

**History of the  
Department of  
Horticultural Science  
and  
Landscape Architecture  
1849-1982**

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**University of Minnesota • Institute of Agriculture, Forestry, and Home Economics • St. Paul, Minnesota**



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### About the Author

Leon C. Snyder was born in Shepard, Michigan, in 1908. He received both his B.S. degree (1931) and his Ph.D. degree (1935) from the University of Washington.

Dr. Snyder joined the University of Minnesota staff in 1945 as extension horticulturist. He became head of the department and superintendent of the University Fruit Breeding Farm in 1953. He served as head of the department from 1953 until 1970. In 1958 he was named director of the Minnesota Landscape Arboretum. On April 1, 1970, he relinquished his duties as head of the department to devote full time to his work at the arboretum.

Under Dr. Snyder's guidance, the arboretum grew from a modest beginning to an impressive acreage of more than 4,000 species and cultivars being evaluated for cold hardiness and landscape value. Until the establishment of the arboretum, little work had been done on the evaluation of woody ornamentals for severe northern climates.

Dr. Snyder is a member of Phi Beta Kappa; the American Society for Horticultural Science; Sigma Xi, national honorary science fraternity; Gamma Sigma Delta, national honorary agricultural society; the Men's Garden Club of America; the American Horticultural Society; the American Rhododendron Society; the American Magnolia Society; and the International Horticultural Society.

In 1963 he received the Gold Medal Award of the Men's Garden Clubs of America, the highest award of that organization. In 1974 he was given the highest horticultural award of the Garden Club of America, the Medal of Honor. That year he also received the Norman Jay Colman Award, highest honor for research in the nursery trade. In 1976 he received the highest award of the American Horticultural Society, the Liberty Hyde Bailey Award.

Dr. Snyder is author or co-author of many horticultural bulletins published by the University of Minnesota and by the Minnesota State Horticultural Society. He has been writing a weekly gardening column for the *Minneapolis Tribune* since 1966. Since his retirement from the University in 1976, he has written five books: *Gardening in the Upper Midwest* (University of Minnesota Press, 1978), *Trees and Shrubs for Northern Gardens* (University of Minnesota Press, 1980), *How Does Your Garden Grow?* (WCCO, 1982), *Flowers for Northern Gardens* (University of Minnesota Press, 1983), and (as co-author) *A Minnesota Gardener's Companion* (Minneapolis Tribune, 1981). He may be heard on WCCO on a monthly gardening program.

# Preface

Can you imagine a Minnesota spring without the spectacular beauty of flowering crabapples, autumn without the gold and maroon of garden chrysanthemums, or a winter day without the enjoyment of a crisp, tart Haralson apple?

For these and many other esthetic and culinary delights, Minnesotans are in debt to the Department of Horticultural Science and Landscape Architecture at the University.

In a variety of ways, the department, through its programs, has touched the lives of almost every Minnesotan. It has had a tremendous impact on the quality of life and enjoyment of families as well as on the economy of the state.

A problem University horticulturists have wrestled with in their research and breeding programs has been the development of varieties that will both survive and thrive in Minnesota's rigorous climate.

In ornamentals, for example, gardeners in northern climates can now grow chrysanthemums that withstand rugged winters, thanks to the breeding project instituted by L. E. Longley and carried on by his successors. The problem of the breeders has been to develop varieties of this short-day plant early enough to bloom before heavy frost. As early as 1939, Longley introduced the first of such mums, Duluth. Since then more than 60 mums have been developed and introduced, all adapted to northern conditions.

University horticulturists have now developed azaleas, once thought to grow only in warmer climates. Flowering crabapples, such as Radiant, Sparkler, and Vanguard, have brought dramatic displays of color and bloom to home yards and parkways.

Minnesota cuisine would be the loser without many of the University-bred fruits and vegetables especially adapted to the conditions of the Northern Great Plains. Though not thought of as a major apple-growing state, Minnesota can now boast of such popular varieties as Haralson, Prairie Spy, Regent, and Beacon — as well as 14 other varieties of apples University fruit breeders have developed through long years of planting, breeding, and testing.

The highly regarded Latham is one of three varieties of raspberries horticulturists have developed for Minnesota. The Red Lake currant, the Underwood plum, apricots, cherries, crabapples, gooseberries, grapes, pears, and strawberries are among 78 varieties of fruits introduced by scientists at what is now known as the Horticultural Research Center. Some of these introductions are widely grown in other states and countries.

Among 44 vegetables developed for Minnesota gardens — from asparagus to tomatoes — Greengold and Faribo Hybrid squash, the Early Fireball and Mingold tomatoes, the latter yellow fruiting, are outstanding.

Another important contribution of the Department of Horticultural Science and Landscape Architecture has been the dissemination of reliable methods of home freezing of fruits and vegetables as well as other foods at a time when freezing became a popular method of food preservation. Such research was started under the direction of J. D. Winter as early as the 1940s in what was then the Frozen Food Laboratory but what has now evolved, with expanded activities, into the Laboratory of Quality and Sensory Evaluation. The fact that a publication prepared originally by Winter and Shirley Munson, *Freezing Foods for Home Use*, was the University extension bulletin most frequently requested by the public for many years attests to the usefulness of the research.

Many ornamentals, fruits, and vegetables developed by the University enhance the enjoyment of home gardeners, but the commercial value of these introductions must not be overlooked. They have made a notable contribution to the economy of the state. Although it is difficult to put a dollar value on such plantings, it is safe to say that horticulture has an economic worth to Minnesota of well over half a billion dollars.

# Horticulture in the Early Years 1849-1887

The history of horticulture in Minnesota can be traced as far back as the creation of the Minnesota Territory by Congress in 1849.

At that time settlers began talking of the importance of having an agricultural college. An early promoter of such a college was John Harrington Stevens, a farmer who lived near the Falls of St. Anthony in Minneapolis. In 1855 he moved to Glencoe and in 1857-58 was elected to the Territorial Legislature.

As a legislator he introduced a bill to establish an agricultural college in his home town of Glencoe. About the same time another farmer-legislator, William S. Chowne of Minnetonka Township in Hennepin County, authored a bill to establish a state agricultural college. On March 10, 1858, the act authorizing the establishment of the Minnesota Agricultural College in McLeod County became law, providing for instruction in agriculture.

Governing of the new college was vested in a 12-member board of education elected by the state agricultural societies. By 1861, \$10,000 had been collected, largely from Glencoe residents, for the purchase of 320 acres of land and for the construction of a building for the college. Contract for the building was to have been signed by Governor Alexander Ramsey, but he was absent from the meeting at which the matter was brought up. During the Civil War and the Indian Wars that followed, the Glencoe College remained dormant.

In the meantime, on April 20, 1858, the year Minnesota became a state, Justin S. Morrill, a representative in Congress from Vermont, authored a bill to donate public land for the support of state colleges designed to teach "such branches of learning as are related to agriculture and the mechanic arts." On July 2, 1862, Congress finally passed the Land Grant (Morrill) Act, allowing each state 30,000 acres for each member such state sent to Congress.

In 1865 the Minnesota State Legislature assigned the right to the land given by the Morrill Act to the agricultural college in Glencoe, but no land sales were made. A year of bitter debate ensued. It was suggested, for example, that the agricultural college should be made a part of one of the normal schools.

Finally, in 1867, the legislature settled the dispute by awarding the grant to the University of Minnesota, which had been founded in 1851. The next year the legislature authorized the Board of Regents of the University to expend \$8,500 from the sale of this land for the purchase of an experimental farm. John S. Pillsbury, a member of the Board of Regents, offered to sell 90 acres of land he owned just east of the Minneapolis campus for the same price he had paid for it. Thirty additional acres also were purchased. This farm straddled what is now University Avenue and extended from Oak Street eastward to the foot of the hill in Prospect Park.

When William Watts Folwell became president of the University in 1869, he appointed Colonel Daniel A. Robertson as professor of agriculture to be in charge of the experimental farm. Robertson had been active in horticultural circles, having helped to organize the St. Paul Horticultural Society in 1860 and serving as its first president. In 1866 he participated in the organization of the Minnesota State Horticultural Society. He imported seeds of Russian apples and distributed them to apple growers — actually the first attempt by the University to start a program of fruit breeding. A year after his appointment as professor of agriculture, however, finding no students to teach, he became disillusioned and resigned from the University.

The position remained vacant until 1872, when the chairs of agriculture and chemistry were combined, and Dalston P. Strange, a graduate of Michigan Agricultural College, was appointed. He served for one year but was not rehired. In 1874, Professor Charles Y. Lacy, who had an M.S. from Cornell, was employed to replace Strange. For the next 14 years, until 1880, he attempted to grow crops on the experimental farm but became convinced that the land was totally unsuited for experimental use.

In January, 1881, Professor Edward D. Porter was hired to replace Lacy. He operated the farm for one more season but determined that the soil was either too sandy or too swampy to be suitable for agriculture. Furthermore, roads were being built through the farm to connect Minneapolis and St. Paul. At his urging, the Board of Regents agreed to dispose of the land and purchase a more suitable farm. The University sold the Minneapolis farm for \$150,000, thus permitting the purchase of 248 acres in St. Anthony Park in 1882 and 1883 and the construction of four buildings on what is now the St. Paul campus.

Students were few in those early years. In 1882, Porter organized the farm lecture series and featured as one of the speakers Charles W. Loring, U.S. Commissioner of Agriculture. Attendance at the lectures grew from 225 in 1882 to 1,181 in 1884. The only problem was that the students were all from the city; none were from the farm.

Cyrus Northrop was appointed second president of the University in 1884, upon the retirement of President Folwell. Although trained in rhetoric and literature at Yale, Northrop had a sincere interest in agriculture and encouraged Porter to try a series of farm institutes. The first of these was held in Glencoe on February 11, 1886. In the ensuing months, 31 such institutes were held, varying from a half day to three days in length.

In 1885, Edward Porter was appointed the first director of the new Agricultural Experiment Station, which had been authorized by the legislature at what was then called University Farm.

## Research in Horticulture Begins at Experiment Station

During the early years of the experiment station, research in horticulture consisted largely of variety testing. Scionwood of more than 150 apple varieties obtained from Russia was grafted on seedling rootstocks and planted on an exposed site. Nearly a third of the varieties winterkilled the first year. Of 65 varieties planted in 1865, 16 were judged to be hardier than Duchess, then the hardiest variety being grown. At the same time that apples were being tested for hardiness, 370 varieties of potatoes were evaluated, many of European origin.

## Experimental Farm Established in Excelsior

During the same years the experiment station at the University was getting under way, another experimental farm was developing in Hennepin County. By an act of the Minnesota legislature on March 8, 1878, an experimental farm was established near Excelsior for the purpose of testing and developing apple varieties suitable for the area. The University was directed to purchase a specified tract of land of 116 acres at a cost not to exceed \$2,000, the money to come from University funds. The act included an annual appropriation of \$1,000 for operation. The money was to be paid to the superintendent, appointed by the governor, with the proviso that the superintendent report annually to the University Board of Regents.

