010</p>	<p>Millburn 187 Millburn Avenue Millburn, NJ 07041 973-376-4668</p>	<p>Greenwich 90 E. Putnam Avenue Greenwich, CT 06830 203-661-0631</p>
<p>Bellingham 255 Hartford Ave. Bellingham, MA 02019</p>	<p>Hadley Route 9/ Russell Street Hadley, MA 01035 413-586-9932</p>	<p>Newton 916 Walnut Street Newton, MA 02461</p>	<p>Wayland 317 Boston Post Road Wayland, MA 01778 508-358-7700</p>	<p>Montclair 701 Bloomfield Avenue Montclair, NJ 07042 973-746-5110</p>	<p>Manhasset 2101 Northern Blvd. Munsey Park, NY 11030 516-869-8900</p>
<p>Brighton 15 Washington Street Brighton, MA 01235 617-738-8187</p>		<p>Newtonville 647 Washington Street Newton, MA 02158 617-965-2070</p>	<p>Wellesley 278 Washington Street Wellesley, MA 02481 617-235-7262</p>		<p>Providence 261 Waterman Street Providence, RI 02930 401-272-1690</p>

NOFA Exchange

Suffolk work horses: We knew nothing of farming or working horses when we started, so we decided to start with horses bred to do the work at hand. We made the right decision, choosing Suffolk horses. They are moderately sized, calm in temperament, and easy to keep. We have trained teams, green teams, breeding and young stock available. Baldur Farm, N7659 950th Street (Cady Lane), River Falls, WI 54022. (715) 425-0040

Salaried Farmer/Caretaker wanted to live on improved 19th century farm in Norwich, VT and work 2-4 draft horses, using operable 19th century equipment to plow, sow, cultivate and harvest approximately 8 acres and to hay another 30 acres, to maintain farm equipment and to care for livestock. Sufficient solar power has recently been installed to make it possible to live and work off the grid most of the time. No smoking. Time off rotational with other farm staff. Salary negotiable. Send resume and references to PO Box 1024, Norwich, VT 05055 or call 802-649-3635.

For Sale: Homestead in Stamford, VT. 10+ acres of hillside, 1 1/2 acres cleared, balance woodland. Approx. 30 fruit trees: apple, pear, cherry. Also American Chestnut and raspberry patch. 1700 sq. ft. organic garden, 3-4 bedroom frame house built in 1974. Wood heat, attached cold frame greenhouse, gravity feed spring water. 10x14 chicken house with fenced yard. Other outbuildings. 150 day frost free growing season. \$98,600. 802-694-1381 or write McClenachan/Monzo, 224 Forgette Rd., Stamford, VT 05352

Garlic - Not too late to plant for harvest in 2000! Organically grown in Vermont. Many gourmet strains available. Very popular at farmers markets and CSAs. Grow some for yourself, too. It's so much better than grocery store garlic! For catalog and ordering call Northern Prize Garlic at 802-827-6555. \$6-7/lb.

Farmcolony is a concept for a homeowners association. We are looking for a farm, farmable land, and a farmer to run the operation. We are hoping to do this in southern Tolland (CT) county or Lebanon. We are in the process of forming an intentional community where the association owns a working organic farm. Possible benefits to the farmer:

- 1) equity from your land now while keeping your home, your farm and your livelihood
- 2) become part of a community of people committed to learning about & participating in farm life.

For more information contact: Jennifer Higoins, 82 Mott Lane, Moodus, CT 06469, (860) 873-2560, fax: (860) 873-9566, email: higgins @ wsitruss.com

Organic farmer, intellectual, 48-year old man **seeks woman partner.** Have established farm in some of the prettiest country in New England; not a bad business location either. However, I'm also interested in the eco-village intentional community concept/setting to live/farm cooperatively though not necessarily communally. Enjoy most all that life has to offer. Visit my extensive Web site if you'd like to get acquainted and contact me. <http://homepage.fcgnetworks.net/journey>

Internship position available at Ol' Turtle Farm, 18 acre organically managed diversified vegetable farm located at the base of Mt. Tom Reservation in Easthampton, MA. 5 acres veggies marketed through a CSA with additional produce sold to stores and restaurants, 8 acres in cover crops. No experience necessary, but must have good work habits and be willing to work long days and weeks. Intern will have a private room, access to farm vegetables and receive a stipend. Contact Eileen, 385 East St., Easthampton, MA 01027 413-527-9122, email: olturtle @ javanet.com

Many Hands Organic Farm, 411 Sheldon Road, Barre, MA 01005 (978) 355-2853, has available pork cuts for sale, from \$3.50 to \$4.25/lb depending on the cuts. Also, we have a small amount of excellent seed garlic (stiff neck) at \$5.00/lb plus shipping and garlic braids at \$7.50/lb. Finally, we have some ready-to-lay NOFA Certified laying hens, mostly brown egg layers of breeds such as Rhode Island Red, Barred Rock, Light Brahas, etc.

Program Coordinator - Organize educational programs (workshops, farm tours, conferences); coordinate special events and fundraisers. Qualifications: Self-starter, experience as organizer, knowledge of farming and related issues, excellent verbal and written communication skills, computer literacy, familiarity with office procedures, ability to lead groups and run meetings, willingness to raise money. Must have vehicle (mileage paid). Willingness to work occasional evenings/weekends. Compensation starts at \$22,000 to \$25,000 plus benefits. The successful applicant will be part of the two-person staff. Send resume, 3 references, writing sample, other materials that support your application, and letter of interest to Job Search, Regional Farm & Food Project, 27 Elm St., Albany, NY 12202. For questions, call Tracy Frisch at (518) 426-9331.

Growers! Almost new, **1998 Planet Jr.** 4 row vegetable drill setup and Williams row crop cultivator for sale at half new price; \$3,000 takes both. Also a **Hardi field sprayer w/boom**, organic use only for \$1,500. We are no longer growing the crops requiring this equipment. We might deliver in New England (802) 626-9201

Blow Your Own Horn!

Apprentices Wanted: The CSA at Genesis Farm is seeking 2 apprentices for the 2000 growing season (April 1 - October 31, flexible). We biodynamically manage more than 20 acres on a 140 acre farm in northwestern New Jersey. There are 8 acres of vegetables, 3.5 acres of orchards and berries, and the rest in meadows. All produce is sold through a CSA. Applicants should seek hands-on learning on a production-oriented farm. Room, board and a stipend offered. Please visit the farm in the fall or 2 weeks to evaluate the suitability of the position. Send resume and letter outlining goals and interests in agriculture to: CSG at Genesis Farm, c/o Mike Baki, 41B Silver Lake Rd., Blairstown, NJ 07825.

WHY PAY RENT, OR MAKE MORTGAGE PAYMENTS, WHEN YOU CAN LIVE RENT-FREE? The Caretaker Gazette contains property caretaking/housesitting openings, advice and information for property caretakers, housesitters & landowners. Published since 1983, subscribers receive 700+ property caretaking opportunities each year, worldwide. Some estate management positions start at \$50,000/yr + benefits. Subscriptions: \$27/yr. The Caretaker Gazette, PO Box 5887, Carefree, AZ 85377. (480) 488-1970.

News Notes

compiled by Jack Kittredge

Kathleen Merrigan to Head USDA Ag Marketing Service. The former National Organic Standards Board member and aide to Sen. Patrick Leahy (D-VT) will lead the division of the USDA responsible for promulgating and implementing the federal government's organic standards and National Organic Program. *source: Alternative Agriculture News, June 1999*

GE Tobacco Can Clean Soil of TNT. British scientists have reported finding that a genetically engineered variety of tobacco can clean up TNT contaminated soil much more rapidly than other plants. They engineered the tobacco to produce an enzyme which breaks TNT into harmless components. The plants, they suggest, could be grown around contaminated weapons factories. *source: New York Times, May 18, 1999*

Canada Cautious About Water Exports. Whoever said the 20th century was about oil; the 21st will be about water? Apparently Canadian policy-makers agree. Global water demand has been doubling every 21 years and by 2025 the World Bank predicts chronic shortages affecting 3 billion people. Canadian and US lifestyles consume 100 gallons per person per day, 25 times consumption in the Third World. Canada has now voted a moratorium on water exports, following the award of a contract to ship 18.2 billion gallons a year from Blue Lake in Alaska to China. *source: Organic Broadcaster, May-June 1999*

Horizon Buys Organic Cow. Horizon Organic Dairy, the largest producer of organic milk in the country, has bought The Organic Cow brand from HP Hood. Under the agreement, Hood will become the exclusive master distributor of ultra-pasteurized organic milk on the east coast, and Horizon's largest distributor nationwide. Prices paid northeast farmers for organic milk are likely to fall, as The Organic Cow currently pays \$21.25 per hundred and Horizon pays its upstate New York farmers a little over \$18. *source: NOFA Notes, Summer, 1999, New England Farmer, June 1999*

BST Milk Linked to Breast Cancer. Dr. Samuel Epstein, a US research scientist, has linked high levels of the hormone IGF-1, or insulin-like growth factor one, to human breast cancer. The hormone is a potent stimulator of breast cells, including malignancies, and although it occurs in normal milk, it occurs with a potency 40 times that of normal milk in cows injected with growth hormones such as BST (bovine somatotropin). *source: Email from Kathy Lawrence of Just Food, August 2, 1999*

GE Corn Rejected by US Middlemen. Archer Daniels Midland and A. E. Staley Manufacturing announced that they will no longer accept genetically modified corn that is not accepted by European Community markets. As a result, RoundupReady and Bt varieties of corn have lost major market potential. Bt corn is expected to comprise between 20 and 40 percent of US corn acreage this year. *source: Stewardship News, July-August 1999*

GE Trees Destroyed. More than 100 genetically modified 30 ft. tall poplars were cut, snapped, or had their bark stripped from them in a dawn raid in a field maintained by Zeneca Plant Science in England. A man reportedly speaking for the raiders said the trees were a major threat to the world's environment and represented reckless use of technology. A Zeneca spokesperson defended the trees as helping research ways to reduce pollution while making paper, called the attack unwarranted vandalism and said: "These poor things are now dying a slow death". *source: London Times, July 13*

Some Food Facts:

26 million people could be fed at US levels of consumption if the amount of food wasted in the US were reduced by 1/3.

25 million people are slowly dying of famine in North Korea.

2.8 % of the US labor force is involved in farming, fishing and forestry in 1998

2.8% of US residents were in jail or on probation in 1998

11 minutes is how long it takes to earn a Big Mac in the US

480 minutes (8 hours) is how long it takes to earn a Big Mac in Nairobi, Kenya.

source: Elm Farm Research Centre Bulletin, August 1999

Stop for Some Slow Food. The Slow Food movement celebrates and supports time-proven flavors, crops, and the craftspeople and farmers who produce them. The organization, begun in Italy, now has 65,000 members worldwide. Its "Ark of Taste" celebrates the heirloom crops, handcrafted breads, aged cheeses, etc. which are in danger of disappearing. For more information contact Jan Mettler (707) 433-5846, Email bossdogmkt@aol.com. *source: Agrarian Advocate, Summer 1999*

American Organic Standards Stir Controversy. The effort by a number of US certification groups, working under Organic Trade Association aegis, to draw up organic standards has drawn the ire of the international organic accreditation group IFOAM. The second draft of the AOS was released in early August and upset IFOAM because it included standards for accreditation of organic certifiers, something that IFOAM now does. "We consider it counter to the interest of the international organic trade to develop national organic accreditation programs," said Linda Bullard, IFOAM president. Common accreditation will be necessary for certifiers under any national program which authorizes various groups to certify to its standards, OTA spokespeople counter. Comments on the 2nd draft are due by August 30. The final draft standards are to be presented to the OTA in October. *source: Organic Food Business News, August 1999*

USDA Supports GE Labeling. US Ag Secretary Dan Glickman has signaled the administration's decision to appease critics of high tech foods. In a major policy address he called on industry to consider labeling genetically engineered food. His words mark the first time an administration official has done anything but support the Monsanto line that it is impossible to separate out GE foods from natural ones. This shift comes after European rejection of engineered crops and the resulting multi-million dollar losses to US farmers, and the highly publicized news that pollen from engineered corn kills Monarch butterflies. *source: The Gene Exchange, August 1999*

Bt Corn Kills Monarch Butterflies. A Cornell University report states that the pollen of Bt corn kills Monarch butterflies. The report has triggered both the European Commission and the Japanese government to suspend approvals of imports of the modified crop. *source: The Gene Exchange, August 1999*

Minnesota Passes Organic Promotion Act. Minnesota Governor Jesse Ventura has signed into law an act to provide limited funds to help farmers with the costs of farm certification, add organic farmers to the panels advising on state sustainable ag loans and research grants, require the Ag Commissioner to promote and report on the status of organic farming in Minnesota, and instruct the U/Minn Extension to devote more time to organic ag. *source: OEFFA News, Summer 1999*

Alternative Medicine Flourishes. Alternative healing therapies (those not currently practiced or accepted by the mainstream medical community in the US) are doing well. The Office of Alternative Medicine within the National Institutes of Health reports that public use of the therapies has grown 47% since 1991. In 1997 Americans spent \$27 billion out-of-pocket on alternative treatment — about as much as on out-of-pocket physician services. *source: The Human Ecologist, Summer 1999*

GE Does Not Reduce Chemical Use. Proponents of genetic engineering claim that by including various traits within the germplasm of a crop plant, less chemicals will need to be sprayed and the environment will be less contaminated. A new USDA study, however, disproves that claim. The 1997 study shows that cotton farmers increased use of genetically engineered seed from 8 million acres in 1996 to 50 million in 1998. Their yields and profits increased, the USDA reports, but there was no significant drop in herbicide use. *source: Organic Food Business News, August 1999*

reproductive performance, though, a range of 64-91 degrees Fahrenheit, with a relative humidity 70 percent or greater will work best.

