EDN ISSUE 23. SEPTEMBER, 1988

23-1 SOME PERSONAL THOUGHTS. One of our readers commented that he would like to occasionally hear what is happening at ECHO itself -- a good idea.

Our network has grown faster than we would have ever anticipated. The latest EDN went to 2200 people in 90 countries. Each month we receive 60 - 80 letters requesting seeds and/or asking questions.

If you thought you were just writing to Martin, you may be surprised how many people are involved in serving ECHO's network. Each year we hire two recent college graduates as interns. They must have a strong Christian commitment with a desire to work with Third World farmers or urban gardeners, as it is a training opportunity for them. The interns have major responsibilities for operation of the seedbank and farm. A third intern position lasts less than a year and is for people who need the experience but do not have a year available. Interns are given housing and paid a modest salary.

In June Scott Sherman, a past intern who now has a masters in agronomy, filled a much-needed new position as assistant director and will be answering many of your technical questions. Lory White, our secretary, uses the help of several volunteers to keep up with the office work. Barb VanSchoyck works a day and a half a week helping us find funding. Last year 3100 volunteer hours were donated on the farm and in the office, and this year will be higher yet!

In 1987 we built three additional greenhouses. This adds 6500 square feet of protection if we get a freeze. Two of them are used to let us simulate special climates. In one, our "rainforest" climate, sprinklers make it "rain" heavily each day. Another simulates a semi-arid climate.

A special challenge of non-profit organizations that are growing rapidly is that they must commit more and more resources to the ministry while having less and less time to raise money. ECHO is supported entirely by donations and an occasional grant. We must raise $163,000 this year. We always welcome leads to government or private funding possibilities. We do <u>not</u> ask or expect donations from the EDN network, though we have appreciated it when readers who no longer work overseas have begun to help.

We would very much like to increase publication of EDN to six times per year from the current four. We will first need to find the extra funding for writing, printing and mailing and the extra correspondence and seed requests this will generate.

23-1 ELECTRIC SHOCK FOR SNAKEBITE. In issue 23 we shared the success that Don Mansfield had using electric shock for scorpion bites. Several articles have appeared in the past couple years on the subject of using electric shock to treat poisonous bites. It is being investigated by Dr. Jeffrey Williams, a tropical disease expert at Michigan State University. All this began with Dr. Ron Guderian, a missionary in Ecuador, wondering about a widespread notion in Ecuador that electricity was therapeutic for snakebite. We wrote to Dr. Guderian for an update. A summary of his comments follow:

"Right now I do not have a lot of time to devote to this research, so our results are coming slowly. In the laboratory we are trying to determine how the electric shock actually deactivates the venom, or what protein components the shock affects and how. This would give us the scientific basis to say how the shock works, not just that it appears to on trial.

"We have been using the electric shock for treating snake bites in Ecuador for the past 8 years and have found some very interesting results. If the shock treatment is given at the site of the bite and in an appropriate time frame, there is no reaction on the part of the person bitten.

"In the past two months we have treated several patients who have come to us 4 - 6 hours after being bitten. The site of the bite and surrounding tissues were edematous [Ed: in other words, venom had definitely been injected]. Having no other resource, the electric shock was given on the chance that it might help in some manner [Ed: Even though shock treatment is normally done much sooner than 4 - 6 hours]. To our surprise, the swelling decreased and in three days the site of the bite and surrounding tissues were normal. Without treatment, swelling usually increases and can last for weeks. The reduction is important because swelling causes much of the secondary complications from snake bites.

THIS IS ONLY FOR USE IN REMOTE LOCATIONS WHERE ANTI-VENOM IS NOT AVAILABLE. "To answer your question, yes, shock should be used only if anti-venom is not available. Shock is not used along with anti-venom, nor in place of it. I have recorded 74 reports of the use of electrical shock with positive results."

