January 1982

The Boxwood Bulletin

A QUARTERLY DEVOTED TO MAN'S OLDEST GARDEN ORNAMENTAL

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THE SOLOMON LICK HOUSE IN OLD SALEM

Boyce, Va.

Vol. 21 No. 3

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The Editor solicits and will welcome contributions of articles, news notes, photographs suitable for reproduction, of boxwood specimens, gardens, and plantings, and other items of probable interest to readers. It is requested that every item of such material carry the name and return address of the sender and be accompanied by an addressed envelope carrying the proper postage for return. While every effort always will be made for the protection of all material submitted for publication, the Editor cannot assume responsibility for loss or injury.

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The Boxwood Bulletin

January 1982 Vol. 21 No. 3

EDITOR — MRS. CHARLES H. DICK

INDEX

ILLUSTRATIONS

PLANTING AND CARE OF BOXWOODS AROUND THE HOME

Reprinted from *Horticultural Information Leaflet No. 422* by permission of Dr. V. P. Bonaminio. The leaflet was prepared by Dr. Bonanimio, Extension Horticultural Specialist; Dr. R. K. Jones, Extension Pathologist; and Dr. J. R. Baker, Extension Entomologist, all of North Carolina State University.

Introduction

In America, boxwoods (Buxus sp.) have long been associated with colonial architecture and the formal and informal gardens in the Coastal Plain, Piedmont and Mountain areas of North Carolina. Their dense, compact habit of growth, glossy evergreen foilage and suitability for formal and informal landscaping make boxwoods a favorite of homeowners, landscape contractors and nurserymen. Although used extensively, homeowners need to be aware of potential planting, maintenance, insect and disease problems.

Boxwood Species and Cultivars

There are about 30 species of boxwoods found throughout the world. Only two species, *Buxus sempervirens* and *Buxus microphylla,* and horticultural selections or cultivars of these are grown as ornamentals. A cultivar is a natural or induced hybrid that varies from the species and can only be reproduced ("come true") by vegetative propagation. Cultivars are usually chosen because they vary from the species in size, form, texture, color, leaf shape, fruiting, flower color, insect or disease resistance.

Buxus sempervirens - Common or American Boxwood - The American boxwood is a wide spreading shrub or small tree with very dense evergreen foliage. Although *very old* plants may reach 20 feet, it more commonly grows to a height of 5-10 feet. Leaves are dark green above and yellow green beneath, 1/2 - 1 1/2 inches long and are oblong to oval shaped. It is usually used as a foundation, corner, accent or screening plant. This species and most of its cultivars are tolerant of cold weather. They are best adapted to the Piedmont and Mountain areas of North Carolina.

Buxus sempervirens Cultivars

'Angustifolia' - has the largest leaves of this species. Often treelike in habit.
'Argenteo-variegata' - green leaves variegated with white.
'Aureo-variegata' - green leaves variegated with yellow.
'Bullata' - low shrub with dark green blunt leaves.
'Handsworthiensis' - wide, strong growing, upright shrub with dark green leaves. Good hedge plant.
'Northland' - wide spreading plant with dark green foliage all winter.
'Suffruticosa' - very dwarf, slow growing and compact; leaves up to 3/4 inches long. So called "edging" or "English" boxwood. One of the most popular cultivars.

Buxus microphylla - Japanese or Littleleaf Boxwood - The Japanese boxwood is a low growing compact shrub which rarely gets more than 3 feet tall. Leaves are bright green, elliptic to lance shaped and usually 1/4 - 1 inch long. It is usually used as an edging, low hedge, accent or rock garden plant. This species and most of its cultivars are heat tolerant. They grow quite well in the Coastal Plain and Piedmont areas of North Carolina.

Buxus microphylla Cultivars

'Compacta' - also sold as 'Kingsville Dwarf' - very low growing (about 1 foot tall) but wide spreading plant with dense green foliage.
'Japonica' - slow growing evergreen with leaves up to 1 inch long. May attain a height of 3-4 feet.
'Koreana' - loose, open growing shrub. Very hardy but foliage turns brownish in winter.
'Wintergreen' - low, slow growing winter hardy shrub. Retains good green foliage color all winter.

Plant Culture

Planting Site and Soil Requirements

Boxwoods should only be planted in well drained soils. They should never be planted near downspouts, under the dripline of a roof or in any area that stays wet. While boxwoods will live in locations which receive full sun, they grow best in semi-shade. Some organic matter (peat, leaf compost, pine bark) should be worked into the soil. A soil sample should be taken four to six weeks before planting and submitted through the county agent for analysis. Boxwoods grow in soils ranging from slightly acid to slightly alkaline (pH 5.5-7.5).

Based upon a soil analysis the proper amount of lime and fertilizer can be added to the area to provide proper nutrition for good plant growth.

Planting, Mulching, Watering

In order for plants to thrive, special attention must be given to planting. The planting hole should be twice as wide and twice as deep as the rootball. For filling under and around the rootball use a good quality, porous soil which is high in organic matter. This will encourage rapid root growth. Balled and burlapped plants should be set in the landscape no deeper than they were growing in the nursery. The soil around plants which were container grown should come no higher than even with the top of the container potting medium. Deep planting will usually cause an initial loss of plant vigor and eventually plant death.

After placing the plant in the hole, gently firm the soil around the roots and water thoroughly. Regular waterings are much more beneficial than frequent light watering or sprinklings. Thorough watering which moistens the entire rootball and fill soil encourages development of a well branched root system. Properly watered plants will be more firmly anchored in the soil and less susceptible to drought and nutritional stress. Sprinkling or light watering moistens only the upper surface of the soil. This results in shallow rooted plants which are poorly anchored in the soil, are susceptible to drought stress and which never develop an adequate root system to support good top growth. Additionally, they encourage the buildup of high soluble salts which can damage the root system and cause plant death.

Boxwoods are shallow-rooted and grow poorly in hot dry soils. To maintain vigorous plants homeowners should add 3 to 4 inches of organic mulch over the soil surface. The mulch should extend from the plant stem outward to at least 12 inches beyond the foliage canopy. Plantings should be checked annually, and more material added as the depth of mulch decreases due to decomposition. Mulching not only keeps the plant root system cool, but also conserves water by slowing down evaporation of moisture from the soil. Use of clean mulch also reduces weed problems and adds to the aesthetic value of the planting.

Fertilization

Soil tests are necessary to establish a proper fertilization program. Four to 6 weeks prior to fertilization, soil samples should be taken from several places in the area where boxwoods are planted. Soil sample boxes, information sheets and assistance in taking your samples can be obtained from your local County Agricultural Extension Agent. Based upon the soil analysis results, a recommendation will be made as to the amount and analysis of fertilizer that should be used for your boxwood planting.

In the Coastal Plain and lower Piedmont areas boxwoods should be fertilized twice during the growing season. In the upper Piedmont and Mountain areas a single annual application of fertilizer prior to new shoot growth is satisfactory for good plant growth. The initial fertilizer application should be made in early spring before plant shoot growth starts. In areas where needed, the second application should be made in late June or early July. Avoid applying any fertilizer to boxwoods in late summer since it can force late tender growth which is extremely susceptible to frost damage.

The recommended amount of fertilizer should always be distributed uniformly over the planting area. Care must be taken to keep fertilizers off of the plant leaves and never spread fertilizers closer than 6 inches to the plant stem. After fertilization, plant foliage should be washed down with water and the soil should be thorougly irrigated.

Shearing and Pruning

Shearing is the *uniform* removal of all or part of the latest flush of plant growth. Plants are sheared to increase compactness or to maintain a specified size or shape.

During the first few years after planting, boxwoods should be sheared after each flush of growth to encourage additional branch development. Thereafter, they should only be sheared to maintain a desired shape or form. Do not shear boxwood in late summer since this might force new growth which will not have sufficient time to harden before frost.

Pruning is the removal of *selected* branches or plant parts. Plants are pruned to remove diseased, injured, dying or dead branches. Unwanted branches are also removed by pruning especially when plants are being trained to a specific form such as topiary or espalier. Boxwoods are pruned, rather than sheared, to maintain a natural shape and to keep plants at a desired size so that they do not outgrow their landscape value too quickly.

Boxwoods usually require some pruning in spring to remove any branches that may have been winter killed. Also, as plants get older, some of the older branches may have to be removed so that light can get to the inner shoots. Continuous shading of the inner branches results in foliage drop from those shoots thereby decreasing plant value and aesthetics.