Q: Can they work if the temperature and humidity are not within this range? Yes, but only to a point. The beetle mentioned above cannot fly if temperatures fall below 56 degrees Fahrenheit, in which case they would not be as nearly as effective as they could be. The high limit for these predatory beetles is not known to me (as we have never had them fail due to high temperatures in areas where plants are being grown). However, in such a case when the unknown prevails, I simply revert to the rule of thumb mentioned at the beginning of my answer.

Some other predatory critters are even more sensitive to environmental conditions. Certain predatory mites can be this way. This may have to do with their very small size — they lack the protective mass that larger species can rely on to a certain extent. This sensitivity to conditions is a two way street, though. Plant-eating or phytophagous mites are also affected by the immediate environment on the leaf's undersurface (which, by the way, can differ from the average greenhouse conditions a great deal due to the plant's transpiration and the availability of shade).

In certain cases, due to the more stringent conditions required by the mites (as used in this example), the environmental conditions can be manipulated to evoke changes in pest and predator numbers. Phytophagous mites love hot and dry conditions, predatory mites don't — they like cooler temperatures and higher humidity. Providing the latter will slow the advance of the pests while helping the good guys.

To make changes in a greenhouse environment may sound like a daunting task in many cases, but changing the whole greenhouse environment is not really necessary, as the changes need to occur at the micro-climate, leaf surface level. In other words, in this case, frequent misting of the leaves may be all that is necessary to tilt things in your favor. Get out there with a sponge and you'll really be smokin' those mites. Meanwhile, the predatory mites will be fairing better.

Answer provided by Mike Cherim, Director, The Green Spot, Ltd. Have a question for The Green Spot? Submit your question in writing to: The Green Spot, Ltd., Published Q&A, 93 Priest Rd., Nottingham, NH 03290-6204, or by fax to 603 942-8932, or by email to <Info@GreenMethods.com>, or simply call us at 603 942-8925. When submitting questions by email or fax, please put "Published Q&A" in the subject line. Always provide your name and telephone number in case we need clarification. All questions will be answered. Written consultation by means other than through this column is considered a billable service — call for details.

Ask The Green Spot

Q: What is the effect of temperature on predators? Submitted by a Southern NH greenhouse grower.

A: As a rule of thumb, predators will do fine if the conditions are suitable for plant growth. More pre-

cisely, though, each and every predator has an environmental range in which it works most effectively. The range is identified as being optimum, for reproduction, that is. For example: the mealybug predatory beetle, *Cryptolaemus montrouzieri*, can work under myriad environmental conditions. For optimum

Special Supplement on Clever Implements

Old Time Tools

by Jack Kittredge

The Hadley Farm Museum, located right on Route 9 in Hadley Massachusetts, contains a fascinating array of farm and homestead tools. I visited the museum and was shown around by curators Mr. and Mrs. Norman Barstow and their grandson Buddy Bialecki. The museum is housed in a wonderful old barn built in 1782 and moved to the current site from its original location 2 miles away in 1930. The museum is open from the middle of May to the middle of October, everyday except Monday. Tuesday through Saturday it is open 10 am to 4:30 pm, and Sunday from 1:30 pm to 4:30 pm. There is no phone, so just show up. Admittance is free, but donations are appreciated.

(Hadley Farm Museum continued on page 8)



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

This “Dog Power” or small animal treadmill was a common source of power in dairy rooms for churning butter or other repetitive jobs. The treadmill turns a large pulley on the far side of the picture, to which drive belts can be attached.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

This is an old wooden jack. You could use it to jack up a wagon axle to take the wheel off to repair it. You would simply lever the axle up and then hold it up by looping the proper link of chain over the hook in the jack base.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

This is an old washing machine. Crank this lever and the rotor under the lid goes back and forth, driving the agitator. It would have been made in the late 1800s.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

Here is an inside view of the same washing machine, showing the agitator.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

This grinding wheel is driven by foot levers attached to an eccentric on the wheel. It is unusual in that it has a lever for each foot, instead of just one.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

Buddy demonstrates a shoulder yoke. It makes it a lot easier to carry two buckets of water - you don't kill your hands. The inside is hollowed out to fit over your shoulders.



photo by Jack Kittredge courtesy of Hadley Farm Museum collection

This is a fluting iron, used to iron the crinkled collars men wore back in the early 1800's, especially judges and lawyers. Both pieces would be heated on top of the stove and then the collar placed on the flat one and the bowed part of the iron would be rocked back and forth to flute the collar.

Produce Washer Extraordinaire

Dick deGraff
Grindstone Farm
780 Country Route 28, Tinker Tavern Road
Pulaski, NY 13142
315-298-4139

As small scale organic farmers we were in need of an economical means of washing or cleaning some of the many different crops we produced. There were few mechanical alternatives, therefore we decided to make our own barrel washer. After a few setbacks and some modifications, we are now happy with our washer and are offering similar machines to other farmers.

We load by hand from one end and the 30" x 96" wooden barrel rotates. As the water supplied by a garden hose sprays the product, it is pushed out the other end. Time of wash is determined by the adjustable level of pitch down to the exit. We use a table at the exit end for sorting and bagging. Power is supplied by a 1/2 hp 120 volt electric geardrive motor. Framework, legs, and motor mounts are made of aluminum. Produce washed to date includes six varieties of root crops, cucumbers, apples, shallots, and more. This year's price is \$1750 FOB Pulaski, NY. Ten of these units are in use in the northeast.



Photo by Dick deGraff

Produce is washed as it rolls through barrel, rotating on casters, and finally ends up pushed onto the work table.



Photo by Dick deGraff

Close-up of motor which drives chain linked to teeth on barrel.

Eliot Coleman:

Beating the Seasons with Clever Designs

by Jack Kittredge

Maine is not noted for its mild climate or rich soils. Historically, in fact, it has been considered a tough place for farmers to make a living. Perhaps that is why land prices were so low when Scott and Helen Nearing, authors of "Living the Good Life", moved to Harborside, Maine from their Vermont farm.

One of the many people whose life was changed by that book was Eliot Coleman. Then a young teacher, Eliot made a pilgrimage to Harborside, met the Nearings, decided to become a farmer, and bought 60 acres from them in 1968. The fact that Eliot has been able to make a comfortable year-round living on this farm is a testament to his creative growing strategies, meticulous attention to detail, and ingenious tool and structure designs. For the first ten years Coleman ran a market garden, selling from a farm stand right on the property.

"The Boston to Washington corridor all comes up here in the summer," he relates, "and they're used to really good produce. When I opened a market garden here in 1969, they found us! They arrived the first of June, just as the first produce was coming in. Most of them were gone by the first of October, just as I was running out of things to sell."

Eliot left the farm for 12 years to teach at the Mountain School, but returned in 1990 — this time with a passion for beating the short Maine season. He had toured a number of greenhouses in Europe and was impressed with the quantity and quality they could produce during the off season, when prices are much higher. He decided to create a growing system which could employ and reasonably compensate 2 partners using largely local, renewable inputs. He settled on growing a mesclun mix and selling to local stores.



photo by Jack Kittredge

Eliot stands outside one of the greenhouses he slides to a new position each year.

"My wife (Barbara Damrosch) and I are the entire labor supply," he points out. "The whole idea was to set it up at a size two people could run. There are no guidebooks for doing this. It's fun! It's a game! We set up a rule that we'd never sell more than 25 miles from the farm. It turned out we could do that. Between the local towns of Casteen, Ellsworth and Blue Hill, and our own local store which takes a surprising amount of stuff, that's all we need. What's fun about this is having been a June to September farmer, now we sell from October to May. June is our slow month. This year we actually took a vacation. When I got back I started tilling stuff in. I start planting in August."

"We deliver in our own branded boxes," Eliot continues, "which we get back. They're made of local cedar and treated with organic linseed oil. They have a cellulose liner - made from wood fibers. There are up to 12 different leaves in our mix. It is washed three times and then dried in a commercial salad spinner/dryer - we try to minimize the time the leaves are in water. Then we dump it in our mixer, weigh out the mix into our lined boxes, and that's our pack. We set the whole business up so it could be based on Maine products. California can go fall in the ocean. We are feeding our local market better than California! And we have only begun to scratch the surface of potential crops - there are so many!"

Although growing by organic methods, Coleman is too independent to be certified. He feels that fresh is more important than organic, anyway. He believes organic farmers made a mistake supporting the 1990 law giving the USDA authority to define "organic". He supports a program allowing private certification labels to have different standards and believes consumers will then be able to respond to new information and get food produced the way they want.

The key to Eliot's success at Four Seasons Farm is his greenhouse system. He currently has about 13,000 square feet under plastic, primarily in three big houses. Two are unheated but the one with the washing facility in it has a propane burner. He gets 2 crops a year from October to May in the unheated houses, and three in the heated one.

The two unheated houses can slide along a track to either of two positions. At the end of October every year Eliot moves each house to its alternate position, where crops have already been planted for that winter's harvest. The old beds are planted into a dense sweet clover cover crop and allowed



Photo © Barbara Damrosch

Eliot slides a small greenhouse over crops already growing in place. Note the tilting windows. In his later designs he removes the doorway as well.



Photo by George DeVault

Tilting windows enable the greenhouse to be slid right over growing beds.

to winter in the open to rid them of the pests and diseases commonly encountered in greenhouses. In the summer the clover is turned in and beds are formed and planted for the next year. (Southern pea is the green manure in the heated house. It's a hot weather green manure that doesn't share pests with greenhouse crops.)

Each time he puts up a greenhouse, Eliot improves the track and runner system. His first was simply



Photo © Barbara Damrosch

A ball caster helps reduce friction under greenhouse runners.

built on runners. It moves, but a bulldozer is needed to drag it. The second house has rails that slide over posts topped with ball casters planted every 4 feet in the ground. He is able to move that one with his farm tractor. In both cases a cable runs from both leading corners of the greenhouse to pulleys hooked to anchors in the soil at the spots where the ends will be after the house is moved. The cables from both pulleys then go to the tractor. This way the pulling force goes directly down the line of the side, keeping the greenhouse from racking.

Obviously, if you drag a greenhouse over growing crops, they will be crushed. So Eliot has designed windows that tilt up and a doorway which can be taken out for the moving. Also, the ground must be somewhat level under the houses, and there must be good drainage away from them so that in the winter, when the ground is frozen and you get a January thaw with accompanying rains, the water doesn't flood your crops. Coleman spent one whole summer with a bulldozer leveling and preparing the spot where his big houses sit. Moving the houses is also a bit of a bother, Eliot admits. Another downside of the system is that it's prone to problems with voles - burrowing field mice. Eliot traps year round and jokes he is thinking of hiring some weasels!



Photo © Barbara Damrosch

Bent wire wickets hold Ag fibre about a foot from the ground, providing protection within the greenhouse for the coldest winter nights.



photo by Jack Kittredge

Eliot shows how to hold his collinear hoe in a "thumbs-up" position.

"I've thought long and hard," he says, "if there is an equally good way of running this system without mobile greenhouses. The obvious answer is to have a convertible one — where you take down the plastic in June, plant a green manure, and put the plastic back up in October. The problem with that is you don't get the whole 14 months of growth for your green manure. I've found that after 14 months of sweet clover I hardly have to bring in any other amendments, and I have few weed problems. With a biennial legume you really have something."

Winter temperatures in Harborside get down to 15½ below zero. Coleman uses just a single layer of plastic on his houses, and makes no effort to trap heat with water storage or other devices. He relies on the lack of wind in the house, and a layer of Ag fabric, to keep his plants alive.



Photo © Barbara Damrosch

Eliot tumbles his mesclun in this home-made "Pac-Man" to toss and mix it.

"The plants I'm growing," he says, "if I get it too warm, they're unhappy: hardy salad greens, carrots, scallions, Swiss chard. The plastic breaks the wind and makes it the temperature of New Jersey inside. Then we put up sheets of Ag fiber by



Photo © Barbara Damrosch

Some of the tools Eliot uses most hang on the greenhouse wall.

the middle of November. We put up these wickets every 4 feet over the beds and they provide just enough surface to hold sheets of Ag fiber a foot off the ground. The beds are 30 inches, with a one foot walkway. This second layer then moves us another zone and a half to the south, so now we're growing in Georgia. It turns out that all of these things will grow out of doors in the winter in Georgia so long as there's no wind."

