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SFA Gardens Newsletter, Sept 1988

SFA Gardens, Stephen F. Austin State University

FRIENDS OF THE
Stephen F. Austin State University
ARBORETUM

FRIENDS OF THE SFA ARBORETUM NEWSLETTER NO. 7
SEPTEMBER, 1988
DR. DAVID CREECH, BOX 13000, DEPARTMENT OF AGRICULTURE
STEPHEN F. AUSTIN STATE UNIVERSITY, NACOGDOCHES, TX 75962
(409-568-3705)

Welcome back! After four weeks in Pakistan and two weeks on the east coast this summer, one of the first things I had to do was check the arboretum. Much to my surprise, the garden prospered during one of the worst droughts in recent history. Last April's decision to invest a good portion of our precious funds in a solid-set sprinkler system for about four acres of plantings has proven to be a good one. Without it, the hundreds of trees and shrubs recently planted to the LaNana creek collection would have been lost. With a weekly one to two inch application of water, growth and survival has been impressive. Much of the credit must go to a graduate student, Monte Bales. During my absence, the burden of running the program fell on his shoulders. The prospect of dragging hoses on such a large planting seemed futile. A relatively rainless April and May made the irrigation investment seem even more crucial. After four weeks of ditch-witch and plumbing work, the system was operable in late May. The hot, dry summer and fall that followed was not the kind of weather a young arboretum needed. I was pleased that the garden looked great in the heat of my August return. Excellent weed control, a shade house brimming over with unusual trees and shrubs, and a Horticulture Club greenhouse project that looked strong, was just icing on the cake. Maybe I need to leave more often? Thanks go out to Shannon Murphy, Ricky Morris, Olassie Davis, Chuck Martindale, the Y.O.U. kids, Frank Burke and other enthusiasts.

This newsletter documents arboretum happenings, makes a preliminary announcement concerning a new plant sanctuary in our area, chronicles a trip to Pakistan, outlines the highlights of a two-week east coast arboretum and botanical garden tour, provides a few details about the Native Plant Society of Texas, reviews several new garden books, and lists plants acquired since the last newsletter.

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ARBORETUM HAPPENINGS

Irrigation system: Those of you who have seen the sprinkler system in action can attest to its effectiveness. The system was designed to cover a large area at low cost. The sprinkler heads are a new design from Austria manufactured by Salens. They differ from conventional impact sprinklers in many respects: less moving parts, no springs, only one wearing surface, and cost. Sixteen heads effectively cover an acre and deliver about seventy gallons per minute. That amount will provide frost control potential to the site, an attribute that we may or may not need in the future. In an overnight watering we can apply the equivalent of a one-to-two inch rain, depending on the degree of overlap and just where you happen to be standing. A fall project to plant the base of each riser to species that reach four to five feet will effectively "hide" the system from view. All of my students have heard me say: "You are going to pay for an irrigation system whether you buy one or not." That old addage makes just as much sense today as it did yesterday.

Garden structures: A big addition to the arboretum in May was a group of garden structures set quietly into our woodland glen, just east of the Agriculture/Art parking lot. Two small bridges, four garden benches, and landscape timber steps were accomodated in and about our forest "stream". Ferns, hostas, Japanese maples, Pachysandra, and Ardisia colonies are finding a happy home beneath the towering specimens of native willow, river birch, pine, and oak. With excellent planning and a lot of hard work, Benny Serrano, Jim West, Jeff Anderson, Tim Kiphart, and Rick Morris managed to finish the project just before semester's end.

Bog and Wetland: Because a small area of the LaNana bottomland is poorly drained and tends to create a wet area, a bog plant community is in the making. Located at the southeast corner of the LaNana Arboretum property, the project is most kindly referred to as "Peter's bog". It is named after Peter Loos, a recent graduate now working with an exciting nursery in Tomball, Texas. Will Fleming, the owner, has created a nursery brimming over with uncommon natives and impressive specimens. Will's landscaping thought attempts to meld plant texture, diversity, and interest into a pleasing landscape. Our wetland area contains numerous species including Sweet Bay Magnolia, Hoary Azalea, Honeysuckle Azalea, Single flower Hawthorn, numerous types of Hibiscus species (militaris, moscheutos, coccineus, aculeatus) with flower interest, Bog Marshallia, Barbara's Button, Catchfly, Sebastian bush, a native St. John's wort, an inkberry holly, a Cyrilla, a Possumhaw Viburnum, and others. Most interesting are several prospering Pale Pitcher Plants, Sarracenia alata. Peter has created a unique foundation for further development and continues to contribute plants and time to the area. Thank you, Peter. Mark Bronstad, Shannon Murphy, and Scott Reeves, are now carrying the torch and a "catwalk" and new plants will grace the "wetland" garden soon.

Container-growing area: The new outdoor nursery container area just to the east of the Horticulture Club greenhouse has greatly expanded our plant-growing ability. In many ways, it was just in the nick of time. Our shade house was packed to overflowing and contained many plants that needed full sun. The project adds over sixteen hundred square feet of "growing area" to our inventory of assets. The container yard is irrigated via Roberts spinner sprinklers set on five-foot risers. Monte Bales, Ricky Morris, Jim West, and Jeff Anderson provided all of the sweat for this project. Bob Rogers, Maintenance at SFA, provided the fill dirt from another construction project on campus. That allowed our facility development to include the much-needed sun area at a very reasonable cost. Bob Roger's continued support, advice, and interest in our strange collection of bizarre plant wonders is an asset to the effort.

Turf Plots: Dr. Alhashimi's turfgrass plots finally became a reality this past spring. For many years, Dr. Alhashimi's turf class has needed a readily available turf display yard. After a lively and animated discussion, Dr. Leon Young, Dr. Alhashimi, and I decided that the project was worthy of funding through the "Friends of the SFA Arboretum" group. The turf display area adds a new dimension to the arboretum. Located just to the south of the Horticulture Club greenhouse, the garden displays numerous bermuda, san augustine, and centipede grass varieties. Set in four foot squares, the grasses are easily compared as to texture, color, and quality. Jeff Anderson and Jim West put in numerous hours hammering the grid system together. In the next newsletter, I will include a turf grass map that describes the varieties by location.

Arboretum mapping: Our mapping effort is just about current with our planting program. An updated booklet is in the kiosk at the main entrance bed. It contains maps of the beds in the phase 1 and 2 area (Beds A-L), the Agriculture building foundation planting, the new LaNana Creek bottom land collection, and the "Mexico" section just by the Art building. There are maps to our "Asian Valley", Mexico, Southern U.S., and woodland plantings. If you carefully inspect the two top cover maps, you can easily find your way through the booklet and the collection. The maps are accurate as of September 1, 1988 and indicate less than 3% mortality in our field collection since planting was first initiated last year. "Friends" that would like a copy of the map for their very own can contact me at my office. We have made some progress in labelling but that area is still our weakest link. If our rather impressive collection is to ever be a top-flight educational display; good, visible labels are essential. My east coast trip indicated that all arboretums have problems with labelling. In addition, most arboretums have a good percentage of unknowns, plants whose history is not known. As plantings mature, as mortalities occur, and as new plantings are made in busy areas, maps can become quickly outdated. Over the years, it's easy to understand how mistakes are made. With an arboretum of only five or six acres, our record keeping is

far simpler than gardens of several hundred acres. We have spent a good amount of time labelling this summer in the azalea collection (probably because so many cultivars look almost exactly alike and are easy to confuse). In that collection, we are testing several labelling approaches. I like the two-inch polystyrene label predrilled to take a stainless steel wire loop.

Juniperus horizontalis collection: The central box garden in the phase 1 area of our garden is now home to a large collection of creeping juniper cultivars. A gift of North Carolina State University, this world-class assemblage of 52 taxa of that species had been carried one year in the container stage and needed a place to call home. Although our box garden can only hold 36 plants (on four-foot centers), there is similar bed space available in the Phase 2 area. With good sunlight and excellent soil drainage, they should prosper and make a full cover in three years. A student, Shannon Murphy, is in charge of this unique project and positioned clones so that leaf and habit differences are easily distinguished by the visitor. In the center of it all, and perhaps somewhat out of place, is the four foot Araucaria araucana, Monkey Puzzle Tree. Even a die-hard botanist would find interest in this strange green army of conifers surrounding their bizarre and alien leader. Friends should keep an eye on the Monkey Puzzle tree; its hardiness, growth, and long-term potential here is unknown. If it fails to enjoy our East Texas clime, a replacement candidate will be named. Like governments, plant colonies must elect new leaders from time to time.

Just to prove that we have a sense of humor, one of my Vegetable production students, Melissa Willis, was responsible for a formal scroll design in the box garden and, yes, we settled on carrots! Four varieties of carrots are now prospering in the raised beds and make an interesting accent as they circle their creeping juniper distant cousins.