The introduction of the Wealthy apple years earlier had been responsible for the legislation, since great interest had developed in the feasibility of breeding still better varieties in Minnesota. Quite naturally, Governor Pillsbury named the originator of the Wealthy apple, Peter M. Gideon, as superintendent of the new experiment station.

Gideon had moved to Minnesota from Illinois in 1853, bringing a colorful, eccentric personality and a bushel of apple seeds. (He also brought seed of the shellbark hickory. Progeny from his hickory trees are now growing in the arboretum.) Gideon grew thousands of apple seedlings in Minnesota, most of which died of winter injury or were killed by fire blight. One that did survive was the Wealthy apple, named for his wife. Gideon lived to see this variety recognized as one of the leading varieties in America.

Land for the Excelsior experimental farm was purchased and fruit trees were planted in the spring of 1878. It was expected that Gideon, the new superintendent, would develop new and even better varieties than the Wealthy apple.

Although he made the required annual report, otherwise he had little or no contact with the University. His "lone wolf" attitude, so characteristic of all his activities, did not make him popular with University administrators. After his final report in February, 1889, the experiment station was abandoned and the property sold. No new varieties had come from the venture.

It is unfortunate that Gideon's clashing personality prevented him from assuming leadership in the fruit breeding program that was to develop later. He died in 1899.



Peter M. Gideon, superintendent of the first experiment station at Excelsior, 1878-1889

## Excelsior Station Short-Lived

Two years before the demise of the Excelsior fruit breeding farm, the Minnesota State Horticultural Society urged the legislature to establish another branch station. On March 2, 1887, an experiment station under the administration of the University's Board of Regents was established on the state school farm in Owatonna. E. H. S. Dartt, a prominent local horticulturist, was appointed superintendent. Upon his death in 1903, Thomas E. Cashman, a local nurseryman, became superintendent. He continued to serve until the station was discontinued in 1925. Because the Owatonna station had limited land and an even more limited budget, it served as little more than a testing ground for existing varieties of fruit, forest, and ornamental trees.

The Dartt crabapple was introduced by the Owatonna station and named in honor of Mr. Dartt.

# Academic Staff Appointments 1887-1982

On March 2, 1887, the Hatch Act was passed by Congress, making \$15,000 of federal money available annually for the Agricultural Experiment Station. Professor Edward D. Porter, director of the experiment station, was now in a position to hire a competent staff of able scientists. One of these men was Samuel B. Green, a graduate of Massachusetts Agricultural College at Amherst. Born in Chelsea, Massachusetts, Green came to Minnesota with nine years of practical experience in the field of horticulture. Following his graduation from Amherst in 1879, he worked in various places in Massachusetts as a farm manager, market gardener, seedsman, nurseryman, landscape gardener, and foreman of the Horticultural Department of Massachusetts Agricultural College. These jobs, plus six months of graduate study, gave him an excellent background for his new position as head of the Department of Horticulture.

## Green Builds Strong Horticultural Program

Professor Green immediately started a strong and constructive horticultural program on the campus and in the state. From 1896 to 1902, R. S. Mackintosh served as his assistant. In 1902, LeRoy Cady became an associate professor in ornamental horticulture. These men strengthened the new department and allowed more time for Professor Green to carry out his administrative responsibilities.

After Green's death in 1910, Professor Cady was named acting head of the Department of Horticulture. In the same year, K. A. Kirkpatrick joined the staff as extension horticulturist in general horticulture and served in that position until 1913. In 1911, M. J. Dorsey became an associate professor in fruit breeding, a position he held for 10 years. W. G. Brierley was hired in fruit physiology and Richard Wellington in vegetable breeding in 1913. R. S. Mackintosh was again hired in 1913 to replace Kirkpatrick as extension horticulturist. From 1913 to 1919, the department was administered by a committee consisting of W. G. Brierley, LeRoy Cady, M. J. Dorsey, and Richard Wellington. At first, each of these men took turns as committee chairman. Later, Brierley served as permanent chairman of the committee. During this period, the department continued to grow.

As part of the expansion of the department, F. P. Daniels was hired as instructor in general horticulture in 1916 to teach in the School of Agriculture. In the same year, W. P. Tapley became an assistant professor in vegetables. In 1917, J. W. Bushnell was appointed instructor in vegetables, and in 1919 J. H. Beaumont was appointed assistant professor in fruit breeding.

## Alderman Becomes Head

In 1919, Professor W. H. Alderman was hired as the second head of the department, or, as it was then designated, chief of the Division of Horticulture. He held this position for 34 years until his retirement in 1953. During the 34 years he served as chief of the division, the full-time academic staff grew from 9 to 14.

Appointments were made in the ensuing years as follows:

- 1919 — F. A. Krantz replaces Wellington as potato breeder.
- 1923 — C. E. Cary appointed assistant professor in ornamental horticulture, replacing Cady.
  - A. N. Wilcox appointed professor in fruit breeding, replacing Dorsey.
  - J. A. Middleton hired instructor in general horticulture.



Samuel B. Green, first head of the horticulture department, 1888-1910



W. H. Alderman, head of the department from 1919 until 1953

- 1924 — A. C. Hildreth appointed instructor in fruits.
- H. P. Traub appointed instructor in vegetables.
- 1928 — T. M. Currence joined staff as vegetable breeder.
- 1929 — A. E. Hutchins joined staff as vegetable breeder.
- L. E. Longley joined staff as ornamental plant breeder.
- 1930 — Ernest Angelo joined staff as fruit breeder.
- 1931 — R. B. Harvey appointed plant physiologist.
- 1934 — J. D. Winter hired to teach fruit culture in the School of Agriculture.
- 1936 — E. M. Hunt named extension horticulturist in general horticulture, replacing Mackintosh.
- 1939 — T. S. Weir transferred from instructorship at Grand Rapids Experiment Station to position of assistant superintendent at Fruit Breeding Farm.
- 1942 — R. A. Phillips transferred to horticulture from botany greenhouses to assist Longley in ornamentals.
- 1945 — R. E. Nylund transferred from the Crookston School of Agriculture and Experiment Station to the St. Paul campus as vegetable physiologist.
- Leon C. Snyder replaced Eldred Hunt as extension horticulturist in general horticulture.
- 1947 — B. F. Dunn hired as research associate to serve as superintendent of the Mayo Forestry and Horticulture Institute in Rochester. He served until 1952, when support for the institute ended.
- 1949 — Shirley R. Trantabella hired to assist J. D. Winter in frozen foods. Later, as Mrs. Roy Munson, she assumed responsibility for the Frozen Food Laboratory upon the retirement of J. D. Winter in 1960.

— Richard E. Widmer appointed to teach and do research in floriculture.

1950 — Orrin C. Turnquist named extension horticulturist in vegetables, with emphasis on potatoes. He also held a part-time teaching and research appointment.

## Leon C. Snyder Appointed Third Head of Horticulture

Upon Professor Alderman's retirement in 1953, Leon C. Snyder was appointed the third head of the department. He held this position until 1970, when he resigned to become full-time director of the Landscape Arboretum. During the 17 years Snyder served as head of the Department of Horticulture, the academic staff grew from 14 to 28.

Appointments made during his tenure as head were as follows:

- 1954 — Richard Stadtherr hired as instructor in ornamental horticulture.
- A. A. Piringer replaced Brierley in fruit physiology.
- 1955 — C. Gustav Hard named extension horticulturist in ornamental horticulture.
- 1957 — Emil T. Andersen replaced A. A. Piringer in fruit physiology.
- Albert G. Johnson joined staff as a breeder of woody ornamentals.
- Florian Lauer hired as potato breeder.
- 1960 — Conrad J. Weiser hired to develop a cold hardiness laboratory and research program, upon the retirement of J. D. Winter.
- 1962 — Paul Li joined cold hardiness and research program.
- Donald B. White hired to teach and do research in turf.
- 1963 — Robert Mullin replaced Stadtherr.
- 1964 — Plant physiology staff transferred to agronomy, forestry, and horticulture, Albert J. Linck and Eduard J. Stadelmann joined staff in horticulture.
- William Anderson replaced Wilcox as fruit breeder.
- 1965 — David W. Davis replaced Currence as vegetable breeder.
- 1966 — Mervin Eisel named extension horticulturist in ornamental horticulture, to be stationed at the arboretum.
- Harold Wilkins joined the floriculture staff with a part-time appointment in extension.
- 1967 — Leonard B. Hertz hired as extension horticulturist in fruits.
- Harold Pellett hired in woody ornamentals.
- James Kuska hired to teach landscape architecture.
- Cecil Stushnoff replaced William Anderson as fruit breeder.
- 1968 — Peter Ascher joined staff as a geneticist.
- Paul Read hired as superintendent of the Duluth Horticultural Experiment Station, but because the station was temporarily closed, he was transferred to the St. Paul campus to specialize in growth regulators and propagation.
- 1969 — Mark Brenner replaced Emil Andersen in fruit physiology.
- Sharon L. Desborough hired as geneticist.

- Arvo Kallio hired as superintendent of the Duluth station, which had been reopened because of political pressure. Upon the closing of the station, Kallio remained in the Duluth area as a regional horticulturist in the Agricultural Extension Service.

1970 — Jane McKinnon hired as extension horticulturist to head the Horticultural Information Office.

### **Andrew Duncan becomes Fourth Department Head**

In 1970, Andrew Duncan became the fourth head of the department, a position he held until 1975. These appointments were made during his tenure:

- 1972 — Richard Forsythe hired to teach in the landscape architecture program.
- 1974 — Michael Burke joined the staff in the plant hardiness program.
  - Linda Sanford named assistant extension specialist at the arboretum.
- 1975 — Larry Parsons replaced C. J. Weiser, who left to become head of the Department of Horticulture at Oregon State University.
  - Peter Olin replaced James Kuska in landscape architecture.

### **Duncan Resigns, Ozbun Named Head**

Between the time Andrew Duncan left in February, 1975, to accept a position in Florida until Jimmy Lee Ozbun was hired in July, 1976, as fifth head of the department, Robert E. Nylund served as acting head. During this period Michael Burke resigned to accept a position at Colorado State University.

On July 1, 1976, Ozbun became the fifth head of what was now called the Department of Horticultural Science and Landscape Architecture.

The following appointments were made through 1980:

- 1976 — Francis deVos replaced Leon C. Snyder as director of the Landscape Arboretum.
  - John Carter replaced Michael Burke in the hardiness laboratory.
- 1978 — Richard B. Rideout named assistant extension specialist in arboriculture, a temporary position that terminated in 1980.
  - Bert T. Swanson hired in nursery management, with 60 percent time in extension.
  - Deborah Brown placed in charge of the Horticultural Information Office.
- 1979 — Paul Boldt replaced R. E. Nylund in vegetable physiology.
  - Luther Waters replaced O. C. Turnquist as extension specialist in vegetable crops.
  - David Koranski named extension specialist in floriculture.
- 1980 — Albert Markhart joined the plant hardiness staff.
  - Don Taylor hired as extension specialist in turf.

