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**ONIONS IN THE TROPICS AND SUBTROPICS.** A case could be made that onions are one of two universal vegetables that are cherished in almost every culture, tomatoes being the other. Both are difficult to grow in many tropical and subtropical climates. Where a vegetable is both popular and difficult to grow, it brings a good price. If a way can be found to grow that crop, both local farmers and consumers will benefit. While attending a horticulture conference in Honduras, Scott Sherman and I had an opportunity to visit with Dr. Lesley Currah. She travels the Third World working with onion researchers. The interview follows. Be sure to note the offer of seed for a variety trial at the end.

Q. Tell us more about the Natural Resources Institute where you work.

A. The NRI is an agency of the British government, the Overseas Development Administration. Their purpose is to use science and technology to help people in Third World countries develop using their own natural resources. Help is offered to any country eligible to receive British aid.

Q. What is your assignment?

A. I work in the fruit, vegetable and root section. My current assignment is an evaluation of onion production and storage in low latitudes. A particular interest is to expand onion production in very wet climates and on islands at sea level. Our approach is fourfold. (1) We are promoting a network of contacts on onions in the tropics through a newsletter called *Onion Newsletter for the Tropics*. (2) We evaluate onion varieties through trials done by collaborators around the world. (3) We provide training in how to do a trial and interpret the results. (4) We maintain a gene bank of interesting onion accessions.

Q. Often a development worker from a temperate climate will plant onion seed from home only to find that it only makes "little green onions," no bulbs. Explain what is happening.

A. Onions are very sensitive to day length. The kind of onion that is grown in the higher latitudes requires long day length to form bulbs. When onions are grown during short days it is important to plant what are called "short day onions."

Q. Is there a sharp border between long and short day varieties or are there degrees of short-day-ness?

A. There are several intermediate degrees, which would be common in places like north Texas or Spain. A well organized seed catalog will not just say whether onions are "short" or "long" day varieties. They will organize them under day lengths, e.g. 11-13 hour, 12-14 hour etc. Some varieties like Beth Alpha in Israel go to less than 12 hours. These mature around Christmas. However, because the quality of onions harvested at mid winter is often inferior, e. g. with more double bulbs, farmers usually want onions to mature as days begin to lengthen but before the rains have started.

Q. What does happen if you plant a long day onion near the equator?

A. As you said, they grow into little green onions. They may thicken a little at the base. They may actually be preferable for producing little green onions because the short day types might begin forming bulbs too soon.

Q. Do onion sets exist for short day onions?

A. Many in the tropics use the set system to get onions going near the end of the rainy season in order to extend

the onion harvest forward in time. Probably 30% of the onions in Bangladesh are grown that way. Sets are commercially available in Zimbabwe. However, the quality of onions grown from sets can be inferior, for example with more double bulbs.

Q. How would a farmer make his/her own sets?

A. Just as the hot season is starting, sow seeds at a very close spacing. Do not thin the onions. Harvest at ½ inch (1.25 cm) diameter or else they will bolt. If they are sufficiently crowded and if it is well past the day length where the variety would normally bulb, they will die down naturally. It may take a few seasons of trial and error to get it right. Keep the sets in an airy, warm place, for example, just under the rafters.

Q. Under what conditions might a farmer be able to save his/her own onion seed?

A. This is difficult. You need a variety that will easily bolt (send up a flower stalk) the second year. You do not want any variety that bolts the first year because that trait would create havoc in your harvest. Select bulbs from the best onions and store until the next season. Timing then becomes important. If you plant too soon while daily temperatures are increasing they may go into bulbing mode and split rather than flower. Wait to plant the bulbs until the average daily temperatures have started decreasing. The stalk gets a lot of diseases so, unless it is very dry, you may need to spray a lot.

Q. What do you look for in a variety trial?

A. You would want most varieties in your trial to be acceptable to local people. If onions are eaten raw, you want varieties which are mild; if cooked, pungent onions that store well. The pungency, by the way, depends not only on the variety of onion but also on how much sulfur is in the soil. You would want to look for onions where a high percentage of the harvested bulbs are marketable and where the bulbs store well. Even the shape and color may affect marketability and price.

