A History of Minnesota Floriculture

A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

Richard E. Widmer
Professor Emeritus, Department of Horticultural Science
University of Minnesota, St. Paul, Minnesota 55108

Minnesota Report 238–1997
Minnesota Agricultural Experiment Station
University of Minnesota

St. Paul, Minnesota

The University of Minnesota, including the Minnesota Agricultural Experiment Station, is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.
Author

Richard E. Widmer, is a Professor Emeritus in the Department of Horticultural Science, University of Minnesota, St. Paul.

Dedication

This manuscript is dedicated to my wife Muriel Elizabeth for her constant support throughout my professional life.

Acknowledgments

Gathering information for this publication required the kind cooperation of several hundred individuals who were contacted directly, by telephone and by mail. The author also appreciated the use of Minnesota State Historical Society facilities, Minneapolis Park Board Archives (Mary Lerman), St. Paul Park Board Archives (Claire Martin), Iron Range Resource Center (Julie B. Smith), Minnesota State Horticultural Society records (Dorothy Johnsrud), Mower County Historical Society (Monica M. Loneragan), Blue Earth County Historical Society (Carol Oney), Becker County Historical Society (Becky Olenud), Marvin Miller of the George Ball Company, Alvi Voigt, retired agricultural economist at Penn State University, and James Brewer of the USDA National Agricultural Statistics Service, Washington, D.C.

The author also appreciated the assistance provided by staff of the University of Minnesota Department of Horticultural Science in keyboarding this manuscript.

This publication was produced for the Minnesota Agricultural Experiment Station, with design and production management by Larry A. Elkin, experiment station senior editor, Educational Development System, University of Minnesota, St. Paul, Minnesota.

Cover graphics courtesy: Gerald Neilsen, Stanley Hampl, Al Gerdin and Gerald McKay.

Disclaimer

Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Minnesota Agricultural Experiment Station or the University of Minnesota is implied. Registered and trademarked names are the properties of their respective owners.

Availability

To purchase a copy of this publication, contact the MES Distribution Center, 1420 Eckles Avenue, University of Minnesota, St. Paul, Minnesota 55108-6069 (order@dc.mes.umn.edu or call 612-625-8173). In accordance with the Americans with Disabilities Act, this material is available in alternative formats upon request. Please contact your Minnesota county extension office or, outside of Minnesota, contact the Distribution Center.
PREFACE

This report presents a representative cross section of the individuals, organizations and units that have contributed to and been a part of Minnesota floriculture since its inception in 1851 through 1995. No attempt has been made to present an all-inclusive report, nor have any portions or individuals been intentionally omitted.

For the most part, information in this report is presented in chronological order. However, individual segments of floriculture are sometimes presented for a series of years for smoother reading. In other instances, data for the various segments is intermixed in an attempt to provide a clearer picture.
CONTENTS

Chapter 1: The Beginning, 1800s ................................................................. 1
Chapter 2: A New Century, 1900-1909 ....................................................... 18
Chapter 3: Significant Advances, 1910-1919 ........................................... 29
Chapter 4: The Prosperous Twenties, 1920-1929 ....................................... 41
Chapter 5: The Depression, 1930-1939 ..................................................... 52
Chapter 6: War, Then a New Era, 1940-1949 .............................................. 63
Chapter 7: A New Generation, 1950-1959 .................................................. 71
Chapter 8: The Expansive Sixties, 1960-1969 ............................................. 83
Chapter 11: Recent Years, 1990-1995 ....................................................... 150
Chapter 13: Status and Outlook, 1995 ....................................................... 190

Appendix A: Minnesotans Who Served as National Officers of FTD and SAF .................................................................................. 200
Appendix B: Chrysanthemum and Rose Cultivars Introduced by the University of Minnesota Agricultural Experiment Station .................................................. 202
Appendix C: Past Presidents, North Central Florists Association .................................................. 206
Appendix D: Past Presidents, Minnesota Commercial Flower Growers Association .................................................. 209

References .................................................................................................. 211
Index ......................................................................................................... 214
Chapter 1

The Beginning, 1800s

Floriculture as an American industry is a development of the nineteenth century. In 1800, there was one commercial florist known to be in business in the United States. Three more opened between 1810 and 1820, another eight between 1820 and 1830, and 25 more in the next decade. Naturally, population growth and development of the industry occurred later in the mid-western states than in the more populous East.

In 1838, the settlement of St. Paul was started on the east bank of the Mississippi River. The Minnesota Territory was created by the U.S. Congress in 1849. Three public squares in the loop section were donated to St. Paul for park purposes in 1849. They were Rice Park by Henry M. Rice, Smith Park by Cornelius S. Whitney and Robert Smith and Irvine Park by John R. Irvine. This recognition of the need for public park space in Minnesota preceded even the establishment of Central Park in New York City. The beginnings of Minnesota’s floriculture industry followed shortly thereafter.

The Territorial Legislature granted a charter to the University of Minnesota and provided for the establishment of the Department of Agriculture in 1851. The first settlement on the west side of the Mississippi River was established the same year, as was Minnesota’s first commercial nursery.
MINNESOTA FLORICULTURE PIONEERS

The Minnesota Pioneer, Minnesota's first newspaper, was launched in St. Paul about 1848. A few years later the Daily Press appeared in St. Paul. The Daily Press cofounder, and its editor in 1862, J.A. Wheelock, later served as President of the St. Paul Board of Park Commissioners and as St. Paul Postmaster.

Obviously there were numerous leaders among the early residents who appreciated horticulture and its benefits. In 1851, a native of New York State, Lyman M. Ford, started Minnesota's first nursery. His Groveland Garden and Nursery was situated on his 160-acre claim.

Daniel A. Robertson, who, according to University of Minnesota professor William Alderman, "was a wonderful man interested in almost everything including horticulture," was the first president of the Minnesota State Horticultural Society (1866) and the first University of Minnesota Professor of Agriculture. (1869 photo courtesy Minnesota State Horticultural Society)

Samuel B. Green, the first professor of Horticulture at the University of Minnesota (1888) and the chief of the Division of Horticulture until 1910. (Photo courtesy University of Minnesota Extension Service archives)

Lyman M. Ford, often considered to have been Minnesota's first florist, started his 'nursery' in St. Paul's Midway district in 1851. (1898 photo courtesy Minnesota State Horticultural Society)
nearly midway between St. Paul and St. Anthony on St. Anthony Road (now Avenue) in St. Paul. In a few years, Ford added the “pioneer greenhouse” and hired “a good bouquet maker” from Cincinnati to provide “floral luxuries” for people in the “two embryo cities” of St. Paul and Minneapolis. Ford ran the business until 1885. Later the Minnesota Transfer (railroad) was built on part of the land, and the area became a part of what is now Merriam Park in St. Paul.

In 1857, Dr. Alfred E. Ames of Minneapolis brought gardener William Buckendorf from Germany to Minneapolis. Buckendorf was considered by some to be the first florist in Minnesota, although Ford and his “bouquet maker” may be challengers to that claim. In 1858, Ames and Buckendorf built two greenhouses on Eighth Avenue South between Fourth and Fifth Streets for private use. A few years later, Buckendorf began operating greenhouses on a commercial basis.

The St. Paul City Market, an outlet for the sale of horticultural products, opened at 7th and Wabasha in 1853.

Horticultural clubs began springing up. The first garden club in Minnesota, the St. Paul Horticultural Society, was founded on February 20, 1860. Within a month, on March 17, 1860, the St. Anthony and Minneapolis Horticultural Society was formed. The state’s population was only 172,000 in that year’s census.

The Minneapolis Farmers’ Market was established at Hennepin Avenue and First Street by Harlow Gale in the 1860s.

In 1866, Colonel Daniel A. Robertson helped organize the Minnesota Fruit Growers Association and became its first president. In 1868, the name was changed to the Minnesota Horticultural Society, and in 1873 the present day name, Minnesota State Horticultural Society was adopted.

The Austin Ladies Floral Club was organized in 1869.

Comparing the pace of agricultural development in the United States shows Minnesota clearly at the forefront. For instance, the Unit-
ed States Department of Agriculture (USDA) was only established in 1862.

**EARLY FLORISTS AND THE FIRST FLOWER SHOW**

Wyman Elliot bought 80 acres near Franklin and Chicago Avenues in Minneapolis and started the first market garden in that city. In 1862, he built two greenhouses to supply plants and flowers.

The first Minnesota Flower Show was held on July 4, 1863, and Charles M. Loring reported a profit of over $600.00.

Also in 1863, nurseries were started in Minneapolis by William Hanson at Market and Fourth, and by August H. Weigelt at Broadway between 9th and 10th.

In 1865, R.J. Mendenhall built a few small greenhouses at Nicollet and 18th Street South for private use. He hired Henry Buckendorf, brother of William, went commercial, and kept adding to the plant until it was, as reported by one source, “one of the foremost in the country.” After growing his complex until it covered more than a city block, a second range was begun at 28th Avenue South and 38th Street. In 1908, Mendenhall sold his property to L.S. Donaldson, and the greenhouses were torn down one year later. William Buckendorf erected a greenhouse on his own property at Fourth Street and Seventh Avenue South in 1866.

Truman M. Smith started a nursery on Dayton’s Bluff, St. Paul, in 1866, selling hardy roses, fruit plants and evergreens. A diversified businessman, Smith was also a banker and a seller of marble. That same year, Colonel Daniel A. Robertson started a fruit farm and nursery on Summit Avenue, offering bedding plants, flowers, plants in pots, bouquets and fruit plants for sale. His interests too were expansive. By 1869, he was the Sheriff of Ramsey County. Also in 1866, Schiller and Schmidt started their nursery on Third Street above St. Peter Street.

Developments were also occurring beyond the metropolitan area. The Faribault Nursery was established by Oliver F. Brand in 1867. It was to become a leader in peony breeding. The firm name
was changed to O.F. Brand and Son in 1899 and to the Brand Nursery Company in 1911, by Oliver’s son, A.M. Brand.

Jewel Nursery (and florist) was started in Lake City in 1868. The Jewel Greenhouse was still operating in 1995.

Pfeiffer Nursery was established in Winona in 1872. It produced a variety of outdoor cut flowers and plants over the years including peonies, iris, gladiolus, dahlias and other perennials. In the 1930s and 1940s, Pfeiffer sold railroad carloads of gladiolus corms to firms such as Sears Roebuck, for retailing in east coast cities such as Boston and Philadelphia. The business closed about 1960.

**TWIN CITY PARKS**

St. Paul’s City Council created a committee in 1867 to develop and maintain the park lands that had been donated in 1849. The Minnesota Legislature in 1872 required a Ramsey County judge to appoint a commission to locate and contract for 500 to 650 acres of land near St. Paul for a public park. In 1873, land on the shores of Como Lake was identified, and Como Park eventually became the largest of more than 100 parks in St. Paul. A second park, Phalen Park, was established in 1890.

St. Paul parks were under the direct control of the City Council from 1873 to 1887. The Council hired ‘Professor’ Horace W.S. Cleveland in 1873 to design a park system. Over the years, he designed the park systems for both St. Paul and Minneapolis, including the systems of parkways connecting individual parks. He also designed Lakewood and Oakland Cemeteries, plus other tracts.

The Minneapolis Park Board, established in 1883, and the St. Paul Board of Park Commissioners, in 1887, took over responsibilities for their respective park systems from their city councils.

Cleveland also advised the University of Minnesota on the development and landscaping of its properties. He was one of the first generation of landscape architects or landscape gardeners. He came from New England and was largely self-taught. Although never associated with a college, he was addressed with the honorific ‘professor’
because he was well read, widely traveled and articulate. Cleveland Avenue on the west border of the St. Paul Campus (actually located in the community of Falcon Heights) of the University was named after him.

**INDUSTRY DEVELOPMENT IN THE TWIN CITIES**

Early industry listings in St. Paul's city directory were all under the section on 'Nurseries.' By 1869, a 'Greenhouse and Gardens' section was added to make a clearer distinction between florists and nurseries. Overlap remained, however, because many of the pioneer firms offered both floral and nursery products. By 1873, the separate classifications 'Florists' and 'Nurseries' were in use.

There were 26 St. Paul florists and six nurseries listed in 1890 edition of the St. Paul City Directory. Some of the new firms and their founding dates were:

1871  D.A. Baker Greenhouse and Gardens on Wabasha Street, opposite the Post Office.

1873  Lemke Brothers at 96 St. Peter Street with greenhouses at 16 Pleasant Avenue; offering greenhouse and bedding plants, bouquets, wreaths, crosses and decorations.

1878  A.H. Bunde with a downtown retail outlet plus gardens and greenhouses on Hudson Road.

1879  M. Ringhof at Greenbrier Avenue and Jenks.

1881  Mrs. J.W. Groves at De Soto and Minnehaha.

1883  L.L. May and Company; florists, nurserymen and seedsmen; at Como Avenue and Elfelt.

1883  P.J. Dries Drugstore at Ninth and St. Peter Streets; advertised all kinds of garden and flower seeds, just as many current drugstores do.

1884  H.H. Schutte at Grace and Milton; listed house and bedding plants, cut flowers and seeds.
1884  Venzke Brothers in the Hotel Ryan and on Snelling Avenue near the Short Line Rail Road track.

1886  C.F. Haupt, a florist and landscape gardener at 154 East Susan.

1889  August Swanson, a greenhouse business on St. Anthony Avenue; added retail shops in downtown St. Paul and Minneapolis by 1898.

*The St. Paul City Market, which included sellers of plants and flowers, expanded with the construction of Market House at 7th and Wabasha in 1881.*

The industry was also developing and expanding rapidly in Minneapolis. New florists on that side of the river included C.A. Smith, who began his greenhouse range on Portland Avenue in 1880. L.S. Donaldson purchased the plant from him in 1899, selling its products in connection with the department store he had opened in 1888. W.D. Desmond managed the greenhouse operation for Donaldson.

Other new Minneapolis horticulture operations included the international agricultural firm Northrup King, which began in Minneapolis in 1884 as a lawn, garden and farm seed business. Sunnyside Greenhouse, at 817 Fifth Avenue Southeast, was begun in 1885 by Miss Hilliker, and was later operated by Walter Pier, who became her husband.

Henry 'Fred' William Busch started growing vegetables in the 1870s, and in 1885 began building greenhouses on Lyndale Avenue at 50th Street South, then considered to be far out in the country.

Wesling and Hartman started what became the Lakewood Cemetery Greenhouses in 1886.

The John W. Vasatka Greenhouses were built at 3365 Chicago Avenue in 1888. John had worked for R.J. Mendenhall. Unlike many early growers, he grew only floral products from the start.

In 1890, Senator Washburn's greenhouse was erected at Stevens Avenue and 24th Street, Minneapolis. Desmond's greenhouse, erected at Portland and 24th Street, was sold in 1898 to R.J. Mendenhall.
INDUSTRY DEVELOPMENT OUTSIDE THE TWIN CITIES

Expansion of the industry also continued apace outside the Twin Cities. Some of the new, non-metropolitan area, outstate florists and their founding dates were:

1875 Herman Lorentz started his greenhouse business at the corner of State and Marshall Streets in Mankato.

1879 Two florists set up shops in Winona: Mrs. George Hillyer and John Wunder.

1883 P.A. Erickson established a greenhouse and florist business in Brainerd.

1884 Two Duluth florists appear in city listings: H.B. Hill on First Street, between Lake and First Avenue West, and McComb-er-Amasa on Third Street, between 9th and 10th Avenues West.

1884 Walter Boock’s grandfather started his greenhouse business in New Ulm.

1885 Oscar Windmiller acquired land atop the bluffs east of Mankato and started growing vegetables, followed soon after by the erection of greenhouses.

1886 C.O. Hallstrom started his greenhouse business in Red Wing.

1888 S.H. Harrison started a greenhouse and flower garden business in Austin, creating a thriving business, where no town within 100 miles had an equivalent greenhouse range, and with flower prices reportedly about 30 percent lower than in the Twin Cities.

1891 Clinton Falls Nursery established in Owatonna by Michael Rand Thomas Cashman, who also served in the State Legislature for many years.

1891 L.S. Swanson, a brother of August Swanson, operated a flower shop at 31 West Superior Street in Duluth.
THE AGRICULTURAL COLLEGE

The Territorial Legislature established an Agricultural College at Glencoe in 1858. Local citizens provided funds to purchase land and erect a building, but because of the Civil and Indian Wars, no building was erected. Minnesota became a state in the same year.

The University of Minnesota, whose existence predated the establishment of the State of Minnesota, was reorganized in 1867 and a College of Agriculture established. The federal land grant authorized by the Morrill Act was then assigned to the University. One year later the University Regents purchased 90 acres, one-quarter mile east of the University's Minneapolis Campus for $8,500, to provide an experimental farm. Soon, 30 additional acres were purchased. The previously proposed, but stalled development of an Agricultural College at Glencoe was halted.

In 1869, the first Professor of Agriculture was appointed, the ever active Colonel Daniel A. Robertson of St. Paul. There was a rapid turnover of professors at the College of Agriculture between 1869 and 1882.

The Minneapolis experimental farm, bought by the University in 1868, was sold for $150,000 in 1882. The land was sold because it was found to be unsuitable for agriculture. The money from the sale was used to purchase 248 more suitable acres in Falcon Heights, in the St. Anthony Park area, at the location of the current St. Paul Campus and Minnesota Agricultural Experiment Station. The funds were sufficient to also erect four buildings. Edward D. Porter, Ph.D., the fourth in a series of men hired as Professor of Agriculture, was appointed Director of the Agricultural Experiment Station in 1885 and was responsible for planning and guiding the development of the new facilities.

The College of Agriculture's Division of Horticulture and Forestry was established in 1888, with Samuel B. Green appointed as its head. Green, one of six persons selected as members of the new Agricultural Experiment Station staff, laid the foundations for the University's strong horticultural program.
The School of Agriculture officially opened on the St. Paul Campus in 1888 with a two-year practical high school level program. A dedicated effort of the Grange supported the School and 47 students enrolled for the first year. In 1897, the School was made co-ed. It provided a high school diploma to farm boys and girls who attended school for six months and obtained agricultural experience for six months of each year.

The first University of Minnesota Horticulture Building and Greenhouse, erected in 1898-99. The building cost $35,000. (Photo courtesy Department of Horticultural Science archives)

**HORTICULTURE BUILDING**

The Minnesota Legislature appropriated $35,000 in 1898 for a University Horticulture building that included a 4,000 square foot greenhouse. Construction was completed in 1899. Horticulture shared the building with Agricultural Botany at the start.

Breaking new ground in teaching horticulture, in 1899 five college courses in horticulture were offered on greenhouse practices,
nursery practices, fruit growing, vegetable growing and plant breeding. This was one of the earliest horticulture programs in the United States. By comparison, the first floriculture faculty members elsewhere in the country were hired in 1901 by Michigan’s agricultural college, followed by Illinois and Massachusetts in 1903 and Maryland in 1912. Cornell University established the first Department of Floriculture under Dean Liberty Hyde Bailey in 1913.

Professor Samuel B. Green was Chairman of the University of Minnesota’s Committee on the Course of Study for the College of Agriculture. He set high standards, and college courses in floriculture and greenhouse construction were added by 1912.

**COMO PARK**

Como Park remained neglected and undeveloped for 14 years after its purchase by the City of St. Paul. Frederick Nussbaumer, a native of Germany employed at London’s Royal Botanic Gardens, met Horace Cleveland in Paris. Cleveland persuaded Nussbaumer to come to St. Paul, where he was hired as a gardener by the St. Paul Board of Park Commissioners, starting about 1887.

Nussbaumer was foresighted, artistic, a skilled florist, and a good manager. He was an active, progressive Superintendent of Parks from 1892 until his retirement in 1922. Nussbaumer used Cleveland’s plans as a starting point, added his own ideas, and spearheaded the development of the land at Como Lake into Como Park. A 17 x 40 foot lean-to, propagating greenhouse with a wood and coal stove for heat was erected in 1892. Additional propagating houses were erected in the 1890s. Nussbaumer added a ‘Gates Ajar’ planting in 1894, which is still planted each year. In 1899, the Park Superintendent reported the need for a palm house and a pretentious show house.

The quality of Nussbaumer’s work was appreciated by his employer. In 1897, J.A. Wheelock, President of the St. Paul Board of Park Commissioners wrote: “The area of park land under cultivation, exclusive of parkways is but little, if any, greater in Minneapolis than
in St. Paul, while we maintain a large greenhouse and extensive areas of floriculture and floral animation which they do not. The comparison reflects credit on the careful and economical manner in which our parks have been managed.” In the summer of 1899, one million people visited Como Park, with more than 40,000 reported in the park on a single day.

**INDUSTRY STATUS**

In 1882, there were 18 professional flower growers in the state of Minnesota, operating an aggregate total of 86,000 square feet of greenhouses. This was a very small portion of the slightly more than 1,000 florists in the entire United States at that time. The Society of American Florists (SAF), which represented and was comprised of members from all branches of floriculture, was created in 1884. It remains the national organization representing all branches of floriculture to this date, and one Minnesotan has served as its president (Appendix A).

*J.H. Hale, compiler of U.S. Census Reports, noted in 1890 that the commercial florist business made most of its development in the preceding 25 years, with the largest proportion in the previous ten years. He noted that Minnesota floral business growth kept pace with that in most other states.*

A.N. Kinsman purchased Harrison’s greenhouse and floral business in Austin in 1890 and added a series of 18-foot-wide greenhouses. In 1893, his crops included cut roses, carnations, English double violets, cyclamen, cacti, begonias, Easter lilies, foliage plants, fuchsias, geraniums, heliotrope, marguerites, palms and primroses. He issued catalogs and shipped plants and flowers by mail and express almost daily to North and South Dakota and southern Minnesota. The range was moved to a location close to the city’s Water Works Park in 1901. A flood and storm almost wrecked the physical plant. Local business and professional men presented Kinsman with a gift of
five or six thousand dollars to help him restore the plant. He insisted on repaying the donors with interest a little over a year later.

In 1892, August S. Swanson presented a paper to the Minnesota State Horticultural Society on “Progress in the Florist Business in the Last Decade” in Minnesota, and how it compared to other areas and industries. He reported that the annual cost of heating Minnesota greenhouses averaged $70 per 1,000 square feet of glass. Florists in eastern states paid out one-fourth as much for heat and still received the same prices for their products. He concluded that Minnesota growers were at least as advanced as eastern growers, or the latter would undersell the local growers. The increased efficiency of the Minnesotans was attributed to improved growing structures, improved methods of heating (steam heating was almost universally adopted for larger establishments), growing better classes of crops, discarding crops that did not pay, and by more efficient use of labor.

Swanson also noted the industry’s large dependence on the cities of St. Paul and Minneapolis, on its 40 to 50 established florist operations with 352,000 square feet of greenhouse under glass. The remainder of the state had 87,000 square feet of glass-covered greenhouses in smaller cities. Further, he speculated that there was probably $50,000 worth of flowers shipped into Minnesota from other states in 1882. In the next five to six years, that sum appreciated considerably, but more flowers were exported than imported by 1892. Obviously, the early Minnesota florists were intelligent, hard working, progressive individuals who also participated in industry affairs, organizations and advancements. Thus, Minnesota florists kept abreast with industry to the south and east.

Minnesota growers were still thriving and expanding in 1892, despite about a 60 percent fall in price averages since 1882. In most respects, Swanson’s ideas are applying equally well more than 100 years later.

**CATALOG FIRMS: FARMER’S SEED COMPANY**

Farmer’s Seed Company was founded in Chicago, by William F. Kueker and his brother-in-law, Otto Kozlowski in 1888. They were
A new Central City Farmers' Market managed by Harlow Gale opened in 1893. It was located between Second and Third Avenues North, and Sixth and Seventh Streets in Minneapolis. The new facility was not, however, open very long. It was destroyed in an 1894 fire, but was rebuilt at the same location in 1896.

In 1895, E.P. Holm and O.J. Olson founded Holm and Olson at 336 St. Peter Street in St. Paul. They built a substantial floral crop growing range on Duke Street and later opened a retail store on Fifth Street. They also took advantage of improvements in shipping, and expanded their retailing throughout the region through a network of sales agents.

At the turn of the century, florists were found primarily in population centers (i.e., cities). Funeral directors served as agents in outlying districts, selling flowers with the help of illustrated catalogs. Most flowers were shipped quite efficiently via Railway Express. Holm and Olson had over 400 such agents in Minnesota, North and South Dakota and northern Wisconsin, and their floral designers worked day and night shipping orders. After World War I, florists built greenhouses in most towns of any size to handle the local trade, and the agent system gradually faded away. Locally, Holm and Olson was known as the Summit Avenue Florist, as it serviced homes of the well-to-do who lived on the Avenue. Herb Holm and George and Gene Olson were the second generation owners.

A flower shop and greenhouse owned by Christian Bussjaeger opened at Charles and Dale in St. Paul in 1896. F.W. Topel ran the business from 1908 to 1912 when Bussjaeger returned and renamed it Dale Street Greenhouses. There were a series of owners from 1927 to 1936.

In 1897, E.C. Lindsay started Lester Park Florist and Greenhouses in Duluth. William Jap bought the firm in 1903 and enlarged it. After he died in 1949, his daughters Edna Jap and Gretchen Peterson operated the business. In 1967, Gretchen’s daughter Marilyn Solem became the owner. The establishment was sold to Rod Dunbar in 1975 and current owners, Rod and Cathy Lafeve, purchased
the business in 1979. They have opened two additional retail outlets. Two sons of William Jap, Walter and Ernest who also opened retail flower stores independent of Lester Park, are no longer in business. John Morris was the grower at Lester Park Greenhouses from 1947 to 1991.

John J. LeBorius arrived in Duluth in 1897 and worked for W.W. Seekins, who started his business in 1896 at 115 West Superior Street. By 1904, the firm was Seekins and LeBorius and had greenhouses at 921 East Third. In 1906, LeBorius became the sole owner and started building a greenhouse range at 2501 Woodlawn Avenue. It became the largest range in the area. LeBorius died in 1946 and the firm ceased doing business in 1954.

There were six greenhouse establishments in Winona in 1899, including the Orlowski West End Greenhouses, Woodlawn Cemetery and Charles Siebrecht’s Central Greenhouses. Siebrecht’s widow closed down the greenhouses in 1980, and the downtown retail shop about 1989.

At the age of 21, in 1898, Robert L. Gould founded a company to sell produce. The company developed a large retail business with gardeners, and also was one of the largest firms selling supplies to truck gardeners, greenhouse growers, garden supply centers and the turf industry in the upper Midwest. After Gould died in 1945, the firm was run by employees for eight years with Arthur Davidson as president. A branch store was opened in Duluth in 1952 with Gordon Miller as manager. It ceased operating when the building burned in 1958. Employees purchased the firm from the Gould Estate in 1954.
A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

Chapter 2

A New Century 1900-1909

Greenhouses proliferated at a rapid pace as many new firms opened for business in Minnesota. The start of the century was also an era of huge funeral flower displays. These were designs such as wreaths, pillows, crosses, lyres, Holy Bibles, armchairs, broken columns, broken wheels, gates, national emblems, locomotives, all kinds of large emblems, all constructed entirely out of flowers. The designs were built on wire frames available from factories. The frames were wrapped in moist sphagnum moss.

Flower deliveries were made by horse and wagon, or sleigh in the winter. Custom-made boxes, like on milk wagons, were mounted on the wagons and charcoal stoves were used for heat in cold winter weather. The boxes were transferred to the chassis of automotive trucks starting about 1910.

Until 1900, there were only two strictly retail Minneapolis florists: Miss H.B. Whitted, who started in business in 1894, and L.S. Swanson, who started his firm in 1898. By 1912, Miss Whitted added two more shops, including one in the Radisson Hotel building in Minneapolis. Typically, however, growers were their own retailers.

By 1900, there were two florists in Rochester, the Queen City Greenhouse and Rochester Greenhouses.
FIRST COMMISSION HOUSE

Brant and Noe of Chicago started the first Minnesota wholesale flower commission business in Minneapolis in 1900, with Cal Rice in charge. It was not profitable after one year, but Cal and his brother Arthur continued the business under the name Rice Brothers and were eventually successful. They expanded their product line by adding growers' supplies to their inventory. During the depression, they provided credit to many cash-short florists and developed many loyal, appreciative customers. This part of the business was run by John Rohvik in later years and by his son John prior to closing in the early 1960s.

LARGE GREENHOUSE RANGES

The Rice Brothers also built a greenhouse range in Brooklyn Center fairly early in the century. Lloyd Malmberg added a garden center while managing the range in the early 1950s. He purchased the business a few years later. During his first spring of ownership, a hail storm demolished a greenhouse and its carnation crop just a few days before Mother's Day, but his business survived. Malmberg added a retail flower shop in 1959 and a second growing range in Rogers in 1965. He sold the Brooklyn Center part of the business to George Lucht, an employee, in 1972.

In 1900, the Magnuson brothers erected the St. Anthony Floral Greenhouses in northeast Minneapolis. Enlarged over the years, the range was sold to O.H. Carlson in 1916, and then by him to Al Carlson in 1925. Hans Roseacker Company leased the greenhouses from 1935 to 1940. Then Fred and Carl Edmond purchased the establishment.

John Munson started Minneapolis Floral Company in 1900 at 36th Street and Calhoun Boulevard. The range became one of the largest cut flower growers in the country. Emil Olson (not related to O.J. Olson of Holm and Olson) purchased the firm in 1915 and moved the greenhouses to 940 Washington Avenue South in Hop-
kins, where they remain today. A retail shop was opened at 315 Hennepin Avenue and moved to 2420 Hennepin Avenue in 1936. A large retail business developed. Second generation Bert and Curt continued the business. Paul and Larry, third generation sons of Bert, now operate Minneapolis Floral, and have added flower sections in some supermarkets.

The Oscar Windmiller (1885) floral business in Mankato grew with daughter Pauline as the leader. A 50 x 350 foot greenhouse was erected in the early 1900s. In 1935, Bill and Opal Fatzke purchased the establishment and renamed it Hilltop Florists. In 1957, Marguerite and Ed Keane bought the business. Their daughter, Noel Keane Vantol, and her former husband Larry Vantol, now operate Hilltop Florists.

After emigrating from Denmark, Neil Neilsen worked five years for gardeners and florists in the Chicago area, and another five years...
for a leading St. Paul florist, before moving to Mankato. Neil purchased the Herman Lorentz greenhouses on the corner of State and Marshall Streets in Mankato in 1901. The range was enlarged to 50,000 square feet by 1921, and to 125,000 square feet by 1925. Other family members joined the firm. Plant and flower shipments were made to parts of Iowa, North and South Dakota and all of Minnesota. Neil died in 1941 and his children Holger, Ernest and Agnes carried on. Later after Holger died, Holger’s son Gerald, Ernest’s sons William and Paul and second generation Agnes operated the firm. This may have been the first greenhouse in Minnesota to be heated with gas. Their boiler room was spotless. The property was sold for development in 1968.

Hans Rosacker and a Mr. Sauer started the East Side Floral Company on Adams Street in northeast Minneapolis in 1901. The next year, Hans started his own business, the Hans Rosacker Company, with greenhouses built at Stinson Boulevard and 19th Avenue Northeast. Hans’ sons Henry, Hans and Arthur continued and expanded the firm with numerous branches over the years. They purchased a Brooklyn Center greenhouse range in the 1930s. This range had what was probably the first overhead rail, plant-movement system in a Minnesota greenhouse. Henry managed the unit until the late 1940s, when the land became too valuable for greenhouses.

Henry Rosacker was an elected member of the Minneapolis Park Board for many years.

The Rosacker company leased the St. Anthony Floral Greenhouses in Minneapolis from 1935 to 1940 and produced cut roses. From 1942 to 1948, the firm owned and operated the Brookside Bulb and Azalea Farm in Brookside, Oregon. Hans’ son Dick was put in charge of production at the Stinson Boulevard greenhouses in 1949.

Dodd and Betzold established a greenhouse and retail shop in Brainerd in 1901.

