Horticulture in Michigan and at Michigan State University

HISTORY
Michigan State Univ. (MSU) has a long history of rendering outstanding service to the citizens of Michigan, the nation, and the world. Founded in 1855 as the Agricultural College of the State of Michigan, the teaching institution soon began its tripartite mission of instruction, research, and public service. In 1862, the college became a prototype for the 68 land-grant colleges established under the Morrill Act. Now, 132 years later, MSU has 11 baccalaureate-granting colleges that offer more than 125 programs, many of these offering multiple fields of concentration, and an enrollment of ~42,000 students.

Horticulture has been taught at MSU since the university first opened with 63 students. Initially, botany and horticulture were taught in the same department and did not become separate departments until 1883. William J. Beal, who became Professor of Botany and Horticulture and Superintendent of Grounds in 1872, was responsible for expansion of research and teaching activities until his retirement in 1910. Beal took on additional duties in 1875 when he became Curator of the Botanical Garden. In 1885, Liberty Hyde Bailey, first ASHS President, became a Professor of Horticulture and Landscape Gardening and Superintendent of the Horticulture Dept. Bailey, an outstanding teacher, researcher, and author, became known as the "father" of American horticulture. Bailey designed Eustace Hall, which is the first building in the United States to be used solely for the study and teaching of horticulture. Bailey, however, had left for Cornell Univ. by the time the building was occupied in Spring 1889.

HORTICULTURE IN MICHIGAN
Agriculture and agriculture-related enterprises represent the second largest industry in Michigan. The stability of the agricultural industry in Michigan is due in large part to a diversified crop base. This diversified crop base is coupled with leading or second-leading state status for many horticultural commodities. Michigan ranks first in the production of pickling cucumbers, tart cherries, blueberries, and second in the production of lilies, geraniums, apples, and bedding plants. The Michigan floral industry employs 7000 people and has a wholesale value of about $86 million. Michigan's fruit production (tart cherries, blueberries, apples, sweet cherries, grapes, peaches, plums, pears, and strawberries) accounts for about $200 million in revenues for farmers. Michigan vegetable growers annually produce more than 11 million hundred-weight of the fresh and processing vegetables, with a total market value in excess of $130 million. Michigan is also ranked within the top five states in the production of celery, asparagus, carrots, processing green beans, and processing tomatoes. Other major crops include onion, sweet corn, cauliflower, cabbage, fresh-market tomatoes, and green peppers. The state's landscape/nursery industry is valued at more than $100 million, ranking it within the top 10 states in the nation.

NEW BUILDING
In 1986, MSU dedicated its new Plant and Soil Sciences Building, which houses both the Horticulture and Crop and Soil Sciences Depts. (see front cover). This unrivaled, state-of-the-art facility comprises more than 2.4 ha (6 acres) of floor space. The building has a 9150 m² (30,000 ft²) computer-controlled teaching greenhouse, 59 controlled environment rooms, and a central location that can house up to 75 growth chambers. Other joint areas between the two departments include a graphics center, computer center, reading room, auto-tutorial room, seed storage, low temperature laboratory, cytology/histology laboratory, autoclave and dishwashing rooms, and eight conference rooms. Many of the 1988 ASHS activities will take place in this new facility.

TEACHING PROGRAMS
MSU's Horticulture Dept. offers three programs to train students in the technology and marketing required to understand today's and tomorrow's production and promotion methods. The BS program is a 4-year curriculum in which the student takes courses in a variety of areas, including mathematics, chemistry, computer science, economics, and communications. Complementing courses must also be taken in botany, plant physiology, soil science, entomology, and plant pathology. By the junior year, students specialize both in commodity (floriculture, landscape horticulture, vegetable crops, or pomology) and in "option" (minor) areas (production, business, science, design, international, pest management, or teaching certification). For those students seeking practical "hands-on" training and employment skills, the Institute of Agricultural Technology offers a technical 18-month program in three areas—commercial floriculture, landscape and nursery, and fruit and vegetables. This certified program combines the theories and principles of classroom instruction with a supervised internship experience.

Beyond the BS program, the Dept. of Horticulture offers graduate programs leading to MS and PhD degrees in countless subjects, ranging from growth regulator biochemistry to computer growth modeling. Within the Dept. of Horticulture, students can major in the interdepartmental Plant Breeding and Genetics Program. Intensive research areas of this program include cell fusion, stress resistance, evolutionary and physiological genetics, and fruit, vegetable, and flower breeding.

Students participating in these programs are provided with excellent facilities, which include: 0.40 ha (1 acre) of computerized greenhouses, separate cold storage, photoperiod, seed storage, and germination rooms; a retail floriculture teaching lab and flower shop; landscape design studio; and numerous teaching plots, both around the building and at four outlying research farms. Specialized equipment capable of conducting chemical analysis to DNA cloning is available in the laboratories. Finally, with the move to the new building, graduate students can take advantage of the close proximity to the Plant Research Laboratory, Dept. of Botany and Plant Pathology, Pesticide Research Center, and the Biochemistry Dept.