Q. How should onions be stored?

A. We are writing a bulletin on storing onions in the tropics. The humidity should be about 75% and the temperature 25-30°C. If the temperatures drop much below 18°C the onions may begin to sprout. For example, in Zimbabwe we found that stored onions began sprouting when evening temperatures dropped to 15°C. This is somewhat dependent upon variety, but only to a limited degree. Light is not a very important factor. Light may cause some fading of red onions on the surface only. Light can also cause some green color to develop in white onions.

Q. Do short day onions store reasonably well?

A. Yes, but there is room for improvement. The Israeli's have been working to select grano and granex types that will store for a long time. The factors they select for are ability of the bulb to go into a good dormant period and qualities in the skin that will protect the bulb. Their varieties are being tested all over the tropics.

Q. I notice a lot of short day onions named "grano" or "granex," followed by a number. What are these?

A. Texas grano onions came from onions in Spain which over-wintering well in the field, but have poor storage characteristics in general. The granex series is hybrid, the grano open pollinated (non-hybrid).

Q. This brings up an important question. If you are working where it is possible to produce your own onion seed, would it be a big mistake to save seed from a hybrid onion?

A. No, if you are prepared to do a little selection, and if the hybrid is much better than the locally available varieties, you might end up ahead. For example, in India the Pusa Ratnar variety came from the red granex

hybrid. You might have some problems with male sterility in early generations.

Q. How are onions pollinated?

A. Onion pollen is sticky, so there is not much wind pollination. They are pollinated by insects, such as honeybees. Some seed producers throw dead chickens in the field to attract blow flies. Some crawling insects are also pollinators.

Q. Some of the special seeds that ECHO distributes have come from members of our overseas network. Is there any way in which they might help you?

A. I am interested in any traditionally maintained, locally grown onion. However, the needs of our seed bank require that we obtain about 50 g of any new accession. England is so far north that we are unable to increase the seed ourselves. If someone has an onion that might be of interest, they should first write and tell me as much about it as they can, and why they value the onion. My address is Lesley Currah, Horticulture Research International, Wellesbourne, Warwick, CV35 9EF, United Kingdom.

**ONION VARIETY TRIAL AVAILABLE.** Dr. Currah has put together seed for a large onion variety trial that she sends to selected researchers around the world. Most members of ECHO's network would not have the resources to qualify to participate in such a large trial. However, she has sent one trial for ECHO to subdivide and make mini-trials available to you. We have divided them into five sets of six varieties each. We will send one set at no charge to development workers assisting peasant farmers or to university researchers. When you report the results you can request another set. She asks that you be sure to include the best local varieties in your trial for comparison.

If you have the resources to handle a larger trial we will consider a request for two sets, but include a paragraph describing how they will be used. Formal researchers who need both more varieties and more seeds of each, write to Dr. Currah directly to inquire about joining her onion research network.

Dr. Currah is interested in learning how the onions grown from these seeds perform in many different environments. If you are willing to take some careful data, indicate this in your letter. We will then send some special report forms that she has provided, rather than ECHO's general forms.

**AVAILABLE FROM ECHO** Our **jaboticaba** tree *Myrciaria cauliflora* (EDN 34-2) is flowering, so now is the time to request seed if you missed out last year. The last batch of **nuñas** (popping beans) that we obtained did not germinate. Any requests will be on an indefinite back order. A few times a year someone usually sends us fresh **neem** seed. If you cannot find it in your country, we can put your name on a waiting list for the next batch.

We also have fresh seed for **atemoya** trees. This is one of the few fruits I consider a totally satisfying after dinner dessert. The delicious snow white flesh of a chilled atemoya is wonderful. Atemoya was formed by crossing cherimoyas, *Annona cherimola* (an annona that prefers elevations so high that it can "see the snow but not feel it") with sugar apples, *A. squamosa*, from the lowlands. A few of the seeds may produce trees more like one of the parents, but most should be atemoyas. Once you have fruit (perhaps 3-4 years) you can graft from the best tree. Germination times can be irregular and averages 4 weeks. If you are not familiar with this fruit, ask for an atemoya fact sheet when requesting seed.

We have two more technical publications. They are primers, basic introductions for those with little or no prior experience in a field. In both cases a broad subject was distilled down to the basic principles.

"A Beginners Guide to Good Nutrition on the Small Farm" by Dr. Frank Martin offers some simple guidelines for a balanced diet. Discussed are nutrients in food, recommended daily allowances, individual differences and special needs, balancing the diet, and what to do when milk is missing from the diet.