Winter Injury

Winter injury often causes death of entire branches especially at the center and top parts of the plant. A sign of winter injury is a sunken area in the bark of the main trunk just above the soil line or in the crotches and along the sides of main branches. In many cases the bark will separate from the wood and large patches can be easily stripped off. Another indicator of winter injury is when the foliage on entire branches turns rust-brown in color.

Winter injury usually occurs when plant growth is checked during the summer by drought, heat or nutrient stress and then stimulated again by fall fertilization, excessive watering or prolonged rainy periods. In many cases growth forced late in summer or early fall does not have time to harden and is easily injured by frost or cold weather. During mild winters even plants that were properly cared for, may begin to grow during prolonged warm

spells especially if they are planted on the south side of buildings. With the reoccurrence of freezing temperatures the tender growth is easily injured or "burned back". In some cases such injury may not become evident until active plant growth begins in the spring.

To reduce chances of winter injury select cultivars that are suited for growing in your area, fertilize properly and irrigate during drought periods. Winter injury can often be avoided by proper culture which maintains a plant in a healthy condition.

Winter Protection

Winter protection of boxwood involves both the top of the plant and its root system. The soil around boxwoods should be mulched with wood chips, leaf compost or other organic mulch. Mulching prevents excessive loss of water from the soil, rapid soil temperature changes and deep penetration of frost. A 3 to 4 inch layer of mulch over the soil around boxwoods should provide adequate winter protection for the root system.

The tops of your boxwoods may also require some protection to avoid injury if planted in windy areas, against buildings or where alternate freezing and thawing occurs during the winter. Tobacco sheets, wooden lath, burlap or pine branches can all be used as a screen to protect the branches and leaves of your plants. The screen should come up at least as high as the plants. Whatever material is used should be no closer than 3 - 6 inches from the plants so that air can circulate freely. If pine branches are used they should be stuck into the soil around the boxwoods just before the ground freezes. Cloth or burlap screens should be securely fastened to stakes, placed around the plants. Screens should be removed from around your boxwoods in early spring as soon as all danger of hard freezing has passed.

Insects

Boxwood Leafminers

American boxwoods are particularly susceptible to boxwood leafminers, the maggot of small flies. The adult boxwood leafminer flies emerge in the spring as new growth occurs. Eggs are laid on the lower leaf surface, and soon the maggots tunnel into the leaf to develop. Unsightly blisters form around the maggot. For control, use dimethoate (Cygon, Defend) or Metasystox-R and spray the shrubs thoroughly 2 to 4 weeks after new growth appears.

Boxwood Psyllids

Boxwood psyllid nymphs feed in newly developing buds and cause the leaves to form a shelter inside of which the psyllids live. Adults are formed in May and June. By the end of July, egg laying has ceased. Most of the year is spent in the nymph stage feeding on or in the buds and new growth. Dimethoate (Cygon, Defend) or malathion applied in June will kill the adults and prevent subsequent development of these pests.

Boxwood Spider Mites

Boxwood spider mites feed on boxwood leaves and cause them to turn bronzed or yellowish. Close examination shows tiny stiples and "hen scratches" on the upper leaf surface. Because boxwood spider mites develop through resistant resting stages, two applications of Kelthane or Metasystox-R a week apart may be necessary for complete control. Boxwood spider mites are "cool weather" mites and are more abundant in early spring and late fall than during hot weather. Two spotted spider mites may also infest boxwoods in the hot summer.

Japanese Wax Scales

These large, white scales often infest the stems of boxwoods. There is one generation per year. The best time to obtain control is in early June when the crawlers are exposed on the bark. It becomes more and more difficult to control this scale as time passes. Dimethoate (Cygon, Defend), malathion, Metasystox-R or Sevin will give good control in early June.

Diseases

Two disease problems, *nematode decline* and *Phytopthera root rot,* seriously affect English and American boxwoods, particularly in the Piedmont and eastern part of the state.

The above ground symptoms of these two diseases are similar and include: stunted plants, loss of shiny dark green leaf color, dead branches or sections of plants, excessive loss of leaves, and dead plants. Roots on infected plants are often dark colored, rotted, and the outer root cells slough-off easily. In advanced cases of root rot, the bark on the main stems just above the soil may also slough-off.

Boxwood diseases must be prevented before or at planting time since there are no chemicals available to cure diseased plants.

Disease Control for Boxwoods in the Landscape

1. Purchase healthy plants from a reputable nursery or garden center.
2. Avoid planting boxwoods in poorly drained areas.
3. Avoid planting boxwoods in areas where damaging nematodes and root rot are known to occur.
4. In clay soils, set boxwoods in raised beds with pine bark incorporated into the planting site 6-12 inches deep. Use approximately 1 1/2 cubic feet of bark for each plant.
5. Prune out any dead or dying branches promptly.

Other things besides diseases can cause dead branches in boxwoods - - dog damage, dry weather, excess fertilizer, etc. The urine of male dogs can kill small sections of boxwood foliage 6-18 inches above the ground. Prune out dead branches and control the problem.

THE SOCIETY'S RESEARCH ROLE

William A. Gray

One important mission of the American Boxwood Society is that of encouraging research on the genus *Buxus* and in assisting in the dissemination of information thereby acquired. Accordingly, it is the Society's policy to publish, with permission, pertinent research papers from varied sources. The citations listed in Table 1 include reports on pest control, disease, field tests, production techniques, and history; these articles were based on work not sponsored financially by ABS.

Table 1. Research Papers Published in the *Boxwood Bulletin*

Issue	*Pages*	*Title and Author*
V.8 No. 2 (Oct 1968)	28-32	Boxwood Pests an dtheir Control J. C. Schread
V.10 Nos. 2, 3, 4 (Oct 1970; Jan, Apr 1971)	19-23 35-37 55-60	A History of Box in the British Isles M. J. C. Staples
V.11 No. 2 (Oct 1971)	18	Phytopthera Root Rot of Boxwood R. C. Lambe
V.13 Nos. 3, 4 (Jan, Apr 1974)	42-45 62-64	Performance Records of Woody Plants J. E. Ford
V.17 No. 3 (Jan 1987)	37-39	Winter Damage on Box J. E. Ford
V.19 No. 4 (Apr 1980)	47-51	Container Culture of Boxwood F. R. Gouin

The Society also supports in principle and encourages research efforts on propagation, performance, and plant identification at the University of Virginia's Blandy Experimental Farm. As we all know, ABS headquarters resides at Blandy as a non-paying guest; our sponsorship of research at Blandy has not involved ABS funding.

In addition, ABS has established and funded two external research projects. The study on mineral nutrition was conducted at the University of Maryland from 1971 to 1973; the ABS contributed $3000 to the project. From 1972 to 1975, the Society contributed $10,000 to the Virginia Polytechnic Institute & State University study on the etiology of boxwood root rot and decline. Both institutions continued boxwood research after the initial ABS financial support expired.

Table 2. *Boxwood Bulletin* Items: Sponsored Research at University of Maryland.

Issue	*Pages*	*Title*
V.10 No. 1 (Jul 1970)	10-11	Feasibility Report on Boxwood Research
V.11 No. 1 (Jul 1971)	14	Memo of understanding: Boxwood Research on Mineral Nutrition
V.11 No. 3 (Jan 1972)	44-45	Mineral Nutrition Study on Boxwood
V.13 No. 1 (Jul 1973)	10-11	Mineral Nutrition Studies Report
V.19 No. 3 (Jan 1980)	37-38	Dissertation: Mineral Nutrient Elements and *Buxus Sempervirens*

Table 3. *Boxwood Bulletin* Items: *Sponsored* Research at VPI & SU

Issue	*Pages*	*Title*
V.11 No. 4 (Apr 1972)	57-59	Proposal to ABS on Etiology of Boxwood Root Rot and Decline
V.12 No. 3 (Jan 1973)	34-35 37	Status of Boxwood Decline in Va. Progress Report on Causes of Decline
V.12 No. 4 (Apr 1973)	57-58	Recent Findings in Study of Decline
V.13 No. 1 (Jul 1973)	8-9	Boxwood Decline Progress Report
V.13 No. 2 (Oct 1973)	30-31	Further Progress on Decline Study
V.14 No. 1 (Jul 1974)	7-8	Summary of Reports and Future Plans
V.14 No. 2 (Oct 1974)	27	Possible Controls of Boxwood Decline

Issue	*Pages*	*Title*
V.14 No. 3 (Jan 1975)	36-37	Progress Report of VPI Research Team
V.14 No. 4 (APR 1975)	52-56	Boxwood Decline in Virginia
V.15 No. 1 (Jul 1975)	15	Care of English Boxwood under Conditions of Decline
V.15 No. 4 (Apr 1976)	63-64	Boxwood Diseases
V.16 No. 2 (Oct 1976)	32-34	Boxwood Diseases
V.17 No. 2 (Oct 1977)	34-36	Etiology of Decline of English Box
V.18 No. 4 (Apr 1979)	84	Boxwood Task Force
V.20 No. 4 (Apr 1981)	65-69	Boxwood Diseases

Data from the nutritional study suggest: (a) Boxwood needs much less nitrogen fertilizer than many other woody ornamentals; (b) the nitrate form of fertilizer is preferred over the ammoniacal form; and (c) relatively high levels of calcium and magnesium are essential. Hence, for most soils, a relatively light fertilizer feeding plus a generous application of dolomitic limestone seem indicated.