RESEARCH PROGRAMS
Agricultural Experiment Station appropriations for research in Michigan's agriculture represent a substantial investment in the state's future. Every dollar invested shows at least a 50% annual return. Many of the members of the horticulture department have contributed to this growth through a commitment to mission-oriented basic research relating to enhancement of food production. A sampling of these accomplishments include: a) the introduction of trickle irrigation in the 1970s, which allowed orchard expansion to otherwise unusable sites, improved yields, and reduced losses following transplanting; b) discovery and application of hormones for controlling plant growth; c) development of mechanical harvesting for cucumbers, tomatoes, blueberries, grapes, apples, and cherries; d) development of the 'Redhaven' peach, the most widely grown peach in the world; e) winery expansion using French grape hybrids; and f) reductions in production and energy costs that have enabled Michigan's bedding and pot plant industry to become number two in the nation.

New frontiers in research being explored include cellular approaches to plant breeding, greater photosynthetic efficiency, natural compounds with herbicidal activity, parasite-derived resistance, leaf surface characteristics as they relate to spray absorption and activity, and computer-modeled controlled environments for plant production.

EXTENSION PROGRAMS
The third aspect of MSU's tripartite mission is extension. The delivery of the infor-

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mation gained from laboratory and field experiments to those who can use it is an important aspect of the Dept. of Horticulture. The department’s commitment to the extension mission is signified by the philosophy that every faculty member participate in extension activities when appropriate to provide their specific expertise directly to the grower/user clientele. Narrowing the gap between the horticulture user and the current technology, plus shifting to state-of-the-art computer information delivery systems, are two of the main extension goals. Extension demonstration plots often double as applied research plots. Annual Fruit and Vegetable Crop Schools teach the “science” behind fruit production, not just “how-to.” Spartan Ornamental Network (SON), a computerized communications system, keeps county staff and growers up-to-date on the latest production and marketing information. Information available includes a bulletin board for tips of the week, major problems, lab reports, buy-sell, calendar of events, available extension bulletins, and trade association information. Programs available include Agweather, Consult, Grower Guides, Home Horticulture, Hortmath, Landscape Selector, Ornamental Landscape Plants, Growing Perennials, Plant Problem Control, Greenhouse Lighting Program, and the latest insect and disease control information.

THE CAMPUS

Often described as one of the nation’s most beautiful campuses, MSU, located on the banks of the Red Cedar River in East Lansing, reflects more than a century of dedication to landscape beauty. Continued efforts have been made to display the widest possible variety of trees, shrubs, and woody vines adapted to Michigan’s climate and the collection includes more than 7700 woody species and cultivars. Along more than 96 km (60 miles) of campus walks, one can enjoy the vast assemblage of plantings, which are organized in one or more of three typical arboretum categories: 1) synoptic groupings reflecting botanical relationships such as lilies and crab apples; 2) ecological groupings based on habitat requirements, such as acid soil or bottomland plants; and 3) ornamental groupings illustrating landscape principles, such as screen plantings, ground cover plantings, and vine plantings. One of the most unique gardens on the MSU campus is the Beal Botanical Garden. Established in 1873 by Prof. William J. Beal, it is the oldest continuously operated botanic garden in the United States. It covers about 2 ha (5 acres), with more than 5500 species and cultivars including systematic, economic, and geographical–ecological collections.

The Horticulture Gardens, 0.8 ha (2 acres) of landscape plantings of annuals and perennials, is at its colorful peak in August. The Gardens are the site of an All-American Selections (AAS) flower trial garden, one of 33 in the United States and Canada. About 50 AAS entries and more than 900 cultivars of flowering annual and perennial plants are tested. In 1981, MSU was selected as a site for an All-American Rose Selection Demonstration trial, and the roses for this trial are also grown in these gardens. The Horticulture Gardens will be relocated beginning in 1988 to a 2.2-ha (5.5-acre) site surrounding the new building. The formal garden design will make this one of the finest display gardens in the United States. Other annual flower seed cultivars are planted around the Administration Building, Library, Sleepy Hollow across the street from the Library, and the Wharton Center for the Performing Arts.

The Clarence E. Lewis Landscape Arboretum is a newly developed 2.4-ha (6-acre) tract dedicated to giving landscape horticulture students opportunities to design, construct, and maintain various types of landscapes. It will ultimately contain a rotating collection of 30 different landscape areas. Students will be able to monitor the development of plant compositions for several years, noting changes in appearance as a function of time and routine maintenance.

In addition to designed plantings, the campus is endowed with a diversity of woodlands and wetlands supporting indigenous vegetation. Three of these are within walking range of the central campus. The Baker Woodland is 31.6 ha (78 acres) of mixed, upland, hardwood forest. The 20-ha (50-acre) Red Cedar Natural Area consists of a floodplain forest with heavy regeneration stimulated by loss of mature elms to Dutch elm disease. Finally, the Sanford Natural Area is 17 ha (42 acres) of upland ash floodplain forest.

Eustace Hall to the Plant and Soil Sciences Building, flower gardens and arboretums to woodlots and wilderness areas—all of these represent the commitment to horticulture on the MSU campus. It is this history and commitment to the future that we wish to share with attendees at the 1988 meeting of ASHS and The Canadian Society of Horticultural Science.

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