

**CONFERENCE UPDATE.** Details are falling into place for ECHO's first annual conference for agricultural development workers this fall, November 8-10. Dr. Campbell's talk will be on choosing fruits adapted to specific climates in the tropics and subtropics. His wife, Becky, who has quite a local reputation as a cook, will talk on using tropical fruits in cookery. We will soon decide on topics for the other two special speakers.

We have been successful in keeping costs very low. Registration is only \$100, and that is reduced to \$20 for development workers, missionaries and students. Motel rooms, walking distance from the meetings, will be only \$78 for 4 nights double occupancy. We hope that local churches will provide at least one meal a day at no charge. Transportation the 8 miles to ECHO will be provided for workshops, tours, and to use the library. "Networking" and study time is scheduled right into the program.

Write us for the conference schedule and an application. If you cannot make it this year, remember that it is our intent to host such a conference early in November every year.

(A reminder -- we cannot provide financial assistance to travel to the conference.)

**TOMATOES RESIST FLOODING IF GRAFTED TO EGGPLANT.** The Asian Vegetable Research Center (AVRDC) in Taiwan is interested in improving tomato harvests during the hot, humid part of the year when supply is short and prices are high. A special problem can be flooding during tropical storms.

They had noticed that eggplants which grew next to tomatoes survived a flood that killed the tomatoes. Simple experiments showed that they could easily graft tomato onto the eggplant rootstock. (They were not able to graft pepper to eggplant). This led to trials in

1993 in which a tomato variety selected for its ability to produce in hot weather was grafted to eggplants. (Their choice was Taichung ASVEG # 4)

"Flooding, which occurred after the first harvest of tomato, caused death of ungrafted plants whereas all tomato:eggplant grafts survived to produce more fruit. Early flooding (at 32 days and 40 days after transplanting) did not diminish growth and yield of the control.... This agrees with our observation in other species that early flooding does not necessarily result in plant mortality. Young root systems probably recover following flooding due to their superficial distribution near the soil surface which dries out first when flooding ceases."

The eggplant should be sown first and the tomato seed planted as the growing point of the eggplant appears above the cotyledons (2-3 weeks later). If necessary, tomato scions (budwood) can be kept in the refrigerator for up to two weeks, but must be wrapped with newspaper and covered in a plastic bag. (The same is not true for eggplant scions). Tomato scions were made when the plant reached the three true-leaf stage by cutting at an angle of 30°.

Simple rubber tubing, of the type used for bicycle valves, was used to hold the scion onto the stock. The tubing was cut at the same 30° angle. Then the rubber tubing plus scion were slipped onto the cut surface of the eggplant. Lining the angle of the cut of the scion with the angle of the cut on the tubing helps to correctly position the scion/rootstock surfaces. They can graft 150-200 seedlings per hour. To reduce grafting costs, they are experimenting with pinching the tops to form two stems so they can plant farther apart.

The plants were kept at 85% relative humidity. The tubing was cut 3-7 days after grafting so as not to restrict stem growth. At the same time plants were removed from the high humidity conditions and hardened off before transplanting.

Thanks to Dr. David Midmore at AVRDC for supplying the picture and details from their 1993 annual report. For a copy of the article, you may write him at AVRDC, P. O. Box 42, Shanhua, Tainan, Taiwan 741.

**GO EASY WITH FERTILIZER AFTER TRANSPLANTING TREES AND SHRUBS.** [The following is adapted from the May 1993 issue of *The Avant Gardener*]. This has long been an accepted but unproven rule. Now a study by Dr. Warren at the North Carolina State University "has shown that root growth decreases as the amount of nitrogen fertilizer is increased. Nitrogen apparently does not enhance regeneration of roots pruned during digging.

"Many studies have demonstrated that after root loss, growth is redistributed in favor of making new roots. Above-ground growth slows as nutrients are transferred to the roots. So it is a mistake to apply fertilizer in an attempt to stimulate top growth, since the plant's "instinct" is to regenerate a full root system. NCSU experiments showed that replacing damaged roots is slowed at a rate directly correlated to the amount of nitrogen fertilizer used. This may negatively impact transplant survival and prolong the establishment period. Little or no nitrogen should be applied in the first year after transplanting.

