

THE PERMACULTURE ACTIVIST

Vol III, No. 4 Newsletter of the Permaculture Institute of North America (PINA) November, 1987

From the Editor

Trees for Life

The theme chosen for this issue, "Trees for Life", could perhaps become a rallying cry for permaculture activists. "Trees for Life" is, at the same time, a well reasoned response to the global environmental crisis, a call to participate in direct action, and an expression of spiritual belief.

After many years of work in environmental politics, I'd like to ask a rhetorical question regarding trees, tree planting and reforestation, "Will anything else make a difference?" In the long run (which is what permaculture is all about) the only way to pull out of civilization's tailspin into ecological disaster, is to restore the Earth's forests to health. And, in most cases, the only way to affect large scale restoration of forests is to plant trees. Tree planting is environmental activism at its simplest and most effective level.

What is encouraging about "Trees for Life" is that tree planting isn't nearly as dull as other options for involvement in environmental work such as: helping out at "mailing parties"; making phone calls to ask for donations; collecting signatures for yet another petition; walking the halls of the Capitol building to lobby elected representatives; or going to countless organizing meetings. And furthermore, trees give something back - food, fuel, shelter, shade, oxygen, wildlife habitat, and long-term companionship.

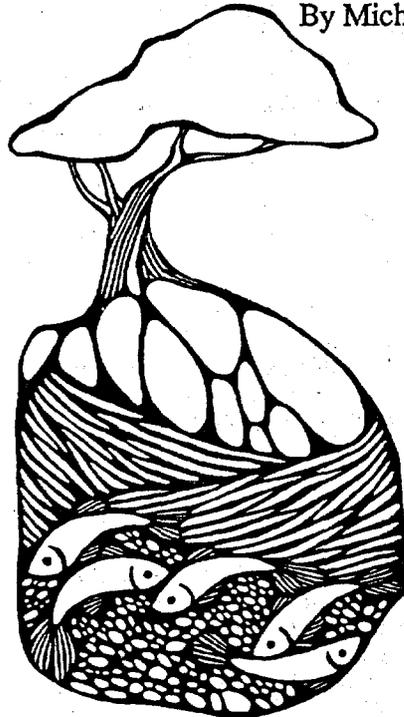
I hope you will find the articles and other material enclosed inspirational, and glean some practical information to use in planting your permaculture. Go out and plant a tree!

Amy Baldwin

P.S. Special thanks go to Sharon Casey for typing & proofreading, Karen Kent, Vicki Mendell, Jeffree Hall and Solomon Teklu for graphics, Shifra Levine for calligraphy, and David Katz for help with the MacIntosh computer.

Reforesting the World: A Permaculture Perspective

By Michael Pilarski: Friends of the Trees Society



drawing by Karen Kent

My purpose in this article is not to explain permaculture to those unfamiliar with it; but rather to stimulate permaculturists to think more about world reforestation and to contribute to this much needed cause.

How many different people and groups have tried to figure out a world reforestation strategy? I am aware of only a few, yet reforesting the world is one of the major items on the agenda for humanity in the next century if we are going to square things with the planet. What are other proposals for strategies to reforest the planet? We favor self-motivated, decentralized, non-authoritarian strategies.

Very few people would disagree that the world needs a lot more trees, but there are many differing opinions on how, with what, where, by whom and for whom.

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PINA News

Viv Ilo Veith

The last few months have been busy ones at PINA's new office. We are settling into our new home in the Good Shepherd Center, a restored historic building in Seattle housing 20 non-profit groups. We still need some odds and ends to make it feel like home, specifically, soft artwork to absorb sound. The fourteen foot ceilings give noise plenty of bouncing room! If anyone has a beautiful quilt or other art work they'd like to donate, it would be appreciated.

Our current office hours are as follows: Tuesday and Wednesday 9:00AM to 3:00PM, Thursday and Friday 9:00AM to Noon. We may change the hours slightly as we head into the fall season. However, "Zone Zero", our trusty answering machine is on duty at all times and can tell you our correct office hours as well as take your message.

Volunteers are working on several projects (see list below). If you would like to become involved, please contact the office. Many of the tasks can be done at a distance from Seattle, so you can contribute to our work even if you can't get to our office.

- Setting up a file on "Who Else Is Out There and What They Are Doing". We are especially trying to collate information on related organizations and Permaculture design sites. Please send it to project coordinator Mason Bowles at PINA.

- Working with TILTH Placement Service and other groups to coordinate Internship Positions with "Individuals looking for Internships". We will probably publish a listing in the *Activist* when we have it ready. If you have an internship opening, please send a job description to PINA; attn: Internships.

- Expanding PINA's Tree Tax Program. See "Tree Tax Update", p.5.
- Faith Hagenhofer is coordinating our Library Project. We are sorting through all of our periodicals and organizing them. Additionally, we are starting a "Clip File" of articles on specific topics. When we have enough volunteer staff aboard, we will eventually use the clip file to answer many of the questions we receive.

Special thanks goes to Volunteers Extraordinaire: Trisha Lowder, Lincoln Kern, Faith Hagenhofer, Judith Jacoby, Mason Bowles, Lea Kouba. Thanks goes out to Steve Brockman, Madelon Bolling, Dorothy Craig, Marc Heusner, Shery Litwin, Joe and Janice Peltier, Qretchen Graeff, Eli Beeman, Jef Ramsey, Richard Reese, Lisa Utter, and David Valbract for their help at the Western Washington State Fair booth. Extra special thanks goes to Joan Hill who constructed a beautiful scale model of a Permaculture Design site. We used it at the fair and plan to use it at many more booths in the future.

PINA Staff Changes

PINA welcomes Keith Dublinica to staff. Keith began work in July as the Director of Permaculture Resources, bringing warmth, enthusiasm and new ideas.

Keith studied architecture, environmental design and biology in New York and California and implemented these disciplines in a Department of Energy project that integrated appropriate technology and alternative energy. Keith has been interested in permaculture for a number of years, and has learned a great deal through reading and applying permaculture principles at his South Seattle home and, in the not to distant future, land trust acreage. He plans to begin more "formal" permaculture education fall and is eager to participate in design workshops and courses.

Keith is on the advisory board for a herb co-op which is currently embarking on a greenhouse construction project. Keith also works part-time for the Metropolitan transportation system in Seattle and volunteers with South End Seattle Community Organization (SESCO) in a project utilizing the Reinvestment Act, challenging banks to fulfill their responsibility to increase loans to local businesses and organizations. This work has included lobbying and meeting on a national level as well as negotiating with large local banks. Keith's sense of community, his dedication and his ability to put his values to work are evident.

This time also marks the departure of Bev Reed from Permaculture Resources. Bev was a key person involved in founding PINA. She was also part of a small group of people who were instrumental in introducing permaculture to the Maritime Pacific Northwest in the early 1980's. We acknowledge the importance and value of Bev's time with us and thank her!

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Note: * denotes Permaculture Design Course graduates

The *Permaculture Activist* is published quarterly by the Permaculture Institute of North America (PINA), a 501(c)(3) nonprofit, tax-exempt organization. PINA is supported by donations, grants, educational program revenues, special projects and membership dues. Donations to PINA are tax deductible. Offices are located at 4649 Sunnyside N., Seattle, WA 98103. Second-class postage rate is paid at Clinton, WA. Copyright, 1986, the Permaculture Institute of North America. Written material and drawings may be reprinted only with written permission from the publisher.

Members of PINA receive a subscription to *The Permaculture Activist*. Membership categories and annual dues are: Regular member - \$25/year; Sustaining Member - \$50/year; Contributing Member - \$100/year; Patron - \$250-\$500; Lifetime Member - \$1000. All of these member categories also receive a subscription to *Permaculture, Journal of the International Permaculture Association*, which is co-published by PINA. A special low-income membership is also available - \$16/year, however, this only includes a subscription to *The Permaculture Activist*. Publications Director of PINA and Editor of *The Permaculture Activist*: Guy Baldwin.

The Institute assumes no responsibility for unsolicited materials. Manuscripts or artwork not accompanied by stamped, self-addressed envelopes will not be returned. Ad rate card is available upon request from: Publications Director, PINA, 4649 Sunnyside N., Seattle, WA 98103. Publication dates and copy deadlines for all materials and advertisements are as follows:

ISSUE NUMBER	PUBLICATION DATE	COPY DEADLINE
Vol. IV, No. 1	Feb. 1, 1988	Jan. 1, 1987
Vol. IV, No. 2	May 1, 1988	April 1, 1988
Vol. IV, No. 3	Aug. 1, 1988	July 1, 1988

Our new address and phone number are:

PINA
4649 Sunnyside N.
Seattle, Washington
98103
(206) 547-6838

Reports from Regional Groups

Editor's note: Each issue of The Permaculture Activist includes this regular column covering the growing number of permaculture groups and projects appearing all over North America. We ask that anyone with news and events to report please contact: Editor, The Permaculture Activist, 4649 Sunnyside N., Seattle, WA, 98103.

East Coast Permaculture Gathering

The 2nd East Coast Permaculture Gathering was held at Heathcote Center in Freeland, Maryland Sept. 26 and 27. Thirty-four Permafolk attended. In between eating, carousing, hugging, smudging, chanting, sweating and working the following was discussed:

Simon Henderson and John Hasse debuted the world premier of "PermaRap" a fun song addressed to the mainstream, that will get you boogieing in your gardens and boycotting agribusiness. Copies are available for \$5.00 - all proceeds go to the Tree Tithe Fund of the School of Living. To order, send \$5.00 to John Hasse, 306 3rd Ave, Hadden Hts., NJ 08035. Satisfaction is guaranteed.

The certification [of "Permaculture Designers"] issue came up and we discussed peer group review as an alternative. We also discussed the need to bridge the gap between taking a Permaculture Design Course and actually going out and teaching. We have accepted the Australian challenge to North America: "To shit or get off the pot." It was the consensus of the group that there was a need for a permaculture teachers' training program. An Education/Outreach Committee was formed to develop guidelines for weekend workshops as well as team teaching - drawing on our own resources to develop our teaching skills. We invite your input to develop this information. We also identified the need to have a standardized publicity packet for fundraising, workshops, marketing, and outreach. We discussed organizing a permaculture slide library to be available for workshops and lectures.

Addressing the issue of "emotional permaculture/personal permaculture", it was revealed that obsessive, compulsive behavior is rampant and results in terminal burnout. We empowered each other to "just say No". Burnout is an ego problem and each person needs to take responsibility for themselves. "Zone 0"

Lella Russell Smith (granddaughter of the late J. Russell Smith, author of the classic text Tree Crops) attended the conference and invited all permaculture people to visit the International Tree Crops Institute located on Mr. Smith's former farm in Roundhill, Virginia.

The Synergist will continue to function as the East Coast connecting organ. The deadline for the next issue is Nov. 15. Contact: Shirlee Seaborn, 5810 20th Rd. N., Arlington, VA 22205 (Subscription - \$6.00/year). Shirlee wants information on what you are doing ... short pieces for the Synergist. "You do not have to be a writer." Just send a list of your interests, projects, discoveries, etc. Poems, photographs & drawings are welcome too.

Bob Macoskey of Slippery Rock University detailed the development of the Permaculture Design Course at SRU (see pp. 7 & 8 for more info). Bob also told the conference of five computers that have been donated to the ALTER project at SRU with the possibility that these will form the nucleus of a nationwide permaculture computer network and database.

The Tree Tithe Project was briefly discussed. Sue Colpas-Ross will facilitate this project. She would like to see folks getting actively involved in talking to organizations that utilize tree products - biomass consumers - to get them to donate tax deductible funds to the Tree Tithe Fund of the School of Living Permaculture Committee, which will distribute the funds to ethical tree planting projects both locally and globally. Contact: Sue Colpas-Ross, 1028 Hill Rd., Boxboro MA 01719, phone: (617) 263-1476.

Doug Hallway volunteered to coordinate initial compilation of archives/resource materials and solicit copies of Permaculture Course syllabi from all instructors. He and Jo Clayson have committed to teach a workshop at the next East Coast Conference on "How to present a workshop".

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Maritime Permaculture Institute (MPI)

Announces: The annual MPI Reunion
Date: Feb. 5, 1988

Location: Breitenbush Community,
Detroit Oregon

Cost: \$35.00 per person (includes: one night lodging, 3 vegetarian meals, use of hot tub and saunas).

Participants will arrive for dinner on Friday (or earlier) and depart Sunday. The agenda is loosely structured at this point - we are asking people to bring books and information for sharing, slides of projects they wish to share, and musical instruments.

We would like to get an idea of how many people will be attending. If you are a Permaculture Design Course graduate living in the Maritime Pacific Northwest (or a dedicated permaculture practitioner) and are interested in participating in the MPI reunion, please drop me a line - it would be appreciated.

Contact: Jude Hobbs, 4705 Fox Hollow Rd., Eugene, OR 97405.

Third International Permaculture Conference (IPC III)

The Third International Permaculture Convergence and Conference is scheduled for February, 1989 at locations on North and South Island, New Zealand. We [i.e., PINA] are working with a major travel company here in Seattle, Travelmasters, in negotiating the lowest fares to New Zealand, not only from the Northwest, but also from any point in the United States and Canada. Special airfares will be made available to PINA passengers. Stopovers in Hawaii, the South Pacific, and the West Coast can be arranged. Even though the IPC III is many months away, start thinking...and saving...for it now!! Details will be announced in future issues of the Activist, and/or contact the conference organizing committee: Steve Hart, PO Box 68166, Auckland, New Zealand.

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Further information was requested on the following:

- Starting an edible landscape business - Garnett Mellen, Rt 1, Box 126, Charlottesville, VA 22901;
- Cistern design and construction - Brad Baker, Box 521, Unionville, PA 19375;
- Mens communities or mixed communities, especially any that would be supportive of same-sex male relationships -- Rodney Boudreaux, 1111 Army-Navy Dr. Apt. B1105, Arlington, VA 22202.

Following the reading of a letter from Dan Hemenway which was addressed to the Permaculture Conference, we recommended that people in their respective bioregions organize a "Divergence before the Convergence" (referring to the International Permaculture Conference III to be held in New Zealand Feb., 1989). We can then present a cohesive report at the IPC III.

Simon Henderson of the Bear Tribe Medicine Society and Sue Colpas-Ross, native American ceremonial apprentice guided spiritual ceremonies throughout the weekend including a healing pipe and a sweat lodge ceremony.

The suggested date for the next East Coast gathering is Columbus Day weekend, 1988. A planning group needs to be formed, and a place chosen. The Education/Outreach Committee plans to meet Nov. 14 at Genesis Farm in Blairstown, NJ to work on team teaching and developing standardized weekend workshop presentation packets. Anyone interested in attending contact Sue Colpas-Ross.

Heathcote Community

Heathcote Community & Conference Center, based since 1965 on 35 acres of the School of Living Land Trust has numerous buildings, gardens, greenhouse, orchards. There are building sites available for new residents. Heathcote is operating a permaculture networking and teaching center, and internship program. More information in the next issue, or contact: Heathcote Community, 21300 Heathcote Rd., Freeland, MD 21053.

Southwest Regional Permaculture Institute

Director Scott Pittman reports that SWRPI will soon be sending out a mailing to about 10,000 people in the Southwest to attract membership and financial support for this newly formed nonprofit organization.

The new address for this institute is: Southwest Regional Permaculture Institute, 142 Lincoln Ave., Suite 818, Santa Fe, NM 87501. Scott Pittman's phone: (505) 982-2063.

School of Living sets up Permaculture Committee

The School of Living is an old decentralist organization/network with a land trust based in the mid-Atlantic region.

The new Permaculture Committee has taken on fundraising for the Gap Mountain Greywater/Marsh Project (see page 3 of the *Activist* Vol III, No 3 for details) and Thelma Snell's Permaculture teaching trip to Nepal.

The Committee will be a support resource for the East Coast permaculture network as well as organizing educational events. One goal is to come up with funding for several paid organizer positions.

Committee membership is still open. We welcome proposals for permaculture projects needing fundraising assistance. Contact: Cynthia Edwards, Heathcote Community, 21300 Heathcote Rd., Freeland, MD 21053.