Polyfabric Weed Barriers: Some of you may remember last spring a discussion of polyfabric weed control products. Available in various widths, the woven polypropylene fabrics are manufactured by several companies and are a hot item in the landscaping trade. Our experiences this past summer with most of the brands is mixed success and failure. The best fabrics can suppress most weed penetrations. Nutgrass, however, is another story. This pest can easily "stab" it's way through the weed barriers and mulch. Once established, the weed is difficult to remove and the fabric prevents a good weeding of the rootlet bulbs. It's important that a coarse bark mulch be used with the fabric; too much wet bark and soil on top of the fabric allows weed germination and establishment. Bermuda grass can quickly climb into and over a bark/fabric planting. In general, most of my students that work with the materials find them cumbersome.

Fall Garden: The fall effort of the vegetable class can be enjoyed in the LaNana Bottomland Garden. cauliflower, carrots, turnips, beans, tomatoes, onic lettuce are prospering and lend a perspective to c vista that's quite appropriate for our mission. snapdragons and a strawberry planting add to the disp

We have touted brocolli and cauliflower as prom Texas Fall crops and this year is no exception. Tria year since 1980 emphasize the importance of doing just right. While the main roadblocks to high yields heads is usually related to excessive fall rainf control, fertility, weed control, and timely irrigat are numerous other tricks to growing "giant" heads. M the Vegetable production class and Olassie Davis ha main army this fall and all are due a note of credit.

Monte Bales: Those of you that have enjoyed fc effort and have met Monte know that there couldn't guy and harder worker. Much of the success of the la must go to Monte. He has just wrapped up an interest thesis that focused on blueberry sensitivity to p water. Monte will be leaving in mid-November and much we'll miss him. He has taken a position as Supervisor at Lufkin State School and has over 100 a disposal. I know he'll make that place shine. Good

Sentinel Sept 25, 1988

NO LOOPERS HERE — According to Monte Bales, graduate assistant at Stephen F. Austin State University, controlling insects, including a small green worm called the cabbage looper, is the greatest problem Mr. Bales recon keep on top of t ticide spraying f Hardy Meredith

Brocolli and Cauliflower Tips

1. Plant healthy transplants in early to mid-September.
2. Adjust pH to 6.0+ with limestone if necessary.
3. Plant is a heavy Mg and B feeder; appreciates compost.
4. Cauliflower, 12-18" apart; Brocolli, 6-12" apart.
5. Rows 36 - 44 inches apart.
6. 100 lbs NPK/acre rate turned under prior to planting
7. Raised beds are essential; plants prone to "drowning".
8. Diazinon granules or spray for cabbage maggot.
9. Spray Dipel + Surfactant repeatedly for cabbage loopers.
10. Tobasco sauce, 2 ozs per 3 gallon backpack for rabbits?
11. In mid-October, 30 lbs N per acre rate.
12. Tie cauliflower leaves together when heads are 3".
13. Snow Crown ready in late November, early December.
14. Green Comet ready in November.
15. A good yield of smaller brocolli heads can be obtained after the first harvest if weather permits.
16. 8,000 lbs per acre brocolli; 10,000 lbs cauliflower.

Conifer and Mexico Plantings: A conifer collection has been planted to the foundation of the east face of the Art building and the "Mexico" section has received a healthy transfusion of new plants, most donated by Will Fleming Nursery of Houston and Mr. Lynn Lowrey of Kirbyville. Both plant enthusiasts have visited our arboretum and never fail to encourage our efforts. Olassie Davis, a student from the Virgin Islands, labored for several hours laying rock to build the two small raised beds in the Mexico section.

Shelby County Courthouse Project: Related to the SFA Arboretum Outreach mission, the landscaping of the Shelby county courthouse is about to enter its second phase. A spring foundation planting designed by Rick Morris and Shannon Murphy and installed by Horticulture students has been a great success. In spite of the drought, most of the trees and shrubs prospered. A fall tree planting and a "memorial marker" meditation garden is in the planning stages. A decision has been reached to plant about twenty east Texas native trees that will include a collection of our native oaks, pines, hollies, and maples as well as several unfamiliar types. The project has been a tremendous educational experience for my students and has been a worthwhile civic thrust.

Native Plant Society of Texas Notice: Our arboretum was given a little state-wide notice in the NPSOT News (Vol. 6, No. 4), July/Aug 1988, issue. I've been pleased at the number of distant visitors that have enjoyed our collection, have helped with advice and new plants, and kept our enthusiasm level at a high pitch. We've even garnered a few compliments from my Aggie colleagues and those aren't always easy to come by!

Shelby County Courthouse

Light & Champion, Sept 23, 1988

Landscaping continues

By ROY WOOLLEY,
Chairman,
Historical Commission

The landscaping and beautification of the historic Shelby County Courthouse was begun over three years ago by the Shelby County Historical Commission.

The fund raising portion of the project began in 1987. It included the preparation of prints of the courthouse, old jail, and historic homes and churches in the county. Those included were the Rogers house, Weaver-Oates house (museum), Jones house (now being restored), and Shelbyville Methodist Church.

The historic structures were made into picture size prints and note cards. The historic courthouse was also embossed on coffee mugs, and all were sold at last year's Poultry Festival. They will be on sale again at this year's Poultry Festival. These items are for sale at the Shelby County Museum and at several stores throughout the county.

Other events included a raffle and a very successful style show conducted by Regina Wright last December.

Early in 1988, the historical commission voted to begin the first phase of the beautification project, which was to include landscaping around the courthouse, restoring the old clock, placing all above-ground electrical wiring underground, installing a complete new water system to all buildings and establishing a cover or grass on the entire courtyard.

Dr. David Creech, professor of agriculture at SFA, offered his services and the service of several of his students to plan, design, and implement the landscape plantings that we have today. Funds for this project were provided by the historical commission and funds from the hotel/motel tax committee, on a matching basis.

Funds were insufficient to complete the project, and Fred Wulf enlisted additional support from the motel tax committee to begin the other activities of the project.

Early this summer, SWEPCO electrical engineers met with members of the historical commission and outlined a reasonable and workable plan to place all electrical wiring underground and at the same time provide electrical power to all buildings. Also, plans were formulated to provide power to illuminate the exterior of the courthouse, a light for the flag and and a power source for maintenance of the grass-covered area, also electrical outlets at each entrance, to provide decorative lighting to be installed later.

Lee Stockton was employed to install the electrical wiring system. The new water system was installed at the same time as the electrical system, and it was difficult to decide if Lee was the electrician or the plumber because he worked on what ever was needed to keep both projects progressing. The water system is now complete, and the county employees say it is the first time they have had ample volume and pressure at the various water outlets. The electrical system is nearing completion; we are making every effort to have it completed by the Poultry Festival.

The successfully growing green grass on the courthouse lawn can be attributed to Mr. and Mrs. Pershing Hughes, Regina Hughes Wright, and Joe Louis Jones. They spent many, many hours hauling fertilizer, planting grass, and moving water sprinklers to make the beautiful lawn a reality. It was not possible to operate county business and water sprinklers at the same time with the old water system. These folks could be found watering the plants and grass at odd hours of the night and on weekends.

The latest information on the clock repair is that the repaired mechanization of the clock will arrive in November and will be installed at that time.

Native Plant Society of Texas News
July/Aug 1988, Vol 6, No.4, page 2

East Texas Arboretum Germinates

The Stephen F. Austin State University Arboretum is finally a reality! With seven acres of University land on the fertile soils bordering La Nana Creek, thousands of ornamental plants are finding a new home.

Particular emhasis is being placed on uncommon and rare natives of East Texas and the South. A special section containing species common to West Texas and the mountains of Mexico is already yielding interesting adaptation information.

Initiated by the Horticultural program at Stephen F. Austin University, implemented and maintained by students in the program, and supported by a "Friends of the S.F.A. Arboretum" group, the Arboretum encourages input and contributions from anyone interested in the development of the first Arboretum in East Texas.

Supporters receive a newsletter that chronicles Arboretum happenings, plant performances, plant searches, plant sales and give-aways.

For further information, please write:

Friends of the S.F.A. Arboretum
Dr. David Creech, Director
Box 13000 / Dept. of Agriculture / Stephen F. Austin University
Nacogdoches, Texas 75962

PLANT SANCTUARY DEVELOPMENT PROJECT

A remarkable plant community that thrives in the watershed of Mill Creek just west of Nacogdoches, Texas, is going to receive some very special attention in the future. The Hayter trust is graciously funding a two-year master plan development by granting a graduate research assistantship to Mr. Chuck Martindale. Chuck's project will involve the creation of three maps: a topographical map, a site characterization map, and a biological inventory map. About 2.4 miles of preliminary trails and loops will be run in the watershed to access the area for ease of study.