"Basically," he continues, "I took the ideas I developed for the home garden and found a way to replace cold frames with something a little more economical. You don't get quite the protection of a cold frame with Ag fabric - maybe at 15½ below zero it would go to 21½ above in a cold frame inside a greenhouse, and only 15½ above under the inner layer of Ag fabric. That temperature would kill these crops out of doors, but in there with no wind it's okay. Cold wind sucks juices out of plants, but with no air movement it stays moist. I've had hydrometers in there under the Ag fabric and it stays at about 70% moisture during the day, but as it gets colder at night moisture comes out of the ground and it stays at 100% all night. Nothing can desiccate in 100% humidity."

Eliot feels that the key to his winter growing system is to start all the stuff ahead, usually planting in August. On the 15th of November

everything stops growing. It has nothing to do with day length, it has to do with soil temperature. Lettuce maximizes its photosynthesis at the hours of sunlight it gets in the winter. If you heat up the soil, you can get 30 day lettuce even in the winter. It can't use any more sun. He feels the concern



Photo © Barbara Damrosch

Wooden blocks which fit over the tines of a garden rake create a simple device to mark out planting spots. Eliot draws the rake down the bed to mark out rows, and then across the bed to fix the proper distance plant to plant within the row.



Photo © Barbara Damrosch

This roller levels the seedbed to a uniform height and prepares it for the pinpoint seeder. Eliot also rolls the bed after seeding.

some studies have expressed over the nitrate level in winter produce is misplaced. Only those using chemical nitrogen in their greenhouses to get their lettuce to grow quickly will have nitrate problems.

To prove his point, Coleman cites a research trip he took with Barbara: "We followed the 44th parallel across Europe for 20 days one winter. People thought we were going to Oslo, but that latitude cuts across the south of France. We get the same amount of sun here in Harborside, Maine as they do on the Mediterranean coast of France. They're warmer, because of the Mediterranean, of course, but the light is the same. We found guys out harvesting their gardens on January 15th. The



Photo by Eliot Coleman

A simple spacer enables Eliot to mark out planting locations for widely-spaced crops.

landscape is still green, people are harvesting wild plants. This is the food deer and rabbits are eating all winter. If that's filled with nitrates, God designed the place wrong! If you use dried blood or chemical nitrogen, they you might have a problem."

To follow Eliot's system you need to find the right moment in the fall to plant your crops so they are just getting up to size and sit there during the Persephone months - mid November to mid March. Things will taper down after sliding the greenhouse over the crops. Coleman harvests mesclun the whole month of October out-of-doors, and can harvest baby carrots until the end of November out-of-doors. The stuff he harvests out of doors is planted a little extra-early so it's up to size in October.

To make the whole proposition financially feasible, Eliot only works with crops he can gross \$1.50 or more a square foot off of. He shoots for getting it to \$5 a square foot on an annual basis, or \$1.75 per crop. In the heated greenhouse, he has discovered, that one extra crop in 3000 sq. ft. grosses \$4500, or more than enough to pay for the \$1500 in propane he uses all winter to keep it 60 degrees.

"I hated to find that out," he muses. "The system with no heat works so well, I'm sorry to see it make sense - from a business point of view - to use the propane. I could use wood, but it would cost me \$10,000 to put in a wood boiler, instead of \$500 for that burner."

Moveable greenhouses are not the first Coleman innovation in farming. Given to tinkering, he is well known for the study he puts into redesigning tools to make them easier to use. He believes a tool should balance in your hand, not force you to exert energy fighting it. It should be light, so you're not lifting extra weight all day, and the working end should be sized to do the job you want.

Eliot uses different cultivating tools for various tasks. In the path, for instance, he'll use a stirrup hoe, but in the rows the stirrup is too tall and its edges will take out low leafed crops. He uses a draw hoe he designed in the rows, because it will slide under crops and only disturb the small weeds at the soil surface. With his draw hoe you put your thumbs up the handle - like with a broom - and hold it at about a 70 degree angle to the soil. That way there is no back strain.



Photo © Barbara Damrosch

This pinpoint seeder allows Eliot to plant the crops in his mesclun mix at a uniform density of 12 rows to a 30 inch bed.

Coleman has sandy soil and had to water crops like carrots a lot at first. But when he used his "Cavex" hoe to scrape off the very top layer of soil, I could make an indentation to plant into. The water flows to the plant roots, so he can use less.

One tool that Eliot is especially pleased with is the pinpoint seeder. He transplants very few crops, relying instead on direct seeding in the greenhouse bed. The pinpoint seeder, carried by Johnnie's Selected Seeds, makes this all happen. It's an axle with 4 different size holes in it - small, medium, large and extra-large. You can slide the axle back and forth under four hoppers. As the wheel turns the axle the seed comes out of the hopper into the hole and falls into the ground. There is a brush in the hopper that you can use to make fine adjustments. The wheel marks in the bed guide you to the next set of rows.

"I have 30-inch beds," Coleman confides, "and I get 12 rows of almost anything I plant into a 30 inch bed. I'm doing carrots two and a quarter inches apart, and two inches in the row. That's how I can afford to do carrots in this system. We pack all our mesclun greens in like that. I get a solid bed of them when they're ready to harvest. Our yields in the greenhouse doubled with this. The reason most people avoid the seeder is they figure in 2 1/4 inch rows you can't weed. You

can't. But we weed by making sure there are no weed seeds. I have a green manure in here and I weed that in late May. That is the fall weeding because without any weed seeds there won't be weeds. Barbara calls me the weed Nazi! Other guys growing mesclun are old field growers. They have single rows a foot apart. They haven't been paying attention to the new crop. It doesn't need to be cultivated so you don't need the distance between plants. You're cutting it when it's 30 days old and the weeds don't have a chance to compete."

The density of greens Eliot gets with his system has led him to search for another labor-saving tool. He wants a small, cheap, hand-held harvester that will mow his crops and collect them the way a cranberry scoop picks and cradles berries. He is playing around with a battery-powered prototype using a bandsaw blade. It has runners you can adjust depending on height of the crop.

"Part of my philosophy," Coleman says, "is that the small grower can beat the hell out of the big boys! Except that no one is helping make the right tools because they're convinced there's no money in it!"



Some of Eliot's favorite cultivation devices.

photo by Jack Kittredge



photo by Jack Kittredge

Eliot holds prototype for greens harvester he is designing.

Meri-Crusher & DynaDrive

By Charles Szymanski
8337 Kuhn Rd.
Dansville, NY 14437

I operate a piece of equipment called a Meri-Crusher made by a Finnish company (Suokone). It is basically a heavy-duty rotavator. I use it as a one-pass tillage tool. The term used to describe this practice is "grind" tillage. Rotavators are not new to farming; however, rotavating soil laden with rocks is difficult. It requires a tool that will hold up under a lot of abuse. We certainly have put the Meri-Crusher through its paces here in our rocky soils of the Finger Lakes Region in Western New York.

This Meri-Crusher has 84 cutters, which have carbide tips similar to the ones used in mining and construction equipment. The advantage of one-pass tillage is that you cover the ground once and plant. The swath width is about 7 feet and we can cover about an acre an hour. Compared to conventional tillage where you plow, disc, and drag, we can save time and fuel per acre with this one pass tillage. Without three-pass conventional tillage it takes about one and a half hours per acre (my conventional equipment incorporates the use of an 80 horsepower tractor with a 5 bottom plow, 10 foot disc harrow, and 18 foot drag). There are other advantages of the Meri-Crusher over conventional tillage. Another is that there is better incorporation of residue, leaving a seedbed that won't be washed away so easily and a seedbed that is more uniformly mixed with the biomass. Also,



photo courtesy Charles Szymanski

The Meri-Crusher

the Meri-Crusher tends to pulverize the sedimentary rocks. The disadvantage is that replacement of the cutters is a little more expensive than the other parts replacement on conventional tillage tools. The verdict is still out on that, however, because one has to weigh the total cost of replacement parts for three pieces of equipment for the many-pass tillage versus the cost of replacement parts for one piece of equipment. This should also be seen in the context of the value added when considering the decrease of labor and time using the one-pass tillage method as opposed to using the conventional three-pass tillage method.



photo courtesy Charles Szymanski

The Dynadrive

The second piece of equipment we have incorporated into our operations that is a little different in comparison to conventional equipment is a mini-tiller called the DynaDrive. The DynaDrive is three-point hitch mounted and is quite heavy. It incorporates numerous tines (or spikes) that are staggered along the circumference of two drums. The unit is ground propelled, so then it must be in the ground moving at a ground speed of at least 5 mph in order for it to operate correctly. The working width is about 7 feet and it levels the ground quite nicely. We use it for secondary tillage or mini-till for fall cropping.

A Wheel Reel

By Wayne M. Hansen
C.E.O. (completely exhausted operator) of
Wayne's Organic Garden
PO Box 154
Oneco, CT 06373

We had a very dry Spring here in eastern Connecticut, perhaps you did, too. I usually don't put out drip tape so early and found that using one of my garden carts to hold a reel of tape meant having to change it back when I needed it to hold transplants. Luckily, we had salvaged a wheelchair with two good rear wheels. We brazed on lengths of old greenhouse hoops to replace the front wheels, then turned the front wheel yokes upside down and brazed them to the uprights above the front wheel location. This might be accomplished also by drilling and bolting. The yokes then hold a pipe which passes through a drip tape roll. This worked quite well for setting out tape on the acre of crops around the house and left both garden carts free for other things.

Since fashioning this and then using it, we've thought of a few improvements we've not yet made:

- 1) It's good to have the line pay out close to the ground. I now put a block of wood under the front foot to accomplish this, but the same might be done with a loop just above the foot.
- 2) A full 7500 foot 8 mil reel is pretty heavy. The back uprights should be extended for better leverage.
- 3) It would be nice to have a box somewhere incorporated to hold dripline end caps, scissors, punch, and all the accessories. I use a



photo courtesy Wayne Hansen

Wayne's Wheel Reel for quick and easy laying out drip tape.

five-gallon bucket which sits nicely behind the reel, but only after a third of the tape is used.

I don't know where to get old wheelchairs, but my wife says there are three broken ones in the garage of the group home where she works.

How about a wheel reel race at the Summer Conference Fair? Unless someone else has one of these dealies, I might even win!

Antique Farm Equipment

By Jack Kittredge

Early settler and farm families in our region lived largely self-sufficient lives. The food, fiber and energy they needed for subsistence were produced on-farm. The few items they could not produce were available locally on a barter basis. This way of life has been captured in several historical museums in the northeast which specialize in recreating life as it was in certain places and periods of our past.

These museums, such as Old Sturbridge Village and the Hadley Farm Museum in Massachusetts, the Farmer's Museum in Cooperstown, New York, the Howell Living History Farm in New Jersey, Coggeshall's in Rhode Island, Shelburne Museum in Vermont, Stonewall Farm in New Hampshire, the Maine State Museum in Augusta and many more have collections of period tools and implements. These tools illustrate the cleverness with which our forebears faced their daily tasks.

Frank White, curator of the Old Sturbridge Village (OSV) collection, has a degree in the classics and started at OSV as an interpreter. The Village has space and staff to display only 10% of its tool collection during most of the year, but does open the barn to the public during the special Agricultural Fair the last weekend of September. Frank was kind enough to give me a special viewing, and discuss with me local agricultural tool-making during the end of the 18th and first half of the 19th century.

Over the 50 years from 1790 to 1840, major changes occurred in tool-making. At the beginning of that period tools were largely local. Metal blades or tips to shovels, axes, plows, etc. were either produced on-farm or by the village blacksmith. The wooden handles were usually cut and shaped by the farmer. Implement designs were largely regional. Plows used in Pennsylvania in the 18th century were different from those used in New England or the Hudson River valley.

As the years passed, however, more tool-making took place off-farm. Patents for tools were filed by common everyday people – local blacksmiths or mechanics. They were making tools on an everyday basis and saw ways to improve them. By the late 1820s the New England Farmer Seed Store in Boston put out a catalog listing seeds and various farm equipment. You could visit the store and take it home with you, or order from the catalog and take delivery through your country store, which would have someone going to Boston on a regular basis. By 1840 a comparable store opened up in Worcester, Massachusetts, Ruggles, Nourse, Mason. Beside stocking equipment made by others, they manufactured the cast iron "Eagle" plows which gained a national reputation. Manufacturers like this had agents going to Pennsylvania or beyond, trying to sell their products. A plowmaker in Hampden had plows in Texas, Louisiana, and the midwest.

The OSV implement collection is particularly strong in plows, and Frank illustrates the changes in society during this period from the changes seen in plowing tools. "In the early 19th century," he relates, "one of the most important changes in agricultural technology was that from wooden plows, ones which were locally made, to cast iron ones – still with wooden beams and handles, but

with cast iron share and moldboard and landside — that were factory made. The wooden plows had some iron, usually a point and locking coulter (the vertical sod cutting knife), but the moldboard was wooden, though often faced with iron "There would be a plowmaker in the town – someone who was a reasonably skilled woodworker. Sometimes it would be the blacksmith



Old Sturbridge Village photo by Thomas Neill

This cornsheller was one of the most common old time farm implements. You place the ear of dried corn against the wheel in the box and turn the crank. The teeth on the wheel strip the kernels from the cob.



