CHAPTER 1

Exploring the Horticulture Industry

OBJECTIVES

This chapter provides background information on horticulture, including its history and importance. It has the following objectives:

1. Explain horticulture as a science, technology, and industry
2. Describe the three major areas of horticulture
3. Trace the history of horticulture
4. Explain the popularity of horticulture

TERMS

agriculture
botany
floriculture
foliage plant
horticulture
horticulture industry
horticulture science
horticulture technology
interiorscaping
landscape horticulture
nursery
olericulture
ornamental horticulture
pomology



1-1. Horticulture is concerned with the culture of specific crops for food, comfort, and beauty.

PEOPLE like plants! All of us like the beauty, comfort, and food they provide. Having plants and their products when and where we want them requires special skills. A huge horticulture industry has emerged to help meet demands.

Flowers have special meaning to people. A good example is Valentine's Day. Red roses are used to express human feelings for each other. The demand for roses is greater just prior to February 14 than any other time of the year. Sometimes shortages develop and the price goes up. That's when you need to have roses to sell!

The horticulture industry is more than pretty flowers on a special day. It is a broad industry that meets human needs in many ways.

HORTICULTURE COMES TO LIFE

Plants are living organisms. In order to live and grow, the needs of plants must be met. Plants will not grow, and may die, if they don't have the proper care. Humans learned long ago about some of the basic needs of plants.

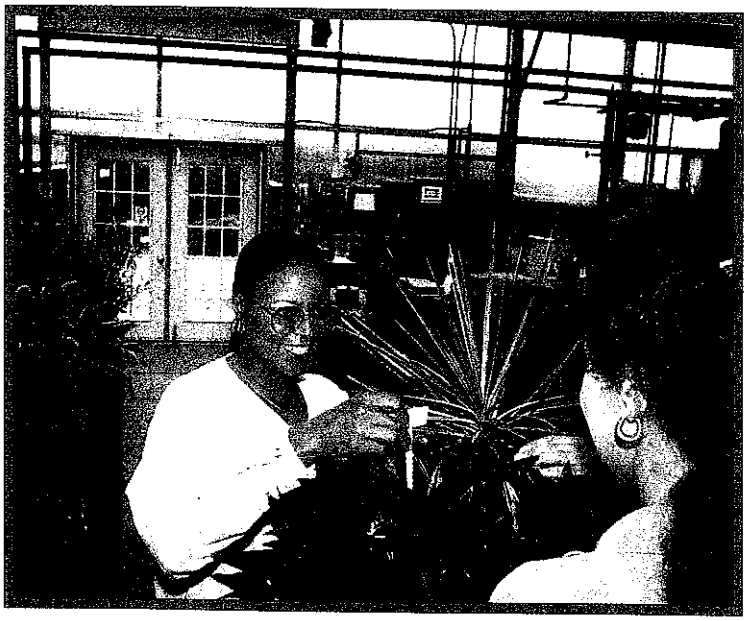
AN AREA OF AGRICULTURE

Agriculture is the production of plants and animals to meet basic human needs. Humans must have food, clothing, and shelter in order to survive. Many of these needs are supplied by plants.

Agriculture includes three important areas of plant science: horticulture, agronomy, and forestry. All three areas deal with growing and using plants to meet human needs. Horticulture has a unique place in plant science.

Horticulture

Horticulture is the culture of plants for food, comfort, and beauty. This includes a wide range of important and useful plants. It does not include the traditional agronomy crops, such as grain and fiber, nor forestry, which focuses on tree production for timber.



1-2. The horticulture industry is all of the activities that support meeting the needs of consumers for horticulture products.

The modern notion of horticulture has developed over hundreds of years. Historically, horticulture was "garden culture." The word "horticulture" is derived from the Latin words *hortus*, meaning garden, and *colere*, meaning to cultivate. Today, horticulture is far more than "garden culture."

An Industry

Practicing horticulture is much more than growing certain kinds of plants. People don't work alone. They have a vast network of support for their efforts.

Horticulture industry is all of the activities that support meeting the needs of consumers for horticulture products. The horticulture industry includes the supplies and services that growers use, the actual production of horticultural crops, and the marketing of the crops so that they reach the consumer in the desired forms. Just think about what it takes to get the beautiful flowers into the local florist shop!