Cedar Hollow New Age Community Land Trust

C.E.D.A.R. - Center for Ecological Design and Restoration - Hollow is the pilot community of New Age CLT founded in 1983 and located on 42 beautiful acres in South-Central Kentucky. Cedar Hollow hosted a Permaculture Design Course in 1984 and has continued outreach in organic gardening and alternative nutrition. Cedar Hollow is seeking others interested in joining the community and short or long term interns. Contact: Cedar Hollow NACL, c/o Rt 2 Box 23, Edmonton, KY 42129, (502) 378-6588.

Report from Dan Hemenway, roving Permaculture Teacher

Editor's note: this article is condensed from a letter received from Dan back in May. Although it's a little too late to help Dan with the funding and organization of his world teaching tour - he is an inveterate traveler and can stretch a little bit of funding a long way in providing permaculture outreach and education in Third World countries and in the "developed" countries of North America. Activist readers can help by sending tax deductible contributions to: School of Living, Permaculture Education Project, c/o Minot Weld, RD 2, Box 235, Ovid NY 14521, or write to Dan at his new address - Yankee Permaculture, 40A Brooks St., Worcester, MA 01606, to organize a lecture, workshop, or Permaculture Design Course in your area.

Dan Hemenway

In Manila I was met by AT-80 managing editor Jake Tan. The next day I was on a boat to the island of Mindoro where I stayed in the field with a team of foresters, agroforesters, and social workers who are attempting to support the cultural survival of the Mangyan hill people. These folks formerly practiced swidden agriculture but the pressures on their ancestral lands by logging, displaced lowlanders, charcoal burning (due to encroachment of the cash economy) and pressures associated with tourism have forced them to the situation where they have virtually burned off all the forests and lost much of their cultural diversity and wisdom in the process.

I was able to provide the Mindoro team with some useful addresses and one of them will participate in the Permaculture Design Course which begins tomorrow. After a few days ... back in Manila, I took the bus five hours north into the mountains where I was hosted by a group based in Baguio City which is also working with hill peoples. I had time to travel further into the highlands to see the

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new address:

**Yankee Permaculture
40-A Brooks St.
Worcester, MA 01606**

Toward a Permaculture Design Services Cooperative: Synopsis

This paper outlines concepts for a North American (Pacific Northwest, at least) Permaculture Consultancy. The consultancy will market and implement Permaculture concepts of all types and scales, up to and including community development, resource management, and environmental protection. The consultancy needs to be able to provide a dependable livelihood to its working members, compete successfully with other consulting businesses, and enhance the effectiveness of allied groups.

A Mondragon-style cooperative business structure is envisioned, to provide full democratic control by participating members, with minimum shared liability and maximum tax advantages. Design/project teams (including individuals) should be able to form and operate independently within the cooperative structure. Administrative services, marketing, project review, policy, and similar functions can be centralized. A computerized directory will facilitate formation of teams and efficient preparation of proposals.

What we would like from Permaculture Design Course graduates: If a livelihood-basis, village-scale Permaculture consultancy interests you, please **STUDY** this information. Please **COMMENT** on any or all aspects and **INVOLVE** yourself to the degree you wish to participate. We want to move forward with this idea and would appreciate your input and assistance.

Following the Maritime Permaculture Reunion (Feb., 1988 at Breitenbush Community, Oregon - see announcement on page 3), we will be offering refined concepts through *The Permaculture Activist* and the *International Permaculture Journal* for feedback from Permaculture folks here and abroad.

For further information contact: Mark Shaffer, 68837 NE New Brooklyn Road, Bainbridge Island, WA 98110, phone: (206) 842-3984 home, 842-4859 office.

Committee Members: Kristan Johnson, (206) 437-2430 (Pt. Ludlow), Robert Hatton, (206) 321-6639 (Whidbey Island) or (206) 382-0719 (Seattle), and Mark Shaffer.

The following presents some ideas for establishing a Permaculture design and service consultancy in the Pacific Northwest. This represents the results of discussions at the 1987 MPI reunion and further meetings.

Goals

The objective is to form a successful permanent business organization for providing and marketing Permaculture Services, including both design and implementation. The organization should:

1. Facilitate creation of design teams for specific projects;
2. Provide a structure within which design teams (including individuals) can form and operate independently;
3. Provide a centralized cooperative center for administrative services, such as contracting, billing, distribution of income, marketing, report production, and liaison with other Permaculture organizations;
4. Provide a format and structure for contracting outside services;
5. Limit financial and professional liability on a given project to members who are actively involved in that project;
6. Minimize taxation - by business structure and links with the non-profit portion of Epicenter and by distributions through a liberal employee expense policy, medical reimbursement plan and other non-taxable or business-deductible member benefits;
7. Improve the skills of the membership by post-project evaluations and sharing of project reports and experience;
8. Encourage permaculture implementation and education by communication with non-profit Permaculture organizations, financial donations to the non-profit portion of Epicenter, and performance of projects in disadvantaged areas funded by Earthbank, Epicenter and other charitable organizations.

PINA's Tree Tax Program

The Tree Tax Program helps account for the true costs of tree derived products such as the newsprint you are holding in your hand. PINA "taxes" each subscription to *The Permaculture Activist* one dollar. PINA, in turn, donates the money to groups doing reforestation work in North America and elsewhere around the world. In 1986 three grassroots groups were given small grants from the fund. This year PINA plans to distribute grants to four or five groups.

The Permaculture Institute in Australia instigated its Tree Tax Program in 1984. The books *Permaculture One* and *Permaculture Two* each carry a 50¢ tax and *Permaculture, the Journal of International Permaculture Association* (which PINA co-publishes) carries a 25¢ tax per issue. In two years the Institute has funded the planting of over 5,000 trees. The Institute also sent out a letter encouraging groups who use tree products to start their own Tree Tax Program to help fund reforestation projects.

PINA is expanding its Tree Tax Program and encouraging other people to start programs of their own. You can help out by telling people who use tree products about the program. This could include newspapers, furniture makers, wood-millers, printers, and many others. Encourage them to:

- "tax" the wholesale price of the product (or tax a part of their advertising revenue.)
- use the monies collected to plant trees or to fund groups working in reforestation.
- donate the monies to an ongoing Tree Tax Program, such as PINA's (see p.3 for information on the School of Living's Tree Tithing Fund).

You can also help PINA by letting us know about groups working on community-scale reforestation projects in North America and elsewhere. We have many contacts, but are always looking for more! At this point, the tax revenues in our Tree Tax Fund don't amount to much - around \$800/yr. However, this amount of money can go a long way toward helping out tree planters working in the Third World.

PINA's Tree Tax Program can receive tax-deductible donations from any of the abovenamed businesses as well as from individuals, corporations and other nonprofit organizations.

Permaculture Educational Programs

Personal Permaculture Workshop

Permaculture is Design!

Permaculture uses the natural qualities of plants and animals (including people) combined with the natural characteristics of structures and landscapes to produce a sustainable, low maintenance, productive system using the smallest practical area.

This workshop, through instruction and reappraisal of our skills and knowledge, empowers us in implementing Permaculture design principles in our daily lives. We will learn how our choices in the realms of food, housing, clothing and recreation affect our bodily and mental health, the earth and all its beings - all the way from germplasm and mycorrhizal fungi to the whales and the forests.

Using the principles of recognizing abundance, conservation, stacking functions, appropriate scale and harmony, we will produce a design outline for a home and its immediate surrounding area (Zone 1). We will learn how to conserve time, money, resources (including personal and purchased energy) while enhancing food supplies, health, self-esteem, work and leisure, as we consciously participate in the creation of our personal existence.

Some specific topics will include: organic gardening, composting, water and energy conservation, non-toxic building, cleaning and personal products, food preservation, recycling just about everything, health maintenance, greywater and other "waste" systems, solar energy, barter and income-producing activities (which some people call "work").

For further information on Personal Permaculture Workshops contact:

Thelma Snell
21300 Heathcote Rd.
Freeland, M.D. 21053
(301) 343-0280

Permaculture Design Course -

Organized by Simon Henderson of the Bear Tribe Medicine Society, this program is tentatively set for June, 1988 in Spokane, WA. Simon would like to hear from people interested in team teaching and/or participating in the program. Contact: Simon Henderson, Bear Tribe Medicine Society, PO Box 9167, Spokane WA 99209.

Guatemala Permaculture Study Tour

Dates: November 22 - December 5, 1987, January 10 - 23, 1988.

Sponsored by the Aprovecho Institute and Permaculture Institute of North America this program involves a two week study tour of traditional sustainable mountain agriculture systems, with an optional third week for a special project.

Within a small area in western Guatemala are arid and humid tropical ecologies, rainforests, export crops and subsistence farming. The region is a unique reservoir of sustainable peasant agriculture, of traditional villages and cultures, often at high altitudes on precipitous slopes. Guatemalan farmers are under pressure to adopt imported tools, fertilizers and pesticides, which has led to disintegration of traditional cultures.

At the invitation of the Guatemalan Minister of Agriculture, Aprovecho Institute is studying traditional agricultural systems and advising how permaculture methods (both traditional and modern) can be incorporated into government agricultural policy. The study tour will collect materials for a report to be prepared in week three. Participants thus have an unusual chance to affect public policy for an entire nation.

The program is for land and resource planners, local development workers and extension agents, agricultural missionaries, students and teachers of third World conditions, foresters, international networkers, researchers in sustainable agriculture and appropriate technology and

international volunteers. Participants from Central America will be encouraged to attend, providing a diversity of background and experience in the group.

Location: based at Solola School of Agriculture on Lake Atitlan, surrounded by intensive traditional vegetable farms, with spectacular views of lake and volcanoes. Daily field trips to traditional farms, markets and villages from sea level to 10,000 ft. Examples of most tropical and sub-tropical agriculture systems - coconuts to potatoes - are all found within 50 miles.

Instructors: Dr. William Roley and Ianto Evans will lead a teaching team of international development workers and Guatemalan agricultural specialists.

Roley and Evans have taught four Third World Permaculture Design Courses together; both have extensive experience in small-scale agriculture and practical permaculture. Both have worked in Guatemala, where Evans spent three years developing fuel-conserving cookstoves and studying agriculture and settlement patterns.

Cost: \$600, not including transportation. Part of the fee provides scholarships for Central Americans. Cost includes tuition, accommodation, food and all field trips. \$100 deposit. 20 person limit. Partial work trades are available as well as partial scholarships for Third World residents.

For more Information:
Guatemala Study Tour, Aprovecho Inst., 80574 Hazelton Road, Cottage Grove, OR 97424, U.S.A. Phone: (503) 942-9434.

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environmental destruction there and the kind of agriculture presently practiced, to visit the gold mine despoiling the Baguio region (and reportedly releasing mercury into the river), and to visit a woman doing outstanding experimental work with re-forestation and agroforestry in the midst of a desolated landscape.

After a few days back in Manila studying the local situation and brushing up on tropical systems, I am wrapping up details for the first Philippine Permaculture Design Course which will begin tomorrow with between 32 and 35 participants. I'll have about 10 days after the course to work in the field with one or more participating groups and I'll be off to New Zealand for an intense 45 days of speaking, workshops, a Permaculture Design Course (with special emphasis on Maori participation), and advanced training for N.Z. permaculturists to support them in taking on teaching courses and workshops in New Zealand and the South Pacific region in general.

Permaculture Educational Programs

Permaculture Design Courses At Slippery Rock University

With the blessings and encouragement of the Permaculture Institute and PINA, Slippery Rock University now offers a credit-bearing Permaculture Design Course.

The first (45 hour, 3 credit) workshop, "Introduction to Permaculture", was led by design-course graduate, Ted Simanek. Students studied the philosophy and basic concepts of Permaculture and toured local organic farms and homesteads. The second (90 hour, 6 credit) workshop, Permaculture Design, was led by Dawn Shiner and Darrell Frey of Three Sisters Permaculture Design Service. In this session the students studied the "1986 Design Report" in relation to their assessment of the site, the University and work already begun. Representatives of ALTER requested (and received) more specific designs for garden layout, wildlife control/pest management, public composting toilet facilities, educational outreach programs, inter-university networking, a recycling plan for university glass, metal, paper and primary vegetable matter, and staging plans to make Harmony House habitable by March, 1988. Workshop graduates received designer apprentice certification with PINA.

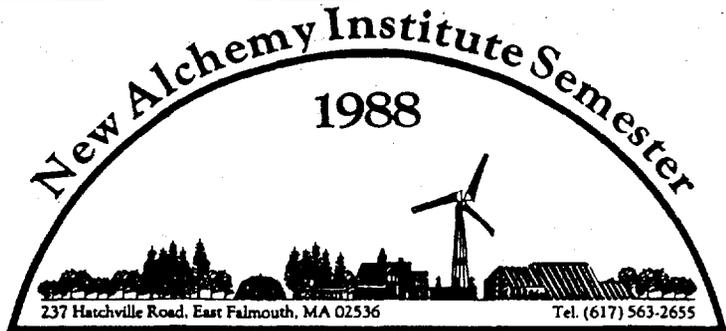
The result of the 1987 courses was the "1987 Permaculture Report", setting the stage for the next six to eight months by refining specific areas of the broader "1986 Permaculture Report".

ALTER will offer the design course sessions again in the 1988 Spring semester and as an intensive 1988 Summer workshop. Students will then further refine and develop Permaculture with ALTER at SRU. A background in basic ecology, an awareness of appropriate technology and the reading of Permaculture Two are recommended.

ALTER publishes a monthly newsletter, *The Alternator* - a generator for alternative currents in agriculture, energy, and lifestyles. Subscriptions to *The Alternator* are available for \$10 for 12 issues per year and are included with all memberships in ALTER: Regular \$20 - \$50/year; Sustaining \$60 - \$100/year; and Patron \$150 or more per year. All contributions are tax-deductible. Slippery Rock University: ALTER Project, Slippery Rock, PA 16057, (412) 794-7322.

For more information on Permaculture Design Courses and Workshops at SRU, contact Dr Robert Macoskey with ALTER at the above address or Dawn Shiner and Darrell Frey, Three Sisters Permaculture Design Service, R.D. 1, Box 75-C1, Carlton, PA 16311.

Editor's note: see page 8 for a description of the permaculture design for Harmony Homestead" at SRU.



New Alchemy - "Semester in Sustainable Design" Dates: Jan. 25 - May 20, 1988

This program combines hands-on experience with classroom work at the Institute's twelve-acre research and demonstration center on Cape Cod, MA. This cooperative effort between New Alchemy Institute and the National Audubon Society Expedition Institute is geared for third-year college students or persons with equivalent experience. Students can receive full academic credit for their Semester course work through Lesley College or through their own schools.

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For more information, contact: Semester Manager, New Alchemy Institute, 237 Hatchville Road, East Falmouth, MA 02536. Phone: (617) 564-6301



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Permaculture Design: ALTER Project - Slippery Rock University, Pennsylvania

by Darrell Frey

ALTER

The Alternative Living Technologies Energy Research (ALTER) Project at Slippery Rock University (SRU) in Slippery Rock, Pennsylvania, is dedicated to bringing the concepts of ecologically-sound lifestyles and organic agriculture to Western Pennsylvania. For five years ALTER has been sponsoring workshops and discussing options for developing a property to demonstrate alternative agriculture and appropriate technology.

Harmony Homestead

In August of 1985 Dan Hemenway led a one-day Permaculture Workshop at SRU. It was immediately apparent that a permaculture design was exactly what ALTER needed to develop its 140 acre site.

Dan returned to SRU in July, 1986 to conduct a Permaculture Design Course and led six students through the process of designing the site, now known as Harmony Homestead, named for its Harmony Road address. The result was the "1986 Permaculture Report" which lays the foundation for developing the Harmony Homestead as a model of permaculture design in the Allegheny Watershed Region.

The "Report" calls for extensive retrofit of the uninsulated farm house on the site. The house will serve as a home for the steward(s) and will include office space, a farmhouse kitchen, passive solar greenhouse, root cellar, an icebox, solar/wood hot-water system, mudroom/outdoor kitchen, composting toilet, gray-water system and an attached woodshed. The plan is to buffer the original house with well-insulated additions and windbreak plantings.

To the South and East of the house the plan calls for an area of approximately one acre to be developed to demonstrate various gardening methods: a diversified, multi-story orchard/poultry forage system; wetland utilization; a rain catchment pond; a springhouse; and other elements - all together demonstrating the process of conscious, integrated Permaculture design.

