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**UPDATE ON ECHO'S AGRICULTURAL MISSIONS CONFERENCE (November 8-10, 1993).** As this is written, the

last issue went out too recently to have heard from our overseas network. Several people in the US have expressed interest. I am especially pleased that Dr. Hugh Popenoe, Director of the Center for Tropical Agriculture at the University of Florida, has volunteered to be one of our speakers. In addition to his work at the university, for the past 15 years he has taught at the Transcultural Seminars that the Mennonites provide for outgoing missionaries. Topics have included lessons learned from indigenous systems, sustainable agriculture, and underutilized plant or animal species (based on his participation in writing some of the National Academy of Science books on those subjects). It is going to be hard to select which talk he should give.

I was asked, "Do I need to be a missionary to attend or to make a presentation?" Absolutely not. This will be open to anyone doing community development work in a Third World setting.

Please send us a note expressing your interest (even if it is not certain you can attend). Also mention when you will be in the US, and what your address will be while in the States. Because this is our first conference, we need some measure of how many *might* be here. We hope to make this a *very* inexpensive but high powered conference.

**SEED AVAILABLE FOR A CARROT THAT WILL SET SEED IN THE TROPICS.** In the spring of 1992, William Tabeka wrote from Uganda. He wanted to grow carrots, but seed was not available. I sent a copy of EDN 31-4 in which we discussed the difficulties of producing carrot seed in the tropics. Carrots normally spend a winter dormant in the ground, then produce the second year. I also enclosed just a few seeds from a packet we had just received from Dr. Warwicke Kerr in Brazil. He said that this carrot, called 'Uberlandia,' would set seed even in the tropics, and would do so in a single season.

Our interest in this carrot increased greatly when Mr. Tabeka sent us a picture of himself and his family standing by what appeared to be carrots in full bloom. I wrote right away inquiring if that is indeed what I saw, and what he thought of the taste. He replied, "I assure you that the carrots really did put on seeds. The taste of the root is good and there is a difference, because that one which put on seeds has a root that is a bit longer than the others (some high carotene carrot seeds we had sent). There is no difference at all in the appearance of the seeds." A recent letter says he is now growing carrots from seeds that he harvested during the last rainy season.

We planted a couple plots last spring to produce seed for our seedbank. By early summer, as you can see from the picture, they blossomed heavily and eventually produced seed. We need to work on timing to see if we can get seed during the dry season, as the heat and humidity make it difficult to obtain high quality seed. None-the-less, we can now offer our network seed with about 70% germination.

We allowed nearly every plant to go to seed, so we have little information on size or taste of the roots (by the time seed was mature, the roots had shriveled up). I sampled two 3 inch carrots, trying them both raw and boiled. I prefer the varieties I am used to, but if they were the only carrots available, I would be glad to have them.

Someone familiar with plant breeding could do a great service to the peasant farmer. Presumably a variety with superior qualities could be developed which would also still produce its own seed.

A free sample packet can be requested by development workers and overseas scientists, \$2.50 to others. We will be VERY interested in your experience with and impressions of this carrot.

**IMPROVING CARROT EMERGENCE IN CLAY SOIL.** (The following is taken from the July 1993 issue of *HortIdeas*). Researchers in Brazil "tested various techniques to boost the emergence rate of carrot seedlings in heavy clay soil. Shading the seed bed worked better than mulching with organic materials such as sawdust and straw; adding a layer of sand resulted in poorer emergence than with bare soil." The *HortIdeas* editors add that they have "had no complaints about our stands of carrots since we began, several years back, covering the rows with boards until a high percentage of the seedlings break through the soil surface."

**NEW DATA ON MORINGA SEED TO PURIFY WATER.** Use of moringa seed on a small scale (household level) to purify water has been mentioned in EDN #11-7 and #21-6. Dr. Geoff Folkard at the University of Leicester in England sent us articles concerning very recent work in Malawi. "This is the first time that *Moringa oleifera* seed has been used as a primary coagulant [to clarify water in a treatment plant] at this scale (flow rate 16 m<sup>3</sup> per hour)."