TECHNICAL DETAILS. NEVER USE CURRENT FROM THE POWER COMPANY OR ALTERNATING CURRENT FROM YOUR OWN GENERATORS! "You need a DC pulsating electric current, 20-25 Kv and only milliamps of current. The best source of shock that we have found is the spark plug of an auxiliary gas motor such as a chain saw, motorcycle or outboard motor. Shock can also be applied directly from the coil of a car. Should a missionary carry a stun gun? Some people are carrying stun guns, but they should only be used if no other source of shock is available. It is important that the stun gun does not exceed 20,000 volts of power. Again let me say that this is experimental so far. The most important concept is that the patient be treated as soon as possible, preferably within 10-20 minutes. Otherwise permanent tissue damage may have already occurred.

"Most snake bites occur on the limbs. Ground the limb on the side opposite the bite. Hold the electrodes in place with tape as contact is otherwise broken during the discharge. Apply the shock directly to the bite for 2 seconds, rest and repeat 2 - 3 times depending on the size of the snake. [Don Stilwell with SIM sent us a summary of a conversation with Dr. Guderian saying that the larger and more potent the snake and the more venom injected, the more shocks may be necessary, even up to eight discharges.] If using a stun gun, to one of the terminals add a 2 - 3 foot copper insulated wire connected to a 4 x 4 inch plate that is a good conductor. The other terminal is applied directly to the site of the bite and the current discharged by pressing the button. This allows for maximum current at the site of the bite."

Dr. Guderian requests that, if you use this method, please keep a record of patients treated and note the type and location of bite, type of snake, time elapse between bite and treatment, source for current and patient's response. "Since we are still collecting data to prove that this method works in other parts of the world, I would appreciate receiving any such data." His address is Hospital Vozandes; H. C. J. B. Casilla 691; Quito, Ecuador; South America. ECHO would like to know your results too.

23-2 SOME SOURCES OF PASTURE AND/OR TREE SEEDS. (1) In EDN 13-1 I reviewed the Yates Seed Company's colorful book Better Pastures for the Tropics. Some of you wrote that the book was out of print, but it is available again, for they just sent me a new copy. Their price is now $10. I frequently send their sizeable seed price list to people who write for a source of tropical and subtropical grasses or legumes. Note their new address in ordering: P. O. Box 616; Toowoomba, Queensland 4350; Australia. (Phone 076/34-2088; Telex AA 40412 YATES).

(2) Samuel Ratnam, the director of the Inland & Foreign Trading Co., sent us a 2 page listing (prices only upon specific inquiry) of pasture, cover crop and shrub/tree seeds. He said they have marketed these seeds for 40 years, especially to plantations, ranches and reforestation programs. Their address is P. O. Box 2098; Maxwell Road Post Office; Singapore, 9040. (Phone 2722711; Telex RS 25254 IFTCO). (3) Dr. Martin Knoblauch who works with a development group in Costa Rica sent us the catalog of an Argentinian pasture seed company, Pallaro Hnos. Though not as large or complete as the Yates catalog, it is similar with interesting text (IN SPANISH) and several color pictures of some subtropical grasses and legumes. Their address is Asuncion 2133/35; (1419) Buenos Aires, Argentina. (Phone 571-8226; Telex 23192 PALL AR).

(4) SETROPA has an especially complete listing of tree seeds. Their 20 page catalog gives prices per kilogram, so if you want only a small amount you should specify the amount when you write for information. Their address is P. O. Box 203; Bussom, Holland (Phone 31/2152-58754; Telex 73255 Setro NL). (5) Roughly 250 ornamental and forest trees and shrubs, including palms and conifers, plus some green manures, grass and bamboo are in the 4 page listing of the M/S Balkishen & Co.; 106, Rajinder Nagar; Dehra Dun, India; Phone 27513). (6) The Endangered Species catalog lists 144 kinds of bamboo (plants only). Write to Endangered Species; Hermine & Roger Stover; P. O. Box 1830; Tustin, CA 92681 USA. (Phone 714-544-9505). (7) If you still cannot find what you want, we also have addresses of other commercial tree seed companies, including a two page listing of tree seed companies in Australia. Order well in advance of planting date, because tree seed companies often must fill orders from the next harvest (especially larger orders).

