

# Pennsylvania-The Keystone of Horticulture

The Pennsylvania State University was originally chartered by an act of the legislature of the Commonwealth of Pennsylvania on 22 Feb. 1855. The name "The Farmers' High School" was selected to show ordinary farmers that the institution was to be different from classical colleges and hence merited their support. After considering several sites in central and western Pennsylvania, the trustees, in Sept. 1855, voted to build the new school on a 200-acre tract in Centre County that was donated by a local ironmaster and agriculturist. This site was chosen because it was considered sufficiently rural that students would be free from the distractions and temptations of large cities. The first class of 69 students enrolled in Feb. 1859. The name was changed to the Agricultural College of Pennsylvania in 1862 and was soon expanded to include other areas of study. In the 1870s it became known as The Pennsylvania State College, one of the three original colleges offering studies in scientific agriculture that surpassed anything then available in the United States. Penn State Univ. was the first American institution of higher education to offer a Master of Scientific Agriculture.

The College of Agriculture is considered the "hearthstone" of the institution. Around it has grown the family of colleges that make up the university. The School of Agriculture was designated in 1869. The Dept. of Horticulture can trace its independent existence to 1907, when Dean Thomas F. Hunt reorganized the college to create seven undergraduate departments in the College of Agriculture. Further reorganization created the present College of Agriculture in 1953. It now includes 11 academic departments and the School of Forest Resources.

The Dept. of Horticulture has had a strong tradition in the shaping of the college. William G. Waring was the first instructor of horticulture and superintendent of the gardens and nurseries. The trustees commissioned Professor Waring to begin preparations for agricultural experiments in 1857. He began his research with fruits and vegetables, and planted the first fruit orchard on campus in 1865. Of the 12 deans of the College of

Agriculture since 1895, four have been former chairmen of the Dept. of Horticulture, and two others were faculty with horticulture responsibilities.

## Pennsylvania horticulture industries

The outstanding features of commercial horticulture in Pennsylvania are its balance and diversity. All major commodity groups are well-represented and all benefit from the research and education programs of Penn State's Dept. of Horticulture. Pennsylvania is among the top states in terms of the combined number and scope of its horticultural industries. The soils, climate, and abundant water resources in the state result in the successful growth of many edible and nonedible crops, maintaining a large and diverse production industry. Additional processing and related handling industries use many of the crops as well.

Geography and topography have contributed to the diversity of the horticulture industry in Pennsylvania. Pennsylvania is situated between two major population belts—the Washington, D.C., to Boston and the Buffalo to Chicago corridors. These belts include 120 million people, or nearly 50% of the U.S. population, and provide a ready outlet for Pennsylvania products. In addition to the proximity of domestic markets, the ports at Philadelphia and Erie, Pa., provide access to international trade via ocean shipping routes. Topographically, the state is traversed by numerous Appalachian Mountain ridges running from southwest to northeast. The ridges provide shelter in some areas from the harsh prevailing winds and create abundant sites for horticultural crop production, as well as scenic vistas. Pennsylvania, although located in the populous northeastern United States, is largely rural; one-third of its population is classified as rural and nearly 58% of the land is covered by forests. The Dept. of Horticulture has a long history of commitment to and close working relationship with the commodity groups within the state. The State Horticultural Assn. of Pennsylvania, the oldest commodity organization in the state, has been in existence and has met annually since 1859.

## Floriculture

The 1989 Floriculture Crop Report indicates that Pennsylvania has  $\approx 5.2$  million  $m^2$  (17 million  $ft^2$ ) of floricultural greenhouse production space, placing Pennsylvania seventh in the United States in greenhouse hectareage. It is estimated that there are, at present,  $\approx 700$  greenhouse-flower growers, including more than 200 growers who also produce in excess of 120 ha (300 acres) of flowers outdoors for the fresh market or for dried ma-

terials. Although cut-flower production in Pennsylvania has declined dramatically in the past two decades (much of it is being replaced by imported flowers), the state still ranks second nationally in the production of standard chrysanthemums and roses. Most Pennsylvania growers produce only potted plants and bedding plants. Pennsylvania rank second nationally in the production of potted geraniums and poinsettias, and in the top 10 for most other potted and bedding crops. The importance of herbaceous perennials in containers has increased in the past 5 years. At the same time, growing specialty crops such as African violets and orchids remains profitable. The wholesale value of Pennsylvania floral crops reported for 1988 in the Floriculture Crops Report is \$93 million.