Immediately adjoining the house to the South is the Zone One salad-culinary garden, which will demonstrate the process of biodynamic intensive gardening.

Further South and East of the spring house (which will be expanded) is the poultry house /rabbit house /storage shed. Radiating from the deep-mulched poultry yard are three 800 sq. ft. grain growing areas, separated by fencing and hedges of caragana, buffaloberry, russian mulberry, bush cherries and autumn olive. Within these areas buckwheat, millet, amaranth and other grain crops will be sown in rotation. After harvests poultry will glean, weed, till and fertilize these areas. Harvested grain will be stored for poultry feed. Hedge fruit and prunings will supplement the poultry diet, as will the mulberry tree in the deep-mulched yard and the honey locust tree in one of the grain growing areas. The poultry will also have controlled access to the multi-fruit orchard and the zone one and two gardens.

The Zone Two garden area begins with half of the wetland area just out the back door and will be planted with various useful wetland plants. Beyond this area is a 20-year old maple tree surrounded with a 100 ft. (circumference) circle of raised beds at its dripline. Perennial and Annual herbs are being established in these no-till beds. To the South and East of this maple, the Zone Two garden will cover a 70 ft. by 70 ft. area. Various gardening methods and patterning schemes will be demonstrated and researched here.

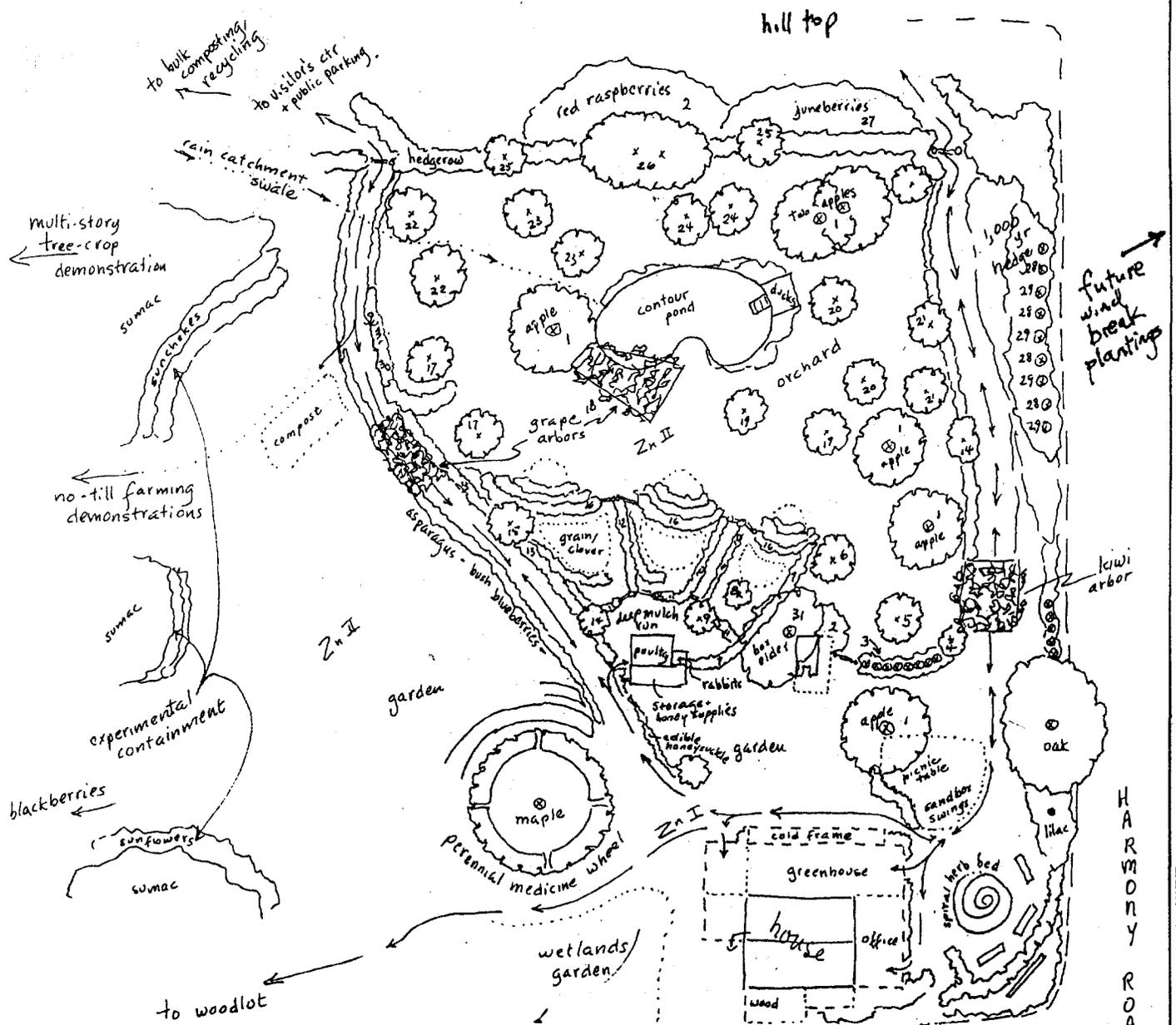
Public pathways will be defined by hedgerows of asparagus, rugosa rose, bush cherries, blueberries and edible honey-suckle. Other mixed plantings--the "100 year hedge" bordering the road-- will provide microclimate moderation, screen noise and pollution from Harmony Road, and form ecological islands by providing food and habitat for a wide variety of songbirds, insects and wildlife.

Outlying areas will be developed to demonstrate natural farming of grain (no-till/succession experimentation), keyline planning techniques, wild food gardening, wildlife food management, a multi-story fruit and nut orchard/pasture (Zones Three and Four) system, an ecologically managed woodlot, and soil restoration. Community gardens and a visitors' workshop center are also planned in Zones Three and Four.

In addition to the site design, the "1986 Permaculture Design Report" notes and recommends many valuable links with the University. Various departments, environmental studies and other sciences, can use the site for many types of study. Fraternity groups and other volunteers bring as many as 50 laborers (watch out!) a day to dig, plant and mulch on work weekends. Unsprayed leaves and trimmings from the campus are dumped in a composting area near the proposed visitors' workshop center on the Harmony Homestead site. Plans are being considered to compost up to a ton per day of organic primary wastes from food preparation to the University's cafeterias. The cafeteria operators have expressed interest in purchasing produce from the ALTER project. It is hoped that this and many other marketing possibilities and educational programs will make the project financially self-sustaining.

The primary purpose of the Harmony Homestead is to demonstrate to the general public concepts and techniques of Permaculture. A series of workshops, workdays and seasonal celebrations will surround the implementation of the design. The process is being documented with video tapes, slides and written reports. The project will also serve the region by location, identifying and growing locally-hardy, disease and pest resistant varieties of fruits and nuts by working closely with the North American Fruit Explorers (NAFEX) and the Northern Nut Growers Association, also by participating in the Seed Saver's Exchange's efforts, along with the Rare Breed Societies' efforts to maintain rare vegetables and animals.

Permaculture at Slippery Rock University:
ALTER - Harmony Homestead



- * 1. apple
 - 2. red raspberries
 - 3. quince hedge
 - 4. dwarf orange quince
 - 5. nectarine
 - 6. am. cranberry
 - 7. autumn olive
 - 8. honey locust
 - 9. white mulberry
 - 10. caragana
 - 11. comfrey
 - 12. russian mulberry
 - 13. bush cherries
 - 14. elder berries
 - 15. sweet pit apricot
 - 16. buffaloberry
 - 17. manchurian apricot
 - 18. grapes
 - 19. cornus mas
 - 20. peach
 - 21. pear
 - 22. sour cherry
 - 23. cornus kousa
 - 24. paw paw
 - 25. hazelburk
 - 26. chinese chestnuts
 - 27. juneberries
 - 28. hawthorne
 - * 29. barberry
 - 30. gumi
 - * 31. box elders
- * on site along with oak, lilac, maple, sumacs & blackberries

T.S.P.D.S.: d.s. 9/87

Permaculture Food Forestry Using Nut Trees

Larry Geno, Bear Creek Nursery

Food Forestry is the use of native and improved forest trees for multiple uses stressing food products for humans and other wildlife. In permaculture zones 4 and 5 [ed. note: areas furthest from the dwelling] these species assemblies offer opportunities to construct interactive ecologies that provide food production, nutrient upwelling and recycling, integrated trellising, assist pest control, are self mulching and provide a diverse range of products.

By careful design, these forestry plantings can optimize the capture of available energy by providing a "net" of functional relationships, useful niches and yield storages. Concurrently, we find that by designing food forests as effective interception nets there will be a consequent increase in:

- species diversity;
- organizational complexity;
- energy/nutrient storage sites;
- stability.

Environmental Directives

Environmental conditions determine much of the scope of a food forest design. Constraints include available heat units, rainfall, soil fertility, type, and depth, size of drainage area and other abiotic realities. The permaculture designer will make careful note of the environmental conditions on a site when incorporating non-local species to ensure that species chosen are reasonably adapted to the site. Microclimates, seral evolution, and interplanting can be exploited to facilitate survival of marginally adapted species.

Functional Goals of Food Forestry

The primary goal of food forestry is the use of forest trees that provide food in addition to conventional forest products such as timber, poles, coppice smallwood, fuelwood and shelter. Secondary goals include the provision of forest yields such as animal forage, seed, solar and nutrient trapping, wind screening, mulch biomass, wildlife habitat and bee forage. Further, food forests are designed to function and evolve over time by incorporating species that are harvested at appropriate intervals.

Food forests are very conscious of the spatial element over time, where the natural process of seral evolution dictates different plants and harvestable products over time as forest dominants change and different species mature. Ongoing management in the food forest is required, through less so than in the more intensively managed permaculture zones 1-3 [ed. note: areas closest to the dwelling]. This management usually involves planting and interplanting, thinning, partial harvest, animal stocking and, at times, severe restructuring to a less mature state to increase harvestable production.

Appropriate species - temperate nut trees

Nut trees are especially appropriate to food forestry for several reasons: 1) they are capable of producing valuable timber and wood products and have a long history in this use; 2) they produce high value foods, usually easily harvested and stored. 3) they are generally "intelligent" trees that have not been altered much by domestication (as opposed to "stupid" trees such as peach); 4) they provide a wide diversity of structural shapes, 5) they offer a multitude of end use products.

Chestnuts

Chestnuts come to mind as an ideal permacultural forest tree. They grow in varied structural shapes from the upright tree-type American and European species to the wide spreading shape of the Chinese and Japanese species. They also vary in shape with degree of crowding when young. Young chestnut trees grow very quickly when given open sun and fertile, well drained soils.

Their natural tendency to

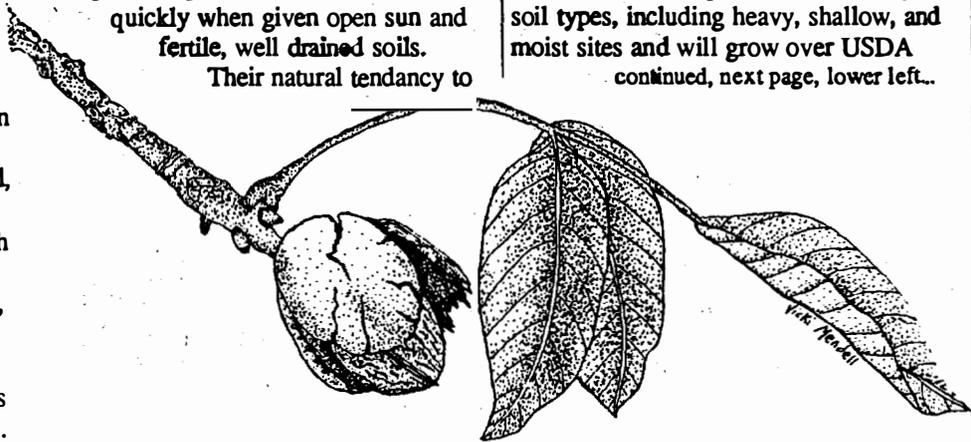
sucker from the base creates an ideal potential for managing as coppice, producing rot-resistant post material, fuelwood, and forage boughs (deer & goats love chestnut leaves!). Few species excel as the chestnut in the production of hardwood timber or veneer logs. Their deep taproot offers excellent potential for recycling deep soil nutrients to understory plantings, primarily through litter from leaf fall. The nuts, while not easily stored except by refrigeration or drying, are produced in large amounts and can be a staple food for humans, foraging animals, and wildlife.

Chestnuts are adapted to USDA climate zones 4 through 7, requiring 700 hours chilling, deep well-drained slightly acidic soils, and 20" annual rainfall (minimum).

Hazelnut

Hazelnut, including Asian and American species and their hybrids, have a clear potential in food forests. With the exception of the upright Asian tree hazels, most hazels are multistemmed, suckering large shrubs well suited as forest understory plants in the early seral stages and forest edges of more mature food forests. Their relatively shallow lateral rooting structure exploits a different soil horizon than the tap rooted trees, enhancing structural complexity and increasing species stacking in the forest. The easy-to-harvest nuts are high in protein and oils, keep well in storage, and are borne in profusion. Particularly amenable to coppicing, they can provide supple withes [slender, flexible branches or twigs] for various uses. The Asian species grow as a single trunk to 12" diameter, offering attractive veneer or craft wood timber.

Hazels are adapted to a wide range of soil types, including heavy, shallow, and moist sites and will grow over USDA
continued, next page, lower left..



Multi-purpose Tree Crops

by David Bainbridge

DLRI Bibliography No. 2
Dry Lands Research Institute
University of California, Riverside
Riverside, CA 92521

Forestry is often very narrowly defined in the developed countries, emphasizing the intensive production of single-purpose trees for timber or fiber. This sometimes leads to poor management of lands in the developed countries and often results in poorly designed assistance and development projects and lack of popular support for forestry programs in the developing countries (Bainbridge, 1987a). This is particularly true for development projects that rely on single purpose trees like *Eucalyptus spp.* in areas where multi-purpose trees have been used in traditional agricultural systems (Fernando, 1986).

It is very helpful to consider the many functions and purposes trees may fulfill when planning forestry or agricultural projects or environmental restoration programs. The ecological (Jarrell and Bainbridge, 1987) and social environment (Brokensha et al, 1983; Rambo and Sajise, 1986; Bainbridge, 1987a) should be carefully considered.

Trees used in agroforestry projects should be local species whenever possible. These should be planted in mixed stands rather than monocultures to reduce risk. A wide variety of techniques can be used to help establish trees in difficult environments (Virginia and Bainbridge, 1987). The uses and functions which trees can provide include:

- a) fuel: wood, tinder, charcoal, liquid
- b) fodder: animals, birds, etc. (fruit, nuts, leaves, etc.)
- c) food: fruit, pit, nut, sap, leaves, bark, etc.
- d) building material: lumber, poles, etc.
- e) material for tools, garden use, furniture, etc.

- f) industrial materials: insulation, stoppers, dye, soap, tanning agent, oil, gum, resin, wax, rubber, etc.
- g) fencing
- h) fiber
- i) medicine
- j) soil improvement
- k) shade, microclimate modification
- l) wind break
- m) precipitate fog
- n) bee feed, honey source
- o) habitat for wildlife
- p) erosion control
- q) ground water management
- r) flood water management
- s) reinforcement for land stabilization and landslide management
- t) host for food production, mushrooms, sugar, scale insects, etc.
- u) host for fiber production, silk worms, etc.
- v) religious purposes
- w) fire resistant barrier
- x) noise barrier; y) prospecting tool
- z) concentration of metals or pollutants
- aa) ornamental

Editor's note: Formerly a solar home designer, David Bainbridge's writings on Oaks, Mesquite, Tree Crops and low-cost buildings have frequently found their way into Permaculture publications. David now works with the Dry Lands Research Institute, a program of the University of California at Riverside. Their newsletter, the Drylander (ISSN -0888-5532) reviews useful plants, cultural practices, appropriate technologies for dry land agriculture, and is a valuable reference for any permaculturist working in these areas. Address for the Drylander: DLRI, U.C. Riverside, Riverside, CA 92521.

continued from Permaculture Food Forestry, p. 10...

