

DEVASTATING DISEASE OF NEEM TREES IN WEST AFRICA. We are suddenly hearing from many in our network about this disaster. Mike Bengé with USAID phoned to alert us to the problem and to say that they were sending a team to investigate. Steve Maranz in Niger writes that the neem disease has now reached all the way to Senegal. [ED: That's as far west as one can go in Africa.] "It should be noted that to the villagers here, none of the products and services rendered by neem compare to its value as a shade tree. When there is nothing in the bare landscape between you and the blazing sun, the thick shade of a neem is heavenly. So much more the loss, then, when a 20 year old neem tree dies." On a related note, Steve writes, "I saw that our cowpeas were infested with beetles (I assume the bruchid beetles one reads about). I asked our field technician if he had ever used neem oil to control these pests. His answer was interesting. He said he knew it was effective, but would rather lose half his cowpeas than have to taste neem in his food. This is from someone who eats kola nuts every day, which are as bitter as quinine."

Steve sent a copy of a letter from George Eaton, director USAID mission to Niger written to the United Nations representative in Niger (and directed toward the broader development community) concerning this disease. Because of the importance of this problem, I will quote at length.

"Early this year the Government of Niger requested assistance from USAID/Niger to carry out an investigation and determine the nature of the disease. ...an investigation was conducted by plant pathologist Dr. Paul Batra in June/July. Dr. Batra confirmed the existence of an apparently widely dispersed disease affecting large numbers of neem trees. ...[He] collected plant material and soil samples which were analyzed in the United States. The disease has been provisionally diagnosed as an infection by a soil-borne fungus." [Mike Bengé says they are still unsure what is the cause.]

"Subsequent investigations by CARE/Niger staff in the Maggia Valley have confirmed that a very high percentage (100% of their sample) of the mature pollarded neem [i. e. the tops cut off, probably to use in firewood] and over 15% of the younger neem were affected. In addition 100% of the 1991 planting stock and many private woodlots are affected, as well as neem seedlings in the Tahoua nursery. As a result, CARE/Niger has proposed no further planting of neem until further notice.

"Subsequent investigations in and around Niamey by USAID/Niger staff have confirmed a high incidence of the disease in mature trees planted around town, ... in the Niamey Greenbelt, as well as in younger trees in several urban plantations. ...it has been noticed that the outer layer of the cambium of diseased trees (just under the bark) is bright red. This is true for trees that show external signs of the disease (e. g. a dead branch) as well as for those that do not yet show these signs. We are in the process of obtaining samples [elsewhere. If the same symptoms are present], this would provide a way of more easily diagnosing the disease at an earlier stage."

He then explains how neem was brought from the Indian subcontinent to Sudan in 1925, from there to Nigeria in 1935, then to Senegal in 1944 and Mali in 1953. It presumably came from Nigeria to Niger in the 1940's, where it is the principal species for reforestation (currently 2 million trees). "Given the high probability that most neem planted in West Africa come from a very narrow genetic base, it is expected that little resistance to this disease is likely to be found in the local population [Ed: italics mine]. USAID, ICRISAT Sahelian Center and possibly others are continuing to study the problem.

This last statement should be expanded. Sometimes a single packet of seed planted for evaluation gives such good results that a large project develops from its offspring. Possibly every seed in that packet came from one or a few related trees. There is nothing wrong with this in itself. But if large acreages are planted and a disease or insect problem arises that seriously harms the trees, it is possible that every tree will be equally susceptible. In the tree's country of origin a lot of genetic diversity would exist, possibly including resistance to the current problem.

An example of such vulnerability might be the kiwi fruit industry in New Zealand. At the New Crops Symposium last fall a scientist from New Zealand said that kiwi fruit was introduced to his country some years ago by a missionary who brought seed from China. He said it is quite possible that every seed might have come from a single fruit. They are working now to make sure there is a broader genetic base by bringing in plants from China.