### **Ozbun Resigns; Bartz Named Head**

In February of 1981, Ozbun resigned to accept a position at Kansas State University, and Jane McKinnon served as acting head until January 1, 1982, when James F. Bartz became the sixth head of the department. The following appointments were made through 1982:

- 1982 — Wesley P. Hackett became the first appointee to the Gordon and Margaret Bailey Chair in Environmental Horticulture.
  - Joan I. Nassauer joined the landscape architecture staff.
  - James J. Luby replaced Cecil Stushnoff in the fruit breeding program.

# Civil Service Staff

The civil service staff has been a vital part of the department since its beginning. A department could not function without a loyal staff of civil service personnel. Gardeners, research plot supervisors, and laboratory technicians are essential for any research program. Research and teaching assistants not only provide valuable experience for our graduate students but also increase the effectiveness of the academic staff. In recent years, there has been an increase in the number of full-time assistant scientist,

scientist, research fellow, and research associate positions in the department.

The numbers of civil service staff prevent the listing of their periods of service. This does not mean that they are of any less importance. Many have served to retirement and have become well known to the gardening public and commercial growers. At the present time more than 100 people hold civil service positions, not including part-time summer employees.



Summer meeting of the Minnesota Horticultural Society, 1899. A report on the meeting included this description. "The exhibit, mainly consisting of strawberries, under the circumstances was an extraordinary one. For necessary reasons the meeting was called a little early for the full ripeness of this crop, and a light show was looked for. Instead, it was the largest ever made, we think, at our summer gathering. At least 150 plates of this luscious fruit were shown, comprising some 60 named varieties. The fruit was well ripened, of most extraordinary size and in prime condition."

# Development of the Physical Facilities

## St. Paul Campus

The first land for horticultural and agronomic research, consisting of 120 acres, was acquired just east of the Minneapolis campus in 1868. Because after a few years it proved to be unsuitable for experimental research, it was sold in 1882. With the proceeds, the University purchased 248 acres of land south of Larpenteur Avenue in St. Anthony Park and constructed four buildings on what is now the St. Paul campus.

A portion of this land was used for variety testing of fruits and vegetables. In recent years, this land has been used for breeding and cultural experiments with vegetables and garden flowers.

In 1888, Samuel B. Green was hired as the first head of the new Department of Horticulture. He and his staff shared one of the original buildings (built in 1883) on the St. Paul campus with other departments.

In 1898, the legislature appropriated \$35,000 for a new horticulture building, which was completed in 1899. In January, 1900, the departments of horticulture and agricultural botany moved in. The three-floor building included a 4,000 square-foot greenhouse, a machine shed, and a nursery storage cellar. It was built for \$32,000, leaving \$3,000 for equipment and office furniture. Half of the first floor was used for dressmaking and sewing and the other half for a classroom for mathematics and English. The second floor was used for horticulture classrooms, laboratories, and offices, the third floor for botany and physics. At the time, this building was considered one of the finest horticultural facilities in the country.

Some years later a fourth floor and a wing on the east side were added. Agricultural education occupied the fourth floor and part of the third floor. Horticulture and the Minnesota State Horticultural Society occupied the rest of the building until 1970.

By 1945 the department had outgrown this building. When Leon Snyder was interviewed for the position of extension horticulturist in the fall of 1944, he was told that the Department of Horticulture was in line for a new building — in fact, was on the University's 10-year building request to the legislature. Through the 1950s the department remained on the list of new buildings needed but seemed no nearer to approaching top priority.

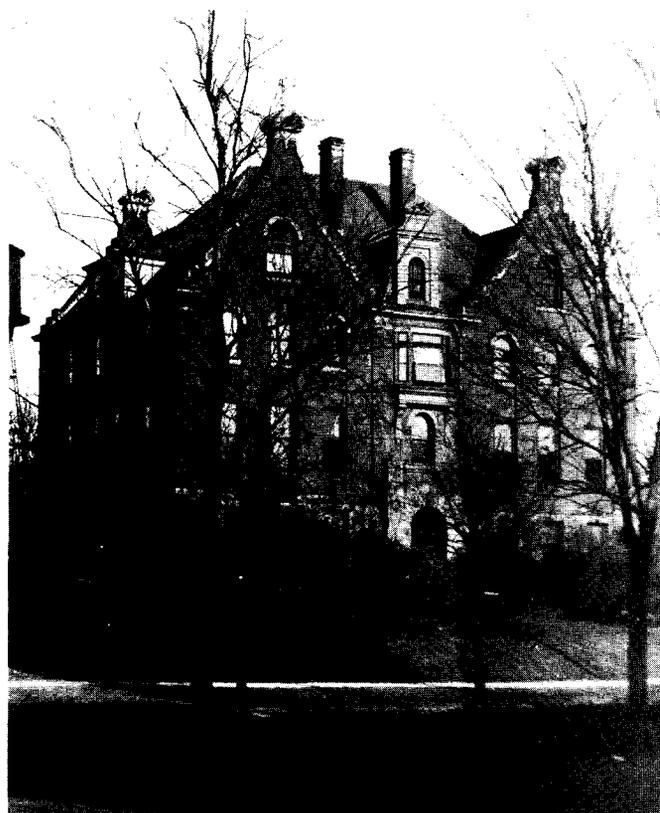
To help the department in obtaining new facilities, United Minnesota Horticulture (UMH) was organized. This group consisted of representatives from all horticulture groups in the state including nurserymen, florists, fruit growers, vegetable growers, the Minnesota State Horticultural Society, Federated Garden Clubs, the Golf Course Superintendents Association, and many others.

UMH met regularly and was helpful in advancing the building to first place in the University requests to the legislature. Members of UMH then met with legislative appropriation committees to convince them of the department's needs. At one such meeting

UMH was told that the legislature had more important things to consider than pansies and petunias! Only when the monetary impact of horticulture to the state's economy was documented did the legislature show an interest in the department's need.

Finally, during the 1965 session of the legislature, an appropriation of \$80,000 was made to draw up plans for a new building. The building was funded in 1967, and the architects were asked to proceed with construction drawings. The present facilities were completed in 1969, and in early 1970 the department moved in.

The new structure, which cost more than \$3 million, included the four-story modern office and laboratory building with about 50,000 square feet of floor space, and a two-story headhouse with cold rooms and attached greenhouses, providing the department with the finest facilities in the country. In the spring of 1970, the building was dedicated and named Alderman Hall in honor of the second head of the department. Professor Alderman, then 85 years old, attended the dedication.



First chemistry-horticulture building, early 1900s



Present horticulture building (Alderman Hall), constructed 1969-1970

## Horticultural Research Center

In 1907, the legislature appropriated money to purchase 78 acres of land near Excelsior to establish a fruit breeding farm. Charles Haralson, who had been an assistant to N. E. Hansen, an eminent fruit breeder at South Dakota State College, was hired as superintendent. Additional lands were purchased in 1920 and 1931 to increase the Fruit Breeding Farm to 230 acres, the size of the present Horticultural Research Center. The center now consists of two separate tracts of land located along State Highway 5 with headquarters at the junction of Highway 5 and Rolling Acres Road. The second tract is two miles farther east at the junction of State Highways 41 and 5.

The buildings originally consisted of the farm structures acquired with the land. In 1908, an 18 x 50 foot greenhouse was constructed with an attached house of seven rooms. A storage cellar was built just north of the greenhouse. This was 25 x 50 feet with a basement with concrete walls for storing tender, tub-grown trees over winter. The upper floor was used for grading and selling apples. A barn with an attached shed was built for horses and field equipment. In 1910, three summer cottages were constructed to house staff and visitors. In 1915, the legislature appropriated \$4,000 for a superintendent's residence and provided funds for a steel water tower, septic tanks, and an additional greenhouse. The 1927 legislature provided funds for a machine storage building, and in 1931 made funds available for the present laboratory and office building. This building was completed in 1932 at a cost of \$13,500.

During the depression years prior to World War II, the Fruit Breeding Farm received help from the federally funded WPA (Works Projects Administration). In 1939, funds and labor were provided to replace the old greenhouses, which were in a bad state of repair. A nursery storage cellar was built to store nursery stock. This 30 x 50 foot building consisted of two stories, the basement for nursery storage and the ground floor for chemical, equipment, and supplies storage. A summer cottage was constructed on the shore of Lake Tamarack for the use of the head of the department, W. H. Alderman.

In recent years, improvements have been made on a more or less regular basis. Biennial building requests are made to the legislature by the Board of Regents. When funding results, improvements follow. Since 1953, the following major improvements have been made: upgrading electrical wiring, replacement of one of the staff cottages by a year-round cottage, construction of a machinery repair building, as well as a machine storage building, an apple grading and sales building, chain link fencing, and a sanitary sewage connection.

## Castle Danger Potato Breeding Farm

The potato breeding project is one of the oldest continuing research projects in the department. F. A. Krantz began the potato breeding work in 1919. At first he made his crosses on the St. Paul campus and at the Grand Rapids Experiment Station. Since seed set was poor at these locations, he began making crosses on a rented farm on the north shore of Lake Superior. The results were satisfactory but Krantz thought they would be more certain if the testing were on land owned by the University. In the late 1940s a 40-acre farm was purchased near the rented land and the breeding operations were transferred there. Since the University now owned the land, it was possible to improve the soil by adding lime and fertilizers. A combination cottage and laboratory was built on the shore of Lake Superior and a machine shed was added. Krantz continued to make his crosses at this station at Castle Danger until his death in 1958.

Florian Lauer joined the potato breeding staff in 1957. Although he continued to use the Castle Danger farm for a few years after the death of Krantz, he discovered that crossing could be done in the greenhouse on the St. Paul campus during the winter months with good results and at a lower cost than maintaining the experimental farm at Castle Danger. The land and buildings were turned over to the University of Minnesota, Duluth.

## Mayo Forestry and Horticultural Institute

In 1947, the Mayo Institute in Rochester offered land and financial aid to start a forestry and horticultural institute. B. F. Dunn, a local vocational agriculture teacher and former president of the Minnesota State Horticultural Society, was hired as superintendent. The institute served primarily for fruit variety testing and cultural experiments on fruits. The institute terminated when funds were withdrawn in 1952.

## The Landscape Arboretum

The Landscape Arboretum, started in 1958, has grown into one of the finest institutions of its kind in the country.

From the beginning, emphasis has been on the testing and evaluation of trees, shrubs, and ornamental plants for landscape use. A beautiful natural landscape provides the setting for the study collections of plantings. A new master plan stresses landscape design and development of gardens with plants arranged in pleasing combinations complemented by harmonious garden architecture. Besides the display plantings, research collections are growing in number. Among breeding programs under way are those on azaleas and shade trees.

Guidelines for future developments will include more interpretive exhibits and colorful seasonal plant displays, strengthening of the research program, and a greater diversity of educational programs geared to various age and interest groups.

"By presenting visitors with the wealth and beauty our earth has to offer, we hope to inspire people to demand a more livable environment," says Francis deVos, who became director of the Landscape Arboretum in January, 1977.

The idea for an arboretum was initiated in the Men's Garden Club of Minneapolis when a number of men in the group started

a test planting for unusual trees and shrubs in the backyard of a member's suburban home near Hopkins. Archie Flack, an onion and potato broker who received early training in horticulture at Kew Gardens in England, was the leader of this group. When Howard Bishop, owner of the land for the test planting, retired and moved to Florida, the group started another test planting on land owned by the Minneapolis Park Board. This site proved unsuitable, however.