The Boxwood decline investigation proved to be a lengthy and difficult task; the research effort is still underway, long after the Society's funding was completed. Decline appears to be associated with a complex of factors, rather than with the spread of any single pathogenic organism. No chemical treatment can be recommended at this time. Obviously, the answers to this problem are not yet in.

As illustrated in Table 4, external research was funded over four fiscal years, in part from gifts, in part from savings, and the balance out of current operating revenues.

Table 4. ABS External Research Funding (May 1971 - May 1975, Distribution of Funds:

FY ending	May 72	May 73	May 74	May 75	Total
University of Maryland	$2200	$800	—	—	$3000
VPI & SU	—	5000	$4000	$1000	10,000
					13,000

Source of funds:

Gifts contributed to May 1975		$4190 (32%)
From ABS assets (May 71, $5417; May 75,	$2202)	3215 (25%)
From ABS operating revenue		5595 (43%)

Since May 1975, after all research payments were completed, Society assets have recovered. Over the six-year period to May 1981, the sum of ABS savings plus CD's has grown from about $1500 to a bit over $8000.

Biographical Note: Mr. Gray is a longtime member and frequent contributor to *The Boxwood Bulletin*. He was elected to the Board of Directors at the Annual Meeting in May 1981 and was appointed chairman of the Research Committee at the fall Board meeting.

MINUTES OF THE ABS BOARD MEETING

November 6, 1981

The Board met at Kenmore, Fredericksburg, Virginia on Friday, November 6, 1981. President Richard Mahone called the meeting to order at 10:15 a.m. Officers and Directors attending were: Mr. Mahone, Professor Beecher, Mr. Butler, Mr. Ewert, Professor Faiszt, Mrs. Frackelton, Mr. Gray, Mr. Mak, Dr. Speese, Mr. Symmes and Mrs. Ward.

After welcoming the new Officers and the two new Directors, Mr. Mahone called for the Treasurer's Report which showed receipts of $1,711.50, disbursements of $4,474.56, a checking account balance of $80.39, a savings account balance of $2,645.72 and a certificate of deposit in the amount of $5,691.62. The report was approved with a request from the Board that various categories be more finely detailed for analytical purposes and for the benefit of donors.

Mr. Butler expressed concern about the Society's financial condition in light of increasing costs. He suggested that a study be made of the Society's sources of income and its expeditures to determine more accurately whether income was keeping pace with expenditures and, if not, where deficiencies were occuring. Mr. Beecher suggested that a budget be drawn up periodically for the purpose of financial control. Mr. Ewert pointed out that recent costs of publishing the *Bulletin* were high: $1,600 for the April issue and $1,150 for the July issue. The President agreed that the financial condition of the Society required attention and promised to appoint a group to look into the matter.

Committee chairmen then gave their reports to the Board:

Memorial Garden. Mr. Ewert reported that 59 plant labels had been received and that he was now considering various designs for stakes on which to mount the labels. Professor Faiszt circulated a sample of the stakes used at VPI & SU; he offered to find out for Mr. Ewert where the stakes are manufactured. Mr. Ewert revealed plans to move more plants into the Memorial Garden and to relocate others within the Garden. Some additional annuals will be planted to add to the beauty of the Garden.

Boxwood Registration. Dr .Speese reported that there have been no new registrations of boxwood plants since the last meeting.

Membership. Mr. Symmes reminded the Board that at the Annual Meeting in May it was voted to raise dues in view of constantly rising costs. Discussion ensued as to how this could be accomplished in view of the fact that the categories and amounts of dues are stipulated in the Society's Constitution. It was agreed that the Constitution will have to be amended before dues can be raised. A motion by Mr. Symmes calling for the President to meet with members of the Executive Committee to formulate plans for amending the Constitution was passed.

Bulletin. Mr. Butler reported that a revised membership list, which does not include addresses, would be published in the next *Bulletin.* He suggested that the views of the membership be sought with regard to including addresses in subsequent lists. Mr. Butler then noted the cumbersome method now used to maintain the membership rolls. He recommended that the operation be computerized. After some discussion it was agreed that such a step would be desirable. Professor Faiszt offered to investigate the feasibility of using the boxwood workshop mailing list which is already computerized at VPI & SU for this purpose.

Bulletin. It was agreed that Mrs. Dick be encouraged to find an assistant editor to help her. It was also recommended that the Bulletin Committee and Mrs. Dick meet together at Blandy well in advance of publication dates to review material for the upcoming issue as well as to plan for future issues.

The President than called for discussion of new business. Mr. Ewert asked if the Society would consider sponsoring the forthcoming Holiday Decoration Workshops at Blandy as an extension of its educational function (boxwood is extensively used in these decorations). Upon assurance that sponsorship would not cause a financial drain on the Society and that all of the work would be performed by people at Blandy, the Board approved Mr. Ewert's request, provided further that receipts from participants be entered in a special account so as not to complicate the Society's regular accounts.

Following this action, the President circulated for the consideration of the Board Members a preliminary research proposal entitled "Establishment of a boxwood field planting at the Virginia Truck and Ornamental Research Station at Virginia, Beach, VA, for observation and experimentation." Action on the proposal was deferred until the next Board Meeting.

The President then proceded to the appointment of committee chairmen for the next year. The following appointments or reappointments were made: Memorial Garden — Mr. Ewert; Boxwood Registration — Dr. Speese; Membership — Mr. Symmes; Bulletin — Mr. Butler; Hospitality — Mrs. Frackelton; Educational Program for 1982 Annual Meeting — Mrs. Frackelton; Finance — to be announced; Education and Publicity — Professor Beecher; Handbook — Professor Beecher; Buyer's Guide — Professor Beecher; Research — Mr. Gray; Nominating Committee — Mr. Symmes; Workshop Program — Professor Faiszt; Boxwood Tour — Mrs. Frackelton; Executive Committee — Mr. Mahone, Mrs. Ward, Mr. Mak. Each committee chairman was instructed to select other members of his committee from the membership.

The final item discussed and approved was a proposal to hold a boxwood workshop on February 16th, 1982 in cooperation with two local garden clubs at Eastville, Virginia.

The President announced that the next meeting of the Board would be held Wednesday, March 17, 1982 in Williamsburg, Virginia. The meeting was adjourned at 1:40 p.m.

Respectfully submitted,
Dayton S. Mak
Secretary

PRODUCTION OF JOJOBA IN ARIZONA

by

LeMoyne Hogan, Professor of Horticulture

David A. Palzkill, Adjunct Assistant Professar

Robert E. Dennis, Extension Agronomist, Department of Plant Sciences, The University of Arizona.

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Jojoba (*Simmondsia chinensis* (Link) Schneider) is an evergreen shrub found in native stands mostly below 5,000 feet elevation in Arizona. Jojoba (pronounced "ho-ho-ba") plants in the wild usually range in height from three to 15 feet and are believed to have a potential longevity of 150 to 200 years.

Female jojoba plants produce seed containing 40-60 liquid wax. Chemical properties of this wax are very similar to those of sperm whale oil. Interest in jojoba developed rapidly in the early 1970s when further importation of oil of the endangered sperm whale was banned. Today, several thousand acres of jojoba are being grown under cultivation in Arizona, California and Sonora, Mexico.