In terms of garden potential, the site is blessed with just about all of the necessary ingredients. The sound of water is never far away. Two spring-fed ravines will soon be tumbling their way into an eight-acre lake. A lake has been created by the repair of a very old dam. Many years ago the stream's power was used to run a grist mill. Besides large rock and boulder structures in the miles of stream beds, a beautiful waterfall lies just behind the dam. With a wonderful canopy of pine and oak forest, the area is already a pristine plant paradise. The ravines and wet areas are home to numerous uncommon natives. There are some very impressive Sweetbay Magnolias, native azaleas, dogwoods, and fern colonies thriving in the cool shade near the streams. A small colony of Carolina Holly, Ilex ambigua, resides in a dry sandy area and includes several ten-foot specimens that fruited heavily this fall. Dr. Ed McWilliams, Texas A & M University Horticulturist, Lynn Lowrey, and I made a seed collection trip to the site in early October and should have small plants ready for planting in another year. The site is blessed with rolling topography and offers numerous potential viewing vistas. Most amazing is the fact that one can walk uphill just a few hundred feet from a "swamp" habitat to an east Texas "desert." The soil is a coarse sand with excellent drainage characteristics. Large boulders and rocks are a part of the stream-side picture. As the project defines itself over the next few months of study, I will keep the members informed of our progress.

This project is an example of numerous outreach opportunities often accepted by arboretums, botanical gardens, and nature conservancies. By working directly with landowners, garden groups are making progress in preserving our priceless plant heritage. While this project is certainly breaking new ground in Texas, and many details are still unresolved, the prospects for a wonderful new resource in our area looks strong.

The SFA Arboretum recognizes the responsibility and opportunity associated with an endeavor of this sort. Whether the project realizes its full potential depends on Hayter Trust wishes, the feasibility of the Master Plan, and the value of the site to nature conservancy groups.

6C—The Sunday Sentinel, Nacogdoches, Texas, Sunday, October 9, 1988

KELLY BELL

GRANT TO SFA — ~~Guy Anderson~~, center, representing the Hayter Trust, conveyed a two-year grant to Stephen F. Austin State University in connection with a plant sanctuary development project. With him, from left, are SFA representatives Dr. Leon Young, chairman of the Department of Agriculture; Dr. James Reese, vice president for academic affairs; Dr. David Creech, principal overseer of the grant project, and Chuck Martindale, graduate student who will develop the project under Creech's direction. (SFA Photo)

Hayter Trust grant awarded to university for project

A Hayter Trust grant has been awarded Stephen F. Austin State University in connection with a plant sanctuary development project on land owned by the Hayter Trust near Nacogdoches.

The two-year grant essentially will cover the stipend costs of a graduate student in horticulture who will work with his principal professor in developing a master plan and a primary trail through the site.

The site, involving some 100 to 200 acres on the eastern edge of Hayter trust lands about seven miles west of Nacogdoches, "is blessed with tremendous potential," according to Dr. David Creech, [redacted] professor of agriculture and principal overseer of the grant project.

The specific project area involves the watershed of an unnamed tributary that feeds Mill Creek. According to Creech, it contains "a bounty of plant community capabilities. From true 'bog' representatives to hillside swamps, from stream-side magnolias to sandy knoll dogwoods under pine tree shade, the terrain is blessed with tremendous public garden potential."

Chuck Martindale, a graduate student from Round Rock seeking a master's degree in horticulture, will carry the brunt of the project under Creech's direction.

The master plan and trail development for Mill Creek Gardens will be the primary thrust of the project, with an estimated 90 percent of the land dedicated to native plants. Creech emphasized that having the SFA Arboretum "just down the road" enhances and simplifies the local support. An impressive plant inventory of over 2,000 is already in place, according to Creech.

The native plants to be utilized would include species already on the site and species that probably would have been on the site, allowing the reintroduction of numerous species into appropriate plant pockets, according to Creech.

The grant was finalized this week with Guy Anderson representing the Hayter Trust.

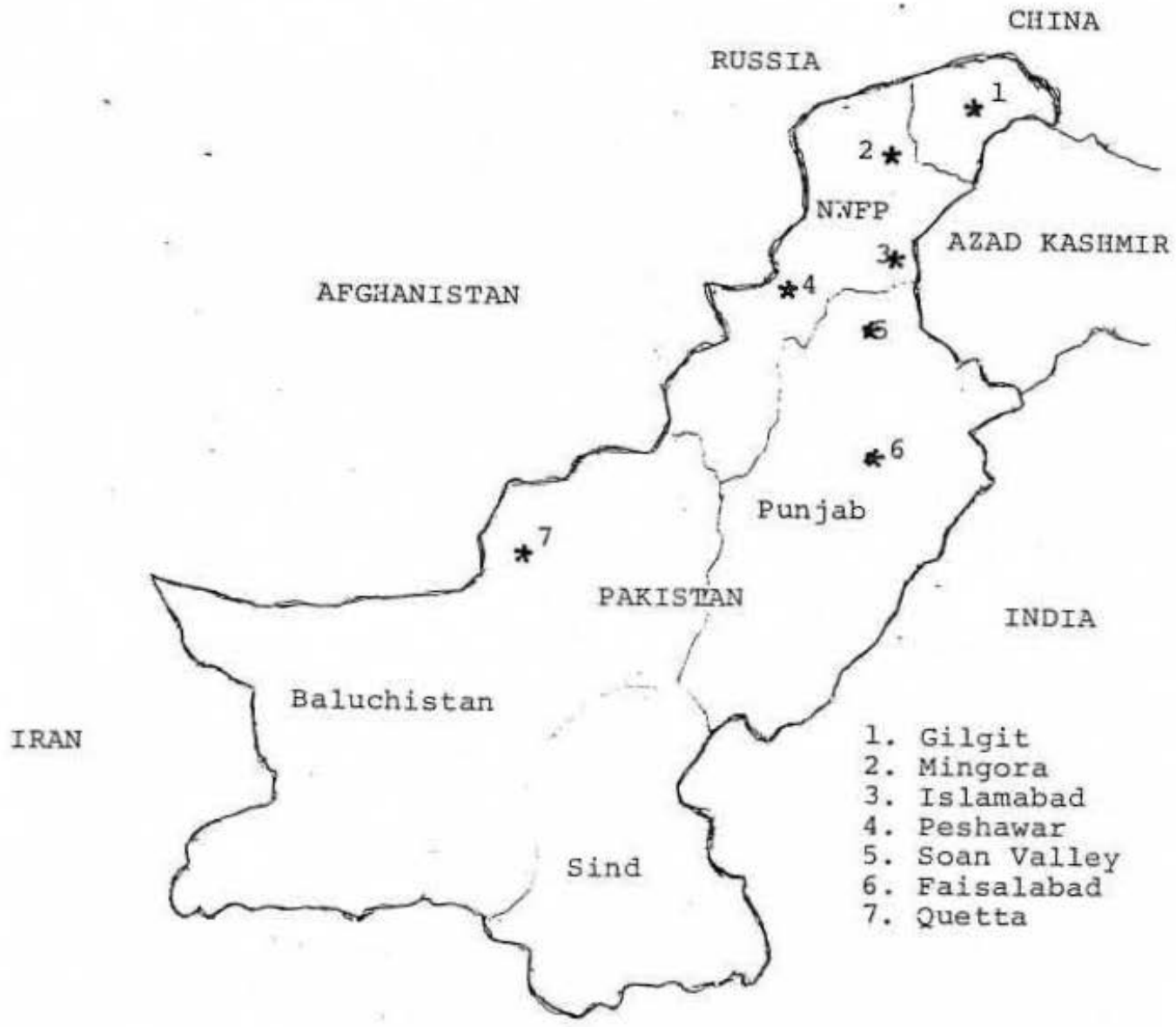
—SFA News Service

PAKISTAN TRIP

I was fortunate enough to enjoy a return consultancy to Pakistan for USAID. Because arboretums must crusade habitat protection, this section attempts to underline just how difficult a task it is that lays ahead. What might seem a simple goal, plant conservation, is all too often at the mercy of local political; sociological, and economic realities.

Winrock International, based in Morrillton, Arkansas, acted as my principal contractor for the four-week assignment, a review of existing temperate fruit research and production and recommendations for improvement. Special emphasis was placed on scrutinizing the existing fruit germplasm base, wild and cultivated, in Pakistan and assessing the total technical horticultural manpower base available in Pakistan. Because this was my fourth trip to Pakistan, I was returning to horticultural friends as well as professional colleagues. I was also returning to many of the same agricultural obstacles, roadblocks, constraints, and problems presented to me in the early 1980's. The road to effective horticultural improvement schemes is fraught with many potholes in Pakistan.