23-3 HOW DO I BEGIN AN EXPERIMENTAL/ DEMONSTRATION WORK? Chris Alexander in Zambia asked about how to develop a testing site at the church. I very much encourage this "experimental" approach. God has filled this creation with far more resources than most of us ever imagine. We only need to learn about them and then find which ones can be a blessing to our communities. You can never be sure that any new plant or technique will work until it has been tested in the community where it is being considered. Just remember not to be embarrassed by "failures." If in your personal garden you do not have some things that are not working out, you are probably "playing it too safe", doing things you know will succeed rather than trying many new things, some of which will fail and some be outstanding. Above all, never think that special university training in research is needed to do your own "adaptive" research. (Adaptive research is trying things that have worked elsewhere to see if and how they can be adapted to your community). Several of you have reported how the small farmers themselves enjoy being involved in the research process. Roland Bunch told me that he believes teaching farmers to be experimenters may be more important in the long run than the particular technologies he introduces.

"The Guide for Beginners In Small Scale Tropical Agriculture" that Dr. Martin wrote for ECHO could be a good starting point. The seeds you request through ECHO are likewise a good place to start. Actually much of ECHO DEVELOPMENT NOTES is written for this very purpose, to suggest new things that you might want to try. So in a real sense, I am continually answering this question. If you do not have a set of back issues ($15 including air postage) I would highly recommend that as a starting point. You should soon have enough ideas to keep busy for a few years.

23-3 ARE MACADAMIA NUTS A GOOD CROP FOR BELIZE? Several have expressed an interest in macadamia nuts as a cash crop in one country or another, so our answer to this question may be of interest to many. Carl Campbell says, "Poor yield is a very common problem where people have planted in the Americas. In Hawaii they figure their break even point at about 100 pounds of nuts per mature tree. By comparison, in Florida we get 15-20 pounds. Macadamia trees seem to do best in the areas where coffee does best. Processing is a problem too. People have put in little plantings, only to find that they cannot get the nuts processed. Some have even shipped from Central America to Hawaii for processing. Many of

those who have been in it the longest seem discouraged." Carl adds that *Macadamia tetrafolia*, the rough spiny leafed and rough shelled macadamia, is the preferred rootstock. *M. integrefolia* is the other macadamia.

23-3 SOME TIPS FOR RABBIT RAISERS. At ECHO's weekly seminar our interns share highlights of what they have studied during the week. I found the article that J. R. Crouse summarized on nest box behavior of rabbits so interesting that I asked him to write it up for you. Some of the things we worried about when we got our first rabbits, I now know, were normal rabbit behavior. He based the following on an article by Dr. James I. McNitt and George L. Moody, Jr. in the Journal of Applied Rabbit Research (Vol. 10, no. 4, 01987). By the way, you might wish to subscribe to this practical journal. Send $15 in the US and $20 elsewhere to Dr. N. M. Patton, Rabbit Research Center; Oregon State University, Corvallis, OR 97331.

It may well seem that a doe does not take much interest in her offspring. Closer examination, however, reveals that the reproductive behavior of the domestic rabbit is apparently based upon that of its relative, the wild rabbit. "Non-interest" behavior towards kits may actually enhance their chances of survival in the wild. Unlike many other domestic animals, does only nurse their young once per day, and for only a short period. In the wild this behavior has survival value because the infrequent, brief visits to the nest area by the doe decrease the chance of detection by predators. Domestic does also will not retrieve their young if they climb out of the nest box. Wild rabbit nests are built at the lower end of the burrow, causing all strays to be returned to the nest by gravity. Thus, the wild doe has had no selected behavior for kit retrieval.

As mentioned above, the doe is in the nest box for nursing for only a short time. The blind kits benefit if they are ready to receive the mother for suckling. Observation by Dr. McNitt showed that at about 22 hours since the previous nursing, the kits actively gathered in a group on top of the nesting material. It is critical that each kit nurse, as a missed suckling period decreases its chance of survival. Rabbit raisers who cover up the young when exposed may be interfering with their preparation for nursing. A few seconds after the doe has entered the nest box, the young contact the nipple. This quick detection is facilitated by pheremones (chemicals the mother secretes which are detected by smell).

Does were further observed depositing a few fecal pellets in the nest box at each nursing. Kits showed excitement over this event and nibbled on the pellets. Dr. McNitt feels this normal behavior (different from definite nest fouling) may be a means of inoculating the kits with intestinal microorganisms.