Early History

Jojoba has been part of the Arizona scene for hundreds of years. Early Spanish explorers found the native people using it; however, it was not until this century that it was realized that the seed contained a potentially valuable liquid wax. Through the cooperation of workers at The University of Arizona and of the Boyce Thompson Arboretum, this discovery was made in 1933.

Only one sizable jojoba planting was established in Arizona prior to the mid-1970s; this was a 320-acre field planted in 1946 near Florence. The site selected was unsuited for cultivated jojoba because of low temperatures. Plant freezing combined with damage from rodents and cattle destroyed the plants and the land was eventually switched to traditional row-crop use. Following this interest in jojoba remained at a low level until the present decade.

Adaptation

Jojoba is widely distributed in the Sonoran Desert, with natural populations mostly located between 23° and 34° north latitude and between 110° and 118° west longitude. It occurs from sea level to about 5,000 feet. At the higher elevations, jojoba is usually found on mountain slopes; on these slopes temperatures are somewhat milder than in adjacent valleys. In the warmer parts of its natural range, jojoba plants are commonly located on the valley floors.

Temperature.

Temperature is believed to be the most critical factor to consider when selecting a site for commercial production of jojoba. In very general terms, jojoba appears to be best adapted to those parts of Arizona where the highest cotton yields are obtained. Those parts of the state where the production of stub cotton has been successful or where lemons can be safely grown without frost protection are especially good candidate areas for jojoba plantations.

Jojoba plants three or more years old can usually survive winter temperatures as low as 15F; however, many flower buds are killed by temperatures of 20-25F or lower, reducing yield. This limits commercial plantings to areas where temperatures are expected to be above 25F. In Arizona, most areas having winters this mild are located where valley floors are at less than 1,000 feet elevation. Effects of different durations of time at particular low temperatures have not yet been determined.

Moisture. Some natural stands of jojoba are found where annual precipitation is as low as five inches; however, the best native stands are located where precipitation averages 15-18 inches per year. Under cultivation, jojoba plants will likely require 1-2 feet of irrigation water per year to insure consistent production. Information on the effects of different amounts of water applied at different times is not yet available.

Soils. Jojoba can be grown on a number of soil types from sand to loam; however, the soil must be well drained. Young plants are very sensitive to flooding. Six to seven year-old plants have been killed when flooded for 36 hours. Very sandy soils have the disadvantage of a low water holding capacity and will likely require more frequent irrigation. Plants have made best growth in either a sandy loam or a loam soil.

Salinity. Germinating seeds and young seedlings may be adversely affected by salt in the soil or irrigation water. Seedlings vary greatly in their salt tolerance. Established plants are more salt tolerant. The effect of salinity on seed yield of mature plants has not been studied.

The Jojoba Plant

Jojoba is a woody shrub that usually has several stems. Plants in nature vary from 2-17 feet in height and 2-30 feet in width. Jojoba plants do not produce annual growth rings in their stems, making age determination difficult; however, it has been estimated that the older naturally-occurring plants may be as old as 150-200 years.

There is much variability between plants in size, shape and color of leaves, as well as in their thickness and amount of pubescence (hairs). Most leaves are 1/2 to 3/4 inches wide by 1 to 1 1/2 inches long. They are usually olive-green in color and become somewhat lighter colored when under water stress. Individual leaves of jojoba live for two or more seasons before they are replaced by new leaves.

The root system of jojoba is composed of several thick, deeply penetrating roots, with smaller amounts of fibrous roots in the upper soil layers than most conventional crops. Older plants have roots that may reach depths of 25 to 30 feet or more where there are no restrictive soil layers. It is likely that irrigation method and frequency will have a large influence on rooting pattern; however, this has not yet been studied.

Jojoba is dioecious, about one-half of the plants produce male flowers and one-half produce female flowers.

Female flower buds are grey-green, urn-shaped, and fairly inconspicuous. On female plants, single flower buds are usually formed at alternate nodes, but buds may also develop singly at each node or in doubles or multiples at alternate nodes or at each node.

On male plants, multiple flower buds are usually found at alternate nodes. In some cases multiple buds form at each node.

Jojoba flowers do not have petals, nectaries or scent glands.

Flower buds usually develop in late summer on new growth and remain dormant until warm days of early spring. In the spring, male flowers produce bright yellow pollen which is blown by the wind to female flowers. Much variation exists in time of pollen release by different males and the receptivity of female flowers.

When pollen from a male plant lands on the stigma of a female flower, it germinates by the production of a small germ tube. This germ tube grows down through the female flower to the ovules where fertilization takes place. Each female flower contains three ovules. In most instances only one of the three ovules becomes fertilized and develops into a mature seed; however, in some cases two or all three of the ovules may be fertilized and develop into mature seeds.

Maturation of fruit occurs during July and August in Arizona, about five months after pollination. Seed size varies from less than 300 to more than 2,500 per pound. New flower buds for the next season's crop are forming on new vegetative growth at about the same time that fruit are maturing on previous years growth.

Stand Establishment

Plantings of jojoba may be established with seed, seedling transplants or rooted stem cuttings. For all three types of planting stock, the soil should be well prepared in about the same manner as for cotton or sorghum. Plantings can be done on the flat or on beds of various types. Raised beds will facilitate mechanical harvesting.

Direct-seeding. To date, most acreage in Arizona has been direct-seeded, using seed collected from wild plants. The cost for plantnig materials is relatively less for direct-seeding and planting equipment used for other large seeded crops can be adapted for jojoba and is available to most growers. There are some indications that root systems of direct-seeded plants are superior to those of transplants, at least during the first year.

In direct-seeding seeds are planted six to 12 inches apart within the row at a depth of one to three inches. At this seeding rate, a large number of extra plants are produced, which allows for removal of undesirable female plants and excess male plants. Depth of planting is dependent upon soil texture and season; seeds are planted deeper in coarse soils and where temperatures are higher than in fine soils and where temperatures are cooler. If rows are 12 to 16 feet apart and seeds are planted a foot apart within the rows, 5 to 9 pounds of seed will be required per acre.

Only fully mature jojoba seed should be planted. Immature seed may germinate, but seedlings produced will be weak and may not survive.

After seeds have been planted, soil around them should be kept moist until germination occurs. Good seed properly planted usually germinates within two to four weeks.

Germination of jojoba seed proceeds most rapidly when soil temperature at seed depth is in the range of 70-85F. Because of this, seeding should take place in the spring after soil temperatures reach 70F or during the early fall. Some germination will occur outside this range, but chances of obtaining a good stand will be decreased. Field experience indicates that the exceedingly high seedbed temperatures that can occur in mid-summer can kill the tips of emerging seedlings. Maintaining adequate soil moisture can also be difficult at higher temperatures. Cold winter temperatures slow the germination rate and favor invasion of the seed by microorganisms in the soil.

Seedling Transplants. Several growers have established their plantings using nursery-grown seedlings as planting stock. Seeds are planted in small containers and seedlings are transplanted into the field when three to six months old. Seedlings can be purchased from companies specializing in their production or they can be produced by the grower himself.

Transplants are better able to compete with weeds than are direct-seeded plants, and less water is usually required for stand establishment. Also, with transplants, a grower is more nearly able to plant to a stand, but if this is done the ability to rogue out undesirable females is reduced.

Disadvantages of transplants compared to direct-seeding include a much greater initial cost for the

planting material, and possibly a lower quality root system.

A major disadvantage of both direct-seeding and use of seedling transplants is the large amount of variation that occurs between plants. Individual seed-propagated plants vary in almost every characteristic, including sex, shape and yield potential. When using seed-propagated plants, a grower does not know what sex or shape individual plants will have. Yield potential of individual plants will vary from very poor to very good. Through plant breeding, varieties with desirable traits that come true from seed will likely be developed. In the meantime, a way of obtaining plants with desirable traits is the use of vegetative propagation.

Rooted Cutting or Tissue Culture Propagated Plants. Vegetatively propagated plants can be produced by various methods. The two most promising methods for jojoba are rooting of stem cuttings from field grown plants and the use of a tissue culture method in which large numbers of very small "cuttings" are produced and rooted under sterile laboratory conditions.

A characteristic of vegetatively propagated plants is that they have the same genetic make-up as the mother plant from which they were taken. Once plants with high yield potential, desirable shape, known sex, insect or disease resistance, etc., are identified, they can be propagated in large numbers and used for field plantings.