Old Sturbridge Village photo by Henry E. Peach

The Dutch plows used in the Hudson River valley had a pyramidal share, wrought iron with a welded steel point. You can see that the iron wears through on the share. This is a Dutch-style plow with a pyramidal share. These would be used every year. It has a welded steel point on the wrought iron share, with a wooden moldboard faced with several strips of iron. The strips are laid so that the iron fits the contour of the moldboard. For turning over new soil you would use a much larger plow, drawn by two or three pairs of oxen.

himself. But the plows were locally made. The advantage to that is that if you are on limited means, as many farmers were, you could take your plow to the shop and have it repaired for an exchange of labor or scrap iron instead of having to come up with cash. In the rural areas there wasn't much of a cash economy in the early 19th century. But in 1818 a man named Jethro Wood patented a plow with moldboard, share and landside in three separate castings. With this plow you could replace the point when it wore out or broke. In this area from the late 1820s into the 30s a lot of the farmers who could afford to were converting from their wooden plows to cast iron ones. They were mass produced and as a result were much more uniform than the earlier ones. The problem with cast iron, factory made plows was that you would have to lay out money for them. And repair parts would cost you money as well. But by 1830 cash was more prevalent in the region. A good farm worker might get a dollar a day for his labor."

By 1830, White asserts, there was enough commerce in farm implements that a design would be patented and then an iron foundry would buy the rights to cast those parts. Then a local plowmaker would go down to the iron foundry in Hartford, get a load of castings, and bring them back. He would then make the wooden parts for them and sell the plow. If you were a farmer you would buy directly from the plowmaker. If you wanted a different plow you could go to your local store and order one, or go yourself to an agricultural warehouse like the one in Worcester and buy one there.

Plow design became much more standard across regions, too, as time passed. Massachusetts plows were popular in the midwest and south. On prairie soil, however, the cast iron plows made here didn't scour well – the dirt didn't fall off the moldboard. That opportunity was met by John Deere, a Vermonter, in the 1840s, with his steel plow. Cast iron rusts, but in New England abrasion from the soil scours it to a shiny finish. In prairie soils that doesn't happen. Steel, which polishes differently, turned out to be the answer.

Other new implements had to do with processing corn and other grains. Corn was the biggest crop grown in New England. It was grown for the seed, which was either ground into meal for human

consumption or cracked for animal feed. When you harvested your corn you would husk the ears by hand and then put them into a raised shed to dry. Later in the fall when it was dry you would shell it. There were a number of ways to do this. You could take a shovel with an iron tip, place it over the edge of a tub, and rub the ear of corn back and forth across it. The kernels would fall into the tub. Or you could flail your corn on the barn floor. The problem with that is the kernels scatter all over the place and you have to shovel them up, which isn't very clean.

One of the pieces of equipment that became quite popular, according to Frank, was a corn sheller. There were various kinds made. One, patented by Harris, was a simple device made in Vermont in the 1830s. It's a matter of two cast iron plates with teeth on them, one mounted on an easel, one with a handle. You put the ear of corn between the plates and work it back and forth. This was produced for many years and there are a lot in existence, so White believes it was reasonably effective. A smaller, bench mounted version just had nails in it. That, too, was quite common.



Old Sturbridge Village photo by Henry E. Peach

This is a manufactured, cast iron plow of about 1830. It is a Howard plow. It comes in three separate castings – the point or share, the moldboard, and the landside.

The most effective corn sheller had large wheels studded with iron teeth. A hand crank drove the wheel through gears. On the side of the box there were also iron studs, facing the wheel. You laid the ear in against the wheel, turned the crank, it rotated the ear, pulled it down, and striped it clean. Some of these were made in small one or two-man shops, like the one OSV has which was made in Woodstock, CT. Others were made by larger factories.

Another major introduction, which compared with the corn sheller, has to do with processing small grains. Farmers didn't raise much wheat here because they had trouble with rust and other diseases. The climate was too damp and crop rotations weren't customary, so the problem kept recurring. Finally they introduced resistant varieties, which did better, but with the opening of the Erie canal in the 1820s grain prices plummeted and farmers found they couldn't compete with the wheat which came in from upstate New York. In the early 1800s, however, farmers in New England did raise a lot of rye and oats.

They harvested small grains with a sickle, bending the stalks over after being cut for someone else to come along to bind. In the late 1700s harvesters began to use a cradle, which is a scythe with an attachment of fingers which catch the cut grain and hold it. Someone still has to put it into sheaves, but it's a lot faster. The cradle was common in the middle Atlantic states and New York before coming here, perhaps because they raised more grains there.

After harvesting, farmers in southern New England threshed their grain with a flail on the barn floor. The grain shattered and the stalks were separated out. By the 1830s there were people designing threshing machines, mostly in New York and Maine where the crops were large enough for that.

But cleaning the grain still took a long time. You would pick it up, after removing the stalks with a pitchfork, and put it through a riddle – a sieve with open latticework. You would shake it and catch the larger debris there. Then you would take a winnowing tray into the barn when a wind was blowing, open both doors for cross-ventilation, and toss the grain repeatedly into the wind so it would blow away the chaff. Eventually you ended up with clean grain, but it was fairly labor-intensive.

So fanning mills, or winnowing machines, became popular. You pour the grain into a hopper, crank a



photo by Jack Kittredge of Old Sturbridge Village collection

This simple cornsheller was quite popular and sold well for many years. It's made of two cast iron plates with teeth on them, one mounted on an easel, one with a handle. The ear of corn is worked back and forth between them.

fan in the back which creates a draft in the box as the grain drops through a series of screens of different size. These screens are connected to the crank so they slide back and forth as the fan turns. Your clean grain falls into the bottom of the box in a tub. You could change the screens to those of a different mesh, depending on the size of the grain you were winnowing. You could even winnow peas or beans.

There is evidence that fanning mills were actually first developed by the Chinese for cleaning rice. The idea apparently was brought to northern Europe by people who had traveled in China. The mills were used in Europe, and then moved to America via German immigrants, who used the mills in Pennsylvania and New York long before they were popular in New England.

One more major improvements in 19th century farm technology had to do with dairying. Farmers were moving from producing for their own use and for a limited local market to producing for a much broader market. Herd sizes were increasing. Barns were getting larger. Butter and cheese were being produced in larger quantities on-farm for shipment to market.

Refrigeration, of course, did not exist. Commercial ice-production was only beginning in the 1820s and 1830s - Frederick Tudor started the business in eastern Massachusetts and found a market for ice, packed in sawdust, shipped to the Caribbean Islands. But on farms ice-cutting didn't become common until mid-19th century. There were occasional ice cellars, and later in the century most towns would have an icehouse.

Farmers, however, needed to keep dairy products cool and relied on spring houses or underground storage. Salt was used to preserve butter, which was made in cooler weather (cheesemaking occurred when it was warmer). Many people are familiar with the dasher churn - the one with a plunger in it - which the housewife or daughter would lift up and down until the cream was made into butter. For larger quantities other methods were developed. One is a barrel on a rocking chair base which could be operated with a foot while doing something else. Others were hand-cranked, and there were a lot of different designs for mechanizing this process.

One interesting innovation, usually found in back rooms or dairy rooms, is the "dog power". This is an endless belt or treadmill, perhaps 5 feet long. A

dog or goat or other small animal would be hitched onto it and trained to turn the belt, which would turn a crankshaft driving a pitman rod that would operate a churn or some other piece of equipment. Dog powers were used a lot in the middle to late 19th century and were available as early as the 1830s. Larger versions of it involving horses or oxen drove thrashing machines, while balers were driven with sweeps.

Once the butter is churned, the moisture still has to be worked out of it. This is usually done with wooden paddles, working the butter back and forth while adding salt. You pour off the liquid every so often. OSV has a butter worker - a one handled rolling pin which can be used to roll butter back and forth and work out the liquid. You can change the pivot hole to get butter that catches in the corners. Later models had a hand crank and gearing which drove a fluted roller in a rectangular trough to do the same thing.

When you make cheese you have to break up the curd. Several devices handled this. One is a multi-bladed knife, another is a hopper with teeth and a crank. Later you have to press the cheese curds and drain the liquid out. Some presses used a

screw system like a vise, others used weights and gravity. But one problem they encountered was that, as the water is driven off, the cheese gets smaller. Instead of resetting the screws a lot, one clever device - called a self-acting cheese press - uses the weight of the cheese, amplified through levers, to press it.

There are many other interesting implements in the OSV collection. One is a sausage grinder - similar to current meat grinders except that it has wooden teeth. Another is a hay press, or stationary baler. They were quite rare, according to White. You fork loose hay into the cabinet, crank the ropes tight with the windlass to compress the hay to about half its size, and then pass cords around the bale to tie it off. Then you open the doors and take the bale out. For transporting normal distances you would carry hay loose, in a wagon. But you would bale hay for long distance shipment when space was at a premium. The OSV baler came from a farm in Connecticut where they were shipping hay out on board ships. Larger, horse operated hay presses were in existence, Frank says, which pressed up to 500-pound bales.

In the early 1900s cider was usually pressed in a large mill, which might be part of a large farm with an orchard. Other farmers would come and have their apples pressed there and take the cider home in barrels. Of course it got hard, and that is what cider was - unless it was hard they didn't call it cider. Cider milling was a source of extra income to the mill owner. The OSV mill is typical for the time, coming from a farm in Brookfield, New Hampshire. The press bed is 5 or 6 feet square, and it has three large wooden screws.

The apple crusher has a ten foot trough which feeds apples to be ground up into large toothed cylinders. A horse or ox was hitched to a wooden beam or sweep which drove the wooden gears of the crusher. Then the pomace would be shoveled up and put into "cheeses" on the press - layers of crushed apples contained in layers of folded straw. Several "cheeses" would be stacked on top of each other and pressed at one time.

Another OSV implement is the woodworking lathe. The lathe is driven by a foot treadle on which is mounted a connecting rod that turns a large overhead wheel. The wheel, through a belt connection, drives a lathe spindle. Blocks slide along two wooden bars paralleling the spindle to serve as stops and tool rests.



photo by Jack Kittredge of Old Sturbridge Village collection

This simple foot-operated butter churn left the hands free for another task.

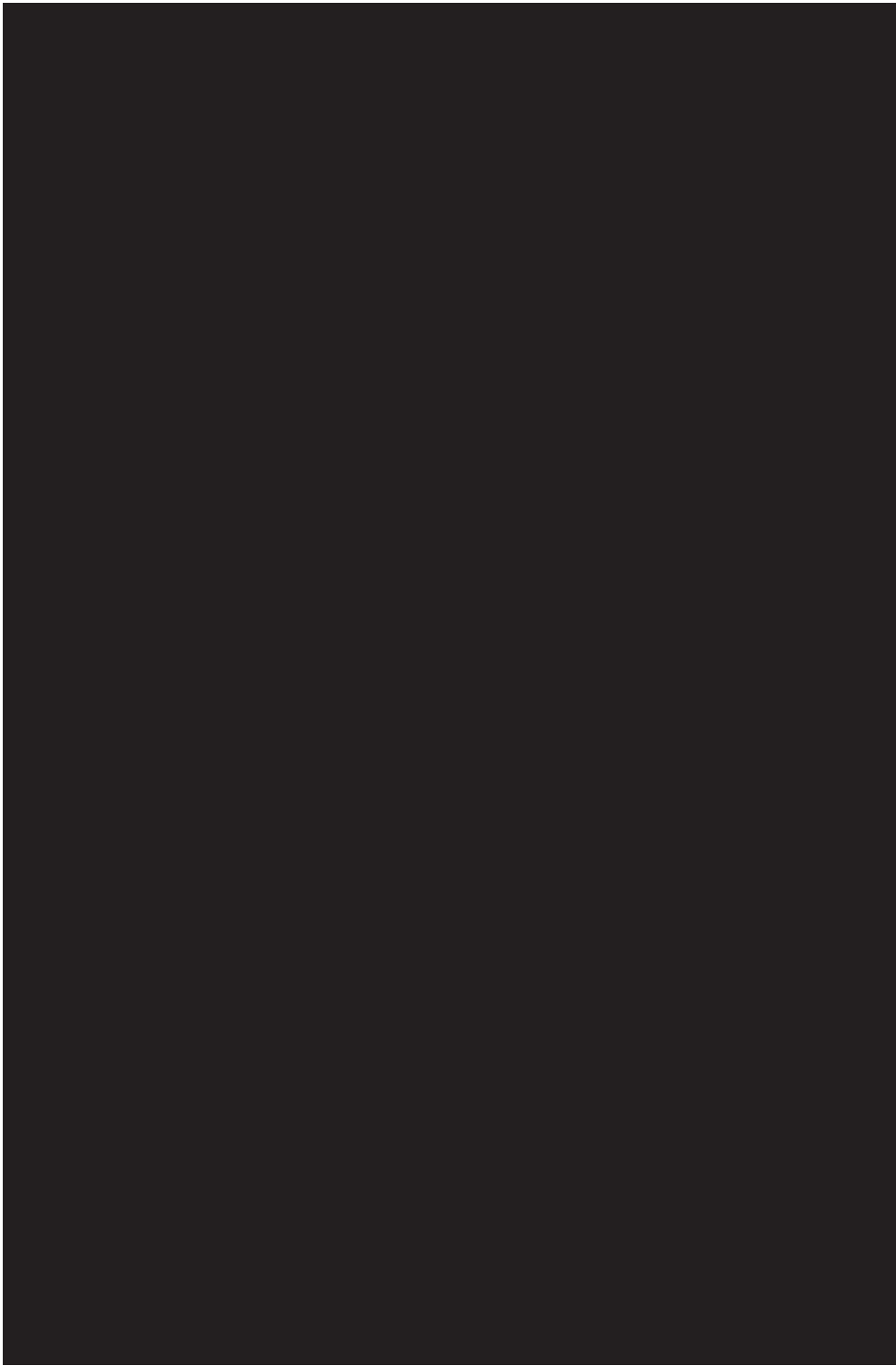


photo by Jack Kittredge of Old Sturbridge Village collection

This self-acting cheese press uses the weight of the cheese to press the moisture out of it.