The water plant normally uses alum, an imported chemical, to clarify the water. They only had enough seed to run the plant six hours. Water quality was monitored before and after the switch from alum to moringa was made. There was no deterioration in performance. They used twice as much moringa as alum (50 mg/ml of moringa seed vs 75 mg/ml).

Laboratory trials show that using alum and moringa together (they call it co-coagulation) can give superior results to either used alone. Moringa seed (either *M. oleifera* or *M. stenopetala*) were equivalent to alum and even superior in water of unusually high turbidity. (If you are interested in the chemistry involved, the active ingredients in moringa seed have been identified as two small water-soluble proteins with a net positive charge.)

"For many countries, imported alum is the major cost element in the provision of potable water. Malawi currently spends in excess of £220,000 each year on imported alum. Switching to moringa would both save foreign exchange and generate farm and employment income.

"Further full scale trials in Malawi are planned for January 1994. It is hoped that demonstrations for interested parties from other developing countries will be arranged." Dr. Folkard's address is University of Leicester, University Road, Leicester LE1 7RH, England.

Dr. Folkard is now working on extracting the oil from moringa seed. Preliminary tests indicate that the cake remaining after the oil is extracted is still able to clarify water. He is conducting further tests. Because the oil is quite valuable, this could have a big impact on the economic viability of a moringa-based water treatment program.

**A NEW REARING METHOD FOR COCHINEAL INSECTS.** The red dye, carmine, comes from the bodies of female cochineal insects, *Dactylopius coccus*. In Peru and the Canary Islands, these have for centuries been reared on prickly pear cactus plants, *Opuntia ficus-indica*. The insect can only survive on varieties of this plant. With use of synthetic dyes for human consumption coming under increasing criticism, the demand for natural dyes is increasing.

In parts of southern Africa there are large, aggressive wild stands of prickly pear, but rainfall patterns and intensity make it impossible to grow the insects on plants cultivated in the open. Any rainfall washes insects from the plants and they do not survive. A new rearing method allows them to make use of the vast supply of healthy plants, according to *Economic Botany* (vol 4, pp 154-162, 1993). "Healthy, fully mature terminal [pads] are suspended from hooks inside large sheds (90 m<sup>2</sup>) after they have been seeded with crawlers (immature stages of the insect)." After three months in the summer to five months in winter, the mature females are harvested by placing the pad over a container and blowing compressed air over them. Some females are allowed to reproduce. All females are eventually dried at 60°C for two days before they are exported.

"Preliminary estimates are that annual production of dried cochineal insects for a rearing unit of 90 m<sup>2</sup> will be 75 kg. Based on a world price of US \$40 per kg, this represents a gross income of US \$3,000." They estimate that 3-4 rearing units could be maintained for every densely populated hectare of cactus."

This work was done by Dr. H. G. Zimmermann, director of the Plant Protection Research Institute in South Africa (Agricultural Research council, Private Bag X134 Pretoria 0001, Republic of South Africa). He told ECHO that his research had to be stopped for lack of funding. The original research paper he sent us lists the following problems that still need to be solved. (1) 80% or more of immature crawlers are lost. (2) Optimum temperatures are not known. Also conditions leading to periodic excessive decay of pads are unknown. (3) Contamination of

the insect population by *D. opuntiae* can be a problem. (This insect was brought into South Africa as a biological control of prickly pear cactus.)

**A NEW IDEA FOR AN EMERGENCY MILK SUBSTITUTE IN WEST AFRICA.** Ken Flemmer with Adventist Relief and Development International sent us the following report from two of his staff, Jim and Yoko Rankin. It concerns a totally new use for egusi, a plant that we first featured in EDN 7 -1.

During a training seminar in Ghana a local farmer stated "that his wife did not have sufficient milk to feed their 6 month old baby. Our first thoughts went to soy milk, but as they do not have soy beans it was not a practical solution. Also, soy milk is not easy to prepare and becomes acidulated very quickly."