ECHO asked Dr. Warren to clarify a couple points. Does this apply only when the plant has been dug up and root damage has occurred, or also when a plant is carefully transplanted from a pot into the soil? "I have no direct data, but I believe it applies to all transplanted material since establishment is still dependent upon generating new roots into surrounding soil."

Do you mean to add no fertilizer or just no nitrogen fertilizer? "The data is only applicable to nitrogen fertilizer. I would make sure there are adequate levels of P and K. Recent information suggests that these two do not interfere with root growth."

**REMOVING SALTS FROM CONTAINER GROWN PLANTS.** I vividly remember as a toddler watching my father boil down a can of saline water to show all the salt that was left behind. I think of that when week after week I water a potted plant during a long dry season or in a greenhouse where it never receives rain. As the water evaporates or is taken up by the plants, more and more salt builds up. Sometimes you can even see a white crust appear on top.

David Silber writes in the June 1992 issue of *The Fruit Gardener* that one way to correct this problem is to "semi-annually leach the soil with tap water (rainwater is better) that has been acidified to a pH of 4.0. I use a commercial grower's acid blend containing nitric and phosphoric acid. But you can also use vinegar as an acidifier: 2 tablespoons per gallon of water will yield the desired pH. The solution should be flushed through the growing container three times. In my experience the leaching water went in at a pH of 4 and came out at 6.5. This effectively removes lime and bicarbonates as well as sodium. I've used this on miracle fruit, coffee, pitomba, jaboticaba and lychee. The plants responded within two weeks with a new flush of normal leaves."

ECHO used this technique in the greenhouse where we grow rainforest plants. Plants were not thriving and leaf margins were turning brown on some species. They seemed generally healthier after the treatment.

*The Fruit Gardener* is published six times yearly by the California Rare Fruit Growers chapters. Membership/subscriptions cost \$16 (\$25 Canada/Mexico; \$30 foreign surface mail; \$40 foreign airmail). California Rare Fruit Growers, The Fullerton Arboretum, California State University at Fullerton, Fullerton, CA 92634 USA.

**SOMETHING NEEM WILL NOT DO.** There has been a stream of reports concerning how extracts from seeds or leaves of the neem tree (*Azadirachta indica*) can control various insects and even some fungal diseases. Unfortunately, a study in England has shown that azadirachtin, the principle active ingredient from neem, has negligible effect on the feeding behavior of slugs. (This information taken from *HortIdeas*, March 1992, p 33).

**SOME MAJOR CHANGES FOR THE NITROGEN FIXING TREE ASSOCIATION (NFTA).**

Over the past dozen or so years NFTA's tree seedbank has been an outstanding resource to Third World development organizations. Different times in EDN we have mentioned them as a source for variety trials of nitrogen fixing trees. That service is no longer available.

NFTA's Mark Powell and Jim Roshetko have moved to Winrock International, where they hope to carry on some of NFTA's work. NFTA found it increasingly difficult to raise funds for its publication and seed distribution efforts. They hope that with the merger there will be new avenues to fund their publications. They may even broaden their scope to include trees other than those which fix nitrogen.

In any event, the seed distribution program has been closed. Thanks, NFTA, for several years of invaluable service in seed distribution! They will still be available to help you find an in-country source. They just sent us a very helpful 4 page list of tree seed suppliers in the Pacific area and a brief summary of seeds in stock for each. They hope to revise this periodically.

Their new address is Nitrogen Fixing Tree Association; c/o Winrock International; Petit Jean Mountain; Morrilton, Arkansas 72110-9537 USA (phone 501/727-5435).

**MORINGA AND CAROTENE** Dr. C. E. Peterson wrote, "I have removed fresh moringa leaves and left them overnight in my greenhouse, where they very promptly dry and can be rubbed over a screen to make a powder. The fresh weight value of beta-carotene is about 88 ppm and the dried leaves will be about 300 ppm, equal to some of our best high-carotene carrots.

"Even if addition to rice were to be limited to a teaspoon or so without any detectable flavor change, if it were done 2-3 times a day every day it could be a very substantial source of vitamin A where deficiency is causing blindness and other serious health problems."

I would add that if people eat soups, substantially more of this powder could be added. Joel Matthews in Niger says people there preserve dried moringa leaves (not crushed) for use during the dry season as a food. They use it in their sauces. One popular food is a mixture of leaves and peanut press cake.