Statistics alone present an incomplete picture of the Pennsylvania floral industry. There is a strong regional distribution of the industry in Pennsylvania, with most production occurring in eight counties surrounding Philadelphia. Other important regions are in the southwestern part of the state, near Pittsburgh, and in the northeast, in Luzerne and Lackawanna Counties, near Wilkes-Barre and Scranton. Columbia County and others in the rural northcentral part of the state are more recently becoming important flower production areas. The age of the average firm, firm size, and the use of new technologies vary with the region.

In the future, there is potential for the development of additional floricultural enterprises in Pennsylvania to fill consumer needs for fresh floral products grown locally. A number of large production firms may switch between flowers and vegetables at various times of the year, and outdoor production of fresh and dried floral products is expanding.

Pennsylvania has a large number of power plants that generate heated waste water from cooling that can be used to heat greenhouses. Greenhouses using waste heat have started in Columbia and Indiana Counties, and others are being developed. This situation seems somewhat unique to Pennsylvania. It is estimated that the waste water from some of these power plants can each support as much as 40 ha (100 acres) of greenhouses.

Future industry growth in Pennsylvania will depend on the adoption of technologies that increase production efficiency, market development to increase demand, integrated communications in the distribution channels, quality transportation, and a regulatory environment within the state that is conducive to the profitable operation of floral businesses.

## Fruit crops

*Tree fruit industry.* Tree fruit production in Pennsylvania is a major industry, with a farm gate crop value of about \$79 million. In addition to this value, three large fruit processing companies significantly increase the value of the crop and add to the Pennsylvania economy. The yearly average value of the used production of the tree fruit crops for 1988 and 1989 was estimated in excess  
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Cover: Research plantings at Rock Springs, Pa. 'Delicious' (Campbell) and 'Golden Delicious' (Gibson) on M.27 planted in 1983 and spaced 1 m in the

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of \$1.8 billion. About 60% of the apples produced in the state are processed either for on-farm retail (cider or baked goods) or for the commercial production of sauce, slices, and juice. The presence of a large processing industry was an integral part in the development and continuation of the Pennsylvania tree fruit industry. The largest commercial processor had gross sales of \$160 million for 1986-87. Pennsylvania ranks fourth or fifth, depending on the year, in apple and peach production in the United States, fourth in grape production, eighth in pear production, sixth in tart cherry production, and ninth in sweet cherry production. Total commercial hectareage for all tree fruit in 1987 was 17,270 (42,650 acres), down 4% from 1982. Numbers of trees, however, continue to increase; nectarines lead, with a 56% increase, followed by sweet cherries with 38%, tart cherries with 22%, apples with 13%, and peaches with 11%.

The statistical trends indicate that the hectareage of tree fruit crops will continue to decrease, trees per hectare and the total number of trees increase, but total production will remain steady. Tree fruit are produced in every county of the commonwealth. However, Adams, Franklin, York, Berks, Snyder, Bedford, Erie, Allegheny, Schuylkill, and Lehigh are the major counties that produce tree fruit. A concern in many areas is the increasing urbanization and sprawl from large cities, the subsequent increase in land value, and the problems associated with the urban-rural interface. The Baltimore-Washington corridor, as well as the areas around Philadelphia and Pittsburgh, are regions of greatest concern. There are also recent indications of an increase in the number of part-time diversified farms close to the urban areas. These owners typically will work during the day at another job and tend their orchards at night and on weekends.

**Small-fruit industry.** Few statistics are available on the size and distribution of Pennsylvania's small-fruit (strawberry, bramble, and blueberry) industry. The most recent information estimates strawberry production at 730 ha (1800 acres), while county extension surveys estimate brambles and blueberries at  $\approx$ 202 ha (500 acres) each. The brambles include an unusually high percentage of black raspberries (33%) due to a local preference for this type. While the industry has centers of concentration in the southeastern, central, and southwestern portions of the state, it is widely scattered, with small fruits grown under every diverse soil and environmental condition.