1-3. The major area of science in horticulture is the study of plants. (Courtesy, Jasper S. Lee)

HORTICULTURE SCIENCE

Horticulture science is the broad field that deals with observed facts and relationships among the facts as related to horticulture. Many of the facts are from areas of plant and soil science. Relationships are carefully studied in research stations, natural settings, and plant production.

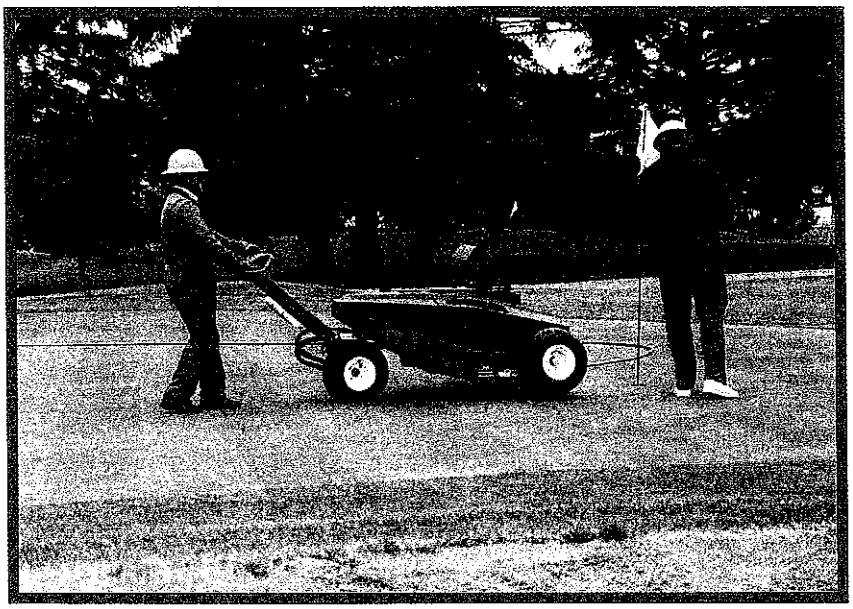
The major area of science in horticulture is botany. ***Botany*** is the study of plants. This includes their life cycle, structure, growth, and classification. Processes occurring in plants and how to promote growth are studied. Today, this is taken further than ever before with biotechnology. Many improvements are being made in horticultural plants using biotechnology methods. Some of this deals with basic plant science, such as genetics and physiology.

The goal of horticulture science is to have more and better plants. This must be accompanied by efficiency and profitability for the producer.

HORTICULTURE TECHNOLOGY

Horticulture technology is applying science in horticulture production. It includes several important areas.

Controlling and managing a plant's environments (macroenvironment and microenvironment) serve as major contributors to success in the horticultural industry. Developing and using the proper cultural practices (mowing, pruning, fertilization, irrigation, pest control, etc.) will impact the visual, functional, and productive qualities of the



1-4. Water aerification is one of the latest technologies in turfgrass management.

host plant or community of plants. Combining modern technology with a solid, scientific understanding of plants promotes a more effective management program.

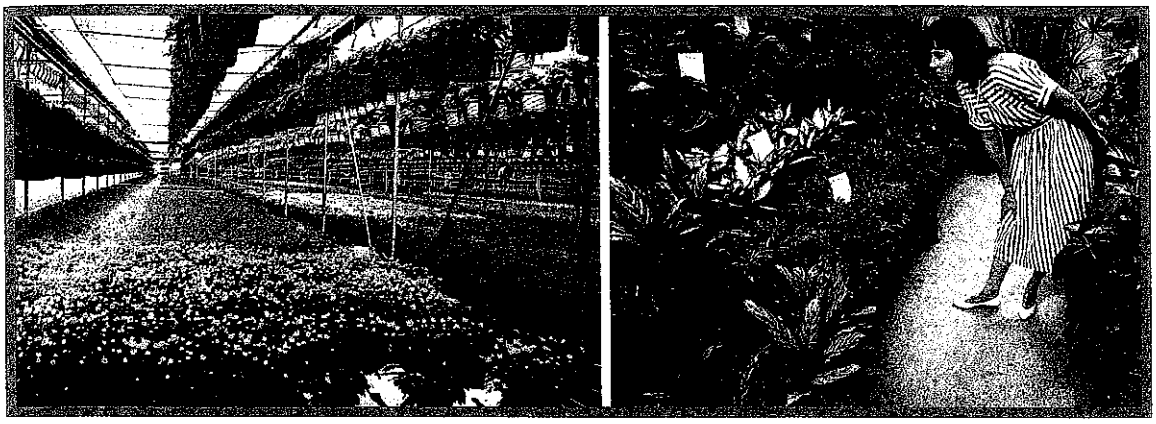
AREAS OF HORTICULTURE

Horticulture is a broad and diverse science divided into three important areas: ornamental horticulture, olericulture, and pomology. In general, horticulture meets the needs of people for food, comfort, and beauty.