Backwoods Engineering

by Phil Whitney
303 Fisher Rd.
Fitchburg, MA 01420-1548

Farmyard Physics was a name coined for historic rigging techniques that were used by builders, farmers, engineers and, surprisingly enough, by hundreds of rescue personnel who were trained to work with only available equipment.

Stonewall Farm is an Education Center and, obviously, when you start talking about physics instead of pioneer rigging, our academic population perks up its ears. The entire program is geared to show the normal mechanical advantage that we gain with such simple things as the inclined plane and pulley systems.

How does any of this affect the current-day farmer? The cost of rental for backhoes, cranes, excavators and other equipment could easily overwhelm a small farmer, but for a small job many times some of the historic techniques would work very well. The A-frame was traditionally used to build stonewalls and two A-frames together made an excellent support for the jack to pull out needless stumps in the field. Remember, our New England walls are there because we cleared all of this land and pulled all of these stumps in our forefathers' era.

When we construct a post-and-beam barn today, some of the contractors still raise the timbers with a ginpole. It would be very hard for most of us to believe that the steel electric transmission towers, some of them 100' high, crossing our New England mountains were built with nothing more than a ginpole.



photo by Linda Rubin

Tripod with jib arm that can turn 360½ is used here for lifting ice blocks cut from pond, but can also be used for lifting other objects like rocks or animals for butchering.

A month ago ten people from the Student Conservation Association, two leaders and eight students, constructed over fifty feet of fieldstone wall at the entrance of the farm in five working days and the surprising part is, only half of the group worked on this wall at any given time. An A-frame was used to set the stones in place. These people learned valuable lessons on how to properly rig a set of blocks and how much manpower it takes to maneuver the material to where they want it.

Some of the enclosed illustrations will give you an idea of what went on. If you want to see it in person, join us on the 9th and 10th of October at Stonewall Farm in Keane, NH for Autumn Fest where some of these devices will be in operation.



photo by Linda Rubin

A stone is lowered onto the wall and set in place. Each stone must rest on at least two others and, except for the very top ones, touch between 6 and 9 other stones.



photo by Linda Rubin

Phil Whitney demonstrates an A-frame with a windlass between the legs. This allows the user to pick up well over 100 lbs. with little effort.



photo by Linda Rubin

Kully Mindemann building horse drawn snow roller using pair of old iron spoked wheels. Snow rollers were used to pack sleigh trails and roads before snow plowing.

Homemade Compost Spreader and Waterwheel Planter

by Steve Porter
Porter Farms
PO Box 416
Elba, NY 14058
(716) 757-6823

Porter Farms is a 400 acre certified organic farm in western New York state. Major crops are corn, soybeans, triticale, barley, hay, cabbage, cucumbers, winter and summer squash, along with smaller acreage of other vegetables. We also feed 2000 lambs per year along with running a 500 head ewe flock.

In the spring of 1998 we built our own compost spreader because we were dissatisfied with using a manure spreader and were unable to rent a lime spreader when we needed it. We incorporated parts from a junk manure spreader and junk forage wagons, along with some new steel. A welding shop cut the steel for the spinners and rolled the steel for the U-shaped auger tube. The most important feature of our compost spreader is its versatility. We can bulk spread compost with the spinners. The U-shaped auger assembly (pictured) can replace the spinner assembly (in about 15

minutes with a forklift) which puts down 3 bands of compost five feet apart. We also use the compost spreader with no attachments to lay a 2 ft. wide band.

In 1999 we converted an old New Holland combine into a water-wheel planter. After removing the threshing mechanism we were able to use a combination of the threshing and transmission belt drives to produce speeds as slow as 10 feet per minute. We built a frame to extend in front of the cab, cut off the steering axle in the rear of the combine, and moved it up in front. We really like

having all activity in front of the driver. It lets the driver watch where he is going, keep the water wheels centered on the plastic mulch, and observe the workers as they plant. The other feature that we like is that we now carry 400 gallons of water, which cuts down on refill time. Building this planter also frees up a tractor to perform other tasks in the busy spring season. Its only drawbacks at this time are lack of plant tray storage space (to be built this winter) and the fact that it takes a lot of room to turn around. For this reason we kept our 3 point hitch waterwheel planter for small fields.



photo courtesy Steve Porter

Compost can be spread with the pictured auger, with spinners, or applied directly to the soil from the hopper.



photo courtesy Steve Porter

Planter carries 400 gallons of water and can travel as slow as 10 feet per minute.

Soil-heated mini-greenhouses

By Norbert Hugnagl

Starting transplants in a climate controlled miniature greenhouse for 0.1¢ a day!

Watching my farmer friends struggling with grow lights in their basement or porch to get all those early seedlings going made me think about a different approach to this common problem on small farms. We ourselves can't have a real greenhouse due to zoning restrictions, and the people who do have one, often hesitate to start it up as early as January or February.

Adequate lighting is obviously much more difficult to provide than adequate heat, so I decided to start my seedlings OUTSIDE. Adhering to the classical greenhouse design, I built several 4 x 8-ft hooped miniature greenhouses with clear poly cover and foam insulation at the bottom. I equipped them with casters, which make it easy to plant the seedling in a warm environment (like a barn) and then move them outside. Also, in case you expect a Blizzard or other severe weather, they can easily be moved back inside.

Each greenhouse has a loop of about 100-ft of 1/2" copper or poly tubing at the bottom that supplies heat to the root zone of the seedlings. A soil thermostat regulates the flow of the hot water. A 10 gal 2 kW electric hot water heater supplies the energy for up to 3 frames.

We use 2-inch soilblocks for our seedlings, set on special flats with an open bottom to insure proper contact of the soil blocks with the 1-inch layer of soilmix that covers the heating pipes. An automatic front to back ventilation system provides air circulation during the day when the heat of the sun would otherwise burn the seedlings.

Each germination house holds 1056 soilblocks. The soil temperature can be adjusted between 50 and 90 degrees to whatever the particular seedlings need. We get close to 100% germination within 3 to 4 days (i.e. tomatoes); the electricity used costs about \$ 2.50 per day for 3 frames (or 3168 seedlings) With air temperatures of 27F and an additional poly cover, the soil temperature kept right at a cozy 85½.

An additional air heater was not necessary so far; the additional cover in very cold nights (0 to 10 degrees) provided enough insulation to keep the seedlings alive. Watering is done through the front and rear vents with a watering wand and a fogger nozzle. A permanently installed mister can be used too, but they tend to freeze up over night and are then useless.

We use this design successfully since 1995 and have generated an excellent quality and quantity of transplants for our organic farm at a very reasonable cost. Almost all components can be obtained at your local hardware and farm supply store.

Complete plans for the germination house and heating system can be obtained for a nominal fee of \$ 25 from Fields of Dreams, 117 Fredon Springdale Rd. Newton NJ, 07860. We also supply ready to use turn key systems upon request.

Fields of Dreams Organic
Tel (973) 300 0563 - Fax (973) 300 0595
e-mail: dreamfield@compuserve.com



Tiller Row Marker and Bed Lifter

Ed Stockman
Plainfield, MA

Rototiller Row Marker (photos A - D)

During bed preparation, the row marking implement which is attached to a tractor-mounted rototiller not only prepares the seed/transplant bed but marks rows with either a line in the soil or a shallow, narrow furrow.

Bed Lifter (photo E)

Illustrated is Ivy Donovan's bed lifter. He used the blade from an old two row potato digger and attached it to a tool bar. It is a handy implement for harvesting carrots, parsnips, garlic and other root crops.



Photo by Ed Stockman

Photo A - Square, hollow steel tubes are welded to the tailflap of a tractor-mounted rototiller. The marker shafts are inserted into these tubes and are held in place by "T" clamps. These clamps are made by welding two bolts together. Holes are drilled in the hollow steel tubes and nuts are welded into the holes. When the "T" clamps are threaded into these nuts, the shafts of the row markers are securely held in place. The marker can be used as illustrated to produce a small furrow, or rotated 180 degrees to produce a line in the soil with the pin side of the marker. The furrow side was made by welding a piece of angle iron onto a section of U-steel.



Photo by Ed Stockman

Photo B - This shows a 4-row bed configuration with the marking pin in the working position. The rows are spaced one foot apart.



Photo by Ed Stockman

Photo C - Here a 3-row system is planned, with the rows spaced to accommodate the cultivation system that will be used during the growing season. These rows are spaced 16 in. apart.



Photo by Ed Stockman

Photo D - Here 4 furrowers are positioned on the tailflap. These will create furrows and ridges as the rototiller works through the soil. Direct seeding or transplanting can occur either on the ridges or within the furrows.



Photo by Ed Stockman

The implement illustrated is a bed lifter constructed by Ivy Donovan of Hawley, MA. The top link can be used to set the angle of the blade. The action is such that soil and crops are lifted up without inverting the soil profile or mixing the soil horizons.

Ending Greenhouse Snow Buildups

David Trumble
52 Poor Farm Rd.
Weare, NH 03281

The problem we are attempting to solve with the rollup system we show here is to end the buildup of snow on greenhouse frames during winter months.

The manufacturer recommends that we run a piece of wood strapping about 4 or 5 feet high on the outside of the bows to secure the plastic. This also serves as the top edge of the roll-up. We have always had trouble with snow gathering there and this impedes the snow from sliding off the side of the greenhouse. It makes the job of “popping” the snow from the inside of these greenhouses even more tiring.

A carpenter friend, Dave Erickson, and I worked together to develop a system using a hemlock 4x4 on the inside of the greenhouse at 5 feet high. There is a notch taken out of the 4x4 at each bow. The wood is held in place from slipping by a metal plate about one-eighth (1/8) inch thick by 4 inches wide by 12 inches long which is placed over the bow and screwed into the wood. Also, you can attach the plate to the greenhouse bow with a tek screw. On the outside, the plastic is held in place with a strip of Spring Lock Poly Fastener (known as “wiggly wire”). Depending on the type of snow, the snow will slide off on its own, or require a good popping from the inside.

Another solution to this problem is to heat the inside of the greenhouse during particularly heavy snowstorms. It costs a little bit in money, but compared to losing a greenhouse, it is good insurance. We figure the heat costs for last winter’s snowstorms to be about 1% of the capital investment we have in our greenhouses. After losing a 28 foot wide greenhouse two years ago during a heavy, wet snowstorm, we use the combination of heating the greenhouses and the 4x4/wiggly-wire snow sliding system. The snow slides off like butter on a hot pancake griddle.

This also keeps the volume of snow along the side of the greenhouse from building up. In a very heavy snow year, this can become another source of danger to your greenhouse structure unless you hand shovel or plow the snow away from the side of the greenhouse. There are always walkways to shovel and driveways to plow. Removing greenhouses from the list of snow removal chores helps make the winter rest a little more enjoyable.



photo courtesy David Trumble

Inside shot of greenhouse showing 4x4 hemlock notched for each bow.



photo courtesy David Trumble

Outside shot of greenhouse showing wiggly wire fastener in channel.