A new St. Paul City Market opened at 10th and Jackson in 1902 and was enlarged in 1936. Half of the area was lost to freeway development by 1964 and much of the remainder was used for parking thereafter.
VEGETABLE GROWERS

As the commercial viability of horticultural enterprises grew, many primarily vegetable growers began shifting their product emphasis from vegetables to flowers. For example, Albert Linder, a native of Switzerland, built his greenhouses on Wheelock Parkway in St. Paul starting in 1901. He first grew celery and other vegetables for the market and gradually shifted to flowers and flowering plants over the years. His sons Peter and Walter added more greenhouses and sold at retail and wholesale.

August Cornelius started in the vegetable business in south Minneapolis in 1901. His son-in-law, Emil Wagner, continued the vegetable business on Penn Avenue South, a few blocks from Bachman's vegetable farm on Lyndale Avenue.
Cornelius's brother James operated a greenhouse vegetable business next door. The Wagner firm slowly shifted to floral crops after World War II, though some lettuce was still grown in their greenhouses into the 1980s.

Peter Hermes started truck crop gardening in 1906 on Larpenteur Avenue in Falcon Heights, just north of the University’s St. Paul Campus. He soon started building greenhouses and the range grew to about four acres, plus a retail flower shop at the greenhouses. They grew a wide range of cut flowers, greens and potted plants over the years and always specialized in cut roses. Sons Ewald, Vic, Bob and Al took over the business with Ewald as president, Vic in wholesale, Bob in the mechanical end, and Al in charge of the retail business. Several other family members also worked in the business. A commission house and supply business was added.

MORE GREENHOUSE RANGES DEVELOPED

Lumbering and iron mining triggered economic development and population growth in northern Minnesota. The first florist on the east end of the Iron Range was the Virginia Greenhouse and Floral company established in Virginia in 1904. The founder, Alfred Johnson, was a native of Sweden. He built an 18 by 35 foot wood frame greenhouse just off Chestnut Street. In 1908, he erected the first large glass greenhouse north of Duluth, on Fifth Avenue, Virginia. A third greenhouse was built on Southern Drive in 1916. Alfred’s son Harold managed the newest structure. A full scale flower shop was opened on Chestnut Street in 1930. Alfred’s son Ralph and daughters Elsa, Ardy, Esther and Marie operated the shop. Alfred Johnson died in 1939. The Fifth Avenue greenhouse was moved to Southern Drive to complete a 30,000 square foot range.

On June 7, 1952, a wind and hail storm broke more than 10,000 panes of glass and destroyed the plants in the greenhouses of the Virginia Greenhouse and Floral company. A week after reglaz-
ing was completed, a second storm destroyed 500 square feet of the new glass. The range was eventually closed and taken down in 1975. Marie Ralston's youngest daughter became manager of the flower shop on Chestnut Street in 1975. A branch outlet was opened in the Thunderbird Mall in 1977. Alfred's granddaughter Mary Jo Ralston managed the mall shop, until it closed in 1992. Mary Jo now manages the Chestnut Street location currently known as the Virginia Floral Company.

Robert Stern erected a greenhouse in 1904 at 38th Avenue North and Girard Avenue in Minneapolis. More greenhouses and a

Three-panel panoramic photo of Holm and Olson's retail flower shop in downtown St. Paul about 1900. An enlarged area in the second image (below) shows the store's large flower display cooler. The ice man would place large blocks of ice in the back of the cooler every morning to help keep the flowers fresh. When mechanical refrigeration was developed, it replaced the ice man. (Photo courtesy Stanley Hampl, retired from Holm and Olson).
retail shop were added later. Sons Eric, Sr. and Julius entered the business later. They were followed by Eric, Jr. and Julius’ sons Robert and Richard. It was named Robert Stern Florists, Inc. New greenhouses replaced the old in 1963. The business was sold in 1992.

In 1905, Alonzo B. Franklin started his nursery in Minneapolis. Later the firm became well known for the hybridizing and introduction of new peony cultivars. The firm closed down about 1952.

Carl Lindskoog and Glen Goodlund opened Lindskoog-Goodlund Florist on Franklin Avenue in Minneapolis in 1905. Carl had been employed previously by the L.S. Donaldson and the Minneapolis Floral Company greenhouse firms. Goodlund left the partnership some years later to open his own shop, and the firm’s name was shortened to Lindskoog Florist to reflect the change. Later, Carl’s son continued the business. Both Lindskoog’s were active in floral industry activities.

Charles Nedved established a retail shop at 900 Palmer in St. Paul in 1905. A greenhouse range was added thereafter, and Charles’s son Emil continued the business, which was moved to West Seventh Street. Emil’s son-in-law, Arnie Roth, joined the business and managed it after Emil passed away. The greenhouses closed about 1967. Currently, Arnie’s widow Lue and their son Steve operate two retail shops located in St. Paul and Eagan.

In 1908, Ralph Latham opened a flower shop in downtown Minneapolis. He was the son of Allanson Latham who was the executive secretary of the Minnesota State Horticultural Society for almost 30 years (1891–1920). The widely grown Latham raspberry introduced by the University was named for Allanson. Ralph’s grandson Kenneth also operated the florist business for several years before it was sold to Neut Beugen in the early 1940s. Neut moved the business to a downtown Minneapolis skyway location. Don Lindskoog, who operated Lindskoog Florist with his dad Carl, became the owner in 1979. His son Richard now owns the shop and credits the skyway with providing high traffic in the shop area. It is currently called Lindskoog-Latham Flowers.

In 1909, Moore’s Greenhouses opened in Detroit Lakes, selling plants and cut flowers.
A relationship developed between park board personnel and the florists. In 1906, Theodore Wirth became the superintendent of Parks in Minneapolis. He later became known as the 'father' of the Minneapolis park system. Born in Switzerland and educated in Europe, Wirth came to the United States in 1888, at the age of 25. After working in various positions in New Jersey and Connecticut, he moved west to Minnesota. He was a dynamic, progressive, energetic leader who loved flowers and was quite active in florists' activities on a local and national basis.

The first two Minneapolis Park Board greenhouses were erected in 1907. Prior to 1906, the Park Board had purchased their bedding plants. In 1906, wooden hotbed frames were used, along with space in the neighboring Minneapolis Floral Company greenhouses, owned by John Munson, a friend of the parks system. Two more Park Board greenhouses were built in 1909 and a third pair was added in 1912. An annual greenhouse chrysanthemum show was initiated in the fall of 1908 at the Lyndale Farmstead greenhouses, and it continued until 1978. The 1.5-acre outdoor rose garden was established and 4,000 roses were planted in 1907.

MINNESOTA STATE FLORISTS' ASSOCIATION

With Wirth's leadership, the Twin Cities Florists' and Gardeners' Club was founded in 1907 and one year later it became the Minnesota State Florists' Association. He served as the first president of the association from 1908 to 1911. It became the North Central Florists' Association in 1969.

UNIVERSITY DEVELOPMENT

In 1902, LeRoy Cady was hired as Professor Samuel Green's assistant, and as an associate professor in ornamental horticulture at the University of Minnesota. Cady was quite active in florist circles and
served as president of the Minnesota State Florists’ Association in 1917-1918. The College of Forestry was carved out of the Division of Horticulture and Forestry in 1909. Green became the Dean of Forestry as well as chief of the Division of Horticulture.

*The American Society for Horticultural Science (ASHS)* was founded in 1903. It has become the recognized professional horticultural organization for individuals engaged in horticultural research, teaching, agricultural extension, and for a portion of the commercial horticulture industry. It became a very active society with an international membership.
An early president of ASHS was Professor William H. Alderman who served in 1920. He was chief of the Division of Horticulture, University of Minnesota, from 1919 to 1953. Other presidents from Minnesota included Larry C. Corbett of Northrup King (1914), M.J. Dorsey of the Division of Horticulture (1924), C.J. Weiser of the Division of Horticulture (1981) and Roy A. Larson (1989) a floriculturist then affiliated with North Carolina State University, Raleigh, but a Cloquet native. Larson earned his bachelor’s and master’s degrees in floriculture at the University of Minnesota before moving on to Cornell University for his doctorate.

Continuing development of the University’s Division of Horticulture included the awarding of its first graduate degree in horticulture in 1907. The program was well advanced compared to what was available at most other institutions. For instance, floricultural research was only initiated at the New Jersey Agricultural Experiment Station in 1908. The first floricultural research publication in the American Society for Horticultural Science Proceedings only appeared in 1910.

College Park was just one block from the University’s St. Paul Campus. It remained undeveloped and an eyesore as viewed from Professor Green’s home. Therefore, he donated trees and shrubs to be planted there in 1908. The St. Paul Board of Park Commissioners planted them at a labor cost of $88.79.
A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

Chapter 3

**Significant Advances, 1910-1919**

Highlights of the 1910-1919 decade included hosting the 1913 SAF Convention and Trade Show, and the FTD Convention, concurrently in Minneapolis; the building of the Como Park Conservatory in St. Paul and the enlargement of the Horticulture Building on the St. Paul Campus. This occurred as World War I was being fought in Europe from 1914 to 1918.

**NEW FLORISTS OPEN FOR BUSINESS**

A number of new florists opened for business in 1910. Several new businesses opened in each of the Twin Cities, and others also opened outside the St. Paul and Minneapolis metropolitan area.

In St. Paul, F.W. Topel operated the F.W. Topel Conservatory at 191 East Seventh Street for many years. Albert Zachman’s shop and greenhouses were started at 1247 Grand Avenue. The Ratterman Brothers range on Snelling Avenue grew to a fair size before closing in the 1950s. And, the second Minnesota wholesale flower commission house was opened in 1910 by O.R. Eckhardt in downtown St. Paul. Later, sons Robert and Howard owned and operated the business until the late 1960s, when it closed.

In Minneapolis, Mrs. E.H. Mazey from Scotland opened what became known as ‘Mazey’s Society Florist’ in 1910. She added a
greenhouse range on France Avenue South. Later her niece Nan Sutherland (also from Scotland) joined her in the business. Mazey took down the greenhouse range of 45,000 square feet in 1935, during a period of labor disturbances. Sutherland closed the shop in 1986.

In 1911, a Mr. Hopper and the Magnuson brothers built the greenhouses and shop of Central Floral Company on Central Avenue and 16th Avenue, N.E., in Minneapolis.

Anderson Floral opened in St. Cloud in 1910, and later became Allison Floral.

**ORGANIZATION ACTIVITY PROLIFERATES**

An excellent flower show was staged in Minneapolis in 1910 by the Minnesota State Florists' Association. Also in that year, the Florists' Telegraph Delivery Association (FTD) was established as a section of SAF (see Appendix A).

Horticultural societies proliferated in the Twin Cities area in the early years of this century. The Minnesota Rose Society, founded in 1904, became the Minnesota Garden Flower Society in 1911. The Minneapolis Florists' Club was organized in 1911, and had 75 members within two years. The St. Paul Florists' Club was reactivated in 1912 after a period of dormancy. The Minneapolis Ladies Florists' Club was formed in 1912 and continued functioning until 1994.

In all probability, some of the new floral groups formed in this period were a local response to the national SAF convention being planned during that period for Minneapolis in 1913. Theodore Wirth, who was the SAF vice president at the time, was an excellent organizer who, no doubt, sought and promoted a solid cooperative effort from local members of the industry.

**OVERCOMING OBSTACLES**

Most individuals founding floral businesses in this region had to overcome significant adversity. Many overcame the numerous obsta-
cles and went on to became leading business people. Numerous examples can be pointed out.

Max Kaiser came to America from Germany in 1906, worked as a rose grower at Donaldson’s Greenhouses and as City Forester for Minneapolis. In 1911, he and a partner purchased August Swan­son’s Greenhouses in St. Paul, and later Kaiser renamed it Merriam Park Floral Company, Inc. Their first order was to decorate all the office buildings between sixth and seventh Streets on Nicollet Avenue with window and lamppost flower boxes. There were 3,100 feet of window boxes. Unfortunately, Kaiser’s business partner collected the money from the downtown merchants, partied and ran off to Chi­cago with the company’s check book. Kaiser survived by laying off all of his employees except foreman Julian Bilski, who worked with­out pay until the business could be refinanced with the blessing of nu­merous creditors. The range of greenhouses eventually grew from six to a total of 23, and producing a wide range of floral crops, and in­cluded a house of orchids.

Kaiser’s second daughter, Maxine, was born in February 1912. On the evening of the birth, with his wife in labor, the doctor was unable to get through snowdrifts during a winter storm. A family friend and amateur midwife delivered the baby. Shortly before the birth, the greenhouse heating plant’s main return pipe from the greenhouse burst, shooting a heavy stream of hot water into the boiler room. Max was forced to replace the pipe within two hours to keep the plants from freezing. Baby, mother and plants survived. After graduating from the University of Minnesota, Maxine worked in the business for a number of years.

Heman Gibbs came to Minnesota in 1849 via steam boat, and homesteaded on Larpenteur Avenue in St. Paul. He built a partially below ground sod hut in which he and his wife lived for five years while he farmed. A new home was built once he could afford it. His son Frank Gibbs founded Gibbs Florist in 1912, on family land adjacent to the St. Paul Campus. A series of greenhouses were erect­ed in subsequent years.

Later, School of Agriculture student George Nelson married fellow student Alice Gibbs, who was Heman’s granddaughter. The
firm soon became Gibbs-Nelson Florist and the three Nelson sons, Gordon, Donald and Earl, worked in the business. The University of Minnesota bought their greenhouse range, which was surrounded by University land, in 1960. After the sale, Gordon worked at the Como Conservatory, Donald became a sales representative of florist products and Earl left floriculture. The Department of Horticulture still uses one of the Gibbs-Nelson greenhouses, with the remainder used by other university departments.

Another flower show for the public, held in St. Paul in 1912, was a success.

This group picture of some of the people attending the Society of American Florists national Convention, held in Minneapolis in 1913, was taken in front of the Minneapolis Armory, where the convention was held. Note how additional attendees were backed up into the doorway of the Armory. (Photo courtesy Paul Olson, Minneapolis Floral Company)
SOCIETY OF AMERICAN FLORISTS

In 1913, from August 19-23, Minnesota hosted the national SAF Convention and Trade Show. The fourth annual FTD Convention was held in the Twin Cities at the same time, with the two organizations' memberships overlapping. The various sessions of the two meetings were held in the National Guard Armory in Minneapolis, and on some open park land flanking the Armory on Lyndale Avenue at Kenwood Parkway.

Minneapolis had 325,000 residents and St. Paul had 235,000 in 1913. Theodore Wirth took advantage of the presence of the joint
SAF/FTD conferences to support the area’s population with an activity designed to counter Minnesota’s icebox reputation. This was a special display garden, planted to “demonstrate to the out-of-state visitors that the Minnesota climate is not so adverse to successful achievements in floriculture as some people from other parts of the country are inclined to believe.” Growers from all over the country were invited to send new bulbs, seeds and plants to the Twin Cities to be grown for exhibition purposes. Contributing growers paid for the growing space, and Minneapolis Park Board employees planted and cared for the exhibits.

The growing season was exceptionally favorable for the plants in the demonstration garden, and conference attendees were quite impressed. Having such a garden at the convention, a garden which included many new cultivars, was a new concept and was very popular with the industry and the public. Exhibitors expressed their desire to continue this activity in future years, but it was discontinued for economic reasons.

Although attendance was a bit lower than anticipated, a solid program plus many activities and excellent florist cooperation provided the visitors with the excellent impression of Minnesota that Wirth aimed to present. Some of those attending were involuntarily ‘baptized’ when the dock on which they were standing while watching water activities collapsed into Lake Minnetonka. The display garden became a regular park garden and is now the site of the Sculpture Garden.

Wirth became SAF President the following year. He was the only Minnesotan up to 1995 to have served in that position. His son, Theodore Wirth II, married O.J. Olson’s (of Holm and Olson) daughter Helen.

**TRADE JOURNALS**

A review of clippings in scrapbooks maintained by the elder Theodore Wirth shows that a large number of magazines and journals of value and interest to florists were already in existence at the

The number of journals addressed to practitioners in the floriculture industry were a clear indication that the early florists were eager to learn and advance in their profession. A gauge of the public's interest in flowers at this time was seen in the many candy and grocery stores that sold flowers.

**MORE GREENHOUSES**

Greenhouse flower production of Cashman Greenhouses, in Owatonna, began around 1910. Cashman Greenhouses operated a 100,000 square foot range, producing cut flowers in 1913. Bob, a second generation Cashman operated the retail, wholesale and growing business next. After he died, his son, also named Bob, a floricultural and business graduate of the University of Minnesota, ran the business from 1978 to 1986 when the land was sold for development. He is now a sales representative for a national seed, plant and supply firm.

The 'Fred' Busch Greenhouses were moved from Lyndale Avenue in Minneapolis to Golden Valley in 1915 and became Busch Brothers, under the operation of sons Fred, Bernard and Bill. They continued to grow vegetables until after the elder Fred's death in 1927. A gradual conversion to flowers was made, and the firm specialized in carnations for many years. Quality pot plants were produced later. They custom built a series of galvanized steel greenhouses in the 1940s and 1950s. The third generation Fred served as President of the American Carnation Society and chaired the committee which hosted their 1957 international convention, which was held in Minneapolis. Other family members who worked in the greenhouses in later years included Bill's sons, Bob and Leonard, plus third generation Fred's sons, Carl and Fred.
START OF LARGEST FLORAL BUSINESS

After he arrived from Germany in the late 1800s, Henry Bachman worked for the first Fred Busch, who was his mother’s brother, and for a Minneapolis produce commission house. Bachman and his wife Hattie went into the truck crop business in South Minneapolis in 1885. In 1889, he built 10 greenhouses, but no flowers were grown until 1914. Henry had five sons, Fred, Walter, Arthur, Henry, Jr. and Albert.

It was Albert Bachman who, because of his interest in flowers, planted carnations and sold them at Oak Hill Cemetery. A carnation house was finally built in 1924 for $10,000. As the vegetable market was declining with southern farmers shipping their produce north, Albert demonstrated that an armload of carnations actually could earn more than a truckload of vegetables. Flowers gradually replaced vegetables in the greenhouses.

The first Bachman’s retail store was opened in 1927. Later, an unusual attraction, an alligator donated by a customer, lived in a safely fenced pool in the attached conservatory for 20 years. In the 1930s, Albert selected a purple paper color for wrapping plants and flowers which became the symbolic color, a ‘Bachman purple,’ for the firm’s operation. It extended even to the color of their delivery trucks. Also in that decade, a nursery branch was started.

Bachman’s first Edina branch store opened in 1941, and a new store replaced it in 1947. The company introduced large coolers for retail store displays of pre-made floral arrangements. They also introduced the delivery of arranged bouquets to hospitals in vases. In 1948, the firm acquired Woodend Farms on the shore of Lake Minnetonka and operated the range of nine greenhouses. By 1949, the third generation of the family took over managing the firm.

MORE GREENHOUSES

In 1915, three of John W. Vasatka’s sons started Vasatka Brothers by building greenhouses at 4321 Chicago Avenue in Min-
neapolis. Edward later bought out his brothers, Otto and Julius, and changed the firm name to Chicago Avenue Floral. Only floral products were grown from the start. As more greenhouses were erected, the firm extended to 4351 Chicago Avenue. Edward's sons Donald and Calvin (Bud) operated the business from the late 1940s. The

Alex Anderson moved to Alexandria in 1915 and built a home. Next, he built the flower shop and the two 14 x 50 foot greenhouses seen here. (Photo courtesy Lorraine Anderson)

greenhouses were taken down in 1965. Donald and his son Donald currently operate the Chicago Floral Company retail shop at 4351 Chicago Avenue.

Alex Anderson moved from Deerwood to Alexandria and bought ten acres of land in 1915. Flower growing had been his hobby. He immediately built a house, and soon thereafter, a store and two 14 x 50 foot greenhouses. The business grew steadily and there were five larger greenhouses when son Ardyce and wife Lorraine bought the business in 1950. There were ten greenhouses when the firm was sold in 1990 to Dave and Jan Pederson.

John Robert Johnson, a native of Sweden, worked for a member of the Cargill family and for Minneapolis Floral. In 1916, he built
Johnson Greenhouses on Edward Street in St. Anthony Village, where land was relatively low priced. In the 1940s, the firm specialized in cut carnations, and later added a wide selection of green plants. John Richard, John Robert’s son, took over the business after World War II. A wholesale commission house, Johnson’s Wholesale Florist, was started in 1958. Supplies for growers and retailers were added to their product line within a few years. The company name became J.R. Johnson Supply, Inc.

In 1916, Edward Schuster started Schuster’s Nursery and Flower Shop in Crookston. Ernest Zitzer began working in the greenhouses there in the late 1920s, and purchased the business when Schuster died in 1936. Zitzer’s Nursery and Floral expanded to 11 greenhouses and produced a wide array of cut flowers, pot plants and bedding plants, as well as all types of perennials and nursery stock in the fields. Crops were sold at wholesale and retail. Funeral flowers were sold on a commission basis all over northwestern Minnesota. Dale Wreisner operated the business from 1960 to 1962. The greenhouses were then closed and the land sold for development. Bill Montague purchased the downtown flower shop in 1966 and continues in business in 1995. Currently there are also two other flower shops and a small greenhouse in Crookston.

*The influenza epidemic during World War I stimulated the demand for flowers, and greenhouse construction increased after the conflict.*

**UNIVERSITY ACTIVITY**

In 1910, a fourth floor and an east wing were added to the original Horticulture building on the St. Paul Campus. Building occupants were the Divisions of Horticulture and of Agricultural Education, plus the Minnesota Horticultural Society. This shared facility arrangement continued until 1970 when Horticulture and the Minnesota Horticultural Society moved to a new building. The old building was then renovated and occupied by part of what was then called the College
of Home Economics. Also, in 1910, K.A. Kirkpartick was hired as the first full-time agricultural extension horticulturist (1910-1923). Others that followed included R.S. Mackintosh until 1940, E.M. Hunt until he became executive secretary of the Minnesota State Horticultural Society in 1945, and L.C. Snyder until 1953. Thereafter, horticultural staff appointments increased.

LeRoy Cady was Acting Chairman of the University’s Division of Horticulture after Professor Green died in 1910. Cady also taught floriculture and ornamental horticulture classes, and wrote a column for florists in the Minnesota Horticulturist. LeRoy Cady died prematurely at the age of 44 while preparing a State Fair floral exhibit in 1923. After Cady, the Division operated under a rotating chairmanship for a number of years.

Professor W.H. Alderman took over leadership of the Division of Horticulture in 1919 and developed an emphasis on plant breed-
ing in the 1920s. The Horticultural faculty increased from 9 to 14 during his 34 years of leadership.

**COMO CONSERVATORY**

The St. Paul Board of Park Commissioners provided $50 in 1913 to develop a set of plans for a conservatory being considered for Como Park. A year later, a major bond issue was approved by city residents for park improvements, including the Como Conservatory. The English Victorian styled structure was completed in 1915 at a cost of $58,825. The structure has regularly drawn about one million visitors each year.
Chapter 4

The Prosperous Twenties, 1920-1929

While extensive construction of greenhouses occurred in the Twin Cities, greenhouses also began appearing in Minnesota towns of almost any size. Flowers became more readily available from local sources throughout most of the state than they had ever been before. The result was that shipment of floral products from firms like Kinsman, Holm and Olson, and Neilsen to agents in the upper midwest gradually diminished. New greenhouse owners were often recent immigrants from Europe.

Another byproduct of the growth of the floral market was a corresponding decline in greenhouse vegetable production. The decline, which began to set in after World War I, left only a few species, especially tomatoes, commercially viable in Minnesota until the second world war.

FLORISTS’ COOPERATIVE EFFORTS

Florists of the era worked together quite well professionally in their organizations (conventions, short courses, flower shows, state fair exhibits, etc.) and socially through annual summer picnics (for both owners and employees), baseball teams and florist bowling teams. Times were prosperous for industry.
Interstate florist working relationships were strengthened by the founding in 1920 of the Tri-State Florists' Association in Fargo, North Dakota. As suggested by the name, members came primarily from the Dakotas and Minnesota. Approximately 75 percent of the charter and associate charter members were from North Dakota. A few of the charter members were Frank Shotwell of Fargo, North Dakota, Ben Siebrecht of Aberdeen, South Dakota, and E.W. Schuster of Crookston, Minnesota. Associate charter members included R.W. Lumry of Bismarck, North Dakota; Frank Siebrecht of Rapid City, South Dakota; and from Minnesota, Morris Fredericks of Moorhead, and O.R. Eckhardt and Max Kaiser of St. Paul.

During the Tri-State Florists' Association annual meetings, which rotated among locations outside the Twin Cities, the organization's members usually visited flower shops and greenhouses in the local meeting area. The association also had a strong social component, providing time and opportunity for members to come to better know their colleagues. In some years educational growing and design schools were included. Ardyce and Lorraine Anderson of Alexandria served as the group's elected officers from 1946 to 1959.

With improved transportation, a need for efficient operations and so many florists' educational activities available across the country, interest in the mainly social Tri-State Florists' Association gradually waned. Florists from the Dakotas frequently attended meetings and short courses in Minnesota. The Association ceased functioning in the late 1970s.

The Minnesota State Florists' Association staged a flower show in the Kenwood Armory in Minneapolis in November, 1922. Prizes totaled $6,000 in cash and cups. The admission fee was 50 cents per person.

**RUSH OF NEW GROWERS**

Carl F. Wahl purchased the Sunnyside Greenhouse business in Minneapolis in 1920. His grandson LeRoy Erickson became the owner in 1957. The business closed in 1975 because of urban redevelop-
opment and Erickson worked at Twin City Florist Supply in Minneapolis until 1994.

Mr. and Mrs. Paul A. Janisch established Eveleth Floral Company as a retail florist in 1920. A greenhouse was added in 1925 and two more later. A native of Germany, he worked in greenhouses in Ohio, Michigan, Montana and Minnesota before starting his own business. Daughter Virginia and her husband Jim Squillace, an engi-

The R.L. Gould & Company headquarters in the mid 1920s. (Photo courtesy Al Gerdin of Northstar Turf)

neer, plus Paul’s son, Robert Janisch, took over the business in 1950. The new set of owners added a greenhouse and in 1952 started Jim’s Flower and Gift Shop in nearby Virginia. They added more growing area and are now the only greenhouse firm growing floral crops the year round on the East Range. The two shops have a total of 15 employees. Jim and his wife Virginia’s five daughters will be the new
owners. Jamie is now the general manager and Paula is the bookkeeper and assistant manager.

In the early 1920s, Paul Koennicke started a greenhouse and flower shop in Perham. Robert L. Perry purchased the business in the second half of the 1940s. In 1976, John Bergum bought the firm. He currently operates 45,000 square feet of greenhouses. Primary crops are bedding plants and potted plants.

George and Viola Butterfield started the George Butterfield Greenhouse in 1920 in Orono and added a retail shop. In time, customers included some of the prosperous residents who lived on estates around Lake Minnetonka. George's son Ned took over the business in 1957 and moved the retail shop to Wayzata in 1967. Also in 1967, he started a seasonal business for making evergreen wreaths which are sold at wholesale. Lorna, Ned's wife, was active in the retail business. The company name was changed to Butterfield's around 1970.

Leo Hertog came to Minnesota from Holland via South America and worked for Max Kaiser. In 1920, he started his Hertog greenhouse range in St. Anthony Village next door to the John R. Johnson
range. He first grew vegetables and flowers. After World War II, his sons John, Leo and Ronald took over the business, renamed it Her­
tog Floral, Inc., and expanded the range. A retail business was add­
ed in 1940, discontinued during World War II, and then restarted in 1945.

Herman Kersten started growing floral and vegetable products in his greenhouses in New Brighton in 1920. The floral products were primarily pansy and petunia plants. Later his son Fred operated the business until he sold it in 1976 and retired. The new owner was Joseph Chenoweth III. Chenoweth's grandfather had been a grower at Como Park Conservatory, while his father had opened a retail floral shop in downtown St. Paul in 1953. Chenoweth II, moved his business to his son's greenhouse location where an attractive new retail shop was built, and the greenhouse area expanded. The younger Chenoweth has operated the retail and greenhouse business since his father's retirement.

Nic Lebens started his greenhouse and retail floral business on Larpenteur Avenue in St. Paul, also in 1920. His sons Nic II and Laurence continued and expanded the business with a large wholesale volume and a garden center. Nic II also added flower farms in Guatemala in 1964 and 1975. The two farms were at different elevations to permit growing different crops. The Lebens family collected clothing and shipped it to Guatemala to help the natives following a devast­
ating earthquake. Prior to Nic III's premature death, the firm op­erated a propagating range in Florida for rooting geranium cuttings from their farms in Guatemala. Since the death of Nic II in 1986, the Guatemalan farms have been leased to other parties. Current opera­tors in St. Paul are Nic II's widow Pat, son Phil, daughter Jody and her husband Frank Puleo.

John Pletscher started his business in New Brighton in 1920. Early crops included both indoor and outdoor flowers (pansies and petunias) and vegetables. Sons John, Robert and Glen joined the firm and it was expanded, especially after World War II. They built one of the first commercial aluminum green­houses in Minnesota in 1946, a Zachman product. A retail business was developed and a new retail store and garden center were built about 1955. Glen's son Brian is
now in charge of growing, while Glen operates the retail business. Although retired, Bob and John still spend many hours working at the greenhouses.

In 1924, Harold S. Soderberg opened Soderberg's Florist on Lake Street in Minneapolis. Later, his son Harold Jr. joined the business. Lyle Blair purchased the firm in 1976 and is the current owner and manager.

Joseph Weinholzer, a truck crop gardener, built greenhouses in 1924 in Roseville (then called Rosetown) and grew bedding plants. His daughter, Elsie Weinholzer-McLean, a School of Agriculture graduate, bought the business, expanded it and still operates some of the greenhouses in the spring.

John W. Vasatka of Minneapolis, the 1888 founder of the John W. Vasatka Greenhouse, died in 1924. His daughter Mamie Peterson, who operated the retail business, renamed Chicago Avenue Greenhouses. The business closed in 1971 when Mamie died.

*Peonies were becoming very popular in the 1920s. The 21st annual National Peony Show was held in St. Paul in 1924, and the 37th annual National Peony Show was held in Mayo Civic Auditorium in Rochester in 1940.*

Brand Peony Farms evolved from the Brand Nursery Company in Faribault in 1925, when it was run by O.F. Brand's son, A.M. Brand. In 1929, the firm was incorporated to include Myrtle G. Gentry. They developed an active breeding program with peonies as the primary crop and developed a national reputation. In 1955, brothers Robert and Archibald Tischler bought the business, which ceased functioning in 1980. Robert continued to breed and sell new cultivars under the name Tischler Peony Garden. Some Brand cultivars are currently sold by Jerry Lund who owns and operates the Farmer's Nursery and Garden Center in St. Cloud.

In 1925, John Reiss started a greenhouse operation in Golden Valley, producing flowers and vegetables. Over the years, a large modern range was developed devoted primarily to pot plant production. Sons Hans, Henry and Fritz followed John into the business.
Later, Henry's son Hank and Hans' son Bill took over management of the range. Bill's son Greg and Hank's son John worked for the firm a few years before the site was sold for development purposes. Fourth generation Jeff is now head grower at the Minneapolis Floral Company greenhouses where his brother Pat was also employed. In the 1940s and 1950s, Busch Brothers and the Reiss Greenhouses, both wholesale growers, were the only commercial taxpayers in Golden Valley.

Robert Rosacker, a fourth son of the original Hans Rosacker, started the Rosetown Greenhouses on Cleveland Avenue, St. Paul, in 1925. Its location was adjacent to the University of Minnesota Golf Course, located near the St. Paul campus in Falcon Heights. Cut roses was the only crop Robert grew. Al Bilski, formerly a co-owner of the Merriam Park Floral Company greenhouses, purchased the establishment in 1959 and continued growing roses. The University Athletic
Department bought the property in 1969 and converted the area into recreational athletic fields.