The cost of using vegetatively propagated plants will likely be greater than that of either direct-seeding or using seedling transplants. Vegetatively propagated plants from high - yielding mother plants are not yet available on a large scale, but should be in the near future. Growers can set up their own greenhouse facilities for rooting stem cuttings of selected mother plants, but this requires special training and skills that are not normally possessed by most growers. The initial cost per plant is greater than for plants grown from seed, but this should not be a major problem considering the greater yield per plant and uniformity of the plants.

Spacing of Plants

Few studies on the effect of planting pattern on yield have been conducted. At present most growers decided on a spacing for jojoba plants based primarily on the expected equipment available for harvesting and other cultural operations. Until now most growers have thinned plants to five feet apart within rows on rows 12-16 feet apart, resulting in a population of 544 to 726 plants per acre. At a five-foot spacing within rows, plants will eventually grow together to form a continuous hedge.

Irrigation

Jojoba plants can survive with minimum water, but highest yielding plants in native stands are found in areas having significant precipitation. At the lower elevations in Arizona where jojoba is best adapted, temperatures are high and evapotranspiration rates increase consumptive use. Probably 18-24 inches of water will be required each year for successful jojoba plantations in these areas.

The moisture requirement for establishing jojoba stands may exceed 30 inches during the first year. It is important that surface soil be kept moist during the first month or so after jojoba is planted. Consumptive use for jojoba is affected by the same factors that determine water needs for other plants. These factors are principally temperature, air movement and soil texture.

Many desert plants have the capacity to absorb large amounts of water quickly after rainfall. While jojoba plants have some shallow, fibrous roots, most of their root system is much deeper. Therefore jojoba in established plantings will probably not respond to light irrigations or light rains.

The greatest need for water by jojoba plants occurs during the late winter and spring and fortunately this is a time when the water demand for many Arizona field crops is at a minimum. Adequate water is also needed in the fall when buds for the next year's crop are beginning to develop. When water is a limiting factor after flower fertilization, many developing fruits abort. Fruit that do not abort produce small seeds of relatively less value.

Water stress in September in the cultivated areas of Arizona may help to harden plants and make them better able to survive the cooler temperatures of winter without damage.

Fertilization

Little is known at present concerning the nutritional requirements of jojoba, when grown under plantation conditions. Jojoba requires the same mineral elements as other plants, but the amounts required are not known. Fertilization with nitrogen has increased growth and seed yield of jojoba plant in some field tests but not in others. It is possible that these different results obtained in field tests were caused by differences in the residual amount of nitrogen from previous crops in the soil. On new desert soil or on depleted cropland, an immediate response to nitrogen fertilizer may be found, while on soils with a high residual of nitrogen from previous crops, deficiencies may show up only after several years of cropping. Until more information is available, it is suggested that growers who suspect a deficiency evaluate the effect of two or three different rates of nitrogen on several rows of plants before routinely applying nitrogen to the entire field.

Weed Control

Weeds are probably the most serious immediate problem facing jojoba growers. Weeds are potentially a problem wherever jojoba is grown and have already been a serious problem for most growers. Although newly cleared fields have had relatively few weed problems to date, problems will probably develop in the future in these fields as the population of weed seeds increases.

Herbicides are used for weed control in most conventional crops, however, no herbicides are currently registered for use on jojoba, several herbicides are being tested, but until they are labelled for use it is illegal to use them.

Mechanical cultivation can be used effectively on some weed problems in jojoba. Due to the

nature of the root system of jojoba, soil fairly close to young plants can be cultivated without damaging the plants.

Hand-weeding is effective and is being used on a number of plantings, but it is too expensive to be depended upon for economical growing of jojoba.

Insects and Mites That Damage Jojoba

Many different insects have been observed feeding on jojoba in Arizona, with most of these observations made on wild plants. Pests observed include aphids, mites, leafhoppers, grasshoppers, mealy bugs, ants, beet armyworm, and a larva that feeds on immature fruit.

Plantings near Hermosillo, Sonora, Mexico, have been damaged by the beet armyworm, leafhoppers, leaf rollers, thrips, aphids and termites. Several beneficial insects were also observed in these plantings, including collops beetles, minute pirate bugs and lacewings.

Further studies concerning insects and their control are needed, and it is expected that control methods for some species of insects will be required.

Damage Caused by Animals

The foliage of jojoba plants may be eaten by cattle and deer, especially when range pasture is limited. Cattle may be kept from plantings with fencing, but preventing deer from causing damage is difficult.

Rabbits may feed on young stems just above ground level, leading to death of the plants. Rabbits can be controlled with special fencing or by trapping.

Ground squirrels and birds often dig in the soil and feed on recently planted seed.

Coyotes and rabbits often damage drip irrigation tubing in their search for water.

Diseases of Jojoba

Jojoba appears to be relatively free from diseases in native stands, but it is known that several pathogens may cause losses. Several soil-borne fungi, including *Phytophthora, Pythium, Rhizoctonia,* and *Fusarium* have been isolated from naturally infected plants in Arizona. Organisms that may attack foliage are *Alternaria, Coniotherium* and *Strumella.* In established stands, root diseases are expected to be of greater significance than foliar diseases. Further studies concerning jojoba diseases in cultivated plantings will be needed to facilitate domestication of this plant.

Pruning and Training

Mechanical harvesting methods for jojoba are being developed. Plants in native stands usually have a low branching growth habit which is not well suited to mechanical harvest. Plants will need pruning or training so that their growth is more upright if they are to be machine harvested. The pruning method used will be determined by the type of mechanical harvester. Since the wood of jojoba plants is brittle, several stems should be left on each plant to provide support for one another. Pruning bearing branches may encourage development of new growth to produce fruits the following year, but the effects of pruning are not known yet. Detailed pruning studies must wait until the development of plants that are genetically uniform.

Harvest

At present, all jojoba seed is harvested by hand. Where plants are high-yielding and closely spaced in native populations, an experienced, hard-working picker may harvest 4-5 or more pounds of seed per hour. Fruit of some plants shatter and seeds drop to the ground. On some other plants fruit cling very tenaciously to the plant, making harvest difficult.

Ultimately, it is hoped that jojoba can be harvested by machine; for this will be the only way that large scale production can be competitive in the United States. Mechanical harvesting methods are being researched but completely satisfactory harvesters are not yet available. It will be necessary to develop plants that mature seed uniformly and to eliminate plants whose seed either shatters or is held too tenaciously. Selected vegetatively propagated plants with these characteristics and higher yields should be available to growers in from 2 to 5 years. With mechanical harvesters it will probably be necessary to harvest each plant at least twice, as is usually done for cotton.

Data concerning yield of established cultivated jojoba plants in Arizona are not available. Estimates of probable yields from good stands of 10 year-old cultivated plants, receiving excellent care, range from less than 1,000 to more than 3,000 pounds of clean seed per acre.

Jojoba Wax and Meal

The cotyledonary cells of jojoba seeds are filled with a liquid wax which accounts for about 50% of the weight of seeds. The wax of jojoba is not a fat as in the case of cottonseed, safflower or soybean oil. The wax is clear and odorless and the molecules are somewhat larger than those obtained from sperm whale oil. However, characteristics of sperm whale oil and jojoba wax are similar.

Most of the jojoba wax now produced is used to manufacture cosmetics. With increased production, wax is expected to be used as an anti-foaming agent in certain pharmaceuticals and in the manufacture of high temperature, high pressure lubricants, adhesives and plastics. When hydrogenated, jojoba wax is hard and has a melting point of 158F. Hydrogenated wax is suitable for the production of quality candles and polishes. Jojoba wax to be used as a lubricant is sulfurized. It then remains as a very stable liquid and maintains its viscosity over a wide temperature range. It can be stored for years without becoming rancid.

The wax of jojoba may be obtained by applying pressure to seeds or by the use of solvents. The meal remaining after wax removal contains 26%-32% protein and may become a valuable feed resource. The meal however, contains a toxin that must be removed before the meal wax may be used for livestock feed. Uses for the hulls, which contain about 7% protein, may also be identified.

OLD SALEM BOXWOOD WORKSHOP

Professor Albert S. Beecher

Photo-Courtesy Old Salem Restoration, Winston-Salem, NC

Main Street of Old Salem near Salem Square showing two guides dressed in costumes typical of the early period.

The culture of boxwood, use of boxwood in the landscape design and control of boxwood diseases and insects were discussed at the workshop held in October at Old Salem, Winston-Salem, North Carolina. The program was sponsored by the American Boxwood Society in cooperation with the Department of Horticulture at Virginia Polytechnic Institute and State University and the Extension Service, North Carolina State University. In attendance were members from Virginia and North Carolina.