Have you had such success with a tree species that thousands of trees might someday be planted? Can all the trees be traced to a single packet of seeds? If so, you should consider obtaining additional packets from different locations, preferably from the center of origin of that tree. If you have one variety of a species that is particularly desirable, e. g. a particular kind of leucaena, it is especially likely that it has a limited genetic pool to call upon in time of need. In a case like this you should seek out additional leucaena varieties, even if some are not quite as good for your purposes as your favorite.

This is also a good time to mention again how important it is to have as wide a number of species as possible making up the core of your development efforts. The more widely used any one species becomes the greater the likelihood that an epidemic might occur and the greater the damage it can cause your program.

GARDENING IN VOLCANIC ASH. Our note in EDN 35 about farming in volcanic ash in the Philippines resulted in some networking at its finest. We now have a lot more information to share. A big thanks to those who wrote.

Ken Turner with Mercy Corps sent an interesting letter and pictures. "I guess I'm your reporter on the spot. Our community and my home (until the eruption) is 15 km from Mt. Pinatubo. We evacuated June 7, two days before the first major eruption. One of our staff returned a few weeks later. It looked pretty dismal.

"Now it is a different story. Some pretty amazing harvests have drawn a lot of attention. Banana planted a few weeks before the eruption produced a good crop. Most amazing was the watermelon harvest -- more than twice the yields of past years, melons (sugar baby variety) twice the size on the average and still sweet, and vines more than twice the usual length.

"The ash is now about 8 inches (20 cm) deep. The soil has remained moist (and I suspect cool)

under the sand, even after 3 months of dry weather. I did not check the pH, but 30 km from the mountain the pH is about neutral. It appears that sweet potato is thriving in rice fields 30 km from the volcano.

"The crops and generally lush growth is encouraging farmers to return, even though the road is likely to become impassible early in the rainy season. "

Victoria Coronel with IRRI sent very specific and helpful recommendations. Highlights are summarized below.

The eruption of Mt. Pinatubo brought havoc to more than 38,000 ha of farmland. Even though the Philippines has several active volcanos, they could find no published reports of studies on revegetation.

Some findings from the Mt. St. Helens volcano in the United States are relevant. (1) Ash has a lower permeability than soil. This means that flood water will remain longer on the surfaces of the ash-covered soils. (2) The ash layer acts as a surface mulch both reflecting solar radiation (increasing photosynthesis) and impeding water flow and evaporation from the soil to the atmosphere. An estimated 40-60% of the light is reflected. Peak daytime soil temperatures beneath 2-3 cm of ash were 6-10°C lower than adjacent sites where ash had been incorporated into the soil. (3) The abrasive effect of ash particles is harmful to insects. Unfortunately beneficial insects were the most affected.

Studies from Mt. Galunggung in Indonesia provided the following insights. (1) Crop yields were still high in areas with up to 20 cm of volcanic materials. Productivity declined with greater amounts. (2) Yields of rice and other food crops were high when the ratio of volcanic materials to soil were as high as 5:5 and 7:3. If there is less than 20 cm of ash, plowing into the soil seems the easiest solution. If deposits are deeper, adding organic matter may be needed (20 t/ha manure or other organic materials). Dumping organic waste from Manila has been suggested, but transportation is a problem. Green manure crops may be the answer.

The following cropping pattern was suggested if volcanic materials are less than 20 cm and the irrigation system is intact. After plowing 30 cm deep (a 7:3 ratio of volcanic materials to soil), plant rice-rice-corn/ soybean or rice-rice-leaf onion. For 20-30 cm thick deposits, plow the volcanic material when dry, incorporating any organic material that is available. Food crops can be planted in the early rainy season. Rice and corn are not generally recommended. If volcanic materials exceed 50 cm, pineapple would be suitable since it thrives well in sandy soil with pH range of 4.5-7.15 and requires minimum care and inputs. Hybrid coconuts can also be planted. Fruits like guavas, nangka [jackfruit], papaya and banana grew well, even better than before the eruption of Mt. Galunggung.

Preliminary tests show some rice varieties do better than others. The top 3 were all varieties grown in acidic areas of Indonesia. In one area, corn exhibited early leaf yellowing (corn requires a lot of nitrogen). Sweet potato gave the best growth, followed by kangkong and cassava. Green manures also gave initial excellent growth. A second eruption destroyed the experiment.