Schreiner's Iris Gardens started business in St. Paul in 1925. F.X. Schreiner began growing irises as a hobby in 1915, and it evolved into a business. His son Robert took over after his death in 1931. Robert's sister Connie and brother Bernard (Gus) joined the business full time after World War II. In 1946, the company was moved to the Willamette Valley near Salem, Oregon, seeking a better climate for growing and developing irises. Currently the business
is run by third and fourth generation family members. They have won
top notch awards in the iris world. Schreiner's is now the largest re-
tail iris growing operation in the world, and they have a worldwide
business.

Bill and Emil Dey opened North Oaks Floral in the James J. Hill
(North Oaks) Estate greenhouses north of St. Paul in 1927. In 1939,
they bought the Hansen Greenhouses at Dale Street and Maryland Av-
ue in St. Paul, and moved to the new location. They renamed it Dey
Brothers Greenhouses, Inc. and added a retail shop in 1948. Bill's son
Jim worked at the firm and together with his son they rebuilt and en-
larged the range. Jim and his wife later ran the business. In 1994, the
firm closed and offered the land for development. Christian Hansen's
son was the librarian on the St. Paul Campus during the period after
World War II.

Holm and Olson (75 percent) and Harald Thompson (25 per-
cent) purchased the Emil Rieple Greenhouses in Rochester in 1927.
The range was enlarged in 1930 and efficiently managed by Mr.
Thompson. He added a garden center and a retail shop. Mr. Thomp-
son passed away in 1957. The Rochester branch of Holm and Olson's
business was sold to Bachman's in 1971. The presence of the Mayo
Clinic accounted for a very good wire order business.

Northrup King of Minneapolis developed a large flower and
vegetable packet seed market over the years. Around 1929, it estab-
lished a one-acre flower test plant area in Eden Prairie. James Donald
maintained the plot until 1959 when Kermit Henrikson succeeded
him. The test and demonstration area grew to several acres and in-
cluded All American trials as well as established cultivars and trial sam-
ples of seed lots considered for purchase by Northrup King. The tri-
als included vegetables, turf and field crops.

The Northrup King flower test plots were located alongside busy
U.S. highway 169 and were open for inspection by florists and oth-
er interested persons, including home gardeners and seed industry
personnel from around the world. It was a valuable asset for growers
in the upper midwest. D. Bruce Johnstone, a University of Minneso-
ta botany graduate, was head of the company's flower section during
this period and into the 1980s, when he retired. Northrup King start-
ed a greenhouse unit to sell seeds and supplies to professional growers about 1960.

**FLORAL AFFAIRS AND CLUBS**

Florists active in industry affairs in the 1920s and 1930s included Max Kaiser, Carl Lindskoog and Charles Mathes of Holm and Olson, who was secretary-treasurer of the Minnesota State Florists’ Association into the 1950s, plus Olaf J. Olson of Holm and Olson, Hans Rosecker II, Henry Rosacker and Harald Thompson.


**UNIVERSITY GROWTH**

The University of Minnesota School of Agriculture, including the horticulture division, reached early peaks of attendance with 672 students in 1921, and 621 students in 1929.

Assistant professor C.E. Cary was hired in 1923 to replace Mr. Cady in ornamental horticulture. Graduate study in horticulture at the University became available in 1925.

Louis Sando, an Englishman, was hired by the University in 1926 to teach School of Agriculture classes. He was quite active in florist’s activities and served as president of the Minnesota State Florists’ Association from 1937 until his retirement from the University in 1941.

In 1929, Louis E. Longley, Ph.D., a busy and highly capable broad spectrum floriculturist, was hired to the Division of Horticulture’s faculty on a nine-month appointment as an ornamentals plant breeder.
Expanding the range of the division's activities, his expertise complemented the Division of Horticulture's existing reputation as a plant breeding unit. He also taught the college level courses in floricultural, plant propagation and woody plant identification, and conducted a variety of research studies.
Olga Bryant gave her husband Bob an orchid plant about 1930. He became so enamored with orchids that he left the stock brokerage business and built three greenhouses on his land adjacent to U.S. Highway 7 in Minnetonka. He assembled an outstanding collection of orchids, including some highly rated Cattleya cultivars. Bryant Orchids sold both to local florists and individuals. Bryant was the only commercial orchid specialist in Minnesota for many years. After his death in 1978, his wife gave the bulk of their plants to the University of Minnesota Landscape Arboretum.

Harold and Jessie Whiting opened Whiting's Flowers in Rochester in 1931. They added greenhouses in 1935 and a downtown store in 1937. Later their son Don and his wife Gladycla operated Whiting's Flowers and Greenhouse and added a greenhouse range outside of town. Don also raised mink and grew Christmas trees. Third generation Tom now runs the retail business, but discontinued the greenhouse operation.

Former Holm and Olson employees, Aaron Johnson and a Mr. Bennett, opened a flower shop in 1932 at Rice Street and University Avenue in St. Paul. Bennett left the business in 1935. The shop moved to Grand Avenue in 1936 and Aaron's son Gerald started working in it. Aaron Johnson Florist eventually became A. Johnson and Sons. A small greenhouse was added in 1970 and Gerald's son Tom started working in the shop in 1974. He took over in 1979 and continues in charge today.

MUMS FROM MINNESOTA

In 1932, Ruth and E.C. ("Dick") Lehman started a business in Faribault selling plants from their home garden. Lehman Gardens added greenhouses in 1934 and started mail order sales of hardy perennials. Dick’s brother Walter and his wife joined the firm, but then left the business in 1946. Walter started his own nursery business in Rochester. Horticultural hobbyist E.J. Kraus, Ph.D., of the University of Chicago, contacted the firm after World War II, ar-
ranging for it to become an outlet for garden chrysanthemum and daylily cultivar introductions that he bred after retiring from his faculty position. Dick also bred and introduced some new cultivars.

Holm and Olson's Rochester range in 1931. Note the two men working atop one greenhouse (see enlarged detail at left) as well as the interrupted (called broken in the trade) vents on three of the houses in front. (Photo courtesy Stanley Hampi, retired from Holm and Olson)

Over the years, Dick Lehman provided a ready market for garden chrysanthemums introduced by the University of Minnesota's plant breeding program. He produced a sizeable annual color catalog, coined the phase 'Mums from Minnesota' and developed a thriving local and national mail order business. Busloads of people would descend on Faribault each fall to see the colorful indoor and outdoor displays of garden chrysanthemums. Leading garden club
There was some labor strife in the industry associated with the Teamster's union activity during the 1930s.

The Chicago wholesale cut-flower firm, Amlings, opened a branch in Minneapolis in 1936. Carl Hanson was the unit's manager until 1945 when Jerry Sykora took over that role. A good business developed.

In 1939, the FTD held its National Convention in St. Paul.

Minneapolis florists' Club 25th anniversary meeting in 1936. Identification by Mrs. Fred Busch and Maxine Kaiser Russell (left to right; * = first name not provided): (row 1, front) Mrs. Tom Lynes, unidentified, Mae Boeglin, Klara Kaiser, Mrs. Hans Rosacker, Sr., Leona Wirth, Theodore Wirth, Mrs. Edward Vasatka, unidentified; (row 2) Mrs. Backes*, Mrs. Herman Bachman (operated greenhouses in south Minneapolis, but not related to the Henry Bachman family), Mrs. Eric Stern, Edward Vasatka, Mrs. Fransen*, Anne Ruedlinger, Evelyn Van Lierop, Mrs. Fred Busch; (row 3) unidentified, Eric Stern, unidentified, Sena Rosacker, unidentified, Della Rosacker, Mrs. Barney Busch, Mrs. Rosene*, Mrs. Harvey Bliss, Henry Rosacker, Mrs. Arneson*, Max Kaiser, Mrs. Weeber (the greenhouse builder's wife); (row 4) unidentified, Harvey Bliss, Fred Busch, Tom Lynes, unidentified, unidentified, Louis Boeglin (Minneapolis Park Board Horticulturist), Arthur Ruedlinger, Hans Rosacker, Jr., Buster Bachman (son of Mrs. Herman Bachman), Barney Busch, Mr. Arneson*, Mr. Rosene*. (Photo courtesy Jan Vasatka)
MORE FLORISTS AND GREENHOUSE OWNERS

Mr. and Mrs. Alfred P. Seeger bought Dale Street Greenhouses in 1936; sons Gerry and Richard took over in 1960. Betty Stromer, bought the firm in 1992, and has been rebuilding the physical plant and revitalizing the business.

In 1937, Lawrence and LeRoy Bergen purchased Bergen's Truck Farm in Detroit Lakes from their parents, who started the business in 1926. They built their first greenhouse in 1937 and started growing plants year-round. By 1954, Bergen's Greenhouses had 35,000 square feet under glass. Lawrence added a downtown retail store in the 1940s. LeRoy and his son Bob, who joined the firm in 1962, continued to expand the greenhouse range and the service area. In the mid 1960s, the firm's name was changed to Bergen's Wholesale Florists and currently back to Bergen's Greenhouses.

Ernest Binnie started growing vegetables in cold frames in 1932. He built his first greenhouse in 1938, and began growing a few flowering plants. His son Robert bought the business in 1957 and Binnie Floral was born. He became a retail grower and started a nursery and garden center in 1979. Currently the business is run by sons Bruce and Kirt who operate two retail shops. The greenhouses have been dismantled.

Bernard 'Red' Goldstein opened Metropolitan Florists in the Lumber Exchange building in Minneapolis in 1939, and closed it in 1941. He co-founded Radio City Florists in 1941, but left the firm in 1945 when he established Flowers, Inc. Red tried trucking tropical flowers from California to Minnesota in refrigerated vehicles. The venture did not succeed as the flowers froze enroute in the Rocky Mountains, but Flowers, Inc. continued to operate as a flower importer.

ALUMINUM GREENHOUSES

Albert J. Lauer and Arnold Zachman were probably the first full time commercial fabricators and builders of aluminum greenhouses in the country. The business grew out
of a greenhouse and retail floral firm operated by Arnold’s father, Albert Zachman.

The elder Zachman started his greenhouse and florist business at 1247 Grand Avenue, St. Paul, in 1910. By 1938, his son Arnold was in the business and he built a few steel greenhouses. However, when steel was not available during World War II, he turned to aluminum. His second cousin, Albert J. Lauer, an engineering graduate of the University of Minnesota, helped Arnold with his greenhouse design work. In 1947, Lauer took over the greenhouse construction business and Arnold Zachman continued growing and retailing flowers and plants.

In the 1960s, the Zachman site was purchased for construction of a supermarket. Lauer’s son Ed now operates Albert J. Lauer, Inc., but Albert remains involved. Their headquarters is in Rosemount.

FARMERS’ MARKETS

In 1938, a larger $6,000 Minneapolis Farmers’ Market opened at its current location of Lyndale and Glenwood Avenues. The Federal Works Progress Administration (WPA) paid one-third of the cost. There were nine sheds, each 320 x 43 feet, providing a total of 540 vendor stalls. Management of the facility was by the Central Minnesota Vegetable Growers Association. At least at first, the new farmer’s market facility was always fully occupied. Over time, however, both consumer interest and the number of vendors declined, leaving only a portion of the market seeing regular use. Subsequent highway construction was routed through the area occupied by the market, and by 1960 only three of the original nine sheds remained.

Interest in both the St. Paul and the Minneapolis markets has seen growth and renewal in the 1990s and both facilities could easily use more stalls and more parking spaces to accommodate the renewed interest.
The Division of Horticulture at the University added an agricultural science undergraduate curriculum in 1935 for students planning to enter graduate school.

 Floriculture research efforts applied to the growth and production of floricultural crops started to expand on a national basis in the 1930s.

 Breeding of greenhouse chrysanthemums was initiated at the University of Minnesota in 1924, apparently by C.E. Cary, the ornamental horticultural faculty member at the time. Louis E. Longley continued the work with greenhouse chrysanthemums after 1929. Seven greenhouse cultivars were released from 1934 to 1940 (see Appendix B).

 In 1936, Longley became the first person to publish results on a scientific, controlled study of the use of low temperature to hold cut flowers for extended time periods. It was printed in the proceedings of the American Society for Horticultural Science. Because the Division of Horticulture lacked adequate refrigerated facilities, he used the facilities of the neighboring Hermes Floral Company. Some years later, Kenneth Post, Ph.D., of Cornell University, conducted more extensive studies in this direction.

 Longley was also a breeder of garden roses, releasing the cultivars ‘Pink Rocket’, ‘Red Rocket’ and ‘White Dawn’ in 1949, the year he retired. ‘White Dawn’ was a popular, double, white flowered climbing rose. He also contributed to the ornamental crabapple breeding program.

 When Longley initiated the university’s garden chrysanthemum breeding program in 1936, he could not have known how long-lived and highly successful it was destined to be. At the time there were no attractive garden chrysanthemums which bloomed prior to killing frosts in Minnesota and other areas of similar climate and latitude. The breeding program changed that completely, and by 1949 there were 26 introductions, many of which were grown on a national basis (see Appendix B). Assistant Professor R.A. Phillips was hired in 1942 to assist Longley and teach landscape classes.
PARK PERSONNEL

Theodore Wirth retired as Minneapolis Superintendent of Parks in 1935. He had been instrumental in bringing the National Flower Show to Minneapolis in 1930, and was responsible for much of the development of the park system in Minneapolis.

Folmer Lorenzen became Como Conservatory Supervisor in 1936. He retired in 1952 and was replaced by Bob Schweitz. Les Day replaced Bob in 1978. Lorenzen was active with garden center businesses after 1952 and passed away in the early 1980s.
Chapter 6

**War, Then a New Era**

1940-1949

Labor and construction materials were not abundant in the first half of the 1940s because of World War II, but the demand for florist products was good. A few firms made their start during this period, but the pace really accelerated after the war ended in 1945.

Frank Lindig started the Lindig Manufacturing Company on the north border of the University of Minnesota's St. Paul Campus in 1940. His first product was a very popular soil shredder which was also sold overseas. Other innovative new products introduced by the company included the first commercial, aerated steam soil sterilization wagons (1960) and the first true front-end loader, tractor fed soil shredder/screener. Lindig's son John now runs the business which makes landscape equipment as well.

In 1941, Harry Wartnick started in the flower commission house business in Minneapolis. Ben Stollar, his brother-in-law, joined him in 1942 to form the Midwest Florist Supply Company. In the 1940s, the first known commercial air shipment of cut flowers was made via Northwest Air to Midwest Florist Supply Company. The shipment was from Tom Beal, of Beal's Greenhouses on Vashon Island in the state of Washington.

Wartnick died in 1950 and Stollar continued the business. The non-floral, supplies portion of the company was sold to employee Bill Heiserer in 1952 and became Lakeland Florist Supply, Inc. Stollar
contracted with Len Busch Greenhouses to pay a set price for their rose cut-flower production year round from 1968 to 1978. This arrangement guaranteed that the wholesaler received the full crop for holidays and provided a stable income to the grower. After Stollar’s health failed, his son Barry and Wartnick’s son Norman ran the business. Norm opened branches in Duluth and in Grand Forks, North Dakota, in the 1970s. The firm was sold to J.W. Perry of Wisconsin in 1982, and ceased operating in 1989.

John Eisele started truck farming in 1941 in Minneapolis. He soon added greenhouses and began to grow some flowers among the vegetables. Bruce Anderson became a partner in 1955 and flower crop production increased. In 1965, the firm moved to Farmington and continued expanding. Eisele’s son Bob joined Anderson in 1965 and the firm became the South Cedar Greenhouses. They specialized in perennials. Alan and Judy Leipnitz purchased the business in 1991 and additional expansion occurred. They now have three acres of greenhouses and specialize in geraniums, hanging baskets, and perennials. Bob Eisele continued to work at the range.

Alfred J. Louiselle worked at Hans Rosacker Company for 25 years. In 1942, he purchased the Central Floral Company greenhouses and retail shop in Minneapolis. His son Gerald joined the operation. In 1966, the site was sold. Gerald then joined J.R. Johnson Supply, Inc. in sales.

Harold Ahrens started growing truck crops in Osseo in 1943 and built greenhouses and cold frames in 1945. People stopped in and wanted to purchase plants, so he started producing flowering bedding plants about 1948. He has since discontinued retail sales and vegetable production and specialized in wholesale bedding plants since the early 1950s. His three sons Gary, Harvey and LeRoy now run the large range, although Harold is still on the scene.

HAILSTORM AND VOLUNTEERS

Max Kaiser’s Merriam Park Greenhouses in St. Paul was a victim of very unusual weather on June 22, 1944. Hail-
stones larger than golf balls hit all 23 of the firm's greenhouses, causing considerable damage in a storm during which hail struck only across a local area smaller than one square mile. Daughter Maxine and crew cleaned up the growing area and carefully eliminated most of the glass in the soil. Still, it was wartime and no extra, experienced help could be found.

With fall approaching, the outlook was bleak for getting the range reglazed before winter. In August, a group of volunteers appeared unexpectedly, and within two weeks, 47,500 square feet of new glass was installed. The volunteers came from Hermes, Jansen Brothers, Gibbs-Nelson, Ratterman Brothers, Hans Rosacker and other greenhouse firms. This act illustrated the appreciation his colleagues had for Max's contributions to the industry over the years.

INDUSTRY DEVELOPMENTS

Julian Bilski and his sons Al, Ben and Joseph bought Merriam Park Floral Company in 1945. In 1959, the establishment was demolished to make way for the new Interstate Highway 94. Al purchased the Robert Rosacker rose range in Falcon Heights and operated it until 1969, when the University of Minnesota purchased the site. Ben operated a retail flower shop for a few years and in 1964, Joseph served as the first floriculture instructor at the new Brainerd Technical Institute.

Carl Seagren, an undertaker in Two Harbors, opened a flower shop in 1945. His son Dick now runs the shop. In the early 1980s, Dick opened a second shop in the Harbor Landing Mall, but closed the shop after three to four years because of the limited availability of parking in that area.

Robert Savory started Savory's Gardens, Inc., in Edina in 1946. He specialized in orchids, but also grew annuals and perennials including Hostas. Later the orchids were discontinued and Savory ceased working in the business about 1985, because of ill health. His wife
Arlene and son Bob now operate the firm. They breed and specialize in Hostas and also grow perennials. There are 1,300 cultivars of Hostas in their three garden locations.

Ed Fiksdal worked for Kinsman in Austin from 1935-1937, and then for Whittings in Rochester until 1947, with time out for military service. In 1947, he opened Fiksdal Flowers across from St. Mary’s Hospital in Rochester. His brothers Al and Muds worked in the flourishing flower shop business until Muds switched to managing the Fiksdal Motel, a few doors away, from 1965 to 1986. Ed’s son Gary now operates the shop and motel, but Ed is still on the scene.

AFRICAN VIOLETS

Robert G. Anderson worked in a greenhouse range for ten cents per hour while a teenager in 1933. Later he went to work at Bachman’s, where he was employed in their greenhouses for nine years starting at 20 cents per hour, eventually working his way up to 60 cents per hour. After serving in the military during World War II, he started Tonkadale Greenhouses in Minnetonka in 1947. Anderson built an 18 x 100 foot greenhouse with glass glazing on the south half only.

Anderson specialized in breeding and selling quality African Violets. The business he established grew, and he won top prizes for his cultivar introductions, including three grand sweepstakes in national African Violet shows. Just a few cultivars existed when he started in business. An expert plant breeder, Anderson introduced over 200 African Violet cultivars across his career, including the first double, pink-flowered cultivar.

Anderson was quite innovative in refining growing methods and designing structures. He was one of the first to use fluorescent lights for producing African Violets commercially. He constructed three-level, waterproof, concrete benches in which plants were watered by injection, heated with hot water pipes (which also provided the structural support, running under or through the bench bottoms) and illuminated the plants with fluorescent lamps over each level. This green-
The house was 16 feet high with a flat, insulated roof to conserve heat for the high temperature African Violet crop.

As Anderson expanded the range, he also grew unusual pot plants and bedding plants. During the peak of the African Violet craze, annual African Violet shows were held in the Twin Cities. They drew large crowds regularly. When Anderson noticed that some greenhouse visitors (potential amateur propagators) plucked leaves from new cultivars and slipped them into a pocket, he posted the sign, "Don't sell your soul for a leaf."

The Tonkadale Greenhouses were sold in 1978 to Bill Maruska. He and his family have continued the business and broadened the crop range and retail services.

NORTHERN MINNESOTA

In 1946, Glen Sams bought the George McComber Nursery that had been started in Duluth in 1928. (A McComber-Amasa Florist had previously existed in Duluth in 1884). The George McComber Nursery name was changed to Sams's Florist and Greenhouses when Glen added greenhouses and a retail flower shop. His son Ray and wife Georgianne now operate the business.

Norm and Marge Overby opened Town and Country Floral with a shop and greenhouse in Moorhead in 1946. They had both had worked for Bachman's and other firms. The thriving business was sold to the current owners Craig and Jan Hermanson in 1981.

Michael H. Hafner, Sr., started a greenhouse and flower shop in Park Rapids in 1947. The business has grown steadily over the years. Park Rapids Florist and Nursery now sells to discount stores such as Kmart and Pamida, as well as smaller outlets. The greenhouses, covering more than four acres, are now run by sons Mike and Tom. Daughter Beth Pederson runs the retail business and a new shop was recently built. The elder Hafner is still active in the business.

Gerald B. Anderson worked for Lester Park Greenhouses in Duluth as a youth. He was a University of Minnesota graduate in agronomy before World War II. He served in the military, worked at
Duluth grain elevators and then entered the greenhouse business. In 1948, he and his wife Alice purchased land in Two Harbors and erected a small greenhouse. He worked another job for ten years while building the business and enlarging the greenhouse. A new retail building was added in 1971. At the time he started his business, there were no other greenhouse floral operations on the north shore of Lake Superior between Two Harbors and Thunder Bay, Canada. Anderson grew a wide range of cut flowers, pot plants and bedding plants, and also purchased plants and cut flowers from Duluth greenhouses. The business was sold in the early 1980s to Jim Shogren and Jeff Peterson who had worked there part time. They doubled the size of the retail building and established a complete retail flower shop.

Eldred M. Hunt (left), Executive Secretary and Editor, Minnesota State Horticultural Society (1944-1974); and Dr. Louis E. Longley, University of Minnesota, Professor of Floriculture (1929-1949); Dr. Longley initiated the garden chrysanthemum breeding project. Photo taken in the mid 1940s. (Photo courtesy the School of Architecture Archives, Gerald McKay)
Anderson's son, Robert (not related to the Robert G. Anderson of Tonkedale Greenhouses), worked at the greenhouses, earned bachelor's and master's degrees in floriculture at the University of Minnesota, and a Ph.D. in botany from the University of Florida. He has continued in the field and is now an extension floricultural specialist at the University of Kentucky.

Clarence Rheinschmidt started Little Falls Greenhouses and Floral as a retail and wholesale business in 1947. Cal Bengston, who operated the Nicolett Hotel Flower Shop in Minneapolis, bought Rheinschmidt's firm in 1963. In 1980, Bengston's sons Dennis, who was a University of Minnesota floriculture graduate, and David bought the business now called Little Falls Greenhouses, Inc. They enlarged the range and operate truck sales routes throughout central and southern Minnesota.

Loren Butterfield is one of two sons of George Butterfield who started Butterfield Floral in Orono in 1920. After military service in 1947, Loren started growing delphinums outdoors for cut flowers. His first greenhouse was built in 1948. He now has 37,500 square feet of greenhouses in Orono producing floricultural crops.

In 1949, ownership and management of Bachman's passed to the third generation, which included Henry's sons Ralph, Lloyd and Stanley, and their cousins Larry, Harold and Carl. Ralph served as president.

**UNIVERSITY ACTIVITY**

In 1945, Leon C. Snyder, Ph.D., replaced Eldred Hunt as the University of Minnesota's extension horticulturist in general horticulture. Eldred became the Executive Secretary of the Minnesota State Horticultural Society, a position which he held until his retirement in 1974.

In 1948, the annual Florists' Convention had grown to such a size that it moved from the University's St. Paul Campus to a hotel. Undergraduate student major enrollment in horticulture, which had ranged between 30 to 40 individuals, increased to 65 with the
influx of World War II veterans on the GI bill. Floriculture students represented about 30 percent of those students.

Richard (Dick) E. Widmer was hired as an instructor in floriculture at the University of Minnesota in 1949. He replaced the newly retired Louis E. Longley. Widmer taught seven courses, including woody plant materials and plant propagation, conducted a research program, and coordinated outreach activities with the local industry. He also spent some of his time working toward his Ph.D.

**PARK BOARD**

In 1944, the Minneapolis Park Board opened the most northern American Rose Society test garden in the United States. The garden near Lake Harriet was tended by Carl Holst for many years.
Many young growers began to enter the floriculture business after World War II. Cooperation across the industry increased in step. Crop production in greenhouses in the northern tier of states was approximately 80 percent cut flowers and 20 percent container grown plants.

Chrysanthemum stunt disease was first observed in 1946. It threatened to eliminate the nation's most widely grown cut flower. Two Minnesota natives and University of Minnesota Plant Pathology graduates Curt J. Olson and Herbert G. Johnson, while employed at Yoder Brothers in Ohio, helped determine the cause of chrysanthemum stunt. They also developed control methods which saved the species as a commercial crop. In 1951, Herb was a graduate research assistant in Plant Pathology at the University of Minnesota, and later became a Minnesota Extension Service specialist.

FLORISTS' PUBLIC RELATIONS COMMITTEE

The Twin Cities were and continue to be a hub for floriculturists in the upper midwest who also looked to the University of Minnesota floriculturists for assistance, guidance and leadership in their professional activities.
The Minnesota Florists' Public Relations Committee was formed in 1950 to develop greater public visibility for the industry, and to counter the increasing number of 'please omit' notations found in obituary notices. Perry Williams, a former newspaper man, was hired as Executive Secretary. In 1960, the Committee and the Minnesota State Florists' Association merged to become the Minnesota Allied Florists' Association. Stuart Gang then replaced Perry Williams, who retired. Jim and Gen McCarthy replaced Gang in 1967.

The effectiveness of the association improved under the combined efforts of the McCarthys and the organization's elected officers. Their advertising program became a statewide effort. In 1967, when a group of South Dakota florists joined the Association, president John R. Johnson's plans for a regional organization became a reality. The name was changed to North Central Florists' Association in 1969. Florists from several other states have also become members.

**INDUSTRY CONTINUES TO DEVELOP**

Bachman's grew rapidly and a plant leasing department was added in the early 1950s. A close business relationship was initiated with Dayton's Department Stores in 1951, and they opened Dayton's Flowers by Bachman's in Dayton's Minneapolis headquarters and flagship department store. Bachman's expanded with Dayton's into the new Southdale shopping mall in 1957. By the end of the 1950s, Bachman's had five retail floral shops, 34 greenhouses, a year-round garden center, plant leasing and landscaping businesses and a nursery growing range. Sales totaled $2.2 million in 1959.

Adam Gerten started growing vegetables in Ramsey County around 1890. His son Frank was a county agent who eventually turned also to the vegetable growing business. Frank's sons, Robert and Jerry, took over the business in 1951 and started growing some floral crops by 1959. Most of their products were sold at retail.

Sam Rutman started selling fruits from a cart on Hiawatha Avenue in 1948. He moved to South Lyndale Avenue in 1952 and opened Lyndale Fruit and Vegetable Market, adding bedding and flow-
ering plants, nursery stock, etc., as his garden center grew over the years. His son Burt, and son-in-law Palmer Siegel, both became active in the business by 1960, and started a growing range in Lakeville.

Bob Anderson of Tonkadale Greenhouses, designed a unique greenhouse in the 1950s. It was 16 feet high with a flat, non-translucent roof and glass sides to minimize heat loss while growing African Violets, which require relatively high temperatures. Photo shows two of the three bench levels used to maximize production per square foot of floor space. Heat was provided from below the plants through hot water pipes which also supported the concrete, water-tight benches. Florescent lamps illuminated the plants. (Photo courtesy Bob Anderson)
In 1952, the Hans Rosacker Company opened a wholesale growing operation in Del Ray Beach, Florida. Arthur Rosacker, his son Arky, and Dick, a son of the second generation Hans, started the unit which grew to about 100 acres of production area. It eventually became an independent wholesaler. The Minneapolis firm also leased land at the New Brighton Arsenal after the Korean War for the production of cut chrysanthemums outdoors under saran mesh cover, as well as for growing azalea and hydrangea plants during the summer. Marv Saline, an employee who became a partner, and Hans Donald (Don), a second son of Hans, took charge of Rosacker’s business in the 1960s, and were sole owners by the end of that decade.

The Vietnam war ended the land lease at New Brighton, so Rosacker’s bought a farm in Lino Lakes. The firm continued the outdoor production until it was no longer economically feasible. It has since gradually developed a 150,000 square foot greenhouse range on the farm to supplement the production in Minneapolis. Don (third generation) made a mobile bridge on wheels to facilitate installing two layers of plastic film on quonset houses in one operation. He later updated the greenhouses with his own designs.

Roger O. Schnabel, who had worked for the Hans Rosacker Company, bought St. Anthony Roses, previously known as St. Anthony Floral Greenhouses, in Minneapolis from Fred Edmond in 1953. Roger improved the range and was quite active in national and local florists’ circles and the United Minnesota Horticulture group. He was President of Roses Inc. from 1967-1970. The range was sold to John R. Johnson and Rachel Case in 1973. In 1980, the range was demolished and the land used for housing.

Snyder’s Greenhouses was established in Carlton in 1954. It produced floral products for the wholesale market the year-round. Jim Fahrenholz, a former Bachman grower, bought the business in 1986 and is still operating it.

Flowers, Inc. imported baby Vanda orchids from Hawaii in 1954 for use as incentives in charitable fund drives and special events. Red Goldstein also sold at wholesale from his floral shop. Mike joined his father in the business in the early 1950s and his brother Jim joined the firm about 1955. In the later 1950s, Red sold 1,500 anthuriums
to Bachman’s for a Valentine’s Day promotion. In 1967, Flowers, Inc. bought a run-down orchid farm called Island Orchids in Hilo, Hawaii. Mike ran the farm and also sold anthuriums from a bordering farm which they acquired. A wholesale house was opened in Minneapolis as a branch of Flowers, Inc. in 1969. Island Orchids was sold to Florafax in 1973. Red passed away in 1973. At its peak, anthurium production totaled 26 acres. Mike remained with the firm after it was sold.

In 1956, the Society of American Florists again held its annual meeting in St. Paul. In July 1956, the FTD held its Sales and Management Rally for Florists on the Minneapolis Campus of the University of Minnesota. Local and national florists joined University personnel as participants in the program of the five-day session.

In 1957, the American Carnation Society National Meeting was held in Minneapolis. Carnation production in
northern states was decreasing at the time. Colorado production was increasing and the growers were shipping carnations throughout the country.

Vince and Florence Dooley started Dooley Gardens in Hutchinson in 1957. They specialized in garden chrysanthemums, originating some of their own cultivars and offering University of Minnesota introductions. The Dooleys sold at retail, including mail order, and at wholesale and are still in business.

Sunnyside Floral opened as a floral shop and greenhouses in Hibbing in 1957. Louis Bachnik bought the business and renamed it Range Floral. Later, he sold the company to John Knuckey. The present owners, Jack and Jill Trenbeth, purchased the firm in 1987 and operate the greenhouse for spring crops.

Joe Holasek, a truck gardener, moved to Chanhassen in 1957. Joe’s son Earl built a greenhouse and started growing flowers. The business grew rapidly and in time Earl was joined by Earl Jr. to form Earl Holasek and Son, Inc. They burn sawdust and woodchips for 70 percent of their heat. Earl Jr., his wife Sharon and his sister, Carol H. Thuening, work in the business.

