

ACADEMIC ARBORICULTURE AT NORTH CAROLINA STATE UNIVERSITY¹

by Ted Bilderback

Arboriculture has a history of 3000 years as pointed out by Chadwick in an article entitled *Arboriculture — Past, Present and Future* (3). The need for training in arboriculture has long been recognized. Dr. George Stone in the late 1800's taught a university course about the subject (4) and John Davey was an early leader in training people interested in tree care (1). Recently attention has focused on arboriculture in university and college curricula. John Andresen's survey indicated that at least 52 North American universities teach such courses (2). Ohio State, the University of Massachusetts and the State University of New York at Farmingdale have outlined their programs in the *Journal of Arboriculture* (4, 5, 6). Mr. Robert Felix of the National Arborist Association suggested that an ideal curriculum would include diagnosis of plant disorders, plant pathology, entomology, soils, botany, plant identification, business, technical writing, equipment use courses and arboriculture (5). The one area which might be a weak point in higher education is the use of equipment. Climbing techniques and equipment use can be provided in instruction of arboriculture, nursery or landscape maintenance courses. Also many universities have developed internships in cooperation with industry personnel to provide much of the experience required to become a proficient arborist or nurseryman.

The responsibility of an arboriculture instructor is to bring all of these topics into an arboriculture course. At N.C. State University, arboriculture has been designed to develop skills in all aspects of tree care and woody plant maintenance and to provide knowledge about why specific techniques are used. Two lectures and 4 labs are currently taught to accommodate 75 students.

Development of skills begins with learning how to tie 15 knots which are useful in climbing, tree removal, moving heavy objects, storing rope, joining ropes together, or just to get a coke up the

tree for refreshment.

Rainy day instruction includes an exercise designed to acquaint students with the large body of information available on maintenance and tree care if they just know how to locate it. Sources include trade magazines, scientific journals, extension publications, books, supply catalogs, equipment specification sheets. They are asked to record subscription addresses, summarize several articles, locate information with indexes and fill out a purchase order for a large order of supplies and equipment. This exercise gives students an idea of the cost of equipment used in class. Few students enjoy this laboratory at first but graduates say it's very useful information. Another rainy day class coincides with what professionals do on rainy days; maintenance and sharpening chains, hand saws, loppers and pruning shears.

Tree and landscape appraisal is taught using the guide developed by the Council of Tree and Landscape Appraisers. Students are assigned several plants to establish replacement values for and also trees beyond replaceable size are assigned to provide experience with large trees.

Chain saw maintenance and operation is taught to provide experience in basic maintenance of saws, chain sharpening with files or a grinder and safe use of a saw. The students work with chain saws on the ground since climbing is a new experience. They go into the trees armed with hand saws, loppers and pruning shears only.

Tree and shrub fertilizing is done with a $\frac{3}{4}$ " electric drill and soil auger and a water lance with hose attachment to a large orchard sprayer capable of up to 600 psi. Fertilizer placements, analysis rates and liquid volumes are taught and all controversial issues are mentioned.

Transplanting begins with an exercise in digging, burlapping and pinning and usually climaxes with moving several large plants in our arboretum.

¹Presented at the annual meeting Southern Chapter, ISA, in Tampa, Florida in February 1980.

We have moved camellias with soil balls weighing over 2000 lbs but our biggest challenge was a crepe myrtle with a 5000 lb ball. It was moved 150 miles. The 1980 class will move a 5-inch caliper Japanese maple across town to our arboretum.

Pruning labs and information include techniques for pruning the largest variety of plants time permits, since horticulturists and arborists may be asked to prune nearly anything. Certainly large shade tree pruning with ropes is most emphasized but experience in rose bush, shrub pruning and rejuvenation, flowering trees, fruit trees, grape vines and tree building of small trees is done. Lectures provide information on, how, what, when and why. New research on wound treatment and care are also included in this section of the course.

The application of two knots, a running bowline and a triple bowline are used in tree removal procedures. Trees are notched and backcut but pulled down with a block and tackle rather than cut down to demonstrate a safe accurate placement technique. Use of tree spikes is taught with tree removal and students are encouraged to try them.

Bracing, cabling and cavity techniques are taught on the ground by bringing cavities and weak crotches into the lab.

A tree and shrub inventory of areas on campus is done to provide species, size, condition and management needs for our campus facilities planning department. Although this inventory is not computerized, several computerized systems are mentioned.

The final project is an assignment of several trees on campus for diagnosis of problems and recommendations of management needs. All disorders, genetic, insect, disease, compaction, girdling root, construction, decay, past history of location and any complexing factors must be taken into account for this assignment.

Several guest lecturers appear on the lecture schedule through the semester including state specialists for ornamentals in pathology, entomology and landscape. Also usually a private or city arborist speaks to the class.

It would seem that today training people in tree care and landscape maintenance is of paramount

importance. Cities and towns throughout the United States are faced with planning their urban programs. Large trees planted years ago without regard to suitability to location, or growth of an urban area without regard to tree location, costs cities fortunes to maintain and remove trees each year. Ordinances are often placed into effect to save the canopy of cities. Planting, maintenance and removal must fit projected budgets and often it costs more to do nothing than something. Public tree inventories can help project needed budgets. The enforcement of tree ordinances, supervision of maintenance crews and implementation of tree inventories are responsibilities which require trained individuals. Municipalities are slowly becoming aware of their predicaments.

The arboriculture course at N.C. State University is designed to provide students with knowledge and skills related to the arboricultural industry and provide personnel with training for a position with a private arborist, municipality, nursery, landscape designer or landscape maintenance firm or in an extension or teaching role. Recently there has been considerable interest by students in tree care employment but positions have been limited. With the great need for trained personnel, hopefully the 1980's will bring new opportunities.

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