IRRI recommends that the above fruit trees be planted as quickly as possible for the longer term; that sweet potato, cassava, kangkong and green manures be planted for the intermediate term;

that livestock that eat roots (e. g. swine) be associated with sweet potato and cassava growing; that aerial seeding of green manures, including ipil-ipil [*leucaena*], be considered.

Scientists desiring to see the entire report, "Mt. Pinatubo - Controlled Revegetation" by B. S. Vergara and V. Coronel can write to Dr. Coronel at IRRI, P. O. Box 933, 1099 Manila, Philippines. Workers outside of Asia can write to ECHO.

SERRATED HAND HOE. I-Tech (P. O. Box 795, Davis, CA 95616) is an organization specializing in appropriate technologies. Public disclosures are made of all innovations so that they are in the public domain. The serrated hand hoe is their latest disclosure.

Figure 1. Metal blade hand hoe with grooves.

"The hoe normally uses a straight edge to cut plant roots and stems. This can be improved by grinding slanted grooves or notches on its cutting edge. The grooves give a serrated edge to the hoe and keep the plant from sliding out of the cutting edge as it is being cut. Grooves are slanted at a slight angle, those on the right side slanting one direction and those on the left in the other.

It also requires less force to hoe with a serrated edge, for a couple reasons. First, the serrated edge has less surface area for initial contact with the plant. The result is that the entire momentum of the swinging hoe is transferred to a smaller area of the plant, giving a deeper cut. Second, the grooves also tear as well as cut. The tearing action is enhanced by slanting the grooves.

The modification can be done with a hand-held electric grinder in a couple minutes. Grooves are approximately 0.8 mm (1/32 inch) deep by 16 mm (5/8 inch) long, spaced 13 mm (1/2 inch) apart. They are ground on the flat side of the hoe that faces the worker. Grooves ground on the flat side of the hoe will not wear out as quickly as those ground on the beveled side facing the earth, away from the worker. Grooves are also retained when the blade is sharpened on the beveled side. As the hoe wears, the sharp edges of the grooves are exposed.

ORAL VACCINE FOR TYPHOID. When I think of typhoid shots I think of finding time for three trips to a doctor, major soreness and some fever. A trip that comes up suddenly often does not allow time for completing the series. So when Glenn Munroe told me that he was just immunized with no noticeable side effects by taking four pills, one every other day, I asked for details. He said the immunity is supposed to last 5 years. The series cost him \$35. It is a live vaccine and must be refrigerated at all times. It is manufactured by the Swiss Serum and Vaccine Inst, Berne, Switzerland. I contacted Andy Murai at their U. S. subsidiary, Berna Products Corporation, 4216 Ponce de Leon Blvd., Coral Gables, FL 33146. He said they are glad to ship overseas, even if orders are small. Phone 800/533-5899 in the US or 305/443-2900; FAX 305/567-1043.

A LIVING FENCE THAT MIGHT BE DEADLY? The following is based on a note in the October-December 1991 issue of Agroforestry Today (reviewed in EDN 23-3,4), which is in turn based on an article in The Economist (July 6, 1991 pp 86,87) and The Lancet (May 30, 1987 pp 1257-58).

"Farmers near Kabale in Kenya describe traditions, now considered superstitious, that certain euphorbias cause cancer when planted near the homestead." [Euphorbias in Africa fill many of the environmental niches that are filled by cacti in the Americas.] Now the carcinogenic effects of one common living fence species, Euphorbia tirucalli, have been described. The active carcinogen has been found not only in the plant itself, but in extracts from nearby soil, vegetables and drinking water. "The report suggests that Burkitt's lymphoma, a common childhood cancer in East Africa, is caused in part by consumption of water and vegetables from sites near this euphorbia."

The plant grows profusely in Kenya's Eastern, Western and Nyanza Provinces and in parts of Tanzania. In southwestern Uganda it is widely planted as a living fence to exclude livestock from protected springs, suggesting the frightening prospect that water that has been assumed safe is in fact very hazardous. It is also commonly used as a living fence to protect food crops.