Estes Machines

Rick Estes
357 Old College Rd.
Andover, NH 03216
(603) 735-5300

Planting Roller

I planted lettuce in 4 ft. wide beds on 10 inch spacing (I had sandy soil so the close spacing did not cause any problem). To help me with transplanting the lettuce soil blocks, after tilling up my beds, I came through with an old Farmall Super A tractor with wheels spaced to straddle a 4 ft. bed. Underneath the belly of the tractor, mounted to the

Narrow Offset Harrows

After years of using this setup, I started thinking about the potential soil structure disruption caused by the rototiller. One year in the middle of the season I started using disc harrows to do bed prep with. I had a set of 8 ft. wide double disc harrows. These worked okay for bed prep, but every once in awhile the space that is not disced between the sets of discs would fall right where the roller wanted to punch a hole. The soil was not worked up right, the roller would not punch a hole and it made transplanting difficult at best. Soo... over the winter I built a set of custom harrows. Double disc harrows have two sets of discs; the front ones angled in a backwards facing vee and the back ones facing forward. This leaves a space 2-3 inches unworked which is not a big deal when preparing a field for cover crops, etc. but is a concern for transplant operations. What I needed was a set of offset harrows. Offsets have the front set of discs set to throw all the soil one way and the back set throws it back the other way without the space in the middle like double disc harrows. They are usually heavy, expensive and no one makes them narrow. What I wanted was a set of 5 ft. offset harrows. So I built a set. I had an old set of drag harrows that were in excellent shape. That means the discs were not broken/bent and the bearing towers were in good shape with bearings

cultivator bar, was a steel roller with 1 1/2 in. steel blocks welded on 10 inch centers (see illustration). This roller would punch holes to receive 1 1/2 inch

soil blocks and firm up the bed surface at the same time. Into these punched holes we would place lettuce transplants.

intact. I took these parts, discarded the rest of the frame/axles and started from the ground up. First I built new axles to mount the discs, spacers and bearing towers on. Next I built a frame out of 4 inch square tubing. Square tubing is extremely

strong for its weight and a frame welded out to tubing is very rigid, so it wouldn't rack out of shape with the pressures exerted during the harrowing experience I was going to put it through. This setup worked very well.

Quick Attach System for Loader Bucket

Most farms have a tractor with a bucket loader on the front for material handling. Unless you are moving feed or old bedding for animals on a daily basis, the bucket doesn't do much except stick off the front of your tractor and make the front end very heavy and unwieldy. It would be nice not to have the bucket on, but still have the hydraulic arms to lift things with and be able to put the bucket on without making it a major operation. To accomplish this, I built a quick attach system that allowed me to quickly and easily put my bucket on/off and gave me a lifting system when the bucket was off. It was basically an angle iron frame mounted permanently to the loader arms by the same pins that held the bucket on originally. In the middle of this frame was a piece of tubing with a moveable arm with a hook on the end to be used for lifting. During normal operation, the hook was always there to lift a sundry of things. When I needed the bucket, I would take the hook arm out and drive up to the bucket and pick it up. This was accomplished by two pieces of half pipe welded onto the top of the frame that would get in under the pins on the bucket and lift it up. I would then install bottom pins and the bucket was firmly

attached and ready to go. This setup does stick the bucket out about 6 inches further than factory mounting, which must be considered when using the loader for heavy material handling like sand/gravel. It does, however, offer an option to having the bucket on all the time. I found that the bucket was hardly on, but I used the lifting arm almost daily.

The Bean Machine

The last thing I want to tell you about is what we called "the bean machine". Anyone who has picked beans on a large scale knows that it is hard on your body either bending to harvest or working on your knees. I wanted to sit upright to pick, so I built a bean harvester. I planted beans in double rows with a 2 ft. path between rows. I planted E-Z Pick green beans because they have very high pod

set and seem to be bred for mechanical harvesting. The bean machine is two narrow platforms mounted on mountain bike wheels that straddle a double row of beans. The platforms are connected together with 1 inch square tubing and are large enough for a small seat and a picking bucket which was actually a bus tray from a restaurant supply house. The original design enabled extreme adjustability to cover a large range of crop heights/

widths. We never used it for anything except beans, but it would work for anything less than 3 ft. high and 5 ft wide. Most things are not as labor intensive as beans, so it might be practical for larger item harvesting.

These drawings are not to scale, but this type of thing has to be customized to your particular needs. These are just ideas to ponder. I am available for consultation or fabrication of anything you can think of.

Vitals of Lehman's

Lehman's
P O Box 41
One Lehman Circle
Kidron, OH 44636
Ph 330-857-5757
24 hr orders only 330-857-1111
fax 330-857-5785
e-mail: info@lehmans.com
web site: www.lehmans.com

Lehman's Grain Mills

Most grain mills work in a similar manner. As the handle is turned, an auger feeds grain (or another substance) in between two burrs made of cast iron or stone. One burr is held in place while the other one turns. The burrs rub past each other to grind grains, beans, nuts, or seeds into flour, coffee, meal, cereal, or peanut butter. Depending on the desired fineness, the burrs are adjusted closer or farther apart. The flour or other finished product drops out from between the burrs as they turn.



Lehman's Best grain mill is so-named because it is the best grain mill available under \$200. This mill, made by Lehman's in Kidron, Ohio, is extremely versatile since it can be converted from stone to cast iron burrs in moments and can grind any grain, nut, seed or bean. It also adjusts from powder-fine to flaky-coarse with the turn of a knob.

Lehman's Diamant grain mill is unique in that it is made from solid cast iron, weighs almost 60 pounds, and needs to be bolted down to a tabletop before use. A 16" v-belt pulley serves as a fly-wheel with a handle but also allows it to be easily motorized. This particular mill is considered to be



one of the best, if not *the* best, hand mills in the world. It is very fast, relatively easy to turn and quickly converts from grinding fine flour for baking pastries to cracking grains for animal feed. Extra fine and extra coarse burrs are also available for an even greater variety.



Lehman's Glass Butter Churn

There was a time when each family made their own butter at home or bought it from someone who did. Traditional, upright, old-style dasher churns are often impractical for people who want to make their own butter today. This butter churn is a good alternative, especially since you can watch the churn work. Lehman's makes it in Kidron, Ohio and it is the only one made today with a glass jar. The design is similar to the well-known "Dazey" churn found in antique stores.

Lehman's Solid Oak Food Dryer

In the past, drying food was one of the best ways to preserve it. Food drying still makes sense as it locks in many more nutrients than canning or freezing since the food doesn't have to be boiled, cooked, heated or frozen. It is also cheaper because you can dry fruits and vegetables when they are in season and plentiful so you pay much less.

To use, cut fruit or vegetables into thin slices, lay the slices out on the oak framed fiberglass drying screen and put it on a windowsill, in a greenhouse, on a porch, or even in the trunk of a car. All it needs is heat in the range of 105 –140 degrees Fahrenheit. Although it may take several days for the food to dry, the end result will be delicious *and* nutritious.



Lehman's Can Sealers

The can sealer works in three different stages. First, center the can on the chuck and put a lid on top of the can. Lower the lever to clamp the lid and can in place. Second, begin to turn the handle clockwise. The first seaming roller will curl the seam. After one complete revolution of the can in the sealer, the second seaming roller automatically flattens the seam to seal it tight. This is the third stage of the can sealing process.

Canning in steel cans still often requires hot water baths and in some cases heating of the food before it is put into the can.

Lehman's Reading 78 Apple Peeler

Lehman's *Reading 78* apple peeler has been made in the same basic style continuously since 1878. It is now made by Lehman's in Kidron, Ohio. This handy tool peels apples so fast it is hard to keep it busy. One apple is done before you're ready to put the next one on the spikes. It does not core or slice the apple but it will drop the peeled apple into your bowl when you are done.

Simply push the apple onto the four prongs and turn the handle. As you turn, the blade, held tight to the apple by a spring, takes off a wide strip of peeling. In five turns, the blade has gone completely around the apple and the peeled apple is pushed off the prongs and into your bowl. It has been clocked at over 10 apples per minute.



(continued from page 1)

farmer's museum, whole farm planning, herb and herbal product business, bedding plants, access to land - from land assessment to ways of financing, allia, mechanics - small engine tractor, solar power and technology, community related workshops, i.e., intentional community examples, and farming in community, advanced farming workshops, sharing with other farmers, ornamental plants, i.e., culture, varieties, hardiness; mushroom cultivation, small business, native plants, drought resistance, economics of small farming and marketing, advanced greenhouse growing, irrigation systems,

root cellaring, stenciling on fabric, quilting for the teens, landscaping, cobb houses, permaculture, orchards, globalization, alternative energy (solar, wind, etc.), more on veggie production, direct action/environmentalism involving radically diverse folks in the organic movement, cheesemaking, felting, biodynamics, legal aspects of forming a cooperative, basketry, sourdough bread, rug braiding, hot water bath and pressure canning, tai chi exercise, landscape architecture, intermediate/advanced gardening with nature spirits, weed control, specific weeds, flower gardens, edible soybeans, Japanese veggies,

mulches, exotic composting methods, cover crops, veggie garden design, twig furniture, alternative economic systems, local currency, CSA shares. start a farm, financing, small engines and tractors, irrigation systems, dairy goats, llamas, external herbal health care (skin eyes) etc., spinning, knitting, beekeeping, metaphysics and Taoist perspective, a beginner's workshop on grafting with an expert teacher, sheep dogs, poetry, prose and public performance for older kids.

Hey, thanks for coming. See you all next year!



photo by Jack Kittredge

Inger Källander delivers the keynote.



photo by Jack Kittredge

The herbalism workshop turned into a tour of the campus to identify numerous herbs.



photo by Jack Kittredge

Onlookers learned how to make shingles the way countless New Englanders did.



photo by Jack Kittredge

Julie Rawson takes a dunking



photo by Jack Kittredge

Dale Perkins was the hit of the fair.



photo by Jack Kittredge

The poultry workshop was attended by many, some with webbed feet!

Book Reviews

A Museum of Early American Tools

By Eric Sloane

Published by Ballantine Books

105 pages, \$9.00

reviewed by Jack Kittredge

Eric Sloane books are always a joy. He clearly loves his subject – usually a nostalgic rural New England theme. Since so much of early American life was endless work, Sloane’s focus is often on work – tools, agriculture, woodworking, barnbuilding, etc. His abundant illustrations dominate these books, drawings which elucidate the specific points he is making in the text. His work is crafted and fits together the same way the work that he eulogizes in his books does.

In this case, Sloane talks about tools – tools for clearing land, building, farming, and making common items of daily life. The endless variety of tools our ancestors designed for specific jobs is staggering. Most of us own an ax or two, but how many own separate axes for downing trees, hewing beams and making mortises? He explains the early use of European-style axes in the colonies and their gradual evolution into American axes with heavy rear “polls” for extra weight and momentum in chopping.

He illustrates the various ways of notching log cabin logs, and the tools needed for each. He shows simple systems for clamping, supporting, levering, joining, barking, lifting, etc. – all the basic requirements for homestead work – with simple tools, largely of wood and forged iron. A simple perusal of the book has already given me several ideas for ways I could manage tasks better. Let me just give you a sample of his copious illustrations, and see if you don’t get some ideas too!

Handy Farm Devices and How to Make Them

by Rolfe Cobleigh

Published by The Lyons Press, 123 West 18th St., New York, NY 10011

288 pages, \$12.95

reviewed by Jack Kittredge

First published in 1909, “Handy Farm Devices” is a small treasure. It contains several hundred descriptions of simple aids the average handyperson can build, each usually with an illustration or two. The chapters cover Workshop & Tools, The Steel Square, In and Around the Home, Barns & Stock, Poultry & Bees, Garden & Orchard, Field & Wood, Gates and Doors, When We Build, and Worth Knowing. Many of these devices are as clever now as they were then, and would be useful on many homesteads I have seen. Rather than describe a number of the devices, let me show a few:

Bridge Over a Stream

Seed Corn Rack (to dry ears and select the best)

Fence Wire Tightener

Simple Gate Catch

Chicken Tractor

Hog Trough (one the pigs can’t get into)

Sliding Gate

Small Animal Treadmill

Log Jack (work lever position up by raising fulcrum pin a notch while resting on the other)

Pedal Power Device

Post Puller (transfers horizontal pull to vertical lift)

Wrench for Turning Small Bolts

The Pipe Twister (in lieu of a pipe wrench)

Manure Heated Hotbed

Truing a Steel Square

Farm Conveniences and How to Make Them

anonymous

Published by The Lyons Press, 123 West 18th St., New York, NY 10011

256 pages, \$12.95

reviewed by Jack Kittredge

Similar to the above volume, this one was originally published in 1884. Again, many are interested and could be of use today.

Free Range Hen's Nest

Post Anchor

Post Driving Block

A Wagon Jack

Birds of a Feather: Saving Rare Turkeys from Extinction

by Carolyn J. Christman and Robert O. Hawes
Published by American Livestock Breeds Conservancy, PO Box 477, Pittsboro, NC 27312
76 pages, \$21.95 & \$4.00 shipping from ALBC at 919-542-5704

reviewed by Jack Kittredge

This is a gem of a book for anyone who has raised, or has wished to raise, turkeys on a small farm scale. The authors' fondness for these open, curious, and self-confident birds is obvious. Anyone who has raised that other bird (the furtive, aloof, and socially climbing one) will have a new view of poultry after a year of two of the big birds!

"Birds of a Feather" opens with a fascinating history of the wild and domesticated turkey in North America. The only birds native to this hemisphere, wild turkeys were backed by Ben Franklin over the bald eagle for national bird status. Two species are recognized, one almost peacock-colored line in Central America, and North America's more *conservatively attired* *Meleagris gallopavo*. The variety *silvestris* (or forest turkey) is the most common of these, and predominates east of the Mississippi.