**USING GRAPEFRUIT TO CONTROL SLUGS?** The "Letters" section of *Organic Gardening Magazine* contained the following suggestion. The writer lived in Oregon where she was "surrounded by slugs." She tried oyster shells, rough bark dust, rosemary, hunting them down and sprinkling salt on them and beer baits, and found them all inadequate. "Then I discovered grapefruit. After you've used the pulpy insides for breakfast, set the rinds (with a little pulp left) upside down igloo-style around your garden." She says that the slugs will hide underneath the grapefruit and die. We have no slug problem at ECHO, so we cannot verify this technique. If you do, please let us know one way or the other whether it worked. This seems too good to be true, but it would be wonderful if it does work.

**A METHOD FOR KEEPING RATS AWAY FROM OIL PALMS.** The following is taken from *West Africa Link* (see review on page 7 of this issue). "Rev. Noah Kyireh, agronomist at the Nyankomasi Methodist Agricultural Project, has found an effective method of keeping rodents away from young oil palms. The young trees can be attacked by rodents, which will eat the stem right at ground level, killing the tree. Wire netting placed around the tree is not completely successful because the rodents can dig under the wire and still get to the tree. Noah Kyireh has been putting logs of dry wood around young oil palms at a distance of some 20 centimeters from the stem. It is the tropical fire ants, which subsequently inhabit the dry wood, which then keep the rodents away. He says it is much more effective than the use of wire netting, and certainly much cheaper.

**UPDATE ON MALARIA CONTROL (ARTEMISIA AND VACCINE).** The following is abstracted from *World Watch*, May/June 1994. "More than 20 years ago Chinese scientists confirmed the antimalarial qualities of artemisinin, ... extracted from a fern-like plant *Artemisia annua*." This plant has been used as an anti-malarial drug for more than 1,500 years. Now derivatives of artemisinin that can be taken orally or injected have been developed and are widely used in Southeast Asia, and in parts of Africa and Latin America. The injectable form acts more rapidly than any other antimalarial and is effective against multi-drug-resistant parasites. It is not yet approved in any developed country.

In EDN 23-5 we mentioned the work of a Colombian scientist in developing a malarial vaccine. Because malaria is caused by a protozoan (a small animal) rather than a bacteria or virus, it has been difficult to develop a vaccine. The new approach is to synthesize polypeptides that are identical to portions of protein found on the surface of the protozoan.

The update on this work in *World Watch* says that clinical trials have now been done and that "40-66% of participants were protected from the most common and deadly strain, *Plasmodium falciparum*, which is responsible for 95% of malaria cases." "Although Patarroyo's initial field trials were criticized

because they did not meet international protocols, he answered their skepticism by conducting trials that did meet those standards. One of those trials, completed in 1992 in Ecuador, showed that the vaccine was successful in protecting 66% of the volunteers from the common malaria strain." It has been tested on 41,000 people in South America. Finally the World Health Organization and the Walter Reed Army Institute of Research are beginning tests in Africa and Asia.

"Meanwhile, other researchers are ... studying the feasibility of altering the mosquito's genetic makeup so that it will be unable to carry and transmit the parasite to humans." [Presumably this mosquito would compete with normal mosquitos for food and breeding grounds, so the number capable of infecting people would drop.]

**WHAT ABOUT RHIZOBIA INOCULANTS?** (by Scott Sherman). "What about rhizobia inoculants? I don't recall any mention of them in the 'Seeds Available from ECHO' listings. Isn't it likely that many of the legume seeds will need rather specific rhizobia inoculants at planting time?" - Bob Tillotson, Thailand. "Does the seed [velvet bean] need to be inoculated to fix nitrogen or will it naturally do it on it's own?" - Jim Triplett, Guam. Similar questions regarding legume inoculation come up often. The following attempt to answer these questions is based on an article by Dr. Paul Singleton with NifTAL which was sent to us by one of our readers, Brian Hilton. The article, "Enhancing Farmer Income Through Inoculation of Legumes with Rhizobia: A Cost Effective Biotechnology for Small Farmers," addresses a series of questions. We will summarize these and add a few others.

**What are rhizobia and what do they do?** Rhizobia are a genus of soil bacteria that infect the roots of legumes and can fix (make available to the plant) atmospheric nitrogen. Unlike disease-causing bacteria, rhizobia enter into a symbiotic relationship with the plant. The legume provides the bacteria with energy and the bacteria provides the legume with nitrogen in a form it can use.