A SMALL TRIAL PACKET OF SOLAR SET TOMATO AVAILABLE. Visitors to the lowland tropics often wonder why only smaller tomatoes are found in the market (cherry tomatoes and "plum" or "roma" type tomatoes). The reason is that these are the only types that will set fruit. High temperatures, especially prolonged night temperatures greater than 70°F (21°C), reduce fruit set in most market tomato cultivars. 'Solar Set' is a fresh market HYBRID tomato that sets fruit moderately well under high temperature (92°F [33°C] day, 72°F [22°C] night) and high humidity conditions.

'Solar Set' was developed by the University of Florida to extend the tomato season by a few weeks at either end of the normal season. It was not developed to produce throughout our terribly hot, humid summer, although we intend to plant then to see what happens.

The hope is that it will produce tomatoes a few weeks earlier than other varieties, bringing a superior price. Presumably it might also extend the season into somewhat warmer weather, although the premium price for end of season tomatoes will be less than that commanded by the first tomatoes of the year.

We have not yet grown this tomato, but it is described as having large fruit with few defects even

under adverse weather conditions. 'Solar Set' does not flower earlier than other cultivars, nor do fruit ripen more quickly. The improved earliness is entirely a result of a greater number of fruit which set early in the plants' development. It is resistant to fusarium races 1 and 2, verticillium and gray leafspot. It is apparently not resistant to nematodes.

Because this is a hybrid, the seed is relatively expensive. It is distributed by the Asgrow Company. ECHO does not normally recommend hybrid seeds because growers cannot save their own seed. However, there will be many situations where purchase of seed will make economic sense if farmers could get a significantly higher price for out of season tomatoes or if for the first time large tomatoes were available. We have obtained an ounce of the seed and repackaged it into small trial packets. We will send one packet free to individuals working with organizations that assist peasant farmers or urban gardeners. Others please send \$2.50.

UPDATES FROM PAST ISSUES

A CORRECTION ON AVAILABILITY OF THE BOOK "FOOD LEGUMES." In EDN 35 we mentioned that this book was out of print. Nick Davison, the press officer for the Natural Resources Institute writes that this was in error. They have 330 still in stock at a price of £7.50 each. Many of our readers might be eligible for a free copy. Their catalog states that "single copies of publications are sent at no charge to governmental and educational establishments, research institutions and non-profit organizations provided they are working in countries eligible for British Government aid. However a charge will be made for airmail costs." Because the book is so helpful, and available while the supply lasts, the original review in EDN-14 follows.

I turn several times each month to this 435 page book, first published in 1979, to find alternative names, main uses, preferred climate, possible toxicity, etc. Let us look at Vigna unguiculata (cowpea) for an example of their treatment. Seven major common names and three botanical names are given at the top, followed by 119 other common names and the countries where these names are used. The next 14 pages cover a detailed botanical description, origin and distribution, cultivation conditions, planting procedure, pests and diseases, growth period, harvesting and handling, primary product, yield, main use, subsidiary uses, secondary and waste products, special features, processing, and products and trade, followed by 13 pages of bibliography.

The book covers twenty-seven legumes: adzuki bean, asparagus bean, bambara groundnut, broad bean, chick pea, cluster bean, cowpea, grass pea, haricot bean, horse gram, hyacinth bean, jack bean, Kersting's groundnut, lentil, lima bean, moth bean, mung bean, pea, pigeon pea, rice bean, runner bean, sword bean, tepary bean, urd, velvet bean and winged bean.

BOOK AND NEWSLETTER REVIEWS

NETWORKING NEWSLETTER FROM THAILAND In EDN 20-1 I recommended The Small Farm Newsletter, a networking newsletter published by CUSO in Thailand. CUSO is involved in another newsletter, together with IDRC in Canada, called The Sustainable Agriculture Newsletter. Their network now extends to 3,000 subscribers (no charge) in 72 countries. The issue in front of me (July 1990) is almost a magazine, with 32 pages. They have

a substantial section for input from members, but each issue devotes several pages to a major feature prepared by a guest editor.