Walnuts

Walnuts come in a wide variety of sizes, shapes, and adaptability. In general they are long-lived, nonsuckering, high-value, large-timber trees. Walnuts are especially useful as the eventual dominant and have been used in China and Europe to grow up through earlier, more intensive crops such as grape and shrub berry plantings. When choosing among the many walnut species, local experience and assistance of a competent forester or nurseryman will be of benefit. The extensive taprooted structure of most walnuts is useful for nutrient upwelling and recycling, though a few species are allelopathic from root and leaf exudates. Potential products from the walnut are veneer and timber logs, small wood, and the delicious nuts. If intensive management is available, manipulation can generate further benefit such as grafting improved nut producing persian walnut 20 feet high on veneer producing black walnut stocks, thus providing both nuts and wood products in their best type.

Walnuts are adapted to moderate moisture soils that are well drained in USDA Zones 3-7.

Additional temperate species worthy of research and development include chinkapin, hickory, pecan, and castanopsis.

In summary, food producing forest trees like nut trees can offer much in expanding the stability and productivity of permaculture forest plantings.

BEAR CREEK NURSERY

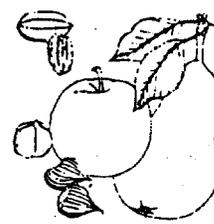
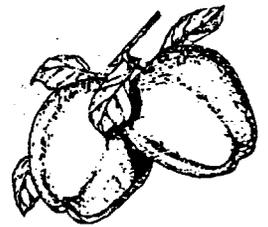
Large selection of antique and Hardy apples

Rare and valuable nut trees

Semi-dwarf disease resistant pears, berries and small fruits

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TreePeople

Strategies for Enhancing the Urban Forests in Metropolitan Areas

Editor's note: this is an edited version of a paper presented by Rick Ryan to The Second International Permaculture Conference (IPC II), August, 1986, Olympia, WA, U.S.A. The work of TreePeople is an inspiration to activists working in their communities to promote ecological awareness and to provide real solutions to environmental problems.

For further information, contact: TreePeople, 12601 Mulholland Dr., Beverly Hills, CA 90210. Phone: (219) 769-2663, 769-CONE.

Rick Ryan

Introduction

TreePeople is a private, nonprofit corporation that has been serving the Southern California area since 1973. Originally founded to replenish the forests surrounding the Los Angeles basin that were being destroyed by smog and fire, TreePeople's work has expanded to include planting trees in urban areas to help solve pressing environmental problems and improve the aesthetic and spiritual quality of our community.

Our headquarters are at Coldwater Canyon Park, a 1920 vintage fire station, located at the eastern end of the Santa Monica Mountain Range. The park is a 20-minute drive from downtown Los Angeles. The 12 acres surrounding the buildings are steep slopes and fire roads. In cooperation with the City Recreation and Parks Department, we operate and maintain the park as an environmental education and participation center.

Purpose

TreePeople's purpose is to encourage people by education, example, and assistance to heal and enhance the environment by planting and caring for trees.

TreePeople works on many levels of organizing. Over 12 million people live in the urban sprawl generally referred to as the Los Angeles area. Within this larger

mega-community there exist a multitude of smaller communities.

On the small scale we help with individual and community street tree plantings involving from one to over a hundred trees. In the larger metropolitan area, TreePeople is best known for the "Million Tree Campaign", using the 1984 Olympics as its focus.

Many countries have modeled tree planting projects after the Million Tree Campaign:

- Canada is organizing a nation-wide program involving youth groups to plant trees.
- London has started a "Forests of London" campaign.
- Australia is planning to plant 200 million trees to celebrate its Bicentennial in 1988. Government assistance is being given to farmers to plant tens of thousands of trees on grazing land.

Educational Programs

In our education programs TreePeople is acting and thinking locally as well as educating people about global issues. As

part of our on-going environmental education programs, we schedule a series of evening presentations known as "The Big Picture".

The best established of our educational activities is the school and scout programs for children. 15 - 20,000 children, ages 4 - 14, get to participate in a presentation and discussion, tour an environmental discovery trail, plant a tree seed, and take home and plant a tree seedling that was started earlier in the program. Over 100,000 trees have been distributed in this way.

TreePeople also hosts monthly volunteer and membership meetings to keep people informed and inspired. They are titled "Thriving in L.A." and are entirely organized by TreePeople volunteers. An educational presentation is always scheduled within the generally up-beat programming which often highlights a tree and its usefulness in the urban forests.

TreePeople Nursery

Trees are grown in our nursery to support the projects and plantings as well as to supply appropriate species for the southern California urban forests.

The primary function of the nursery is to provide trees for our schools program. We also grow seedlings for our reforestation... continued, next page...

ENERGY CONSERVATION PROPERTIES OF TREES

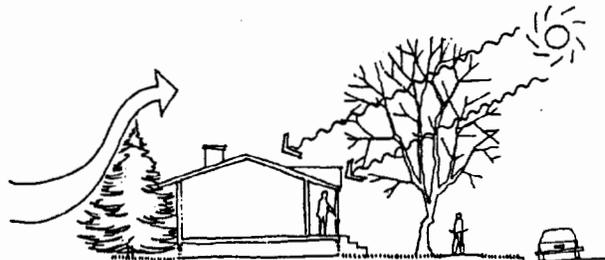
SUMMER



North Side of Street:
Deciduous Tree Close to House

South Side of Street:
Planting in Parkway/Shades Street

WINTER



Evergreen Tree on North Side

Deciduous Tree on South Side

Illustrations from A Planters Guide to the Urban Forest. ©1983 by TreePeople.

tion programs. The "Save the Valley Oak" project produced seedling oaks for planting in several areas. Acorns were gathered on location and seedlings were returned to that area for planting.

The nursery provides trees to support our community plantings, from 15 gallon street trees to small stock for promotion of events and sometimes working as a brokerage and/or wholesale retailer.

In each of the 6 annual issues of our newsletter, *Seedling News*, a different membership tree is highlighted. This tree is available free to members of TreePeople.

Volunteer Systems

Definition of volunteer:

- * one who enters into any service of their own free will;
- * one who springs up naturally or spontaneously, as from fallen or self-sown seed.

We perceive that there is a great and growing need for people to be actively involved in environmental healing activities. We, therefore, use media to let people know they are needed and we create opportunities for their involvement. Even more importantly, we give others -society in general -- the idea that they can make a difference.

Our goal is to open doors and facilitate communication. We encourage everyone to get involved. We emphasize tree plantings as a way to bring people together to put something back into the earth. We have had plantings where the army worked with college students and environmentalists worked side-by-side with 4-wheel drive clubs.

The end result of this is an informed and excited public, tangible results on a micro-scale and a perception by politicians that there is a broad-based political will to support the ideas and issues with which we are involved.

TreePeople's entire success is based on its volunteers. We give people one of the few chances available in the Los Angeles area to make a positive difference in the quality of the urban environment in which they live.

Illustrations from *A Planters Guide to the Urban Forest*, ©1983 by TreePeople.

Design Services

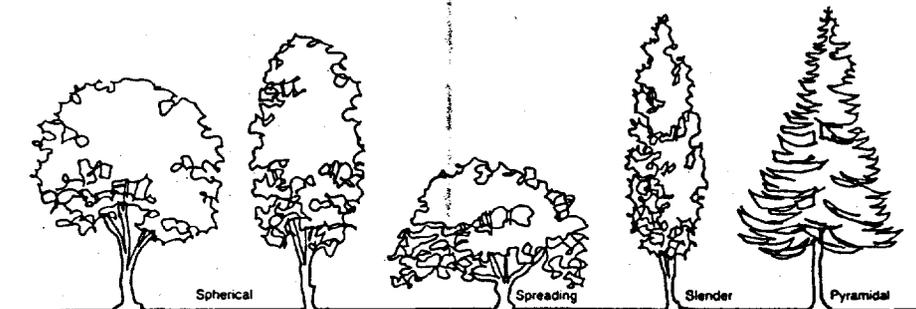
We often lose track of the impact we have individually in the large urban environment. But we all created positive or negative impacts that add up to a large problem or a large solution. For example, the individual driving a single car seems to create an insignificant amount of smog, yet together the L.A. basin's millions of drivers help create a problem of almost incomprehensible magnitude. Likewise, a few people planting a few trees may seem ineffectual, yet when considered with thousands of other individual and group planters, each makes a significant contribution to a part of the big solution -- the urban forest.

TreePeople is prepared to help individuals and groups on many levels of the tree planting process, from selection of species to providing tools, labor and trees. We have thoroughly explored the bureaucratic maze that gets in the way of many good intentions and can help individuals and community groups chart the best course to accomplish their tasks.

Clear outlines of the project and estimated costs for installation and maintenance are important factors for anyone being approached with the idea of getting involved in a planting. Some important things to consider are:

- * Defining the issue -- eg. this place needs some shade;
- * Knowing what you want to do -- eg. Plant some shade trees, 1 to 100;
- * Enrolling community leaders by visiting or writing your intentions to scout leaders, rotary club, beautification club;
- * Identifying resources -- eg. neighbors, nurseries, businesses;
- * Setting a realistic time period -- eg. next summer.

TREE SHAPE



TreePeople is starting a Citizen Forester Training to help community leaders, organizers, and individuals plan and manage a tree planting project. The program consists of 5 parts:

- * Introduction
- * Planting Supervision
- * Maintenance
- * Planting Development
- * Community Consulting.

There is a program fee of \$25.00. The eight classes are spaced over a nine week period. There is on-going support for graduates of the program to assist them in the plantings they generate. The goal is to have many plantings occurring simultaneously throughout the city every month, week, or day.

TreePeople has created a manual for planting trees in Los Angeles which can easily be adapted to any urban area. It is an excellent resource for anybody who desires to improve their city by planting trees. It is entitled, *A Planters Guide to the Urban Forest*, and is a must for citizen foresters.

Permaculture

Permaculture design depends on the interconnection of many systems to hold useful products and energy in easily accessible storages while they are being used or until they are needed.

The best model we have for designing these systems is the natural interconnections of an undisturbed ecosystem.

The greatest challenge to developing self-reliant urban areas is the urban dweller's alienation from the natural environment.

At TreePeople we identified a problem that was well understood by everyone - dirty air -- then identified a way to do something about it -- plant a tree.

By using trees as a focus for environmental education, we lay the foundation for the broad understanding and application of permaculture principles.

Africa Tree Centre

Editor's note: several issues back we ran a short letter from Mr. R.T. Mazibuko of the Africa Tree Centre, a group to whom PINA donated a portion of its annual revenues from its "Tree Tax Fund". This letter, reprinted from the International Federation of Organic Agriculture Movements (IFOAM) "International Letter", No. 22, Feb., 1986, gives more background on Mr. Mazibuko's work at the Africa Tree Centre.

R.T. Mazibuko

"Before the white man came, Africa was a green continent. Trees were everywhere, even far into the Sahara desert there were trees. And the Africans knew their country. They wandered about with their herds of cattle and they knew so well the needs of their animals as well as the potentials of the land that they always knew where to go next. In those days trees also played an important part. Each tribe had its own special kind of trees which was planted in areas visited by the tribe. After many years their offspring were still able to recognize places where their tribe had stayed earlier.

Then the white man came and many things changed. Trees were cut down in large areas to make room for the whites' plantations. When the white man arrived, he came as a very wise person, a person who knew a lot. He knew so much of



what the Africans did not know that he was able to uproot the Africans in all the fertile lands which contained something that the Africans did not know, which were the minerals. Then the white man removed these people thus putting them in one or two or three or four corners which were unfertile and unsuitable for their cattle. And this has forced the government to pass a law of resettlement, and these people go into these places with their heads of cattle, sheep and other animals soon grazed the land unto exhaustion. And all what is developing there is soil erosion and the result is soul erosion. The soil was spoiled and the Africans do not know how to care for the land. Therefore they do not have enough to eat and they are now dying in their hundreds. It is my duty as well as it is the duty of everyone to help these people to try to make the best out of the worst.

It takes nature 20,000 years to make an inch of topsoil, but because of man's folly that inch of topsoil may disappear with a single downpour. And the topsoil is the soul of the land and the only thing to sustain man on this planet. In many places we must now start from scratch to recreate the topsoil and in this process trees are a great help. When the trees come back we expedite the building up of the topsoil. The residues of the animals and the birds and the leaves falling down, all is adding to the formation of humus which is a necessary part of the topsoil. Even the trees themselves are important in raising the water table, in purifying the air because they use our carbon dioxide and

giving us the oxygen that we breathe. Therefore trees are so important in the process of helping the Africans to find themselves in line with ecology.

I spent 15 years of my life to train myself in all branches of agriculture in order to help the Africans not to be indoctrinated by the technology coming from the so-called 1st and 2nd world. After having prepared myself, I started looking for a piece of land, where I could carry out my experiments, and a lady from Switzerland, Mrs. H. Meyer, helped me to purchase a piece of land, equivalent to 1 acre. That is where I plant the young trees and in this my nursery, I raise the trees from seeds, from cuttings, and by budding and grafting.

Then they are distributed to the people, and each family only gets one tree and not as a gift. They must pay a little bit of money because if you want to spoil a person, you give him everything, but if you want to help, you give him the tools. My trees are a tool of the future. When I teach an African to plant a tree it is something totally new to him. He will say to me that only God plants trees, because the Africans have no tradition to plant trees. But they soon realize that trees are useful. Of course we only grow trees that bear useful fruits, and we teach the Africans to utilize the fruits by making jam and by drying them and rapidly they become important in the family household. It is a kind of permanent agriculture where you do not need to sow every year. And this is important in Africa right now because trees are the only vegetation that can prevent soil erosion and the spreading of desert.

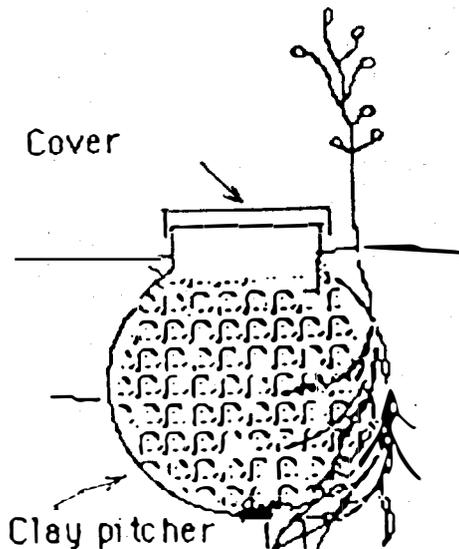


R.T. Mazibuko planting a tree with children at the North American Bioregional Conference I (NABC I) in Missouri, May, 1984. Photo: Guy Baldwin.

Pitcher Irrigation

David A. Bainbridge

Figure 1. "...make 53 pits in one tenth hectare, each pit 70 cm across and 10cm deep. To each pit add 18 kilograms of manure. Mix the manure well with an equal amount of earth. Bury an earthen jar of 6 liters capacity in the center of the pit, let its mouth be level with the ground. Fill the jar with water. Plant 4 melon seeds around the jar, Cover the jar with a tile. Always fill jar to the brink if the water level falls." Fan Sheng-chih Shu. (The book goes on to describe interplanting onions or beans with the melons and suggests the probable profit, 90,000 cash.)



Editor's note: This article has been published as Working paper #1 by the Dry Lands Research Institute, University of California, Riverside, Riverside, CA 92521, August, 1986 (3rd rev., May, 1987)

Although the majority of the world's dry lands are still farmed by small scale, subsistence farmers, small scale, low cost, simple methods of irrigation for dry land agriculture have been ignored in favor of large scale, expensive, and complex systems. The needs of these farmers have been neglected and the traditional systems that could be of great use to them have not been well studied or publicized.

The pitcher or clay pot method is one of the more effective systems for small scale irrigation. This method has been shown to have higher water use efficiency than drip irrigation but more experimentation is needed to help farmers match pitcher surface area and porosity to different crops, climates, and soils.

The use of pitcher irrigation in China is described in the book Fan Sheng-chih Shu (about 100 B.C.). Current practices are virtually identical (see figure 1).

It is likely pitcher irrigation had been used for some time before this description was published. Pitcher irrigation is now used on a small scale in the dry lands of India, the Middle East, and Latin America. This method would probably be used more widely if farmers and gardeners were aware of it. It may also prove of value for landscaping and growing vegetables or flowers in containers.