ORNAMENTAL HORTICULTURE

Ornamental horticulture describes growing and using plants for their beauty. These plants may be used inside or outside of our homes. Ornamental plants are used for their aesthetic qualities and their appeal to the human senses. Ornamental plants provide beauty and a feeling of comfort for people. Ornamental horticulture can be further divided into two major areas: floriculture and landscape horticulture.

Floriculture is the production, transportation, and use of flower and foliage plants. Greenhouse growers produce cut flowers, flowering potted plants, foliage plants, and bedding plants. Cut flowers are sold to florists, who arrange them into beautiful bouquets and sell them to the public. Flowering potted plants are sold in the containers in which they



1-5. Floriculture is the production, transportation, and use of flower and foliage plants.

grew. Foliage plants are often sold in pots for use as houseplants. A variety of annual flowers are sold as bedding plants that homeowners will transplant into their flower gardens.

Landscape horticulture deals with producing and using plants to make our outdoor environment more appealing. A ***nursery*** is a place where plants, shrubs, and ornamental trees are grown for transplanting to landscape areas. Nursery managers propagate and grow ornamental plants for installation in landscapes. The landscaper designs planting plans, installs plant material, and maintains the plants in the landscape environment. Lawn and turf maintenance is another area of study under landscape horticulture. Golf course management includes maintaining all the grass areas of the golf course and is another part of landscape horticulture.

Interiorscaping is the use of foliage plants to create pleasing and comfortable areas inside buildings. ***Foliage plants*** are only grown and sold for their beautiful colored leaves



1-6. Landscape horticulture uses plants to make our outdoor environment more appealing.

and stems. Most offices and businesses use these plants to create an attractive interior environment.

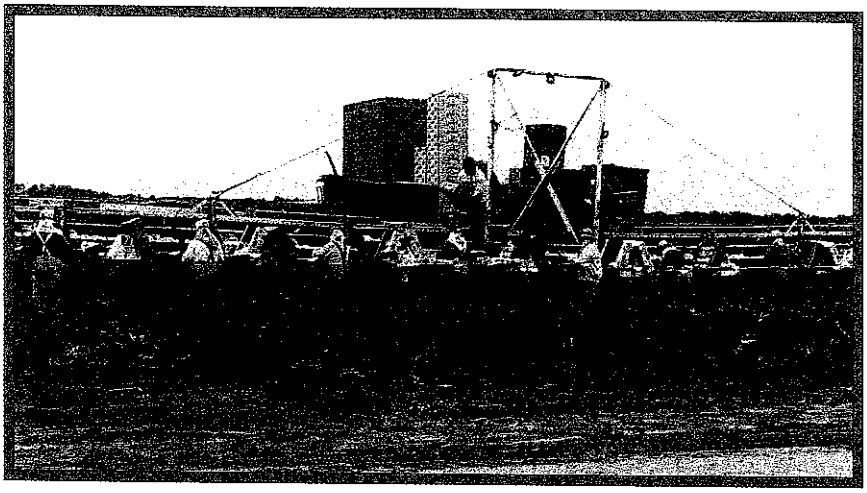
FOOD CROP PRODUCTION

Many horticulture crops are grown for use as food. The toppings on your favorite pizza—tomatoes, olives, peppers, and onions—are examples of horticulture plants used as food.

Horticulture crops used for food can be divided into olericulture (vegetables) and pomology (fruits and nuts). With horticulture as broad as it is, some additional areas of production may be important in local communities.