By the early 1800s land clearing throughout New England had pretty well wiped out wild turkeys, and a century later the same had occurred in the Midwest. It was not until World War Two was over that federal attention turned to restoring our national heritage of wild turkey flocks.

Domestication of turkeys probably originated with the Aztecs about 2000 years ago, forced by a swelling population and decreased natural habitat to find a substitute for wild meat from the hunt. In addition to their food value, this culture also prized turkeys for their colorful feathers - used as ornament and in ceremonial garb.

Turkeys were sent to Spain shortly after the conquest, in the early 1500s, and to England by 1541. Their European propagation was so quick and widespread that within 3 generations domesticated turkeys were returned to the New World as an important agricultural commodity (Jamestown, 1607 & Massachusetts Bay, 1627).

In addition to meat production, turkeys were also valued in many farming situations for their pest control services. The Chesapeake region depended on their appetite for tobacco hornworms to keep that cash crop from being decimated. Small farmers kept turkeys on range as their foraging habits included devouring beetles, grasshoppers, weed seeds, and other nuisances to produce a delicious product for practically no cost.

Turkeys also took to the west, where they were raised in such quantities that thousands of them would be driven to market by a few men and boys in meandering "turkey trots", making 6 or 7 miles a day behind a wagon throwing down corn. The profitability of turkey-raising was such that by the early 1900s 6 million birds were raised annually, at a cost of roughly 8¢ per pound, and sold for up to 5 times that price.

Breeders set about "improving" turkeys to get larger birds, with more breast muscles. The Mammoth Bronze was developed, then in the 1930s was crossed with the Cambridgeshire Bronze to create the "Broadbreasted Bronze". This bird dominated production until the 1950s, when the Large White took its place, primarily because the lack of feather pigment left a cleaner looking carcass after plucking. Commercial turkeys are now so large they cannot breed naturally and have frequent leg problems supporting their own bulk.

The market for turkey also grew, primarily among institutional food processors who found many uses for this inexpensive, low fat meat in hot dogs, sausages, school lunches, etc. Now some 270 million turkeys are raised annually in America, 20% of them as smaller holiday broilers, and 80% heavy birds destined for institutional processing.

The second half of "Birds of a Feather" examines the existing varieties of domesticated turkeys and what is being done to maintain them. Not enough, report the authors. Five old breeds, the Black, Bourbon Red, Standard Bronze, Narragansett and Royal Palm are on the critical list, with as few as 70 breeding females in the US. Far more research needs to be done on these and other old breeds to see if the traits which have been bred out of commercial turkeys but are needed for sustainable production (disease resistance, natural breeding, foraging on range, broodiness), are still available in these breeds.

Christman and Hawes appeal to small farmers to learn about these birds and, if they have a suitable operation, to buy and raise a few old breed turkeys. This is not only to increase the numbers of individual birds, but also to create more discreet flocks from which birds can be swapped to minimize inbreeding. An appendix lists hatcheries and what varieties each carries, for those who are inspired to try.

Mark Your Calendars and Save the Date!

NOFA-New York's Annual Education Conference

will be held on JANUARY 29 AND 30, 2000.

The Theme of the Conference: The Art and Practice of Seed-Saving and Seed Production Today.

Seed Saving: Methods, Equipment, Costs in time and space, Who is doing What, Seed Businesses in the Northeast, including cooperatives, nonprofits, exchange groups, cover crop seed production, seed saving, seed enhancement, groups and systems for cooperating in seed production and seed saving, genetic engineering—precisely how does it work, what is new from research conducted in '99, Government, grower and nonprofit cooperation to save seed.

In recent years, a wide variety of seed saving organizations have been created. The best known is probably the Seed Savers Exchange, in Iowa, founded by Kent Whealy. In addition, there appear to be a growing number of farm-based seed businesses in the Northeast. And there are groups in-between, all encouraging more people to get involved in the fascinating process of plant propagation.

The government is also in the business of saving seed – saving germplasm to be precise – living tissue from which new plants can be grown. This can be seed or another plant part, such as a leaf, a piece of stem, which can be grown into a whole plant. The National Plant Germplasm System is part of the USDA's Agricultural Research Service and its activities take place in locations throughout the country. Staff collect, evaluate and catalog germplasm from around the world. They also distribute germplasm to people upon request.

There are also some interesting innovations to bring government and growers together, including an effort started by Oregon Tilth, called the Farmer Cooperative Genome Project. This effort is working to encourage people to seek out seed, cuttings and other tissue stock from the National Plant Germplasm System, multiply the seed or plant material and bring back into circulation seed varieties not commercially available.

Consolidation in the seed industry has driven many to think about seed saving. With an increasing amount of seed being sold coming from fewer and fewer companies, there are very simply fewer choices for farmers and gardeners buying seed from major seed producers. While large companies are increasing their market share, new, smaller companies are striving to keep older seed varieties available to growers.

The feeling of urgency regarding seed saving has been heightened by the realities of genetically engineered crop production in the U.S. Last year, according to the USDA, 44% of the soybean crop and 36% of the corn crop were grown from genetically engineered seed. A number of farmers participating in meetings with the U.S. Environmental Protection Agency earlier this year stated that they couldn't get the best hybrid genetics for corn and soybeans without their being combined with Roundup-Ready or B.t. modified genes. Considering what we know and don't know at this point about genetically modifying major crops, it seems optimistic to say that we are gambling in a high stakes poker game – a game no one can afford to lose.

Combining these forces with our inherent fascination with plants and we've got a great deal of energy focussed on seed. Even though farmers and gardeners always think seed, there is always more to know and think about. This year, the annual conference theme for NOFA-New York is going to revolve around seed saving, seed production, small seed businesses, cooperatives, seed exchange groups, and the practical skills, equipment and planning needed for seed saving and production. And we will dabble in understanding as well as practicing plant breeding through seed selection.

We hope to see many of the small seed enterprises in the Northeast represented at the conference.

WHY SAVE SEED?

Plants Adapt to their environment

One of the most important reasons to save seed year after year is because of the nature of plants to respond and adapt to their surroundings. Plants adapt to their environments in ways that the most sophisticated plant geneticist doesn't understand. Our environment can be broadly defined as organic growing systems in the Northeast. We need to take advantage of the adaptive ability of plants by closely observing the crops we grow and selecting for the plant attributes that are desirable for us. We might select plants for excellent yield in a standard organic production system, ability to out-compete cold-germinating weeds in Spring, delicious flavor, ability to yield in dry conditions, or cold tolerance. Many other factors that might

not catch the eye of a commercial breeder but are important to us can be selected for.

Availability

Another reason to save seed is to ensure the availability of favorite varieties of seed that may fall out of favor for commercial producers. Of course this is only possible for open-pollinated varieties, not hybrids. Some people think that selection can bring open-pollinated (heirloom varieties) up to the yield and vigor we now depend on from hybrids.

Preserving Diversity within Species

Many people are fascinated with the job of preserving varieties that might otherwise cease to exist because they are not being reproduced commercially. The preservation of germplasm can be rewarding on many counts, including seeing for oneself just how many iterations there are among dry beans or tomatoes or whatever vegetable, flower, herb or fruit has caught your eye.

Plant Breeding

When we select plants and their seeds with our own needs in mind, we are acting as plant breeders, doing what people have done since the dawn of agriculture. The more informed we become about how to do what we desire, the more we can accomplish.

Are we doing what plant breeders are already doing? Apparently not. Take plant resistance to disease. Most of us think along the standard lines of Mendel, that there is or is not a gene for resistance to a specific disease. Consequently, general methods are to select plants (and their seeds) only when there is no disease present. It turns out that there are at least two clearly identified types of plant resistance, one directly matching gene for gene a particular disease (vertical resistance), which is the standard method used by those who adhere to the presence of specific gene resistance theory.

The second type of resistance is not related to any specific gene, but rather is related to the plant's overall ability to resist or survive a specific disease, called horizontal resistance. This overall ability to resist disease and pests can be strengthened by selecting plants exposed to disease and having survived it. So, rather than choosing plants that have managed to remain disease-free with no purposeful exposure, a few plant breeders recommend breeding for resistance by exposing plants to disease and then working with those that manage to survive and selecting them over time.

These two methods of plant breeding appear to be diametrically opposed to each other, yet they have to coexist in order to explain what we see in the fields. Proponents of reducing our dependence on pesticides advocate using horizontal plant breeding techniques, rather than the gene for gene techniques now typically used. We hope to be able to explain enough about how this system works for folks to understand and participate in this type of plant breeding program.

Commercial breeders are not necessarily providing us with varieties specifically adapted to organic growing systems, so we need to think about doing so ourselves. We need varieties resistant to some of the most intractable diseases, such as early and late blight in potatoes.

The Seed Business

Can organic farmers produce our own supplies of seed? This is an important question we don't know the answer to, but which may be answered only after we see where we are and how we might get to where we want to go. If we work together we can buy and sell more from each other, supporting the local economy and improving seed quality at the same time. Farmers now multiply seed for seed companies. Is it worth their time and effort or is the financial return less than their least profitable crop? Farmers will be on hand to answer these questions.

We are Already Doing It

Farmers and gardeners are close observers of their crops. Observation leads to making important connections between plants and their environments. And plant selection follows naturally from being observant and knowing what is desirable for your situation. We can make contributions to organic agriculture by simply noting what we see. We may use the information ourselves or pass the information on to those who may be making it their avocation or their job to keep track of such information in order to note trends that are helpful to researchers or others in plant science.

Of course, there will be other workshops as well, not directly related to seed production or seed saving. Watch for details in the December issue of The Natural Farmer or contact NOFA-NY for the conference brochure, available in October.

Will Bonsall is the keynote speaker at the NOFA-NY conference this January 29 and 30, 2000. He will also be giving workshops throughout the conference.

Will Bonsall

A tall man with a healthy flowing beard, Will Bonsall seems larger than life. His words and thoughts flow in torrents, powered by a keen mind and unrestrained enthusiasm. He started the Scatterseed Project in Maine, a regional seed exchange for this area. His collection matches his energy, 3-4000 accessions (he doesn't know exactly how many and more), of which he annually makes 1,500 to 1,700 available through the Winter Yearbooks of the Seed Savers Exchange. Since 1989 he has been curator for a substantial part of the SSE collection, including potatoes and peas. Probably he is more impressed with his 50-60 parsnip varieties ("more than the USDA") and 50-60 Jerusalem artichokes ("to my knowledge the largest in the world") than his 1,000-plus peas or 650 potatoes.

When he came to rural Industry, Maine (a fitting name for the locus of his work), in 1971, Bonsall's initial focus was self-sufficiency. "We were growing our own food, let's grow our own seeds, too."

He soon became intrigued by the Cowhorn Potato, a northern New England heirloom with a long skinny shape like a cow's horn and purple skin. Orlando Small, a neighbor, gave him a dry horticultural bean (Orlando's) and a white runner bean (Small's Carolina lima).

Through the years he has been a fount of knowledge about regionally adapted varieties, pointing us to Boothby's Blonde cucumber and Sheba barley (available from Fedco's catalog), and occasionally growing seed for us as well.

He was giving classes on seed saving when someone told him about Kent Whealy. So he gave Whealy a call. The rest, as they say, is history.

Trying to find species that others have neglected, Bonsall concentrates on so-called 'minor crops' like beets, rutabagas, turnips, chicories, radishes and parsnips. Within the last year he has become curator for Favas (140-150 varieties and Runner Beans (Over 200 varieties from all over the world).

In the days when grassroots organizations and the USDA national germplasm system had almost nothing to do with one another, Bonsall served as a liaison, helping them get acquainted. A lot of material has since flowed back and forth.

More recently, Bonsall has turned his attention to global linkages. He has worked with the Nordic Gene Bank in Sweden, with the former East German Collection at Gatersleben, with the Scottish Agricultural Science Agency, with Innes and HRI in England, with Australian Temperate Field Crops. In the John Innis collection he located Banner Wheat, an historic hard red spring wheat going back to 1820 that was once one of the most common varieties grown in Maine, and had been long since extinct in the United States. He has put government agencies in touch with non-governmental collectors, groups and vice versa, facilitating exchanges of germplasm.

Bonsall has accomplished all this on a shoestring budget. He dreams of becoming more effective in his work, of getting better funding, maybe an endowment to help put deer control and drought problems behind him. One fantasy is to strike it rich on the monumental futuristic novel on which he has been working the past 10 years. Knowing Will Bonsall, I won't bet against it.