Pitcher irrigation uses a buried, unglazed earthenware pitcher or pot filled with water to provide controlled irrigation to plants near it. (Standard clay garden pots are suitable for use if the bottom hole is plugged.) Pitcher irrigation is effective with both annual and perennial plants. Pitcher irrigation can allow crops to be grown in saline soil where conventional irrigation would not work, and has been shown to provide a better environment for root growth than drip irrigation in these difficult soils. Pitchers are also likely to be of value in very coarse sand or gravel where it is difficult to hold water in the plant root zone. Experiments in India with tomatoes suggest that pitchers may also be valuable when irrigation with saline water is necessary. Tomato yields were high with saline irrigation water, EC 10.2 mmhos/cm.

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Up to now we have planted 21,000 (as of June 16, 1986), that is 21,000 families, who have been taught how to help their neighbours to plant trees. This has caused a great demand for trees. Only in May, June and July this year we have received applications for 6,000 trees. But we have got no money and before we find somebody who will finance us we are not able to buy those trees.

Now, another objective of mine is to teach the young boys and girls of the rural areas. It is another way of helping the Africans, because these young people who can neither read or write but who have the skills to plant and graft and make trees grow, they have the possibility to give something to their communities which educated boys and girls cannot give. I have found this system to function very very well.

I give a three month's course, where the young people can come and learn, but unfortunately I have too little room to give them accommodation during that time, boarding nor lodging. At the moment I am trying to find nurseries in Europe who will apprentice some of our young people and train them in the art of growing trees, that they may learn the skills: the budding, the grafting, the layering and the sowing of seeds. Europeans are very good at this - they have been growing trees for 2,000 years and we are just a 100 years out of the dark. Therefore we need their skills, but not their technology. Their

technology is confusing, because it is too advanced. We want to start with our own technology, but with the art of the white people of Europe. So if I succeed to find a place, a farm or nursery that will teach these young boys even for a year I shall be satisfied in that in 10 years time the black people of South Africa, who number 25 millions, would be free from hunger, from malnutrition and from other diseases that are a result of not having enough food to eat.

Anybody who is going to help the Third World must go and improve what the Third World's people are doing already, but he must not impose anything, since the imposition is like a man, digging a grave to bury his own father. If you want to kill the people of the Third World, go and impose your methods. But if you want to help, go and help with what they are doing and give them the tools of progress. In this way we will be able to strafe out starvation and diseases, because then they will work with you. But if you come flying in an airplane, they will of course be hiding all the time, because you are like a hawk, you are like an eagle coming to pick chickens."

Mr. R T. Mazibuko
AFRICA TREE CENTRE
PO Box 90
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South Africa

Reforestation of the World: A Permaculture Perspective

continued from front page...

By Michael Pilarski: Friends of the Trees Society

Foreword - September 1, 1987

Viv Ilo Veith, the new Executive Director of PINA, recently commissioned me to write an article relating to trees for The Permaculture Activist. The ensuing article was written hastily, and I have not had time to look up much data that I would like to include. In the next issue of the Activist I hope to continue this article and cover additional topics such as: What kind of trees to plant; Trees for whom; Who makes the decisions. I'm also planning to expand and improve this article in my next Friends of the Trees Yearbook which I hope to have completed by February, 1988.

The foci of the Yearbook will include world reforestation, arid/semiarid lands, international volunteer placement services, horticultural education opportunities, plant species indexes, resources for medicinal herbalism, as well as the usual sections on seeds, native plants, fruits, etc. Pre-publication price is \$5.00.

Editor's note: Michael (Skeeter) Pilarski has been a central figure in Friends of the Trees Society since its inception and edits several publications including the Friends of the Trees Yearbook, and the Actinidea Enthusiasts Newsletter. The Yearbook is an invaluable source of information on the subject of reforestation, permaculture and numerous other global concerns. Copies of the 80-page 1986 Yearbook are still available for \$4.00 from: Friends of the Trees Society, PO Box 1466, Chelan, WA 98816.

Drawing by Jeffrey Hall, for The Permaculture Activist. "The Earth as our central home, this sketch represents the diversity of plant life that blankets her skin. The present balance (or imbalance) of things is held by the hands of humankind."

How can Permaculture Design Contribute to World Reforestation?

- Permaculture design is a whole systems approach synthesizing many techniques.
- Permaculture is site-specific and culture-specific design.
- A major goal of Permaculture Design is to maximize beneficial symbiotic relationships in the system.
- Zonation concepts & Sector planning.
- Permaculture emphasizes an understanding of plant inter-relationships.
- A reliance on trees and perennials and frequent use of native plants is emphasized.
- Stacking (multiple story production) is frequently utilized.
- The international permaculture network forms a hardworking core-group of dedicated individuals and groups sharing a commitment to sustainability.

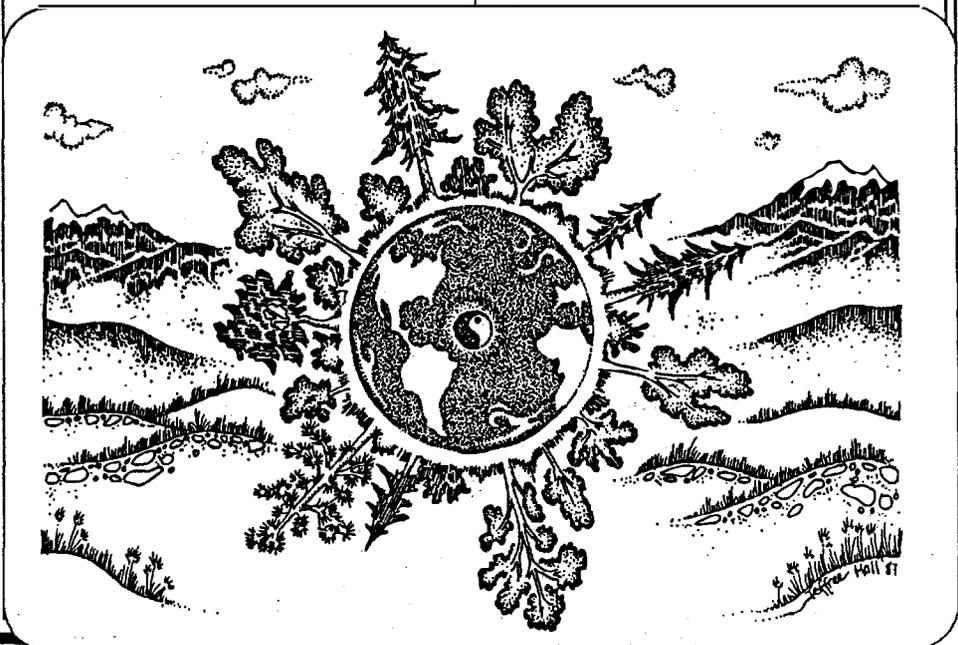
Forests and the Global Carbon Cycle

Climate experts disagree on how the world's climate is changing although most agree that Carbon dioxide buildup in the atmosphere is a driving force behind dramatic changes. Some say it will get warmer and the polar icecaps will melt and

flood present coastlines. Others (most notably John Hamacker, author of The Survival of Civilization***) say an ice-age is upon us and that things will get colder in the temperate latitudes. Hamacker says the earth will heat differentially and that the extra heat at the equators will lead to increased evaporation, hence greater cloud cover and precipitation in the higher latitudes - creating continental icecaps. Whether you favor global warming theory or ice-age theory, both schools of thought say that the best chance humanity has to lower CO₂ levels in the atmosphere and to stabilize climate favorably for humanity is to plant massive numbers of trees.

The reason we plant trees to stabilize the climate is that forests are the Earth's primary mechanism for storing carbon away from the atmosphere. The amount of carbon tied up in living and dead plant matter (as sugars, carbohydrates, proteins, oils and other organic molecules) is much higher than what is actually in the atmosphere. "The terrestrial vegetation and soils, largely the forests, contain at least 2,000 billion tons, (of CO₂) about three times the amount in the atmosphere" (George M. Woodwell, director of The Woods Hole Research Center).

** The Survival of Civilization is available from Yankee Permaculture, c/o Minot Weld, RD 2 Box 235, Ovid, NY 14521. Cost: \$12.00 + 10% Postage & handling



Part of the reason for atmospheric CO₂ buildup is the burning of fossil fuels. Another is the release of carbon into the atmosphere by the destruction of forests, plants and humus.

The Earth has now only about 35% of its prehistoric forest cover. Human-caused destruction and degradation of forests over the past 10,000 years has released large amounts of carbon into the atmosphere. After hundreds of years even snags and stumps break down and release their carbon. Temperate forests also contain huge amounts of carbon stored as humus in the soil. Dead forests mean no thick layers of humus and this carbon returns to the atmosphere.

Overgrazing, mining and other human induced changes in shrublands, grasslands, and deserts (so-called) also decrease the amount of plant life in non-forested parts of the earth with a consequent loss of associated humus. This represents another huge chunk of carbon returned to the atmosphere.

Agriculture often results in a draw-down of the humus levels of the soil with eventual erosion and exhaustion of soil productivity for agriculture and biotic life. Since the advent of chemical fertilizer, farmers have less reason to build-up or conserve soil humus.

Destruction of forests, grasslands, and soil humus has greatly increased over the past few hundred years during the industrial era. Our karma is being reaped as the CO₂ we have released into the atmosphere increasingly alters climate and weather patterns around the world.

The way to reverse this process is to begin to tie up the carbon in the atmosphere again by replanting our forests; increasing plant cover in all parts of every continent; building up humus levels in agricultural soils; and by switching from fossil fuels to solar, wind, and biological power sources.

Trees to Feed the World

A vast majority of the world's people are not receiving an adequate diet. Millions starve to death each year. Many are chronically hungry. Many are malnourished from lack of quantity and quality of food. Even the world's so-called "privileged" elite who have plenty of money to buy food are consuming processed, de-vitalized food with poor mineral content and laced with pesticides, additives and other poisons.

Tree crops are one of the best hopes for feeding the world. Tree crops do not need soil tillage every year. Much less energy is needed to support a tree crop agriculture. Many tree crops can be eaten raw or cooked with a minimum of fuel. The human digestive system evolved to eat a diet primarily of fruits and nuts. Few serious students of diet would dispute that tree crops could provide a much larger percentage of human diet than at present. Fruits provide carbohydrates, sugars, vitamins, minerals. Many of the nut trees provide high quality protein. Nut trees as well as oil palms, olives, lindens, and many other trees produce oils which will substitute for our annual oilseed crops. Other trees produce food comparable to

grain crops - chestnuts, acorns, and breadfruit. The leaves of many trees can be eaten, providing people with the equivalent of salad greens and vegetables (although not many temperate zone trees have edible or palatable leaves, many tropical trees do.)

By changing to an agriculture based on tree crops we can provide all the food types we need: oils, sugars, proteins, starches, carbohydrates, minerals, vitamins, enzymes, etc. We can do it with much less energy expended.

The Example of India

Take a look at India. Their diet is based on rice, grains and pulses, all of which require a lot of energy to produce and to cook. As a result of fuelwood harvesting, India has deforested its landscape to cook its food. Since the forests are gone, people now use most of the livestock manure to cook the food - thus the land goes hungry for fertilizer and can't produce good yields or nutritional food.

India has gotten itself into a downward spiral and its only hope is to use the resources left to reforest the country. One of the biggest resources they have going down the drain is their own shit. The whole country is awash in its own wastes, resulting in much disease. This wasted fertilizer has to be put back into the soil, not the water systems. First, it should be processed in biogas generators to produce methane.

In the underdeveloped countries much of the human waste is deposited directly onto the soil or the streets. However, the developed world's sewage treatment system is not much better. The flush toilet is one of humanity's biggest mistakes - it wastes clean water and valuable fertilizer.

If India would switch to a diet based more on tree crops and involving less cooking they could solve many of their problems. If they were meticulously careful about their own "manure" then they would have less need to cook everything in order to make it safe to eat because of the large numbers of pathogens in the water and in the food.

Now this isn't just to pick on India, since much of this could be said about most Third World countries and much of it applies even to our so-called "modern" countries.

continued, next page...

Tree Culture - Curtin Mitchell

Editor's note: this is a short excerpt from Permaculture with Native Plants Network Newsletter #6, ©1987 by Curtin Mitchell. This publication is available for free from Permaculture with Native Plants, Box 38, Lorane, OR 97451.

Planting trees is planting a community. As the tree provides shade and protection from the wind, it allows other plants to grow under them. As the tree provides perches for birds, the birds provide seeds. In addition to the nurse functions, trees also may be allelopathic (the inhibitory effects of one plant on another by the secretion of toxic substances.) So we must be most thoughtful and careful about trees. Trees not only live a long time but determine the character of the plant community.

The function of trees and other long-lived perennials is little understood but new information is becoming available. In the last few years the importance of mycorrhizal fungi on the roots of many plants has been documented. They are especially important in nutrient availability and drought tolerance. The importance of the smallest (fungi spores) to the largest (trees) provides another example of how interconnected everything is. It has been suggested that 80% of the terrestrial plants have mycorrhizal symbiotic relations with fungi.

How many trees would it take to reforest the world?

Well, we can't plant trees everywhere since some areas are not suitable, plus we'd like to keep a few views open, however, estimates are that forests presently cover from as high as 10 billion acres (FAO) to under 2 billion acres (John Todd). Forests once were the climax vegetation on somewhere between 35% to 45% of the earth's surface depending on what expert you are talking to. The Earth's surface is 33 billion acres excluding Antarctica.

Asia	16,500,000 sq. miles
Africa.....	11,850,000
North America	9,124,000
South America	5,894,000
Europe.....	4,129,000
Australia.....	<u>2,974,000</u>
Total.....	50,471,000 sq. miles

What percentage of the Earth is presently forested?

We would be well advised to take the official figures from any country with a grain of salt. Take for example India, which had to drastically revise downward their figures estimating forest cover when satellite photos were studied. Reporting a higher forest cover percentage than actually exists allows government forest managers to justify higher forest cutting rates. There is also quite a difference between fully stocked forests (closed canopy) versus degraded forests, open forests, parklands or savannas. Much of Africa's "forest land" is actually a thin scattering of scrub with a very small percentage of the ground under tree canopy. In the United States, much of what is classified as forest land is, in actuality, non-forested for one reason or another - usually because regeneration or reforesting after logging was not effective. Much of what is currently classified as forestland in the world actually needs reforesting and much of the world's forests could be increased in density by planting.

Assuming that 50% of the world's land surface is capable of supporting some sort of tree cover we could conceivably have 16 billion acres with trees. To fully accomplish this task would mean planting trees on somewhere between 7 and 14 billion acres. In this proposal, I will choose a goal of reforesting 8 billion acres.

How many trees would it take to reforest 8 billion acres?

The number of trees planted per acre varies a great deal depending on site. In some arid regions you might be happy to get 10 trees to the acre. Reforestation acreage in the Pacific northwest of North America is commonly planted at 300 to 800 trees per acre. The following chart gives you some idea of number of plants planted at different spacings.

Spacing	Plants per acre
3 ft. x 3 ft.	4,840
6 ft. x 6 ft.	1,210
8 ft. x 8 ft.	680
10 ft. x 10 ft.	435
12 ft. x 12 ft.	302
15 ft. x 15 ft.	193
20 ft. x 20 ft.	108
30 ft. x 30 ft.	48
40 ft. x 40 ft.	27

Most older orchards in the Pacific Northwest were planted at around 200 trees to the acre. Recent dense plantings of dwarf and semi-dwarf apples are planted at 500 to 1500 trees to the acre.

The Millions of Trees Club in India advocates planting a million trees per village in India. At 1500 trees to the acre a million trees would cover 666 acres. This density isn't required in many places.

If we plan on an average of 400 trees to the acre to reforest 8 billion acres that would be 3200 billion trees. If we take 5 billion people as the worldwide population that would be 640 trees per person. Theoretically if we could get each human to plant 64 trees a year for 10 years we could replant 8 billion acres at 400 trees to the acre. Of course we can't get everyone to plant trees. But it won't take too much of a tax per person on those who are unwilling or unable to plant trees to pay for the planting.

How much does it cost to plant trees?