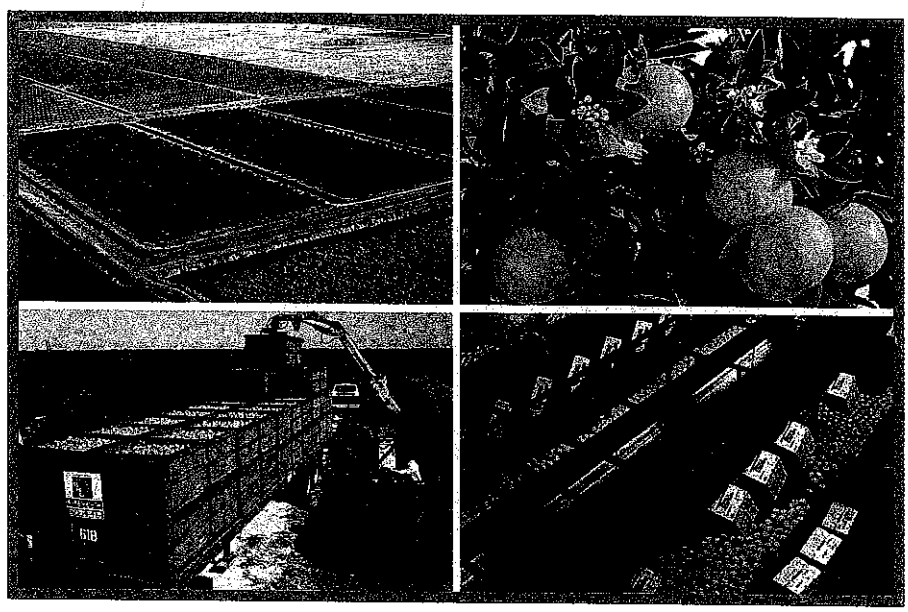
Olericulture is the growing, harvesting, storing, processing, and marketing of vegetables. This is a huge industry in some farming areas. For example, many important vegetable crops are produced in the Salinas Valley of California, including lettuce, celery, tomatoes, broccoli, beans, and sweet corn. Olericulture is found throughout North America, with many families having gardens where their favorite vegetables are grown.

Pomology is the growing, harvesting, storing, processing, and marketing of fruits and



1-7. Cauliflower being harvested in Salinas Valley, California.

nuts. Oranges, apples, peaches, cherries, grapes, strawberries, blueberries, pecans, walnuts, and pistachios are a few examples of pomology crops. Pomology is found throughout North America. Nearly every region produces some type of important fruit crops. States, such as Washington, Michigan, and Virginia, grow apples and similar crops. Florida citrus is well known. Georgia is known for peaches and South Texas for citrus. California is known for grapes, strawberries, citrus, and nuts. Most fruit will grow in many locations, but some places have much better growing conditions than others.



1-8. Oranges are grown in groves, harvested, graded, and placed in boxes for shipment. (Courtesy, Florida Department of Citrus)

HISTORY

Early work in horticulture was often by botanists, who called what they were doing "applied botany." A knowledge of taxonomy (plant classification), anatomy (plant structure), physiology (plant function), entomology (insects), pathology (plant diseases), heredity (plant genetics), and weed control was crucial.

Horticultural science relates to the cultivation of ornamental plants, vegetables, and fruits. It includes the technology modern horticulturists use along with current management strategies.

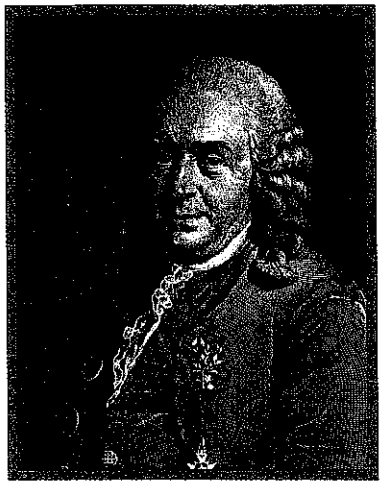
THE EUROPEAN INFLUENCE

The ancient Greeks were innovative in sciences, including horticulture. The most significant Greek horticulturist was Theophrastus (377–288 BC), who was precise in his work. He speculated that the roots of a plant absorbed nutrients. He observed differences between the leaves of germinating seeds of wheat (monocotyledon) and the leaves of germinating bean seeds (dicotyledons). He described how root pruning encouraged the flowering and subsequent fruiting of plants.

The Greek influence declined with the rise of the Roman empire, which adopted different techniques in agriculture. The Romans, while holding agriculture in high regard, were not innovative and scientific thinkers. Instead, they adopted and improved some of the

Greek techniques of farming. The use of legumes to improve poor soil, manure to improve soil production, and cultivation to impact weed control were started by the Romans.

The techniques of post-harvest storage of fruits were developed by Varro (116–20 BC). He recommended the placement of straw in a cool, dry place, such as a cave, which provided the Romans a means of storing and having fruits during the colder months.