"Someone suggested agushi melon seed [ED: this is surely a Ghanaian spelling of egusi.]. I set up the blender, took 100 grams dehulled agushi seed and blended it with two cups (400 ml) of water and tasted it, added another cup of water, 2 teaspoons of honey and 1/4 teaspoon of salt and behold, we had a milk tastier and creamier than soy milk with a closer texture resemblance to real milk."

"The dry dehulled seeds resemble a large pumpkin seed. In the village every home has stone mills or small grinding plates. The seeds are easily crushed into a peanut butter consistency. Mixed with water, honey and salt -- instant raw milk. To make it equal to mother's milk we found that we must add 6/7 cup of water per 1 cup (100 g) dehulled seed. It does not form gas and the school children who have tasted it have not complained of any problems."

"The agushi melon grows throughout Togo, Ghana, Cote d'Ivoire and Benin [Ed: also Nigeria, Zaire and probably elsewhere.] One type has large seed and a very thin papery hull which slips off when seeds are rubbed between the palms of the hand. The other two types have a very hard shell on seeds that are slightly larger than cantaloupe seed. We have tried making milk from all three types, but the smaller varieties with hulls intact make a slightly bitter tasting milk. I presume that if the hulls can be removed the bitter taste would disappear."

I mentioned all this to gardener and ECHO supporter Glen Munroe in Indiana, lamenting that we had no idea how the "milk" tasted. Surprisingly, Glenn had grown egusi this summer and could do a few trials for us. Here are some highlights of his experience. Unlike in Ghana, he did not dehull the seeds.

"I blended 75 g seed, 1.5 cup water, 1/16 teaspoon salt and 1 teaspoon honey in our Osterizer blender at the 'liquify' setting. After straining I had 1/3 cup of meal and 1.5 cup of what looked like milk. It had a subtle raw cucumber-like taste. The meal was similar to corn meal mush with a distinct feel of some additional fiber and a raw flavor. After boiling the flavor was unchanged, but good. The flavor a bit strong, but I believe I could adjust to eating it as a breakfast cereal.

"I repeated, using a Vita-Mix juice blender that more completely pulverized the seed, leaving out the honey. I then did a taste test with various additives, using 2% milk as a standard (rating of 5). The raw cucumber taste come through in all samples, but was hardly noticeable with Hershey chocolate syrup added (rating of 5-). After drinking 2 ounces, though, I noticed an itchy feeling in my throat, I think due to the fine fiber. Adding honey or maple syrup gave drinks that I rated as 4+."

The variety of egusi that ECHO distributes is larger than a watermelon seed. Egusi, *Colocynthis citrullus* L., looks like a watermelon while growing, but the white flesh of the round, 6 inch diameter fruits is bitter and inedible.

Of course, just because something looks and tastes like milk does not mean it can be a milk replacement. We found no information comparing the nutritional value of egusi to milk, but did find a very helpful article *Chemical, Functional and Nutritional Properties of Egusi Seed Protein Products* (J. Food Sci, 47, 829-835, 1982). We can send a copy if you are interested in that much detail. Dehulled seeds contain approximately 50% oil and 30% protein. They are good sources for the essential amino acids arginine, tryptophan and methionine, and vitamins B<sub>1</sub>, B<sub>2</sub> and niacin and the elements sulfur, calcium, magnesium, manganese, potassium, phosphorous, iron and zinc. Egusi has potential as a source of calcium and niacin in low milk consuming regions.

Biological indices of protein quality were "lower than soybean but comparable to or higher than most oilseeds." The most limiting amino acids are lysine followed by threonine. "Histidine has been known to be an essential amino acid for infants. ...Thus the low content of histidine in egusi seed should be considered in the use of this product in food formulations, especially if the foods are intended for infants."

Heating the "milk" is going to be a problem. Glen writes, "as soon as the liquid felt hot to my finger it began to curdle. By the time it boiled it was clumped into 1/4 to 1/2 inch (0.6-1.2 cm) diameter particles that easily broke up when stirred."