"Principles of Agroforestry" by Dr. Frank Martin and Scott Sherman defines agroforestry as "the integration of trees, plants, and animals in conservative, longterm, productive systems". Agroforestry is seen as an approach to agriculture, not a single finished technology. Benefits for the farmer include: food, feed, fuel, fiber, soil conservation and renewed soil fertility. Tables include: trees with edible products; principle agroforestry species; successful examples from various locations; successful examples of integrating trees and crops; and seed suppliers. The tables are followed by a section of definitions, a bibliography, and two pages of related resources and organizations.

**CAN CITRUS RESIDUE BE USED FOR ANIMAL FEED?** Someone in our network asked us this question. The following is abstracted from a University of Florida bulletin "Citrus Feeds for Beef Cattle." Although the bulletin is directed toward cattle, similar results would probably be found with other ruminants. To the best of my knowledge the residues are not fed to monogastric animals such as pigs or chickens, because much of the material would be indigestible.

Dried citrus pulp is high in calcium and digestible energy, but low in digestible protein and phosphorus. (What is the difference between, for example, "digestible" energy and just plain energy? Just because something is present in a food does not mean an animal's digestive system can make use of it. Only the digestible protein is available to an animal; the rest is excreted in the manure.)

When good quality citrus pulp makes up no more than 40% of the ration, and is properly supplemented with protein and phosphorus, it has a feeding value 85-90% of shelled corn. It is highly palatable, i. e. is readily eaten. (We have purchased beef feed containing citrus residue. The smell was wonderful). Citrus pulp is classified as a "bulky concentrate feed" because it is a bulky material that is also relatively high in digestible energy. Because it is relatively low in protein (approximately 6%) it is primarily an "energy feedstuff with roughage properties."

The bulkiness of citrus residue limits how far it can be transported economically. The volume can be greatly reduced by pelletizing. Its density can be increased from 13 pounds per cubic foot to 42. The reduced volume not only makes transportation less expensive, but also cattle can hold more and might gain a bit faster.

Dried citrus meal (the material that passes through sieves while dried citrus pulp is being made) can be used as a substitute for cottonseed or soybean meal.

The more relevant question for most of our readers, who will not have the facilities to process citrus waste, is the feeding value of fresh wet pulp. It is not widely used today in the States because of the expense of transporting and handling a material containing 70-85% water. Fresh grapefruit was fed routinely by Florida farmers before the dried product became available. Fresh grapefruit is more palatable than orange pulp.

The greater the water content of the pulp the lower the nutritional value. It is basically a carbohydrate (energy) feed, so supplements are necessary. If fed in a feedlot, supplements must include protein, a dry carbohydrate material, a source of roughage, vitamin A and minerals. If fed as a supplement to pasture, it is important to also feed protein and minerals.

During the 1940's several experiments were done on making silage from citrus waste. Including some hay or sugarcane improved the quality and palatability.

**HOMEMADE DEWORMER FOR GOATS.** According to the September 1991 issue of the Sustainable Agriculture Newsletter, some small farmers in the Philippines are using ipil ipil seeds (*Leucaena leucocephala*) to deworm young goats. About 50-100 young seeds are removed from the pods and are pounded to form a paste. This is mixed with 5-8 ounces of water and given to the goats as an oral drench. The laxative effect kills or expels the ascaris (*Ascaris lumbricoides*) and other stomach worms.

**IS THERE A BENEFIT TO HAYMAKING?** When compared to making hay, much less work is involved if

livestock are simply allowed to graze on dead grasses during the dry season. "A major benefit of haymaking is that the nutritional value of green grass hay is substantially better than standing brown grass. Nitrogen content was on the average more than 50% higher in hay, and in vitro dry matter digestibility of hay [Ed: a laboratory test to estimate how much of the material a ruminant animal can digest] was 60% greater in a study conducted by the International Livestock Center for Africa." Taken from the International Ag-Sieve (#6, 1992).

**ARE RAW VEGETABLES MORE NUTRITIOUS THAN COOKED ONES?** People taking the educational tour at ECHO often ask, "Can this vegetable be eaten raw?" The unexpressed implication may be that raw vegetables are better for you. Delia Hammock, registered dietitian and nutrition editor for the Good Housekeeping magazine says this is not necessarily the case. "While it's true that overcooking reduces the nutritive value of all foods and even moderate heat can destroy certain vitamins, raw food are not always more nutritious. Some raw foods contain natural substances that actually block the digestion of nutrients or interfere with the absorption or use of vitamins. Cooking inactivates these nutrient blockers." There are also many examples of toxic substances in plants that are detoxified by cooking.