1-9. Carolus Linnaeus developed a taxonomy for classifying living organisms. (Courtesy, Stock Montage, Inc.)



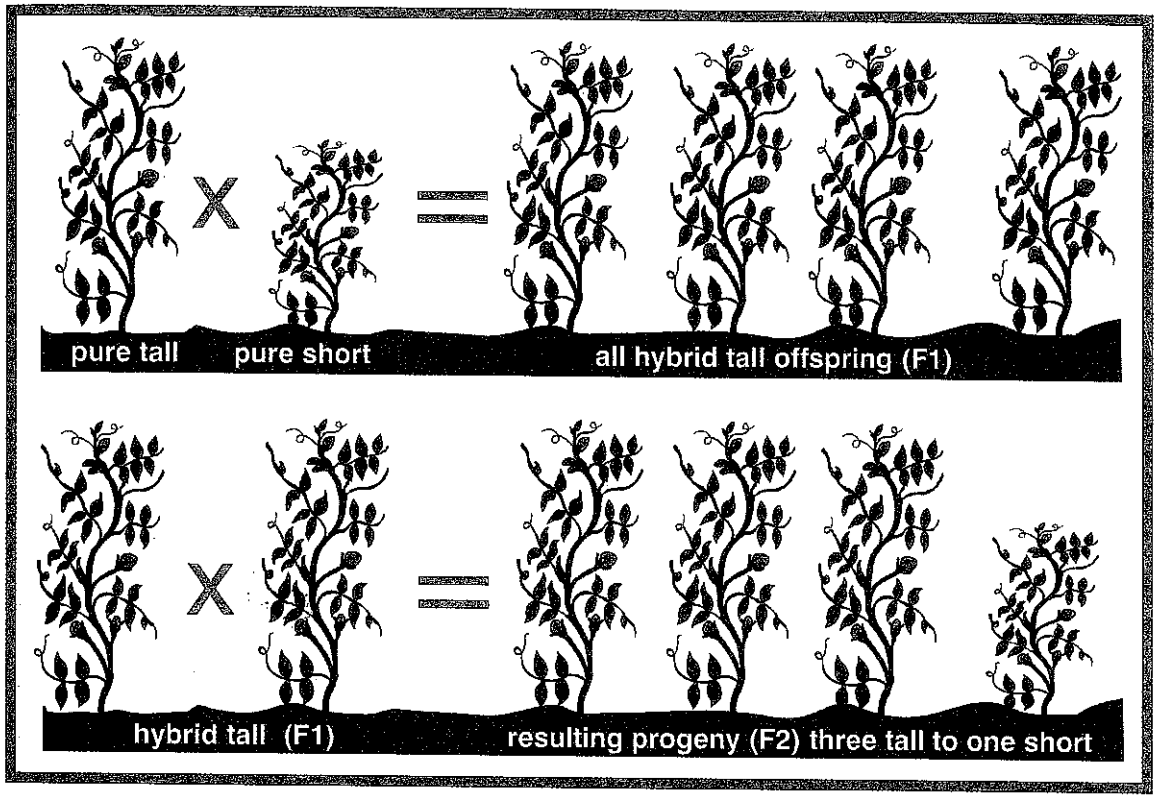
1-10. Gregor Mendel laid the foundation for the science of genetics. (Courtesy, Stock Montage, Inc.)

Knowledge of plants reached its peak with the publication of an authoritative book by Dioscorides about 77 AD. This book, *De Materia Medica*, served as the authority for 1,500 years. It had practical information and described roots, stems, leaves, and sometimes flowers. For centuries, no drug plant was considered genuine unless it could be identified by the descriptions given by Dioscorides.

Approximately 1,700 years passed before the next major authority. C. V. Linnaeus (1701–1778), a Swedish botanist and physician, made a big impact in the sciences. He developed a method of classifying and naming plants by clear and concise descriptions. The plant names were known as binomial nomenclature. They have endured the trial of time, as modern plant explorers and taxonomists classify and name plants by the same technique.

Two additional botanists, Charles R. Darwin (1809–1882) and Gregor T. Mendel (1822–1884), were important. In his *On The Origin of Species*, Darwin concluded that "favorable variations would tend to be preserved and unfavorable ones to be destroyed. The result of this would be the formation of a new species." Darwin was the first to present a scientifically sound explanation of evolution. He wrote another important book, *The Power of Movement in Plants* (1880), in which he referenced the ability of plants to respond to the effects of light and gravity. This was a fundamental recognition of phototropism and geotropism, or the responsive growth of plants to light and gravity.