One visitor from Africa told me that whenever a group of men were standing around talking, their hands were usually busy dehulling egusi seeds. It is ground into a paste and mixed with a variety of condiments to make stews, is made into a substance like peanut butter, roasted, cooked in soups, etc. The Paulsons in Central African Republic tell us that dry dehulled seeds can be placed on a skillet and popped like puffed rice. They add that egusi is one fruit that monkeys do not bother.

It is usually intercropped (see EDN 41-4), e. g. with corn, coffee and cotton. After 4 weeks of growth the plants completely cover the soil surface. Flowering occurs 4-5 weeks after planting and fruits mature at 7-8 weeks. Fruits are softened by beating with a club and allowed to rot for about a week to make the seeds easier to remove. Seeds are washed and dried for storage.

Since it is such an important crop in West and Central Africa, it is surprising that we have heard no reports of acceptance elsewhere from people to whom we have sent seed. Perhaps its possible use as an emergency milk will make a difference. A free sample packet can be requested by development workers and overseas scientists, \$2.50 to others. Please let us know if you try this.

**ANOTHER SEED SUPPLIER WITH A LARGE SELECTION.** Shivalik Seeds Corporation sent an impressive list of seed (primarily forestry, medicinal, hedges, green manure, and ornamental) which they supply from India. The prices also seem reasonable (e. g. 1 kg neem is US\$7, moringa \$8, plus postage). Seeds are divided into three categories: seeds of short viability and hence only available right after harvest; seeds normally available throughout the year; and seeds which can be supplied on special request. Their address is 47, Panditwari, P. O. Premnagar, Dehra Dun 248 007 (U.P.) India. Phone 91-135-683-348; FAX 91-135-29944; telex 585 211 PCO I

**AGROFORESTRY STUDY TOURS.** (Abstracted from *Agroforestry Today*). Technical and Study Tours, Ltd. organizes study tours in Kenya focusing on agroforestry, agriculture, forestry and the environment, as well as wildlife safaris. Participants can become acquainted with more than a dozen successful agroforestry projects, meet with ICRAF staff, make use of ICRAF facilities, and visit their field station at Machakos. Contact Technical and Study Tours, P. O. Box 50982, Nairobi, Kenya. Telephone (254-2) 791227/780461. FAX (254-2) 780461.

#### **CAN YOU HELP US?**

*Moringa stenopetala* (EDN 32-5, 36-8, 37-7) seems to have many advantages over the more common *M. oleifera* that we have mentioned so many times in EDN. It is more drought resistant, has larger leaves that are perhaps better tasting, and larger seeds. It is extremely difficult for us to obtain seeds, and they are quickly distributed. Our four year old tree is still not bearing. We would like to know if anyone that received seeds from us now has a tree that is bearing. If so, perhaps we could arrange to obtain a quantity of seed from you periodically. Even if you do not have seeds, we would be interested in an update on how the trees are performing for you.

In the meantime, the International Livestock Centre for Africa (ILCA), has a very limited quantity of seed. Dr. Jean Hanson, head of their Forage Genetic Resources Section writes, "Although we have tried to increase seeds we have not been very successful. We can provide very small quantities but would prefer to send seeds directly to requesters. ILCA provides this service free of charge. I have not come across any commercial suppliers for this species."

Dr. Hanson adds, "**The ILCA genebank** holds about 12,000 accessions of a wide range of forage legumes, grass and fodder tree species. Small experimental quantities of seeds are available free of charge for forage research and development workers. It usually takes up to a month to fill seed requests." For large projects, they publish a catalogue in 3 volumes. Volume 1: multipurpose trees and large shrubs; Volume 2: tropical lowland forages; Volume 3: temperate and tropical highland forages. "ILCA also has a Herbage Seed Unit that can provide larger quantities of a limited range of species to begin local forage seed multiplication programmes. You may wish to mention our service in your newsletter so that readers can write to request seeds."

We have always found the people at ILCA to be very responsive and open to helping development workers. If you are having trouble finding something, keep them in mind. The address is P. O. Box 5689, Addis Ababa, Ethiopia.