Another interesting observation was urination by the kits during nursing. After nursing, the kits vigorously dug into, and fluffed up, the nesting material. These may be adapted behaviors to promote drying of the nest in order to maintain nest health. The nest is only wetted (and immediately dried) once per day, instead of continually being soiled.

When kits open their eyes at about 10 days, they are approximately three times as large as at birth and have greatly improved motor coordination. Because larger kits will displace smaller kits in the struggle for space in the nest box, the boxes should be removed as early as possible. This will allow ample nursing space and opportunity. Two weeks is the maximum time to keep young in a nest box.

23-3 NEW ADDITIONS TO OUR SEEDBANK. We have added several new accessions to our seedbank. We do not have space to describe all of them now. They are listed so if you have been looking for any of them you know that we have them. Limit -- 5 free packets per order unless your need for more is amply justified. No limit at $1.50 per packet, the price for U. S. gardeners.

Naked oats (*Avena nuda*?), an oat that has no hull, from Howard Harrison, Coker's Seed. Co.; umxoxozi

(Citrullus or Cucumis species), a "wild" white-fleshed watermelon from H. P. Harmon in southern Africa, grows prolifically [It is not sweet, but rather is eaten as a vegetable with corn meal. Order only if your culture would enjoy such a vegetable.]; Hawaiian supersweet #9 sweetcorn (Zea mays), a tropical sweet corn from Tony Sotomayor in Puerto Rico; [if corn is important in your area, please enclose government import permit with order.]; calabash or birdhouse gourd (*Lagenaria spp*.), very prolific, parent produced 70 gourds, from Laymond Hardy in Florida; sunn hemp (*Crotolaria juncea*), a leguminous green manure becoming popular in East Africa, from Univ. of Hawaii and another from Father Gerold Rupper in Tanzania; snake gourd (*Trichosanthes cucumerina*) from Dennis Kearns at the Univ. of Texas; *Leucaena retusa*, a large shrubby leucaena from Texas that endures very cold temperatures, from James Sturdivant in Texas [because it does not become a valuable large tree, make sure it doesn't become a weed!]; Hopi red lima bean (*Phaseolus lunatus*), for arid regions, from Native Seeds Search in Arizona; frijol de cabra (*Phaseolus vulgaris*?), a popular arid-region bean from Tony Stevens at 6500 feet in Mexico; Thailand long bean, a cowpea grown for pods or seeds (*Vigna unguiculata*) from Joe Javorchik; buffalo gourd *(Cucurbita foetidissima*).

Trees. *Guazuma ulmifolia*; *Acacia albida*; *Albizia lebbeck*; *Acacia tortilis*, drought resistant, cattle eat pods, dense wood for posts, firewood, has weed potential in humid tropics, from Bob Burns in Bangladesh; sissoo (*Dalbergia sissoo*), hard strong wood comparable to teak, can reach 3.7 meters in a year under ideal conditions, animals eat pods, for semi-arid reforestation, from Bob Burns in Bangladesh*; Albizia lucida*, fast-growing, nitrogen fixing tree, Bob Burns in Bangladesh; mahogany (*Swietenia mahogani*), hard, strong, heavy wood used in all types of carpentry, seeds are enclosed in pod fragments, as removal from pods results in seed breakage, Bob Burns in Bangladesh; calliandra *(Calliandra calothyrsus*), bushy firewood for humid tropics, fast growing, can be harvested annually, from Nitrogen Fixing Tree Association (NFTA) in Hawaii; madre de cacao or mata raton (*Gliricidia sepium*), fast growing, living fences, green manure, fodder, beekeepers, from NFTA in Hawaii; guacima or bastard cedar (*Guazuma ulmifolia*), furniture, firewood, fruit contains sweet pulp with many seeds, potential weed, from Jim West in Ecuador.