This country is bordered by some interesting neighbors. Iran and Afghanistan on the west, Russia and China in the north, and India on the east. At one time or another, the tribes in the region now called Pakistan have fought just about every possible invading group. They have been subjugated to outside invasions and occupations for thousands of years. They have always managed to throw off their captors and have returned to their own brand of feudal/tribal government. When the British, Hindus, and Muslims carved out the boundaries for India, Pakistan, and East Pakistan in 1948, they did nothing to remove the fact that numerous regions wanted their own independence. Many tribes wanted to be their own "nation." The Pathans of Afghanistan and the Pathans of the Northwest Frontier Province have much more in common than with the Punjabs in Punjab Province. The Punjab Province happens to be the home of the central government. The Baluchis in Baluchistan have always maintained a tough tribal area stance, giving the federal government very little attention. Being armed and accustomed to fighting, they make for a dangerous adversary. Inevitably, a political truth and understanding has arisen and is defined by the designations within provinces. Certain regions are called federal areas, federally administered tribal areas, or tribal areas. The three areas define central government power in the provinces: total power, some power, and no power. This political reality and a British-created bureaucracy has created numerous difficulties in tranferring agriculture technology from the research station to the farmer. The farmers of Pakistan, about 52 percent of the population, have endured wars, rumors of wars, droughts, civil unrest, university student clashes, and years of struggle. Because Pakistanis found quick and profitable work in Saudia Arabia during the oil boom, money flowed easily into the country. During all of this, population growth has averaged over 3% and has swollen to over one hundred million. The map below



		Pakistan	USA
1.	Size (HA)	78 million	937 million
2.	Population (million)	100	240
3.	Agriculture Population (million)	55	7.0
4.	Arable Land (HA)	20 million	190 million
5.	Irrigated Area (HA)	15 million	20 million
6.	Arable Land as % of Land Area	26%	20.72%
7.	Agriculture Land per 100 persons (HA)	20	80
8.	Forest (HA)	3 million	265 million
9.	Forest as % Land Area	4%	29%
10.	Pop. Density (People/sq KM)	129	26
11.	GNP per Capita	$380 (US $)	$15,490 (US $)
12.	Cattle Pop. per 100 Persons	16	46
13.	Sheep Pop. per 100 Persons	25	4
14.	#Chickens per 100 Persons	95	440
15.	Literacy Ratio	30%	100%

indicates some of the fruit growing regions visited during this consultancy. The demographic information emphasizes just a few of the problems of that portion of the world.

The Afghan war created a new set of problems and opportunities in Pakistan. The refugees, all four million, brought with them their goats, sheep, cattle, camels and buffaloes. International relief agencies, over eleven in all, have created a well-run, well-oiled machine that hires numerous Pakistanis. The aid has resulted in well-fed camps and the creation of numerous, large Afghan "cities." The refugee population is a large "cottage industry." The final disposition of the Afghan refugee issue is difficult to determine. It's easy to say only that its solution will be painful. Now that the refugees are going home, Pakistan is losing countless millions of dollars in circulated monies that once helped salve numerous economic wounds. The dissolution of the parliament by President Zia ul Haq in May came just shortly after the army depot explosion near Rawalpindi. That explosion launched hundreds of missiles into Islamabad and Rawalpindi with much destruction and loss of life. Politically, Pakistan was ripe for an incident similar to the one that took the President's life and the life our ambassador, Arnold Raphel.

Pakistan and USAID recognize that Pakistan's great agronomic strides in the last twenty years can be traced to two things: 1) a tremendous surge in improved genetic strains created in Pakistan by breeders trained abroad. 2) a strong technical manpower base available in soils and agronomy. As a result, Pakistan is a strong contributor to the world's rice, wheat, and cotton picture. Every research institute at the federal and provincial level is blessed with troops of PhDs addressing agronomic problems.

Over the years, horticulture has taken a back seat in development projects in Pakistan and other third-world countries. There are only five horticulture PhD's in the entire country of Pakistan, a country with a population over one hundred million. Consider that Texas alone has over one hundred Horticulture PhD's! Technology transfer has been slow to the fruit and vegetable production industries. Numerous consultants over the last twenty years have agreed that Pakistan's numerous valley floors, protected from climactic upheavals, and blessed with plentiful water, are strong candidates for high-tonnage fruit and vegetable production. Swat valley, in the North West Frontier Province, is remarkably similar to Yakima Valley, Washington. In spite of agroclimatic advantages, the fruit and vegetable industry has never been able to break away from century-old constraints. For instance, a discouraging marketing system involves "commission men." With a strong hold on buying and selling via tribal unions, they act as an all-powerful middle man. As a result, farmers receive only eleven to twenty-two percent of the final product value, much lower than in developed countries. The grower, with such poor return, has no incentive to improve his craft, further hindering progress. Pest control strategies are nearly always more intense on horticultural crops than agronomic crops. Apples, for instance,

may need up to ten sprays per year in high disease and insec pressure areas. Pesticides are costly, may be out of date, o may be adulterated. Protective gear for applicators is rarel seen and safety-in-handling concepts not appreciated. In spit of numerous problems, the fruit and vegetable industry ha managed to deliver to the consumer a bountiful supply of frui and vegetables. Pakistan's wish to be the "fruit bowl" of th mid-east, an exporter of high-quality fruit and vegetables depends on instituting real changes in quality control an marketing.

There are rays of light in work of this type. In 1982, I wa responsible for the dissemination of about 100 fruit and nu varieties. Trees were planted at three widely separated researc farms. Six years later, several clones have emerged as adapte and superior to local types. A new industry in the Peshawar val has been created around the EarliGrande peach variety, a early-ripening, low-chilling type developed by Texas A & I University. In the NWFP, several hundred acres are approachin commercial production. Other varieties and advanced selection look promising. Pecans have done well, in spite of obvious zin deficiencies in all three test areas. Most of the fruit growin regions in the three provinces harbor loam, clay loam, and sil loam soils and are prone to pH and salinity problems. It' unfortunate that Pakistan has gotten such a late start with th most advanced fruit germplasm.

One special trip to Soan Valley is worth describing becaus it relates to an important aspect of arboretum function: habita preservation. Soan valley is south and east of Islamabad. Th area is over a hundred miles below the true foothills of th Himalayas. The approach involves a brief and gentle climb to th pass which is only slightly above the valley plain at fiv thousand feet. Of the 230,000 acres in the valley, only 56,00 acres are under plough. Forty percent of the cultivated acreag is irrigated via wells or canal. In Soan Valley, frui production is a new industry with less than five hundred acres The forty thousand inhabitants of the valley make their livin primarily through agriculture. Like the rest of Pakistan grazing patterns and rules that have been developed ove centuries are now breaking down under excessive pressures. Wit a growing human population, with increased goat, buffalo, camel sheep, and cattle numbers, and with four million Afgha "guests", the environment has been picked clean. The societ finds itself with too many people on too little land, much of i dry and desolate. Because eighty percent of the populatio relies on firewood for cooking and heat, the forests have take a heavy beating. Grazing pressure and human needs make shor work of reforestation efforts. Soan Valley is no exception. Fo thousands of years, the area has relied on Persian wheels t draw water from sixty to ninety feet below the surface. A came or buffalo provides the power to deliver about ten to twent gallons per minute. With less than twenty inches of rain pe year, most of which falls in just a few months, the people hav evolved rather elaborate, energy-efficient water distributio systems.

An interesting example of an irrigation project is in the gardens of two Forestry Rest Houses. Lord Whitborn, a British engineer, was responsible for the Valley around the turn of the century. He laid down metal track roads into side valleys, constructed canals, administered civil regulations, and left behind a horticultural legacy still evident in the region today. His interest in fruits, vegetables, and ornamental plants spilled over into neighboring villages. The garden and rest house at Kanahatti carries with it an interesting history.

Lord Whitborn, it seems, had a horticultural bent that included plant testing. He introduced numerous fruit varieties to the area. The gardens that surround Kanahatti contain a diverse collection of fruit types that includes apples, pomegranates, walnuts, mangoes, oranges, avocados, peaches, plums, apricots, almonds, and others. Old arborvitaes tower here and there in the two hundred acres irrigated via spring flow. I learned that Malik Nazir Mohammed, the fruit specialist in the Valley and my guide and friend, had just received the responsibility for the garden. He was to bring it back to its former glory. New fruit varieties have been planted, neglected field plots cleaned up, and Lord Whitborn's irrigation system brought back from disrepair. Malik said, "Would you like to see the mouth of this stream?" I said, "You bet, I never miss an opportunity to check out a spring." The mouth of the spring is a single source that pours from a hole in the base of a cliff. The springhead is five hundred feet above and three miles from the rest house and gardens. The stream cascades through narrow ravines and meanders across two small upland flats before fanning out at the gardens. Lord Whitborn's workers essentially carved out a small canal that rode the edges of the ravines down to the valley below. In some sections the canal was split into separate streams using concrete aqueducts in rocky and precarious sections. In the valley, the canal was split and resplit to distribute water to many acres. Easily shored up with stone and mortar the canal is simple and carries a great deal of water; the day I was there, I estimated its flow at over one thousand gallons per minute. As Malik and I made our way up the stream we had to cross every now and then when the gorge narrowed. He explained that in the 1950's the rest house and garden were taken over by Mohammed Khan, a locally famous bandit-assasain. Mohammed Khan couldn't have chosen a better place to house his activities and his private army. The only way into the valley is via a single pass. A five-hundred foot, steep-sided, rocky outcropping which faces the pass served as the lookout tower. The single rocky trail that makes its way down to the gardens is overlooked on both sides by easily-defended mountainous slopes. It seems that Mohammed Khan made his living removing enemies of political personalities. A career like this demanded a high level of security and protection and, of course, over the years he created many political enemies of his own. He operated for years and became somewhat of a local legend, remembered fondly by many poor landowners in the area. In 1981, all of this came to an end. At that time, his fame and personality well-known and an

embarrassed federal government had been unable to extract him from the sanctuary. Mohammad Khan was finally lured to Rawalpindi by the kidnappers of his daughter and it was there that he was captured and put behind bars. Malik was quite glad to have the new responsibility and challenge. He grumbled that the bandit had "let the garden go to hell."