In addition, the digestibility of many foods is improved as heat alters their physical structure. "Cooking carrots breaks down the cell walls making more of the carotenes available for absorption by the body. While on average only 5 percent of the beta-carotene is absorbed from a raw carrot, cooking makes 25-30 percent available. This is a 5-6 fold increase. Pureeing cooked carrots boosts absorption even more."

**UPCOMING EVENTS** **Nitrogen Fixing Tree Association** plans an international workshop Rosewood (Dalbergia spp) - Multipurpose and High Value Timber Nitrogen Fixing Tree. This workshop for researchers and practitioners will be held in Hetauda, Nepal from May 31-June 4, 1993. Write James Roshetko (by January 31 if you want to present a paper), NFTA, 1010 Holomua Rd., Paia, Hawaii 96779 USA. Phone 808/579-9568, FAX 808/579-8516.

**WORKSHOPS ON ANIMAL POWER.** Tillers International (1402 Milcrest Ave., Kalamazoo, MI 49008, USA; phone 616/342-6040) is again offering a series of 1-5 day workshops. Unfortunately the workshop dates are spread over a long period (April - October), making it impossible to take a month for intensive study. The "Basics" series are introductory short courses of 1-2 days duration (Introduction to blacksmithing, ox driving, sustainable pasture practices, draft horse basics), the "Skill Development" series lets you hone your skills more intensively (oxen basics, yoke building and fitting, animal-powered tillage and cultivation, blacksmithing for toolmakers, small-scale forage production, blacksmithing), and the International Development series has added a stronger policy component to the technical issues (rural development with animal power, low-cost animal powered tools for agriculture, building rural infrastructure with animal power). They also have an internship program (EDN 29-8).

### **GRASS MULCH - AN INNOVATIVE WAY OF GARDENING IN THE DRY TROPICS (Written by Scott Sherman).**

When I visited Jamaica a couple years ago I learned that farmers in south St. Elizabeth Parish were growing a good crop of scallions. What was unique is that they relied on rainfall in an area that is normally too dry for intensive vegetable production without irrigation. In fact, they were growing tomatoes, cucumbers, carrots, green beans etc. where traditionally yam, cassava, tree crops and a few drought tolerant legumes predominated. Working with the Jamaica Agricultural Foundation and the University of Florida, Mac and Pat Davis set out to study this indigenous system of growing vegetables in a guinea grass mulch. The following is based on their two part study of scallion production.

Rainfall averages 125 cm (50 inches) annually during two brief periods in the spring and fall. In addition warm temperatures and high winds combine to rapidly dry the soil after the rains. Farmers have found that mulching with guinea grass (Panicum maximum) not only conserves moisture, but offers other benefits as well.

In the study, all critical steps (i. e. mulching, planting, cultivation, and harvest) were carried out by local farmers in accordance with local practices. Replicated plots were all treated identically (weeded, mulched with a layer of

guinea grass and planted) except that after planting the mulch cover was removed from half the plots. Undisturbed fallow plots were left adjacent to each replication for comparison purposes.

Plots mulched with Guinea grass were found to have significantly lower soil temperatures than the unmulched plots. [Ed: Based on a graph in the article, afternoon soil temperatures appear to have averaged about 4°C less with mulch.]

Mulched plots maintained a significantly higher soil moisture content than unmulched or fallow plots. As the dry season progressed and moisture became limiting, growth rates in the mulched plots were superior to those of the unmulched plots (leaf counts were 40% higher at first harvest).

Guinea grass mulch also greatly reduced the amount of weeds (weed counts being up to five times as great in the unmulched plots). Plots were harvested five times. Total yields, marketable yields, and mean bulb diameters were all greater in the mulched plots than the unmulched. Over the course of the experiment, mulched plots produced 75% more bulbs than unmulched plots.

According to Mac, the mulch system is used by all the farmers in the area and no vegetable production is attempted without it. In addition to providing mulch for the principle crops, the grass is also an important part of the crop rotation, serving as a cover crop and sometimes as food for animals. While most farmers keep part of their land in grass and part in vegetable production, farmers with very small farms purchase the grass needed for mulch while those with larger farms grow extra for sale.