**ECHO HAS A NEW EMAIL NUMBER** ECHO is now on the internet system. Our number is PRICEM@mail.fern.edu. At present the volume of mail is so small that we will only be checking it twice a week. So if it is extremely urgent that we see your message immediately, you might consider a one minute phone call or fax just to say "check email for an urgent message from ...".

**WE ARE TRYING TO CONTACT SOME PAST MEMBERS OF OUR NETWORK.** In ECHO's early years, people would sometimes send us a modest amount of money to hold for them in a special account to be used when they asked us to purchase something for them. We stopped that service some time ago and refunded account balances to most people. (Today people send us a credit card number when they have such a need.) However, several people still have money in their account who are no longer on our mailing list and did not reply at the last address given. If you see your name in the following list, or know their address, contact us quickly. At the end of our fiscal year, March 31, we will transfer any unclaimed balances to our general fund.

Carl Berg, Dick Both, Pere Brutus, Henrietta Byma, Joseph Classens, Marvin Devries, Neal Eash, Rhine Fecho, Pat Franje, Craig Frederickson, Tim Frederickson, John Glennon, Mary Grimes, Lou Haveman, Mike Krahwinkel, Virginia McNair, Fred Pettitt, Tom Powell, Ron Prins, Sibs Project, Gary Rohwer, Gary Shepherd, Graeme Smith, MCC Swaziland Account, P. Undah, Bill Van der Klippe, Clayton Weeks.

**SUCCESS WITH VELVET BEAN IN THE REPUBLIC OF BENIN.** Velvet bean, *Mucuna pruriens*, has probably had more impact on farmers lives than any plant distributed from our seedbank. You have read about it in many issues (see especially 20-3, 24-4 and 37-1).

A brief review for new readers. Velvet bean is an extremely vigorous vine that grows well in moderately poor soil, is drought resistant, and fixes a lot of nitrogen on its roots. It is interplanted with corn as a green manure. Soon after the corn matures, it covers the entire field, killing weeds. It can even kill vigorous grasses like imperata grass. It is cut back and left in place just before corn planting time. This kills the vine, which now protects the soil from erosion, retains moisture, and eventually turns into compost.

How effective can it be? Tom Post reported that in Beleze it had doubled and, in some cases even tripled, corn yields. A Project Global Village publication in Honduras reported up to 4-fold increases in corn yields.

The latest annual research from the International Institute for Tropical Agriculture in Nigeria reports on their experience in Benin. Demonstration plots of different kinds were established in farmers' fields. Groups of farmers met periodically to observe the results and to discuss what experiments they would want to do on their own fields. They were especially impressed that velvet beans could smother young shoots of the vigorous weed "spear grass" (*Imperata cylindrica*). Farmers harvested 80% more corn with velvet bean than on continuously cropped land. Farmers that chose an alternative experiment (pigeon pea) had only a very modest improvement.

Next farmers with "completely depleted fields" were given two optional experiments: plant acacia trees for a multi-year fallow or velvet bean. Many planted velvet bean one month after sowing corn, during the first rainy season, then let it grow into a dense cover during the second rainy season. The results were dramatic. They recorded, on average, a 10-fold increase in corn yield (from 200 to 2,000 kg per hectare). National extension authorities are now applying this

technology in all zones where soils are depleted and imperata is a problem.

The article ascribes the success of the effort to several factors. Farmers were not just involved in the experiments but also in choosing which experiments to do. A range of options were presented. Farmers had a chance to see demonstration plots showing the effects of technologies before they made a selection. They were not simply told about hypothetical benefits and asked to make a selection. Finally, the effect of velvet beans on corn yield plus the bonus of imperata control had a decisive impact.

The amount by which velvet bean can increase yields clearly varies greatly from place to place. If the soil is sufficiently depleted, it has the potential to make an enormous difference. If you have not yet tried velvet bean and it is not readily available near you, we can send a trial packet. If you do not have back issues of EDN, you might also want to request the Technical Note on Green Manures at the same time.