The July 1990 issue (the latest as of September 1991) begins with an illustrated 16 page practical guide for beekeeping using a native Asian bee, *Apis cerana*. Why not use the more productive *Apis mellifera* that is used in much of the world? Although *A. mellifera* has been introduced to Asia by many development projects, it is only in northern Thailand and the highlands of the Philippines that it has been successful. Even there new queens must be introduced." *A. mellifera* has a hard time with two species of mites. The native bees have developed various defence mechanisms. *A. cerana* involves a lower investment in "sugar, comb foundations and labor". "We do not recommend importing *A. mellifera* as a number of diseases can (and in some cases have been) imported."

The 16 page discussion is followed by 3 pages of addresses of beekeeping experts in several countries, a 2 page annotated bibliography, and a page of agencies studying or offering training with *Apis cerana*.

The September 1990 issue featured agroforestry seeds. Again it is a thorough and practical guide. Titles of sections include: Seed collection and preparation; Seed drying: when are seeds dry enough?; How to lengthen seed storage life; Botanicals and other substances for seed protection; Farm level seed technologies; Seed quality testing; Pre-germination treatments; Mist propagation; Enhancing growth in marginal areas; Mycorrhiza inoculants; Tissue culture; Seed production of indigenous tree species. A special 8 page removable reference section lists agroforestry seed sources in dozens of countries; 4 pages list agencies doing agroforestry seed-related research, training or development; 3 pages of resource people; and a 2 page annotated bibliography.

Two other special issues were August 1989 on Botanical Pesticides and March 1990 on Rice-Fish Culture. Development workers or researchers in sustainable agriculture who would like to become part of CUSO's network should write to Philip Bontuyan, Editor; Sustainable Agriculture Newsletter; SIBAT; P. O. Box 375; CPO Manila, Philippines.

ORGANIC MATTERS, A NETWORKING NEWSLETTER IN THE PHILIPPINES.

Those of you working in the Philippines will surely want to receive this free quarterly journal on Philippines "low external input agriculture." I read nearly every article as soon as it came because they dealt with farmers' actual experience with many of the techniques about which we routinely write and correspond. The lead article in this issue reviews 5 years of contour farming in one community: the unexpected problems and disappointments as well as the benefits. Soil erosion from a farmer's perspective is the second article. Another mentions a most peculiar problem. Apparently some military units in one area think contour farming is subversive and have even damaged the contour barriers. The final two articles deal with results of a rice variety trial and a comparison of 3 tree species that are commonly planted on contours. Subscriptions are free (at least in the Philippines). Write to SNV, Organic Matters; 35 Wilson str. cor Washington Str.; 1500 West Greenhills, San Juan; Manila, Philippines.

SPANISH IN THE FIELD. The agAccess Company has just released this set consisting of a 248 page illustrated book, 4 cassette tapes and a pocket farm and agribusiness dictionary. If you or your employees work with Spanish speaking farmers and are not fluent in Spanish, this is a great investment. It is designed to teach the unique agricultural and mechanical terms that few

Spanish courses cover.

Chapters in the book are: preliminary unit; pay, hiring and firing; time, weather and calendar; directions and measures; tools, containers and materials; soil preparation; irrigation; machinery and parts, safety in the field and shop, how to drive; health problems, accidents; chemical spraying; grapes; cotton; trees; row crops, produce; grains and cereals.

The book is primarily vocabulary, sentences that one might want to say while working on the subject of the chapter, and drawings with parts named. The tapes primarily consist of sentences followed by the Spanish translation. Although I have a good general knowledge of Spanish, I have never heard much of the daily hands-on agricultural vocabulary. I am finding it helpful to listen to the tapes over breakfast or while driving.

The price is \$59.95 plus 3.95 shipping in the USA. Order from AgAccess, P. O. Box 2008, Davis, CA 95617, USA. They have a very wide ranging selection of agricultural books. You might want to ask for their catalog.

A CATALOG SPECIALIZING IN AUDIO FOREIGN LANGUAGE SELF-STUDY COURSES. My wife brought home a fascinating catalog from the school where she teaches. Audio-Forum, "The Language Source" offers 215 courses in 76 languages. As far as I can tell, they do not produce their own courses, but retail selected materials produced by others. This includes the Foreign Service Institute series in those languages where this is available. (The FSI series in Spanish was extremely helpful to me some years ago).