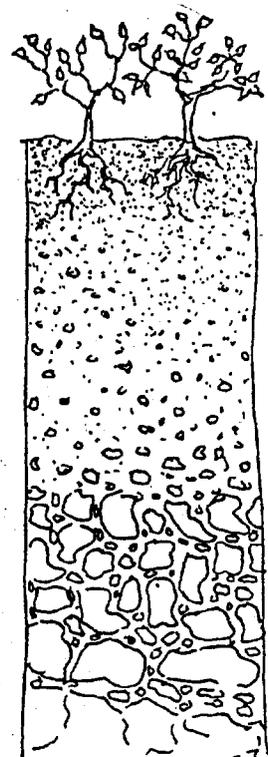
The cost of planting trees varies depending on the harshness of the environment and also depends a great deal on how much protection or follow-up care is needed for successful establishment. It doesn't do much good to plant a million trees if 90% of them die. Establishment rates for most large-scale plantings on U.S. Forest Service (USFS) lands are from 70% to 95% (with no protection).

It costs the city of Los Angeles, California \$100 to plant and protect each street tree. They use older, expensive

stock, and give them good protection and follow-up care for this price. On the other end of the scale are people like the Boys Town Trust in India who are growing out, planting and tending trees for under 25¢ per tree. It currently costs the USFS 50¢ to \$1 per tree, including nursery production and planting out.

Cost depends a lot on the size of the tree. And, of course, grafted trees cost more. Grafted fruit trees in the U.S. presently wholesale for between \$3.00 and \$8.00. Most small seedling trees wholesale for between 10 cents and \$2.00 each, depending on the species and ease of propagation.

In many parts of the world the highest cost for successful tree establishment is not in growing the tree or planting it. The highest cost is protecting the tree. Livestock is the greatest threat to newly planted trees over much of the world including such critical areas as the Sahel [regions bordering the Sahara] and India. Stout cages have to be built out of thorn bushes and/or wire. In some places trunk screens are needed for small rodent protection and in others an underground barrier to must be used to stop burrowing rodents. And then there are locusts and other insects.



Soloman Teklu

Cost also depends on how much follow up tree tending is necessary for successful tree establishment - including irrigation, weeding, mulching, cultivation, fertilization, etc.

How much does it cost to actually plant the tree? In the U.S., professional tree planters are paid as little as 3¢ a tree or as high as 50¢ a tree depending mainly on the difficulty of the terrain and the size of tree. In the southeastern U.S. the most common tree planting pay is 3¢, 4¢ or 5¢. Serious tree planters there strive to plant 2,000 to 4,000 trees a day. The ground is generally fairly level and often sandy. Trees are small, spacing is close, and they can be planted fast.

In the Pacific Northwest, pay ranges from 10¢ to 50¢ a tree. Seldom is it over 25¢ a tree but for soddy sites or other especially difficult planting terrain the price per tree can be more. Tree planting conditions are generally more difficult

than in the southeastern states because of mountain slopes, brush, slash, rock, sod, difficult access and other complications. Inspection is also usually more demanding than in the Southeast.

So, we see there is a wide range of costs for tree establishment in different parts of the world. The cost of living and hence labor costs are cheaper in third world countries. If we took \$1.00 a tree as an average cost for tree raising, planting out, protection, and tending for several years it would cost us \$3,200 billion (\$3.2 trillion) to reforest 8 billion acres. This is affordable since the world military budget is currently running in excess of \$600 billion a year. Five and half years of the world's military budget would pay for the 8 billion acres of effective worldwide reforestation.

What percentage of the world's population is in the armed forces or civilians directly involved in military support work, munitions manufacture and the like? My guess would be somewhere between 2% and 5%? Has anyone got more accurate data on this?

How many tree planters would it take?

Hopefully a large percentage of humans will take part in planting trees, even just one, or ten a year. But we also could use many more professional tree planters.

Tree planting is generally seasonal work since environmental conditions are usually only suitable for tree planting for relatively short periods of the year. This is especially true in temperate regions where dormant stock has to be used. In many areas, tree planting has to be timed to coincide with rainfall periods.

Professional tree planters in the U.S. can plant up to 5,000 trees a day. For instance, a friend of mine, Pepper Goldsmith, planted 400,000 trees himself during the winter season of 1986/1987 in the Southeast U.S. It is not unusual for hotshot tree planters who stick it out for many seasons to be able to brag of planting a million trees.

Henry Converse, who received the prestigious Milo Gibson award in 1987 from the North American Fruit Explorers, has personally planted over a million trees mainly on public lands in his vicinity. Few non-professional tree planters can boast of such a number.

Of course, even a hotshot planter can only plant a small number of trees a day in such harsh sites as arid areas where utmost attention has to be given to siting, planting techniques, mulching and protecting such as might be necessary in the Sahel - allowing only 100, or 50, or even fewer trees to be planted in a day there. And if a planter was digging 4 foot holes into rocky talus slopes and backfilling with imported soil they might only plant 10 trees or less a day.

Let's take 400 trees a day per tree planter, and a 60 day planting season as worldwide averages. Thus each seasonal tree planter will plant an average of 24,000 trees each season. If our goal is to plant 160 billion trees each year for twenty years it will require the services of

continued, page 21, right column...

Fuelwood - A Burning Question? - or Compost Pile?

John Hamacker and many other people who advocate changing from fossil fuels to wood fuels most commonly talk of burning the wood to produce energy. Combustion of wood releases the stored carbon right away, producing CO₂ gas as an undesirable byproduct just as with fossil fuels.

Another way to produce energy is to shred the woody matter and compost it. During the breakdown process, energy is released as heat and/or methane, both of which can be readily utilized. The woody materials are "slow burned" by the metabolic processes of the microorganisms. After the energy is extracted, what is left is a carbon-rich, humic fertilizer which can be used for agriculture or reforestation - sort of like eating your cake and keeping it too. You get the energy but the carbon is still tied up. Composting of non-woody plant matter is fairly well known but usually the energy released is not captured for human use. Composting with woody matter is less well known.

Some of the best work in this area was done by Jean Pain, a Frenchman, as outlined in his book *Another Kind of Garden* (See *Friends of the Trees Newsletter* #8, pp. 6-7). Pain developed shredders which were much superior to any other chipper/shredder/hammer mill available in Europe or North America at the time. His machines used counter rotating hammermill blades to shred the woody material into thin strips which are much easier for microorganisms to break down quickly compared to thicker "chipped" material. Although the equipment developed by Pain could handle large diameter branches it could not shred whole tree trunks - technology for shredding larger diameter wood most likely will be developed.

Although I agree that humanity should switch over more to wood energy, I would recommend that we base it more on small diameter wood and utilization of compost systems. I would also argue for many small wood energy systems rather than big, centralized systems. There are now giant, wood-burning power plants that generate electricity by burning low value wood wastes. If humanity went hog wild on this sort of thing they could shove our remaining forests into the maws of giant wood power plants to fuel our urban industrial centers with electricity for a few more frantic decades. Planting forests for industrial power sources is likely not to help much. We need to rethink our industrial mentality rather than plant trees to prop up our present insane, technological machine. Compost piles can fuel a decentralized, earth-based, humane, production system.

The Integration of Forage Trees with Agriculture and Stock Raising

Marc Bonfils

Editor's note: this article has been condensed from a paper by the same name and another entitled "Fodder Trees in Temperate Climate" both copyright ©1986 by Marc Bonfils and Association las Encantadas, Address: Ferme la Garrigue, 11300 Festes St. André, France.

In olden times, herbivores with horns (cattle, sheep and goats, etc.) were not only pasture animals but also forest animals, feeding on the leaves of trees and bushes as well as grass. Long ago, especially during Neolithic times, in all of Europe where prehistoric agriculture was practised, the forests and field forests were used as summer grazing while providing shade. During the hottest periods in pastures reduced to dry straw, as soon as the grass became too hard, too sparse and lacking in digestible nitrogenous matter (DNM) the livestock would eat a maximum of leaf forage rich in DNM from trees and shrubs.

South of the Mans in the Belinois up until the 1960's you could still see a lot of oak and elm trees in the middle of pastures and cultivated fields, living proof of the ancient agriculture economy, but they have since all been pulled out because they cannot be reconciled with mechanized agriculture. Nevertheless, we could consider planting fodder hedges which would be exploited by nibbling in dry years. Hedges and trees resist the hot weather much better than grass because of their deep root systems.

Leaf fodder can be very useful for eking out hay reserves during winter. Thus elm leaves were sometimes collected into dryleaf faggots for sheep and goats in the Massif Central and Italy. Finally, forage trees can serve as a reserve fodder with a view to filling a gap in summer, as well as emergency pastures in case of heavy droughts. Nothing is more uneconomical than cutting hay in spring only to feed it to the livestock in summer.

The exceptional richness of fodder leaves from the better species compensates partially or even completely for their lack of digestibility: indeed, these leaves can contain as much as 18-20% nitrogenous matter, which gives a nutritional value of complete nitrogenous proteins almost twice as high as clover or alfalfa. However, proteins in clover and alfalfa are much better reabsorbed by cattle than those of tree leaves.

The dried leaves and ramifications of ash trees were traditionally used as reserve winter fodder in the mountains of Laucaune where the goats throw themselves at it and seem to prefer it to hay. The leaves and ramifications of beech, poplar (except black poplar which is toxic) hazelnut, (*Sorbus Aucuparia*) elder, Silver birch, linden, fig and tree lucerne (*tagasaste*) have sufficient nutritive value as well as being quite appetizing.

Although the nutritional value and digestibility of tree leaves varies with different species, some species give fodder of high nutritional value which is particularly appreciated by cattle. Examples include elm, mulberry and elder which furnish the best leaf forage in our latitudes. Similarly, carob trees in mediterranean regions, ash, *Robinia pseudoacacia* (black locust), and

European marine gorse also give forage of excellent quality. *Robinia* leaves have a nutritional value comparable to dehydrated alfalfa flour... and the flowers are an excellent nutritional product for humans. *Robinia* also improves sandy acidic soils rapidly, partly because of the presence of nitrogen-fixing rhizobium bacteria, and partly because its deep roots bring chalk up from the sub-soil after dissolution of the bedrock - thereby increasing the pH. The ashes of *R. pseudoacacia* can contain up to 75% chalk.

Unappetizing and toxic tree leaves

The leaves and small branches of willow, alder, chestnut, horse chestnut and olive trees are difficult to digest, unappetizing and only suitable for sheep and goats. Olive trees give a very bad taste to the milk of ruminants. Coniferous needles are absolutely undigestible and unappetizing. Black poplar leaves are toxic. Walnut, laurel, pink laurel, goldenchain laburnum, *Cytisus scoparius* (scotch broom), yew and box leaves are very poisonous for animals and humans.

Oak leaves and acorns as animal feed

Oak and evergreen oak leaves are just about OK for sheep and goats but used only in very small quantities for cattle because they reduce the milk production in cows and their high levels of tannin and astringence are toxic. In fact, oak leaves should only be fed to dry sheep and never to milk producing animals. Nevertheless, oak acorns are good for livestock because of their richness in feed units at the end of autumn and during winter. This is the time when lack of sunshine and the migration of carbonized reserves towards the roots causes the graminiae (grasses) to lose energetic value, so that supplementing with forage containing lots of feed units is beneficial. But large quantities of acorns given to cows brings down their lactation level. Acorns should be considered a complementary food, not a base food.

Acorns as human food

Our neolithic and gallic ancestors gathered sweet acorns for their own consumption (sweet acorns are used in the same way as chestnuts). Oaks producing sweet acorns (evergreen oaks, such as *Quercus ilex*) and *Balotta* are forest trees in the Mediterranean region and are not very demanding on the soil. continued, next page, left column...



Sheep feeding on a limb cut from Tagasaste (*Chamaecytisus palmensis*) in New Zealand. Photo: Guy Baldwin.

Sweet acorn evergreen oaks (yeuse) are cultivated in orchards as well as in the middle of plowed fields in Sardinia. Ordinary evergreen oaks and cork oaks produce acorns that are too rich in tannin and burn the stomach. These acorns are normally reserved as winter fodder. They are only eaten by humans when food is scarce

Coltura promiscua

In the Emilian Romagna Hills (in northern Italy) the "coltura promiscua" ** also integrates fodder trees within its very intensive agropastoral system. It has the reputation of giving the best yield per hectare in all of Italy. Fields of "coltura promiscua" are often cultivated under cover of forage tree parks consisting essentially of elm, maple and a few ashes. The trees are regularly pruned so as to leave only the top branches. They are grown in mid field to serve as live stakes for climbing grapevines (trained in lines between the fodder trees). They are also associated with companion cultures such as cereals or broad beans or chick peas and all sorts of vegetables or even with fodder such as alfalfa.

In this way the Kabylie of Djurdura (in the country east of Algiers, Algeria) keep their cows on land covered with ash leaves in the summer. Pruned every 2 to 3 years, the ash trees, with straw from cereals and weeds (pulled out from fields and dried) guarantees the summer feeding and furnish the main nourishment for the animals during for three months. In autumn after the fig harvest, fig leaves take their turn in the forage chain. Blackberry leaves provide an even better leaf forage than fig or elm.

The Kabylie civilisation is essentially arboreal. They practise an agro-silvicultural system which integrates annual cultivation and tree culture; the majority of cereals are planted between olive, fig and elm groves. The long yoke enables animals in pairs to plow even the steepest slopes. Winter cereals (wheat and barley associated with lentils and chickpeas) are planted between the trees in the orchard and fodder trees.

Broad beans and summer cereals, especially sorghum, are also cultivated there.

Contrary to what most people think about forage tree parks, when the species are carefully chosen, they do not compete with other cultivated plants, either for water or fertilizer: the old theory concerning the exportation of fertilizing elements by plants which dates from the end of the last century should be reconsidered. In fact, a lot more fertilizing elements are lost through erosion or leaching and a lot more water is lost through runoff or evaporation, than through plants.

** the *International Permaculture Journal*, Issue #15, Feb. 1984 has an article on Coltura Promiscua, and Issue #16, May 1984 has an article entitled "Permaculture in History", that covers this same subject.

Reforestation of the World, continued from page 19...

approximately 66 million planters for two months each year - or one person out of every 76 people in the world. Probably a third of the human race is presently unemployed or underemployed, so available labor is certainly not a problem. Raising, planting out and tending for new trees will create numerous productive jobs.

Where to plant the trees?

Trees need to be planted in every part of every country. The potential number of trees which could be planted (per area of land surface) is greater in countries with a low level of forestation (such as India, England and Australia) as compared to countries such as Brazil, Sweden, and Canada.

The percentage of each country that can be afforested depends partially on what percentage of the country is capable of supporting trees. For instance, we are unlikely to push the polar timberlines or mountain timberlines above their present levels. Aridity, salinity, alkalinity, presence of avalanche chutes, and bedrock at or near the surface are some of the other factors which delineate places where trees cannot grow. However, there are such a wide range of tree species with so many forms of adaptation that we can successfully establish trees in many places that few would believe capable of afforestation.

Arid and Semi-Arid Lands

The Earth can be divided up into various rainfall zones such as humid, semi-arid, arid, and hyper-arid. Our greatest opportunity for increasing percentage of world forest cover over the long-term may be in the semi-arid zone. Much of what is now classified as semi-arid was subhumid before human intervention and supported a much greater tree cover.

One-third of the Earth's land surface is semi-arid or arid. Methodologies for ascertaining which sites in arid and semi-arid areas will support trees, and techniques for successful tree planting do exist and must be greatly expanded upon and refined as we begin to put more energy into tree planting in these regions. In *Friends of the Trees 1987-1988 Yearbook I* will be reviewing an extensive bibliography of references on reforestation and agriculture in semi-arid and arid regions (I hope to have this available in February, 1988).

Humid Lands

Reforestation is much easier in humid climates. This is where we can likely make the most rapid progress in increasing tree cover - in both developed and developing countries

Much of the world's population lives in humid regions in high population densities, notably Europe, eastern Asia and eastern North America. These areas have large pools of labor available in relation to the area of land on which it is desirable to plant trees. Abundant rainfall means that it is fairly easy to establish trees. It would not take many years in humid areas to achieve optimum forest cover given a widespread desire to plant trees - with far-reaching benefits of climate stabilization, soil conservation and resource production.

Most of the world's humid zones are presently forested or were historically covered by forest. In some parts of the world such as the tropics or the Pacific Northwest rainforest it is a

continued, next page...

constant task to keep the forest from recolonizing cleared ground. In these parts of the world reforestation would simply require letting the area naturally reseed and grow up to trees.