In 1955, the group decided to ask Curtis Rice, then president of the Minnesota Horticultural Society, to appoint a committee to explore the need for a statewide arboretum. At a meeting of the executive board of the society held in the Curtis Hotel on March 3, 1955, approval was given for appointing such a committee. With Archie Flack as chairman and P. W. Young as secretary, this committee met regularly to study the needs and to search for a suitable site.

It was decided that the location should be near the Horticultural Research Center, which was then called the Fruit Breeding Farm. By this time a sizable planting of ornamental trees and shrubs had been started at the Research Center and it seemed logical to select a site near by.

In the winter of 1956 a member of the arboretum committee reported that Dr. Herbert J. Berens was agreeable to selling 160 acres of his 320-acre farm for the purpose of developing an arboretum. The committee voted to take an option on this land. In June, 1956, the option was taken with money provided by Mrs. Grace B. Dayton. A goal of \$75,000 was set to acquire the land and to start development. By November of 1956, \$7,137 had been raised. That winter several meetings were held with the Lake Minnetonka Garden Club, and by the fall of 1977 the club had raised the \$35,000 needed for the land acquisition. With the announcement of this news, additional money started coming in.

A grant of \$60,000 from the Hill Family Foundation for research over a five-year period enabled the arboretum to get off to a good start. On February 6, 1958, the land and a check for



An early planting at the arboretum



The Wilson Rose Garden and the clematis collection at the arboretum

\$40,000 were turned over to the University after the Minnesota State Horticultural Society had received assurance from the Board of Regents that the development and direction of the arboretum would be a part of the ongoing research and educational program of the Department of Horticultural Science. The society agreed to continue its effort to solicit financial aid to help support the developing arboretum.

During the summer of 1958 a gravel road was constructed and a few plantings were made. An entrance gate was built in 1959 with funds provided by the Lake Minnetonka Garden Club. Also in 1959, the Founders Fund of the Garden Club of America provided \$2,500 for a master plan of the arboretum, and the landscape architecture firm of Hare and Hare in Kansas City was engaged to prepare such a plan. In 1962, Mrs. Charlotte Ordway provided funds for a picnic shelter. Ed Lundie, a prominent St. Paul architect who had designed the entrance gate, was selected to design the structure, which would add a social center for arboretum activities.

Late in 1962, when it became apparent that 160 acres would not be enough land for the expanding arboretum, an option was taken on 97 acres of land just to the south of the original purchase. The St. Paul Garden Club offered to raise the \$45,000 needed. Mrs. David Winton then asked if the arboretum would accept \$15,000 to purchase additional land. After 45 acres were located at the southwest corner of the arboretum that could be purchased for \$30,000, Mr. and Mrs. Russell Bennett agreed to give the additional \$15,000 to complete the purchase in 1963. The arboretum now had 302 acres. In the same year, the University provided \$8,000 from the Regents' Reserve Fund to construct a 30 x 60 foot machine shed and shop building, a badly needed facility. This building was remodeled in 1968 to serve as an office and classroom building, for which purpose it was used until 1973.

In 1964, Mrs. John S. Pillsbury, Sr., purchased 20 acres of land just north of the Winton-Bennett addition and gave it to the arboretum in memory of her stepfather, Edmund Pennington.

Also in 1964, the vine trellises and the woodland pond were built with funds provided by the Lake Minnetonka Garden Club. A pumphouse, designed by Ed Lundie and funded by an anonymous donor, also was constructed.

In 1965 a legislative appropriation permitted the expansion of the road system through the Winton-Bennett and the St. Paul Garden Club additions, bringing the road system to about three miles.

In 1966 an option was taken on 98 acres of land just to the east of the original purchase. Dr. Berens offered to give 18 acres of this land as a memorial to his son. The balance was purchased with money provided by a number of interested families. The arboretum now consisted of 420 acres.

In 1967, the 55 acres just north of the original 160 acres were purchased and paid for by a grant of \$30,000 from the Minnesota Outdoor Recreation Organization and by a gift from the Bush Foundation. Three acres of land and a farmhouse withheld from the original St. Paul Garden Club addition by the former owner also were purchased in 1967 and paid for out of operating funds.

In 1968, the arboretum took an option to buy the remaining 65 acres owned by Dr. Berens, giving him and his family a lifetime estate of the buildings and seven acres of land. This was paid for over a five-year period with the final payments made by the Bush Foundation.

In 1969, three additional picnic shelters were built on a site just north of the classroom and office building at a cost of \$120,000. The Federal Agency, LAWCON, provided money matched with a gift from the Margot estate to build the shelters with the parking lots and landscaping. In the same year, a maple syrup evaporating house was built near the classroom building with funds provided by the Arboretum Auxiliary. The auxiliary also refurbished the reception cottage, the only original building in the arboretum, with funds from the Andromeda Church of the Open Door. An irrigation system was installed to pump water from the pond, and

the roads were blacktopped. Funds for these last two projects were furnished by the legislature.

The year 1970 marked a turning point in the arboretum. Leon Snyder relinquished his duties as head of the Department of Horticultural Science and Landscape Architecture to become the full-time director of the arboretum, thus necessitating several significant changes in the fund-raising organization. Until this time the arboretum membership office had been located in the headquarters of the Minnesota State Horticultural Society on the St. Paul campus. It was decided to move the membership office to the arboretum.

Also, in 1970, an Arboretum Foundation with a board of trustees was set up to undertake the construction of an education and research building and to administer the membership funds and special gifts to the arboretum. These were functions formerly handled in the offices of the Minnesota State Horticultural Society. At this time, Ed Lundie had nearly completed architectural plans for the new building, and John Morgan, in charge of special funds, had raised about half of the \$1.5 million needed for the building.

The direct involvement of the Minnesota State Horticultural Society in fund raising for the arboretum was thus ended. Since the arboretum owed its existence to the society, this move was made reluctantly but with the hope that members of the society would be proud of the part they had played in establishing the arboretum and would continue to cooperate and help in its support.

In 1971 ground was broken for the new education and research building. A deep well was dug at the southwest corner of the arboretum to provide water for a continuously flowing stream through the arboretum. This latter project was funded by a gift from Mr. and Mrs. Richard Gale. In the same year a machine shed and shop was completed at the back of the arboretum with funds provided by the legislature. A lathhouse was constructed near the machine shed for the propagation of azaleas, and a shade trellis was built for the ground cover area as a memorial to Mr. and Mrs. Stanley M. Lyman and Mr. and Mrs. Stanley M. Lyman, Jr. In 1971, 33 acres of land were purchased at the northwest corner of the arboretum with money from the Bush Foundation, thus bringing the total land area to 576 acres.

With the death of Ed Lundie and John Morgan in 1972, the arboretum lost two fine friends. Because of the dedication of these two men and the help of the foundation, money continued to come in for the completion of the building. A second plastic greenhouse was constructed near the new machine shed, again with money provided by the Arboretum Auxiliary.

In the fall of 1973, the arboretum staff moved into completed portions of the new building, but it was not until spring of 1974 that the building was actually finished and opened to the public. Landscaping for the building, including parking lots, outdoor lighting, and a pond and fountain, was started in 1974. In that same year, a plastic-covered A-frame structure was built near the machine shed for the purpose of wintering rhododendrons of borderline hardiness. This project was supported with funds from the Nerken Foundation.

The new Education and Research Building added a much-needed facility and prompted a rapid growth in arboretum membership. Visitors to the arboretum increased markedly also.

In 1975, new greenhouses and the headhouse, built with funds from the legislature, were completed. In 1976, the waterfall was installed with money from the Margaret Rivers Fund.

Snyder retired officially on June 30, 1976, but remained on until a replacement could be hired. Francis deVos became the second director of the University Landscape Arboretum in January, 1977. Upon Snyder's retirement, the new Education and Research Building was named the Leon C. Snyder Building.

Under deVos's guidance, the arboretum has continued to expand. In 1978 a comprehensive plan for future developments was started by the firm Environmental Planning and Design of Pittsburgh. In 1979 the Meyer-Deats Conservatory to house a collection of bromeliads and other conservatory plants was started with funds provided by Dr. Edith Potter Deats. This conservatory was opened to the public in the spring of 1980.

The overlook just to the west of the Leon C. Snyder Building also was completed in 1979 and landscaped in the spring of 1980 with funds from the Sumner T. McKnight Foundation. Also, in 1979, plans were developed to transfer azaleas and hostas to a new woodland garden area near the fir collection. This beautiful display garden was completed in the fall of 1980. In 1979, a decision was made to transfer the garden rose collection to a specially designed garden within the trellis area with planting in the spring of 1982. As part of executing the master plan, the herb garden was redesigned and construction and plantings proceeded in 1980 and 1981.

Adequate parking space, long a problem, was intensified with the construction of the Meyer-Deats Conservatory, which took valuable parking space. To offset this loss, temporary parking lots were built in 1980 to accommodate about 80 cars.

In February 1981, 116 acres of land were purchased from Jonathon at the southeast corner of the arboretum, bringing the total land area to 692 acres. This area includes the red barn.

## Present Developments at the Landscape Arboretum

Over the past five years the arboretum had been critically analyzed, particularly as to the nature and direction of its physical development. As a result of these studies a new master plan was developed that was designed to correct current problems, to provide for orderly growth in the next 25-30 years, and to increase attendance and revenue for the arboretum. Specifically, the master plan is designed to do the following:

- 1) Through relocation and expansion, increase public parking from 100 cars to 450 cars, improve vehicular circulation, and remove parking from garden areas.
- 2) Create a nucleus of 60 acres of high interest plantings and support structures to improve visitor orientation and pedestrian walkways (especially for the disabled and senior citizens) and to provide a more interesting and pleasurable environment for the visiting public. Existing woodlands, marshes, generic plantings, and research plots will *not* be changed under this plan.

Basic elements of this plan include creation of a visitors center and the development of landscape gardens and highly colorful seasonal displays of annuals, perennials, and bulbs.

In 1981 the Minnesota Landscape Arboretum Foundation started a growth campaign of \$1.3 million to implement the master plan. Pledges and gifts received through November of 1982 totaled \$1.2 million.

The elements of the master plan that have been completed include: the Hosta Glade, a landscape planting of hostas and

other shade-tolerant plants; the Palma J. Wilson Rose Garden; the McKnight Overlook; the expanded building terrace, waterfall overlook, and bridge; and the first phase of a new herb garden. The perennial garden is under construction and is scheduled for completion in 1983. Other projects scheduled for 1983 include the completion of the herb garden and realignment, regrading, and surfacing of the pedestrian pathway system. Planning for the Home Demonstration Garden will continue through 1983 with construction scheduled for spring 1984. This development of garden-like settings of home garden size will display the best landscape plants for central and southern Minnesota; garden design, techniques, and methods to meet specific needs, problems, and desires; garden architecture, including fencing, trellises, and decks; and landscape construction materials.

The full implementation of the new master plan will better meet the needs of the gardening public by increasing their enjoyment through a more pleasurable environment.