The work of Gregor Mendel (1822–1884), beginning in 1843, laid the foundation for the science of genetics. With garden peas, Mendel observed seven pairs of contrasting characteristics which became the first step towards analyzing inheritance. The next step was to cross the individuals which had different specific characteristics. He then crossed the resulting hybrids and observed the segregation that had taken place. As an example, a tall pea and a short pea parental line were crossed. From the seed formed (F1 or first filial generation), he observed that all of the progeny (F1 hybrids) were tall. In his next step, he crossed two of these hybrid tall plants and



1-11. Gregor Mendel's work with garden peas discovered that crossing pure tall with pure short plants resulted in all tall offspring (F1). He crossed two of these hybrid tall plants and found that segregation took place with the resulting progeny of F2 generation. There was a distinct ratio of three tall plants to one short plant, illustrating the characteristics of dominant and recessive traits.

found that segregation took place with the resulting progeny of F2 generation. There was a distinct ratio of three tall plants to one dwarf plant, illustrating the characteristics of dominant and recessive genes. The tall plant gene is dominant and the short plant gene is recessive.

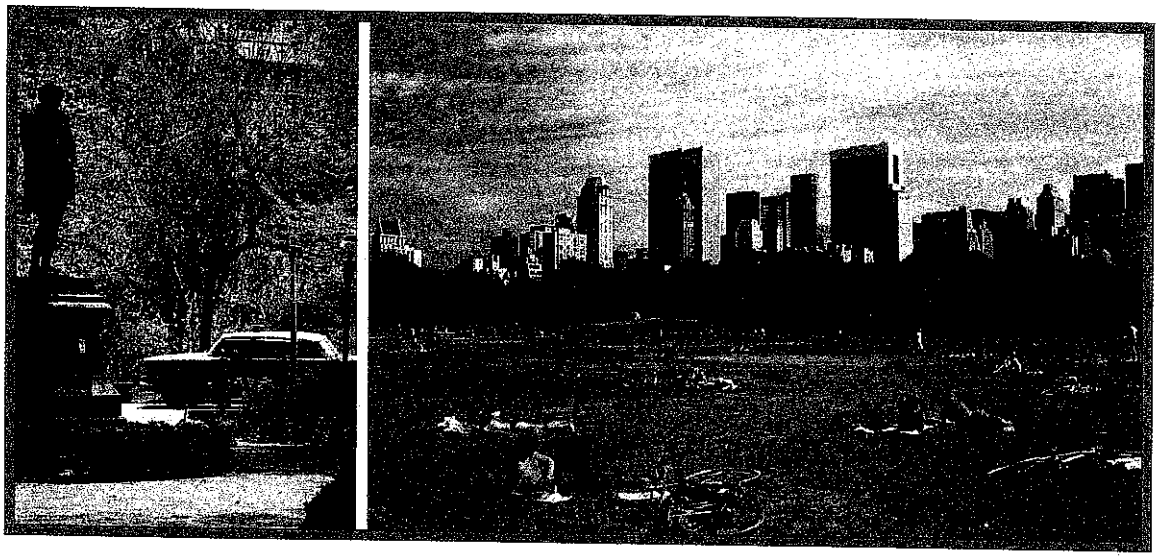
EARLY U.S. HORTICULTURE

The first commercial nursery in the United States was founded by the Prince family during the early 1730s. Robert Prince established the Prince Nursery at Flushing, Long Island, New York. Under the influence of his son, William Prince, the nursery expanded rapidly until the American Revolution. In 1794, a catalog published by the nursery contained an extensive list of plants, including apricots and nectarines. The fruit trees were the foundation of the business and necessary for stocking the country during a period of new and different growth. Ultimately, ornamentals became a significant part of the business. In 1784, the Lombardy poplar was introduced into America, and the Prince Nursery became a major sup-

plier of these trees. The Lombardy poplar became the emblem of a democracy. During the post-Revolutionary era, these trees became the most popular trees in America.

The mere presence or abundance of trees and shrubs does not automatically provide an attractive landscape. As the interest in landscape gardening continued to develop, it was only reasonable that some great, creative people emerge and expand it. Andrew J. Downing (1815–1852) was the first great American landscape gardener. His influence was on developing a simple, natural, and permanent landscape. Previously, the Italians, Dutch, and French gardeners developed complex, artificial, and temporary landscapes.