About halfway up the stream, an adobe/rock grist mill was centered on slight ten-foot drop. Two local farmers, their two burros loaded with sacks of grain, were using the grinding stone the day I visited. Other than the two surprised farmers, the trail and canyon showed little sign of human activity. Golden rain trees were in bloom and wild oleanders scattered their pink blooms up and down both sides of the stream. The plant community around this special place must have been magnificent just thirty or forty years ago. I could understand why Lord Whitborn chose the place. In the main sitting room of the rest house, there was a large yellowed parchment on the wall that carried the message of this garden's creator so many years ago. I took the time to write it down:

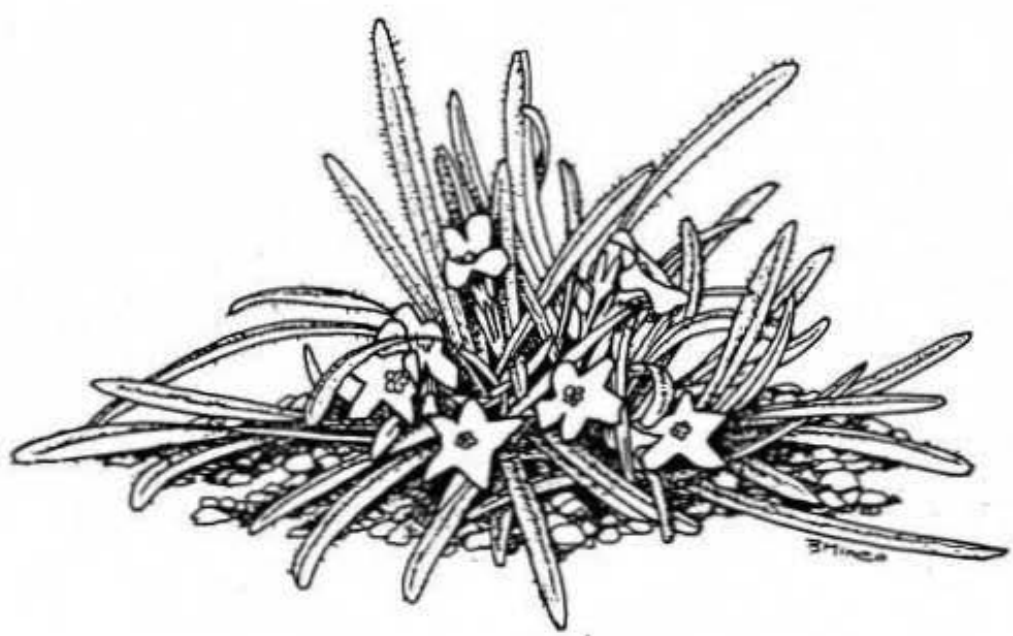
> Why destroy forests? The forests are going under axe. Millions of trees are perishing. The houses of wild animals and birds are being laid waste. The rivers dwindling and drying up. Wonderful scenery is disappearing never to return and all because lazy man has not the sense to stoop down and pick up the fuel from the ground. One must be an unreflecting savage to burn this beauty in ones stove, to destroy what we cannot create. Man is endowed with reason and creative force to increase what has been given him. But hitherto he has not created but destroyed. There are fewer and fewer forests, the rivers are drying up, the wild creatures are becoming extinct. The climate is ruined and every day the earth is growing poorer and more hideous.
>
> When I walk by peasant's woods which I have saved from cutting down, or when I hear the rustling of the young crops planted by my own hands, I realize that the climate is to some extent in my power, and that if in a thousand years man is to be happy I too shall have some small hand in it. When I plant a tree and see it growing green and swaying in the wind my soul is filled with pride.

Lord Whitborn would not like what he would see today. Wildlife is virtually gone. The few forest remnants that remain today are heavily exploited. Forest guards patrol stands in a futile effort to stem tree robberies. In spite of stiff tree protection laws on public and private lands, the percentage forest cover loss per year is substantial. Much of the reason for the thousands of acres of fruit trees is due to reforestation schemes. Fruit tree give-away programs to farmers were successful in the sense that most of the trees were

planted and given some degree of care and culture. Pine and hardwood seedlings often ended up as kindling because the farmer saw them as a threat to the way he made a living. Reforestation efforts through various international agencies have been stymied by lack of local support and the reality of the fact that the people must have wood to survive.

In Abotobad, I was fortunate enough to have a meeting with Dr. Maxine Thompson, President of the International Board for Plant Germplasm Resources. She was in the midst of a six month germplasm search with particular emphasis on fruits and nuts. We spent an hour comparing botanical notes and she agreed that her project was about twenty years too late. One of the few Corylus trees she spied was impossible to get to. Across a stream and gorge, the tree lay on a small ledge with sheer cliff above and below. The tree had chanced into a goat-proof location. Filbert stands used to run in a wide swath through the Himalayan mountain range. Other fruit and nut species can trace their ancestrage through the range. Most pome and stone fruits have evolved from Asian origins. In the face of increased human pressure, fruit and nut species were often favored and protected over other less-useful species. As a result, there remains to this day a bountiful germplasm base available for screening. For instance, Persian walnuts, Juglans regia, dominate the roadways, field edges, and garden plantings in many mountain valleys. Because they are all seedlings, the germplasm base is healthy and is bound to have a treasure trove of high quality genetics. The same could be said for apricots, loquat, jujube, and guava. Whether or not this material will ever be screened by Pakistan or outside horticulturists remains to be seen.

While many argue that in the U.S., we have become "environmental fanatics" or that we are just a little "woodpecker crazy", it's my opinion that we're on the right track when we bend to protect a plant or animal from extinction. A ravaged homeland is never a pleasant sight.



EAST COAST GARDEN TRIP

A highlight of this summer's work was a two-week tour of east coast public and private arboretums, botanical gardens, and parks. Funded by a faculty development grant, the objective of this two-week study tour was to acquaint myself with the operations, funding, inventory and record keeping components of arboretums and botanical gardens. I had a particular interest in focusing on "new" university gardens, those that were in the planning stage or just a few years old. The study tour started at Arnold Arboretum, Harvard University, in Boston and ended at Woodlanders Nursery, Aiken, South Carolina.

Arnold Arboretum allowed Sandi Elsik, a records verification officer, to guide us around the arboretum and other Massachusetts gardens for three busy days. Arnold Arboretum, Arborway, Jamaica Plain (Telephone: 617-524-1717) is part of the "Emerald Necklace", a greenbelt that winds its way nine miles into the heart of Boston. Sandi described Arnold as a "jewel in the necklace". The arboretum is one of the oldest and most important centers for worldwide plant research. The two-hundred and sixty-five acres are occupied by over 6000 species. With a heavy emphasis on trees and shrubs, the gardens are home to many old, mature specimens. A part of my visit involved consultations with department officers. Gary Koller is chief horticulturist, Peter Tredici is assistant horticulturist, and Jack Alexander is in charge of a busy propagation program. Dave Michener acts as a Research Taxonomist and Curatorial Administrator. While staffing looked good on paper, I was surprised to learn that of 65 staff, only fourteen grounds personnel were involved. Only six to eight of these were actually assigned to the living collection. The rest were associated with propagation and nursery matters. With over 30 acres per worker, it's easy to see why problems arise. Over one hundreed "volunteers" contribute their time weeding, acting as tour guides, and assisting in certain project areas. Some of the tree specimens that impressed me the most were the oldest Dawn Redwoods in the country, beautifully shaped Stewartias, some truly giant Parrotias, massive oaks and an extensive collection of mature conifers.

A good portion of my time was spent studying Arnold's inventory and mapping strategy. A new computer software program, Revelation, is being used as the foundation. Kerry Walter, the developer of the software and a consultant to Arnold, provided me with an excellent walk-through of the system. Because thousands of species have been handled over the past hundred years, there are numerous records. The moment a plant enters the arboretum (propagation and nursery department), it is given an accession number that lasts forever. Propagation and nursery production data, living collection observations, flowering characteristics, and other parameters are recorded for years. Rows of old wooden file cabinets are packed with aging note cards. A large grant is being used to put all of this data on file to allow its manipulation and recall in numerous and useful ways. By tying

the inventory records with Auto-Cad, a mapping program, plant follow-up and exact location is simplified.