The second study focused more on soils, which in the area are well-structured, red or brown bauxitic loams with high aluminum content and near neutral pH. In addition to the benefits mentioned above, this study showed a strong correlation between mulching practices and extractable soil phosphorus.

This finely tuned system appears to be well adapted to growing scallions and other vegetables in that climate. The Davis's believe that similar grass-mulch systems could be adapted to other dry areas. Guinea grass seems to be a particularly good mulch because it easily reseeds itself, produces a lot of biomass, dries down quickly and decomposes slowly. While preparing mulch requires extra labor, less time is spent in weeding, watering etc.

Might such a system allow farmers in other dry areas to intensively produce certain vegetables where they may not otherwise be grown? The author believes so. Such a system would not only increase the farmers' profit potential over traditional crops in a region, but also provide a means for improving the nutritional status of a community. Mac suggests "the best approach would be to begin on a small scale with subsistence garden plots until farmers become familiar with the technique and some marketing infrastructure can be developed."

We would be interested to hear if any of our readers have run across similar systems? Gene Purvis, now working in Costa Rica, says that he used a grass mulch system in Panama. Normally his garden took daily watering. He reduced the time of each watering AND reduced the frequency to two times a week by running poly pipe with small holes drilled in it under a cover of chopped paragua grass. He said that any tough, slow decomposing grass, when cut dry, would work well. Rice hulls worked well. Chopping the grass had several advantages.

**WHERE CAN WE BUY SOLAR SET TOMATOES?** ECHO recently offered a small packet of this new hybrid for your evaluation. Now those who found it promising are wondering where to purchase the seed. The variety was developed by Dr. Jay Scott at the University of Florida. The Asgrow Seed Company produces the hybrid seed for them. We spoke with Tom McBride at Asgrow about solar set. So far results have been very good in areas where plants are flowering at high temperatures. 'Solar Set' is not an indeterminate variety like many of our readers may be used to. In other words, relatively short plants will flower and set fruit for a relatively short period of time (30-40 days), but they fruit heavily and will do a good job of holding what fruit does set. While the tomato is a warm season plant, there is a point where it may be too warm for good germination (probably around 100 degrees).

Asgrow (Asgrow Seed Co, 7000 Portage Rd., Kalamazoo MI 49007, fax: 616/548-2368) sells overseas through their distributors. Unfortunately their smallest unit in the States is a 60,000 seed can for \$585! ECHO will send a small packet for trial free to our overseas network, \$2.50 to others. If enough of you find solar set is superior, and you need intermediate amounts but cannot find that locally, we would consider buying a can and selling you smaller packets.

**ECHO GIVES A HAND TO RUSSIA.** ECHO is still waiting for someone to give a serious try to the inexpensive rooftop gardening techniques we have developed (EDN 30). The rest of the world needs a successful model to be convinced of the potential. So we decided to become a hands-on partner somewhere, and selected Russia. On a brief exploratory and speaking trip last fall I was thrilled at the enthusiasm Russians showed at the idea. Millions live in multistory buildings with flat rooftops built to hold the weight of the worst conceivable snowfall. A mayor in St. Petersburg has made available both unused land in the city for community gardens and variety trials, and rooftops to demonstrate the technique and what can be done there. Our in-country partner is the Center for Citizen Initiatives.

ECHO sent the following letter to our supporters in the States. It prompted so many comments that I have decided to share it with you. It will not help your work and is not typical EDN material, but I hope you enjoy reading it.

What was it like for a 49-year old man to visit the country that for as long as I can remember was "the evil empire" and our country's arch enemy? The Russians' response to ECHO's rooftop gardening idea for their cities was indeed gratifying. And their eagerness to get to know Americans was equally moving. At the personal level, it was an emotional trip, comparable in its impact to my first trip to a Third World country. I was there as one of seven speakers and consultants.

Our sponsor, The Center for Citizen Initiatives, is a citizen diplomacy group based in San Francisco. Since "perestroika" they have begun efforts to help the Russian people survive and develop a strong democracy, but their person-to-person approach is still very much in evidence.

For example, several times local families took two or three of us to see their small gardens and apartments. (The two times that a meal was served, the main course was a pot of boiled potatoes. Food is definitely at a premium.) Our translator/tour guide in Moscow is a professor of agricultural economics and a member of the Soviet Academy of Sciences. He brought a bag to each meal, discretely hidden under the table, into which he placed any food we did not eat to take home.