John Bauer, an apple grower, opened a roadside stand in LaCrescent in 1953 and started Bauer’s Greenhouses in 1958. He added greenhouses regularly thereafter and the range was completely rebuilt in 1983. Crops grown in the two-acre range have included bedding plants, fall chrysanthemums, and poinsettias sold at retail and wholesale. John’s son Eugene took over the greenhouse operation about 1992. Another son Bruce took over the garden center-apple market.

Successive ownership of Hallstrom’s (1886) in Red Wing descended directly through Frank, then Evan to present owner David. Evan experimented with air-supported greenhouses since 1958, but most of the growing houses are conventional greenhouses. They also operate a retail shop.

Dudek Supply Company of Minneapolis was started by Don Dudek in 1958 to sell hard goods to retail florists. Current owner is Tim, Don’s son.
NATIONAL INDUSTRY DEVELOPMENTS IN THE 1950s

The flowering of chrysanthemums the year round was becoming more widespread. Production of cut flowers was increasing rapidly in Florida and California. Shipments of cut flowers to the north, including Minnesota, meant less cut flower and more container grown plant production in this region. Bedding plant production in Minnesota increased about 280 percent in wholesale dollar volume, and the number of growers increased from 161 to 227 establishments in the 1950s.

There was a trend toward growing and selling bedding plants in packs and other containers, rather than growing in flats, digging the desired number of plants and wrapping them while the customer waited. Although customers liked to buy their bedding plants in bloom, there was also a marketing trend toward selling plants in the vegetative state, labeled and with a color picture of the flower in each container. Plants of some species induced to flower in the pack were in a reproductive stage and they did not produce as much vegetative growth in the garden.

The University of California manual on the fine sand-sphagnum moss peat growth media, and the Cornell peat-lite mixes, among others, motivated the movement toward using soilless growth media. Evaporative pad cooling for greenhouses was developed, as were automatic watering systems and fertilizer injectors.

MINNESOTA COMMERCIAL FLOWER GROWERS

The Minnesota Commercial Flower Growers’ Association was formed in October 1953. Its first objective was to initiate a program for securing adequate facilities for the University’s floriculture section. They took over funding the printing and mailing of the Minnesota State Florists’ Bulletin, and the Minnesota Spider Mites group was disbanded.

The commercial flower growers’ group met ten times a year, with agendas that included tours of greenhouse ranges, followed by
dinner and a business-educational session. The group remains active today with continuing goals of fostering education, research, a mutually beneficial working relationship between the University and people in the floriculture industry, cooperation among growers, and providing representation for the industry in government related subjects. They have cosponsored a floricultural technician in Agricultural Extension at the University since the late 1980s.

UNIVERSITY ACTIVITIES

The University’s Soil Test Service for farmers was not adequate for greenhouse operators. Thus, arrangements were made to initiate an appropriate test for the florists in 1950. The testing was conducted by Muriel Widmer, the spouse of Dick Widmer, in the soils laboratory of the University’s Paul Burson. In June 1951, the Minnesota State Florists’ Bulletin was started, edited by Dick Widmer. Ewald Hermes founded the Minnesota Spider Mites group with annual voluntary dues of one dollar. The dues underwrote printing costs and, combined with the cooperation of the Division of Horticulture and the Agricultural Extension Service, made the Bulletin a reality six times annually. It was mailed to all known florists in the state for many years, but has been limited to subscribers, mostly in Minnesota but including others from around the world, for about 20 years.

An eight week, one night per week class, was offered retail florists in fall 1951. Another night class on flower arranging and business practices followed in 1952. Night classes for growers were presented in 1955 and 1956. The classes, held at the University with speakers from industry and the University, were well attended. Florist Conventions were held each February in Twin Cities hotels.

During a College of Agriculture reorganization in 1952, the Division of Horticulture was renamed the Department of Horticulture.

HONORARY FLORICULTURAL FRATERNITY

The international honorary floricultural fraternity Pi Alpha Xi was founded at Cornell University in 1923. Professor Arno H. Nehr-
ling was Pi Alpha Xi's first president. Additional chapters were established, including the University of Minnesota chapter, Lambda, chartered in 1968.

Pi Alpha Xi sponsored the first of what was to become an annual Intercollegiate Flower Judging Contest in Toronto, Canada, in 1938. Six colleges which taught floriculture entered teams. Early contests were held in conjunction with the annual National Flower Show.

Dick Widmer coached and brought the first University of Minnesota team to the Intercollegiate Flower Judging Contest in Cleveland, Ohio, in 1953. A member of that Minnesota team was Roy A. Larson, who later became a president of Pi Alpha Xi. He is currently a Professor of Floriculture at the University of North Carolina, Raleigh. Later, the site of the annual contest was moved to the campus of the co-sponsoring university. Some years later, the SAF also became a co-sponsor.

The number of teams entered in the flower judging contest peaked at 24 in 1979. Over the course of that competition's existence, the University of Minnesota has entered teams 21 times with Dick Widmer and/or Harold Wilkins coaching most of them prior to 1988. Minnesota teams have placed in the top five at ten of those contests. The 1973 team, coached by Wilkins, placed first. The 1959 team, coached by Widmer, placed third with team member Ollie Hoffman the top judge in a field of 60 entrants.

UNIVERSITY STAFF

Leon C. Snyder, Ph.D., became head of the Department of Horticulture when William H. Alderman retired in 1953. By 1970, when Snyder stepped down as head, the faculty had grown from 14 to 28 members including a second floriculturist, H.F. Wilkins. Snyder attended many florists' meetings and florist's short courses while he headed the Department.

Louis Longley died in 1954. R.J. stadtherr, a former student of Longley, was hired as an instructor in ornamental horticulture in 1954. Stadtherr also had some Agricultural Extension responsibilities and these included visiting outstate greenhouses to provide assistance to growers during the 1950s.
In 1955, Dick Widmer completed the requirements for his Ph.D. degree.

Herbert G. Johnson, Ph.D., became an extension specialist in plant pathology in 1956, working part-time with greenhouse operators. Plant pathology researcher and teacher Louise Dosdall, Ph.D., was also very cooperative to the floriculture industry. In entomology, L. Cutkomp, Ph.D., and A. Granovsky, Ph.D., helped growers solve their insect related problems. Dosdall died in 1958.

University of Minnesota nematologist Donald P. Taylor, Ph.D., surveyed Minnesota fields and found that, contrary to popular belief, nematodes were just as common in the north as in the south. He noted that greenhouse crops were as severely attacked by nematodes as were any other group of crops.

**UNITED MINNESOTA HORTICULTURE**

United Minnesota Horticulture was organized in 1959 to seek a new horticulture building at the University of Minnesota, new and improved greenhouse facilities, and to generally support the University’s horticultural programs. Its members came from a wide array of commercial horticultural interests, with additional members drawn from the Department of Horticulture. Early members included Lloyd Bachman, John R. Johnson, Gordon Bailey, Sr., Ken Law, Eugene Peterson, Fred Gerten, Leon Snyder, Dick Widmer and other faculty members. Other industry individuals who became involved with the group included Bruce Johnstone, Don Rosacker and Roger Schnabel.

A new 5,400 square foot, aluminum research greenhouse with glass glazing was erected for Department of Horticulture (including floriculture) use in 1959. This was the first greenhouse constructed on the St. Paul campus for horticulture since 1900, when a 4,000 square foot greenhouse had been added on to the horticulture building.

**UNIVERSITY OF MINNESOTA FLORICULTURE RESEARCH**

Floricultural research in the 1950s at the University of Minnesota included investigations of soil fertility and amendments, climate, rooting techniques, and alternative glazing materials. Examples of this research abound:
• Symptoms of deficiencies of nitrogen, phosphorous, potassium, calcium, magnesium and boron were induced and documented in plants of three poinsettia cultivars. Sodium delayed the development of visible potassium deficiency symptoms. Fluorine supplied in the nutrient solution applied to the sand growth medium at 20–25 times the quantity added to city water supplies had no negative effects on the poinsettia plants.

• Low temperature sensitivity levels of garden chrysanthemums were determined. Plants hardened by exposure to cool (around freezing) temperatures showed limited injury to the crowns (not plant tops) at 15° Fahrenheit, severe injury at 5°, and were killed at lower temperatures. Degree of injury was also influenced by soil moisture, premature foliage loss, type of plant development, cultivar and length of exposure to low temperature.

• Trials determined the best production schedules and Minnesota garden chrysanthemum cultivars for spring flowering pot plant production. Replicated field trials evaluated preferred herbicides for weed control.

• Studies with Croft Easter Lilies showed that a steady supply of nitrogen fertilizer of appropriate types, high soil calcium levels and a soil pH in the vicinity of 6.5 virtually eliminated leaf scorch.

• Several years of experiments determined the best rooting media, temperatures and conditions for rooting poinsettia cuttings including directly in pots with intermittent mist.

• As plastic films of various types became available for glazing greenhouses in the 1950s, trials were established to evaluate light transmission through the films, their useful life span, and plant growth under the films. The variety of useful results included findings that polyethylene had a useful life of up to one year and transmitted a lower percentage of the available light than did glass in the winter. Polyvinyl cost more, had a similar life span at the time and had an affinity to dust. Weatherable Mylar and Scotch-Pak, a polyester film reinforced with nylon mesh, had appreciably longer service lives, but were much higher priced. Polyethylene film provided a great poten-
tial for use in building low-cost, wood frame greenhouses, especially for bedding plant production. Crop quality in such structures was quite good. Rigid plastic, fiberglass-reinforced panels which were much more resistant to breakage than glass, were also available starting in the late 1950s. Light transmission through the rigid plastic panels was appreciably less than through glass and decreased as the material weathered.

Development of new cultivars in the plant breeding programs also continued apace. New cultivars of garden chrysanthemums developed by the breeding program are listed in Appendix B. In 1957, the introductions 'Minnpink' and 'Minnbronze' marked the beginning of a popular series with a cushion growth habit, all of which were given names with the 'Minn' prefix.

**Como Park Conservatory**

After years of neglect, the Como Conservatory was partly rehabilitated in 1953 and 1957. Damage from a 1962 hailstorm necessitated an emergency appropriation of $75,000 for additional repairs. Fiberglass reinforced plastic glazing was used extensively in replacement of the glass. Concern over the safety of persons in the structure during sudden storms helped influence the selection. A reopening was celebrated on October 1, 1962.
Chapter 8

The Expansive Sixties
1960-1969

The Minnesota Commercial Flower Growers started fund raising activities at their annual convention short course in late February 1960 to support efforts to obtain new research and teaching facilities at the University for floriculture and horticulture. The chief recipient of funds in the 1960s was United Minnesota Horticulture. They also paid for the printing of a career bulletin, prepared by the Department of Horticulture, featuring jobs in horticulture and the teaching program of the department. These bulletins were distributed to high schools in the state and to potential University students. The industry was growing, further expansion was anticipated, and a supply of people trained and educated with appropriate floricultural skills was needed.

Clint Chastek started growing vegetables and raspberries in Hopkins in the late 1920s. In 1960, his son Stan started growing bedding plants and built additional greenhouses. In 1971, Stan moved to Corcoran where he built a three-acre range. Main crops are bedding plants and hanging baskets. Stan's sons, Scott and Jeff, are now active in the business.

Fred Hurias, Sr. began growing truck garden crops in St. Paul in 1934. His sons, Fred, Jr. (Bud), and Marvin, later joined him. About 1960, they started to change to floral crops. Later, the sons developed their own greenhouse business. Bud died in 1992. Marvin still
runs a thriving bedding plant operation in Roseville with his four children, daughters Dianne DeGrood, Patricia O'Connell and Lynn Gustafson, and son Tom.

The Puvogels sold their retail business on Grand Avenue to Don and Kay Minni, and Jim McGinty and wife in 1960. The greenhouses were dismantled, and Don and Jim, who had worked for Hans Roesacker Company, moved the shop to 949 Grand Avenue. After Jim died, the Minnis continued the business. In 1991, the retail shop was sold and renamed Stems and Vines by its new owner, Peter Linney, of Chicago.

Hertog Floral, of St. Anthony Village, built an attractive new retail shop at its greenhouses in 1960. Cut flowers, pot plants and bedding plants were grown until the business closed after being destroyed by a tornado in 1984. Thereafter, John Hertog’s son David worked for J.R. Johnson’s wholesale and growing business. For three years starting in 1991, Dave, under a joint agreement, operated the Holm and Olson range in St. Paul.

O. Eidsmoe and University of Minnesota floriculture graduate R. Brostrom purchased R.L. Gould & Company in 1962 and expanded both its product lines and market areas. However, they discontinued the retail portion of their business when they moved to a new building in Arden Hills in 1965. Their customers included flower growers, garden centers, nursery operators and golf courses. A branch of the company operated in Portland, Oregon, from 1975 to 1987, selling chain saws and related hardware to that area’s lumberjacks. Another branch operated in Green Bay, Wisconsin, from 1979 to 1987. The firm closed in 1988, primarily because of the failing health of both owners.

David Sindt of St. Paul started breeding mini irises in the 1960s, eventually introducing 30 cultivars through the Riverside Iris Garden in Minneapolis. His new cultivars included ‘Zipper’, which was a top rated cultivar across the nation. Sindt died in 1986.

In 1963, the national meeting of Roses Inc. was held in Minneapolis. It included a ‘Land of Lakes Rose Show’ which featured 70,000 rose blooms. Open to the public,
the well-attended show was staged in the Dayton’s department store auditorium in its flagship downtown Minneapolis location.

In 1964, Harold and Lucille Thomford opened Thomford’s Garden Center in Crookston. They sold potted plants, bedding plants, nursery stock and supplies. Their son John and his wife Jean now run the business, with Harold still on duty.

BRAINERD VOCATIONAL TECHNICAL INSTITUTE

Formal education programs in horticultural subjects expanded outside the Twin Cities in 1964, when floriculture retailing began to be taught at the Brainerd Vocational Technical Institute, known since 1993 as the Brainerd/Staples Technical College. The one-year program included an internship in industry. Very little content on greenhouse operations was included in the program, and its instructional curriculum was on a technical school level. At the peak, Brainerd averaged 24 graduates per year.

Joe Bilski, who had been a co-owner of Merriam Park Floral, taught the course at Brainerd in its first year. Rudy Hillig taught the Brainerd retail florists program from 1965 to 1971. He had worked in the University of Minnesota floriculture greenhouse and had owned a retail flower shop. Bert Knandel taught from 1971 until his retirement in 1991. Jeff Dirks took over teaching the floriculture program in 1991.

ANNUAL DAYTON’S-BACHMAN’S FLOWER SHOW

In 1964, Dayton’s and Bachman’s joined forces to present a spectacular garden flower show in the downtown Minneapolis Dayton’s department store auditorium at the end of the winter. The show, free to the public, has become a much anticipated annual event, drawing about 100,000 people every year during its 15-day run.
lar, on the outdoor side had an extended service life. Longer lasting polyethylene films were being developed, as were better greenhouse support structures. Glass 24 inches wide was used in most new standard styled greenhouses. Glass 20 inches wide had been used after World War II, and 16-inch glass before that.

Low cost, plastic film greenhouses at the Ahrens range in Osseo. The houses were used for bedding plant production. Wide, paved driveways permitted loading plants on trailers or trucks directly from doors or openings in the sidewalls of the greenhouses. (Photo by author)

By 1970, the average Minnesota range size was 18,391 square feet with 15,287 glazed with glass and 3,104 covered with plastic. Some greenhouse operators, especially wholesale producers, were moving out of the Twin Cities and locating or relocating within a 50-mile radius of St. Paul-Minneapolis.
UNIVERSITY DEVELOPMENTS

HAIL DAMAGE

Hail struck a relatively narrow, but several mile long strip on the northern edge of the Twin Cities on June 23, 1962. Approximately 90 percent of the glass was broken in most of the University of Minnesota's St. Paul Campus greenhouses. The Como Conservatory, in nearby Como Park, also needed significant repairs. Garden chrysanthemums in field plots were reduced to stubs and 15-20 percent of the plants were killed. Tomato plants in the University's fields were, quite literally, wiped out.

SCHOOL OF AGRICULTURE CLOSES, SHORT COURSE STARTED

The high school level School of Agriculture on the St. Paul Campus closed in 1960. Annual Garden Center Operators short courses were presented by the Department of Horticulture from 1961 through 1967.

The Commercial Flower Growers Short Course was started by the University as a one day session on the St. Paul Campus in Fall 1964. The program was planned in cooperation with commercial growers Don Rosacker and Dave Linder. It was well received and has been expanded to a two and one-half day course over the years.

ST. PAUL CAMPUS HORTICULTURE FACILITIES EXPANDED

The Gibbs-Nelson greenhouses adjacent to the Agricultural Experiment Station were purchased by the University in 1961. They were rehabilitated and put into regular use by several University departments. Their physical condition deteriorated over the years, however, and by 1994 the glazing was in poor condition, when they were recovered with a double layer of what was hoped would be a long lasting polyethylene plastic film.

Hard work of numerous United Minnesota Horticulture members paid dividends in 1965 when the state's legislature appropriated $80,000 to initiate the development of plans for a new horticulture building and greenhouse complex at the University. The original Horticulture Building, which is still standing, cost $35,000 when it was
built in 1898-99. Funds were appropriated by the Legislature in 1967 for construction of the new building and greenhouse complex. The Department of Horticulture specialized in plant breeding for 50 years. An effort was begun to broaden the program’s research scope in the 1960s, efforts which continued into the 1970s.

UNIVERSITY STAFF

In 1966, Harold F. Wilkins, Ph.D., an Illinois native, was hired by the University as a second faculty member in floriculture. The activities of his position were split among research, teaching and extension responsibilities.

The University’s Northwest School of Agriculture at Crookston offered the two-year high school level program until 1966. Bruce Beresford, who was on the Minnesota Agricultural Experiment Station staff, also taught some horticultural classes. The School was expanded to a two-year Technical College in 1966. Roger Wagner, who had garden center experience, was added to the teaching staff in 1975. Beresford retired about 1987. Programming at the College expanded again in 1993, with the addition of several four-year college pro-
grams. There were 17 students majoring in floriculture and 17 in nursery management in 1996.

Dick Widmer was on sabbatic leave from the St. Paul Campus from August 1968 to June 1969. He spent that academic year at the Kinsealy Agricultural Research Center in Ireland. His focus during that year in Ireland was research into the conditions associated with successfully growing florist plants in a sphagnum moss peat medium. He followed that year of research with a summer of visits to floricultural research institutions, commercial growers and botanic gardens across Europe.

UNIVERSITY FLORICULTURAL RESEARCH FINDINGS

There were many significant findings from the floriculture research studies conducted at the University in the 1960s. The use of herbicides was investigated, with several positive findings associated with the University's renowned garden chrysanthemum breeding program. Chloro IPC herbicide spray or granular applications to garden chrysanthemum field soil provided good weed control in three out of four growing seasons. Additional trials at two locations over two years showed that Trifluralin granular applied post-planting, pre-weed emergence, and tilled after application, provided excellent weed control for 12 weeks.

To properly grow potted, spring flowering, garden chrysanthemums, stock plants were found to require low temperature (30-45 degrees Fahrenheit) for about five weeks to obtain a maximum number of sturdy, fast growing cuttings. Appropriate Minnesota cultivars and complete production schedules were developed and made available to the industry. Twelve garden chrysanthemum cultivars were released to the public in the 1960s. (see Appendix B).

Several important results came from research into plant breeding. For garden chrysanthemum breeding, a 50 degree Fahrenheit night air temperature was found to result in greater seed production than did a higher 60 degree temperature. Plants properly fertilized with nutrients provided greater seed production than did insufficiently fertilized plants. Differences in the combining ability of individual cultivars was discovered to be a major factor in seed production.
Other plants also received their share of attention by the University research staff. Detailed Ace Easter lily fertilizer treatments showed that applications of four kinds of new, slow-release fertilizer were effective for up to 4½ months after application. Their use was also found to be a plus for the production of quality geraniums and poinsettias.

Easter lily plant heights were found to be greater when nitrogen was lacking. A short photoperiod after March 1 limited plant stretch. The pre-cooling of bulbs planted in pots, contrasted to in-case cooling, resulted in better plants and higher bud count.

Annually revised detailed reports and recommendations for lily plant production based on the latest Minnesota research findings (and key studies elsewhere) were initiated in 1968. The leaf counting lily...
timing technique developed by A.N. Roberts in Oregon was popularized by the University of Minnesota's Harold Wilkins.

More than 100 water soluble dyes for coloring cut carnations were tested in C.J. Weiser's, Ph.D., laboratory. They also showed the influence of various environmental effects on the dyeing. Recommendations were prepared and presented to the industry.

Application of rooting hormones were found to significantly accelerate the rooting of poinsettias, in both soil mixes and soilless media, in pots under intermittent mist. Good rooting and growth was found in a mix of 2 parts sphagnum moss peat, 1 part sand and 1 part soil, but rooting was quicker in lighter mixes. Incorporating a slow-release fertilizer in the rooting medium at proper rates was discovered to be especially beneficial.

Applications of CCC (Cycocel) effectively controlled plant stretch when applied after rooting. Both soil and foliar applications were found to be effective, but foliar applications were the most efficient. Use of B-995 (B-Nine) required higher concentrations than CCC to be effective.

Environmental effects on growth regulator effectiveness were also studied. Supplementing greenhouse CO₂ levels significantly advanced and improved poinsettias, if treatment started no later than 10 days after the initiation of short days. Late propagated plants were found to benefit most.

Azaleas coming from several southern sources were found to be nematode infested.

A range of experiments with plastic alternatives to glass for greenhouse glazing were conducted. An air-supported greenhouse covered with Scotch Pak plastic film withstood the elements for more than three years, including a severe hail storm. Normal, good quality crops were grown in this structure. Another greenhouse glazing alternative, improved long-life polyethylene film, had longer life than regular film, but did not survive a second winter season. Weatherable Mylar was still in good condition after five years.

Insecticide use charts were published in the Minnesota State Florists' Bulletin regularly. The new F-1 (first generation hybrid) seed propagated geraniums were subjected to intense growing trials to de-
termine environmental effects on growth and plant quality. They looked quite promising, but were late to bloom.
Minnesota greenhouse area totaled more than 5.85 million square feet of covered growing space by 1980, and this figure did not even include many smaller part-time horticultural producers. Average size of a major commercial greenhouse range was 22,000 square feet.

Cut flowers shipped into Minnesota accounted for as much as 75 percent of retail cut flower sales. The sources were varied. Many were grown in California and Florida. Imports of cut chrysanthemums and carnations from Central and South America were increasing. Imports also came from Europe, Israel, South Africa, Hawaii, Australia and New Zealand.

Bedding plant and seed geranium production remained a Minnesota mainstay, increasing faster than production of all other crops in Minnesota, especially to meet demand for the increasingly popular first generation hybrid cultivars. Production of poinsettia pot plants, hanging baskets and diverse new crops also increased. There were fewer rose growers by 1980, but improved growing methods and larger ranges resulted in greater rose cut flower production.

Foliage plant sales in Minnesota increased eight-fold between 1970 and 1977. Most of the foliage plant production had moved to warmer climates, but the sales surge resulted in a limited increase in local production. Minnesota was 16th in population in the United States, but local bedding plant growers were 11th in wholesale produc-
tion value in the late 1970s. There was a significant decline in joint grower-retailer floral operations in the country, but such was not true in the midwest.

INDUSTRY DEVELOPMENTS

The Green Giant firm wished to take advantage of both the popularity of outdoor living and its positive corporate and consumer image in vegetable processing, to enter the garden center field. The first Green Giant Home and Garden Center opened in St. Paul in 1970. Within four years it operated six centers in the Twin City area, including Bob’s Produce Ranch which it had purchased.

Fifty percent of the garden center business is usually done in April, May and June. Green Giant tried to overcome limited off-season sales by adding items such as crafts, gifts, casual furniture, wine making ingredients, etc., with limited success. Previous company experience had been with wholesale, not retail sales, and their limited retailing experience showed. Management overhead systems were structured for a large scale, rather than a limited scale business. Thus, while individual stores may have been profitable, the addition of Green Giant overhead costs probably resulted in losses or minimal profits. In 1974, the Green Giant Home and Garden Centers were sold to Frank’s Nursery and Crafts, a Michigan firm that operated a large chain of garden centers in the midwestern states. Frank’s has grown to operate 15 garden and craft centers in the Twin City area alone.

Herman Holland bought Scheidler’s Nursery in Moorhead in 1970 and added five greenhouses to the operation. He currently sells bedding plants, nursery stock and garden center items.

The first National Bedding Plant Conference to be held outside of Michigan was held on the St. Paul Campus of the University of Minnesota in 1971. SAF’s annual meeting and conference was held in Minneapolis, also in 1971.

Richard Donahue purchased Lehman Gardens in Faribault in 1972. He continued the garden chrysanthemum business, but concen-
trated on wholesale sales in the United States and Canada. The com-
pany discontinued the outdoor plantings and indoor displays. Its range
was enlarged significantly and a second large range was developed in
the 1990s in nearby Warsaw. In 1990, the firm name was changed
to Donahue’s Greenhouses.

The largest area of Donahue’s Greenhouses has been devoted
to bedding plants. The firm became the country’s largest clematis
propagator, selling the bulk of them as potted plants. It grew 25,000
pans of poinsettias for wholesale and retail sales. Other plants were
produced on a smaller scale for its retail business. Donahue had a rail-
way caboose car moved to the Faribault location in 1990. It was re-
furished to make an unusual but attractive private office. In 1994,
Donahue’s sold the garden chrysanthemum business to George Chap-
puis, a Faribault resident. Donahue had seven of his children work-
ing full time in the greenhouse business: Mike, Mark, Kathy, Julie,
Mary, Tim and Joe. He also purchased a $50,000 transplanting ma-
chine for his bedding plants. Donahue died in September 1994. His
children have continued to operate the business.

In 1972, the third generation of Linders, Dave, Lill, and later
Rob and Peter, began running Linder’s Greenhouses. They enlarged
the establishment regularly, and started working with plugs in the early
seventies. The greenhouses have been mostly of their own design and
glazed with plastic film. In 1984, they erected a large, attractive, year-
round garden center on the Larpenteur Avenue end of their proper-
ty. The attached display and growing greenhouses were glazed with
double layer, box-rib, acrylic panels.

George Lucht, an employee of Malmborg’s, Inc., in Brooklyn
Center, purchased the Brooklyn Center part of the business from
Lloyd Malmborg in 1972. He leased Malmborg’s second range, in
Rogers, until purchasing it from Malmborg in 1976. Lucht specialized
in quality geraniums and wholesaling young plants to commercial
growers around the country. He also grew bedding plants, perenni-
als and other crops for the retail store and garden center.

Northrup King’s field crop trial plots were moved to a new re-
search center in Stanford in 1972. Sandoz Ltd. of Switzerland, a large
chemical company, purchased Northrup King in 1976. Kerm Henrik-
son retired in 1979. The flower trials were moved to Stanford, but discontinued shortly thereafter in the early 1980s. Rodger Robb, a University of Minnesota Horticulture graduate, headed the greenhouse unit after D. Bruce Johnstone retired. In the late 1980s, the greenhouse unit was sold to Vaughan’s, an Illinois firm also owned by Sandoz. Sandoz owns seed companies around the world and had estimated total seed sales (including field crops) of $660 million in 1992. This was second only to the Pioneer Seed Company which does not sell flower seeds. While the Northrup King Corporation headquarters was moved to Golden Valley, the field crop processing and distribution units have remained spread across approximately 20 locations in the United States.

**WASTE HEAT RESEARCH BY NORTHERN STATES POWER**

When the modern period of high fuel costs began in the early 1970s, Northern States Power Company (NSP) began collaborating with the Environmental Protection Agency (EPA) and the University of Minnesota on research to determine the feasibility of heating commercial greenhouses with waste heat, 85-95 degree Fahrenheit water from NSP cooling towers.

A preliminary project was financed by NSP, coordinated by Russ Stansfield, NSP’s Administrator of Agricultural Research, and conducted in a Hans Rosacker Company greenhouse in Lino Lakes beginning around 1973. Assistant Agricultural Experiment Station Director L. Boyd, Ph.D., spearheaded the University’s portion of this program. With positive preliminary results, a half-acre experimental range was erected at the Becker NSP electric generating plant. Flowers, including cut roses, as well as vegetable crops were grown successfully.

**MORE FLORIST DEVELOPMENTS**

In 1977, Al Hermes and his sons built an acre of 17-foot-wide connecting hoop greenhouses, covered with two layers of polyethyl-
ene film, on power company land in Becker. They produced cut flowers with warm waste water from the NSP coal-fired electric generating plants being the primary heat source. The use of this heat source proved to be economically feasible, and in 1978 the Hermes Company purchased an adjacent vegetable production range.

In 1979, the original Hermes property on Larpenteur Avenue in Falcon Heights was sold and the greenhouses were replaced by a large commercial building. Ewald, Vic and Bob retired and Ewald’s son Bill became the State Fair’s horticulturist. Al and his sons then purchased a smaller wholesale rose range across Larpenteur Avenue which had been owned by Jansen Brothers, leased by Emerson Kohler and owned by Vic Peterson and son Ron, in that order. Ron now owns and operates Wadena Floral Greenhouse in Wadena. Hermes added a new retail complex, continued the wholesale cut flower business and within a few years replaced the old greenhouses with new ones.

Erickson Greenhouses, which had been established in Brainerd in 1883 by Peter A. Erickson, has passed through several family members on its way to its current owner and operator, David Erickson. David is a great-grandnephew of the founder. Peter had been followed to the company’s helm by David’s grandfather Carl A., and by David’s father C. Hilding Erickson. David became the owner in 1972 and has continued to run the greenhouse and retail shop to the present.

**Julius Wadekamper, a former monk who served in South America, opened Borbeleta Gardens in Elk River in 1972, and later moved the business to Faribault in 1986. He also earned a master of science degree in Horticultural Science at the University of Minnesota. Wadekamper grew four specialty perennials: lilies, daylilies, Siberian irises, and dwarf and intermediate bearded irises. He sustained an active breeding program which led to the development and introduction of more than 70 new cultivars of Asiatic lilies. Wadekamper’s firm also maintained a large area of display gardens. David and Jeanne Campbell purchased Borbeleta Gardens in 1992, but Wadekamper has maintained**
a relationship with the new owners of Borbeleta Gardens, continuing the hybridizing program and releasing new cultivars through that firm.

Metro Florist Supply, Inc., started in Roseville in 1973 as a delivery service. During the shortage of gasoline supplies in 1976, the firm became a center for pooled deliveries for retail florists. Lynn Graves, the founder, branched out into selling, not growing, potted plants and supplies in 1987. Cut flowers were added to the offerings in 1989.

Christopher Boock, of Dutch origin, had grown flowers as a hobby before turning it into a business. He started New Ulm Green-
houses in 1884, later operated by his son Otto in the late 1890s. Otto's sons Walter and Erwin subsequently operated the business together until Erwin left in 1960. Walter continued growing and selling flowers and plants until 1973 when his nephew Jerry Danheim took over for a few years. It was renamed Holiday Growers in 1981.

Busse Garden Center and Nursery was started in Cokato in 1973 by Norman and Ainie Busse. They published their first mail order catalog in 1978 under the name Busse Gardens. In 1984, they opened the Busse Bed and Breakfast in their home at the garden center site. In 1986, the garden center and home were sold and the business was moved to a 35-acre farm in French Lake township, eight miles north of Cokato. A corporation was formed in 1988. In 1994, the business returned to Cokato. Busse Gardens' business is 75 percent wholesale and 25 percent retail conducted through catalogs. Busse Perennial Center added ornamental shrubs and shade trees in the fall of 1996. Ainie Busse is one of the founders and past presidents of the national Perennial Plant Association.

Wayne Davis started growing outdoor vegetables in 1973 and worked in a greenhouse in the winter. In 1974 he started the Green Valley Greenhouses in Anoka. With Ron Hunt, his partner from 1973 to 1977, he expanded the wooden frame, polyethylene film greenhouse range. Davis became the sole owner and continued to expand the business after 1977. Later, he rebuilt the greenhouses with improved metal frame units. Green Valley Greenhouses specializes in foliage plants and hanging baskets, but also grows many other crops in its large range. No bedding plants in packs are produced in this wholesale business.