This is but a partial history of the development of the physical facilities at the arboretum. It outlines only the most important additions. The arboretum is deeply indebted to the Minnesota State Horticultural Society, the Federated Garden Clubs, the Arboretum Foundation, the many plant societies, the arboretum membership, the auxiliary, and to numerous foundations, corporations, and individual families for their generous support in providing the University with this excellent facility.

## **Duluth Horticultural Research Center**

In 1968, the Northeast Agricultural Experiment Station in Duluth was changed from a general agricultural station to a horticultural research facility. Paul Read was hired as superintendent. Before he could report for duty, the decision to close the station had been made. The former superintendent, Ralph Grant, had been transferred to the dairy husbandry department on the St. Paul campus. The civil service staff and much of the equipment had been transferred to Grand Rapids and to other stations and departments except for a few staff members who were asked to stay on to assist with the horticultural research program. When it was announced that the station would be closed, the remaining civil service staff who wished to transfer were moved to the Department of Horticultural Science on the St. Paul campus.

Because of local political pressure, the station was reopened in 1969 as a horticultural research center. Arvo Kallio was appointed superintendent and a small civil service staff was rehired. But support for the station was entirely inadequate to carry on an effective research program. In 1975, the station was closed and the land and buildings were turned over to the Duluth branch of the University.

# **Research Progress**

It is impossible to detail all of the research that has been done in the department. To do so would require volumes of scientific publications. The following brief discussion indicates the direction the research has taken over the years.

Since the beginning of the department in 1888, the research staff also has had teaching responsibilities. Very few staff members have had full-time research appointments.

The progress of the research program is presented under the following headings: variety evaluation studies, plant breeding and genetics, cultural studies and plant physiology, and food processing.

## **Variety Evaluation Studies**

Since the beginning of the department, the evaluation of varieties of fruits, vegetables, and ornamentals has been an important part of the total research program. Even before the turn of the century, a thousand or more potato varieties had been evaluated for yield and culinary use. Early evaluation studies included many varieties of both fruits and vegetables. Late in the 19th century, Professor Green planted trees and shrubs on the St. Paul campus to determine their hardiness and landscape qualities.

As plant breeding projects developed, variety and species evaluation studies preceded the actual breeding as an adjunct to the project. Much of the variety evaluation has been done at University branch experiment stations at Waseca, Morris, Crookston, Grand Rapids, and Duluth, and also on privately owned farms. University extension specialists often have been involved in this variety testing. Perhaps the largest continuing evaluation has taken place at the Landscape Arboretum, where thousands of ornamentals have been studied. Turf grasses have been evaluated on the St. Paul campus and at some of the branch stations; floricultural plants have been studied in greenhouses on the St. Paul campus as well as in privately owned commercial greenhouses.

## **Plant Breeding and Genetic Studies**

Minnesota has long been recognized as a leader in plant breeding.

**Fruit breeding** started even before the department was established in 1888. When the present Horticultural Research Center, then known as the Fruit Breeding Farm, was started in 1907, hundreds of seedlings from controlled crosses of apples, plums, pears, grapes, raspberries, and strawberries already growing on

the St. Paul campus were moved to the new farm near Excelsior.

Early efforts in fruit breeding were directed toward the development of hardy fruits of acceptable quality rather than to their disease resistance. In recent years more attention has been paid to quality for commercial potential and fresh and culinary use and to insect and disease resistance.

Until about 1965, many fruits were included in the breeding program: apples, pears, cherries, plums, apricots, peaches, grapes, currants, gooseberries, strawberries, and raspberries. Since 1965, emphasis has been placed on apples, blueberries, grapes, strawberries, and raspberries. Hybrids of the highbush blueberry crossed with our native lowbush blueberry have been introduced. These are Northblue and Northsky.

Since the fruit breeding started, the Horticultural Research Center has introduced a total of 81 varieties. These include 18 apples, 2 apricots, 2 blueberries, 3 cherries, 4 cherry-plums, 3 crabapples, 2 currants, 2 gooseberries, 6 grapes, 3 pears, 20 plums, 3 raspberries, and 13 strawberries. These varieties with dates of their introduction are listed on pages 22-23. Staff members who have been associated with fruit breeding include W. H. Alderman, William Anderson, Ernest Angelo, J. H. Beaumont, M. H. Dorsey, Cecil Stushnoff, Arthur N. Wilcox, and James Luby.

**Vegetable breeding** also started early. Potatoes were the first vegetable to receive attention. In fact, Samuel Green started making potato crosses in 1901. By 1905, he was crossing South American species with standard varieties to improve disease resistance. In 1907, A. H. Kohler joined the staff to do research on potatoes. He undertook the task of classifying the existing potato varieties, which numbered over a thousand. In 1913, R. Wellington replaced Kohler and served until he resigned in 1919. F. A. Krantz followed Wellington and served until his death in 1958. Krantz was recognized as one of the foremost potato breeders in the country. He was responsible for introducing eight varieties. He worked closely with the USDA and other potato breeders in important potato-producing states.

Florian Lauer joined the staff in 1957 and assumed the leadership for the potato breeding project in 1958. O.C. Turnquist, Sharon Desborough, and numerous research assistants have

worked with him. The variety Anoka was introduced in 1965. Two new varieties, Agassiz and Erik, are scheduled for release in 1983. These varieties have good disease and hollow heart resistance and fill special roles in production and processing. Several seedlings currently are being considered for introduction. In recent years, frost hardiness and high protein content have been introduced into the breeding program.

**Vegetable breeding other than potatoes** began with the hiring of T. M. Currence and A. E. Hutchins in 1928 and 1929. These men worked on asparagus, beans, cucumbers, eggplants, muskmelon, parsley, peppers, squash, and tomatoes. For the most part they were interested in producing varieties for home and commercial use. After the advent of F<sub>1</sub> hybrid vegetables, they supplied one or both of the inbreds to private plant breeders working for seed companies. In all, some 25 varieties were introduced. See page 24 for a list of their introductions.

Since 1965, D. W. Davis has been the leader in vegetable breeding. His emphasis has been in developing breeding lines with insect and disease resistance that can be used by plant breeders working for seed companies. Davis has concentrated his efforts on beans, cucumbers, muskmelon, green peas, sweet corn, and parsnips. Various advanced lines of sweet corn, peas, and muskmelon have been released. He has worked closely with industry people, growers, and cooperating staff members in plant pathology and entomology. In 1983, the W. Atlee Burpee Company released Honeybush muskmelon, a short internode type released by Davis in 1976 as Minnesota 266.

**The breeding of ornamentals** got off to a late start compared with fruit and vegetables. L. E. Longley started breeding chrysanthemums in the early 1930s. He continued with chrysanthemums until his retirement in 1949. He was assisted by R. A. Phillips, who joined the staff in 1942. Longley also made some crabapple crosses and introduced four varieties of roses. The rose breeding was continued by Phillips, who was responsible for two more roses. R. E. Widmer joined the staff in 1949 and immediately started to work with Phillips on the chrysanthemum breeding project. After Phillips retired in 1969, Peter Ascher worked with Widmer on the project. Emphasis in chrysanthemum breed-



Flower show and dinner held in Drill Hall on the St. Paul campus, 1908

ing has been on early bloom, flower quality, frost resistance of the flowers, plant form, disease resistance, and more recently on seed propagation cultivars. Since the project started, seven varieties of greenhouse chrysanthemums and 65 varieties of garden chrysanthemums have been introduced.

Research on the breeding of woody ornamentals (other than roses and a few ornamentals that were byproducts of fruit breeding) did not start until 1954. Since that time, R. Stadther, A. G. Johnson, R. Mullin, C. Stushnoff, and H. Pellett have worked on the breeding of ornamentals. This project received a real boost with the creation of the arboretum in 1958.

One of the outstanding achievements has been the development of hardy azaleas. In 1957, A. G. Johnson crossed *Rhododendron* x *Kosterianum* (Mollis azalea) with *R. prinophyllum* (Roseshell azalea). The resulting seedling proved perfectly hardy. The original plants from this cross are still flowering nicely in the arboretum. This self-propagated hybrid was introduced in 1978 as the Northern Lights azalea. Numerous other azaleas from controlled crosses have been selected and named and are being propagated for release in 1984 and 1985.

Other ornamentals with which breeding work is under way include viburnum, white ash, red maple, and honeysuckle. Inter-generic crosses also have been made between the chokeberries, cotoneasters, and mountain ashes. Honeysuckles have been irradiated to induce mutations of a more compact form. Selections of the redosier dogwood have been made for winter stem color. Efforts also are being made to select superior clones of white ash, buckeyes, red maple, and sugar maple for fall color. A complete list of woody ornamental introductions is given on pages 23-24.

Breeding/selection of turfgrasses in horticulture began with the employment of Donald White in 1961. He concentrated selection efforts on the creeping red fescues. The breeding objectives had to be abandoned for economic reasons. Several superior selections resulted from the program, however, and are being considered for introduction.

Genetic studies often have been a part of the plant breeding effort. Peter Ascher and Sharon Desborough have added depth to these genetic studies. Ascher has studied the genetics of incompatibility and the mechanism by which self- and interspecific incompatibility reactions prevent the normal function of pollen tubes. Test plants have included *Lilium longiflorum*, *Nemesia strumosa*, and *Petunia* x *hybrida*. Desborough has studied the genetics of the inheritance of high protein and frost resistance in potatoes.

## Cultural Studies and Plant Physiology

There is no sharp line between research involving improved cultural practices and more basic laboratory research in plant physiology. The same staff members often are involved in both types of research.

Cultural studies were an important part of the early research in the department and continue to be a significant part of the total research effort. Some of the more important cultural studies that have given valuable information to growers of horticultural crops include the following: spacing studies to determine the optimum number of plants per unit of land, pruning and training studies,

chemical weed control studies, chemical thinning of fruits studies, studies of the use of plastic mulches to increase earliness in vegetables, winter protection studies, studies of the effect of shading on container-grown nursery stock, studies of chemical pruning of roots in tap-rooted trees, studies of the use of growth regulators to control size in plants, and studies of temperature and light requirements of floricultural crops and low temperature tolerance of plants. Staff members who have been involved in cultural studies include E. T. Andersen, Paul Boldt, W. G. Brierley, S. B. Green, L. B. Hertz, A. Kallio, R. E. Nylund, A. A. Piringer, Harold Pellett, P. E. Read, B. T. Swanson, O. C. Turnquist, T. S. Weir, D. B. White, R. E. Widmer, and H. F. Wilkins.

The recent hiring of trained plant physiologists and biochemists has enabled the department to gain a deeper insight into how plants grow and adjust to their environment. Basic physiological research in the laboratory and under controlled environmental conditions in growth chambers is helping to solve common problems.

**The Plant Hardiness Laboratory**, started in 1960, has become one of the leading centers for cold hardiness studies in the world. Research in this laboratory helps explain how plants harden for winter and explains what happens when trees show winter sunscald and leaf burn in evergreens. Studies on growth regulators and plant hormones have practical applications in plant propagation and in the successful culture of a variety of plants. Studies in membrane permeability help to explain how chemicals move into and through the plant. Staff members who have been involved with basic research in plant physiology include W. G. Brierley, Michael Burke, J. V. Carter, R. B. Harvey, J. Levitt, Paul Li, A. J. Linck, R. E. Nylund, L. R. Parsons, A. A. Piringer, P. E. Read, J. R. Sowokinos, E. J. Stadelmann, C. J. Weiser, and A. H. Markhart.