NOFA Contact People

Connecticut

NOFA/CT Office: P O Box 386, Northford, CT 06472, phone (203) 484-2445, FAX (203) 484-7621, Email:

NOFACT@Connix.com, website: <http://www.connix.com/~NOFACT/>

President: Dudley R. Warren, 34 Schnoor Rd., Killingworth, CT 06419, (860) 663-3126 (home), Vice President: Peter Rothenberg, 53 Lanes Pond Rd., Northford, CT 06472 (203) 484-9570 (home)

Treasurer/Membership: Johan van Achterberg, 359 Silver Hill Rd., Easton, CT 06612-1134, (203) 261-2156 (home), Email: vanachj@concentric.net

Secretary: Kimberly A. Stoner, 498 Oak Ave. #27, Cheshire, CT 06410, (203) 271-1732 (home), Email:

kstoner@caes.state.ct.us

Newsletter: Rob Durgy, P O Box 17, Chaplin, CT 06235-0017, (860) 870-6935, Email: rdurgy@canr1.cag.uconn.edu

Staff: Jennifer Barricklow, 586 Skiff St., North Haven, CT 06473, (203) 288-7554, barricklow@juno.com; Marcia Brown, 333 Middletown Ave., North Haven, CT 06473 (203) 239-1944

Massachusetts

President: Lynda Simkins, 117 Eliot, Natick, MA 01760 (508) 655-2204

Vice President: Russell Van Hazinga, Brookside Farm, RFD 1, Rt 12, Fitchbug, MA 01420 (978) 874-2695

Secretary: Jen Mix, 6 Rowland St., Marblehead, MA 01945 (781) 631-2328, jmix@hnt.com

Treasurer and Staff: Julie Rawson, 411 Sheldon Rd., Barre, MA 01005 (978) 355-2853, Fax: (978) 355-4046, Email: JACKKITT@AOL.com, website: <http://ma.nofa.org>

Newsletter: Beth Henson, P. O. Box 603, Cambridge, MA 02140 (617) 628-8019

Certification Administrator: Ed McGlew, 140 Chestnut Street, West Hatfield, MA 01088 (413) 247-9264

website: <http://ma.nofa.org>

New Hampshire

President: Dan Holmes, The Meeting School, 56 Thomas Rd., Rindge, NH 03461, (603) 899-2033

Vice President: Charlie Reid, 97 McCrillis Rd., Nottingham, NH 03290, (603) 679-8101

Secretary: Susanne Clements, 179 Sanborn Hill Rd., Epsom, NH 03234, (603) 736-8075, 736-5858, clements@totalnetnh.net

Treasurer: Susan MacLeod, RR1 Box 78, Deering, NH 03244-9313, (603) 529-1632

Membership and Staff: NOFA/NH Office, White Farm, 150 Clinton St., Concord, NH 03301, Nofanh@aol.com

Newsletter: Organic Certification: Vickie Smith, NHDA Bureau of Markets, Caller Box 2042, Concord, NH 03301 (603) 271-3685

New Jersey

President: Leonard Pollara, Upper Meadows Farm, RD 5, Box 554, Montague, NJ 07927, (201) 293-7350, lenpollara@compuserve.com

Vice President: George McNulty, Stone Hollow Farm, 136 Rt 72, Barnegat, NJ 08005, (609) 698-2405

Newsletter Editor: Amy Hansen, 33 Titus Mill Road, Pennington, NJ 08534, (609) 737-6848, Email: nofanj@aol.com

Secretary: Mike Rassweiler, North Slope Farm, 1701 Linvale-Harbourton Rd., Lambertville, NJ 08530 (609) 466-4191, fax: 466-5974, nsfarm@compuserve.com

Executive Director: Karen Anderson, 33 Titus Mill Road, Pennington, NJ 08534, (609) 737-6848, fax: (609) 737-2366, Email: nofanj@aol.com

Certification Administrator: 33 Titus Mill Road, Pennington, NJ 08534, (609) 737-6848

Technical Resources Director: Emily Brown Rosen, 33 Titus Mill Road, Pennington, NJ 08534, (609) 737-6848, Email: nofanj@aol.com

New York

President: Judith Roylance, 17 Dogwood St., Sag Harbor, NY 11963 (516) 725-1009

Vice President: Richard de Graff, Grindstone Farm, 780 County Route 28, Pulaski, NY 13142 (315) 298-4139, fax: (315) 298-2119, dickgrind@aol.com

Secretary: Cathy Popp-McKenna, RR 1, Box 226, Stamford, NY 12167 (607) 538-9778

Treasurer: Kay Magilavy, 212 18th St., Union City, NJ 07087, (201) 863-1741

Newsletter Editor: Tina Nilsen-Hodges, 1325 Glenwood Rd., Vestal, NY 13850, (607) 748-9367, nilshodg@spectra.net

Executive Director: Sarah Johnston, 597 Route 9J, Stuyvesant, NY 12173, (518) 828-2511, fax: (518) 828-6514 sjds@wizvax.net

Administrative Secretary: Ammie Chickering, NOFA-NY, P. O. Box 21, South Butler, NY 13154-0021, (315) 365-2299

Certification Administrator: Patricia Kane, NOFA-NY Certification Program, 26 Towpath Rd., Binghamton, NY 13904 (607) 724-9851

website: <http://ny.nofa.org>

Rhode Island

President: Julia Cartabiano, 60 Beach Rd., Cumberland, RI 02864 (401) 333-1069

Vice-President: Jeanne Chapman, 17 Station St., Apt. #4, Coventry, RI 02816 (401) 828-3229

Secretary: Kurt Van Dexter, 1740 Stony Lane, No. Kingstown, RI 02852 (401) 294-7994

Treasurer: Gayle Anderson, 9 Diamond St., No. Attleboro, MA 02760 (508) 643-3500

Membership: Elizabeth Jesdale, 64 Harrison St. #11, Providence, RI 02909 (401) 831-9779

Newsletter: Susan Samotey, 105 Bartlett Ave., Cranston, RI 02905 (401) 467-3699

NOFA/RI : P. O. Box 29174, Providence, RI 02909-9998 [288 Dudley St., Providence 02907] (401) 274-4547, fax: (401) 273-5712 Email: nofari@ids.net, website: <http://users.ids.net/~nofari/>

Vermont

NOFA-VT Office, P. O. Box 697, Bridge St., Richmond, VT 05477 (802) 434-4122, Fax: 434-4154, website:

www.nofavt.org

Executive Director and VOF Administrator: Enid Wonnacott, 1561 Sherman Hollow Rd., Huntington, VT 05462 (802) 434-4122 Enid_Wonnacott@together.net

NOFA Office Manager: Kirsten Novak Bower, 65 Wortheim Rd., Richmond, VT 05477 (802) 434-5420,

kbower@juno.com

Newsletter Editor & Bulk Order Coordinator: Heidi Racht, Main Road, Huntington Center, VT 05462 (802) 434-2690

Farm Share Coordinator: Michele Wheeler, 23 Bushey Lane, Westford, VT 05494 (802) 878-9143

Dairy Tech Coordinator: Lisa McCrory, RR1 Box 169, Randolph Center, VT 05601 (802) 728-4416

People Grow Coordinator & Agriculture Education Coordinator: Joshua Brown, 32 Catherine St., Burlington, VT 05401 (802) 864-3329

VOF Admin. Asst.: Jessie Schmidt, PO Box 427, Plainfield, VT 05667, (802) 454-1264

VOF Admin. Asst.: Nicole Raymond, 12 Sawmill Rd., Jericho, VT 05465 (802) 899-1742

NOFA Interstate Council

Tom Kemble, 581 Thompson St., Glastonbury, CT 06033 (860) 633-4503, t-jkemble@erols.com

Steve Gilman, 130 Ruckytucks Road, Stillwater, NY 12170 (518) 583-4613

Charlie Reid, Stonewall Farm, 97 McCrillis Rd., Nottingham, NH 03290 (603) 679-8101

Ed McGlew, 140 Chestnut St, West Hatfield, MA 01088 (413) 247-9264

Bill Duesing, 153 Bowers Hill Road, Oxford, CT 06478, (203) 888-9280, bduesing@snet.net

Enid Wonnacott, 1561 Sherman Hollow Rd., Huntington, VT 05462 (802) 434-4122

Russell Van Hazinga, Brookside Farm, RFD 1, Rt 12, Fitchbug, MA 01420 (978) 874-2695

Kay Magilavy, 212 18th St., Union City, NJ 07087, (201) 863-1741

Leonard Pollara, RD5 Box 554, Montague, NJ 07827, (201) 293-7350

Mike Hutchison, 2325 Boston Neck Road, Saundertown, RI 02874 (401) 295-1030

David Baldwin, 26 Edgewood, Barrington, RI 02806 (401) 246-0275

Joe White, 140 Deerhill Road, Brentwood, NH 03833, (603) 679-5718, sunpit@ttlc.com

Jack Kittredge and Julie Rawson, The Natural Farmer, NOFA Summer Conference, 411 Sheldon Rd., Barre, MA 01005 (978) 355-2853

Northeast Interstate Organic Certification Committee

* indicates co-chair

Bill Hill, 51 John Read Road, West Redding, CT 06896 (203) 938-9403

Eric Sideman*, MOFGA, PO Box 2176, Augusta, ME 04330 (207) 622-3118

Judy Gillan, P O Box 31, Belchertown, MA 01007 (413) 323-4531

Ed McGlew, 140 Chestnut St, West Hatfield, MA 01088 (413) 247-9264

Vickie Smith*, NHDA, Bureau of Markets, Caller Box 2042, Concord, NH 03301 (603) 271-3685

Rick Estes, 145 Mountain Rd., Concord, NH 03301 (603) 224-4469

Emily Brown Rosen, 33 Titus Mill Road, Pennington, NJ 08534 (609) 737-6848

Elizabeth Henderson, 2218 Welcher Rd., Newark, NY 14513 (315) 331-9029 ehendrsn@redsuspenders.com

Frank Banner, 1863 Preble Road, Preble, NY 13141 (607) 749-4614

Pat Kane, 26 Towpath Rd., Binghamton, NY 13904 (607) 724-9851

Dan Lawton, RI Division of Agriculture, 235 Promenade St., Providence, RI 02908 (401) 222-2781, ext. 4516, dlawton@dem.state.ri.us

Polly Hutchison, Casey Farm, 2325 Boston Neck Rd., Saundertown, RI 02874 (401) 295-1030

Enid Wonnacott, 1561 Sherman Hollow Rd., Huntington, VT 05462 (802) 434-4435

Tim Sanford, RR1, Box 224A South Royalton, VT (802) 763-7981

Calendar

Sunday, September 19: NOFA-VT technical workshop on medicinal herbs: Propagation to Processing, Saxtons River, VT *for more info:* (802) 434-4122

Friday, September 24 - Sunday, September 26: Common Ground Country Fair, Unity, ME *for more info:* 207-568-4142

Saturday, September 25 & Sunday, September 26: Exhibition and Sale of Rare and Historic Livestock Breeds, Hancock Shaker Village, Pittsfield, MA *for more info:* 413-698-2044

Friday, October 8 - Sunday, October 10: National Biodynamic Conference, Spring Valley, NY *for more info:* 888-516-7797

Saturday, October 9 - Sunday, October 10: Autumn Fest at Stonewall Farm, Keane, NH *for more info:* 603-357-7278

Thursday, November 4 - Saturday, November 6: International Dairy Sheep Symposium, Brattleboro, VT *for more info:* 802-656-5459

Friday, January 19 - Monday, January 22, 2000: 20th Annual Ecological Farming Conference at Asilomar Conference Center, Pacific Grove, CA *for more info:* 831-763-2111

Saturday, February 26, 2000: Vermont Grass Farmers' Association Annual Grazing Conference, Vermont Law School, So. Royalton, VT

NOFA Membership

You may join NOFA by joining one of the seven state chapters. Contact the person listed below for your state. Dues, which help pay for the important work of the organization, vary from chapter to chapter. Unless noted, membership includes a subscription to The Natural Farmer.

Give a NOFA Membership! Send dues for a friend or relative to his or her state chapter and give a membership in one of the most active grassroots organizations in the state.

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Johan van Achterberg, 359 Silver Hill Rd., Easton, CT 06612-1134, (203) 261-2156 (home), vanachj@concentric.net

Massachusetts: Individual: \$30, Family: \$40, Low income: \$20, Supporting: \$100

Julie Rawson, 411 Sheldon Road, Barre, MA 01005, (978) 355-2853

New Hampshire: Individual: \$25, Family: \$35, Supporting: \$100

c/o White Farm, 150 Clinton Street, Concord, NH 03301

New Jersey: Individual: \$35, family/organizational: \$50, Business/Organization: \$100, Low Income: \$15* *does not include a subscription to The Natural Farmer

33 Titus Mill Road, Pennington, NJ 08534, (609) 737-6848

New York: Student and Senior (over 65): \$15, Student and Senior Family (2 adults): \$20, Individual: \$25, Farm Listing: \$30, 2 adult family: \$30 (each additional adult, \$5), Business: \$35, Patron: \$100, Corporate Sponsor: \$500, Lifetime: \$1000

Ammie Chickering, P O Box 21, South Butler, NY 13154, (315) 365-2299

Rhode Island: Student/Senior: \$15, Individual: \$25, Family: \$35, Business: \$55

Lee Gross, P. O. Box 29174, Providence, RI 02909-9998 [288 Dudley St., Providence 02907] (401) 274-4547, fax: (401) 273-5712

Vermont: Individual \$25, Family/Business: \$35, Sponsor: \$75

Kirsten Novak Bower, NOFA/VT, PO Box 697, Richmond, VT 05477, (802) 434-4122