Swidden (slash & burn) agriculturists have made use of this natural process for millenia. The Earth can stand some swidden agriculture, but presently it is way out of hand. Population pressure has led to a reduction in fallow periods -beyond the ability of the land to recover. But, we can't very well tell 90% of today's swidden agriculturists to go off somewhere and die so we can increase the % of forest cover in their region. Permaculture offers a way to feed all the people and get back the forest cover in these regions. Instead of swidden based on annual crops, multiple story permaculture systems can enable multiple harvest of crops - from upper-story trees, middle story trees and shrubs, as well as low growing plants.

Cities

Cities should be great mounds of greenery -- marvelous hanging gardens of Babylon -- highly productive providers of food ... rather than the concrete jungle hells so many of them have become.

Every parking lot should have an overstory of trees. Every pole and vertical building wall can support trellised vines or espaliered fruit trees. Every window can have a windowbox garden. Even tall buildings could be covered in vines by hanging out vine windowboxes every few stories.

In the U.S. too much area is devoted to lawns. It is said that more fertilizer is used on lawns in the U.S. than in agriculture in all Third World countries combined. Bill Mollison speculates that city suburbs are the areas that could most greatly increase world food supplies. The fertilizer is already used there (mainly on lawns and ornamentals) and irrigation systems are already in place. There is a sufficiently high population level for intensive culture. Front and back yards, waste areas and edges provide a sufficient land base. All that is needed is the vision and a redirection of suburbanites labor - to spend less time working to bring in money to buy food and material goods, and more time growing their own food and materials. Gardening is a pleasurable occupation and would fulfill some of the time suburbanites spend on recreation. There would be less need to escape the city, since the city surroundings would be so much more beautiful and livable.

If cities become the food producing systems they are capable of then there will be a consequent reduced need for food production on farmland outside of the city. This will allow more of the world's marginal farmland to be returned to forest. The greening of our cities will mean that we can have more wilderness too.

Reforestation Cropland

One source says that worldwide cropland totals 4.25 billion acres or 8% of the earth's land surface (this figure seems too low to me. Other sources?). Much of this agricultural land used to be forests and most all of it could support tree cover if replanted. Here is another large area of opportunity for planting trees.

It would not surprize me to find that we could plant half of our agricultural land to trees without reducing food output. This implies that we have to improve yields on the agricultural land we keep in non-tree crops. One way to plant trees without

reducing food production is to base more of our agriculture on tree crops: fruits, nuts, oil palms, etc, etc. Another way is to plant extensive systems of windbreaks, and shelterbelts throughout our agricultural areas. This not only increases tree cover but the windbreaks increase food production in adjacent fields by slowing wind, slowing evapotranspiration, increasing rainfall, decreasing soil erosion, as well as providing other benefits. Trees can also be planted along roadsides, along canals, along fencelines and around homesteads and villages such as in the "Four Along" tree planting movement in China. In all these ways food production can be increased at the same time we are planting trees.

If we can increase food production in cities and increase crop yields with permaculture methods, then we can reforest substantial acreages of marginal farmland. Here we are talking about forests managed primarily for timber. Already in the U.S., some of the land taken out of production under the new Conservation Program is planted to trees. Taking farmland out of production and reforesting it is a policy presently under consideration in the E.E.C. (European Common Market).

To be continued in the next issue of *The Permaculture Activist*..

A Few Statistics

- "It is estimated that there are about 100 million hectares (250 million acres) of newly-created forest in the world and that this figure will be doubled by the end of the 20th century" The Oxford Encyclopedia of Trees of the World, 1980.
- "Each year, about 12 million hectares of forests (an area almost the size of England) are being eliminated from the face of the Earth. Almost all of this deforestation occurs in the moist forests and open woodlands of the tropics. We are also witnessing the degradation of at least a further 10 million hectares of forest a year, again mainly in the tropics, especially the humid tropics. (A degraded forest is one which has been grossly disrupted, leaving behind an impoverished travesty of true forest.)" Gaia, An Atlas of Planet Management, 1984.
- "Of the \$6 billion of foreign aid in the late 1970's sent to the Sahel only one percent went to forestry programs and only 3 or 4 % went to traditional grain-growing agriculture." *ibid*
- "In 1950, 30% of the land was covered by forest, half of which was tropical forest. By 1975, the area covered by tropical forest had declined to 12%. By 2000, we shall be lucky if tropical forests cover 7% of the land. This decline contrasts markedly with temperate forest, whose area remains constant around 20% (thanks to reforestation)". *ibid*.



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Letters

Editor's note: We welcome your letters on any subject of interest to other permaculture activists. We prefer to print concise requests for specific information on plant material, animal husbandry, appropriate technology and any other sort of permaculture practice, or issue of global concern.

As you read through these letters, you will find that many of them contain unanswered questions. Please feel free to correspond with the writers (and send us a copy of the letter if you have good answers to the questions posed). In this way we hope to increase communication and effective problem solving among our members and readers. Thanks for your help.

Dear Editor:

I was delighted to see in the August, '87 *Activist* your pickup of materials on genetic erosion by my friends at Sahabat Alam Malaysia [SAM].

I recommend to readers of the *Activist* that they consider a wide range of publications available from SAM. (copy of price list available from Yankee Permaculture, c/o Minot Weld, RD 2 Box 235, Ovid, NY 14251, USA - please send SASE). We have a large supply of SAM order forms which we distribute for them in appreciation of their good work (and to save SAM the postage).

Yankee Permaculture distributes Rights to Our Genetic Resources by SAM for \$1.50. We also use in our design courses SAM's Seeds and Food Security. This is undoubtedly the best compact work on the genetic erosion situation I've seen - absolutely outstanding. We'd like to distribute that also - we are looking for money to buy a quantity from SAM.

Incidentally, the first 500 pre-publication subscribers to: Solutions 1988: The International Permaculture Species Yearbook (price: \$15.00), will receive a copy of Rights to Our Genetic Resources as a bonus.

Sincerely,
Dan Hemenway, Editor and Publisher, TIPSy, New address: Yankee Permaculture & TIPSy 40A Brooks St Worcester, MA 01606

P.S. Due to my extensive schedule for teaching on the road in 1987, there will be no 1987 edition of TIPSy.

Plant A Tree In Africa

Dear Sir or Madam,

This is to inform you that "Plant a Tree in Africa" has been set up as a registered British Charity.

Our aim is to collect information on grass-roots, social forestry projects in Africa and subsequently to raise funds and seek co-financing for such projects.

Ms. Vanya Walker-Leigh, Vice President for External Relations
Plant A Tree In Africa
120 York Road
Swindon, Wilts. SN1 2JP
England Tel: 0793 32353

Does Anyone Know.....?

Editor's note: We get a continual stream of questions at PINA that we just don't have the resources to reply to. In this column we'll print some of these questions. If you think you can help with answers, please write to the "asker" directly, and send a copy of your answer to PINA. In each issue we'll print a selection of the most interesting questions we receive. Responses are the editor's except where noted.

Dear Permaculture Activists:

I am very interested in preserving endangered plant species for medicinal and future food sources. Can you direct me to an organization or individual who is doing this?

Thank you
Judith O. Mitchell, 5076 Edwards School Rd., West Branch, MI 48661

Allied Groups

In each issue of The Permaculture Activist we cover news of organizations working in related fields. Our goal is not only to publicize the great diversity of inspirational work being done, but to form working alliances, and avoid "re-inventing the wheel" - i.e., to help permaculture activists take advantage of resources and services already being offered.

EcoNet

EcoNet is a computer-based communication system helping the environmental movement throughout the world to communicate and co-operate more effectively and efficiently. A large minicomputer, based in northern California, connected to Telenet (a common carrier), enables EcoNet users to communicate globally, usually through a local phone call.

Does EcoNet require a special computer? No. EcoNet is compatible with nearly any personal computer or computer terminal outfitted with a 300 or 1200 baud modem (also 2400 baud in some locations).

How much does it cost? EcoNet's rates are among the cheapest anywhere. With a \$10.00 sign-up fee, you get a user manual and a free hour of off-peak computer time (weekday evenings, weekends, and holidays). Then you pay a monthly charge of \$10.00, which gets you another hour of off-peak computer time each month. Every additional peak hour is \$10.00 and every additional off-peak hour is \$5.00. There is also a small charge for users requiring a large amount of storage space.

For more information, contact: EcoNet, 3228 Sacramento Street, San Francisco, CA 94115. Phone: (415) 923-0900.

Allied Groups, continued, next page...

Dear Permaculture Activists:

Can you help me find a consultant on permaculture design and development in the Santa Cruz area?

We are starting to develop a 5 acre property in that area and would like to incorporate what permaculture principles we can in the design.

Thank you very much,
Rosemary Raphael, 324 Del Amigo Rd., Danville, CA, 94526

Dear Permaculture Activists:

Our School has a large garden, part of which is being used to experiment with the no-till gardening concepts of Masanobu Fukuoka (One-Straw Revolution, The Natural Way of Farming). Along with our successes and failures, questions have arisen such as: what processes and steps have been

put into practice, are there certain weeds which are absolutely necessary to remove, what effects have climate and rainfall had on the success of this method of gardening, etc? Was tilling initially used on the garden before changing to no-tilling?

I am interested in corresponding with those using the no-till concept, with the possible idea of making up a newsletter to be circulated among those interested.

Tim Bowden, Head Gardener, Revis Mt. School of Self Reliance, HC 02 Box 1534, Globe AZ 85501.

Editor's note: I believe that many of these questions can only be answered by continued experimentation and observation of the land you are working with. Permaculture II, by Bill Mollison, includes a chapter on the "Instant Garden" and sheet mulching - very useful in establishing a no-till system.

Allied Groups

Circuit Rider Productions, Inc.

Our purpose: Circuit Rider Productions (CRP) is a not-for-profit service corporation dedicated to the enhancement of environmental and human resources. Active since 1976, CRP provided innovative programs in vocational training, environmental restoration and community video. Historically, judges, salesmen and ministers travelled established circuits delivering their services. Our name was chosen in the same spirit of diversified service delivery.

CRP operates with the belief that human and natural resources - people, forests, fish, soils, water and scenic beauty - are mainstays of local economies.

The work CRP performs demonstrates that adequate employment and conservation are not mutually exclusive. CRP combines responsible resource management and a trained, reliable work force to serve the environmental and economic needs of the community.

CRP's funding comes from grants, contracts and fees for services; the staff works with government agencies at all levels, not-for-profit corporations and private industry. Our strong track record is based on our commitment to quality service.

Our Services:

CRP's Vocational Training Division prepares people for jobs that fulfill their aspirations and meet the needs of the community and includes:

Classroom Training Programs, current offered in landscaping, tree care, resource conservation and VCR repair;

On The Job Training provides "hands-on" training.

Work Experience: Current programs include a federally funded Summer Youth Conservation Corps and a fledgling year-round Community Conservation Corps.

Job Search/Placement and counseling assistance.

Services by CRP's Environmental Restoration Division include seed collection and propagation of native plants, plan writing, data collection and plant installation. Staff integrates planning and field implementation to ensure responsible resource management. Our primary areas of activity are in revegetation, erosion control and wildlife mitigation.

Revegetation services provided by CRP staff include all phases of a reclamation project from preparation of plans and provision of site-specific plant stock to experienced crews and follow-up monitoring.

Erosion Control prescriptions range from the design of small, temporary mechanical erosion control structures to entire watershed erosion control studies.

Native Plant Nursery specializes in propagation of liner plants for revegetation using site-adapted seeds and cuttings.

Wildlife and Fisheries Enhancement management plans are developed and implemented to improve and protect wildlife habitat; other wildlife services include wildlife population and habitat studies.

CRP's Video Division provides access to the use of video as a communications tool to enable people to address community and educational concerns.

Ecological Gardening Apprenticeships at Linnaea Farm

Linnaea Farm, located on Cortez Island, British Columbia, offers an 8-month apprenticeship program in ecological gardening and small farming beginning March 1, 1988.

The program includes theory and practical experience in growing vegetables, fruits, herbs and ornamentals. Training covers propagation, weed control, irrigation, composting and fertilization, with emphasis on British Columbia coastal conditions, year round cropping, specialty marketing and regenerative soil management.

The farm has 5 acres of gardens and orchards set in a 300 acre ecological land trust under Turtle Island Earth Stewards Society.

Completion of the course provides a thorough grounding in sustainable garden craft. Another benefit of participation is exposure to fulfilling alternatives in food production, livelihood, and lifestyle.

Tuition for the term is \$750 (Canadian funds). For further information contact: David Buckner, Linnaea Farm, Manson's Landing, B.C. V0P-1K0, phone: (604) 935-6717 or 935-6424.

Forest Watch

The Citizens' Forestry Magazine

The public lands managed by the Forest Service and Bureau of Land Management (BLM) are a precious national resource. Yet many people fear that these lands are being mismanaged. Below-cost timber sales, overgrazing and road construction constantly threaten the environmental quality of the public forests. The first step to counter these threats is to watch the forests and the agencies which manage them.

If you care about the fate of your forests, subscribe to *Forest Watch* magazine - the only citizens' journal devoted exclusively to forestry issues. Each month, *Forest Watch* will bring you the latest news on the Forest Service and BLM, new research in forest economics and timber management, tips on protecting wildlife habitat and water quality in the forest planning process, and articles on grazing and recreation.

Subscribers to *Forest Watch* also receive Citizens' Guides to forest management of wildlife, timber and pests.

Forest Watch is published by CHEC, the conservation movement's leading expert in public forest planning. CHEC is the nation's leading forestry consultant firm working exclusively for conservation groups. CHEC has reviewed over 40 National Forest plans in every region of the country. In addition to *Forest Watch* magazine, CHEC publishes pioneering research papers on forest policy, economics and ecology and provides other educational and consultant services. For more information contact:

CHEC, PO Box 3479

Eugene, OR 97403

(503) 686-CHEC

For more information contact: Circuit Rider Productions, Inc., 9619 Old Redwood Highway, Windsor, CA 95492, phone: (707) 838-6641.

PermExchanges

Editor's note: PINA receives dozens of newsletters and periodicals from allied groups in exchange for a subscription to The Permaculture Activist. Since most of our members have neither access to our library nor the ability to personally subscribe to such an array of materials, we will publish selected excerpts from these periodicals in this new column entitled "PermExchanges"

If you want more detailed information related to any excerpt, please write to the organization which published the information. Thank you to Trisha Lowder and Sego Jackson for compiling PermExchanges for this issue.

From Pesticides and You, August, 1987:

"Funds for Sustainable Agriculture Passed"

"June 4, 1987, Minnesota Governor Perpich signed a bill creating "...the world's first endowed Sustainable Agriculture Chair". Approximately \$1.5 million will provide for a permanent funding source for a professor, assistant and several sustainable agriculture programs at the state university. "The 'Sustainable Agriculture Demonstration Grants' will be available to farmers as well as organizations and educational institutions."

From Alternative Agriculture News, July, 1987:

"Parasitic Wasps Save Farmers \$8 Million Per Year"

"Since 1981, about 15 million parasitic wasps have been released in 25 states as part of a biological pest control program sponsored by the USDA Animal and Plant Health Inspection Service (APHIS). APHIS reports that wasps provided virtually 100% protection from alfalfa weevils, saving \$8 million per year in pesticide costs. The program cost USDA \$1 million per year."

From Cookstove News, Winter, 1987:

"A People-Centered Approach to Planting Trees"

"Since March 1983, World Neighbors has been supporting a tree growing program in Garu, a northern Ghana village, that is using three different concepts. 1.) Reforestation - massive replanting of forests by the government; 2.) Social Forestry - use of trees as a development tool that helps improve living conditions and involves villagers in the process of selecting, planning and implementing trees; 3.) Agro-forestry - trees planted for conserving soil and water as well as to help restore soil fertility.

For more information and/or free catalogue write:
World Neighbors Development Communications
5116 North Portland Avenue
Oklahoma City, OK 73112

Cookstove News is a publication of the Aprovecho Institute, 80574 Hazelton Rd., Cottage Grove, OR 97424. Cost: \$10/yr.