The morning session was moderated by Prof. James A. Faiszt, Extension Horticulturist from Virginia Polytechnic Institute and State University and a newly elected Director of the American Boxwood Society. Arthur Spaugh, Director of Old Salem Inc. extended greetings and indicated that Old Salem is a restored Moravian Congregation town located inside the modern city of Winston-Salem; it covers an area of approximately fourteen city blocks. Old Salem, Inc., a non-profit educational corporation founded in 1950, is the major institution responsible for preserving and restoring the buildings and the landscape inside the historic district. The corporation operates several museum houses which are open to the public and is involved in an active program of research, publications, exhibits, tours and classes.

The first speaker at the morning session was Dr. Vinny Bonaminio, Extension Horticultural Specialist, Nursery Crops, North Carolina State University. He discussed boxwood species and cultivars and general plant culture. His remarks will be found elsewhere in the *Boxwood Bulletin* in an article entitled "Planting and Care of Boxwood Around the Home."

Dr. Ron Jones, Professor of Plant Pathology at North Carolina State University, followed and discussed nematode decline and phytophthora root rot. A summary of his comments is also contained in the article referred to above.

Control for the boxwood leaf miner, psyllid, spider mite and Japanese wax scale was covered by Dr. Jim Baker, Professor of Entomology at

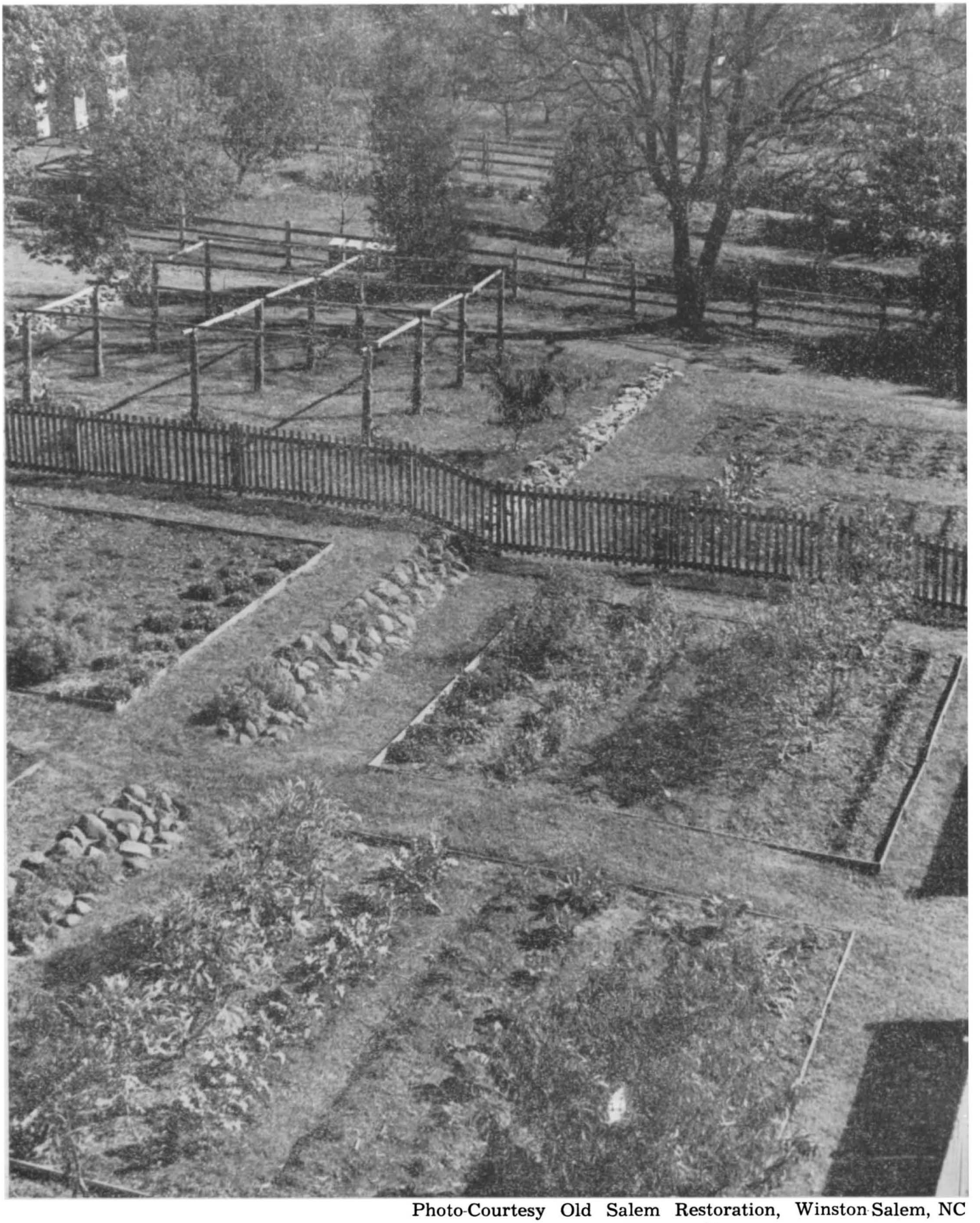

Photo-Courtesy Old Salem Restoration, Winston Salem, NC

Participants to the Boxwood Workshop at Old Salem had the opportunity to visit the gardens that have been recreated. The typical gardens were divided into four or six squares separated by walks of grass or tanbark. Vegetables, herbs and flowers were often grown together in the garden with fruit trees or grape arbors spaced around the the edges or to the rear of the lot.

North Carolina State University. A summary of his recommended control measures is included in the article "Planting and Care of Boxwood Around the Home."

The final presentation of the morning session was on Propagation by Tom Ewert, a Director of the American Boxwood Society. Tom has appeared at several previous workshops where he has discussed the propagation of boxwood by seed or by cuttings. His remarks are not recorded here, but new members who are interested in boxwood propagation should read his paper printed in the *Boxwood Bulletin,* Volume 18, No. 4, April 1979, pages 69 and 70 or the report of the Scotchtown Workshop that appeared in the *Boxwood Bulletin,* Volume 20, No. 2, October 1980, pages 28-30.

The afternoon session was moderated by Albert S. Beecher, immediate Past President and also a Director of the American Boxwood Society, who first introduced Flora Ann Bynum, Chairman for the Landscape Restoration Committee of Old Salem. She presented a most interesting illustrated lecture on the history of Old Salem outlining the various restoration activities. She reported that Old Salem, Inc. was chartered in 1950 and is responsible for the restoration of the Moravian Congregation town of Salem founded in 1766.

Since the restoration project began, 108 properties in the historic area have been acquired by purchase, gift, or lease; about 100 non-conforming structures have been demolished; 57 buildnigs have been restored. Eight buildings, restored and furnished authentically, are open to the public every day except Christmas Day: Single Brothers House (1769 and 1786), Miksch Tobacco Shop (1771), John Vogler House (1819), Winkler Bakery (1800), Boys School (1794), Salem Tavern (1784), Market-Fire House (1803), and Schultz Shoemaker Shop (1827). Other restored buildings have been adapted on the inside for use as dwellings, shops, or offices.

The education program of Old Salem, Inc. serves more than 40,000 school children annually with special tours and, with the new workshop facilities, is expanding opportunities for both students and adults.

Old Salem, Inc. also owns and operates the Museum of Early Southern Decorative Arts, consisting of period rooms from Southern homes dating from the 1600s to 1820, which are open to the public. In addition, the museum has an extensive program of research.

Old Salem Enterprises, Inc., a wholly-owned subsidiary, operates the Old Salem Store, Salem Community Store, and Winkler Bakery.

Capital funds for the restoration and museum have been donated by individuals, corporations, businesses, and foundations. Operating income is currently derived from fees, rents, endowment, grants-in-aid from the State of North Carolina, the City of Winston-Salem, and Forsyth County, and a special grant from the Institute of Museum Services. Another major source of needed operating funds is the FRIENDS OF OLD SALEM program, in which individuals, businesses, and foundations contribute annually.