*Lloyd Bachman reported total production costs per year at $6.71 per square foot in modern glass greenhouses for 1974–1975. The average-sized Minnesota greenhouse range in 1974 was 21,800 square feet for those with wholesale sales greater than $10,000 per year.*

In 1975, Tom Silver and Tim Pellizzer started Terra Products Corporation in Lakeville, selling a wide selection of pots and potted
plants to the wholesale trade. The greenhouse range has been expanded over the years.

Also in 1975, Clarence Engwall sold his Duluth firm to Don Rosacker, Marv Saline and Rochester retail florist Bud Renning. Marv's son Rod became manager of the firm, enlarged the range and added several retail outlets over the years.

**VARIED BUSINESS APPROACHES**


One of Island Tropicals' owners, Mike Goldstein, continues to use the name Tropicals, Inc., operating as a reseller of plants which he purchases, packages and sells direct to retail customers on the mainland. The other former owner of Flowers, Inc., Jim Goldstein, and other partners started a new Minneapolis retail business, Monday Blooms, in 1987. He bought out his partners in 1990, and younger brother Allen joined him in the new business. Flowers, Inc. handles commercial accounts and specials events for the Minnesota Twins baseball team, non-profit organizations and other groups.

In 1976, University floricultural graduate Craig Johnson erected greenhouses in Wyoming, Minnesota, which were later destroyed by a tornado. After working in another greenhouse while rebuilding his range, the new greenhouses collapsed under a 24-inch snowfall because nobody was around to reset thermostats higher while he was out of the state on his honeymoon. Once again he rebuilt, this time on a smaller scale, and he changed from a wholesale to a retail operation. He also chose to diversify his business and developed an 18-hole golf course on his property.
Franz Beelen started the Multiflora Company in Plymouth in 1976, selling bulbs for both greenhouse forcing and to dry bulb retailers. He added perennials to his offerings and contracted with other growers for their production. To utilize his large coolers in the off season, Beelen started potting flower bulbs in 1989, precooling them and selling them ready for immediate forcing. Sales of that product have since grown to 90,000 pots per year. He and four other regional bulb wholesalers in the United States combined their operations in 1991 to form Van Bloem, Inc. A sixth unit in Canada was subsequently added, and Beelen added ownership of three of the other domestic units to his local Minnesota unit. The company maintains centers in Georgia, and overseas in the Netherlands. It continues to contract with other producers in the United States and the Netherlands for bulbs and plants.

The Waldos sold Forest Lake Greenhouses to their daughter Sandy and her husband Mick Roberts in 1976. The business had grown and a 1,600 square foot retail shop was added in 1978.

Van’s of Chicago, a cut flower wholesaler, opened a branch in Edina in 1976. The company now sells plants produced in its Michigan greenhouses, as well as supplies. Jess Poyner is the manager of the Edina unit.

Fred Holasek purchased greenhouses from a tomato grower in 1978. He enlarged the Lester Prairie range and changed its output to poinsettias and bedding plants.

Jerry Fisher opened his Orchids Ltd. greenhouse business in north Plymouth in 1978, specializing, logically enough, in growing and breeding orchids. He had worked at Bachman’s for three years. His 12,750 square feet of greenhouses contained a wide array of orchids, grown primarily for retail sales and for his mail order business which shipped product to buyers around the world.

Dan Tutushek, Sr., grew vegetables in Eden Prairie. In the late 1960s, he erected his first greenhouse. Any space not needed for vegetables was filled with floral plants. His son, Dan Jr., and Jerry Quaal worked on the farm. In 1979, they built a one-acre greenhouse range and began growing bedding plants. In 1981, they erected a range in Monticello to raise hothouse tomatoes, but bedding plants
soon replaced the tomatoes. In 1990, additional property was purchased for further expansion. An existing greenhouse range in Buffalo was acquired in 1992. Another range was built in Montrose, and expansion continued with a new range built near the existing facility in Monticello in 1993–1994. The Dan and Jerry firm then had five ranges totaling 12.1 acres. Crops grown include bedding plants, hanging baskets, perennials, fall garden mums and poinsettias that are sold wholesale to outlets across Minnesota. They also operate garden centers in Monticello and Buffalo.

Ned Butterfield and partner Jerry Ramthun started Flower Farm greenhouses in Delano in 1979. They expanded it to a moderately large growing range, with bedding plants and poinsettias as their primary crops. A wreath business in Orono, which Ned also owned, continued to grow as well, focusing on fund raiser oriented sales to groups such as schools and Scout troops. It has grown to employ about 100 people in each fall season. The management of Butterfield’s retail shop in Wayzata was taken over by Ned’s daughter, Amy Mullen, starting in 1992. A garden center was added next to the shop in 1994. The shop alone was subsequently sold in early 1995 to Tom Bradley, who renamed it Nature’s Harvest.

Ralph Bachman was inducted into the SAF Floricultural Hall of Fame in 1979, commemorating his lifetime of outstanding service to floriculture.

Mr. and Mrs. Glen Ray became an executive secretary and editor team for the Minnesota State Horticultural Society and the Minnesota Horticulturist respectively in 1974, after Eldred Hunt retired. Hunt died in 1993, never having lost his love of gardening and horticulture.

Mike Lemke purchased the Nelson Tree Farm in Zimmerman in 1979. He still produces some Christmas trees, but the business now also includes an expansive garden center. He has more than 100,000 square feet of polyethylene film covered greenhouses, and grows annuals, perennials, rose plants in pots for wholesaling and custom potted shrubs and trees.
INDUSTRY ADVANCES

Use of dry fertilizers became less common through the decade of the 1970s. Fertilizer injectors and sprayers became standard greenhouse equipment as constant application of water soluble fertilizers became routine. Use of lighter and soilless growth media and more highly refined water soluble fertilizers brought with it the desirability of closer monitoring of the use of micronutrients in the growing mediums, and also the levels they were reaching in the plants. Tissue analysis for a fee became available to greenhouse operators through University of Minnesota floricultural faculty. Analysis was conducted by Bob Munter’s laboratory on the St. Paul Campus.

Energy conservation was also becoming essential with the increasingly high fuel costs of the time. Greenhouses were tightened and repaired more frequently. Thermal curtains began to be used at night to limit heat loss. They also served a secondary purpose as photoperiod control covers for the crops which needed such treatment. A negative consequence of this energy conservation was that plant damage caused by pollution from sources inside and outside the greenhouses became more frequent as a result of fewer air exchanges occurring per hour.

Mechanization and automation were becoming more common. The innovations included watering with tubes, capillary mats and nozzles; plant movement equipment; improved direct seeding machines for packs and plugs; flat fillers and equipment for automatic application and removal of covers for photoperiod control; all with computer controls. Improved, uniform evaporative pads made from cellulose fibers started replacing aspen pads for more efficient cooling. Rolling bench tops reduced the numbers of aisles needed, increasing greenhouse growing space utilization from 66 to 90 percent of the floor space. Use of high-intensity, high-pressure sodium vapor lamps advanced crop growth and improved plant quality, especially during the short-day season.

Greenhouse building in Minnesota averaged 140,000 additional square feet per year in the 1970s. The so-called Dutch greenhouses, which started using triple strength glass up to 39 inches wide, became
more evident. Fiberglass reinforced, rigid plastic panels for greenhouse glazing were used less frequently. Instead, use of acrylic, box-ribbon, double layer, plastic structural sheets increased. Use of polyethylene film also increased significantly with the development of clear, longer lasting films. Applying two layers of film with an air layer in between provided additional thermal benefits that could lower fuel consumption by as much as 40 percent.

The Environmental Protection Agency developed and enforced safety regulations in and around greenhouses. Violations often resulted in fines.

Better cut-flower preservatives, such as silver thiosulfate, combined with a better understanding of environmental preferences to improve cut-flower life. There were 18 wholesale cut-flower distributors in the Twin City area by 1980. Twelve of them were non-grower wholesalers and six were operated by Minnesota commercial flower growers. The latter sold their home-grown cut flowers and potted plants, usually supplemented with cut flowers from other growers, local and distant. Large retailers often bought directly from wholesalers in Florida, California, and overseas.

Late in 1970, University of Minnesota researchers and instructors plus students started using this new greenhouse range. There were 21,600 square feet of new greenhouses plus 5,400 square feet erected in 1959, and 3,100 square feet in the house the students rebuilt for a total of 30,100 square feet. Some greenhouse space was also used in the University’s northwest (formerly Gibbs-Nelson) range. The attached headhouse, teaching and research building contained 34,494 square feet on two levels. Buildings in the background are part of the University’s St. Paul campus. (Photo by author)
UNIVERSITY DEVELOPMENTS

The University's floricultural faculty increased its productivity as individuals, and as a department, with the improved and enlarged facilities and new additions to the staff. Student enrollments in the department's programs also peaked during this period.

DEDICATION OF NEW HORTICULTURAL FACILITIES

Dedication of the new Horticultural Science facilities formally occurred on March 24, 1971, with then University president Malcolm A smiling group of florists attending 1971 dedication ceremonies for the new horticulture building and greenhouses. From left: Bob Pletscher (New Brighton), Jim Dey (St. Paul), Vic Hermes-front (Falcon Heights), Ernie Keller-rear (St. Paul), Tom Hermes-front (Falcon Heights), Harold Wilkins (University of Minnesota), Malcom Moos (President, University of Minnesota), Loren Butterfield (Orono), Elsie Weinholzer-McLean (Roseville), Jerry Brown (Hutchinson) and Clarence Engwall (Duluth). The building was officially named Alderman Hall in 1975. (Photo courtesy Department of Horticultural Science archive)
Moos participating. Horticultural symposia were held throughout the week. The main building provided 64,473 square feet of classrooms, seminar rooms, laboratories, research areas, offices and work areas.

In addition to the main building, there was a 50 x 250 foot, one-story headhouse which included a full basement and contained classrooms, laboratories, growth chambers, refrigerated units, photoperiod rooms, work and storage areas, and offices. New facilities also included aluminum research greenhouses glazed with glass, covering 21,600 square feet. Not including the teaching greenhouses, about 25 percent of the total space was allocated to floricultural studies.

Total cost for all the facility improvements was $4.17 million. The University’s vice-president for agricultural programs, William Hueg, Ph.D., facilitated obtaining significant extra funds to assure that the new facilities were completed as planned, and did not suffer cutbacks due to insufficient funding. The University also funded a technician position, assigned to assist Widmer and Wilkins in using the new facilities efficiently and to their full capacity. A second technician position was later added, providing Widmer and Wilkins each with a technician dedicated to his specific program initiatives.

UNIVERSITY’S AGRICULTURAL SERVICE AWARD

Lloyd Bachman was awarded the University of Minnesota’s Institute of Agriculture Service Award at the dedication of the new horticultural facilities. The Award was in appreciation for his aid, dedication and support over many years, to the University and to its Department of Horticultural Science.

Bachman earned the Service Award through 22 years of service on the University’s Agricultural Advisory Council, and five years on the Executive Council. He was a key motivator in United Minnesota Horticulture’s efforts to obtain new facilities for floriculture and horticulture. Bachman’s support of the floricultural program continued for many years thereafter.

PEAK STUDENT ENROLLMENT

Undergraduate horticultural students at the University numbered between 30 and 40 until about 1970. The numbers then began to in-
crease dramatically, reaching a peak of 244 in 1976, with another 67 students majoring in the related Landscape Architecture program. The student population buildup followed the end of the Vietnam conflict and appeared to be closely related to the growing interest of our nation's youth in their environment. Floriculture majors represented about 20 percent of the population of horticulture majors.

The horticultural enrollment peak at the University of Minnesota during this period was paralleled by growing student enrollments in environmentally oriented programs at institutions of higher education across the country. Graduate student numbers also increased, but to a lesser extent because of staff, facility and monetary limitations. Less research money was available later in the decade from government sources, and grants did not keep up with inflation.

Riding this wave of program growth, in September 1971, the University of Minnesota-Waseca horticulture program opened with a major in landscape/nursery. It replaced the School of Agriculture at Waseca, which was closed by 1970. A University of Minnesota-Waseca floriculture/greenhouse major began in 1972 when Phil Allen, who had operated a flower production business in New York state, was hired. Phil was an energetic, capable, well-prepared instructor and the floriculture program thrived. This was a two-year college program offering an Associate Applied Science Degree, and providing appreciable practical experience to supplement the classroom instruction.

Peak registration in Waseca's floriculture/greenhouse program was 1979–1980, with 149 enrolled and more on a waiting list. Phil Allen retired in 1990, two years before the campus itself was closed by the University of Minnesota to accommodate budgetary cutbacks in legislative funding. By that time, a total of 896 student floriculture/greenhouse majors had received degrees from the program, and 206 of those graduates went on to work for higher level degrees. ¹

STAFF CHANGES

L.C. Snyder resigned as department head in 1970 to devote full time to directing the University's Landscape Arboretum, which he had established after much hard work. He had held both positions since 1958. A.A. Duncan succeeded Snyder as department head.
The horticulture faculty continued to expand in 1970. Jane P. McKinnon was hired as Extension Horticulturist in Ornamentals. Her work was primarily focused on amateur gardeners. W.C. Stienstra was hired as an Extension Specialist in Plant Pathology to work with ornamentals including commercial floral crops and turf.

In 1972, the American Society for Horticultural Science annual meeting was held in St. Paul, hosted by the Department of Horticultural Science. Many of the attending floriculturists from other universities toured the new University of Minnesota facilities and some local commercial florist operations.

The University of Minnesota intercollegiate flower judging team coached by Harold Wilkins placed first in the 1973
competition held at North Carolina State University at Raleigh. Team members were Pauline McGinty, Karen Schrupp and Ronald Peterson. Mary Maguire Lerman, who is now Horticulturist for the Minneapolis Park Board, was the team’s alternate.

Frank L. Pfleger, Ph.D., joined the extension staff in 1974 as a specialist in Plant Pathology. His responsibility was split equally between floral and vegetable crops.

Ralph Bachman, Lloyd Bachman and Vincent Bailey were initiated into Pi Alpha Xi in 1975 as honorary members in recognition of their exceptional efforts on behalf of the industry and the Department of Horticultural Science at the University of Minnesota. The initiation ceremony oc-
curred at the organization’s annual meeting, held that year at the University of Missouri in Columbia.

In 1975, the Horticultural Science building which had been dedicated in 1971 was renamed Alderman Hall in honor of the second head of the department. William H. Alderman, then 90 years old, traveled from California to participate in the ceremonies.

R.E. Nylund, Ph.D., of the Department of Horticultural Science served as the department’s acting head for 18 months after A.A. Duncan, Ph.D., moved to Florida. In 1976, Jimmy Ozburn, Ph.D., became the next head of the now named Department of Horticultural Science and Landscape Architecture.

David S. Koranski, Ph.D., became the first full time University of Minnesota Floricultural Extension Specialist in 1978. He also did a limited amount of teaching of undergraduates and promoted the use of plugs in crop production.
CONTRIBUTIONS FROM OTHER DEPARTMENTS

The contributions of extension and research personnel in other departments, especially Plant Pathology, Soil Science and Entomology proved invaluable to the University of Minnesota’s horticultural activities. They assisted in analyzing trouble cases in commercial florist crops, conducted trials and research projects on floral crops and products, regularly contributed articles and research reports to the *Minnesota State Florists’ Bulletin*, and prepared disease and insect control charts and informational bulletins helpful to florists. Collaborators included Ward Stienstra, Don Taylor, Frank Pfleger and David MacDonald (Plant Pathology); John Grava and Robert Munter (Soil Science); and Lawrence Cutkomp and Mark Ascerno (Entomology). The Department’s own horticulturists Widmer and Wilkins interpreted soil and plant tissue analysis results regularly for commercial growers.

In 1975 Harold Wilkins, Frank Pfleger, Ph.D., and Mark Ascerno, Ph.D., initiated the Northern Minnesota Bedding Plant Conferences, staged by extension personnel in various northern Minnesota communities. They were designed to attract the many small operators who could not attend educational meetings in the Twin City area. Attendance was so good that the conferences are still held annually in 1995. Although the number of such small or moonlight operators in Minnesota is unknown, it is believed to be about 200.

Numerous short courses, and conferences for commercial florists were sponsored by University of Minnesota faculty and staff over the years. These included “in-depth conferences” which were one day meetings on single subjects or crops, and “hort industries conferences” and meetings on business and growing techniques.

STAFF TRAVEL OVERSEAS

Dick Widmer participated in a ‘Peat in Horticulture’ symposium in Ireland in 1971. In 1973, he visited Morocco as a consultant to a U.S. Agriculture International Development (USAID) team. In 1977 he served as a consultant to the Central International Agriculture Tropical (CIAT) research station in Cali, Colombia.
Harold Wilkins traveled extensively in the summer months of 1973 through 1979. He attended and participated in scientific conferences and visited commercial, educational and research floricultural institutions around the world. Wilkins also served as consultant to a large California cut-flower and pot plant producer.

**UNIVERSITY OF MINNESOTA RESEARCH**

A multitude of studies were conducted and the results published by the University of Minnesota horticultural faculty in the 1970s. Even a relatively short list of research highlights covers a considerable range, from chrysanthemums to roses, and from nematodes to negative ions.

**ALSTROMERIA**

Removal of 50 percent of the shoots (thin and older ones) by mid-January, and again in September and October, both increased flower numbers and resulted in more uniform flowering. Long days (night interruptions) increased flower stem numbers per plant, lowered flower numbers per stem and accelerated flowering. 'Regina' cultivar plants required vernalization at 40–41 degrees Fahrenheit for more than four weeks at low irradiance levels to flower, and a plant’s flowering continued when the rhizome temperature was 50 degrees or lower. Flowering ceased in 14 weeks at 68 degree and 77 degree rhizome temperatures.

**CHRYSANTHEMUMS**

The latest treatment and Minnesota garden cultivar recommendations for spring flowering potted plants were provided.

Effective radioactive phosphorus treatment methods were determined for application to rooted cuttings of garden chrysanthemums to induce mutations. Flower color changes were the most frequently observed change. Multigenic self-incompatibility in hexaploid chrysanthemums was examined and a rapid method of determining pollen incompatibility was developed.
Eleven garden chrysanthemum cultivars were introduced in the 1970s (see Appendix B). 'Minngopher', a 1977 release, was the first Minnesota Agricultural Experiment Station plant introduction to be patented. The royalty funds received via Pan American Plant Company, and later through Yoder Brothers, helped ensure the continuation of the chrysanthemum program when government support decreased significantly.

CYCLAMEN

Accelerated production of quality plants was a prime objective. Many commercial cultivars and new first generation hybrids were screened for high germination percentage, early flowering and high plant quality. It was determined that after five leaves initiated, the initiation rate accelerated to 1.3 leaves per week until leaf 17, and approximately doubled thereafter. Flower buds initiated in leaf axil six after 10–13 leaves initiated, and plants usually flowered after 35 or more leaves unfolded.

A nutrient enriched moss peat medium with a 5.5–6.0 pH at constant 68 degrees Fahrenheit provided excellent germination. A steady 68 degree temperature at night was also best for growth through the six or seven leaf stage. Then six weeks at 62–64 degree nights usually accelerated flowering by about two weeks. Maximum growth followed at 68 degree nights until 30–35 leaves had unfolded. Then, 60–62 degrees was preferable until flowering.

Plants grew quite well in moss peat media mixes when provided with a steady flow of nutrients. Limiting the nitrogen or potassium supply restricted plant size. Cyclamen were found to require about half the fertilizer quantity required by potted chrysanthemums grown in a moss peat medium. A spray application of 10 parts per million GA_3 (gibberellic acid) to the crown of the plant resulted in earlier, more uniform flowering.

FREESIAS

Seed sown in December and January grew into flowering plants in five months. Spring and summer sown seeds required seven months to flower.
Applying exogenous growth regulators did not substitute for the required 13 weeks of 85 degrees Fahrenheit temperature immediately prior to forcing. A forcing temperature drop to below 59 degrees coincided with floral initiation and corm filling, while temperatures higher than 72 degrees inhibited flowering and corm development. Newly harvested corms stored six weeks at 35 degrees and 55 degrees sprouted from 5–20 days after planting at 70 degrees. Corms stored 13 weeks at 55 degrees pupated and did not sprout, while storing at 85 degrees prevented pupation and allowing corms to sprout on planting. Flower production could be extended by maintaining a 55 degree temperature for eight of every 24 hours.

ABA (abscisic acid) and IAA (3 indoleacetic acid) natural plant hormone concentration increased during active corm growth and decreased as the plants dried down. ABA and IAA levels appeared to be associated with corm development during pupation and with corm formation of plants grown from seed.

LILIES

Lily research involved primarily ‘Ace’ and ‘Nellie White’ cultivars. Precooling at 40 degrees Fahrenheit was satisfactory for both cultivars, but temperatures between freezing and 40 degrees Fahrenheit were less desirable for ‘Nellie White’ and least destructive for lowering flower bud counts of ‘Ace’ bulbs.

Plants grown in an excessively alkaline soil (‘Ace’ especially) were shorter and narrower, with slightly lower flower count. Moderate soil phosphorus levels could encourage leaf scorch, but some phosphorus was essential early in the forcing period to maintain flower count. Leaf tip burn was evident with higher rates of added limestone, because boron level in limestone from one source was above average.

Fluorine in the water supply was not a primary cause of undesirable plant symptoms when plants were grown as normally recommended. Long photoperiod (night interruption most effective) at temperatures below 70 degrees Fahrenheit after shoot emergence was a satisfactory replacement for precooling the bulbs. Bulbs never exposed to temperatures below 70 degrees after harvest never flowered in two years in the greenhouse.
Supplementing the carbon dioxide level in the greenhouse environment increased lily plant height without changing the flowering date. Plants with white puffy buds may be stored for 20 days in the dark at 36–43 degrees Fahrenheit if the soil is moist.

Updated forcing techniques and recommendations were published annually. Other studies investigated the effects of gibberellic acid, ABA and the growth regulator A-Rest (ancymidol) on lily growth and development, the physiology of dormancy and maturity of lily bulbs, plus forcing of colored lily cultivars and root rot control.

NEGATIVE AIR IONS
Greater plant fresh weight, and similar or lower plant dry weight resulted from exposure of plants to negative air ions. Unfortunately, it was also noted that use of negative ion treatment of greenhouse grown plants was not likely to be practical on a wide scale basis.

NEMATODES
Plant parasitic nematodes were found on the roots of roses in most greenhouses sampled in the Midwest. They were not necessarily the type that distorted roots, but they did lower plant vigor and yield.

POINSETTIAS
Molybdenum toxicity symptoms were chlorosis between the leaf veins and abscission of leaves from the base up. No symptoms were evident on vegetative plants supplied with 16 times the recommended rate of 0.2 parts per million molybdenum with every watering for two months. Symptoms developed on reproductive plants supplied with 12 times the recommended rate of molybdenum with every watering for three weeks.

ROSES
Two hybrid tea (‘Forever Yours’ and ‘Briarcliff Supreme’) and two floribunda (‘Rose Elf’ and ‘Red Garnett’) rose cultivars were grown at three atmospheric levels of carbon dioxide: 100–500 (normal),
700–1,300 and 1,500–2,500 parts per million. Supplementary carbon dioxide levels resulted in more flowering stems, more lateral buds, greater fresh weight and stem length. At the highest carbon dioxide level, there was also greater leaf abscission and less root development.

'Red Garnett' cultivar roses were found to have a significantly longer vase life (12 hours) when grown in a carbon dioxide enriched environment.

Flower yield of plants fertilized with a 20-20-20 formula in solution was usually greater, sometimes equal, and never lower than yields of plants receiving a 10-10-10 formula ratio in dry form.

Solar radiation was the primary factor influencing rose flower production. Atmospheric carbon dioxide, air temperature and soil nutrient levels were all found to be of lesser importance.

**SPHAGNUM MOSS PEAT MEDIUM**

Nutrient enriched moss peat media, with several formulas of nutrients incorporated, provided for good seed germination, rooting of cuttings in pots or plugs under intermittent mist and crop growth for a wide range of commercial florist plants.

**COMO CONSERVATORY RESTORATION**

Deterioration of the Como Park Conservatory in St. Paul triggered the formation of the Como Conservatory Restoration Society in 1971. The Conservatory was placed on the national Register of Historic Places in 1974. In 1980, the Como Conservatory Planning Advisory Committee, a citizens group, was created to develop a master plan for renovating and rehabilitating the structure, and to accommodate current and future needs which were to include educational and recreational opportunities.
The Challenging Eighties
1980-1989

Development of new and improved floricultural cultivars continued. F-1 hybrids were grown in greater numbers each year. New cultivars of geraniums, cyclamen, impatiens, geraniums, roses and many other plants were developed and released by public and commercial plant breeders. There was a constant effort to uncover new and novel cut flower and pot plant species. Greater use of plant tissue cultures for plant propagation and for inducing potentially desirable mutations was anticipated.

Insect and disease control remained a constant challenge. Even as efforts to develop resistant cultivars and learn more about the use and effectiveness of natural predators were expanding, government approval of new pest control products was becoming more costly and difficult to obtain. Research findings with floricultural crops emphasized the desirability of more efficient, precise environmental crop production control. Computerized control improvements were coming into use, and further refinements were anticipated.

Increasing imports of cut flowers from low-wage nations, stricter government regulations on domestic producers, including more required documentation and paper work relating to chemical use and disposal, etc., all put additional pressure on domestic producers. Com-
Computers facilitated better monitoring of business and production records, and many Minnesota commercial flower growers adjusted their operations to overcome the challenges. Mechanization and automation were important tools used to facilitate their efforts.

Federal and state funding of university research, agricultural extension and teaching were failing to keep pace with inflation. Floricultural research was often defined as having lower priorities for funds, and many horticultural research and development budgets were cut in the 1980s. Researchers were forced to spend significant portions of their time seeking grant money from non-government sources to supplement their depleted budgets.

The potential sources of private funding for horticultural research stretched across the floral industry. They included state florists groups, industry organizations such as the American Florists Endowment, the Bedding Plants Foundation, the Fred C. Gloeckner Foundation, Paul Ecke Poinsettias, Roses, Inc., and the Ohio Floriculture Foundation. Support was also solicited from and provided by some of the larger greenhouse supply and chemical companies. The University of Minnesota floriculture staff was fortunate to be able to obtain a progressively increasing number of grants to partially offset the leaner budget allocations from the University.

Many American university floricultural faculty members were of the G.I. Bill funded generation of college students. They earned their graduate degrees in the decade following World War II. Many of them were, therefore, reaching retirement in the 1980s, and because of the University’s financial woes, some of the vacated positions were eliminated or reclassified from floriculture to other interests. Minnesota lost the horticultural extension specialist position that had been held by Dave Koranski, but was fortunate to be able to partly replace it with a technical assistant position in extension horticulture.

Extension budgets, including travel funds, were lowered significantly. The result was that greenhouse visits and one-on-one contacts on greenhouse sites were significantly curtailed. Mark Ascerno of Entomology and Frank Pfleger of Plant Pathology continued to be productive colleagues, and continued their frequent contributions to the Minnesota State Florists’ Bulletin.
INDUSTRY DEVELOPMENTS

Mark Swart, who started Valley Floral nursery in Winona in 1977, constructed a 35,000 square foot greenhouse range in 1980. Next, he purchased the West End Greenhouse firm, closed the greenhouses and maintained the retail business.

The original Lyndale Fruit and Vegetable Market burned to the ground in December 1980. A large replacement opened for business in April 1981. Palmer Siegel died in 1985, and Tim Duoos bought the firm in 1986, renaming it Lyndale Garden Center. Duoos and company president Dick Dwyer initiated ambitious retail expansion, opening a second garden center with greenhouses in Burnsville in 1989. This was followed by centers in Fridley (1992) and New Hope (1993). Their Gardener's Paradise center opened in the Mall of America in 1994 with an indoor greenhouse. It was the largest locally owned store in that Bloomington ‘megamall.’

John Dramm, of Chicago area flower wholesaler Koehler and Dramm, bought the Minneapolis branch of Amlings in 1976. His son Rich, who managed the branch, purchased the business in 1981. He built the business into a large operation and added prepared mixed bouquets for wholesaling, an Institute of Floristry (1988) and other innovative features. The business occupied two acres of indoor floor space.

Tom Heiserer, the son of Lakeland Florist Supply, Inc., owner Bill Heiserer, became the owner in 1982. He moved the firm to Edina in 1983 and has continued to operate the business up to the present.

The largest nursery in the upper midwest, J.V. Bailey Nursery of Newport, started building greenhouses in 1982. The business had started as a fruit and vegetable production establishment in 1907, expanding into the nursery field soon thereafter. Since 1957, the business has been wholesale only. By 1995 there were 11.5 acres of plastic film covered greenhouses. More than eight acres were devoted to bedding plants, with the rest used for perennial plant production, plus propagation of deciduous and evergreen cuttings in the fall, and evergreen cuttings in the winter. Third generation Rod and Gor-
don Bailey Jr. operate the business, with eight fourth-generation family members employed in the nursery. Don Sellinger, not a family member, heads the firm's floricultural division. Annual production includes 150,000 flats of bedding plants, 30,000 flats of perennials and 18,000 hanging baskets.

Bailey Nursery invested heavily in mechanical aids and greenhouse automation. Its equipment includes roll-out benches, retractable heat and shade curtains, mechanical seeders, computer controlled traveling boom irrigation systems and seed germination chambers. Bailey invested $100,000 in a bedding plant transplanter and attachments for the 1995 season.

**STUDENTS ERECT GREENHOUSE**

Hermes Floral gave the University of Minnesota a standing 30 x 130 foot steel frame aluminum greenhouse in 1979. It was dis-

![Students gained practical greenhouse construction experience in 1979-80, erecting a donated greenhouse they dismantled and moved from an off-campus location. The unit's availability enabled students to gain additional experience in growing floral crops. (Photo by author)](image)
assembled, moved to the St. Paul Campus and erected by student volunteers and students in class laboratory sections. Greenhouse builder Albert J. Lauer contributed technical assistance. Norm Polzin, research plot coordinator, and Dick Widmer supervised the students reconstruction work. Commercial flower growers and suppliers provided funds and supplies needed for the project's completion. The University provided the utility connections. The facility was dedicated in 1982 and has been providing students with practical experience in growing floricultural crops.

In 1980-1981, Hermes erected more greenhouses at Becker. By 1983, the firm had also finished combining all of the Becker greenhouses heated with warm water, including those built by other firms and the experimental unit, into one complex. Visitors from around the nation, and from countries as far away as New Zealand, came to examine and inspect the facility. The primary crop at Becker was roses, along with some less common flowers.

Hermes' wholesale cut-flower unit in Falcon Heights was expanded in 1985. In 1988, the supply department was enlarged. Crops at the Larpenteur Avenue site were primarily potted plants for the retail business, with some sold wholesale. The Roseville Greenhouses were sold for land development in 1989. New greenhouses were erected in Hudson, Wisconsin, in the same year.

**FARMERS' MARKETS THRIVE**

A new St. Paul Farmers' Market opened at 5th and Broadway on May 1, 1982. It has thrived with a varied selection of vendors offering floricultural crops, in addition to the usual farmers' market array of fruits and vegetables.

In both the Minneapolis and St. Paul markets, the sale of greenhouse grown plants occurred primarily in the spring before outdoor crops were available. Summer and fall sales of floricultural crops were primarily potted plants and cut flowers, both indoor and outdoor grown. Some vendors also resold items produced outside of Minnesota. Crafts produced by Asian immigrants of several nationalities have also been offered for sale there.
MORE INDUSTRY DEVELOPMENTS

Richard Wagner, the third generation of his family to operate their business, and his sons Ronald, a University of Minnesota floriculture graduate, and Scott added new greenhouses to their Minneapolis range and became geranium specialists in the 1970s and 1980s. They also expanded their facilities by purchasing the adjacent Cornelius greenhouse range in 1982, which they subsequently connected to the existing Wagner range to enable them to be operated as a single unit. They started germinating seeds and growing seedlings in plugs in 1980, and also added poinsettias to their product line. The whole range was gradually rebuilt in accordance with a long-range modernization plan developed by the company. Ronald’s cousin, Russ Wright, joined the Wagner firm to direct the firm’s computer controls and programming.