Smith College Botanical Garden and Lyman Plant House in Northampton, Massachusetts, was an interesting stop (Telephone: 413-584-2700). This small college of three thousand students has a new arboretum effort under the direction of Richard Munsin. I was eager to visit the two-acre botanical garden and campus-wide, three-hundred-acre tree arboretum because it mimics what the SFA Arboretum is attempting to do. With a beautifully landscaped garden packed with flowering annuals, herbaceous perennials, and sub-shrubs, the Smith College garden acts as a local attraction and educational display of over thirty-five hundred species. A diverse and majestic collection of trees across campus is labelled with aesthetic metal plates. The arboretum sponsors numerous educational programs and maintains an active research component.

A must stop in Massachusetts is Garden-in-the-Woods, Hemenway Road, near Framingham, Massachusetts (Telephone: 617-237-4924). The garden is open April through November, Monday through Saturday and the entrance fee is four dollars for adults, three dollars for children. David Giblin, Horticulturist, provided us with a delightful tour. The garden is a remarkable collection in a pristine and rolling forest with a primary focus on herbaceous perennials that love shade. Twenty-three acres are home to thousands of small woodland plants, labelled quietly along the trails and loops. Water is never far away and wet areas are intelligently protected and displayed. Bill Brumbach, chief propagator, seems guilty of never having met a plant he didn't like and his propagation benches and outside nursery yard was brimming over with new and interesting plants. David Longland, Garden Director, is responsible for the fifteen to twenty thousand visitors per year and I learned that the garden acts as the headquarters of the New England Wildflower Society. This old and quite active group supports this garden and many other "nature conservancy" projects. I was impressed that only three people were involved in maintenance. David explained that because the garden is heavily to partly shaded, weed control is a less threatening prospect. Trails are designed for ease of maintenance. Erosive areas are gravelled and some trails are carpeted with wood chips and bark. Most of the trails need no barking because the soil is well-drained and non-erosive. Cut-off telephone poles, laid sideways, provided sturdy, aesthetic "steps" on the steeper slopes. The general plant acquisition policy at the garden is to test almost any potential woodland plant in a trial bed. It's disposition, invasiveness, and aesthetic value is evaluated before it is ever placed in the garden grounds.

The Boston Public Garden on Arlington and Beacon Streets is the first botanical garden in the United States and dates back to 1838 (Telephone: 617-323-2700). It is open daily to the public and is a green paradise across from the Boston Common. The garden includes a lagoon complete with swan boat rides. Plant materials are chosen for garden excellence and lively, colorful annual beds are everywhere.

The Isabella Stewart Gardner Museum, 280 Fenway and Worthington Street, is home to a treasure trove of old art and a magnificent open inner court that displays several rare plants. Outside the museum, along formal brick pathways, are rock gardens and outstanding statuary. The garden is open May through October and has variable opening and closing times so call ahead (Telephone: 617-566-1411).

The Fenway Victory gardens are part of the "Emerald Necklace." In a heavily populated section, the gardens consist of small plots given by the city to nearby residents. Literally hundreds of country-loving, apartment and brown stone dwellers have been given an opportunity to grow gardens. Separated by a wide array of fences, planted to ornamentals and vegetables, embellished with the owner's personality, the Victory gardens are a cornucopia of gardening thought.

Tower Hill Botanical Garden, near Framingham, is in the planning stages. The Worchester County Horticultural Society is one of the oldest in the country, boasts a prosperous membership of fifteen hundred and supports numerous projects. An old building, owned by the Society, was sold and the 130-acre site was purchased for $650,000. The hilltop acquisiton was once an old farm and came complete with a very old Victorian home, barns and outbuildings. The site is blessed with excellent vistas, pine forests, rocky outcroppings and plenty of open land. I was amazed to learn that the master plan for this garden's development was just now in place, two and a half years after starting on the road to its creation. Rather impressive amounts of money had been used to create topographic maps, site characterization maps, botanical inventory maps, etc. Legal requirements in Massachusetts are harsh if wetlands are involved. Electricity, sewage, and water constraints are awesome. Plant acquisition, record keeping, and development costs were expected to run the cost of this project to over two million dollars. I couldn't help but be humbled by the fact that while all of the acreage has yet to be planted, two specimen trees, a Stewartia and an Umbrella pine, each about twenty feet tall, had been purchased for $5,000 and planted near the house. The Director, David Kerry, provided me with master plan reports, copies of legal documents, society policies, and financial details. He led us through several newly created trail loops that ran in the pine forest and provided me with plenty of insight into arboretum development problems.

After leaving the Boston area, we headed south and in four hours took in the Connecticut Arboretum, Connecticut College, in New London (Telephone: 203-447-1911). This 415-acre woodland of the 680-acre campus includes native plant communities for research. A new conifer collection and numerous woody specimens are set along miles of lakeside trails. Old stonework, bridges, benches, and garden projects here and there make the garden worth visiting.

In New York, three gardens were visited. Wave Hill Center for Environmental Studies, 675 West 252nd Street, Bronx, New York City (Telephone: 212-549-2055), offers twenty-eight acres

of wildflowers; rose, herb, and acquatic gardens; and nature trails.

The New York Botanical Garden, Bronx Park, 1 East 200th Street, Bronx, New York City, is an old and popular park. Shrubs, trees, and plants from all over the world are scattered across the 230-acre park. Asphalt trails guide hundreds of thousands of visitors per year through well-labelled plant materials. Beautifully landscaped, embellished by old buildings, a restaurant, and comfortable surroundings, the garden leaves a lasting impression. The 3.5-acre rock garden is not to be missed. Other items of interest include a hemlock forest, a large rose garden, aquatic gardens, and an extensive collection of herbs. The conservatory alone is worth the visit.

The Brooklyn Botanic Garden, 1000 Washington Avenue, is a 50-acre green island in the heart of Brooklyn. The garden features roses, fragrant plants for the blind, a rock garden, an Iris garden, a collection of Magnolias, and an herb garden. There are three Japanese gardens to enjoy. A conservatory and bonsai collection are impressive. The grounds are free but a fee is placed on the conservatory and Japanese gardens. Open and close times vary call ahead, (Telephone: 212-622-4433).

Two days were set aside for the U.S. National Arboretum, 3501 New York Avenue, Northeast, Washington, D,C., (Telephone: 202-475-4815). Skip March, Horticulturist, acquainted me with the overall strategy of the arboretum and the problems encountered. Established in 1927, the 415 acres display excellent collections in naturalized settings. The Gotelli dwarf conifer collection is one of the best in the world. The Camellia collection, the Morrison Azalea Garden, the Lee azalea garden, and the bonsai collection are additional highlights. An "Asian Valley", under the care of Barry Yinger, is undergoing an extensive expansion. I was amazed at the amount of bark compost being used to secure azaleas on some rather steep slopes. I spent some time with the new curator of the herb garden and was impressed by her labor of love. After securing cutting permits, we spent several hours working over the Viburnum species. Many Viburnums perform well in Nacogdoches, are excellent landscape plants, and root quite easily in the propagation bed. Over thirty taxa were collected.

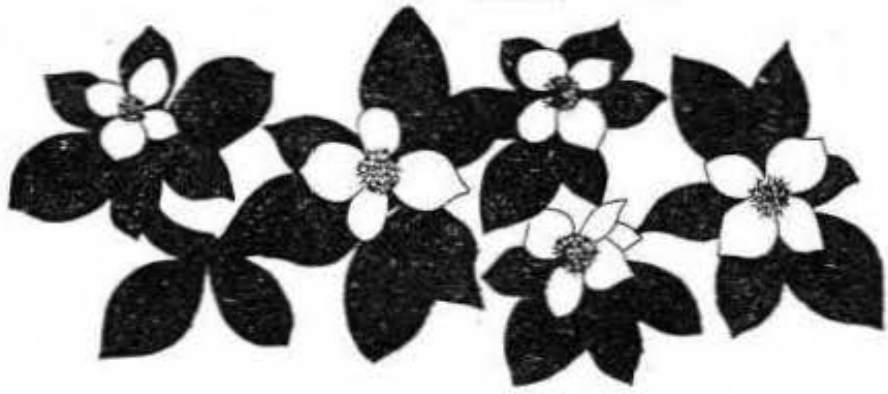
Three days in North Carolina went by too quick. Coker Arboretum, University of North Carolina at Chapel Hill Campus, and North Carolina Botanical Garden, Laurel Hill Road were visited. Both are located in Chapel Hill, North Carolina (919-967-2246). Combined, the gardens offer 329 acres of native plants and endangered species displayed in their natural habitat. The Botanical Garden is currently managing several plant outreach sanctuaries, works mightily to preserve rare and endangered species, and has made a mission of preserving unusual habitats.

The Sarah P. Duke Memorial Gardens, Durham, North Carolina, is at the West entrance of the Duke University campus and is a 55-acre display of annuals, perennials, flowering trees and shrubs. Natural and formal areas in the forest are travelled by taking numerous trail loops, (Telephone: 919-684-3698).