## Food Quality — Sensory Evaluation — Processing

In the mid-1930s, James D. Winter joined the department staff and began his research on the physiology and handling of small fruits. He was instrumental in introducing a high concentration carbon dioxide treatment of berries that enabled them to stand up during shipment and sale. Later he began experimental work in freezing fruits and vegetables. "J. D." formulated the interdepartmental food technology curriculum.

Shirley Munson, who was hired as J. D.'s laboratory assistant in the 1940s, became project leader at his retirement in 1960.

Results of experiments on freezing fruits and vegetables were summarized in numerous University publications, and demand for these publications has exceeded two million.

Sensory and quality attributes of advanced breeding selections have been evaluated for color, texture, flavor, storage ability, and usage. This information has contributed to University introductions of fruits, vegetables, and potatoes. Greater interest in potato quality in recent years has prompted studies of quality attributes such as color, texture, flavor, and culinary characteristics in cooperation with the Red River Valley Potato Research Laboratory.

# Instruction

Except for an occasional lecture in horticulture given to classes in other departments, no formal courses were offered in the University before the establishment of the Department of Horticulture in 1888. Samuel B. Green, the first head of the department, played a leading role in reorganizing the curriculum in the College of Agriculture in 1891. Cyrus Northrop, president of the University, wrote, "He carefully planned the curriculum, and as chairman of the committee on the course of study he secured the adoption of the present high and excellent curriculum. So far as the College of Agriculture is concerned, Professor Green was the man who molded it into its present shape and gave it the resulting attractiveness." This was high praise for the new department head.

The first horticulture courses were taught in both the School of Agriculture and the College of Agriculture. The school program

was designed to give a high school diploma to farm boys and girls who attended the University for six months each year for four years. During the early years the school continued to attract more students than the college. Some of the graduates of the school program transferred to the college and thus helped to attract students to the college program.

Little has been written about the early courses offered in the Department of Horticulture, but we can assume they were of a practical nature. In 1899 five horticulture courses were offered in the college and three in the school: Fruit Growing, Vegetable Growing, Greenhouse Practices, Nursery Practices, and Plant Breeding in the college and Fruit Growing, Vegetable Growing, and Plant Propagation in the school.



W. H. Alderman's office in the chemistry-horticulture building, 1919



Plant propagation students, winter of 1961

By 1912, General Horticulture, Commercial Fruit Growing, Floriculture, Landscape Gardening, Systemic Pomology, Greenhouse Construction, and Orchard Spraying had been added to the college curriculum. The courses in the School of Agriculture remained the same. By 1925, 20 courses were listed in the college curriculum. They included Small Fruit Culture, Vegetable Forcing, Plant Materials I and II, History of Landscape Architecture, Landscape Problems, Landscape Construction, Judging of Horticultural Crops, Horticultural Crop Breeding, Advanced Vegetable Production, Systematic Olericulture, Commercial Truck-Growing, Potato Production, and a seminar.

As early as 1925, special courses of a more technical nature were offered for those students planning to continue in the graduate program. Also included were courses in other disciplines. By 1935, the College of Agriculture, Forestry, and Home Economics offered two separate curricula. The curriculum in General Agriculture was designed for those students who planned to return to the farm or work for some agribusiness firm upon graduation, and the Agricultural Science Curriculum was designed for those who planned to continue their education in a graduate program.

During the 1940s and 1950s the number of courses offered in the department continued to grow. With the closing of the School of Agriculture on the St. Paul campus in 1960, a two-year certificate program was started. This program was terminated in the late 1960s.

By 1966, 62 organized courses were taught in the department. Twenty of these were open to undergraduate students only; nine were open only to graduate students. The remaining 33 were open to both upper division and graduate students. About this time a comprehensive revision of the curriculum had just been completed. Undergraduate instruction was to be offered in five major curricula: Agricultural Production and Industries, Agricultural Economics and Business Administration, Biological and Physical Sciences in Agriculture, Food Science and Industries, and Resource and Community Development. Most of the horticul-

ture majors chose Agricultural Production and Industries. The Landscape Design students retained their separate identity under the Resource and Community Development curriculum.

Until about 1970, the number of undergraduate majors in the department remained small, fluctuating from 30 to 40 students a year. The number of graduate students was almost as large as the undergraduate enrollment. Thirty-two graduate students were registered during the fall quarter in 1966.

The 1970s brought a great influx in the number of undergraduates, probably prompted by the Vietnam War and the concern of young people for their environment. Between 1969 and 1976, the number of students majoring in horticulture jumped from 32 to 244. In the same period, those majoring in landscape architecture grew from 28 to 67. This latter increase was due in part to the offering of a degree in landscape architecture resulting from the union of the faculties in landscape architecture in the School of Architecture with those in the Department of Horticultural Science. As a result, the name of the department was changed to the Department of Horticultural Science and Landscape Architecture.

The graduate program in horticulture has undergone several significant changes in recent years. In 1964, when the Department of Agricultural Botany was terminated, the plant physiologists in this department were transferred to agronomy, forestry, and horticulture. Graduate students wishing to major in physiology could do so in any of the applied plant science departments. At the present time, the department offers an M.S. (Plan A, with thesis, or Plan B, without thesis) and the Ph.D. degree. A Master of Agriculture degree also is available. For the Ph.D., students can major in horticulture with a minor in plant physiology or they can major in plant physiology or plant breeding with a minor in horticulture.

The first graduate degree was awarded in the department in 1907. During the ensuing years, the department has awarded 217+ M.S. and 156+ Ph.D. degrees.

# Agricultural Extension

Horticultural extension started early in the history of the department. In 1910, K. A. Kirkpatrick was hired as a full-time extension horticulturist and served until 1913. In that year, R. S. Mackintosh was appointed an extension horticulturist and held that position until 1940. Mackintosh became secretary of the Minnesota State Horticultural Society in 1920, but continued as extension horticulturist on a half-time basis. In 1936, Eldred M. Hunt was employed as a full-time extension horticulturist, a position he held until 1945, when he resigned to become executive secretary of the Minnesota State Horticultural Society.

During the early years, the extension horticulturist had broad responsibility for extending the knowledge of horticulture to all interested individuals and organizations, whether amateur or professional. These duties involved a great deal of travel and left little time for professional improvement or for preparing publications.

In 1945, Leon C. Snyder replaced Eldred Hunt. He served until 1953. In 1949, Orrin C. Turnquist joined the extension staff to work in the field of potato and vegetable production. In 1955, C. Gustav Hard joined the extension staff in ornamental horticulture. Mervin Eisel was hired in 1966, also in ornamental horticulture, to develop an educational program at the arboretum. Leonard Hertz joined the staff in 1967 as a fruit specialist. In 1969, Arvo Kallio became superintendent of the Horticultural Field Station in Duluth with a part-time extension appointment. Later, when the station closed, he became a full-time extension specialist working out of Duluth.

Jane McKinnon was put in charge of the Horticultural Information Office in 1970. In 1974, Linda Sanford was appointed a naturalist at the arboretum. In 1978, Deborah Brown took charge of the information office to free Jane McKinnon for statewide extension work. The department became involved in a state Shade Tree Program targeted at control and eradication of Dutch Elm disease. Richard Rideout was hired as arborist on this project from 1978 to 1980. Additional extension staff hired in 1979 and 1980 to complement the expanding horticultural industry needs in the state included Bert Swanson in nursery management and Luther Waters as specialist in vegetables. A position in the floriculture area also was added.

An innovative learning-by-telephone system was introduced in January of 1983. DIAL U, an information system designed to respond to questions from the public concerning plants and insects, is available to most people within the toll-free calling area of the Twin Cities for a small charge that is added to the caller's phone bill.

In recent years most of the extension specialists have held joint appointments, with a percentage of their time devoted to teaching and research, making for a closer tie with the teaching and research staff.

The rapid increase in the number of specialists in horticulture reflects the growing awareness of the University administration to the importance of horticulture to the state's economy. This increase in staff has enabled the specialists to work more closely with their clientele and has allowed more time for preparation of publications and for professional improvement.



Spraying muskmelons near Brooklyn Center, about 1917

# Academic Staff

Staff Member	Years of Service	Highest Degree	Highest Rank	% Ext.	Location	Field of Specialization
Alderman, William H.*	1919-53	M.S.	Professor		St. Paul	Fruit Breeding
Andersen, Emil T.	1957-69	Ph.D.	Associate Professor		St. Paul	Fruit Physiology
Anderson, W. Ralph	1964-66	Ph.D.	Assistant Professor		St. Paul	Fruit Breeding
Angelo, Ernest	1930-39		Assistant Professor		St. Paul	Fruit Breeding
Ascher, Peter D.	1968-	Ph.D.	Professor		St. Paul	Genetics
Bartz, James F.*	1982-	Ph.D.	Professor		St. Paul	Vegetable Production
Beaumont, J. H.	1919-28	B.S.	Assistant Professor		St. Paul	Fruit Breeding
Boldt, Paul	1979-81	Ph.D.	Assistant Professor		St. Paul	Vegetable Physiology
Brenner, Mark L.	1969-	Ph.D.	Professor		St. Paul	Fruit Physiology
Brierley, W. G.	1913-54	Ph.D.	Professor		St. Paul	Fruit Physiology
Brown, Deborah L.	1978-	M.S.	Assistant Professor	100	St. Paul	General Horticulture
Burke, Michael	1971-76	Ph.D.	Assistant Professor		St. Paul	Cold Hardiness
Burrell, B. O.	1923-27	B.S.	Instructor		St. Paul	Vegetables
Bushnell, J. W.	1917-23		Instructor		St. Paul	Vegetables
Cady, LeRoy	1902-23		Associate Professor		St. Paul	Ornamentals
Carter, John V.	1977-	Ph.D.	Associate Professor		St. Paul	Cold Hardiness
Cary, C. E.	1923-28	B.S.	Assistant Professor		St. Paul	Ornamentals
Cline, Van	1979-	M.L.A.	Assistant Professor		St. Paul	Landscape Architecture
Currence, Troy M.	1928-66	Ph.D.	Professor		St. Paul	Vegetable Breeding
Daniels, Frank P.	1916-37	B.S.	Instructor		St. Paul	General Horticulture
Davis, David W.	1965-	Ph.D.	Professor		St. Paul	Vegetable Breeding
Desborough, Sharon L.	1969-	Ph.D.	Associate Professor		St. Paul	Genetics
deVos, Francis	1977-	Ph.D.	Professor		Arboretum	Ornamentals
Dorsey, M. J.	1911-21	Ph.D.	Associate Professor		St. Paul	Fruit Breeding
Duncan, Andrew*	1970-75	Ph.D.	Professor		St. Paul	Vegetable Physiology
Eisel, Mervin	1966-	M.S.	Assistant Professor	100	Arboretum	Ornamentals
Forsythe, Richard H.	1973-78	M.L.A.	Associate Professor		St. Paul	Landscape Architecture
Green, Samuel B.*	1888-1910	B.S.	Professor		St. Paul	General Horticulture
Hackett, Wesley P.†	1982-	Ph.D.	Professor		St. Paul	Woody Plants
Hard, C. Gustav	1955-	Ph.D.	Professor	20	St. Paul	Landscape Horticulture
Harvey, R. B.	1931-44	Ph.D.	Professor		St. Paul	Plant Physiology
Hertz, Leonard B.	1967-	Ph.D.	Professor	55	St. Paul	Fruit Physiology
Hildreth, A. C.	1924-27	Ph.D.	Instructor		St. Paul	Fruits
Hoover, Emily E.	1982-	Ph.D.	Lecturer		St. Paul	Fruit Physiology
Hunt, Eldred M.	1936-45	M.S.	Extension Horticulturist	100	St. Paul	General Horticulture
Hutchins, Arthur E.	1929-65	Ph.D.	Professor		St. Paul	Vegetable Breeding
Johnson, Albert G.	1957-77	M.S.	Research Associate		Arboretum	Ornamental Breeding
Kallio, Arvo	1969-80	Ph.D.	Professor	100	Duluth	General Horticulture
Kirkpatrick, K. A.	1910-13		Extension Horticulturist	100	St. Paul	General Horticulture
Koranski, David	1979-82	Ph.D.	Assistant Professor	70	St. Paul	Floriculture
Krantz, Fred A.	1919-58	Ph.D.	Professor		St. Paul	Potato Breeding
Kuska, James	1967-73	M.L.A.	Assistant Professor		St. Paul	Landscape Architecture
Lacy, C. Y.	1874-80	M.S.	Professor		St. Paul	General Horticulture
Lasheen, Aly	1977-	Ph.D.	Professor		Morocco	Fruit Physiology
Lauer, Florian I.	1957-	Ph.D.	Professor		St. Paul	Potato Breeding
Levitt, J.	1975-76	Ph.D.	Professor		St. Paul	Cold Hardiness
Li, Paul	1962-	Ph.D.	Professor		St. Paul	Cold Hardiness
Linck, Albert J.	1964-	Ph.D.	Professor		St. Paul	Plant Physiology
Longley, L. E.	1929-49	Ph.D.	Assistant Professor		St. Paul	Ornamentals
Luby, James J.	1982-	Ph.D.	Assistant Professor		St. Paul	Fruit Breeding