After one meeting I enlisted a young woman, who I had noticed knew some English, to help me in a conversation where my limited Russian had only gotten me lost. Later she said that a couple years earlier, in the very hall in which we were meeting, she took notes as secretary of the local young communists league. "Now that we know we were lied to, we just do not know what to believe." She said that many of her friends are turning to the church, but she felt that since she was not brought up a Christian this would not be possible for her.

It may sound strange, but I always envisioned Russia as black, white and grey. Maybe it was because as a child I only saw black and white images of Russia on TV and in the newspaper. So I was unprepared to find that St. Petersburg and Moscow are beautiful. The Kremlin lit up at night was as colorful as something out of Disneyland. People love color and gardeners over and over requested that when garden seeds are distributed next year they should include flower seeds!

I expected there might be one or two multi-lane highways, but instead found dozens of them. On each side of many of these highways are miles of spacious sidewalks surrounded by a row of trees on each side. To walk the sidewalk was almost a walk in the park, complete with park benches.

Everywhere one meets people who are hustling to start one kind of small business or another. There seems to be a desperation to find a way to earn an income beyond their salary. There is good reason for their concern. My taxi

driver to the Moscow train station was elegantly dressed. He is a physician, head of the rheumatology section at the clinic, and is trying to supplement his 8,000 ruble a month salary (US \$40). Professors make the same salary, retirees much less, some laborers more.

Many Russians are avid gardeners, and others would become gardeners if the government let them have a plot near their home. Someone told me that 1/4 of the people in Moscow and St. Petersburg have access to a small plot somewhere in the country. Gardening brings people of diverse backgrounds together here in our own country. The small farmer, the businessman, the housewife, the doctor all face the same gardening successes and failures. They can readily share favorite gardening hints or seed of special varieties. Our common interest in gardening helped us make personal bonds quickly.

I was frustrated at how slow Gorbachev was in privatizing farmland. Now that I see how difficult it is to become a private farmer, I think he was wise. How would you farm 50 or 100 acres if you had only been an employee on a HUGE farm doing one or a few specific things? Your savings, if any, are lost to inflation. How much land can you farm with only hand tools? Where do you get fertilizer and seeds, and how do you pay for them? How will you harvest your crop and where will you store it? Where will you sell it, and how will you get it there?

One man who wanted to plant potatoes on the 30 acres he had just been given told us that the bank wanted 100% interest and half the harvest. Many farmers are hoping to find foreign partners, other farmers, to help them get minimal equipment. And organizations to expedite such arrangements exist.

When a government becomes weak it often fails in one of its prime duties -- to restrain the effects of sin that pervade every culture. Most employees of state farms, and most managers, are against privatization (change). If a new private farmer is somehow successful, it is so resented that in many cases his fields and/or home are burned. I was told that some farmers are petitioning the government for permission to bear arms to defend their farms.

Over and over we heard of the Russian mafia's control of marketing of vegetables. Remember those TV segments of all those vegetables for sale but few could afford them? Did you wonder why they didn't lower the price then? People are convinced they would be killed if they even lowered the price to quickly move some produce that was about to spoil.

Retirees are especially worried. After one retiree showed us his garden, his son told me that his dad was very frugal. "He saved 10,000 rubles and could have bought a new car three years ago. Today his savings might buy two pair of boots."

Our team of six speakers spoke to 350 would-be urban gardeners in the hall used by the former communist party for political indoctrination. The "energy" between the group and the Americans was moving. The meeting went from 10 a.m. to 4 p.m., and people seemed hesitant to leave. As the oldest speaker, it fell to me to make a few concluding remarks. I shared how I was struck at how very much alike our two peoples are, and that I was especially thankful that our missiles were no longer pointing at each other [I hope that is right!].

At that both the audience and speakers gave a loud applause, for it had been an unexpressed thought on all of our minds. There were reasons we had to arm ourselves. But these hospitable gardeners, and in some cases fellow believers, in front of me could fit readily into the farm community where I grew up in Ohio. It is moving to meet and enjoy the very people that we would have killed.

## ECHO'S FROM OUR NETWORK

**Peter Storey, England.** In EDN 38-7 you mention the "hopeful" sign that many neem trees are going through a period of heavy flowering. This is not a hopeful sign. Unusually heavy flowering in trees can be a sign that the tree is having one last fling. It will use up its carbohydrate reserves and may die the next season. One of the signs of citrus decline is heavy flowering which is followed by death of the tree in one or two years.