The North Carolina State University Arboretum, Beryl Road, Raleigh, North Carolina, (Telephone: 919-737-3133), is the creation of Dr. J.C. Raulston. On only eight acres, five thousand taxa are being evaluated for their adaptive abilities. A three-hundred foot perennial border is a main highlight. The Shade house is home to many species that might not be considered hardy to North Carolina. Excellent collections of Nandina, Mahonia, Cercis, Magnolia, and others are displayed in a pleasing landscape. Small theme gardens create interesting landscapes in courtyard-like settings. The technician in charge, Newell Hancock, does a wonderful job keeping the eight acres of grounds weed free and in good health. J.C. sees the garden as a nursery industry resource and has channeled numerous unknown but promising plants into the trade. The garden is ten years old and was begun mostly by planting small container plants. Heavy bark mulching and intelligent gardening philosophy has made this shoe-string budget operation a great success. Supported primarily by outside funds, the garden has generated great interest in North Carolina. I spent a humid morning filling up a cooler with cuttings for our collection.

The last stop on my trip was saved for Camellia Forest Nursery, 125 Carolina Forest Road, Chapel Hill, North Carolina 27514, (Telephone: 919-967-5529). Under the shade of a peaceful pine forest, Kai Mei Parks led us through a collection of rare and uncommon trees and shrubs. Her husband, Clifford Parks, is a botanist at the University, Chapel Hill. Small by industry standards, the nursery specializes in mail-order and offers reasonably priced, small container plants. I couldn't pass up the opportunity and ended up carting away a small car load of trees and shrubs (see plant acquisition list). Of course, by this time, we had already decided that we had passed the point of no return. With so many plants, the luggage had to make it home by bus.

The trip was certainly a horticultural eye-opener. East coast gardening philosophy is quite different than that in the south. Herbaceous perennials are "hot" landscape items. Great sums of money are spent in developing gardens. Botanical gardens, arboretums, and public parks are common at universities and are often supported by a combination of state and outside monies. As a group, Arboretum Directors often complain of too much work, too little time, too few people, and not enough money, and the fact that they aren't appreciated. Plant diversity, habitat preservation, and environmental protection are big issues. I learned that arboretum workers, as a group, tend to be dedicated plant lovers, hard workers, and eager to share their enthusiasm with anyone of the same persuasion.



NATIVE PLANT SOCIETY OF TEXAS

The Native Plant Society of Texas held its annual meeting October 14-16, 1988 at San Antonio, Texas with over two hundred registrants. This year, the convention focused on preservation and conservation of Texas species. The ressurection of *Styrax texana* from the brink of extinction, the battle to save South Padre Island, and other conservancy projects were outlined. Dr. Linda McMahan, Director of the Nature Conservancy, Boston, Massachusetts, was the keynote speaker and she described the many projects underway at this time. With eighteen botanical gardens acting as "reintroduction" sites, many rare and endangered plants are being carefully encouraged to increase in arboretums and in satellite preserves.

While in San Antonio, the Horticulture Club visited the San Antonio Botanical Garden, the Sunken Garden, the Japanese Garden, and the San Antonio Zoo. All are must stops for plant enthusiasts when in the San Antonio area. The Botanical Garden has just completed a 6.5 million dollar conservatory that may be the best in the South. Just looking at that monstrosity and thinking about the budget involved made our own financial problems seem ironic in comparison. Paul Cox, a former SFA Horticulture major, Class of 1977, directs much of the native plants effort and led my students and I on a seed and cutting collection that added numerous new plants to our inventory. Paul's good humor, obvious love of plants, and his easy generousity are much appreciated.

Because NPSOT officers are aware of the promise of our very own SFA Arboretum and because east Texas harbors so many unique plant types, I was enlisted as a Vice-President for the Society. Hopefully, our university forum, the Arboretum's growth, and a cadre of eager student workers, can add a positive element to this group's focus. I have attached a brochure that describes the NPSOT mission. Those of you who want to learn more about utilizing native plants in landscapes and understand the issues behind plant conservation, and just *cannot* pass up a good cause, might think about joining this association.

BOOK REVIEWS

The Traveler's Guide to American Gardens, Revised 1988 edition, edited by Mary Helen Ray and Robert P. Nicholls, The University of North Carolina Press, Chapel Hill, North Carolina, is an excellent state-by-state listing and description of top public and private gardens. While I don't necessarily agree with their zero, one star, and two star rating system, the details of garden emphasis, fees, open/close times, addresses, and phone numbers are very useful. I found it interesting that there were only 15 gardens listed under Texas and that most states had two or three times that number. With over one thousand garden entries and a focus on old, historical gardens, the guide should be a useful companion to garden

Christopher Lloyd's, The Adventurous Gardener, was published in 1985 by Vintage Books, a Division of Random House, New York. Christopher Lloyd has a delightful writing style, vividly describes landscaping thought, philosophy, and plant selection. He maintains that the greatest gardening pleasures are gained when one takes new directions with plants. Being risky, trying something absolutely new, and not being afraid of a design mistake allows for a lifetime of pleasant surprises. Lloyd's preface to the book ends with the following:

> "Gardening is endlessly fascinating and diverse. Those of us who are irretrievably committed are immensely lucky. I am an enthusiast and I do believe that, numerous as the world's band of gardeners is, there should be more of us. Not just routine but mad, keen gardeners. Many lack the opportunity but with others it's only a matter of finding the right person to start them off; someone prepared to communicate and share. This book is an attempt at sharing."

The Education of a Gardener, Russell Page, reprinted in 1985 by Vintage Books is by one of the world's great gardeners. He has international landscaping experience and in this book, he shares a treasure chest of gardening memories. He walks the reader through vivid descriptions of town gardens in Switzerland, France, and Italy; he gives his opinion freely on numerous trees, shrubs, and flowering plants; he outlines his ideas about style, composition, and design. Any gardener wishing to intensify his understanding of the craft would find this book interesting and useful reading.

Successful Perennial Gardening, by Lewis and Nancy Hill, is A Garden Way Publishing Book, Storey Communications, Pownal, Vermont. This easy-to-use two hundred page guide book is an excellent start into the wonderful world of perennials. While adaptation information is lacking somewhat, numerous species are described alphabetically.

ANNOUNCEMENTS

Project areas to keep an eye on this fall include the Mexico section, soon to recieve a new transfusion of plant materials and a general facelifting.. The bog area will be enjoying the company of new plants to that area. A project to create a few more garden bench settings is in the planning stages.

The Men's Garden Club extends an invitation to their fall meetings. Held in the Agriculture Building, the second Thursday of each month at 7:00 p.m., various garden programs are presented in an informal coffee-and-donut setting. On November 13, 1988 we will have a bulb expert sharing his knowledge; come and get acquainted.

GARDEN QUOTES

A garden is a lovesome thing, God wot!
Rose plot
Fringed pool
Fern'd grot
The veriest school
Of peace; and yet the fool
Contends that God is not
Not God! in gardens! when the eve is cool?

Nay, but I have a sign;
'Tis ver sure God walks in mine.

Thomas Brown
My Garden

"It takes a minimum of 50 years to create a garden and, if possible, one should allow 200 years".

Introduction to Successful Perennial Gardening, Lewis and Nancy Hill

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"Gardening in England seems like a slow process of wooing growing things into giving their best. There is no finality and there would be no satisfaction if there were."

Russell Page, The Education of a Gardener

FRIENDS OF THE SFA ARBORETUM MEMBERSHIP RENEWAL

The Arboretum continues to operate on outside support, hard work, and enthusiastic students and volunteers. Those of you who have not renewed your membership in a year or so are encouraged to help us with our mission. I have attached an SFA Arboretum brochure and mailer for your convenience. Pass the brochure on to a friend!

PLANTS ACQUIRED MARCH, 1988 to AUGUST, 1988

65- 88 Hemerocallis X Hesperus 1950 (Barnhart)
66- 88 Hemerocallis X Painted Lady 1957 (Barnhart)
67- 88 Hemerocallis X Revolute 1953 (Barnhart)
68- 88 Hemerocallis X Mov? 1954 (Barnhart)
69- 88 Hemerocallis X Dauntless 1955 (Barnhart)
70- 88 Hemerocallis X Naranja 1956 (Barnhart)
71- 88 Hemerocallis X Ruffled Pinfore 1957 (Barnhart)
72- 88 Hemerocallis X High Noon 1958 (Barnhart)
73- 88 Hemerocallis X Salmon Sheen 1959 (Barnhart)
74- 88 Hemerocallis X Fiary Wings 1960 (Barnhart)
75- 88 Hemerocallis X Playboy 1961 (Barnhart)
76- 88 Hemerocallis X Bess Ross 1962 (Barnhart)
77- 88 Hemerocallis X Multnomah 1963 (Barnhart)
78- 88 Hemerocallis X Frances Fay 1964 (Barnhart)
79- 88 Hemerocallis X Luxury Lace 1965 (Barnhart)
80- 88 Hemerocallis X Cart Wheels 1966 (Barnhart)
81- 88 Hemerocallis X Full Reward 1967 (Barnhart)
82- 88 Hemerocallis X Satin Glass 1968 (Barnhart)
83- 88 Hemerocallis X Ava Marie 1970 (Barnhart)
84- 88 Hemerocallis X Renee 1971 (Barnhart)
85- 88 Hemerocallis X Hortensia 1972 (Barnhart)
86- 88 Hemerocallis X Lavender Flight 1973 (Barnhart)
87- 88 Hemerocallis X Winning Ways 1974 (Barnhart)
88- 88 Hemerocallis X Clarence Simon 1975 (Barnhart)
89- 88 Hemerocallis X Green Flutter 1976 (Barnhart)
90- 88 Hemerocallis X Green Glitter 1977 (Barnhart)
91- 88 Hemerocallis X Mary Todd 1978 (Barnhart)
92- 88 Hemerocallis X Birtie Ferris 1979 (Barnhart)
93- 88 Hemerocallis X Ed Murray 1981 (Barnhart)
94- 88 Hemerocallis X ? 1982 (Barnhart)
95- 88 Hemerocallis X Potentate 1983 (Barnhart)
96- 88 Hemerocallis X ? 1984 (Barnhart)
97- 88 Ilex vomitoria 'Little leaf' (Fleming)
98- 88 Sapindus drummondi (Mexico) (Fleming)
99- 88 Quercus olitodos (Fleming)