\*Department Head

†Gordon & Margaret Bailey Chair in Environmental Horticulture

Mackintosh, R. S.	1896-1902 1913-1940	M.S.	Extension Horticulturist	100	St. Paul	General Horticulture
Markhart, Jr., Albert	1980-	Ph.D.	Assistant Professor		St. Paul	Cold Hardiness
McKinnon, Jane P.	1970-	M.S.	Professor	100	St. Paul	Landscape Horticulture
Middleton, J. A.	1923-25	?	Instructor		St. Paul	General Horticulture
Mullin, Robert	1963-	Ph.D.	Professor		St. Paul	Ornamentals
Munson, Shirley T.	1949-	M.S.	Associate Professor		St. Paul	Frozen Foods
Nylund, Robert E.	1941-79	Ph.D.	Professor		St. Paul	Vegetable Physiology
Olin, Peter J.	1974-	M.L.A.	Associate Professor		St. Paul	Landscape Architecture
Ozbun, J. L.*	1976-81	Ph.D.	Professor		St. Paul	Vegetable Physiology
Parsons, Lawrence R.	1975-80	Ph.D.	Assistant Professor		St. Paul	Cold Hardiness
Pellet, Harold	1967-	Ph.D.	Professor		Arboretum	Ornamentals
Phillips, Robert A.	1942-71	M.S.	Assistant Professor		St. Paul	Ornamentals
Piringer, Albert A.	1954-56	Ph.D.	Associate Professor		St. Paul	Fruit Physiology
Read, Paul E.	1968-	Ph.D.	Professor		St. Paul	Plant Physiology
Rideout, Richard B.	1978-80	M.S.	Assistant Extension Specialist	100	St. Paul	Arborist
Robertson, D. A.	1869-70	B.S.	Professor		St. Paul	Fruits
Rogier, June M.	1971-	B.S.	Assistant Professor		Arboretum	Librarian
Sanford, Linda S.	1974-82	B.S.	Assistant Extension Specialist	100	Arboretum	Naturalist
Simons, Kenneth	1976-81	B.S.	Instructor		St. Paul	Arboriculture
Snyder, Leon C.*	1945-76	Ph.D.	Professor	35	Arboretum	Ornamentals
Sowokinos, Joseph R.	1972-	Ph.D.	Associate Professor		E. Grand Forks	Potato Physiology
Stadtherr, Richard	1954-61	M.S.	Instructor		St. Paul	Ornamentals
Stadelmann, Eduard J.	1964-	Ph.D.	Professor		St. Paul	Plant Physiology
Stushnoff, Cecil	1967-80	Ph.D.	Professor		St. Paul	Fruit Breeding
Swanson, Bert T.	1978-	Ph.D.	Associate Professor	60	St. Paul	Nursery Management
Tapley, William T.	1916-23		Assistant Professor		St. Paul	Vegetables
Taylor, Donovan	1980-81	Ph.D.	Assistant Professor	100	St. Paul	Turf
Traub, H. P.	1924-28	Ph.D.	Instructor		St. Paul	Vegetables
Turnquist, Orrin C.	1945-79	Ph.D.	Professor	60	St. Paul	Vegetables
Waters, Luther	1979-	Ph.D.	Associate Professor		St. Paul	Vegetables
Weidel, Katherine	1979-81	M.L.A.	Assistant Professor		St. Paul	Landscape Architecture
Weir, Theodore S.	1939-66	M.S.	Associate Professor		Research Center	Fruits
Weiser, Conrad J.	1960-73	Ph.D.	Professor		St. Paul	Cold Hardiness
Wellington, Richard	1913-19	Ph.D.	Assistant Professor		St. Paul	Fruits and Vegetables
White, Donald B.	1962-	Ph.D.	Professor		St. Paul	Turf
Widmer, Richard E.	1950-	Ph.D.	Professor		St. Paul	Floriculture
Wilcox, Arthur N.	1923-63	Ph.D.	Professor		St. Paul	Fruit Breeding
Wildung, David K.	1963-	Ph.D.	Associate Professor		Grand Rapids	General Horticulture
Wilkins, Harold F.	1966-	Ph.D.	Professor		St. Paul	Floriculture
Winter, J. D.	1934-60	M.S.	Associate Professor		St. Paul	Frozen Foods

\*Department Head

# Introduced Cultivars and Breeding Lines

## Fruits

### APPLE

- 'Beacon' 1936 — early, red
- 'Fireside' 1943 — high-quality eating, winter
- 'Folwell' 1921 — large-fruited, fall
- 'Haralson' 1922 — tart, winter
- 'Honeygold' 1970 — sweet, yellow
- 'Keepsake' 1978 — long storage life
- 'Lakeland' 1950 — culinary, fall, red
- 'Minjon' 1942 — culinary, red
- 'Minnehaha' 1920 — medium-sized, oblate, red, late fall
- 'Oriole' 1949 — striped, early fall
- 'Prairie Spy' 1940 — culinary, striped, winter
- 'Red Baron' 1970 — red, fall
- 'Redwell' 1946 — red, winter
- 'Regent' 1964 — red, winter, high quality
- 'State Fair' 1977 — red, early fall
- 'Sweet Sixteen' 1977 — sweet, striped, late fall
- 'Victory' 1943 — white flesh, winter
- 'Wedge' 1921 — cooking, late fall, very hardy

### APRICOT

- 'Moongold' 1960 — golden yellow, very hardy
- 'Sungold' 1960 — yellow with red blush, very hardy

### BLUEBERRY

- 'Northblue' 1981 — hardy, half-high habit
- 'Northsky' 1981 — hardy, half-high habit

### CHERRY

- 'Meteor' 1952 — vigorous red pie cherry
- 'Northstar' 1950 — pie cherry, semi-dwarf
- 'Orient' 1949 — large-fruited Nanking cherry

### CHERRY-PLUM

- 'Deep Purple' 1965 — deep purple color
- 'Nicollet' 1924 — fruits resemble pie cherries, unknown origin
- 'St. Anthony' 1923 — flesh dark red, productive
- 'Zumbra' 1920 — fruits dark purple with yellow flesh

### CRABAPPLE

- 'Centennial' 1957 — very hardy, excellent for eating
- 'Chestnut' 1949 — large for a crabapple, fine flavor
- 'Northland' 1957 — very hardy, red

### CURRENT

- 'Cascade' 1942 — large individual fruits, red
- 'Red Lake' 1933 — large cluster of medium fruits, red

### GOOSEBERRY

- 'Como' 1921 — susceptible to leaf spot and mildew
- 'Welcome' 1957 — large fruits, susceptible to mildew

### GRAPE

- 'Bluebell' 1944 — early maturing, good quality
- 'Bluejay' 1944 — very hardy, male sterile
- 'Edelweiss' 1977 — white table grape, needs protection
- 'Moonbeam' 1944 — white grape, needs protection
- 'Red Amber' 1944 — red grape of good quality
- 'Swenson Red' 1977 — red table grape, needs protection

### PEAR

- 'Bantam' 1940 — small fruits, very hardy
- 'Golden Spice' 1949 — small fruits, very hardy
- 'Parker' 1934 — large fruits, hardy, soft core

### PLUM

- 'Anoka' 1922 — red, clingstone, hybrid
- 'Elliot' 1920 — large red fruits with yellow flesh
- 'Ember' 1936 — medium-sized yellow fruits with reddish blush
- 'Golden Rod' 1922 — yellow fruits, not very productive
- 'Hennepin' 1923 — very hardy with red flesh
- 'LaCrescent' 1923 — yellow plum, often a shy bearer
- 'Mendota' 1924 — fruits very large, red
- 'Monitor' 1920 — fruits large, bronze-red, with yellow flesh
- 'Mound' 1921 — productive, large fruits of only fair quality
- 'Pipestone' 1942 — large red fruits for drier areas
- 'Radisson' 1925 — fruits large, red, of good quality
- 'Redcoat' 1942 — freestone with attractive red color
- 'Redglow' 1949 — fruits large, attractive red
- 'Red Wing' 1920 — fruits large, freestone, delicious
- 'South Dakota' 1949 — seedling of native *P. americana*
- 'Superior' 1933 — large-fruited hybrid with pointed fruits
- 'Tonka' 1920 — productive, large freestone fruits
- 'Underwood' 1920 — hardy vigorous trees, large-fruited
- 'Waconia' 1923 — large red fruits of only fair quality
- 'Winona' 1921 — susceptible to brown rot

### RASPBERRY

- 'Chief' 1930 — very hardy, fruits red, rather small
- 'Itasca' 1965 — fruits red, does well at Grand Rapids
- 'Latham' 1920 — large fruits, productive red variety

### STRAWBERRY

- 'Arrowhead' 1946 — June bearing, very hardy, midseason
- 'Burgundy' 1943 — June bearing, late maturing
- 'Chaska' 1921 — June bearing, large-fruited
- 'Deephaven' 1921 — everbearing, susceptible to viruses
- 'Duluth' 1920 — everbearing, very hardy
- 'Earlmore' 1959 — June bearing, early