**Does one rhizobium work with every legume?** No, rhizobia are selective and grouped according to which legume species they will colonize. The rhizobia of some species, e.g. *leucaena*, are very specific. Others cross-inoculate many species. For example the "cowpea family of inoculant" will inoculate *Acacia albida*, *Cajanus cajan* (pigeon pea), *Desmodium spp*, *Lespedeza spp*, *Mucuna* (velvet bean). Some species, such as peanut, called "promiscuous," can be inoculated with any of a number of rhizobia. Often one rhizobium strain will provide some biological nitrogen fixation (BNF) but will be less effective than another. Unless some strain of inoculant suited to the legume species you are growing is present in the soil, no BNF will take place.

**Which of my crops are most likely to respond to inoculation?** Responses are likely from species whose rhizobia are quite specialized such as soybeans and *leucaena*. Areas with a distinct long dry season of 6-8 months are also likely to respond due to existing rhizobia populations dropping off more quickly under these conditions.

**How do I know if I need to inoculate my plant?** Rhizobia live in nodules on the roots and can be easily seen. Well nodulated legumes will have nodules on the tap root. (Dig the plant and remove the soil carefully or the nodules will fall off). Not all nodules are effective, however. Cut several nodules in half. Nodules that are effectively fixing nitrogen will usually be red or pink inside.

**How are rhizobia introduced?** Most commonly legume seeds are coated with the appropriate inoculant just prior to planting. A sugar or gum arabic "sticker" is used to attach the powdery inoculant to the seed. If healthy, nodulating plants of the same species are already growing in the area the proper rhizobia should already be available and need not be purchased. Just add about 5 grams of soil from such a plot to each hole as seeds are planted.

**Can I maintain my own inoculant?** Yes. After a successful crop, soil will always retain some inoculum until the next season. Replanting the same species in the same soil year round will serve to increase inoculum for that crop. But, this practice may also increase the occurrence of some diseases.

**Why doesn't ECHO carry inoculant for the legume seeds it distributes?** This would seem to be the wise thing to do. However, it is challenging enough to preserve and monitor the viability of our stored seeds. Viability of inoculum is even more difficult to monitor and maintain which is why we leave this enterprise to those set up to do the job well.

**How much rhizobium is needed to inoculate a seed?** It takes about 100 grams of inoculant to sufficiently treat one pound of leucaena seeds. A hectare of soybeans requires 286 grams of inoculant. Quality is more important than quantity. The best inoculant contains a billion rhizobia per gram, but it doesn't take long for quality to drop. This is why inoculation is done just prior to planting. Since you can't tell if inoculant is good or bad by looking at it care should be taken to use a good source and handle it properly. Inoculant should be protected from heat, light and desiccation and used as soon as possible. If a cool storage area is not available, a pot buried in a shady area is a good option. If transportation is required, a container covered with a damp cloth works well.

**Where can rhizobia be obtained?** Many countries manufacture inoculants for a number of crops. Contact your local agricultural extension agency or national department of agriculture to see if they have the inoculant you are looking for. If it needs to be imported, probably the best source would be the NifTAL (NifTAL Project and Mircen, 1000 Holomua Ave, Paia, Maui, HI 96779-9744, phone: 808/579-9568, fax: 808/579-8516, Cable: NifTAL@UHCCUX). They will provide small quantities for major tropical legumes, including trees, free to developing countries. ECHO has been keeping a running list of sources we have come across to date. If you would like a copy please let us know. More information on this topic can be obtained by contacting NifTAL. Other possibilities include the international agricultural research center nearest you (e.g. CATIE, CIAT, ICRISAT, IITA, IRRI, etc.), UNESCO (Microbial Resource Centre, Karolinska Institute, 10401 Stockholm, SWEDEN), the BNF Resource Centre (Soil Microbiology Research Group, Rhizobium Building, Soil Science Division, Department of Agriculture, Bangkok 10900, THAILAND, fax: 662-5614768) or Liphatech Company, 3101 West Custer Avenue, Milwaukee, WI 53209 USA. 800/558-1003; 414/351-1476. FAX: 414/351-1847.