In addition to the most commonly studied European languages they have courses in Afrikaans, Albanian, Amharic, Arabic, Armenian, Bulgarian, Burmese, Chinese, Chinyanja, Czech, Dutch, Finnish, Fula, Greek, Hausa, Haitian Creole, Hindi, Hungarian, Igbo, Indonesian, Japanese, Khmer, Kirundi, Kituba, Korean, Latvian, Lithuanian, Luganda, Malay, More, Norwegian, Polish, Romanian, Sanskrit, Serbo-Croatian, Shona, Sinhalese, Slovak, Swahili, Swedish, Tagalog, Telugu, Thai, Turkish, Twi, Urdu, Vietnamese, Welsh and Yoruba.

The address is 96 Broad St; Guilford, CT 06437, USA. There is a London office as well, but I have no address for it.

BOTANICA DE LOS CULTIVOS TROPICALES. This 445 page, spanish language paperback is written "to give students of agronomy in Latin America the basic information about origin, diversity and structure of cultivated plants in the tropics." The abundant detailed line drawings are especially impressive. It appears to be somewhat like the famous Purseglove's "Tropical Crops," with better illustrations and more spacious. We paid \$18 from IICA; SEDE Central; Apdo. Postal 55-2200; Coronado, San Jose, Costa Rica.

ECHOS FROM OUR NETWORK

CANS TO WATER TREES. **Dr. Carl Campbell, University of Florida.** "I was especially interested to read about the use of pots or cans sunken into the ground for watering plants. I have been doing that in a limited way for a long time too, and have seen and read about many cases in which the method is used. For me a useful variation is to leave the container above ground, on the surface, so it can be moved to water more than one plant. I like to use large plastic jugs with a very tiny hole when I am going to be gone for a few days and have some tender, newly planted trees to take care of."

KEEPING MONKEYS OUT OF THE GARDEN. We asked how to do this in the last EDN. **Fr. Gerold Rupper in Tanzania** sent us the following. It involves a plant that is an old "friend" to our readers -- sunn hemp. You may recall from EDN 26-5,6 that sunn hemp is receiving widespread acceptance as a green manure in East Africa. The species they grow is *Crotalaria ochroleuca*.

Fr. Rupper writes, "Early in the campaign for planting sunn hemp (also called zanziberica), we got a report from a youth group that monkeys had been afraid to traverse a belt of sunn hemp around their field of maize. I could not ask the monkeys why they did so. But one can imagine that first of all it is a strange sight to see sunn hemp growing together and forming a barrier. Secondly, the husks give a clattering sound, which may disturb the monkeys. [Editor: Scott Sherman points out that the word "crotalaria" comes from the Greek root *crotal* meaning a rattle or castanet. The genus for rattlesnake is *crotalus*.] Thirdly, if they are caught stealing maize, it is almost impossible to flee through the sunn hemp field as the branches form a rather strong network like wire. In the case of maize [corn] there is some synchronization between the maize and sunn hemp. The husks of both crops form about the same time (depending on the variety of maize). People like to let the corn dry in the fields, at which time the barrier effect of sunn hemp becomes important.

"Meanwhile we have developed a new method of planting sunn hemp. Two rows of maize alternate with one row of sunn hemp. Here the maize is well protected against monkeys.

"By the way, here is another story. Some years ago Tanzania feared an invasion from South Africa. People were told to dig pits and cover them. Of course, before people went into hiding, snakes and other reptiles made their home there. So we sunn hemp people told them to grow sunn hemp. The plants form a solid black coverage where chickens etc. feel very safe from preying birds. If an invasion had come, they would have never suspected that sunn hemp fields are the best air shelters, although not yet listed as a war technology.

Fr. Rupper's comments about how the upright plants fall into each other helps me understand a problem we have had. ECHO grows only very small plots of each plant for our seedbank, perhaps only 2 rows deep. The sunn hemp plots usually look terrible because they fall over. Apparently that is what they are supposed to do, but in the field they fall into each other and so hold each other up. There must be a sermon illustration in there somewhere.