Prof. James A. Faiszt presented an illustrated program on "Boxwood in the Landscape." His slides showed the various ways that boxwood can be used in garden design and in the foundation composition for homes and public buildings. He pointed out that boxwood is often associated with the Colonial architectural period, and often ignored by designers of Contemporary Landscapes. Boxwoods can be successfully used in modern design because there is a wide variety of form and growth found in the many varieties and cultivars of boxwood. It is also a valuable plant because of its color and textural interests. Boxwoods blend and harmonize well with other plants.

The final speaker on the program was Phil Page, Horticulturist for Old Salem, who briefly discussed the gardens that have been recreated by Old Salem. They cover the period of 1759 to 1847. When Salem was a flourishing church town inhabited primarily by skilled tradesmen and their families, each lot in the community included a garden which was maintained year-round and served as the family's main source of food. The typical garden was divided into four or six squares separated by walks of grass or tanbark. Vegetables, herbs, and flowers were grown together in the garden with fruit trees spaced around the edges or to the rear of the lot. One square was often left with grass to serve as a bleaching green.

Following Page's remarks, the group was divided and tours of the gardens were led by Phil Page and Flora Ann Bynum. At the conclusion of the tour many headed for the Winkler Bakery to sample some of the goodies baked in the wood-fired oven.

PARTICIPANTS

Old Salem Boxwood Workshop

October 2, 1981

1. Mrs. Lady Ruth Ellis
   1903 Runnymeade Road
   Winston-Salem, NC 27104
2. Mrs. Robert Massengale
   7 Cobb Terrace
   Chapel Hill, NC 27514
3. Mr. & Mrs. William Massengale
   Box 213, Rt. 1
   Grassy Creek, NC 28631
4. Janet & Greg Rogers
   Route 2, Box 381
   Charlottesville, VA 22901
5. Mr. & Mrs. William N. Mays
   Rt. 5, Box 117
   Amherst, VA 24521
6. Mr. & Mrs. Robert B. Jennings
   2818 Chelsea Circle
   Durham, NC 27707
7. Ms. Linda Gillespie
   40 Marsh Avenue
   Concord, NC 28025
8. Mr. & Mrs. John N. Dorsey, Jr.
   P.O. Box 823
   Pinebluff, NC 28373

9. Ms. Betty Jo Hulin
5809 Tulip Drive
Wilmington, NC 28403
10. Ms. Rita Hulin
5809 Tulip Drive
Wilmington, NC 28403
11. Mr. William B. Graves
Rt. 1, Box 498-B
Mechanicsville, VA 23111
12. Mr. William J. Martin
Rt. 1, Box 470
Thaxton, VA 24174
13. O. Halsey Hill
P.O. Box 8038
Roanoke, VA 24014
14. Andy Boyd
Ext. Agent - Horticulture
P.O. Box 20428
Greensboro, NC 27420
15. Mr. & Mrs. Les Smith
1417 A-Anderson Street
Wilson, NC 27893
16. Mr. & Mrs. Harvey Wiggins
5 Silver Lake Villa
Wilson, NC 27893
17. Jim Loesel
Route 5
Lexington, VA 24450
18. Thomas E. Alexander
Route 4
Lexington, VA 24450
19. Mr. & Mrs. John Boyd
South Boston, VA
20. Mr. & Mrs. L. Vernon Snyder
714 Thornhill
Lexington, VA 24450
21. Bill & Vickie Murphy
Rt. 6, Box 297
Mocksville, NC 27028
22. Buddy Eaton (Boston Nursery)
Rt. 8, Box 170
Mocksville, NC 27028
23. Chris & Carolyn McMurry
Box 871
Lexington, VA 24450
24. Preston Stockton
Reynolda Gardens
100 Reynolda Village
Winston-Salem, NC 27106
25. Fred Miller
1450 Fairchild
Winston-Salem, NC
26. Ms. Brenda McDonald
Rt. 1, Box 613
Halifax, VA 24558
27. Mrs. Lee T. Wray
2007 Westmoreland Street
South Boston, VA 24592
28. Mrs. Sue O. Whitehead
4057 Beaver Brook Rd.
Clemmons, NC 27012
29. Mrs. Susannah Watson
2300 Princess Anne
Greensboro, NC 27408
30. Russell Lyday
Rt. 4, Box 62
Advance, NC 27006
31. James W. Keesee & Goldie
P.O. Box 66
Gretna, VA 24557
32. Ms. Ruthie Kirk
1216 Brookstown Ave.
Winston-Salem, NC 27101
33. Albert S. Beecher
807 Sunset Drive, SE
Blacksburg, VA 24070

SPEAKERS

Dr. Vinny Boniminio - Horticulture Spec.
NC State University
Raleigh, NC

Dr. Ron Jones - Plant Pathology
NC State University

Dr. John Baker - Entomologist
NC State University

Mr. Phil Page - Horticulturist
Old Salem, Inc.
Winston-Salem, NC

Mrs. Flora Ann Bynum, Chairman
Landscape Restoration
Old Salem, Inc.
Winston-Salem, NC

James A. Faiszt - Ext. Spec.
VPI & SU
Blacksburg, VA 24061

Thomas E. Ewert, Director
Blandy Experimental Farm
Boyce, VA 22620

MAILBOX

Old Salem, Inc.
Drawer F, Salem Station
Winston-Salem, NC 27108

Albert Beecher
807 Sunset Drive, SE
Blacksburg, VA 24060

Dear Mr. Beecher,

I agree with you that the Boxwood Workshop was a success and I hope you will consider using our facilities for any functions of a horticultural nature in the future. We are always glad to share Old Salem with groups such as yours and we certainly benefited from such an educational and professional program. Please thank Mr. Faiszt for all he did to make the day a success. Enclosed are three black and white photos I hope you can use for the *Boxwood Bulletin.*

Sincerely,
Philip Page
Horticulturist

BLANDY FARM HOLIDAY GREENERY WORKSHOP

Jane Harris Ghramm

It was cold and blustery outside, but warm and spirited inside, as Blandy Farm hosted their 10th annual Holiday Greenery Workshops. This year, for the first time, the American Boxwood Society graciously consented to co-sponsor the workshops so that the costs would not rise prohibitively. They were held in the library at Blandy on December 5 and 12 with Kay and Tom Ewert directing the participants as they completed four holiday projects.

Many folks sign up year after year for a variety of reasons — to enjoy a full day of new and old friendships against a background of warming fires and Christmas carols; to complete a large portion of their Christmas decorations weeks in advance; to learn new ways of using natural plant materials in decorative and imaginative ways. Indeed, the skills learned in these sessions can be used successfully all through the year.

The sessions began with hot coffee or tea and doughnuts. The registrants are then ready to begin the first of two projects done before lunch. This year, a small wicker basket, styrofoam, baked whole nuts, and small pine cones, pods, acorns, and burrs were used to create a Nut Basket. This can be used year after year: if a piece falls off in storage, it can easily be glued back on.

The second project, an annual favorite, was a Pine Cone Wreath made with various cones picked up at Blandy Farm. About thirty large cones are needed for each wreath, as well as the participant's own choices of wisteria pods, small cones, mixed nuts or any dried plant material in beige or brown hues. Linoleum glue is used to attach the smaller cones, etc. to the main body of the wreath, the base of which is wire. The large cones are twisted forcefully into the sections of this wire wreath base, and the gaps filled in with the other materials. Both this project and the Nut Basket should be sprayed with clear acrylic or polyurethene at the finish.

Upon completion of these two rather messy projects, the participants, 15 strong on December 5 and 29 strong on December 12, enjoyed a delicious luncheon of hot broccoli casserole, chicken salad, warm, buttered, homemade rolls, and pumpkin pie with coffee — all immeasurably enhanced by a large crackling fire in the Blandy Farm dining room. The highlight of the day for many participants was the completion of their Fresh Green Wreaths, most of which are proudly hung on front doors to greet all holiday visitors. Kay Ewert very patiently showed everyone a fail-safe technique for making a lovely red bow, while Tom Ewert discussed the merits of membership in the American Boxwood Society and distributed literature.

Upon choosing their favorite greens from a fine variety pruned from Blandy's specimens, the members of the group eagerly began forming small bunches and wrapping the greens onto a wire wreath frame with waxed green cord. Boxwood, pine, spruce, juniper, arborvitae, yew, and fir species were used to great advantage in the wreaths. The bows were wired on, and the group told to spray the wreath with water periodically to help retain its freshness. The greens can be discarded at the end of the holiday season and the bow and wire frame used again.