**Some concluding remarks:** Each situation is different. If farmers can obtain inoculant quickly and reasonably it can be a low-cost input with high returns. If planting something like soybeans for the first time in an area, special efforts should be made to obtain proper inoculant. Legumes will grow without rhizobia, they will just require mineral sources of nitrogen like other plants. Even with proper inoculation, factors like low phosphorous, low pH and insect damage will limit yield. It should also be noted that it can take up to 20 days for biological nitrogen fixation to get going, so an application of nitrogen just after germination can help even if rhizobia are present.

#### **FOR YOUR INTEREST ONLY.**

**What does the "p" stand for in pH?** A letter to the editor in the July/August 1994 issue of *Fine Gardening* answers: "pH is not 'percent hydronium ion' nor 'potential hydrogen.' The 'p' is just a mathematical symbol or operator, much like the symbol " $\sqrt{\quad}$ " for square root." Thus the "p" is a symbol indicating that you should take the negative log of what follows, i. e. of "H", the concentration of hydrogen ions in solution.

**Garlic production from seed?** Why is garlic grown using vegetative material rather than seeds? The Asian Vegetable Research and Development Center (AVRDC) publication *Centerpoint* says it is because

of sterility in garlic. This limits scientists' ability to improve the plant as well. Recently AVRDC scientist Dr. C. S. Pathak found garlic clones that flower. So far, eight clones of this flowering type have been collected in Taiwan, but pollen fertility was noted in only one. Hand-pollination resulted in excellent fruit development with healthy embryos. "This points to the possibility of seed production in tropical garlic."

**Where does the word "germ" come from?** It is from the Latin word for seed. According to the *Oxford English Dictionary*, the word was first used to describe the "seed" of a disease in the early 19th century. Seeds "germinate."

## ECHOS FROM OUR NETWORK

**Cory Thede, Belem, Brazil.** The last time we heard from Cory, his trials (about 600 miles up the Amazon) had been devastated by various lizards. He writes, "Now that we have a dozen cattle, I'm succeeding with vegetables I couldn't grow here two years ago, thanks to the manure. ...Part of the success is from planting the seeds among 'weed vines' so that the plant-eating lizards and ants do not find the seedlings among all the leaves."

**C. H. Hansen, Zimbabwe** wrote concerning the note on monkey painting in EDN 38-6. "When I worked in the copper belt in Zambia a neighbor told me about the same trick: catching and painting a baboon with bright colors. Only they also drenched it in perfumes and evil smelling chemicals. He said that scared off the troupe with the victim in hot pursuit and that they would eventually turn around and kill the victim. Of course, this just moves the problem to some one else's farm."

**Dale Gunnar, Texas.** In southern Texas "we harvest swiss chard year around. When we pull up the old stalks in late winter or early spring, we bury sections of the stalk. These quickly root and send up new growth. This is much faster than reseeding."

**Kevin Hendricksen, Peace Corps, Honduras.** "I planted buckwheat at 1500 meters in early June in an area that receives 1000 mm rainfall. The plants grew quickly, flowered in about five weeks, reached a height of 12-15 inches. But the seeds produced were empty and did not sprout when planted. I made another planting of the original seed from ECHO in July with the same results." Successes in Central America were reported in EDN 10-3 and 38-2. Does anyone know what might have caused this?

**Samuel Ratnam, Singapore** sent a technical note on *Tephrosia vogelii* (EDN 42-5). "The tree has a resemblance to *Tephrosia candida*. However, its pods are larger, longer and very hairy. ... After 5-6 months of growth, the average green material per hectare is about 27 tons. The yield of nitrogen is 112 kg per ha." He adds, "It is used there mainly as a bush green manure in rubber and oil palm plantations and as a shade tree for young tea, cocoa, coffee, and rubber." His company, Inland and Foreign Trading Co., harvests and sells tephrosia seed (Block 79A, Indus Road # 04-418/420; Singapore, 0316. Phone 2722711; FAX 2716118.)

**10 KG OF GLIRICIDIA SEPIUM SEED AVAILABLE.** Craig Elevitch writes that "we have a supply of *Gliricidia SEPIUM* seed which we would like to donate to a good cause. This seed material is first grade, Central American material reproduced in our seed orchard in Hawaii." They have decided to replant with another provenance of *gliricidia* and to avoid cross pollination will not be using this seed. If you can use all or part of that, write Craig at AgroForester Tropical Seeds, 75-5260 Mamalahoa Highway, Holualoa, HI 96725.