The National Academy of Sciences is working on a book called Lost Crops of the Andes. We hope to have seeds for most of those crops by the time the book is out. Most of these are suited only for those of you are working at higher elevations. The ones we have to date are from Gustavo Zegarra in Peru: popping beans or nunas (*Phaseolus vulgaris*); tarwi (*Lupinus mutabilis*); Capuli cherry tree *(Prunus capuli*); soursop or guanabana (*Annona muricata*); cherimoya (*Annona cherimola*); two highland papayas, toronchi (*Carica pubescens*) and chamburro (*Carica chrysopetala*); naranjilla (*Solanum quitoense*); passion fruit (*Passiflora edulis*); kaniwa or canihua (*Chenopodium pallidicaule*); pepino de comer or achuffa (*Cyclanthera edulis*); pepino dulce (*Solanum muricatus*); Peruvian gooseberry (*Physalia peruviana*); and a very limited quantity of tree tomato or tamarillo (*Cychomandra betacea*).

23-4 INTERNATIONAL AG-SIEVE. Robert Wagner with Rodale International has offered to send a free one year subscription for this new newsletter to anyone in ECHO's network. He describes it as "a sifting of news in regenerative agriculture." "A significant proportion will be condensations of current articles on organic farming or gardening of interest to Third World farmers. We are in close contact with what a lot of low-input researchers are doing too. We hope that readers will contribute low-input practices they have found successful, especially concerning crop combinations, green manures, agroforestry and integrated systems." As soon as they begin receiving such case studies they expect to include more of that material. The lead article in the second issue tells how the cassava hornworm is being controlled without chemicals in Brazil. When hornworm larvae that are infected with a particular viral disease are found in the field, they are collected. These diseased larvae are liquefied in blenders and combined with water. The larvae can even be frozen and stored. When sprayed on the crop, the virus kills 90-100% of the hornworm larvae. The method is being disseminated now in Brazil and frozen virus can even be purchased.

The second article reports on a U. S. farmer who uses a similar approach to control soybean caterpillars on his 500 acre farm with a bacterial disease. He grinds dead caterpillars found in the field into a powder which he freezes for use the following summer.

Other items covered are: botanical pesticide safety; intercropping legumes in upland rice; tied ridges improve semi-arid crop yields; low-input cropping for the humid tropics; the lost art of the waru waru in Peru; chemical in myrrh relative repels ticks; plants helping plants; new trends in leucaena psyllid resistance and reviews of some recent books.

The theme for the next issue is to be projects to reduce pressures on tropical forests. It looks like it will be a good series, from the organization that publishes Organic Gardening magazine. To take advantage of this free offer, write to Robert Wagner, Rodale International, 222 Main St., Emmaus, PA 18098 and mention that you are a member of the ECHO network.

23-5 CAN YOU MAKE YOUR OWN BIOLOGICAL INSECTICIDE? The work with the cassava hornworm mentioned in the above review brings to mind something I have been wondering about for some time. Suppose ECHO mailed you in a regular envelope a small packet of *Bacillus thuriengensis* powder (dipel), a bacterial spore that is used widely to control many kinds of caterpillars. Would you be able to kill a few caterpillars with it, then make a spray to kill even more, soon building up a large enough reserve for large-scale use?

I first considered this when Mac Renfro brought a brief note in an old issue of Mother Earth News to my attention. The author sprayed caterpillars, subsequently blended the diseased caterpillars in warm milk and incubated this for a time. This was then used to spray more caterpillars. The work reported in the International Ag-Seive makes me think the warm milk and incubation might not be needed.

Want to give it a try? We will send a very small amount of this harmless (to people) powder if you will agree to share your results with us.

23-5 MENNONITE HARDWARE STORE IS UNIQUE. When we parked in front of Lehman's Hardware store in Kidron, Ohio we had to pick a spot between the horse-drawn carriages common in this Amish / Mennonite community. Reflecting the local tradition of continuing with older ways, Lehman's sells items I have not seen in any other store. There were several makes of wood-burning cookstoves, which I had not seen since I was a small child, complete with all kinds of accessories. I saw wash boards, hand-powered washing machines, all types of wood working tools, kerosene, gas and gasoline lamps and accessories, sausage stuffers, bottle cappers, fruit peelers and pitters, large copper kettles, many, many kinds of cast iron cookware, hand-operated grain mills, many kinds of wood heating stoves, a gas or kerosene refrigerator and a gas freezer, hydraulic rams and other hand pumps, cream separators, home pasteurizers, etc.