**FOR YOUR INTEREST ONLY. Supplemental Currency.** Currency serves two uses in a community. It buys goods and services from outside the community. Until then, it recirculates within the community making economic activity possible. A common lament is heard throughout much of our overseas network (and in our own country as well). "It just makes no sense. Willing labor goes unused and local produce and goods unsold because no one in the community has money. This remote area has so little to 'export' out of the region that very little money comes in to it."

A missionary once told me, "Even if our projects had no effect themselves, the ripple effects of the money we spend recirculating in the community is in itself an enormous value." In my less restrained thinking, I have pondered, "If all this productive potential sits unused for lack of currency, then why not create a local currency, valueless except for goods and services in that community?" The idea seemed intriguing, far out and probably illegal.

You can imagine my surprise to read in the September 1993 issue of *Mother Earth News* that two years ago a group in the community around Ithaca, New York (the location of Cornell University) created a supplemental currency called HOURS. A one HOUR note is worth one hour of labor, or its equivalent in "barter" for other goods and services. It is accepted by an increasing number of people (laborers, farmers market vendors, baby sitters, hair dressers), and businesses such as restaurants. One credit union even accepts HOURS for deposits, though not with any equivalency with dollars.

Supplemental currency may well be illegal in the country where you work, and it is still a "far out" idea. But it is sure a fascinating article. (Interested readers in Third World countries can write us for a photocopy. Others please refer to your local library. You can order a *Hometown Money Starter Kit*, including forms, laws, barter articles, past and future issues of their newsletter, sample currency for \$25 (in US dollars!) from the group that started the Ithaca project: Ithaca Money, Box 6578, Ithaca, NY 14851.

**ECHOS FROM OUR NETWORK Saidou Jallow in the Gambia.** "The bird resistant dwarf sorghum did absolutely well. I find no fault in it. Both the people in my village and surrounding villages like it. I hope in the near future it will be widespread in the area because it has the following advantages: short duration, wind resistance, and less or no disease. A free sample packet can be requested by development workers and overseas scientists, \$2.50 to others.

**Malcolm Davis, Georgia, USA** shared the results of a "small" trial (20 plants) with 'solar set' and 'heat wave' tomatoes. "Although I am in the temperate zone, there is a period during the summer where tomatoes usually will set very little fruit because of high night temperatures. This makes it difficult to produce a satisfactory late crop of tomatoes. I wanted to see whether adding some 'solar set' or 'heat wave' tomatoes might extend the season. I am happy to report that I did have good fruit producing during that difficult late period. The heat tolerant plants set more fruit during the hottest months than the cultivars usually grown here. This resulted in a larger total crop because of the increased fruit set during the late part of the season. ...it might be worth passing along to workers in temperate Third World countries as it might produce a heavier crop when fruit

set is low due to high night temperatures."

**Rev. Herbert Perry**, a former missionary in Zimbabwe (then Rhodesia), wrote in response to a letter in EDN 38-6. It said that in Ethiopia a monkey is painted, then set loose to join its group. The strange colored monkey scares the rest of the tribe away. "I suspect your report is somewhat incomplete. Studies of monkey life and behavior have been conducted over a number of years by field workers who routinely dye a monkey so that it may be identified and observed over a period of time. As far as I know, there is no evidence that the alteration in color in any way disturbs the rest of the clan."

"In Zimbabwe monkeys and baboons are frightened away in a way similar to that report, except that instead of paint farmers use the animal's own blood. [Ed: This becomes gory and neither I nor Rev. Perry recommend it. But it is life so you should know about it.] After trapping a single animal, they strap it securely to a board and proceed to flay large areas of the animal's body, releasing it as a bleeding mass of screaming pain. When this animal attempts to rejoin its compatriots, they indeed are frightened off. Eventually, of course, the wounded animal dies. It strikes me as being unnecessarily cruel and inhumane." If any readers have first-hand and successful experience with the painted monkey technique, please send us every detail you can think of about the process and its effect. It might save a lot of animals from being tortured.