## UPCOMING EVENTS

**Two courses will be offered by the International Institute of Rural Reconstruction in the Philippines (IIRR).** From August 1-26 will be a course on **Rural Development Management.** "The 4 week course focuses on enhancing the effectiveness of key leaders of rural development organizations. Planning, implementation and development are covered." Two areas considered are managing sustainable and people-centered development **programs** and managing development **organizations.**

**An International Course on Regenerative Agriculture** will be held October 1-29, 1994. The participants are project managers, trainers and extension supervisors with government and NGO's and should have at least 3 years experience, be proficient in English and medically fit. Major themes are natural resource management strategies; technology development and dissemination; and managing regenerative agriculture projects.

The cost of each course is US\$2,500, including everything except airfare. A limited number of fellowships are available. Courses will be at IIRR's headquarters in Silang, Cavite, Philippines. For more information and application forms, write to The Director, Training Division, IIRR, Silang, Cavite 4118 Philippines. Phone 0969/ 9451; fax 0969 / 9937. Or send at the Manila office: Rm 38 Elena Apts, 512 R Salas St., Ermita, Manila; phone 02/582659, fax 02/522-2494, email iirr@phil.gn.apc.org. In the US: IIRR 475 Riverside Drive, Room 1270, New York, NY 10115; phone 212/870-2992; fax 212/870-2981; email eblitz@cce.cornell.edu.

**"Tentmakers" Conference.** The U. S. Association of Tentmakers (people who do some of the work of missionaries but have a job or business so as to be self-supporting) will hold its second annual conference September 16-19 in Charlotte, North Carolina. This is a membership organization, so you might want to ask about membership when requesting the conference brochure at: U. S. Association of Tentmakers, P. O. Box 35, Cascade, CO 80809 USA.

**International Workshop on Albizia and Paraserianthes Species** will be held in Mindanao, the Philippines November 13-19, 1994. It is a research oriented conference, with research papers welcome. Write James Roshetko, Winrock International; Petit Jean Mountain; Morrilton, Arkansas 72110-9537 USA (phone 501/727-5435).

**Eden Valley Institute Offers Training in Organic Farming.** We enjoyed getting to know farm director Joel Meyer when he spent some days using ECHO's library this spring. The school farm specializes in small farm operation for schools, missions and family-based market gardening. They offer a course "designed especially for small farm management, with emphasis on food production for schools and market gardening through an apprenticeship experience for one full growing season. Classroom instruction and field application are blended together. The course trains individuals in the science of biological gardening so they are prepared to instruct others." The program is run by and for Seventh-Day Adventists, but is open to all Christians interested in agricultural missions (US or overseas). The main focus is commercial-scale, hands-on organic and vegetarian market gardening.

The course outline includes: A philosophy of agriculture and medical missionary work; Biblical principles in nature and agriculture; practical Christianity; biological crop management; food preservation and storage; agriculture equipment and maintenance; energy efficient greenhouse design and operation; fruit culture; methods of crop marketing. (Course fee \$1,500, including room and board).

This year the course began January 17 and will end October 23. Also last December they offered an intensive seminar "for the serious gardener or small farmer with emphasis on participatory food production (utilizing group involvement) for schools and missions. (The 5-day course costs \$300 including room and board).

Contact Steve Meyer for more information at 6263 North County Road 29, Loveland, CO 80538-9598 USA. Phone 303/667-9225.

## **BOOKS AND OTHER RESOURCES**

**A NETWORKING NEWSLETTER FOR AFRICA.** Since 1990 the Methodist Church Division of Social Responsibility and the Methodist Relief and Development Fund have produced a networking newsletter called *West Africa Link*. It is part of their West Africa Agroforestry Program, published twice a year. Typical contents include brief news items provided by members telling what they are doing, conferences or workshops they have held or plan to hold, and references to resources available in Africa. Each recent issue has included a complete reprint of an article selected from another publication which the editor believes would be of interest to members. An item we gleaned from the last issue (how to keep rats from young oil palm trees) appears on p. 3 of this issue. African development workers can write them at Methodist Relief and Development Fund; Division of Social Responsibility; 1 Central Buildings; Westminster, London SW1H 9NH, United Kingdom.