- 'Easypicker' 1921 — June bearing, male sterile
- 'Evermore' 1945 — everbearing, excellent plant maker
- 'Minnehaha' 1920 — June bearing, large fruited
- 'Minnesota' 1920 — June bearing, susceptible to viruses
- 'Nokomis' 1921 — June bearing, fruits soft
- 'Northland' 1981 — June bearing, hardy
- 'Trumpeter' 1960 — June bearing, red fleshed fruits

## Ornamentals (by genus)

- Acer rubrum* 'Northwood' 1980 — hardy strain with good fall color
- Aesculus* 'Autumn Splendor' 1980 — selection with red fall color

## AZALEA

- 'Pink Lights' 1984 — hardy, dark pink (in wholesale production for sale on retail market in 1984)
- 'Rosy Lights' 1984 — hardy, light pink
- 'White Lights' 1984-85 — (in wholesale production for sale on retail market in 1985)

## CHRYSANTHEMUM (greenhouse types; no available descriptions)

- 'Daisy mum' 1940 — single, white starlike flowers
- 'Fawn' 1935
- 'Hiawatha' 1934
- 'Northstar' 1935
- 'Sioux' 1940 — single, rays aster-purple, twisted
- 'Snowflake' 1935
- 'Winona' 1940 — single, lemon-chrome flowers

## CHRYSANTHEMUM (garden types)

- 'Aurora' 1945 — 2.25-inch, blood-red double flowers
- 'Autumn Fire' 1977 — large, double, burnt orange flowers
- 'Boreas' 1941 — 2-inch, white double flowers
- 'Bountiful' 1948 — 2.5-inch, carmine double flowers
- 'Brilliant' 1947 — cushion, 2.5-inch, Brazil-red, double flowers
- 'Butterball' 1944 — 2.5-inch, lemon-chrome pompon flowers
- 'Centerpiece' 1982 — 4-inch rose-lavender, quilled flowers
- 'Chippewa' 1942 — 2.75-inch, purple semi-double flowers
- 'Creamtop' 1966 — 3-inch, white flowers with yellow centers
- 'Dee Dee Arens' 1946 — 2-inch, white double flowers
- 'Dr. Longley' 1949 — 3-inch, rose-pink decorative flowers
- 'Duluth' 1939 — 2-inch, lemon-yellow, semi-double flowers
- 'Glacier' 1944 — early, 3-inch, white decorative flowers
- 'Gold Country' 1982 — 4-4½" peachy yellow, fully double decorative flowers
- 'Gold Strike' 1964 — 2-inch, golden yellow pompon flowers
- 'Golden Fantasy' 1957 — 2-inch, golden yellow decorative flowers
- 'Golden Jubilee' 1971 — 3-inch, deep gold decorative flowers
- 'Golden Star' 1977 — yellow, spoon-petalled flowers
- 'Harmony' 1941 — 2.25-inch, yellow to red double flowers
- 'Harvest Bronze' 1952 — 3-inch, apricot-bronze double flowers
- 'Lindy' 1974 — large lavender-pink, quilled flowers
- 'Maroon 'n Gold' 1945 — 3.5-inch red to maroon double flowers
- 'Mellow Moon' 1982 — 4½-inch to 5-inch cream fully-double decorative flowers
- 'Mesabi' 1955 — 2-inch, copper-red double flowers
- 'Minnautumn' 1962 — cushion, 2.5-inch reddish bronze decorative flowers
- 'Minnbronze' 1957 — cushion, 1.5-inch, bronze double flowers
- 'Minnehaha' 1958 — 2.5-inch, salmon double flowers

- 'Mingglow' 1972 — cushion, 2.25-inch, lemon-yellow decorative flowers
- 'Minnogopher' 1977 — cushion 2.0-2.5-inch, ruby red decorative flowers
- 'Minnpink' 1957 — cushion, 1.5-inch, rose-pink decorative flowers
- 'Minnqueen' 1979 — cushion, 3-inch, rose-pink decorative flowers
- 'Minnrose' 1966 — cushion, 1.5-inch, rose-pink pompon flowers
- 'Minnruby' 1974 — cushion, 2.25-inch, ruby-red decorative flowers
- 'Minnwhite' 1968 — cushion, 2-inch, white decorative flowers
- 'Minnyellow' 1972 — cushion, 2-inch, lemon-yellow decorative flowers
- 'Moonglow' 1941 — 1.75-inch, lemon-chrome double flowers
- 'Moonlight' 1949 — 3-inch, pale yellow reflexed flowers
- 'Pipestone' 1943 — 2.75-inch, Brazil-red semi-double flowers
- 'Prairie Moon' 1959 — 4-inch, creamy-white double flowers
- 'Prairie Sunset' 1952 — 2.5-inch, rose-pink double flowers
- 'Princess' 1957 — 2-inch, rose and gold semi-carnation flowers
- 'Purple Star' 1942 — 2-inch, purple double flowers
- 'Redgold' 1942 — 2-inch, scarlet pompon flowers
- 'Redhawk' 1944 — 2-inch, red quilled flowers
- 'Redwing' 1941 — 1.75-inch, red, semi-double flowers
- 'Redwood' 1944 — 2-inch, carmine semi-double flowers
- 'Royal Knight' 1979 — 3.5-inch, maroon-purple decorative flowers
- 'Royal Pomp' 1969 — 2-inch, bright purple pompon flowers
- 'Silver Pink' 1947 — 2.5-inch pink with silvery sheen, double flowers
- 'Snowball' 1944 — 2.5-inch, white double flowers
- 'Sunny Glow' 1968 — 2.5-inch, orange-gold decorative flowers
- 'Sunred' 1942 — 3-inch, Brazil red semi-double flowers
- 'Superior' 1965 — 3-inch, bronze-orange decorative flowers
- 'Tenstrike' 1963 — 1.5-inch, bright lavender pompon flowers
- 'Tonka' 1959 — 3-inch, yellow double flowers
- 'Violet' 1946 — 3-inch, purple double flowers
- 'Vulcan' 1955 — 2.5 inch, dark red decorative flowers
- 'Wanda' 1956 — 3-inch, raspberry double flowers
- 'Waterlily' 1943 — 3-inch, raspberry double flowers
- 'Wayzata' 1961 — 3-inch, bright yellow decorative flowers
- 'Welcome' 1941 — 1.75-inch, mallow-purple semi-double flowers
- 'Wendy Ann' 1974 — 4-inch, fawn yellow semi-spoon flowers
- 'Wenonah' 1954 — 2.25-inch, lavender double flowers
- 'Yellow Glow' 1969 — 2.75-inch, rich yellow decorative flowers
- 'Zonta' 1964 — 2.5-inch, apricot-bronze pompon flowers

*Cornus sericea* 'Isanti' 1971 — compact form

*Forsythia* 'Northern Sun' 1983 — hardy

- Malus* 'Flame' 1934 — white flowers, red fruits
- 'Radiant' 1958 — oval tree form, red fruits
- 'Sparkler' 1969 — flat-topped tree, deep red fruits
- 'Vanguard' 1963 — vase-shaped tree, red fruits

*Pinus banksiana* 'Uncle Fogey' 1971 — prostrate, drooping habit

- Prunus* 'Manitou' 1923 — almond of hybrid origin, pink flowers
- 'Newport' 1923 — plum hybrid with purplish-red leaves

*Rhododendron* (Northern Lights strain) 1978 — hardy azalea, pink flowers

Rosa 'L. E. Longley' 1949  
 'Pink Rochet' 1949 — single, pink flowers, repeat bloom  
 'Prairie Fire' 1959 — single, pink flowers, repeat bloom  
 'Red Rocket' 1949 — single, red flowers, repeat bloom  
 'Viking Queen' 1963 — double, pink flowers, climber  
 'White Dawn' 1949 — double, white flowers, climber

## Vegetables

### ASPARAGUS

(4-way cross) 1945 — vigorous, productive hybrid  
 'Faribo F' 1952 — male parent supplied to Farmers Seed Co.

### BEANS, SNAP

'Duluth' 1939 — short, flat-podded wax bean  
 'Zenith' 1940

### CUCUMBER

'Midget' 1940 — bush type with small fruits  
 'Mincu' 1937 — small vine with small blocky fruits  
 'Faribo Hybrid C' 1948 — hybrid vigor, disease resistant  
 'Faribo Hybrid D' 1954 — hybrid vigor, disease resistant  
 'Minnesota Dwarf XII' 1949

### EGGPLANT

'Minnoval' 1942 — small, oval-shaped fruit

### MUSKMELON

'Golden Gopher' 1940 — resistant to Fusarium wilt  
 'Hybrid 16' 1962  
 'Minnesota Honey' 1954 — densely netted fruits, Fusarium resistant  
 'Minnesota Midget' 1948 — small vines and fruits  
 \* Minnesota P 1971  
 \* Minnesota 3 1971  
 \* Minnesota 155 1971  
 † Minnesota 266 1975  
 \* Minnesota 553 1971

\* Breeding line with Fusarium resistance and early maturity.

† Breeding line with powdery mildew and Fusarium wilt resistance; bush type with very small seed cavity.

### PARSLEY

'Minncurl' 1960 — compact plant, finely divided curled leaves

### PEA

‡ Minnesota 108 1976  
 #Minnesota 494 — all 1980

### PEPPER

'Faribo Hybrid F<sub>1</sub>' 1951

### POTATO

'Anoka' 1965  
 'Chisago' 1949 — smooth white oblong tubers  
 'Kasota' 1948 — introduced with Nebraska  
 'Mesaba' 1938  
 'Osseo' 1954 — early, white skin, uniform  
 'Red Warba' 1939 — similar to Warba but red skin  
 'Satapa' 1949 — pale red skin, medium-sized  
 'Warba' 1933 — high-quality tubers with deep eyes  
 'Waseca' 1949 — red skin with shallow eyes

### SQUASH

'Faribo Hybrid G' 1951  
 'Faribo Hybrid R' 1951  
 'Greengold' 1939 — yellow Buttercup type with green stripes  
 'Kitchenette' 1920 — small, Hubbard-type  
 'New Brighton Hybrid' 1932 — large, Hubbard-type  
 'Rainbow' 1947 — long, nearly cylindrical with pink background

### SWEETCORN

:AS9 1980

### TOMATO

'Early Fireball' 1965 — mutation induced by radiation  
 'Faribo Hybrid E' 1947  
 'Faribo Hybrid EE' 1960  
 'Mingold' 1939 — yellow fruits

### WATERMELON

'Northern Sweet' 1932

‡ Breeding line with resistance to common root rot (*Aphanomyces euteiches*) and resistance to race 1 of *Fusarium oxysporum* f. sp. pisi.

# Breeding line highly resistant to common root rot (*Aphanomyces euteiches*) and to races 1, 2, and 6 of *Fusarium oxysporum* f. sp. pisi, and moderate resistance to race 5 and to root rot caused by *Pythium ultimum*.

: Breeding line resistant to first brood of European corn borer. A composite.