Downing's greatest influence was his ability to inspire his pupils. Such inspiration is evident through one of his most renowned learners, Frederick Law Olmstead (1822–1903). Olmstead is now considered to be the father of landscape architecture. He retained Downing's concepts and became the primary landscape architect for Central Park in New York City, as well as parks in Buffalo, Chicago, and Detroit. Olmstead was a "revolutionary," and his developments were bold, sweeping, and imaginative. The natural, restful settings of his finished projects masked the political turmoil and frustrations that filled his personal life.



1-12. Frederick Law Olmstead was the primary landscape architect for Central Park in New York City.

Modern horticulturists have also impacted the field. Liberty H. Bailey (1858–1954) is comparable to the ancient plantsman, Dioscorides. Bailey's many books are often quoted as the standard authority on plant nomenclature, taxonomy, pruning, etc. It is difficult to believe that one man could contribute so much to a particular profession in just one lifetime, yet his credits are valid. Three of his most popular books were *Manual of Cultivated Plants*, *Hortus Second*, and *How Plants Get Their Names*. He established the Bailey Hortorum at Ithaca, New York, during the last years of his life.



1-13. Roses were initiated in the ancient Egyptian culture.

Horticulture will continue to impact many lives—as a hobby, a second or seasonal interest, or perhaps a career choice. Whether for food production or ornamentation, the industry will continue to grow and develop.

THE POPULARITY OF HORTICULTURE STUDY

The renewed interest in plant life began in the mid-1960s and continues into the 2000s. From the free spirit attitudes of the 1960s and 1970s to the environmental issues of the 1980s and 1990s, the interest continues to increase in our culture—young and old, rich and poor.

Interests and site development have resulted in an increased awareness and job market in horticulture. Plants function as a food source for all animal life, but also provide emotional and psychological gratitude to people. Technology has expanded and career choices abound throughout the field of horticulture.

Land grant universities and two-year college programs in America are experiencing an acceleration in horticultural and agronomic enrollments. This increase is an indicator of the professional interest in horticulture as a career. In addition, the job market for those completing a degree is excellent.

The study of horticultural science and technology has a dominant role in the potential of those electing to find successful careers in this dynamic industry. Associate degrees emphasizing technology are awarded to those individuals successfully completing prescribed colle-



1-14. Many colleges and universities have outdoor botanical gardens where plants grow and can be studied in a natural setting.

giate programs of study in two-year colleges. Bachelor, master, and doctorate degrees emphasizing the horticultural sciences are available at universities. Students must identify the degree requirements and take needed courses for the degree.

REVIEWING

MAIN IDEAS

Horticulture helps meet important needs of humans. Culturing plants for food, comfort, and beauty has resulted in a large horticulture industry. The industry focuses on ornamental horticulture and food crop production, especially vegetables, fruits, and nuts.

Horticulture in North America was influenced by developments in Europe and, a little later, the United States. Early efforts were known as applied botany and dealt with basic plant growth and genetics. Plant classification efforts led to horticulture becoming a science-based activity.

Today, horticulture products are in greater demand than ever before. People are enjoying the beauty of carefully designed and maintained landscapes. The special qualities of a beautiful flower are used to express the gentleness and caring of people.

QUESTIONS

Answer the following questions using complete sentences and correct spelling.

1. What is horticulture? How is it distinguished from agronomy and forestry?
2. What is the horticulture industry? Why is it important?

3. What are the three important areas of horticulture? Define each.
4. Briefly trace the history of horticulture in Europe and in the United States.
5. Identify one specific contribution of the following people to horticulture: Carolus Linnaeus, Charles Darwin, and Gregor Mendel.
6. What areas are in landscape horticulture?
7. What are foliage plants?
8. What is the distinction in cut flowers and flowering potted plants?
9. What is horticultural technology?
10. Why is the study of horticulture popular?

EXPLORING

1. Select an important area of horticulture and investigate how it is practiced in your community. Arrange to interview horticulturists about their work and industry. You can select landscaping, floriculture, olericulture, or pomology. Determine the kinds of plants and what they need to grow well.

2. Select an individual who made important contributions to the development of horticulture. Conduct library or computer research to collect details about their work. Give a written or oral report in class.

3. Investigate opportunities for education in horticulture. Contact a local college or university and get information about opportunities in studying horticulture. Prepare a poster or bulletin board that reports your findings.