A group of 13 Minnesota growers toured Denmark in the summer of 1983 to visit some of the outstanding floricultural enterprises. Harold Wilkins planned the trip, and Dick Widmer accompanied the group. Enterprising growers, supply firm and sales representatives also visited Europe individually to examine new ideas and growing methods being pioneered there.

Terry Crombie established Poly Tex, Inc., in Castle Rock in 1983 to develop and sell new and helpful products and structures for the greenhouse industry. A major item brought to market in 1986 was the portable, plastic film covered ‘garden mart’ greenhouse designed for spring retail sales use. Other products include plastic heat blankets, collapsible plastic tube greenhouse vents, and greenhouses designed for maximum natural ventilation. Sons Brian and Michael also work for the firm.

In 1984, Brian Anderson started operating the old New Ulm Greenhouses under the name New Ulm Growers 99 years after the firm was founded. Brian now owns the whole unit and specializes in plants for his retail store.

A tornado which touched down in St. Anthony Village in April 1984 destroyed the home base greenhouse range of John R. Johnson. It also decimated the greenhouse facilities of the adjacent
Hertog Floral Inc. The Johnson facility had been expanded over many years. Instead of rebuilding, both firms sold their land for redevelopment. In 1987, a new range called Everton Growers was started in Hugo by the John R. Johnson firm. Hertog Floral Inc., ceased doing business.

Ambergate Gardens was opened in Waconia in 1985 by Mike Haeger. He had been a landscape gardener at the University of Minnesota Landscape Arboretum, and was a University graduate with a major in foreign languages. His perennial business has grown significantly with the increased popularity of perennials in recent years. Haeger is active in the Perennial Plant Association.

In 1986, the Minnesota Commercial Flower Growers and the J.R. Johnson Research Fund arranged for the preparation of a packet of video tapes, an employee training manual, booklets and forms to legally inform and protect owners and employees working with and around pesticides. This was done to help owners and employees conform with Minnesota’s ‘Right to Know’ law. The Safe Handling of Pesticides packet was sold nationwide, with profits going to the J.R. Johnson Research Fund.

Roses Inc. held a ‘Growers School’ in Bloomington in October 1986.

**BACHMAN’S TURNS 100 YEARS OLD**

The Bachman firm celebrated its 100th birthday in 1985. At that time, the Society of American Florists coordinated the Christmas floral decoration of the White House in Washington, D.C. As part of the commemoration of its centennial year, the firm contributed a custom-made metal stand that held 160 poinsettia plants, stood 12 feet high and was shaped like a Christmas tree. Alan Bachman himself set up the poinsettia ‘tree’ in Washington. The White House was so pleased that they ordered a second tree complete with plants a few days later.
The White House tradition continued with Bachman's poinsettias through the Reagan administration. The poinsettia 'tree' stands were not used after Reagan left office, but the poinsettia plants used for decorating public areas of the White House continue to be Minnesota-grown and purchased from Bachman's.

By 1985, Bachman's was operating 15 retail stores in the Twin Cities metropolitan area, and one more in Rochester. There were also 48 European Flower Market shops in Minnesota, 12 acres of greenhouses, a 438-acre nursery, a garden and landscaping division, a commercial interior landscaping division, a wholesale nursery center, a commercial floral sales unit and Department 56, the wholesale gift subsidiary.

With 1,200 employees, Bachman's had grown to be one of the world's largest florist and nursery operations. Sales were in excess of $50 million annually. During the winter holidays, Bachman's made up to 14,000 floral deliveries per week, with a fleet of 23 floral delivery trucks owned by the firm, and numerous others leased for the busy holiday season. When Stanley retired as president in 1987, Lloyd's son Todd, a floriculture graduate of the University of Minnesota, became president of the company.

OTHER CENTENNIALS

Professor William H. Alderman, living in California, reached 100 years of age in 1985. The University's Department of Horticultural Science and Landscape Architecture sent their former chief an arrangement of 100 red sweetheart roses to celebrate his centennial birthday. He died a few days later.

One hundred years after 'Fred' Busch started building greenhouses in 1885, in what is now south Minneapolis, third generation Frederick and his sons Carl and Fred built modern greenhouses in Rogers. They had worked at the Busch Brothers range in Golden Valley until it was sold for land development in 1984. Their primary crops in the new range were seasonal pot plants. They also grew and purchased some cut flowers for wholesaling.
Table 1. Average wholesale prices of cut flowers, bedding and potted flowering plants in the Twin City area increased significantly from 1979 to 1986.

<table>
<thead>
<tr>
<th>Crop</th>
<th>1979</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-inch potted chrysanthemums</td>
<td>$1.25</td>
<td>$2.25</td>
</tr>
<tr>
<td>6-inch potted chrysanthemums</td>
<td>3.25</td>
<td>4.75</td>
</tr>
<tr>
<td>4-inch potted cyclamen</td>
<td>1.80</td>
<td>2.25</td>
</tr>
<tr>
<td>6-inch potted cyclamen</td>
<td>3.50</td>
<td>4.75</td>
</tr>
<tr>
<td>6-inch potted Easter lily (5-8 flower buds)</td>
<td>2.75</td>
<td>5.00</td>
</tr>
<tr>
<td>4⅓-inch geranium</td>
<td>0.75</td>
<td>1.30</td>
</tr>
<tr>
<td>6-inch pinched poinsettia</td>
<td>3.25</td>
<td>4.95</td>
</tr>
<tr>
<td>bedding plant flats (11 x 22 inches)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>begonias, seed geraniums, impatiens</td>
<td>7.00</td>
<td>8.75</td>
</tr>
<tr>
<td>other species</td>
<td>5.25</td>
<td>6.75</td>
</tr>
<tr>
<td>standard chrysanthemums, stem</td>
<td>0.50</td>
<td>1.04</td>
</tr>
<tr>
<td>pompon chrysanthemums, bunch</td>
<td>2.00</td>
<td>3.20</td>
</tr>
</tbody>
</table>

**FLORIST PRODUCTS AND WHOLESALE PRICES**

Floricultural product prices continued to increase along with those of most other products. This wholesale price trend was confirmed in surveys conducted by the University of Minnesota for the years 1979 and 1986. (Table 1)

Minnesota Distributing and Manufacturing, Inc., was started in Minneapolis in 1987 by Steve Grabski and Dave Rogowski, former employees of J.R. Johnson Supply. Their product line offered greenhouses, growing benches and growers supplies.

The Landscape Alternatives company was founded in 1987 by Karl Ruser and Ray Robison. Ruser earned a master of science degree and worked as an assistant scientist in horticulture at the University of Minnesota before starting the firm. Robison received his undergraduate degree from the Department of Horticultural Science. Landscape Alternatives has been a wholesale and retail seller of na-
tive prairie wildflower plants and grasses. Their business, which utilizes greenhouses, has been increasing.

**INDUSTRY DEVELOPMENT IN THE DECADE**

The leadership of Bedding Plants, Inc., recognized the need for a national organization to represent all growers of floral products. In 1988, the organization enlarged its objectives and became the Professional Plant Growers Association. The research funding unit remained the Bedding Plants Foundation, Inc.

*Stanley Bachman was inducted into the SAF Hall of Fame in 1989 for outstanding contributions to floriculture. Clare DaRe also replaced Jim and Gen McCarthy as executive director of the North Central Florists’ Association that year.*

Across the nation, in the 28 states where floricultural production was considered to be a major industry, both the numbers of different floricultural crops and the total volume of sales of those crops continued to increase annually through the 1980s. The USDA tracking of the floriculture industry showed the number of crops increasing from 17 to 28 across the decade, and the total value of those crops growing from $921 million to nearly $2.77 billion by 1990, an increase of about 300 percent. Minnesota production increases nearly kept pace, growing from $15.8 million in 1980 to almost $42 million by 1990, an increase of 265 percent. (Table 2)

Although total cut-flower production sales value significantly increased both nationally and in Minnesota from 1980 to 1990, their percent of market share held by cut flowers decreased appreciably. The possible causes were many, including significant increases of cut-flower imports from South America, and greater increases in domestic production of potted and bedding plants. Dollar volume of potted plant and bedding plant sales increased at least 400 percent in the 28 states and about 300 percent in Minnesota.

Pot plant production sales in 1990 exceeded domestically grown cut-flower sales in all 28 floricultural production states, not just in
Table 2. Growth in wholesale value of floricultural production for firms with sales in excess of $10,000 per year, according to USDA Floriculture Crops Surveys for 1980 and 1990. The first section compares U.S. totals for those years. The second section compares Minnesota industry growth. Bedding plant totals include flatted and potted flowering (including geraniums and garden chrysanthemums), vegetable and foliar plants plus hanging baskets.

<table>
<thead>
<tr>
<th>U.S.—28 states</th>
<th>1980 (17 crops)</th>
<th>1990 (28 crops)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Grouping</td>
<td>Total (in $1,000)</td>
<td>Percent of Volume</td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>245,000</td>
<td>26.6</td>
</tr>
<tr>
<td>Potted Plants</td>
<td>160,411</td>
<td>17.4</td>
</tr>
<tr>
<td>Bedding Plants</td>
<td>214,044</td>
<td>23.3</td>
</tr>
<tr>
<td>Foliage Plants</td>
<td>295,943</td>
<td>32.1</td>
</tr>
<tr>
<td>Other</td>
<td>5,602</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>921,000</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minnesota</th>
<th>1980 (17 crops)</th>
<th>1990 (28 crops)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Grouping</td>
<td>Total (in $1,000)</td>
<td>Percent of Volume</td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>3,115</td>
<td>19.7</td>
</tr>
<tr>
<td>Potted Plants</td>
<td>3,558</td>
<td>22.5</td>
</tr>
<tr>
<td>Bedding Plants</td>
<td>7,090</td>
<td>44.7</td>
</tr>
<tr>
<td>Foliage Plants</td>
<td>2,080</td>
<td>13.1</td>
</tr>
<tr>
<td>Other</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>15,843</td>
<td>—</td>
</tr>
</tbody>
</table>

northern states such as Minnesota. Bedding plants sales represented 55.8 percent of total wholesale floriculture production sales for Minnesota, compared to 35 percent for the 28 state totals. Even in 1980, Minnesota and other northern states signaled their regional bedding
plant surge with 44.7 percent of their wholesale floricultural production in bedding plant sales, versus 23.3 percent for the 28 states combined. Minnesota-grown foliage plant production sales were fairly stable, showing a return to average conditions following the unusually high demand for this crop in the 1970s.

**USE OF HIGH INTENSITY LIGHTING**

Use of supplemental lighting, especially high-pressure sodium lamps, to improve and accelerate plant growth primarily in the short-
day season became relatively widespread in the north in the 1980s. Crops that benefitted from this treatment included chrysanthemum stock and potted plants, plugs of many species, gerbera, gloxinias and rose cut flowers.

Energy prices moderated from their peaks in the previous decade. Probably of equal importance was that many greenhouses were now better maintained and more efficiently operated to limit heat loss.

PLASTIC GREENHOUSES

The 1990 USDA Floricultural Crops Summary disclosed that Minnesota had 244 floricultural production establishments with $10,000 or more in gross sales, and that there were almost 7.2 million square feet of greenhouses in the state. They were glazed with a variety of materials: glass, 1.07 million square feet (15 percent); rig-
id plastics, 1.59 million square feet (22 percent); and film plastics, 4.54 million square feet (63 percent).

The rigid plastics included the now less popular fiberglass reinforced plastics as well as the newer box-ribbed, double layer plastics which are long lasting, heat conserving, break resistant and higher priced than glass. Minnesota appeared to be ahead of the national trend to plastic film covering, in terms of the percentage of greenhouse area under that material.

The lower priced plastic film structures which are widely used for, but not limited to, bedding plant production fueled a healthy increase across the industry in greenhouse area. Nationally, in 1990 there were 404 million square feet of covered greenhouses, plus 313 million square feet of shade and temporary cover growing area. There were also another 26,188 acres of open ground production area devoted to floriculture. Types of glazing materials used by the 9,185 nationally surveyed growers were glass (20 percent), rigid plastic (24 percent) and plastic films (56 percent).

SAFETY STANDARDS

Government agencies established strict standards prior to 1980 for the safety of greenhouse workers and others who might be in the vicinity, as well as for protection of the environment. Development of the standards continued, but enforcement was softened during the terms of presidents Reagan and Bush (1980 to 1992). In the 1990s, tests of soil beneath greenhouses for toxic substances were frequently required, along with the removal of undesirable residues, before bankers would provide financing for the purchase of greenhouses.

INDUSTRY ASSOCIATED ACTIVITY

The Minnesota Commercial Flower Growers continued to hold monthly information meetings. Its functions included serving as the growers’ contact and support group when dealing with the Universi-
ty of Minnesota, government agencies, and other groups and organizations that might effect its members. It also organized educational tours to growers, conservatories, experiment stations, and similar facilities in other states and nations. From its inception in 1953, this relationship between the University and the state's growers remained beneficial to both parties.

An outdoor garden center in late summer featuring potted garden chrysanthemums in bud and in bloom, ornamental kale, blooming garden lilies and more. (Photo courtesy Bachman's)

The North Central Florists' Association continued to stage attractive displays at the Minnesota State Fair, as it has through the century. Amateur designers and flower growers have sought awards there annually in a wide array of staged categories.

Minnesota has been fortunate in that sales representatives of local and out-of-state florist and greenhouse supply firms, who called on Minnesota growers one or more times annually, were usually high caliber, well-informed individuals. They have frequently served as trouble shooters, and offered the latest information on their products in addition to soliciting orders.
Additional advice and assistance to the industry's practitioners has come from a number of local supply firms and specialty growers, and from a few large out-of-town firms regularly sponsoring trade fairs, exhibits, short courses, etc., for growers and retail florists. This private industry assistance has supplemented, but not replaced, the needed, timely assistance received from regular Minnesota Agricultural Experiment Station and Minnesota Extension Service specialists.

**UNIVERSITY FACULTY ACTIVITY**

Jimmy Ozburn, Ph.D., left the University of Minnesota to accept an administrative position at Kansas State University in 1981. Jane McKinnon served as the Department's interim head until James Bartz, Ph.D., became the sixth head of the unit in 1982. Ozburn later became president of North Dakota State University, Fargo.

Dick Widmer was awarded the SAF Alex Laurie Award for Research and Education, and became a Fellow of the American Society for Horticultural Science in 1981. He also served as a Senior Research Fellow at the Levin Horticultural Research Center in New Zealand for 10 months in 1980-1981. His sabbatic leave objectives were to evaluate various growth media nutrient analysis methods, study interpretation of analysis results and determine preferable media nutrition levels for specific crops. Thereafter, he visited various research establishments and commercial flower growers in Australia and Europe before returning to Minnesota.

David Koranski left the Department for a position at Iowa State University in 1982. Graduate student Nancy Olson was hired as a part-time liaison between commercial growers and extension specialists on the St. Paul Campus.

Harold Wilkins was elected a Fellow of the American Society for Horticultural Science in 1984. He spent a six-month leave at the Royal Agricultural University of Norway in 1987, investigating the effects of twilight and of red, far-red and blue light on plant growth.

In 1985, the University of Minnesota hosted the Intercollegiate Flower Judging Contest for the second time on the St. Paul Campus.
Local growers and wholesalers were fully cooperative in donating plant materials and participating in educational sessions. Pi Alpha Xi initiated Stanley F. Bachman and John R. Johnson as national honorary members during their meeting. Both men had long, innovative, productive careers in the floriculture industry, and were highly worthy of the honor. T. Ferris, Ph.D., of the University of Wisconsin at River Falls co-hosted the contest. Dick Widmer chaired the local committee and Harold Wilkins assisted. The American Florists Endowment, Paul Ecke Poinsettias and the national Pi Alpha Xi fraternity contributed the awards for student and team winners. Seventeen colleges entered teams in the contest. The Ohio State University team won first place followed by Cal Poly State University and New Mexico State University in that order.

Dorothy Johnson became Executive Director of the Minnesota State Horticultural Society in 1987.

WIDMER AND WILKINS LEAVE THE UNIVERSITY

Dick Widmer retired from the University on July 31, 1988, after 39 years of service.

Harold Wilkins was inducted into the SAF Hall of Fame in 1988 for outstanding service to floriculture. He resigned from his professorship at the University on December 31, 1988, after 22½ years of service, and became the Technical Director of a large California flower and plant production company. Harold received numerous additional awards, including being named a Pi Alpha Xi Fellow in 1993.

NEW UNIVERSITY FLORICULTURE FACULTY

New faculty members, John Erwin and Mark Strefeler, were hired in the second half of 1989 to fill the University vacancies created by Dick Widmer’s retirement and Harold Wilkins’ resignation. Erwin was hired to conduct research in floricultural physiology and to
head the floricultural extension program. He earned his Ph.D. studying under Royal Heins at Michigan State University. Heins, in turn, had earned his doctorate as a graduate student under Wilkins at the University of Minnesota.

Strefeler, a plant breeder and geneticist, earned his Ph.D. at Cornell University. He was hired to work on cultivar improvement and genetics of varied floral crops, and to teach floricultural courses, which had been reduced in number because of the Widmer and Wilkins vacancies.

The University instituted charges for some laboratory analytical services, including plant tissue (foliar) analysis in the late 1980s. The charge for soil analysis was also increased. John Erwin increased the size of the Minnesota State Florists' Bulletin. Dues of the Minnesota Commercial Flower Growers, which in part paid for bulletin printing and mailing, were increased. In recent years, the bulletin has been distributed to member florists only.
UNIVERSITY FLORICULTURAL RESEARCH FINDINGS

Results of research by faculty and staff of the University of Minnesota continued apace through the 1980s. Even a brief compilation is of substantial length.

ALSTROMERIA

Alstromeria will bloom after treatment at 40 degrees Fahrenheit for two to six weeks, continuing to bloom until soil warms above 60 degrees. Vernalization of the cultivar 'Regina' was provided by six to eight weeks at 40 degrees or 16 weeks at 55 degrees. After four to six weeks at 40 degrees, plants flowered sooner at a forcing temperature of 65 degrees versus 55 degrees. A 13-hour photoperiod provided by day extension or night interruption hastened flowering.

Total shoot production during the flowering span was inversely related to duration up to eight weeks of treatment at 40 degrees. Total shoot and flower shoot production were not influenced by the number of weeks at 40 degrees when grown at 70 degrees if clumps were divided prior to treatment.

Alstromeria require frequent fertilization for best growth and they prefer nitrate-nitrogen with a one-to-one ratio of nitrogen to potassium.

AZALEAS

Greenhouse azaleas were studied to find ways to replace the expensive low temperature requirement, shorten production time and facilitate earlier forcing into bloom. Substituting GA₃ (gibberellic acid) spray for low temperature was promising, but variable. A combination of GA₃ and a shortened low temperature treatment was effective. A night interruption, long day photoperiod should follow low temperature or GA₃ treatment until flowering. High light intensity increased GA₃ treatment effectiveness.

CALLA LILIES

Yellow, Zantedeschia elliottiana, and pink, Z. rehmannii, calla lilies held at 50 degrees Fahrenheit until planted and grown as pot-
ted plants flowered in 62 and 52 days, respectively, when forced at a constant 68 degrees. They required up to 110 days when forced at lower temperatures. Rhizomes replanted immediately after mechanical leaf removal with no storage period did not grow. Rhizomes replanted after leaf senescence induced by withholding water sprouted without storage, but height, leaf number and shoots per rhizome were greater from rhizomes that were stored three weeks at 50 degrees. Height and number of leaves and shoots were greater after storage at 48 degrees than at 39 degrees or 72 degrees. *Z. rehmannii* growth with a medium temperature of 68 degrees or 72 degrees and air temperature of 59 degrees or 68 degrees accelerated flowering compared to a 59 degree air and ambient medium temperature. Flower numbers at all temperatures were the same over a 120-day cycle.

Plants grown with a night interruption in the first cycle, and then replanted and grown for a second cycle, were taller than plants grown from short day first-cycle plants. Flowering was not altered. Lowering natural irradiance up to 85 percent did not alter flowering time or number. A preplanting rhizome soak in GA₃ provided earlier flower bud initiation, and increased numbers of flowering shoots and flowers per shoot.

**CARNATIONS**

A sequence of 30 natural days, 75 short days and 30 natural days until flower harvest increased production 75 percent over the natural day controls when cuttings were planted in June and discarded in March.

**CHRYSANTHEMUMS**

Ten new garden chrysanthemum cultivars were introduced in the 1980s (Appendix B). Significant progress was made in developing seed propagated lines, though none were as yet ready for release. A day-neutral cultivar was developed that bloomed on attractive plants when grown in continuous light at a constant 83 degrees Fahrenheit.

Inheritance of flower color and analysis of flower color phenotypes with thin-layer chromatography were researched. Flower color inheritance was studied using clonal testers. Cultural requirements and
schedules for pot plant production of new and appropriate University of Minnesota cultivars in 3-inch to 8-inch pots were updated.

**CYCLAMEN**

Cyclamen seed germination in a sphagnum moss peat medium occurred at a pH as low as 4.5, but a pH of 5.0 to 6.8 was preferable. A calcium level of 20-25 parts per million, when combined with other nutrients was especially beneficial in early growth. Plant growth in a 50 degree or 60 degree Fahrenheit air temperature with a 66 to 70 degree root temperature for 60 days, starting 90 days after the seed was sown, was equivalent to that of plants grown at a constant 66 degree to 70 degree air temperature and resulted in energy savings.

Capillary mat watering of cyclamen was successful. Vegetative characteristics were significantly affected by rate of application and balance of nitrogen and potassium. Chloride and sulfate sources of potassium were equally effective. Flowering was delayed by inadequate, excessive or unbalanced fertilization.

Leaf blades of the first 17 leaves grew at about the same rate, except for leaves 6 and 7, which grew significantly faster. Growth rate of successive leaf blades after leaf 17 almost tripled. Although the first flower buds initiated in the axils of the sixth and successive leaves, flowering usually did not occur until plants unfolded 35 or more leaves. A spray application of 10 parts per million GA₃ to the crown of plants with 10-20 unfolded leaves accelerated flowering by two to five weeks and provided more uniform flowering. Applying GA₃ also accelerated leaf unfolding. Revised schedules were developed for producing flowering 4-inch to 6-inch pot plant specimens in seven to nine months.

**LILIES**

‘Nellie White’ Easter lily leaf unfolding before visible flower buds ranged from 0.7 per day at a constant 40 degrees Fahrenheit, to a maximum of 2.5 per day at 80 degrees. Maximum flower bud development rate once flower buds were visible was at a constant or a 24-hour average 70 degrees. Higher temperatures did not accelerate flower bud development, but resulted in taller plants. Peak flower
count developed at 55 degrees. ‘Nellie White’ plants with white puffy buds were stored up to 26 days with no loss in plant quality. They were held at 35 degrees with 10-footcandles of light and moist soil.

The annually revised guidelines for handling and producing quality potted Easter lilies were published on a national basis. Evaluations of hybrid colored lilies and cultural requirements for Minnesota pot plant production were also prepared, based on greenhouse studies.

MOSS PEAT MEDIA

Appropriate nutrient formulas were developed for addition to sphagnum moss peat media used for propagation and production of varied florist crops.

PICLORAM (TORDON)

Red and Blue ‘Flash’ cultivar petunias showed flower distortion from as little as four to six irrigations of water containing 0.45 to 3.6 parts per billion of the herbicide picloram within 18 days of the first application. Tomato cultivar ‘Sunny’ exhibited symptoms after 21 days. ‘Novette Pink’ impatiens were more resistant. Reaction to such a low concentration has been considered very unusual.

PLUGS

Guidelines were developed for plug culture.

POINSETTIA

Best response to first pinches of young poinsettia stock plants potted March 15, April 15 and May 15 resulted when leaving seven, nine and eleven nodes respectively. Thereafter, best plant response followed leaving 2 to 4 nodes when pinching or taking cuttings. A constant 70 degrees Fahrenheit resulted in the quickest production of high quality cuttings of ‘Annette Hegg Brilliant Diamond’, ‘Annette Hegg Lady’ and ‘Glory’ (‘Gutbier V-14’) selections. Optimum temperature range for flower bud initiation was between 65 degrees and 70 degrees, with a constant 65 degrees preferable. A short photoperiod hastened bract development between 60 degrees and 75 degrees.
Foliar applications of calcium lessened leaf-edge burn, but soil applications of calcium were ineffective. Attempts were made to determine if a 'free branching' agent was present in poinsettias. New cultivar trials were conducted.

ROSES

Stem length of 'Forever Yours' hybrid tea roses decreased as the level of potassium fertilization increased. Foliar calcium levels were positively correlated to flower bud weight. Flower buds on plants top-dressed with gypsum were longer at all stages, than buds on plants that were not top-dressed.

UNIVERSITY DEVELOPMENTS

The student population pursuing graduate degrees in the Department of Horticultural Science and Landscape Architecture peaked...

Unveiling of the plaque at the student restructured teaching greenhouse dedication ceremony in 1982. Pictured are Paul Olson of Minneapolis Floral (left) and John Hertog of Hertog Floral (right). (Photo by author)
at about 100 in the 1980s. Graduate student numbers in the floriculture program peaked at about 11 at any given time. Not all of these students received grants or assistantships.

The Care of House Plants, Minnesota Agricultural Extension Service Bulletin 274 written by Dick Widmer in 1953, proved to be one of the most popular extension bulletins ever in Minnesota. It was revised in 1961, 1970 and 1982, increasing in size from 32 to 64 pages over those revisions. The bulletin was distributed as a North Central Region Extension Bulletin. An estimated 350,000 copies have been distributed.

GREENHOUSE ADVANCEMENT, MECHANIZATION AND AUTOMATION

New systems, products and methods have been developed and applied across the industry, primarily within the last 30 years and especially in Europe and America (see summary list below). These advances, ranging from improved greenhouse construction to new plant growing techniques, clearly demonstrate that the floral industry has awakened from the relative slump in recent decades that generally paralleled the nation’s economic woes.

GROWING STRUCTURES

• Metal framework for all styles
• Improved life-span polyethylene films
• Use of tempered glass in commercial greenhouses
• Glass now the least used glazing
• Greater use of rigid, box rib, two-layer rigid plastic glazing as well as plastic films

BENCHES

• Rolling bench tops to minimize aisle space
- Bench top trays for growing and moving plants
- Hanging baskets on movable belt lines that are watered, fertilized and sprayed as they pass the work station
- Roll out bench top trays to move plants in and out of greenhouse, depending on the weather, or to the headhouse
- Conveyor belts and tracks with computer controlled destinations
- Special greenhouse carts

GROWTH MEDIA
- Soilless plant media
- Nutrient film technique
- Machine blenders, mixers
- Rock wool

PLUGS
- Containers machine filled with growth medium
- Environmentally controlled growth chambers for seed germination
- Machine seeding, with or without plugs
- Machine labeling of pots and packs

IRRIGATION
- Intermittent mist
- Nozzle watering
- Automated overhead booms
- Ebb and flow (injection)
- Tube watering
• Irrigation mats
• Troughs

FERTILIZER
• Controlled-release, non-organic products
• Wide use of liquid application
• Proportioners and injectors
• Supplemental atmospheric carbon dioxide
• Monitors in line beyond injectors for checking concentration
• Microelement emphasis, especially in soilless media
• Monitors for adjusting liquid and nutrient levels in nutrient solutions in holding tanks

TEMPERATURE CONTROLS
• Natural gas as the most widely used fuel
• Power plant waste heat as source of heat
• Bench bottom hot water tube heating
• Thermal curtains for night use
• Fan-jets for air circulation and temperature uniformity
• Evaporative pad cooling
• Warm night, cool day plant height control technique (DIF)
• Automated waste wood furnaces, where wood supply is reliable
• Fin heating pipe — aluminum and copper
• Horizontal air flow
• Collapsible polyethylene tube vents
• Honeycomb paper evaporative pads
LIGHT

- High-intensity (fluorescent, mercury, sodium vapor) lamps for plant illumination in short-day portion of the year
- Automated photoperiod and light intensity control curtains

COMPUTER CONTROLS

- Available for almost all greenhouse operations and procedures, including most of the items noted in the eight sections above, and for lowering and raising humidity and injecting carbon dioxide into greenhouses, and growth and storage chambers.
In 1990, the population of St. Paul was 272,235, and that of Minneapolis was 368,383. Population of the seven county Twin Cities metropolitan area was about 2.6 million, about 60 percent of Minnesota's state population of about 4.4 million. By 1992, the St. Paul park system totaled 4,200 acres. The Minneapolis park system covered 6,400 acres.

St. Cloud, with a population of about 50,000, had become one of the state's fastest developing areas outside of the Twin Cities and its immediate suburbs. It had 17 retail florists listed in its area directories in 1993.

Bedding plants accounted for 55.8 percent of Minnesota's floricultural crop wholesale sales in 1990. Even the Minneapolis-St. Paul International Airport approach and Twin City major highway roadsides were made more attractive with flower beds. Wild flower seeds were dispersed on state highway roadsides by the Minnesota Department of Transportation.

Imports of cut flowers continued to increase. Better cut-flower preservatives were aiding foreign growers, though vase life of the imports from distant locations was often slightly shorter than with locally grown product, particularly in the case of roses.

In 1990, Greg and Sandy Ennenga built a 4,000 square foot greenhouse range near Grand Marais to produce bedding plants. Their children provide seasonal help.
In 1991, Debbie Schwarze, a University of Minnesota ornamental horticulture graduate, was hired as an assistant scientist to work in extension with John Erwin. Among other duties, she served as the telephone contact for professional flower growers. The Minnesota Commercial Flower Growers organization supported this activity by funding a portion of her salary.

An annual Widmer Florists’ Golf Tournament was started in 1991 to raise money for the J.R. Johnson Floriculture Research Fund. George Lucht started the Tournament with the collaboration of Rick Johnson and Don Rosacker.

Harold Wilkins received the SAF Alex Laurie Award for Research and Education in Floriculture in 1991.

**INDUSTRY PROGRESS IN THE DECADE**

Orchid Zone greenhouses, owned by Dr. Wharton Sinkler, erected a 10,000 square foot, state-of-the-art, greenhouse range in Maple Plain in 1991. The range included double-layer, box-rib, rigid plastic glazing; a triple shading system (photoperiod, light intensity and thermal curtains); ebb and flow irrigation; mobile benches; bench bottom hot water heat tubes and sodium vapor lamps. Its plants were obtained from an out-of-state affiliate. Sales were primarily wholesale potted orchid plants and cut flowers, but few Cattleya’s. In January 1994, the firm was renamed Castle Rock Orchids, Inc., and dropped its affiliation with the out-of-state firm. Sinkler left medicine and now breeds orchids at his range.

In 1991, Marv Saline retired from the Hans Rosacker Company. Don Rosacker became the sole owner, while Saline and his son Rod acquired sole ownership of the Engwall greenhouse firm in Duluth. Don’s daughter Debbie worked at Rosackers for 10 years. Another daughter Kim and son-in-law, Todd Hix, were also employed by the firm. Crops included a wide array of pot plants, cut roses (until 1994), incidental cut flowers and bedding plants for retail and wholesale sale. Don was active in SAF, United Minnesota Horticulture (president in the 1980s), and the North Central Florists’ Allied organization, and
was on the board of the J.R. Johnson Floriculture Research Fund. Don sold the firm to his son, Hans Donald II, in October 1994.