Recently, the pick-your-own strawberry hectareage has decreased due to less consumer interest, but total strawberry hectareage is stable, and good growers are afforded a solid income. The development of micropropagated bramble nursery stock has given that industry new potential, and hectareage is slowly

increasing. Blueberry hectareage is also increasing, but the blueberry industry is currently limited by the number of sites suitable for blueberry production. This crop may see further expansion as genotypes resistant to high soil pH are developed through the U.S. Dept. of Agriculture blueberry breeding program.

Small-fruit production is most limited by labor constraints and, in the case of the raspberry, by poor postharvest longevity. The fact that small fruit potentially has one of the highest rates of return on a land-area basis of any crop grown in Pennsylvania indicates the possibility of future production expansion. The "gourmet" status enjoyed by these crops has produced a large and, to date, unsaturated market. Pennsylvania's challenge will be to produce these fruits at a profit, while competing successfully in a world market.

### **Ornamental horticulture and Christmas tree industries**

Pennsylvania's climate and growing conditions allow for the propagation and production of a wide range of ornamental plant material, from herbaceous perennials to shade trees. Although a majority of the plants are field-grown, there are also many nurseries producing plants in containers. The ornamental horticulture industry in Pennsylvania can be divided into four major components: production of nursery stock and Christmas trees, landscape contracting, landscape maintenance, and retail sales (primarily through garden centers). The wholesale value of nursery stock produced in Pennsylvania is more than \$220 million; in addition, retail sales of nursery stock exceeds \$200 million. The wholesale value of Christmas trees is more than \$100 million. More than 10,000 businesses in Pennsylvania are involved with growing, selling, and maintaining ornamental plants.

Market proximity places Pennsylvania nursery operators in a favorable supply/demand position. They have little problem selling any good-quality plant material they produce. This market also supports retailers and a large and growing landscape design, installation, and maintenance industry segment.

Major changes in the ornamentals industry are revealed by recent statistics: the number of production nurseries increased by only  $\approx$ 8% in 6 years, but the number of retail operations increased 32%; employment in production nurseries increased 11%, while it increased 131% for retail operations. Sales increased only 3.6% for production nurseries, but 116% for retail. Land in nursery use increased 40% for production nurseries and 119% for retail operations. It is obvious that the largest increases in the Pennsylvania nursery industry have occurred in the retail segment. Although wholesale sales of nursery

products have increased only 3.6% in 6 years, Pennsylvania still ranks eighth in the country. The number of Christmas tree growers has increased greatly in the past few years, with more than half the growers in 1985 yet to sell a tree. There is some concern over a glut of trees in the future because five trees were planted in 1984 for each tree harvested in 1983.

### **Vegetable crops**

Production of vegetables is found in all regions of the state, with the majority produced in 34 counties; the other 33 counties have small commercial hectareages of vegetables, generally less than 202 ha (500 acres) per county. The Pennsylvania Dept. of Agriculture reported that nearly 20,250 ha (50,000 acres) were devoted to sweet corn, tomatoes, snap beans, and potatoes in 1988, with a farm value of more than \$58 million. However, the total farm gate value of vegetable crops probably exceeds twice that amount.

The industry in Pennsylvania is characterized by a wide diversity of crops, levels of technology used, and markets. Fresh-market crops account for  $\approx$ 60% of the total value and hectareage; processing crops account for the other 40%. Many market opportunities exist within each of these, and growers have responded accordingly. Roadside markets are the outlet for crops from many highly profitable operations, while population centers provide excellent mass markets within 160 km (100 miles) in any direction from the state borders. High-quality cabbage and tomatoes are packed and transported to more-distant markets—an aspect of the industry made possible by excellent postharvest handling facilities and practices. The greenhouse vegetable industry, primarily tomatoes, lettuce, and cucumbers, is expanding rapidly and comprises  $\approx$ 40 ha (100 acres) under glass. The potential of this segment of the industry is tied closely to the Pennsylvania power plants, which generate waste heat.

### **An invitation**

The faculty, staff, and students of the Dept. of Horticulture extend an invitation to the Members of ASHS to attend the 88th ASHS Annual Meeting at the campus of The Pennsylvania State University in University Park, 21-26 July 1991. We hope that you and your family will enjoy your trip to Pennsylvania and that you take advantage of the many educational and recreational opportunities the Keystone State has to offer.

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