100- 88 Carya mexicana (Fleming)
101- 88 Coursetia axillaris (Fleming)
102- 88 Liatris ? (Fleming)
103- 88 Pieris filiferiolis (Fleming)
104- 88 Clethra alnifolia (Fleming)
105- 88 Quercus fusiformis 'Seabrook' (Fleming)
106- 88 Quercus sartorii (Fleming)
107- 88 Viola ? (Full sun) (Fleming)
108- 88 Nyssa ogeche (Fleming)
109- 88 Ungnadia speciosa (Fleming)
110- 88 Tylopterois ? (Fleming)
111- 88 Hibiscus brazilliensis (Fleming)
112- 88 Buddleia lindleyana (Anderson)
113- 88 Christmas Fern (Doremus)
114- 88 Ardisia japonica 'variegatus' (Doremus)
115- 88 Ardisia japonica (Doremus)
116- 88 Hypericum ? (Doremus)
117- 88 Acer palmatum 'Atrolinear' (Del's)
118- 88 Acer palmatum 'Oshio benji' (Del's)
119- 88 Acer palmatum 'Uneu Homanu' (Del's)
120- 88 Acer palmatum 'Samadore' (Del's)
121- 88 Acer palmatum 'Katsura' (Del's)
122- 88 Acer palmatum 'Villa taranto' (Del's)
123- 88 Acer palmatum 'Garyn' (Del's)
124- 88 Acer palmatum 'Sherwood Flame' (Del's)
125- 88 Acer palmatum 'Scolo rubra' (Del's)
126- 88 Acer palmatum 'Oto Itime' (Del's)
127- 88 Acer palmatum 'Kateezo' (Del's)
128- 88 Acer palmatum 'Ukegumo' (Del's)
129- 88 Acer palmatum 'The Bishop' (Del's)
130- 88 Acer palmatum 'Kurubeyama' (Del's)
131- 88 Acer palmatum 'Shikageori Nishiki' (Del's)
132- 88 Acer palmatum 'Shishio Nimo' (Del's)
133- 88 Acer palmatum 'Coomana Pygmy' (Del's)
134- 88 Acer palmatum 'Mure Libari' (Del's)
135- 88 Acer palmatum 'Sanguinum' (Del's)
136- 88 Acer palmatum 'Whitney Red' (Del's)
137- 88 Acer palmatum 'Beni Grasa' (Del's)
138- 88 Acer palmatum 'Momenshide' (Del's)
139- 88 Acer palmatum 'Sekk yats' (Del's)
140- 88 Acer palmatum 'Tijima sunago' (Del's)
141- 88 Acer palmatum 'Margerate B' (Del's)
142- 88 Acer palmatum 'Murasaki Kiyohime' (Del's)
143- 88 Acer palmatum 'Yezo Nishiki' (Del's)
144- 88 Acer palmatum 'Schichihenge' (Del's)
145- 88 Acer palmatum 'Tewiy No Hosai' (Del's)
146- 88 Acer palmatum 'Yura nime' (Del's)
147- 88 Acer palmatum 'Ukon' (Del's)
148- 88 Acer palmatum 'Shigura Bato' (Del's)
149- 88 Acer palmatum 'Chitoseyama' (Del's)
150- 88 Acer palmatum 'Palmatifolium shir.' (Del's)
151- 88 Acer palmatum 'Tsukabane' (Del's)
152- 88 Acer palmatum 'Japanese sunrise' (Del's)
153- 88 Acer palmatum 'Koto no Ito' (Del's)
154- 88 Acer palmatum 'Hurasame' (Del's)
155- 88 Acer palmatum 'Takinagawa' (Del's)
156- 88 Acer palmatum 'Oshu Shidone' (Del's)
157- 88 Acer palmatum 'Pixie' (Del's)
158- 88 Acer palmatum 'Deshojo' (Del's)
159- 88 Acer palmatum 'Microphyllum' (Del's)
160- 88 Acer palmatum 'Atropurpurea var.' (Del's)
161- 88 Acer palmatum 'Itome Nishiki' (Del's)
162- 88 Acer palmatum 'Filigree' (Del's)
163- 88 Acer palmatum 'Ruby Lace' (Del's)
164- 88 Acer palmatum 'Pendula julian' (Del's)
165- 88 Acer palmatum 'Green cascade' (Del's)
166- 88 Acer palmatum 'Tamukeyama' (Del's)
167- 88 Acer palmatum 'Waterfall' (Del's)
168- 88 Acer palmatum 'Shoju shidone' (Del's)
169- 88 Philadelphus 'Minnesota Snowflake'
170- 88 Philadelphus 'coronarius'
171- 88 Philadelphus X 'Virginalis'
172- 88 Gordonia lasianthus (Fleming)
173- 88 Clinopodium ? (Fleming)
174- 88 Clethra aluifolia 'Rosea' (Doremus)
175- 88 Cudrania tricuspidata (Camfor)
176- 88 Hovenia acerba (Camfor)
177- 88 Deutsia urenata (Camfor)
178- 88 Thuja dolobrata (Camfor)
179- 88 Illicium hernyi (Camfor)
180- 88 Fourthiaea villosa (Camfor)
181- 88 Thuja occidentalis 'Sunkist' (Camfor)
182- 88 Lindera reflexa (Camfor)
183- 88 Lindera chienii (Camfor)
184- 88 Cryptomeria japonica 'knaptonensis' (Camfor)
185- 88 Cedrus deodora 'Kashmiri' (Camfor)
186- 88 Lindera erythocarpum (Camfor)
187- 88 Cryptomeria japonica 'Fortunei' (Camfor)
188- 88 Cryptomeria japonica 'Elegans nana' (Camfor)
189- 88 Juniperus virginiana 'Grey Owl' (Camfor)
190- 88 Cedrus deodora 'Cream Puff' (Camfor)
191- 88 Mangolia salicifolia (Camfor)
192- 88 Thuja plicata 'Stoneham Gold' (Camfor)
193- 88 Pterostyra corymbosa (Camfor)
194- 88 Daphniphyllum macropodum (Camfor)
195- 88 Weigela Floribunda (Camfor)
196- 88 Cryptomeria japonica 'Gyokruga' (Camfor)
197- 88 Callicarpa japonica 'luxurians' (Camfor)

198- 88 Evodia daniellii (Camfor)
199- 88 Cinnamomum japonicum (Camfor)
200- 88 Cinamonum camphora (Camfor)
201- 88 Manglietia fordiana (Camfor)
202- 88 Cryptomeria japonica 'Ben Franklin' (Camfor)
203- 88 Thuja occidentalis 'Tiny Tim' (Camfor)
204- 88 Chaenomeles X 'Hollandia' (Camfor)
205- 88 Callicarpa mollis (Camfor)
206- 88 Mallotus apelta (Camfor)
207- 88 Thuja plicata 'Canadian Gold' (Camfor)
208- 88 Lindera aggregata (Camfor)
209- 88 Thuja occedentalis 'Emerald' (Camfor)
210- 88 Thuja plicata 'pygmaea' (Camfor)
211- 88 Phoebe chekiangensis (Camfor)
212- 88 Phellodendron chinensis (Camfor)
213- 88 Cupressus horizon aurea smertiana aurea (NCSU)
214- 88 Cupressus macrocarpa 'golden pillar' (NCSU)
215- 88 Prunus mume (NCSU)
216- 88 Ilex dimorphylla Ilcornuta (NCSU)
217- 88 Fokienia hodginsii (Arnold Arb)
218- 88 Gordonia lasianthus (Loos)
219- 88 Magnolia virginiana (50) (Loos)
220- 88 Magnolia grandiflora (50) (SFA)
221- 88 Ungnadia speciosa (Fleming)
222- 88 Nyssa ogeche (z) (Fleming)
223- 88 Ilex mexicana (Fleming)