Holm and Olson operated five retail floral stores in the St. Paul area. Dave Hertog, who formerly worked at the Hertog Floral and J.R. Johnson Supply greenhouses, operated the Holm and Olson greenhouses in a joint agreement with the firm from 1991 to 1994, when he left and Holm and Olson resumed direct operation of the greenhouses.

George Lucht significantly expanded Malmborg’s Rogers range, beginning in 1976. He also updated the Brooklyn Center operation’s large garden center. Lucht was active in local and national industry affairs. He was a member of the board of the national Professional Plant Growers Association for ten years, and president from 1990 to 1992. He directed every Widmer Florists’ Golf Tournament fundraiser. His children, Kim, Kerry and Troy, have continued to work in the firm.

Current Malmborg specialty crops still include quality geraniums in all stages, and bedding plants including perennials. The company has also supported its sales with educational activities, including a special 1994 Geranium Day for current and potential wholesale customers. It included talks by specialists, a large display of geranium cultivars grown outdoors in wine kegs cut in half, and ivy geranium hanging baskets. Participants were asked to evaluate the cultivars on printed report forms.

Len Busch retired in 1991, and production manager Mark Wittman became president of the firm. Len’s son Pat and his son-in-law, George Ross, were also employed in the business. The firm became Minnesota’s largest cut flower producer with seven acres of roses, plus another three acres in pot plants and less common cut flowers, all sold at wholesale. Because of range expansion, heat furnished by the automatically supplied wood burning boiler and sodium vapor lamps had to be supplemented on extremely cold days with heat from a natural gas fueled boiler.
The efficiencies of year-round growing technologies also created some problems for growers such as Busch. With the roses illuminated at night with high-intensity sodium vapor lamps to counter short-day photoperiods, area residents were unhappy with the year-round 'long days' so created. Thus, in 1992, at a cost of $100,000, automatic light containment curtains were installed above the lamps and kept closed at night. The curtains provided a side benefit of improved night-time heat retention in the greenhouses. All of the range was glazed with double layer, box rib, rigid plastic panels.

In the fall of 1994, a 7,000 square foot tulip forcing house was built onto the Busch facility. Also in 1994, George Ross became president of the firm, and Pat Busch production manager. Wittman, after relinquishing the company presidency, moved with his family to Australia early in 1995. His wife Rosemary was from Australia. Dave Hertog is now in charge of pot plant production and Randy Reed is in charge of cut-flower production.

In 1992, the John R. Johnson firm added to their Everton Growers range in Hugo. In 1993, Rick Johnson, son of John, became president of the firm. He also served on the SAF Board of Directors. Rick's sister Lynn and her husband, Alan John, headed the Florida branch in Sun City.

Johnson's Belden Plastics division is one of three plastic pot manufacturers in the state. It operates on three shifts, as it has almost from its start. The other Minnesota manufacturers are T.O. Plastics of Minneapolis and National Polymers of Lakeville. All three firms ship their products throughout the country, competing with each other and with Canadian manufacturers.

**DEPARTMENT 56 AND BACHMAN'S**

The wholesale business of Bachman's gift subsidiary unit, Department 56, continued to grow rapidly. In 1992, Todd Bachman stepped down as president of the entire Bachman's firm to be president of Department 56 after it was sold in January of that year to the
Forstman-Little partnership of New York for $270 million. Dale Bachman took over as Bachman's president. Active fourth generation Bachman firm members Dale, Paul, Lee and Alan took over the responsibility for running Bachman's floral and nursery units, which had annual sales of $50 million. This represented one of the biggest such units in the country. Alan left the firm in 1993.

In recent years, Bachman's Woodend greenhouse range, plus the oldest part of the Lyndale Avenue headquarters range, originally used as vegetable production houses, were demolished. The least profitable European Flower Markets were closed. The 11 most profitable locations, in the upscale Byerly's Supermarkets plus a few other locations, were renamed Flowers by Bachman and kept in operation.

A view in Bachman's new (1994–1995) Dutch-type greenhouse range of ebb-and-flow benches. "C" shaped holders on a moving belt (at top of photo) are for holding hanging baskets. The facility has gathered automated shade cloth (dark area) and a vast unpartitioned expanse for large scale crop production. Houses are covered with tempered glass. (Photo by author)
Bachman’s has most recently placed its corporate investment emphasis on developing large Minnesota floral, gift and garden center retail units containing appreciable greenhouse sales areas. There are currently six of these units in operation. They are located at the Lyndale Avenue headquarters in Minneapolis and in Maplewood, Plymouth, Apple Valley, Eden Prairie and Rochester. The seven full-service Bachman’s floral stores bring the company’s total number of retail outlets to 24. It also continues to operate eight acres of greenhouses, including the decorative plant unit, and the 513-acre nursery at Farmington.

Todd Bachman left Department 56 in 1994 and returned to Bachman’s as chairman and CEO.

Bachman’s erected 100,000 square feet of Dutch-style greenhouses in 1995 at the Farmington location to replace the recently demolished houses in Minneapolis. The new structures were glazed with tempered glass and included a movable tray bench system, ebb and flow watering with a nutrient solution, motorized overhead cables for 7,000 hanging baskets, automated heat saving curtains, photoperiod curtains and hot water heat. The ebb and flow system was selected to prevent run-off and ground contamination. After the nutrient solution leaves the benches, it flows through three filters, then passes through a computerized system which adds water and some nutrients as needed before returning to the holding tanks. The cost of the range construction was about $20 per square foot.

**FLORICULTURE RESEARCH FUND CHANGES**

Many growers in states bordering Minnesota contributed to the J.R. Johnson Research Fund, leading the fund’s directors to broaden its objectives in the early 1990s. The fund’s new directions included awarding grants to institutions in other states as well as Minnesota.

The Widmer Research Fund was created at about the same time in an unsuccessful attempt to induce other vendors to contribute funds for horticultural research. Funding did come from the annual Widmer Golf Tournament, the long dormant North Central Flower Show Fund
(created more than 70 years earlier), and annual University Grower Short Course raffles. A transfer of some J.R. Johnson Research Fund money was also being considered to enable the governing board to start an endowment fund.

Widmer Research Fund endowment interest, plus such additional income as might be derived from other sources, would be awarded for floriculture research and related purposes selected by the fund’s governing board. J.R. Johnson Research Fund money would be handled in a similar manner, continuing to fund research across a greater geographic area.

The research funds retained combined balances totalling about $145,000 in January 1995. Since the founding of the funds, about $25,000 had been awarded for research and associated activities approved by the governing boards.

MORE INDUSTRY DEVELOPMENT

Bob Eisele cut back on his work schedule at South Cedar Greenhouses and opened The Plant Shed on Cedar Avenue in Farmington in 1992. He and his wife grow perennials and bedding plants for retail sale.

Hermes Floral bought a 20,000 square foot building next to its St. Paul business in 1992. It was rented it to tenants until 1994 when the building was remodeled to house the firm’s own administrative offices and to enable it to expand the wholesale business.

Hermes Floral’s Hudson, Wisconsin, range was expanded in 1993 with cut roses and a wide range of pot plants as the major crops. It used a Dutch hot water heating system. In the winter of 1993–1994, warm water from the NSP electric generation plants at Becker was not available for greenhouse heating for several months because both generating units were closed for emergency repairs. Unfortunately, warm waste water from the third and newest generating unit was not connected to the greenhouse supply line, making it necessary to use emergency propane gas heating units at a significantly higher cost.
Don Hermes has served both as head of the firm and manager for the St. Paul operation. Brothers Tom and Jim have been managing the Becker and Hudson units respectively. Bill Hermes, a cousin, retired as State Fair horticulturist in 1994.

Earl Holasek is no longer active at the Earl Holasek Greenhouses. His children, Earl Jr. and Carol Thuening, and Earl Jr.’s wife Sharon now operate the business. They erected an additional half-acre of greenhouses in 1994 and now have a six-acre range.

Green Valley Greenhouses near Anoka replaced one acre of old greenhouses with an expanded range that now covers 5½ acres. Wayne Davis produces 40,000 pans of poinsettias annually, plus numerous potted flowering, foliage and bedding plants and hanging baskets at that facility.

NK Lawn and Garden Company is a spinoff from Sandoz owned Northrup King, having left the larger firm in March 1993. The new independently-owned unit sells flower and vegetable seeds to home gardeners, as well as lawn seed, garden products and gardening books for children and adults. It rents office space from Northrup King in Golden Valley and employs about 50 people in Minnesota and about 150 others outside the state. The firm still purchases some seed from its former parent and benefits from Sandoz’s research programs. Seed packets and lawn and garden products are produced and sold at wholesale through plants in Chattanooga, Tennessee, and Tangent, Oregon. It was reportedly the country’s largest supplier of seed for the home gardening market in 1993, with a business in excess of $20 million per year.

Bergen’s Greenhouses in Detroit Lakes was one of the first to grow plugs in the 1970s. It grew a wide range of floricultural crops. Though the company owned several retail outlets in Minnesota and North Dakota, sales were largely via truck routes until the mid-1980s. Bob, a third generation Bergen, has been running the business and is dedicated to producing high quality plants as efficiently as possible. Automation has included plug seeding, booms for irrigation and fertilizing, machine transplanting, bar coding, etc. The Bergens worked with a transplanting machine for bedding plants in 1994 and will work with an improved machine in 1995.
Bergen's new emphasis is selling in volume to major chains such as K-Mart, Wal-Mart, Pamida and Shop-Ko, in Iowa, Minnesota, Montana, Wisconsin, North Dakota, South Dakota, and the Canadian province of Manitoba. It now sells 75 percent of its volume to the chain stores as holiday, bedding and foliage plants. Bergen's sold its retail shops, except for the one in North Dakota which included a greenhouse range of 1 1/2 acres. That facility sells both retail and to small growers in the Dakotas. Its eight acres of greenhouses produce and ship 100,000 flats of bedding plants and 40,000 hanging baskets per year. Bob's son Chris has also been working in the business.

Sandy Murphy purchased Robert Stern Florists Inc. in North Minneapolis in 1992. She operates a full service retail shop and greenhouses under the new name of Crystal Lake Floral Design and Orchids by Murphy. Only orchids are grown in the two greenhouses, and she specializes in Phalaenopsis species. Sandy hybridizes orchids and sells the cut flowers and plants primarily at retail.

Roses Inc., an international organization of professional rose growers, held its annual meeting in Bloomington in October 1994. It currently has fewer members, but the membership comprised primarily the larger growers, many of whom have expanded their production areas.

**GROWER RESEARCH**

Wagner's constant improvements created a modern, highly efficient establishment 4 1/2 acres large. It added assorted potted plants to the bedding plants grown for its large retail business. Flowering geraniums for wholesaling were discontinued as the company built a large wholesale business in plugs, with 90 percent in bedding plants. Wagner's has also sold more than a million cyclamen liners annually throughout the country. Its production facilities have included 12 computer-controlled plug germination chambers, drum seeders, computerized greenhouse environment controls, high-pressure sodium lamps, mobile bench top trays, irrigation booms and automated light intensity control curtains.
For the last three years, Wagner's has conducted large cyclamen trials to select improved cultivars and to improve production methods. All plants in these growing trials have been staged in one greenhouse, fully labeled and made available for viewing by industry representatives from throughout the country.

UNIVERSITY RESEARCH

Funding provided to the University of Minnesota by state and federal sources was quite limited through the first half of the decade. John Erwin and Mark Strefeler raised funds from outside sources to maintain an active research program. In response to industry trends, they emphasized bedding plants in their research studies.

Erwin traveled to England, Norway and Hawaii to speak on plant responses to low-day, higher night temperatures, often referred to as DIF or thermomorphogenesis. Frank Pfleger of Plant Pathology continued to collaborate, while Mark Ascerno's available time decreased when he became head of the Department of Entomology.

Despite the budgetary constrictions, University of Minnesota plant breeding programs continued. The 73rd new garden chrysanthemum cultivar introduction from the University breeding program was released in 1994 (see Appendix B). A program to develop New Guinea Impatiens with improved heat tolerance, lower water requirements, improved insect and disease resistance and other desirable features was making progress.

Temperature effects on geraniums have also continued under study, along with investigations of interactions between cutting position and leaf removal. Rooting of clematis cuttings was found to peak at a medium pH of 8.0.

Removing greenhouse rose flowers with very little stem was found to double the return cut-flower crop. This practice has permitted significantly increased yields for times of the year such as St. Valentine's Day, when demand for this flower is at a peak.
Basic vernalization studies were under way to obtain information that could be applied to Easter lily production. The radish was found to be a good short-term crop indicator plant.

The University's northwest greenhouse range (formerly Gibbs-Nelson) was re-covered with two air-separated layers of plastic film. In addition, the main horticultural range had the glass replaced with acrylic, box-rib, double layer, rigid plastic panels. These changes were designed to lower fuel and maintenance requirements. Computerized environmental controls were installed in the floriculture greenhouse units.

**STATUS OF INDUSTRY-WIDE RESEARCH**

While he was a graduate student at Michigan State University, John Erwin participated in developmental studies of cool-day, warm-night programming aimed at limiting plant stretch. He brought this work with him to Minnesota and successfully encouraged its use on crops like poinsettias and Easter lilies. Other recent advancements occurred with tissue culture propagation, which has seen increasing use in providing disease-free stock for numerous species of flowering and foliage plant propagation.

Genetic engineering focusing on altering key genes to provide disease-, insect- and drought-resistant plants has arrived on the international scene. Disease-free geraniums, hostas and foliage plants are being developed in this manner. Studies on chrysanthemums, roses, African violets and petunias are in progress at a variety of locations around the world. One Dutch firm's recent introduction, for example, is a chrysanthemum cultivar which has a genetically engineered flower color change. In Minnesota, Mark Strefeler is working with such techniques, though no major breakthroughs are anticipated in the near term.

Insect and disease control continues to be a problem as new and resistant races develop. Biological control use is advancing slowly and some of those methods are becoming available to home gardeners as well as commercial growers.
UNIVERSITY DEVELOPMENTS

No count of the number of graduates of the floriculture undergraduate program at the University of Minnesota has been maintained, but it is conservatively estimated at about 300 persons. This number may seem small, but it counts only those majoring in floriculture. It does not include larger numbers of students of other branches of ornamental horticulture who would have been taking all or some of the floricultural course offerings, nor does it include students who did not pursue the full degree program.

Universities across the country, as well as in Minnesota, have restructured the curricula in agriculture. In 1994, Minnesota’s horticultural science department had 80 undergraduate students with 25 percent majoring in floriculture. Students interested in ornamental aspects of horticulture at the University of Minnesota now major in Animal and Plant Systems with an emphasis on Ornamental Horticulture, Floriculture, Landscaping, Turf or Nursery Culture. Less than half of the specific courses in floriculture previously offered were taught in 1994 and the program was still undergoing revision, especially in response to the University’s planned schedule change from quarters to semesters over the next few years.

There were 40 graduate students in horticulture with six of them in floriculture in 1994. This was a reduction from the numbers enrolled in 1990. The shortage of jobs for doctoral graduates since the latter part of the 1980s, funding cutbacks, and a federal government requirement that research projects now pay for costly fringe benefits as well as graduate assistantship stipends, all combined to reduce the number of applicants for graduate study accepted by researchers across the country. Fortunately, the job market for graduates with advanced degrees in horticulture improved by 1994. Some of the advanced degree graduates were working in postdoctoral positions, or as technical specialists, for large floricultural firms rather than in faculty positions at colleges and universities.

Individuals earning master of science and doctoral degrees at the University of Minnesota increase the size and effectiveness of its floricultural research program. They usually advance to positions of
responsibility at other universities, conservatories, or in industry. Graduates of the University of Minnesota floricultural program now fill positions in many states and Canadian provinces, including British Columbia, California, Colorado, Florida, Illinois, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, New Mexico, North Carolina, Ohio, Oklahoma, Texas, Virginia and Wisconsin.

A portion of the rehabilitated Como Conservatory at night. Photo was taken in 1995. (Photo courtesy the Conservatory and Roberta Slack)

**COMO CONSERVATORY REHABILITATION**

In 1993, Roberta Slack, a University of Wisconsin floriculture graduate, replaced the retired Les Day as Supervisor of Como Conservatory. Day had done an excellent job of working with the public, parties associated with the rehabilitation of the ancient complex and his working crew. The main conservatory was completely rebuilt and most of the old growing houses were replaced with efficient greenhouses. A total of $12 million was invested in the renovation. With a new Resource Center still to come, about 500,000 persons tour the restored 47,000 square foot glass houses annually. About 55,000
people visit the Japanese garden, including numerous wedding par-
ties. There were 340 marriage ceremonies performed in either the
Conservatory or the Japanese garden in 1995. There are about 200
public flower beds in St. Paul which are planted and maintained by
the conservatory's staff of 18.
Table 5. Classification of Minnesota flower growers by wholesale gross sales volume in 1993, according to USDA Floriculture Crops Summary data.

<table>
<thead>
<tr>
<th>Sales Value</th>
<th>Number of Growers</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,000 to $19,999</td>
<td>27</td>
</tr>
<tr>
<td>$20,000 to $39,999</td>
<td>33</td>
</tr>
<tr>
<td>$40,000 to $49,999</td>
<td>13</td>
</tr>
<tr>
<td>$50,000 to $99,999</td>
<td>54</td>
</tr>
<tr>
<td>$100,000 to $499,999</td>
<td>58</td>
</tr>
<tr>
<td>$500,000 or more</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>213</strong></td>
</tr>
</tbody>
</table>

A comparison of U.S. Census Bureau and USDA Floriculture Crops Summary statistics for 1992 is presented in Table 6. Number of growers in the census count almost doubled while production area under cover was 17 percent greater, but total wholesale sales differed by less than 1 percent when compared to the USDA's expanded wholesale value of sales. This confirms the accuracy of figures from both sources when that compensating factor is used to include the small producers. Because the USDA reports are more frequent and include more details, their availability is highly beneficial to the floriculture industry.

**THE ROSE STORY**

In 1949, roses outranked all other cut flowers in wholesale dollar sales volume in the United States. Sales averaged 2.69 roses per person annually, but dropped to 2.33 roses per person by 1979, falling to second place in dollar volume behind carnations. Table 7 shows national rose production and sales data for a 44-year span. Rose grower numbers varied, and at 213 in 1993, was less than half the peak of 483 in 1959. Production area increased significantly from
1979 to 1989 and dipped slightly by 1993, while production area per grower increased by 59 percent. Total plant number grown increased significantly, especially in the 1980s and decreased 13 percent by 1993, whereas number of plants per grower more than tripled from 1959 to 1993. This pattern correlated with the increase in growing area per grower. Total numbers of produced flowers sold decreased steadily from 1949 to 1969, increased slightly by 1979, increased by 32 percent in the 1980s followed by a 19 percent dip in the early 1990s. Flower stems per plant decreased in the 1980s and held steady in the 1990s. The wholesale price per rose flower increased regularly until 1989, after which it dipped slightly, especially for hybrid teas.

Table 6. In a comparison of U.S. Census Bureau data with USDA Floriculture Crops Summary statistics for 1992, bureau data includes a large number of small growers whose production value can only be estimated in the USDA Summary. Bureau data covers growers with $10,000 or higher volume. The USDA Summary only counts growers with a minimum $100,000 volume, but the expanded value includes an estimate for firms with sales between $10,000 and $100,000.

<table>
<thead>
<tr>
<th>Category</th>
<th>U.S. Census Bureau data</th>
<th>USDA Floriculture Crops Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Minnesota Growers</td>
<td>442</td>
<td>224</td>
</tr>
<tr>
<td>Square Feet Under Glass or Other Protection</td>
<td>8,952,521</td>
<td>7,631,000</td>
</tr>
<tr>
<td>Wholesale Crop Sales:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut Flowers</td>
<td>$ 7,458,000</td>
<td>$ 7,099,000</td>
</tr>
<tr>
<td>Potted Flowering Bedding Plants</td>
<td>12,799,000</td>
<td>10,253,000</td>
</tr>
<tr>
<td>Bedding Plants</td>
<td>27,836,000</td>
<td>25,078,000</td>
</tr>
<tr>
<td>Foliage Plants</td>
<td>2,065,000</td>
<td>1,320,000</td>
</tr>
<tr>
<td>Total Sales</td>
<td>$50,158,000</td>
<td>$43,750,000</td>
</tr>
<tr>
<td>Expanded Value Total Sales</td>
<td></td>
<td>$49,671,000</td>
</tr>
</tbody>
</table>
California produced 51.7 percent of the domestic rose crop in 1979, and 64 percent in 1989 and 1993, despite a decline from 115 growers in 1989 to 103 in 1993. California roses sold at wholesale for about 75 percent of the average price for the country in 1993.

Rose imports (Table 7) represented 7.4 percent of domestic production in 1979 and increased to 87 percent in 1993. In 1994, rose imports, primarily from South America, exceeded domestic production at prices below those of California-grown roses.

Minnesota rose cut-flower figures are presented in Table 8. Production approximately doubled from 5,000,000 flowers in 1949 to 9,986,000 in 1993, while wholesale value of sales increased almost 11-fold from $494,000 in 1949 to $5,380,000 in 1993. National wholesale sales increased about five-fold over that period. Numbers of production units ran from a peak of 23 in 1959, to 5 in 1993, and 4 in 1994. The average unit quadrupled in size, from 26,850 in 1979 to 111,600 square feet in 1993. Total plant numbers dipped slightly from 350,000 in 1959 to 342,000 in 1989, but rebounded to 410,000 in 1993, while plants per grower grew steadily to 82,000. Flower production per plant was relatively stable until increasing significantly in the 1980s. Yield per plant in 1989 and 1993 exceeded the national average. Average price per hybrid tea bloom peaked at 58 cents in 1989.

Both national and Minnesota figures indicated a trend to fewer but larger rose production units, with the average Minnesota unit size only about 58 percent that of the average national unit in 1993. National sales of domestic roses decreased significantly from 1989 to 1993, while Minnesota hybrid tea production and sales increased appreciably. Increased retail sales apparently absorbed the greater supply of home grown and imported roses available on the wholesale market. By early 1995, about 35 percent of the roses sold wholesale in Minnesota were grown in the state.

Wholesale prices of roses increased along with the cost-of-living locally and nationally. Prices of Minnesota-grown roses were significantly higher than national averages because of a better quality local product and higher production costs. National price averages were pulled down by the prices of California and Colorado roses.
Both imported and domestic roses have benefitted from use of the latest developments in cut-flower preservatives. South American growers used unheated structures and were still dependent on the weather. Thus, they sometimes missed planned production schedules. The imported product sells for less than the domestic product, and foreign producers were found to be dumping their flowers at prices below production costs at times in 1994. As a result, the U.S. government imposed a tariff on imported roses in the second half of 1994. The quality of the imported product has improved.

While Minnesota rose production continued strong, production in numerous other states, including California, Indiana, Ohio, Pennsylvania and New York, declined appreciably. Alert Minnesota rose growers strove to be more efficient, and applied the latest technology in their efforts to maintain a viable business in what has become a highly competitive world-wide market. Advancements have included Len Busch showing young rose plants growing in rock wool enclosed in plastic film tubes. Nutrient solution flows through the tubes at intervals. Seventy percent of his firm's cut-rose production plants were grown in the rock wool medium in 1995. (Photo courtesy Len Busch)
Table 7a. Rose production data for major production states show greatest growth in the 1980s. The data is from USDA Floriculture Crop Summaries and the U.S. Census Bureau. (See 7b for 1979, 1989, 1993)

<table>
<thead>
<tr>
<th>Year</th>
<th>1949</th>
<th>1959</th>
<th>1969</th>
</tr>
</thead>
<tbody>
<tr>
<td>(# of producing states)</td>
<td>23</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Number of Rose Growers</td>
<td>—</td>
<td>483</td>
<td>384</td>
</tr>
<tr>
<td>Production Area (sq. ft.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Average Area/Grower (sq. ft.)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Number of Plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>—</td>
<td>—</td>
<td>14,890,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>3,095,000</td>
</tr>
<tr>
<td>Plant Number/Grower</td>
<td>—</td>
<td>32,000</td>
<td>46,835</td>
</tr>
<tr>
<td>Quantity Flowers Sold (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>389,789,000 combined</td>
<td>360,242,000 combined</td>
<td>317,209,000 combined</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Flowers/Plant (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>—</td>
<td>—</td>
<td>21.3</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>35.6</td>
</tr>
<tr>
<td>Wholesale Flower Price/Stem (cents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>7.8 combined</td>
<td>8.6 combined</td>
<td>13.7 combined</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total Wholesale Sales (dollars)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>30,582,000 combined</td>
<td>30,942,000 combined</td>
<td>43,349,000 combined</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Flower Imported (stems)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Percent Imports/Domestic Flowers Sold</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Table 7b. Rose production data for major production states show greatest growth in the 1980s. The data is from USDA Floriculture Crop Summaries and the U.S. Census Bureau. (See 7a for 1949, 1959, 1969)

<table>
<thead>
<tr>
<th>Year</th>
<th>1979</th>
<th>1989</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>(# of producing states)</td>
<td>(28)</td>
<td>(28)</td>
<td>(36)</td>
</tr>
<tr>
<td>Number of Rose Growers</td>
<td>236</td>
<td>287</td>
<td>213</td>
</tr>
<tr>
<td>Production Area (sq. ft.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>22,937,000</td>
<td>37,327,000</td>
<td>37,052,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>5,665,000</td>
<td>6,170,000</td>
<td>4,129,000</td>
</tr>
<tr>
<td>Average Area/Grower (sq. ft.)</td>
<td>121,200</td>
<td>151,600</td>
<td>193,300</td>
</tr>
<tr>
<td>Number of Plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>15,484,000</td>
<td>24,176,000</td>
<td>21,603,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>3,740,000</td>
<td>3,787,000</td>
<td>2,753,000</td>
</tr>
<tr>
<td>Plant Number/Grower</td>
<td>81,455</td>
<td>97,430</td>
<td>114,350</td>
</tr>
<tr>
<td>Quantity Flowers Sold (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>327,824,000</td>
<td>481,164,000</td>
<td>430,819,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>116,796,000</td>
<td>106,319,000</td>
<td>80,430,000</td>
</tr>
<tr>
<td>Flowers/Plant (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>21.2</td>
<td>19.9</td>
<td>19.9</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>31.3</td>
<td>28.1</td>
<td>29.2</td>
</tr>
<tr>
<td>Wholesale Flower Price/Stem (cents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>23.9</td>
<td>35.1</td>
<td>32.8</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>17.1</td>
<td>25.2</td>
<td>24.7</td>
</tr>
<tr>
<td>Total Wholesale Sales (dollars)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>78,323,000</td>
<td>169,002,000</td>
<td>141,239,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>20,019,000</td>
<td>26,775,000</td>
<td>19,878,000</td>
</tr>
<tr>
<td>Flower Imported (stems)</td>
<td>35,325,000</td>
<td>—</td>
<td>445,391,000</td>
</tr>
<tr>
<td>Percent Imports/Domestic Flowers Sold</td>
<td>7.4</td>
<td>—</td>
<td>87.0</td>
</tr>
</tbody>
</table>
growing new and improved cultivars and more productive intermediate class cultivars like 'Sonia', 'Kyria' and 'Kardinal'. Improved culture techniques have included better growth media such as rock wool,

Table 8a. Minnesota rose production data shows production at an all-time high in 1993, according to USDA Floriculture Crop Summaries and other sources, including the author’s records. (See 8b for 1979, 1989, 1993)

<table>
<thead>
<tr>
<th>Year</th>
<th>1949</th>
<th>1959</th>
<th>1969</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Rose Growers</td>
<td>19</td>
<td>23</td>
<td>22</td>
</tr>
<tr>
<td>Production Area (sq. ft.)</td>
<td>-</td>
<td>358,000</td>
<td>-</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>combined</td>
<td>-</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>-</td>
<td>combined</td>
<td>-</td>
</tr>
<tr>
<td>Average Area/Grower (sq. ft.)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Number of Plants</td>
<td>-</td>
<td>350,000</td>
<td>260,000</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>combined</td>
<td>82,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>-</td>
<td>combined</td>
<td>-</td>
</tr>
<tr>
<td>Plant Number/Grower</td>
<td>-</td>
<td>15,216</td>
<td>15,545</td>
</tr>
<tr>
<td>Quantity Flowers Sold (stems)</td>
<td>-</td>
<td>7,100,000</td>
<td>5,032,000</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>combined</td>
<td>2,490,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>5,000,000</td>
<td>combined</td>
<td>-</td>
</tr>
<tr>
<td>Flowers/Plant (stems)</td>
<td>-</td>
<td>20.3</td>
<td>19.5</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>combined</td>
<td>30.4</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>-</td>
<td>combined</td>
<td>-</td>
</tr>
<tr>
<td>Wholesale Flower Price/Stem (cents)</td>
<td>-</td>
<td>10.0</td>
<td>16.1</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>combined</td>
<td>9.8</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>-</td>
<td>combined</td>
<td>combined</td>
</tr>
<tr>
<td>Total Wholesale Sales (dollars)</td>
<td>-</td>
<td>494,000</td>
<td>1,054,000</td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>-</td>
<td>735,000</td>
<td>combined</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>-</td>
<td>combined</td>
<td>combined</td>
</tr>
</tbody>
</table>
Injecting carbon dioxide into the greenhouses at controlled levels, monitored nutrition, high-intensity sodium vapor lamp illumination of the plants in the short-day half of the year, computerized greenhouse

Table 8b. Minnesota rose production data shows production at an all-time high in 1993, according to USDA Floriculture Crop Summaries and other sources, including the author's records. (See 8a for 1949, 1959, 1969)

<table>
<thead>
<tr>
<th>Year</th>
<th>1979</th>
<th>1989</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Rose Growers</td>
<td>19</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Production Area (sq. ft.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>405,000</td>
<td>348,000</td>
<td>496,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>105,000</td>
<td>69,000</td>
<td>62,000</td>
</tr>
<tr>
<td>Average Area/Grower (sq. ft.)</td>
<td>26,850</td>
<td>52,125</td>
<td>111,600</td>
</tr>
<tr>
<td>Number of Plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>261,000</td>
<td>255,000</td>
<td>363,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>75,000</td>
<td>43,000</td>
<td>47,000</td>
</tr>
<tr>
<td>Plant Number/Grower</td>
<td>17,684</td>
<td>37,250</td>
<td>82,000</td>
</tr>
<tr>
<td>Quantity Flowers Sold (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>5,181,000</td>
<td>6,234,000</td>
<td>8,434,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>2,294,000</td>
<td>1,786,000</td>
<td>1,552,000</td>
</tr>
<tr>
<td>Flowers/Plant (stems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>19.9</td>
<td>24.4</td>
<td>23.2</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>30.6</td>
<td>41.5</td>
<td>33.0</td>
</tr>
<tr>
<td>Wholesale Flower Price/Stem (cents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>35.3</td>
<td>58.1</td>
<td>56.7</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>19.8</td>
<td>36.6</td>
<td>38.5</td>
</tr>
<tr>
<td>Total Wholesale Sales (dollars)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Tea</td>
<td>1,829,000</td>
<td>3,622,000</td>
<td>4,762,000</td>
</tr>
<tr>
<td>Sweetheart</td>
<td>454,000</td>
<td>654,000</td>
<td>598,000</td>
</tr>
</tbody>
</table>
environment and irrigation controls and more efficient means of heating greenhouses. Some California rose growers are now improving their cultural methods, and are not depending solely on climatic advantages.

Len Busch Roses in Plymouth has the largest plantings of current Minnesota rose growers. J.R. Johnson, with greenhouses in Austin and Hugo; Hermes Floral, with greenhouses in Becker and in Hudson, Wisconsin; and Minneapolis Floral in Hopkins are the other major producers. Rose statistics in Table 8 do not include production of Hermes’ Wisconsin range, but those roses are sold through Hermes’ wholesale house in St. Paul.

Minnesota, like much of the United States, has lost the bulk, if not all, of its carnation and chrysanthemum cut-flower production. Rose imports are still increasing at a rapid pace. Production costs are expected to increase significantly in other countries, but their flowers are often larger because of a more desirable climate. There appears to be a good possibility that progressive rose growers will share the market with imports for an indefinite period.