The fourth and final project was a Fresh Green Table Arrangement. Each person was provided with a low oblong plastic container filled with soaked oasis, a candle and a glass chimney. They then picked out branches of their favorite greens from the above listed selection, cleaned the stems, and arranged sprigs of greens around the chimney and candle, which were set into the center of the oasis. Color was added to the arrangement through use of berries, flowers, Christmas decorations, pine cones, and candles. If the oasis is kept soaked, this table decoration should last all through the holiday season.

Our sincere thanks to the American Boxwood Society and the Ewerts for helping us to appreciate the usefulness and beauty of natural plant materials.

(Editor's Note: Mrs. Ghramm is an American Boxwood Society member who lives in Boyce, Va. Mrs. Ghramm's mother from New York, while visiting during the Thanksgiving holidays, attended the first session of our Holiday Greenery Workshops. Mrs. Ghramm accompanied her mother and provided us with the following account of the workshop. We appreciate her help.)

Annual Meeting

American Boxwood Society

May 12, 1982

Please Put It on Your Calendar

WINTERTHUR CONFERENCE MARCH 27 EXPLORES "COLONIAL REVIVAL GARDENS: REAL AND ROMANTICIZED"

WINTERTHUR, DE — The Winterthur Museum's annual gardens conference, scheduled for Saturday, March 27, will examine the influence of the colonial revival movement in America on gardening from the late nineteenth through the twentieth centuries. "Colonial Revival Gardens: Real and Romanticized" will feature four expert speakers in the one-day program. The public is invited to attend.

The development of early colonial restorations, including Colonial Williamsburg, and their influence on the public's later understanding of colonial gardens will be the topic for keynote speaker Charles B. Hosmer, Jr. of Principia College in Elsah, Illinois. Philadelphian Elizabeth P. McLean, a garden historian, will discuss what is known about plants of both the colonial and colonial revival periods, based on gardens in the Philadelphia area. The architectural firm of Mellor, Meigs, and Howe and its influence on early twentieth-century Philadelphia homes and gardens will be the target of Sandra L. Tatman's talk. She is an architectural historian at the Athenaeum in Philadelphia. Landscape architect Rudy J. Favretti of the University of Connecticut will show how colonial influences still appear in current garden designs. He also will discuss the ongoing re-evaluation of colonial and colonial revival gardens.

"Colonial Revival Gardens: Real and Romanticized" is being chaired by Philip G. Correll, coordinator of gardens education programs. Pre-registration is requested, by writing the Education Division, Winterthur Museum and Gardens, Winterthur, DE 19735 (302) 656-8591. The conference fee is $10.00 for the public; $8.00, Winterthur Guild members; and $5.00, students. The Winterthur Museum is located on Route 52, six miles northwest of Wilmington, Delaware.

CONTACT: Catherine Wheeler or Janice Clark, Public Relations Office, Winterthur Museum and Gardens, Winterthur, Delaware 19735. (302) 656-8591.

ABS MEMBERSHIP LIST

Names not included in the Membership List published in *The Boxwood Bulletin,* Volume 21, No. 2, October 1981:

Nelson, Mr. Donald M.
Pouder, Mr. George
Stewart, R. Calvert

New members of the ABS since the published membership was compiled:

Alford, Thomas
Bishop, Russell O.
Brown, J. W., Jr.
Clement, Stephen
Cockrill, Richard
Davis, Mrs. Dolphin A.
Demyttenaere, Jules H. Capt.
Farmakides, John
Grillo, Samuel A.
Gundlach, Mrs. Joe
Harrison, George T.
Hewitt, Mr. & Mrs. Charles L.

Membership, Continued

Holder, Mrs. James S.
Hunt, Ms. Leslie
Knight, Edward L.
Knight, John L.
Lapez, Mrs. Alan C.
McKlveen, Rachel
Parrish, Mr. & Mrs. James L.
Plymate, Joseph A.
Rieser, Maxmillian
Skow, Robert
Stolz, John C.
Wood, Wm. T.
Young, Sara

MAILBOX

Boxwood Exchange Proposed

Editors Note: In the letters reproduced Mrs. George B. Knowles, Jr. of the Buzzards Bay Garden Club indicates that her garden club members would be interested in exchanging rooted boxwood cuttings from other parts of the country.

However in order to ship cuttings it would be necessary for each shipper to have a certification label indicating that the cuttings were free of injurious insects or plant diseases. It is illegal for the post office to accept packages or plants without the proper certification label.

Contact your State Entomologist to obtain the location of your nearest Nursery Inspector. If you do not know the address of your State Entomologist address your inquiry to your state Department of Agriculture. Your County Extension Agent may also be able to help you locate the nearest Nursery Inspector.

Mrs. George B. Knowles, Jr.
Numquid Farm, Box 126P,
South Dartmouth, MA 02748

American Boxwood Society
Boyce, Va.
Dear Professor Beecher:

The Garden Club of Buzzards Bay members are extremely pleased and honored that our Symposium was published in its entirety. Thank you!

Hopefully, we will have rapport with other Boxwood enthusiasts. It would be most interesting to have an exchange of cuttings experimenting in different zones.

Most Sincerely
Edith P. Knowles
(Mrs. George, Jr.)

June 3rd.

American Boxwood Society
Boyce, Va.
Dear Professor Beecher:

I received your letter of June 22, 1981. Yes, you may print the letter in the *Boxwood Bulletin.*

The Cuttings Exchange would be a very interesting project. I assume contact by letter would be the first step. I do not know about other State laws, but, in Massachusetts, we are required to have the Inspector of Agriculture from Waltham, Mass. examine the plants from which cuttings are taken. He does this for us most amiably, and gives us labels and stickers for shipping.

Sincerely,
Edith P. Knowles

June 25, 1981

THE AMERICAN BOXWOOD SOCIETY

INFORMATION

Address: Box 85, Boyce, Virginia 22620

DUES AND SUBSCRIPTIONS

Regular membership dues of The American Boxwood Society are now $5.00. This includes a subscription to *The Boxwood Bulletin.*

Non-member subscriptions are for groups and institutions such as botanic gardens, libraries, etc. These are $6.00 a year, and run by the calendar year.

The Boxwood Society year runs from one Annual Meeting to the next; from May of one year to May of the next year. Those joining the Society at other times are sent all the *Boxwood Bulletin* issues for the current Society year, beginning with the July number. Their dues are then again due and payable in the following May. This was voted by the Society in order to lighten as far as possible the heavy work load of our busy Treasurer.

At the present time any or all *Bulletins* are available, back to Vol. 1, No. 1 (Vol. 1 consists of three issues only, there was no Vol. 1, No. 4). Price per single copy is $1.50.

Besides regular membership dues at $5.00 per year, there are other classes of membership available: Contributing, $10.00; Sustaining, $25.00; Life, $100.00; and Patron, $500.00.

Contributions are welcome for the Research Fund, the Boxwood Memorial Garden, and the Boxwood Handbook.

Gift memberships are announced to the recipients by boxwood-decorated cards which carry the information that *The Boxwood Bulletin* will come as your gift four times a year.

Members of The American Boxwood Society are reminded of the 1968 IRS decision that contributions to and for the use of the Society, are deductible by donors as provided in Section 170 of the Code.

FOR YOUR ADDRESS BOOK

If your letter is concerned with

- Membership, new or renewal
- Payment of dues
- Donations to research programs
- Change of address
- Gift Membership
- Ordering back issues of the Bulletin
- Ordering Dr. Wagenknecht's List

- General information about the Society
- Advice concerning boxwood problems or cultural information
- Boxwood selection
- Memorial Gifts

Write to:

American Boxwood Society
Box 85
Boyce, Virginia 22620

In some cases, depending upon the nature of your request, your letter may be forwarded to a member of the Board or another appropriate member who can provide the help you have requested.

You are also welcome to write directly to the president of the American Boxwood Society:

Mr. Richard D. Mahone
P. O. Box 751
Williamsburg, Virginia 23185

If you have contributions for the Boxwood Bulletin - articles, news notes, photographs, suggestions of anything of probable interest to boxwood people, it saves time to direct them to the Editor:

Mrs. Charles H. Dick, Editor
The Boxwood Bulletin
514 Amherst Street
Winchester, Virginia 22601

or

Mr. Scot Butler
Chairman of the Bulletin Committee
P. O. Box 184
Bluemont, Virginia 22012

BOXWOOD–

A heritage from Yesterday

A privilege for Today

A bequest for Tomorrow