Mr. Lehman took a ten year leave of absence to serve as a missionary with the Mennonite Central Committee in Zaire. "Soon after my return we decided to print a mail order catalog.... Partly in recognition of the loyal, volume buying of the larger missions and partly as our small contribution to the efforts of missionaries we developed special discounted prices on many of the items commonly used in the 'bush'." They will send the $2 catalog free if you write on letterhead of your mission board. HOWEVER, if you want it sent airmail please send $5.00 for postage. If you are a missionary, it is IMPORTANT to also ask for the special missionary "non-electric" price list. To call for quotes or advice on replacement parts, phone 216/857-5441. Write to Lehman Hardware; Box 41; Kidron, OH 44636 USA

23-5 WORLD NEIGHBORS ESTABLISHES "INTERNATIONAL COVER CROP CLEARINGHOUSE". You remember the excellent articles on tropical green manures in EDN 12 and 20 by Roland Bunch, World Neighbor's Central American representative. They have obtained a grant to establish a clearinghouse to provide an exchange of ideas, information and experiences among all those groups and individuals interested in promoting the use of cover crops or green manures among village farmers. They will (1) collect and distribute information on cover crops and green manures from both scientists and practitioners in the field, (2) do a limited amount of field research, (3) publish a quarterly newsletter, and (4) visit other programs working with cover crops. ECHO will normally be able to provide packets of seed for any of the plants they mention.

The director of the new program is Milton Flores. When Milton visited ECHO we gave him the address of some of you who have expressed an interest in cover crops, so you may already have heard from him. MILTON WOULD LOVE TO HEAR FROM YOU whether you are experienced with green manures or just beginning to try them. You do not need to be an "expert." If there is something going on in your community which he might like to see, be sure to describe it. Milton hopes to actually visit several projects. To receive their free newsletter write: Milton Flores B.; Apdo. 278-C; Tegucigalpa, D. C.; Honduras. Phone 32-6474.

23-6 SEED FOR DROUGHT-RESISTANT INDIAN FOODS SOLD BY TALAVAYA CENTER. Since 1983 this non-profit organization (Talavaya Seeds; P. O. Box 707; Santa Cruz Station; Santa Cruz, NM 87507 USA) has collected some 1,300 strains of non-hybrid seeds of native peoples in Southwestern North America (USA and Mexico) and of the Andean Altiplano of South America. Browsing their catalog, I find Hopi [as in Hopi Indians] blue corn, Hopi pink, purple, supai, sweet, turquoise and yellow corn, black Aztec sweet corn, and 7 other varieties of corn; Hopi dryland yellow lima bean, Hopi dryland red bean, and other beans; seven quinoa varieties; as well as amaranth, melons and squashes. Seed packets are $1 each plus $1.00 handling per order. If you wish airmail delivery, add extra. For larger quantities, write for prices and postage costs.

23-6 WE CAN NOW PROVIDE JACK BEAN AND VELVET BEAN SEEDS IN 1-20 POUND QUANTITIES. So many ordered larger amounts that we brought a hundred pounds of velvet bean and some jack bean in from Central America. Due to the high cost of getting it here, we must charge $3.50 per pound plus whatever shipping you specify. ECHO is not responsible for safe delivery through customs in your country (it would be best to send us an import permit). We also have quantities of sweet lupine ($0.50 per pound) and moringa ($5 per pound).

23-6 SEED FOR THAILAND LONG BEAN NOW AVAILABLE. In the heat and humidity of a Florida summer, ordinary beans (Phaseolus species) will not produce. This popular bean from Thailand, new to our seedbank, has become one of our summer favorites. It will trail along the ground, but loves to climb. Like its cousin, the yard long bean, it is a cowpea (*Vigna unguiculata*). Pods, about 8-10 inches long, must be picked before they become stringy. We have found them tasty, disease resistant and productive. We have not eaten mature seeds, but they are a good size and should be good for this use as well. Write for a free packet (or send $1.50 if you are not working with Third World farmers)