We can send a small packet of sunn hemp seed. We usually also send another species developed by the University of Hawaii, *Crotalaria juncea*. You can determine which does best in your conditions. People in Tanzania can contact Fr. Rupper at St. Benedict's Abbey, P. O. Peramiho,

Tanzania. (I have no recent price, but in EDN 26 he was selling seed for US \$7.00 per kg plus postage. He cannot offer phytosanitary certificates and takes no responsibility for safe delivery through customs in your country). He says that people in Zambia can obtain seeds from Ginnie Goodfellow, Box 61, Siavonga; Marleen Kramer, Dioz. Development Committee, Box 450014 Mpika or White Fathers Missions in Mbala, Kasama and Mansa dioceses.

SALT TOLERANCE IN LEUCAENA? Dr. James Brewbaker, University of Hawaii

commented on the note in EDN 35 that leucaena has salt tolerance. "Leucaena's salt tolerance is effective only along shore lines where calcium levels are high. As with many other plant species, the tolerance of "salt" is a complex subject, for salt can represent a great assortment of chemicals. Generally, the major difference is seen when comparing coastal salinity (highly calcareous) with inland evaporative salinity (e. g. Salt Lake), which is usually not calcareous. Leucaena tolerates the former, not the latter.

Calcareous refers to soils with high calcium content, primarily coral-derived soils with accompanying high pH. Arid regions naturally have areas of high salinity due to evaporation and salt accumulation; such soils are often lower in calcium, higher in sodium, and thus more toxic to plants.

A few nitrogen fixing trees do handle the salty non-calcareous soils. The best work with these is at CAZRI (Central Arid Zone Research Institute of India) in Jodhpur, India.

MORINGA STENOPETALA. Michael Madany, World Concern, Kenya. "Since I am quoted in EDN 32-5 with regard to our experience with *Moringa stenopetala* in southern Somalia, I'd like to send a few more comments. The last time I saw the trees we planted in February 1986 was January 1990. They had only flowered once (in 1987 or 1988; only a few flowers) and never set seed. Thus, whenever I wanted to plant more, I was obliged to use cuttings. As far as a source of green vegetable matter in the dry season, the tree surpasses its domestic relative *Moringa oleifera* in that climate (bimodal rainfall of 400-800 mm, temperature 20-40°C). However, for the purpose of producing water-purifying seeds it seems to be not so successful, at least in the first 5 years. I am mystified as to the reasons for this. The provenance for our trees was over 500 km west at a considerably higher elevation." Michael mentions that during the civil war in Somalia the project buildings were destroyed and "all the trees in our demonstration garden were cut

down." Development would not be too difficult a task if it were not for people, would it?

YOU CAN NOW SEND INFORMATION TO ECHO BY FAX. The number to use is 813/543-5317.

SOME CHANGES IN BACK ISSUE OFFER. We find that many newcomers to the ECHO network wish to obtain the back issues. Most of the information in each EDN issue remains relevant for years. We also constantly refer to previous articles for more details on a particular topic, rather than use up valuable space repeating information.

So many issues have accumulated that size is becoming a limitation. And after each new issue adds 8 more pages, our postage costs increase. We have reached a cutoff point with issue #35, our 10th anniversary issue. From now on we will have two back issues. EDN, the First Ten Years will cover issues 1-35. Items in the earliest editions that are no longer relevant or where details have changed, have been deleted or updated. EDN Back Issues #2 will include issues from #36 forward. The price will change quarterly. Single back issues are \$2.50 each.

THIS ISSUE is copyrighted 1992. 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. ECHO is a non-profit, Christian organization that helps you to help the poor in the Third World to grow food.

ECHO DEVELOPMENT NOTES -- ISSUE # 36
17430 DURRANCE ROAD
NORTH FORT MYERS, FL 33917 U. S. A.
PHONE 813/543-3246 FAX 813/543-5317

36-2

36-3

36-4

36-5

36-6

36-7

36-8