**UPCOMING EVENTS** A combined conference: the IX international conference on jojoba and the III International Conference on New Industrial Crops and Products, September 25-29, 1994 in Catamarca, Argentina. "The program will emphasize important new crops such as jojoba, guayule, kenaf, lesquerella, vernonia, chia, cuphea, etc, as well as other uses of traditional crops." Talks will be in English or Spanish, with simultaneous translation available. Registration before August 10 is \$200 (\$50 student). Write them at 25 de Mayo 158, 1st Floor, Of 36 y 37, 1002 Buenos Aires, Argentina. Phone (54-1) 343-0313/3112. Fax (54-1) 331-4143.

## **BOOKS AND OTHER RESOURCES**

**FARMING FOR THE FUTURE: AN INTRODUCTION TO LOW-EXTERNAL-INPUT AND SUSTAINABLE AGRICULTURE** (reviewed by Scott Sherman). The book was written to help development workers assist resource-poor farmers develop productive, sustainable farming systems using locally available resources.

The main themes are: LEISA (low-external-input and sustainable agriculture and PTD (participatory technology development). The first is an approach that seeks to maximize the use of locally available resources, both human and natural, in ways that are economically, ecologically and socially sound. External inputs are seen as complementary rather than foundational. PTD stresses the combination of indigenous and scientific knowledge to find solutions to farmers' problems. PTD is seen as a stepping stone to LEISA.

Chapter 1 explores the need for sustainable agriculture. Chapter 2 considers the farm as a system and decision making at the farm level. Chapter 3 is titled "Technology development by farmers" and focuses on traditional farming systems, farmer experimentation, farmer innovation and farmers' limitations. Chapter 4 introduces basic concepts of agroecology. Chapter 5 deals with principles upon which to build productive, "site-appropriate" forms of LEISA. Chapter 6 deals with developing LEISA systems in the Tropics. Chapters 7 and 8 deal with PTD and linking farmers and scientists in developing LEISA technologies.

Both missionaries and ECHO's interns have found it a helpful resource. It's often checked out when I'm looking for it and our first copy is already dogeared. There are many helpful photographs, graphs and drawings as well as numerous boxes giving examples from the field to illustrate key points. What I find particularly helpful is the 72 pages of appendices which alone make it a valuable resource. Appendix A lists specific promising techniques such as: composting, green manuring, use of trap and decoy crops, natural medicines, water harvesting techniques, etc. Appendix B is a glossary of key terms. Appendix C contains: a list of suggestions for further reading, an annotated bibliography on sustainable agriculture in the Tropics and addresses of organizations concerned with sustainable agriculture. There is also a very good index.



The down side to any book that seeks to be exceptionally complete and detailed is that a lot of words are sometimes used to state the obvious for the sake of completeness. It can make for slow reading.

The authors are all on staff at The Information Centre for Low-External-Input and Sustainable Agriculture in the Netherlands (see EDN 42 for a review of their newsletter). Individual copies are available from the publisher: Macmillan Press, Houndmills, Basingstoke, Hampshire RG21 2XS (Tel. +44-256-29242, Fax +44-256-810526) for £6.95 (around \$11).

**A TECHNICAL NOTE ON OX YOKES.** Tillers International is the group in Michigan that gives training in animal powered traction. We have mentioned their courses before (EDN 29-8). They also study and modify designs and publish a newsletter called *The Tillers Report*. A subscription is \$15 for 2 years, \$25 for airmail.

They also have begun a series of TechGuides. Titles include: Full-scale yoke plans (\$4 per size in one inch increments); Slip scraper construction and operation (\$1.50); Measuring draft power (\$0.50); Bricks, brakes, head yokes for restraining loads behind oxen (\$0.50); and the MOP over-the-row weeder (\$1.00). Postage is 50 cents in the USA and \$1.00 overseas. Order from Tillers International, 5239 South 24th St, Kalamazoo, MI 49002, USA.

A recent 10 page technical note is called *Tillers' Tech Guide: Neck Yoke Design and Fit, ideas from dropped hitch point traditions* (\$1.50). ECHO claims no expertise in this area. But this appears to contain the kind of practical, applied, and well-illustrated information that might be helpful to you. I quote from the introduction.