**CLIPART FOR DEVELOPMENT: A COLLECTION OF COPYRIGHT-FREE ILLUSTRATIONS FOR DEVELOPMENT.** Illustrations attract interest and help you communicate more effectively. But it can be difficult to find good illustrations dealing with agriculture and related topics in developing countries. The authors contacted a number of artists and communicators and assembled more than 150 pages of copyright-free line drawings -- illustrating people, farming practices, livestock and crops in developing countries. You may trace them, enlarge them, scan them into your computer, or whatever you wish. Use them in posters, pamphlets, books, magazines, transparencies etc. It is designed for extension communicators who are not artists but need to produce interesting printed materials.

The price is \$11 plus shipping (\$4 US, \$5 surface elsewhere, \$12 airmail). Professor Eric Abbott, Dept. of Journalism and Mass Communication, Iowa State University, Ames, IA 50011, USA.

**HONEY BEE, A NEWSLETTER ABOUT FARMER'S INNOVATIONS** (Reviewed by Scott Sherman). *Honey Bee* is a newsletter specializing in reporting indigenous knowledge and grassroots creativity.

The focus is on documenting farmers' innovations and experimentation in sustainable technologies. Hundreds of innovations have been summarized to date. A couple examples follow.

Volume 3(2) mentions how farmers in the Tungbhadra area of India control leaf miner damage on groundnuts by flooding the fields overnight. Volume 2(1) mentions tribal farmers in the Bharuch district control rats in wheat fields by intercropping with sunflowers. It is believed this provides sturdy support for the owls that kill and eat the rats at night. The same issue tells about controlling termites with: castor cake, castor oil, kerosene, rotation with castor bean or irrigation.

It is important to remember that reports of indigenous knowledge document what people *do*. This does not prove that they either are or are not effective. You might look at each issue as providing numerous ideas for experimentation.

Subscriptions can be paid in US dollars: \$5 for small farmers and \$15 for development workers. *Honey Bee* is a publication of SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions). This group would like to be in touch with other members of ECHO's network interested in sharing "local knowledge". Write Anil K. Gupta, Editor, Indian Institute of Management, Ahmedabad 380015 INDIA.

**SEMBRADORES DE ESPERANZA: CONSERVAR PARA CULTIVAR Y VIVIR**, by Monika

Hesse-

Rodríguez. 252 pages, Spanish only. Reviewed by Laura Meitzner, ECHO intern. This exceptionally well-illustrated book arose from the experiences of agricultural transformation in mountainous southern Honduras. It details the practical techniques implemented to promote soil conservation in a community-oriented development program.

The author advocates a cautious and flexible approach to agricultural change, and the reader is constantly reminded that a successful method is one which works for an individual farmer in the family field. For that reason, the author presents many alternatives and ideas for site-specific adaptation.

The excellent introduction to the techniques used to conserve soil on sloping land, covers the theory, methods, advantages, and drawbacks of the following areas: the construction and multiple uses of an A-frame, many forms of terracing, vermiculture, agroforestry, green manures, low-tillage systems, intercropping, living fences, and windbreaks.

The book will be useful to community leaders and extension agents, who can benefit both from the insights into implementing agricultural change in a rural community as well as the various techniques discussed. Probably the most striking feature of the book is its constant reference to the farmers' own experience, complete with testimonies from individuals about the use of each technique in his or her own field, clear photographs of over 30 unique applications of the conservation measures in farmers' plots, and questions for reflection in a group training course context. The reader can visualize the end results through numerous line drawings and photos throughout the text,. The format would seem to be easily adapted for teaching and extension.

The many illustrations make this a great book for non-Spanish speakers who want to work on their agricultural vocabulary.

Thanks to Judith Castro for sending a review copy. You can order a copy for \$4 from Senor Juan Bautista Mejia, Servicio de Publicaciones del Obispado de Choluteca, Apdo 40, Choluteca, Honduras. They cannot be making anything at that price, so be generous in including postage.

**THIS ISSUE** is copyrighted 1994. Subscriptions are \$10 per year (\$5 for students). Persons working with small farmers or urban gardeners in the Third World should request an application for a free subscription. Issues through #35 in a binder, *EDN: the First Ten Years*, costs \$20 plus air postage: \$3.00 USA (surface), \$6 Latin America, \$10 Europe, \$13 elsewhere. Issues 36-45 cost \$15 postage paid. ECHO is a non-profit, Christian organization that helps you to help the poor in the Third World to grow food.

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