From Cookstove News, Spring, 1987:

"Waste is Not a Dirty Word When You Use the Crop-Livestock-Energy Integrated Farming System"

"The C-L-E Integrated Farming System makes optimal use of resources where the wastes of one process serve as the raw materials for another. In this system, animal and crop wastes are used to produce food, fuel and fertilizer. In Bangladesh, if 50% of the dung from the country's 26 million cattle is converted to biogas it would supply 75% of the country's demand for energy for cooking. The residual sludge from biogas production would provide roughly 50% of the fertilizer currently consumed. In India, the approximately 70 million tons of dung that is burned annually as fuel has a soil nutrient content equivalent to one-third of India's chemical fertilizer use."

From HortIdeas, May, 1987:

"Flowering Herbs to Attract Beneficial Insects"

Hilde Maingay of the New Alchemy Institute has done extensive research on insectory plantings and discovered the following: "Fennel has the greatest insect attendance and furthermore, it had large attendance of "good" insects. Some of them were outstanding beneficials not found on any of the other flowers in this study... in late August and early September there were more insects on the fennel (and the mint as well!) as could be collected in the experimental procedure."

Other interesting articles include:

"For Biological Brush Control: Goats!";

"Another Use of Buckwheat: Eat the Leaves";

"The Next Alternative Market Crop Fad: Edible Flowers";

"Latest Research on Deer Repellents";

"Efficiency of Intercropping: Largely a Myth?"

Also in this issue: "From England: A Forest Garden Plan"

"Hart (author of "Forest Farming") claims that once the forest garden is established (after about two years), the garden is self-fertilizing, self-watering, self-mulching, self-weed-suppressing, self-pollinating, and self-healing... It is also supposed to have high resistance to pest and disease attacks."

For more info write: The Institute of Social Inventions,
24 Abercorn Place, London NW8 9XP ENGLAND

From HortIdeas, July, 1987:

Interesting Articles:

"Nitro' Alfalfa: Soil Builder Par Excellence"

"Planting by the Plants (Not by the Calendar)"

"Guide to Storing Horticultural Crops"

"Calcium for Better Mung Bean Sprouts"

"Sod-Strip Tillage System for Vegetables"

HortIdeas (ISSN 0742-8219) is published monthly by Gregory and Patricia Y. Williams, Rt 1, Box 302, Black Lick Rd., Gravel Switch, KY 40328. Annual Subscription rates: US \$10; Canada & Mexico \$12; Overseas, \$15 surface mail or \$24 air mail. Single issues: North America, \$1; overseas \$1.50

Classifieds

Books & Publications

GUIDE TO UNUSUAL HOW-TO SOURCES - describes over 50 periodicals and handbooks on alternative tech., gardening, home learning, low-cost shelters, tree growing, travel, etc. All addresses included. Free for S.A.S.E. Light Living, PO Box 190-pa, Philomath, OR 97370.

Natural Insect Controls, over 100. Safe, effective, inexpensive. 10 page pamphlet, send \$2.00 plus a S.A.S.E.: *GROWING (safely) GREEN*, Rt. 1, Box 121, Bardstown, KY 40004.

TWO FOR ONE BOOK OFFER, titles include: *The Owner Built Home, The Owner Built Homestead, Stone Masonry, Fireplaces, The Earth Sheltered Owner Built Home*. Send for catalog: Owner Builder Publications, PO Box 817, North Fork, CA 93643.

ANNOUNCING: New Permaculture papers available: "Pig Raising and Free Range Forage Species", by Bill Mollison: \$2.50; "Circle Garden Patterns for Arid Lands". One page of drawings by Richard Webb: \$1.00. Address orders to: Yankee Permaculture, c/o Minot Weld, RD 2 Box 235, Ovid, N.Y. 14521

Help Wanted/Offered

2 or 3 positions for interns, \$200/mo. + room & partial board. Working herb/vegetable/ sprout farm, integrated systems, chicken heated greenhouse and other permaculture applications. Items marketed: herbs, vegetables, sun-sprouts, eggs, chickens, rabbits, compost, worms. Sold through brokers, delivery route and farmers market in Aspen, CO. Acreage secluded near waterfall. Contact: Jerome Osentowski, Box 631, Basalt, CO 81621. (303) 927-4158.

BURNING PASSION to create a permaculture life? Land trust with water, soil, livestock, forest, vegetable growing equipment and markets seeks innovative, responsible folks to share the labors, social and economic wealth in a cooperative venture. Cave Creek CLT (Community Land Trust), c/o Ardapple-Kindberg, Bass Arkansas 72612, phone: (501) 434-5265.

Help Wanted/Offered

WORK WITH APROVECHO INSTITUTE in sustainable food production, ecological design, Third World problems, education, outreach, community building, permaculture, land stewardship. Positions available: farm manager, facilities/ maintenance manager, bamboo project coordinator, internship coordinator, grant writer. Aprovecho Institute, 80574 Hazelton Rd, Cottage Grove, OR 97424; (503) 942-9434.

BOOKKEEPER for PINA's Seattle office: part-time position, number of hours variable. General ledger experience helpful. Fund accounting double entry system currently used. Responsibilities include preparation of payroll, quarterly and annual reports, and financial statements. Salary \$150/mo, negotiable. Respond to: Viv Ilo, Executive Director, PINA, 4649 Sunnyside Ave N., Seattle, WA 98103.

Internships available to work on a large-scale, multiple-species, nitrogen-fixing, edible hedgerow (a "fedge" = food hedge) intended as a browseable living fence with fruit production & wildlife habitat. Involvement in other farm activities as well - goat dairy and market garden. Room & board + other negotiable. Contact: Chuck Hirsch, Old Mill Farm, PO Box 463, Mendocino, CA 95460.

continued from PermExchanges, page 29...

Books of Interest - Received by PINA

Reforestation in Arid Lands

by Fred R. Weber with Carol Stoney

Called "the Bible for nursery management" in The Gambia, this classic has been updated and improved in a revised edition. The focus of this new text has been broadened to include all of arid Africa--and still applicable in other dry areas. There is also a whole new chapter on agroforestry, reflecting a decade of work in that field. Published by Volunteers in Technical Assistance, (VITA) 1815 N. Lynn St., Suite 200, Arlington, VA 22209-2079.

The Vanishing Forest: The Human Consequences of Deforestation

A report for the Independent Commission on International Human Issues, Zed Press, 1986. Deforestation threatens irreversible climatic changes and loss of gene pools required for future agricultural and medical progress. This report stresses the urgent need for policy changes to make forest conversion a vehicle of sustainable development and enable human civilization in the tropics to continue.

News Flash! - Permaculture I and Permaculture II,

the essential textbooks and reference manuals for permaculture practitioners. have been reprinted and are due in from Australia in October. Reprinted edition: \$16.50 per copy + \$1.50 pstg. & handling. They will be available from numerous permaculture book suppliers including:

Permaculture Resources,
Permaculture Communications, 4649 Sunnyside N.,
PO Box 101, Davis, CA 95617 Seattle, WA 98103.

A great gift for the holiday season (along with a subscription to *The Permaculture Activist*)!!!

Permaculture Communications

Permaculture, Journal of the International Permaculture Association - Back issues are available - an incredible source of background information on permaculture! - practical applications, access to resources, tools, inspiration. Issues #7 - #25: \$3.25 each.

Subtropical Fruits - A Compendium of Needs and Uses is a two-color poster, 26"x30" listing over 98 species and varieties of subtropical fruit trees, vines and shrubs. Great for nurseries, farmers and home orchardists. Info on each species includes climatic tolerance, fruit characteristics, plant uses, cultural/management requirements, maturity times and much more! Cost: \$10.00 postpaid (+ 75¢ sales tax for CA residents).

Permaculture Designers Directory, 1987 Edition lists 450 graduates of Permaculture Design Courses in North America with biographical info, consulting services offered, skills, resources, farm/garden/manufactured products. Cost: \$6.00.

"Perspectives on Plant Symbiosis": \$2.50;
"Symbiont Inoculation Strategies for the Nursery": \$3.50. Both for \$5.00.

by Michael Crofoot. These two works cover: • nitrogen-fixing bacteria • mycorrhizal fungi • their symbiotic interactions with plant roots. • methods to utilize and enhance these species for the amateur or professional plant propagator.

All of the above publications (and others) are available from:
**Permaculture Communications,
PO Box 101, Davis, CA 95617.**

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Advertising Rates

THIS COULD BE YOUR AD HERE! A free 25-word classified ad is included with every membership in PINA - see membership info on next page.

Classified Ad Rates - 20¢/word, \$5.00 min. Contact: Editor: *The Permaculture Activist*, 4649 Sunnyside Ave. N., Seattle, WA 98103.

Bill Mollison seeks funding to develop a Permaculture model in Botswana.

Botswana lies in the Southern portion of the Kalahari Desert. About four-fifths of the nation is desert. Only 4% of the land will support agriculture. Yet Botswana is the model of success for Africa, "If much of Africa is a sinking ship, Botswana is one of the few passengers wearing a life preserver."

None of the country's one million citizens died from starvation during the most recent drought, despite the fact that Botswana's farmers regularly lose more than 80 percent of their crops to drought. It is from the attitude of their government toward its citizens, the planned use of its limited natural resources, a government which vigorously supports research into agriculture, weather patterns, and health. It has the best records on the continent for human rights and effective aid distribution systems, and has remained at peace with surrounding countries.

Bill Mollison has been invited to teach and introduce Permaculture by the Foundation for Education with Production. A fund to raise \$8,000 has been begun to allow Bill Mollison to teach a course in Botswana. Small contributions (all donations are tax-deductible) added together go a long way. Send donations to: The Africa Fund, c/o PINA, 4649 Sunnyside Ave., Seattle, WA 98103. IRS Tax Number 94-282-5217

Please send inquiries and suggestions to: Marianne McNeely, 18861 SE 42 St., Issaquah, WA 98027.

continued from Pitcher Irrigation, p.15

Pitchers are, or have been used to grow pistachio trees in Iran, mesquite, acacia, and eucalyptus in Pakistan, acacia in India, citrus in Brazil, and melons, tomatoes, corn, and other annual crops in China, Mexico, and Brazil. The yield for pitcher irrigated melon in India was 25000 kg/ha with 1.9 cm water/ hectare. Survival of tree seedlings irrigated with pitcher irrigation was 96.5% compared to 62% for hand watering and the height of pitcher irrigated seedlings was 20% greater.

Pitchers are better than drip systems in some respects. First, they are not as sensitive to clogging as drip emitters, although they may clog over time (3-4 seasons) and require renewal by reheating the pots. Second, pitchers can be made with locally available materials, and skills. And finally, the pitchers are less likely to be damaged by animals or clogged by insects. Pitcher irrigation allows soil amendments to be placed where they will benefit crops most and the precise water application minimizes problems with weeds. The drawbacks of pitchers include increased labor to make and install the system and less flexibility once it is installed. Pitchers can either be filled by hand if labor is inexpensive or connected to a pipe network.

Pitcher irrigation should be considered in areas where water supplies are limited or where soil or irrigation water characteristics make traditional irrigation systems unworkable. They will probably prove most valuable in kitchen gardens and subsistence farming but may be of commercial value in some situations.

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- One year subscription to the quarterly *Permaculture*, Journal of the International Permaculture Association (published in Australia)
- Discounts on selected educational events sponsored by PINA
- One free 25-word Classified Ad in *The Permaculture Activist*
- Discounts on selected book titles from Permaculture Resources (see catalog in this newsletter)

Yes!

I want to become a member of the Permaculture Institute of North America (PINA) and work together in developing ecologically sound and sustainable land-use systems. In becoming a member, I pledge to work in some way to help heal, nurture, and regenerate the natural world which we share.

Membership categories:

- \$25/year Regular member
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- \$100/yr Contributing member
- \$250-\$500 Patron
- \$1000 Lifetime member
- \$16/year Low income member - includes subscription to *The Permaculture Activist* only

- Membership rates above are valid for U.S., Canada, and Mexico only. Overseas memberships are only available at the \$25/year rate, which includes *The Permaculture Activist* only. Overseas members may subscribe to *Permaculture*, the *Journal of the International Permaculture Association* through their office in Australia: P.O. Box 367, Maryborough, Victoria 3465, Australia.

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Make check payable to PINA in U. S. \$ and mail to: PINA, 4649 Sunnyside N., Seattle WA 98103. PINA is a federal tax-exempt organization and your membership contribution is tax deductible

Calendar of Events

Nov. 6 - 8, Blairstown, NJ. Weekend Permaculture Workshop with Dan Hamenway. Contact: Sr. Miriam McGillis, Box 622, Blairstown, NJ 07825. (201) 362-6735.

Nov. 22 - Dec. 5, 1987 & Jan. 10 - 23, 1988, Lake Atitlan, Guatemala. 2 week Permaculture Study Tour in Guatemala. Contact: Aprovecho Inst., Cottage Grove, OR. Details, page 5.

November, 1987, Tucson, AZ, 2-week Permaculture Design Course. Contact: Sonoran Permaculture Association, 1250 E. Edison, Tucson, AZ 85719.

February, 1989, Auckland, New Zealand, Third International Permaculture Conference and Permaculture Designers Convergence, to be held in Aotearoa (New Zealand). Plan Ahead! Contact: Steve Hart, PO Box 68166, Auckland, New Zealand.

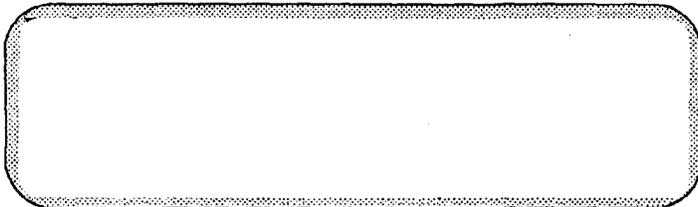
January 13 -16, 1988, Berkeley, CA. Restoring the Earth - 1988. A national conference on natural resource restoration and environmental planning will take place at UC Berkeley. Contact: Restoring the Earth Conference, 693 Mission St., Rm 709, San Francisco, CA 94705, (415) 777-9515.

January 25 - May 20, 1988, New Alchemy Institute "Semester in Sustainable Design". Contact: Semester Manager, New Alchemy Institute, 237 Hatchville Rd., East Falmouth, MA 02536. (617) 564-6301. Details, page 7.

February 26 - 28, 1988, 8th Annual Ecological Farming Conference, Asilomar Conference Center in Pacific Grove, CA. Organic farming practices, issues in Sustainable Agriculture, a chance to meet with 800 other people in "the movement". If interested in helping out contact Steering Committee for Sustainable Agriculture, Box 1394, Davis, CA 95617.

May, 1988, Iowa. Three-week Permaculture Design Course with Dan Hemenway. Contact: Joe Lynch, Rt. 4, Ames, IA 50010. (515) 292-0117.

June, 1988, Spokane, WA. Permaculture Design Course with Simon Henderson. Contact: Simon Henderson, Bear Tribe Medicine Society, PO Box 9167, Spokane, WA 99209.



The Best of Permaculture



This book is a selection of articles, photographs, drawings and essays that have appeared in Permaculture journals and newsletters around the world. The editors have updated information whenever possible. Articles have been selected for their contribution to and reinforcement of permaculture concepts and are inspirational as well as educational. Titles include: Control of Fungus Diseases; City Farms; Trees as Animal Feed; Forest Regeneration; Reafforestation and Agroforestry in East Africa; Foodscapes, Self-Reliance and the Landscape Architect; Composting Perth's Refuse; Double Mulches and Deep Litter.

Cost: \$12.50 each + \$1.50 shipping for one or two books. (Calif. residents add 75¢ sales tax) *The Best of Permaculture* and other publications are available from:

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PO Box 101
Davis, CA 95617

Advertising Rates

Classified ads in *The Permaculture Activist*: 20¢/word, \$5.00 minimum, prepayment required. Display advertising space is available in standard sizes of 1/8, 1/6, 1/4, 1/3, 1/2 page at \$28, \$35, \$49, \$65, \$80 per single inclusion. Other sizes available. Discounts for prepayment and multiple inclusions. For rate sheet or to place an ad contact: Editor, *The Permaculture Activist*, 4649 Sunnyside N., Seattle, WA 98103. Phone: (206) 547-6838. Our circulation is approximately 2,500 throughout North America, about 1/2 located in OR, WA & CA. *The Permaculture Activist* is an ideal place to advertise if you want to reach gardeners, farmers, homesteaders, tree crops enthusiasts, and permaculture activists.

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Membership form on inside back cover

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