"I was struck by the importance of yoke fit and design when training the first pair of oxen at Tillers. I had worked with a number of pairs in West Africa... I began training with a simple yoke like I had used in the African project. It had a pole for a beam, steel rods for bows, and a clevis extending behind the beam for hitching. After a few weeks the team pulled a stone boat willingly, but if I stepped onto it, they would stop.

"Then I placed an historic yoke on the team. They did not mind its extra weight and readily pulled the stone boat. I stepped on and they continued to pull without hesitation. A second person got on and the team still pulled. It took the weight of a third person to discourage them. I was amazed that changing the yoke permitted adding about 330 pounds (150 kg) to their load. I immediately started analyzing that old yoke and reading ... about traditional yoke design and dynamics. Obviously these yokes were superior in some simple ways."

**TWO PRACTICAL BOOKS IN HAITIAN CREOLE.** Edd Russell wrote a 117 page book in Creole called *Ensèk Nan Jaden Nou* (Insects in Your Garden) while working with the Baptist Mission. "This book grew out of my own lack of knowledge about insect pests. I would buy pesticides that came in a plain brown bag or a used food oil can. So I had no idea how to use them properly. Talking with others, I found that there is a great abuse of pesticides in Haiti. ...The book has its roots in a brief agriculture course I was teaching at the request of a local cooperative.

"The book is divided into 5 chapters. Chapter 1: insect life histories and the identification of some common beneficial and pest insects; Chapter 2: pesticides, their dangers, proper use, and how to make home-made pesticides; Chapter 3: first aid information for pesticide poisoning; Chapter 4: a table of Latin, Creole, English and French names for the insects and botanical pesticide sources discussed in the book; Chapter 5: a table of various crops, common pests that attack them, and pesticide treatments that can be used.

"The book is neither complete nor perfect, since I do not profess to be an expert on insect matters." Ed told us that it is weak in two areas. 1. Geographic coverage. He is most familiar with problems in the Cul-de-Sac and Fort Jacque area. 2. It lacks information about some pesticides because many insecticides sold in Haiti are not sold in the U.S. He also said he did not discuss cultural methods of control, such as floating row covers, that he believed were out of reach of peasant farmers. The book is written for people doing extension work, not peasant farmers themselves.

He revised the book this past October "to include general information about organic gardening concepts which I picked up in the apprenticeship in Ecological Horticulture at the U. C. Santa Cruz course this summer."

The Baptist Mission is printing the book on a laser printer as needed and selling it in the Mountain Maid store at the mission. I think every development worker in Haiti knows where the mission is at. The cost is \$7 a copy, including postage. The address if ordering from outside of Haiti is Mountain Maid, Baptist Haiti Mission, Box 15650, West Palm Beach, FL 33416. "Since I am no longer working in Haiti, other interested people may want to work on future revisions...". This could easily be done because of the print-as-needed approach. If anyone wishes to do

this in the future, contact Wally Turnbull at the Baptist Mission. Dr. Terry Berke has written a very helpful 44 page book called ***Plants of Economic Importance in Haiti***. "When I was teaching at the American University in Les Cayes I often had only the Creole name of a plant. Once I had the scientific name I could usually find information about it in my reference books."

The book is not exactly a bilingual dictionary, but can be used that way. A large table lists the names of a great many plants and the family to which they belong. English, Creole and scientific names are alphabetized together. You then turn to the body of the book where each family is discussed. In that discussion the scientific, English and Creole names of the family members are listed along with a very brief discussion of each plant and its uses.

I found the book to be extremely helpful on a trip to Haiti last October. So many times we would be given the Creole name and had no idea what the plant was -- until we checked it out in this book.

For easy reference to more common plants, the book includes one page of scientific names of common vegetables, followed by the English and Creole names. Another page does the same for fruit and multi-purpose trees.

ECHO is publishing the book in-house as needed. The price is \$3.50. First class postage is \$1.25 (or \$3.00 airmail direct to Haiti).

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