When plants (trees in particular) have a higher proportion of carbohydrates than nitrogen, their regulatory mechanism senses that they have plenty of reserves to produce fruit and so produce many flowers. In the opposite case, when nitrogen is higher than normal, the plant produces more leaves so as to make more carbohydrates.

When roots are damaged by disease or pruning, the plant is less able to take up nitrogen and the ratio of carbohydrates to nitrogen increases. This is a signal to the plant that things are not so good and that it is likely to die. To ensure that it reproduces itself, it sends out a lot of flowers.

[Ed: This reminds me of the technique of girdling used by some homeowners to bring fruit trees into earlier bearing. A complete circle is cut around the trunk wide enough to shock the tree but narrow enough that it eventually fills in and does not kill it.]

**Dr. Jason Yapp, Agricultural Services & Development Manager, Rural Development Corporation, Malaysia.** "I would like to reply to Nigel Florida's inquiry regards to successful tropical mushroom cultivation (EDN 34-3). Our organization has been successful in introducing the cultivation of shiitake mushrooms to our target poor farmers (income less than M\$500 per month (US\$200). The elevation is 700-1500 m and night/day temperatures 15°/30°C. We have a central factory to pack, sterilize, and inoculate spawn. Currently we have over 250 contract farmers involved and are expanding to produce 10,000 bags per day."

"Our current efficiency is only 0.18 kg mushroom per 1.2 kg bag. Main problems are high contamination of the bags, high temperature and low humidity leading to small thin mushrooms (grade C). Trials are in progress to produce other lowland mushrooms."

If you want to correspond with Dr. Yapp, his address is Kompleks Ibu Pejabat KPD; 9 km, Jalan Tuaran; Beg Berkunci 86; 88998 Kota Kinabalu; Sabah, Malaysia.

**Timothy Volk, MCC, Nigeria.** "I noted Eddie Visser's comment in EDN #37 on coating roots of seedlings with a mud solution. I recently was on a study tour in Togo and saw villagers doing the same thing. However, rather than using mud alone, they also mix in some cow manure and sand. We were able to see that the seedlings (leucaena mostly) did not dry out during the day and that earlier planted seedlings were doing very well despite a poor rainy season. In addition the manure provides a small amount of nutrients to promote early root growth."

**Larry Radice, Maryknoll Fathers and Brothers, Tanzania.** After reading in EDN 37 about use of moringa to treat a skin infection, "I thought I might share with you and your readers my experience using neem tree leaves to treat scabies."

"I lived in Tanzania for almost 8 years. One day while visiting a friend's home I noticed his daughter

had a very bad case of scabies. ... I was told that she had gone to the local clinic, bought some medicine, but it had run out and the scabies had not cleared up. ... Her scalp was horribly encrusted and she had no hair in the infected area.

"I knew that neem tree leaves had insecticidal properties and that scabies is caused by a small mite. So I thought it would be worth a try.... I had the mother take neem tree leaves, about a hand full, and pound them into a mush adding a bit of water. I believe she then heated this boiling off the excess water and leaving a paste. I told her to apply the poultice to the infected area twice a day for five days, leaving it to dry on the scalp.

"When I visited the home again two weeks later I had hardly said hello before she was excitedly telling me that her daughter was well. In fact by the third day the scabies was drying and by the end of that first week she could see new hair growing. When I saw the child the scabies were gone. I suggested the cure two other times and in both cases I later heard that the scabies had cleared up, but unlike the first case I did not get to see the results for myself."

**Nicola Mears, Ecuador.** "Here in coastal Ecuador the area has been transformed in the last 20 years from tropical forest to cattle farms, so the ecology has changed dramatically. Perhaps this is why we have a population of ticks that is absolutely out of proportion. Controlling them has become worse over the past 5 years. All animals must be sprayed with insecticide at least weekly. Until a correct dose was established many cattle and horses were lost (and who knows how many children were affected). I am continually asked if there is a biological control for ticks. We are experimenting with the idea from EDN 35-2 of using chickens in the feedlot to help. If anyone can shed anymore light on the situation, the community of Muchacho and I will be very grateful." [ECHO will be glad to forward any suggestions you send us to Nicola, as well as make note of them for ourselves.]

**ECHO DEVELOPMENT NOTES -- ISSUE # 39**  
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39-7

39-8