POINSETTIA PRODUCTION

Poinsettias are a natural, off-season, complementary crop for bedding plant growers. Minnesota poinsettia production from 1980 to 1993 increased to a wholesale value of $4.1 million. (Table 9) Number of growers increased from 89 in 1980 to a peak of 115 in 1990, but dropped dramatically to 59 in 1993. A surge in poinsettia popularity coincided with the rapid growth in bedding plant production, and lower wholesale prices in the 1990s. This factor, plus the more rigid cultural requirements and higher production costs of poinsettias in comparison to bedding plants, resulted in some bedding plant specialists discontinuing poinsettia production in the early 1990s. Further, some smaller retail growers probably relinquished poinsettia growing to larger specialist growers.

Increased production space per potted poinsettia plant reflects growing larger, pinched specimens. According to an American Flo-
ral Endowment Research Report, poinsettias account for 54 percent of all floral sales in the Christmas season, and 21 percent of all floral sales on a national basis. The poinsettia is number one by a wide margin in wholesale sales volume of flowering pot plants.

<table>
<thead>
<tr>
<th>Year</th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Growers</td>
<td>89</td>
<td>79</td>
<td>115</td>
<td>59</td>
</tr>
<tr>
<td>Growing Area (sq. ft.)</td>
<td>634,000</td>
<td>780,000</td>
<td>1,157,000</td>
<td>1,427,000</td>
</tr>
<tr>
<td>Number of Pots Sold</td>
<td>457,000</td>
<td>576,000</td>
<td>829,000</td>
<td>838,000</td>
</tr>
<tr>
<td>Price/Pot (dollars)</td>
<td>3.32</td>
<td>3.77</td>
<td>2.34-5.05</td>
<td>2.60-5.27</td>
</tr>
<tr>
<td>Total Value (dollars)</td>
<td>1,517,000</td>
<td>2,172,000</td>
<td>3,891,000</td>
<td>4,123,000</td>
</tr>
<tr>
<td>Square feet per pot</td>
<td>1.38</td>
<td>1.35</td>
<td>1.40</td>
<td>1.70</td>
</tr>
</tbody>
</table>

**EASTER LILY PRODUCTION**

Minnesota Easter lily production from 1980 to 1993 is shown in Table 10. The wholesale price per pot and total wholesale value increased steadily, although slowly for the latter in the 1990s. As with poinsettias, Easter lily grower numbers peaked in 1990, but dipped sharply by 1993 to about half of the 1980 number and to 40 percent of the 1990 number. Production area was variable, but peaked in 1990 and by 1993 had dropped to just 36,000 square feet above the 1980 amount. Plants grown per square foot increased up to 33 percent because of producing more tailored, uniform plants in 1990 and thereafter. Again, as with poinsettias, some smaller growers relinquished Easter lily production and its difficulties to the large specialist producers. Decreased production in Minnesota also points out the
competitive effect of increased shipments of plants from other states such as Illinois and Michigan, rather than decreased retail sales.

Table 10. Minnesota production data for 1980 to 1993 shows production declines for potted Easter lilies in the 1990s, according to USDA Floriculture Crops Summaries. Dollar values are wholesale.

<table>
<thead>
<tr>
<th>Year</th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Growers</td>
<td>64</td>
<td>58</td>
<td>85</td>
<td>34</td>
</tr>
<tr>
<td>Growing Area (sq. ft.)</td>
<td>208,000</td>
<td>191,000</td>
<td>303,000</td>
<td>244,000</td>
</tr>
<tr>
<td>Number of Pots Sold</td>
<td>277,000</td>
<td>293,000</td>
<td>312,000</td>
<td>274,000</td>
</tr>
<tr>
<td>Price/Pot (dollars)</td>
<td>2.87</td>
<td>3.36</td>
<td>3.8-4.1</td>
<td>4.66</td>
</tr>
<tr>
<td>Total Value (dollars)</td>
<td>795,000</td>
<td>984,000</td>
<td>1,250,000</td>
<td>1,277,000</td>
</tr>
<tr>
<td>Square feet per pot</td>
<td>1.33</td>
<td>1.53</td>
<td>1.03</td>
<td>1.12</td>
</tr>
</tbody>
</table>

**BEDDING PLANTS**

USDA Floriculture Crop Summary figures for the wholesale value of bedding plant sales quintupled in Minnesota from $4.95 million in 1978 to almost $24.89 million in 1993. Bedding plants were the fastest growing segment of the industry over these 15 years. From 1990 to 1993, the annual increase was only 7 percent, even with an increase from 28 to 36 reporting states. There was a 1 percent drop in wholesale value of floral crops in 1993. The slowdown, which was attributed to a countrywide economic recession, showed signs of ending in late 1993.

Vegetatively propagated geranium cultivars grown in pots under 5 inches in diameter had a total wholesale value 52 percent greater than F-1 seed propagated cultivars in 1993, although the number of pots sold was only 4 percent greater. The average wholesale sales price per cutting propagated plants was $1.38 versus 91 cents for seed grown F-1 hybrids.
Vegetable bedding plants represented about 7.6 percent of all bedding plant wholesale dollar volume. The development of relatively low priced plastic film glazed greenhouses, automation, increasing efficiency in general, plus new and improved cultivars all contributed to the availability of large quantities of bedding plants at reasonable prices.

**TYPES OF GREENHOUSE STRUCTURES**

Current types of greenhouses and areas involved are shown in Table 11. Whereas Minnesota total greenhouse area increased 8.5 percent to 7,712,000 square feet from 1990 to 1993 for ranges of 10,000 square feet minimum, glass-covered greenhouse area decreased 24 percent, to 11 percent of all greenhouses. Rigid plastic glazed structures decreased little in square footage, probably because newer box rib, two-layer plastic panels helped compensate for the loss of corrugated, fiberglass reinforced, single-layer plastic panels. Film

<table>
<thead>
<tr>
<th>Type of Growing Area</th>
<th>36 states</th>
<th>Minnesota</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Square Feet</td>
<td>%</td>
</tr>
<tr>
<td>Glass Greenhouses</td>
<td>79,396,000</td>
<td>17</td>
</tr>
<tr>
<td>Rigid Plastic Greenhouses</td>
<td>129,810,000</td>
<td>27</td>
</tr>
<tr>
<td>Film Plastic Greenhouses</td>
<td>262,077,000</td>
<td>56</td>
</tr>
<tr>
<td>Total Greenhouses</td>
<td>471,283,000</td>
<td>100</td>
</tr>
<tr>
<td>Average Size Range</td>
<td>46,000</td>
<td></td>
</tr>
<tr>
<td>Shade &amp; Temporary Cover</td>
<td>342,493,000</td>
<td></td>
</tr>
<tr>
<td>Acres of Open Ground</td>
<td>29,561</td>
<td></td>
</tr>
<tr>
<td>Number of Operators</td>
<td>10,235</td>
<td></td>
</tr>
</tbody>
</table>
plastic-covered greenhouses continued to increase, coming to represent 68 percent of Minnesota greenhouses by 1993. Outdoor production, no doubt, included herbaceous perennials.

**MULTI-GENERATION FIRMS**

Many larger greenhouses have been family owned for three or four generations as previously documented. Others have developed large ranges in 'recent' years. First generation firms included Dan and Jerry Greenhouses with 12.1 acres (started in 1979), Green Valley Greenhouses with 5.5 acres (1974), Park Rapids Florist and Nursery with 4.2 acres (1947) and Bauer’s Greenhouses with 2.1 acres (1958). Len Busch is from a greenhouse family, but he started his own business in 1965 and now has 10 acres.

In other instances, non-family members have bought existing businesses and enlarged their facilities. Examples of these include 6.4 acre Lehman Gardens, purchased in 1972 and now known as Donahue’s Greenhouses, South Cedar Greenhouses with 2.5 acres (1991), Lyndale Garden Center with 2.1 acres (1986), Dundee Floral with 1.5 acres (1962) and Four Seasons Greenhouses with 1.4 acres (1977).

<table>
<thead>
<tr>
<th>Greenhouse Area</th>
<th>Number of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0-2.9 Acres</td>
<td>20</td>
</tr>
<tr>
<td>3.0-4.9 Acres</td>
<td>9</td>
</tr>
<tr>
<td>5.0-6.9 Acres</td>
<td>5</td>
</tr>
<tr>
<td>7.0-8.9 Acres</td>
<td>3</td>
</tr>
<tr>
<td>9.0-10.9 Acres</td>
<td>2</td>
</tr>
<tr>
<td>11.0-12.9 Acres</td>
<td>2</td>
</tr>
<tr>
<td>Total Number of Firms</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 12. Classification by 1995 range size of Minnesota floricultural crop producers with a minimum of one acre of greenhouses, according to data collected by the author.
Still another category of businesses are those which existed for some time, but only recently built their own greenhouse ranges. Bailey Nursery is an example for this group. Bailey started its range in 1982, though the nursery is currently a third and fourth generation firm. The company has 11.5 acres used for production of annuals and perennials, plus propagation of nursery stock.

Distribution by size of firms with one acre or more of greenhouses is presented in Table 12. Figures were determined by direct contact with the growers.

**LEADING COUNTIES**

Distribution of greenhouses in eight leading Minnesota counties is shown in Table 13. Figures for many counties in which only a single firm is located are not available in the published census information to avoid disclosure of data for individual firms.

<table>
<thead>
<tr>
<th>County</th>
<th>1982</th>
<th>1987</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anoka</td>
<td>121,666</td>
<td>411,880</td>
<td>507,000</td>
</tr>
<tr>
<td>Crow Wing</td>
<td>136,834</td>
<td>Not Available</td>
<td>208,000</td>
</tr>
<tr>
<td>Dakota</td>
<td>678,794</td>
<td>675,407</td>
<td>1,051,979</td>
</tr>
<tr>
<td>Hennepin</td>
<td>2,058,545</td>
<td>1,867,970</td>
<td>2,273,048</td>
</tr>
<tr>
<td>Ramsey</td>
<td>702,120</td>
<td>727,030</td>
<td>802,480</td>
</tr>
<tr>
<td>Sherburne</td>
<td>25,392</td>
<td>430,244</td>
<td>Not Available</td>
</tr>
<tr>
<td>St. Louis</td>
<td>116,880</td>
<td>212,545</td>
<td>158,018</td>
</tr>
<tr>
<td>Washington</td>
<td>204,025</td>
<td>195,550</td>
<td>609,900</td>
</tr>
</tbody>
</table>
In general, greenhouse area in the Twin Cities area counties increased significantly. Hennepin County, with Bachman’s, Len Busch’s, Wagner’s, Rosacker’s, Malmberg’s, Lynde’s, etc., had the greatest greenhouse area in Minnesota. The total dipped in 1987 as several firms ceased doing business, but their capacity was more than replaced by new structures at continuing business by 1992. Ramsey County, with Linder’s, Leben’s, Hermes’s, Holm and Olson’s, Huiras’, Pletscher’s and Chenoweth’s, a much smaller county than Hennepin, showed a steady slow increase that exceeded the loss of a few ranges over 10 years. Washington County including Bailey’s Nursery and Linder’s Lake Elmo range; Anoka County including Green Valley Greenhouses and the Hans Rosacker farm; Dakota County, with Bachman’s farm, Gerten’s and South Cedar Greenhouses, and Sherburne County with Hermes’s in Becker, Beck’s in Big Lake and Nelson’s in Zimmerman, show the greatest growth.

St. Louis County in northeastern Minnesota showed a fair increase in greenhouse area by 1987, but lost several firms by 1992. Production in a number of northern counties decreased in the 1980s and early 1990s. Crow Wing County, in the middle of the state, showed modest growth. Various good-sized ranges are also scattered in other counties around the state.

**GREENHOUSE CONSTRUCTION COSTS**

Greenhouse construction costs for the 1993-1994 period ranged from as little as $3 to more than $20 per square foot of floor space, not counting the cost of the land on which they were built. Temporary, quonset-shaped, plastic film houses erected for spring bedding plant sales were designed to sell for $3, or even less, per square foot.

Growing structures designed by individual growers and covered with plastic film ran $2 and higher per square foot for materials. With lumber prices skyrocketing, most new greenhouses were built with metal support structures. A grower could add another $5, or more, to the cost for minimal benches, walks, irrigation, lighting, etc. Com-
Ron Wagner showing a chamber for germinating seeds in plugs (above). Eight layers of aluminum bench top trays filled with sheets of plugs use the computerized environment efficiently. Conditions controlled include light, temperature, humidity and carbon dioxide levels. A bank of germination chambers (below) allows high volume production of young plants for national wholesale distribution. Carts in front of the chambers move large numbers of plants throughout the range without individual handling. (Photos by author)
Aerial view of Len Busch's three greenhouse ranges, which are scattered on his property because of the variable terrain. All are Lauer manufactured and glazed with rigid, double-layer, acrylic panels. The Minneapolis skyline is visible on the horizon to the right of center. (Photo courtesy Len Busch)

puterized environmental controls, mobile bench tops, heat and shade curtains and other refinements, if included, further increased construction costs. The cost of materials for installing high-intensity, sodium vapor lamps for growing roses would be about $3 per square foot of greenhouse area. Plastic film-covered, European-style connecting houses, with sturdy metal frameworks and ready to operate, cost $8 per square foot. Labor for construction of any of these options would cost extra.

Highly efficient, sturdy greenhouses, glazed with plastic film and fully equipped, could easily reach the upper $20 per square foot cost range. Large, aluminum framed standard-style greenhouses, glazed with acrylic or ultra-violet resistant, surface-treated polycarbonate, double-layer, box ribbed plastic panels and equipped to grow plants in a rock wool medium could cost about $23 per square foot.

Len Busch minimized his fuel bill by using waste wood to provide 75 percent of the heat his greenhouses needed. The other 25 percent would normally be provided by the high-intensity lamps used daily to increase total illumination units and improve plant production.
and quality. Natural gas was used to supplement the heat supply only on the limited number of extremely cold days. Without the usual heating fuel costs, he heated 400,000 square feet of greenhouses for 25 cents per square foot per year. To achieve this low cost, he also used double layer glazing and internal heat and light retention curtains installed above the high-intensity lamps. The fuel bill for conventional greenhouses heated with natural gas would have been about $1.25 annually for an average winter.

General operating costs per square foot of greenhouse average about $10.00 per year, plus extra costs for individual crops. Figures for northern Minnesota are slightly higher.

**RETAIL SALES**

The 1993 Research Report of the American Floral Endowment, *Flora-Stats*, noted that 57 percent of American households purchased at least one floral product in the period July 1992 through June 1993. The average household annual total expenditure was $46.39, spread over 3.7 purchases, with 53 percent of the customers buying fresh flowers 3.4 times for a total of $40.48. Distribution of sales by outlets in early 1994 is listed in Table 14.

<table>
<thead>
<tr>
<th>Outlet</th>
<th>Percent of Sales</th>
<th>Percent of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florist Shops</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Supermarkets</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td>Garden Centers</td>
<td>18</td>
<td>Not Available</td>
</tr>
<tr>
<td>Discount Chains</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Department Store Chains</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Home Improvement/Hardware Stores</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
No precise figures for the total number of floral and plant product retail sales outlets in Minnesota are readily available. Florists Transworld Delivery (FTD), the largest floral wire service, reports 404 member firms in the state. Further, numerous firms have multiple outlets. Knowledgeable florists estimate that 90 to 95 percent of retail florists are FTD members, and that the membership helps build their dollar volume. Thus, an estimated minimum of 450 retail florists represent 35 percent of the total florist sales volume, but only 14 percent of the total number of sales.

Fifty-one percent of the nation’s approximately 10,000 supermarkets sell floral products, suggesting that about 230 of Minnesota’s more than 450 supermarkets also likely do so. Some of these supermarket floral outlets are operated by retail florists. Combine the aforementioned units with significant numbers of garden centers, discount, department and home improvement stores selling floral and plant products and it can be estimated that there is a minimum of 1,200 retail floral and plant outlets in Minnesota.

Increases in the number of wire and long-distance phone service systems in the country have paralleled increases in floral sales. FTD has 23,000 members. American Floral Services (AFS) is the next largest such alliance with 21,000 members. Other similar operations include Teleflora Inc., Redbook Florist Services, Florafax, Carik Services Inc., 1-800-FLOWERS, and Phillips 1-800-FLORALS. Retail floral firms typically have memberships with FTD plus another service.

TEMPORARY GARDEN CENTERS

Temporary retail outlets operate only seasonally, usually in the spring, often supplementing the retail operations of production firms. They typically setup shop with temporary quonset-type plastic-covered shelters erected in parking lots of large supermarkets, hardware and building supply, and discount department stores. Other temporary centers operate around the winter holidays in short-term rented spaces within other stores, shopping malls, ‘public’ plazas, etc.
Linder's started its second greenhouse range in Lake Elmo in 1986. It currently totals 200,000 square feet of greenhouses designed by the Linder's firm. Its major crop of bedding plants is efficiently produced. Flowering potted plants are also grown for sale at its large year-round garden center on Larpenteur Avenue in St. Paul. Linder's large retail business far exceeds its wholesale business. By the spring of 1995, Linder's had 13 temporary garden centers in the greater St. Paul area.

LaVerne and Marge Christianson are now sole owners of Hiebert's 180,000 square foot range in Mountain Lake. Marge's son Paul, a University of Minnesota floriculture graduate, is also in the business. Gaylord Hiebert and his family retain ownership of the company's greenhouse ranges in South Dakota. Bedding plants are the major crop at Hiebert's and they have automated production in numerous respects. In the spring, they set up temporary garden centers at 50 supermarkets, large hardware stores, etc., in Minnesota and in northern Iowa. They also produce Easter lilies and poinsettias to sell wholesale to florists, but do not have a retail flower shop at the home base.

Other firms have also operated temporary garden centers over the years, and the business strategy may be growing.

The Forest Lake area grew rapidly in the 1980s. Mick and Sandy Roberts rebuilt and renamed their Forest Lake Greenhouses to Forest Lake Floral and Garden Center in 1993-1994. Their new facility included an attractive, 3,000 square foot retail flower and gift shop with storage and work areas, plus 12,000 square feet of new greenhouses and additional parking space. A third generation of the family is waiting in the wings to enter the business, and the family is considering entering the temporary garden mart business.

NORTH CENTRAL FLORISTS' ASSOCIATION (NCFA)

The NCFA is dedicated to the advancement of the floral industry. Its mission is accomplished by providing educational programs, special services and advertising support through cooperative market-
NCFA membership of about 600 is drawn from North and South Dakota, northern Iowa, western Wisconsin, and Minnesota. More than 85 percent of the member firms are in Minnesota. Its members include 48 percent of all retail florists in Minnesota, including many of the larger operations which, in aggregate, represent an even higher percentage of total floral sales in the state. Growers representing the bulk of Minnesota's greenhouse area are also members. Past association presidents are listed in Appendix D.

GOVERNMENT CONTROLS

EPA and OSHA started developing standards for environmental protection and worker safety in the 1970s. Stricter regulations and enforcement were evident in the early 1990s. Minnesota adopted worker protection standards that were stricter than the federal standards, and which applied to farm, forestry, greenhouses and nursery operations and their employees. They required employee training programs for persons using pesticides and equipment, and for persons working in the vicinity. In addition, complete written records had to be maintained to document compliance with the safety standards.

Because the number of enforcement agency employees was limited, most safety inspections followed employee complaints. Penalties for violations in the 1990s were up to ten times as costly as they were in the early years of the safety requirements, around 1974. Compliance with environmental regulations frequently came under scrutiny when a business sought financing for an expansion. Money lenders often required testing to determine if the ground under the greenhouses was free of toxic substances before granting mortgages for the purchase of greenhouse ranges.
University of Minnesota greenhouse facilities are used by horticulture students and researchers. Including the attached headhouse, it provides about 65,000 square feet of teaching and research space. (Photo by Dave Hansen)

GARDEN CLUBS

The Minnesota State Horticultural Society has grown to a membership of 16,000, and in 1993 its headquarters moved off the St. Paul Campus of the University of Minnesota to its own nearby building. The society publishes the bimonthly Minnesota Horticulturist magazine, maintains a large multi-media horticultural library for member use, develops informational seminars and meetings for current members and beginning gardeners, and sponsors tours to outstanding gardens and horticultural features throughout and outside the country. The Horticultural Society is affiliated with 250 local garden clubs throughout Minnesota. It also sponsors the Minnesota Green Community Gardeners program, a grassroots effort to revitalize communities by improving their environments through plantings. It is the only statewide program of this type in the country.

The Federated Garden Clubs, a national organization, has more than 1,000 members in Minnesota. Two of its major activities are operating judging schools and licensing qualified flower judges.

Both the Minnesota State Horticultural Society and the Federated Garden Clubs organizations provide scholarships for horticultural students at the University of Minnesota.
In 1995, Target, an upscale discount department store division of the Dayton-Hudson Corporation headquartered in Minneapolis, decided to enter a floral float for the first time in California's world-renowned, New Year's Day Tournament of Roses Parade. It was a 26-foot-high, 55-foot-long, five-ton replica of a 1935 Dusenberg Speedster with a family of seven bears on board and headed for the Rose Bowl football game.

The parade float exterior shell was an assembly of 250,000 flowers, arranged in various combinations with cinnamon, paprika, seaweed, palm fiber and onion seeds. Flowers included carnations, Cattleya and Dendrobium orchids, chrysanthemums, gerberas and roses. Minnesota florists Dale and Ruth Bachman, Ned and Lorna Butterfield and Jim, Karyn and Irene Goldstein of Monday Blooms were hired to work with 500 Target employee volunteers to prepare and apply the flowers and plant materials to the float. The Target float won the national trophy as best float of the 54 entries in the parade.

**GROWER EXPANSION**

Lynde Greenhouse and Nursery of Maple Grove added 12,000 square feet of greenhouses in 1994. In 1995 the company also in-
stalled a 1,500 foot, in-place, variable-speed conveyor belt plant mover with computerized controls for 24 destinations.

Expansion of Gerten's Greenhouses in Inver Grove Heights accelerated when Robert's sons, Lewis and Glen, joined the firm in 1980. By 1995, with the construction of an up-to-date one-acre addition, there were five acres under cover. Features of the facility include a heated concrete floor, collapsible side ventilation, horizontal air flow and overhead movable cable belts for hanging baskets which permit loading, unloading and watering in one location. The firm's expansion plans also include tripling the size of their retail store. The current operators are Lewis, Glen and Robert's son-in-law Gino Pitera. Sales are primarily retail and include nursery products.

Linder's erected a detached range of 10,000 square feet in St. Paul for forcing its 12,000 potted plant rose crop for spring and summer sales. Ninety percent are sold at retail. This new range will also be used to grow specialty crops. A 10,000 square foot, cold crop area was added to the 200,000 square foot range at Lake Elmo. In addition, a soil preparation area capable of producing 35 cubic yards of mix per hour was completed for use at the Lake Elmo range.

Bachman's large retail centers offer full floral services, potted flowering and green plants, bedding plants, bulbs, seeds, horticultural supplies and tools, patio furniture and gift items. These retail operations include greenhouses and outdoor sales areas. (Photo by author)
Bachman’s constructed a 100,000 square foot addition to its range in Farmington in 1995.

Len Busch Roses constructed a 60,000 square foot range of Lauer aluminum greenhouses covered with double-layer Exolite (acrylic) rigid plastic. It also added a 30,000 square foot headhouse building, large enough to service additional greenhouses which could be added in the future. The new greenhouses included an ebb-and-flow tray bench system, a tray stacker, a robotic plant spacer, and some overhead irrigation booms. This range is devoted to pot plant production with Pat Etzel in charge. The unit cost was about $30 per square foot of production area. Dave Hertog has continued in charge of pot plant production in the original range.

Dan and Jerry Greenhouses built additional plastic film greenhouses in Monticello in 1995. It now has 15 acres devoted to bedding plants.

Firms using automatic planting machines for bedding plants in 1995 included Bailey’s, Bergen’s, Donahue’s and Lynde’s.

Debbie Schwarze left the University in 1995, to accept a position with Koehler and Dramm in Minneapolis. Her position at the University was upgraded to include more responsibilities for independent experimentation and extension activities. Brian Kovanda was hired to fill the newly defined position of Assistant Floriculture Extension Specialist and Assistant Scientist. It continues to be partly funded by the Minnesota Commercial Flower Growers Association.

**FLORIST INDUSTRY MEETINGS AND REGULATIONS**

The annual North Central Florists’ Association Convention and Trade Show is held annually in late winter. In recent years, it has been held at the Minneapolis Convention Center. It continues to be a strong industry activity with 900 reported attendees in 1995. The program included a one-day greenhouse bus tour for growers, another bus tour for retailers, and a large two-day trade show. The second day offered business seminars, a floral design symposium and a floral design competition.
Every autumn, a three-day short course is presented by the Minnesota Commercial Flower Growers Association. Attendance has averaged more than 200 in recent years. The short course program includes a greenhouse bus tour, plus discussions on sales and production techniques spread over two days, featuring talks by University of Minnesota staff and industry specialists from Minnesota and elsewhere. A half-day session on pesticide recertification usually concludes the short course. Past presidents of Minnesota Commercial Flower Growers are listed in Appendix D.

Effective January 1995, Minnesota’s Worker Protection Standards (WPS) for protecting agricultural workers from the dangers of improper use of pesticides were revised. Inspectors now announce in advance when they will inspect individual greenhouse operations, and owners and operators are informed of any violations found and provided an opportunity to correct the problems. Follow up visits are made to determine whether the required corrections were made, and penalties can then be assessed if they are not completed.

**FLORIST INDUSTRY SEGMENTS**

There are currently eight major wholesale cut-flower houses in the Twin Cities area. Three are owned by local growers: Hermes Floral of Falcon Heights; J.R. Johnson Supply, Inc., of Roseville and Len Busch Roses of Plymouth. The others are Koehler and Dramm and Twin City Florist Supply, Inc., both of Minneapolis; Metro Florist Supply, Inc., of Roseville; Van’s Floral Products of Edina and Traders’ Edge of Bloomington. Many of them now sell pot plants as well as supplies for retail florists.

Sales representatives for numerous out-of-state firms that sell seeds, bulbs, young plants and supplies also service commercial clients in Minnesota and visit the state’s florists regularly.

The Minnesota Commercial Flower Growers organization has 120 members who represent a major portion of the floricultural crop production industry in Minnesota. There are also members from neighboring states, plus associate members from other parts of the United States and from other countries. They join primarily to obtain the Minnesota Commercial Flower Growers Association Bulletin.

**ESTIMATED INDUSTRY VALUE**

An estimated retail sales value for Minnesota floriculture is presented in Table 15. The USDA’s National Agricultural Statistics Service Floriculture Crops 1993 Summary provided the basic figures for Minnesota produced crop values. Estimates of percent of crop products sold that were shipped into Minnesota, and the average retail mark-up factor of 2.0 were based on the author’s discussions with industry representatives. Lack of government figures on the value of Minnesota’s retail florist industry necessitated development of the estimated value.

Despite Minnesota’s floriculture profession being comprised primarily of relatively small businesses, the industry’s total thrust on the state’s economy was calculated in excess of $200 million in 1993. Because of continued greenhouse expansion and floral imports, the figure for 1995 could easily exceed $250 million. This figure includes sales through the assortment of retail outlets listed in Table 14. Wholesale sales to retailers in neighboring states might lower the Minnesota retail value by an estimated 5 to 10 percent.

**OUTLOOK AND ANALYSIS**

Based on U.S. Census Bureau figures, the current Minnesota greenhouse production area for floricultural crops exceeds 9 million square feet.
Table 15. Estimated retail value of the Minnesota floriculture industry in 1993.

<table>
<thead>
<tr>
<th>Crop Grouping</th>
<th>USDA Mode Expanded Wholesale Value</th>
<th>Estimated Percent of Product Sold That is Shipped Into Minnesota</th>
<th>Estimated Wholesale Value of Minnesota Shipped in Floral Products Sold in</th>
<th>Estimated Total Wholesale Value</th>
<th>Estimated Markup of 2.0 for Retail Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut Flowers</td>
<td>$8,308,000</td>
<td>85</td>
<td>$47,079,000</td>
<td>$55,387,000</td>
<td>$110,774,000</td>
</tr>
<tr>
<td>Potted Flowering Plants</td>
<td>$12,352,000</td>
<td>20</td>
<td>$3,088,000</td>
<td>$15,440,000</td>
<td>$30,880,000</td>
</tr>
<tr>
<td>Bedding Plants</td>
<td>$28,297,000</td>
<td>5</td>
<td>$1,489,000</td>
<td>$29,786,000</td>
<td>$59,572,000</td>
</tr>
<tr>
<td>Foliage Plants</td>
<td>$1,096,000</td>
<td>85</td>
<td>$6,210,000</td>
<td>$7,306,000</td>
<td>$14,612,000</td>
</tr>
<tr>
<td>Total</td>
<td>$50,053,000</td>
<td></td>
<td>$57,866,000</td>
<td>$107,919,000</td>
<td>$215,838,000</td>
</tr>
</tbody>
</table>

A strong effort by Minnesota flower growers was always required to overcome the weather-related obstacles presented by our harsh winter climate, and varying economic climates and other vagaries of life. In time, they faced the competition of florists in other states nearby, the southern states of the United States, and now, producers throughout the world.

As with much of agriculture, flower and plant producers work with live, non-forgiving crops which have a limited shelf life. The flo-
eral industry has responded intelligently to the challenges with hard work, initiative, ingenuity, through times of adversity, with courage and pride. Their efforts in Minnesota have had the cooperation of the University of Minnesota. In floriculture, a high percentage of wives have always worked beside their husbands to develop the family business and meet the challenges. It was a progressive attitude that substantially predates the modern trend of women working at paying jobs outside the home.

The University of Minnesota's mutually beneficial working relationship with the industry started early in the twentieth century. The role of the University, to facilitate the development, survival and advancement of floricultural product production, has on the whole been successfully executed. The University's end of the partnership has been characterized by several approaches:

• Development and application of technical advances to hasten and improve production;
• Ascertaining causes of and remedies for difficulties encountered by professional growers;
• Educating the non-industry public about appropriate and beneficial uses of floricultural products;
• Familiarizing professional producers with research findings; and
• Educating undergraduate and graduate students to provide persons equipped to further the development of floriculture.

Over the years, the University of Minnesota has also played a significant role in aiding florists in neighboring states and beyond. It has aided growers throughout the country in efficiently producing high quality specialty crops such as Alstromeria, Easter lilies, Poinsettias, Bedding Plants, Roses and Cyclamen. In return, Minnesota's growers have benefitted from developments at agricultural experiment stations in other states. With major competitive changes occurring in recent years within the industry, domestically and internationally, greater efficiencies continue to be a priority requirement. This suggests a probable need for the University of Minnesota and Minnesota florists
to continue their partnership as the floriculture leaders in the upper midwest region of the United States.

A few of the larger firms in the floriculture field are developing their own research programs. These are expected to become stronger, and the trend more commonplace in the field. Fruits of the efforts of ingenious, innovative growers have always been evident. The fact that Minnesota commercial floriculture is basically an industry of small businesses highlights the essential need for a continuing, strong, supportive role by the University of Minnesota.

Use of bedding plants in Minnesota gardens and the indoor use of flowers and plants, despite significant increases, are just scratch-
ing the surface. One need only visit numerous European countries including the Netherlands, to see visual proof of the potential.

Weather remains an important factor in Minnesota production, although its effect may be modified in a few instances by the utilization of new cultural techniques. Sales of floral products may be modified significantly by adverse weather conditions, and to a greater extent than sales of inanimate objects. Stormy weather immediately preceding holidays such as St. Valentine's Day and Easter has the substantial potential to affect sales negatively. Easter lilies, for example, are not purchased the day after Easter; and a series of cold, rainy spring weekends will likely significantly curtail bedding plant sales to home gardeners.

Production must be made increasingly productive and efficient, as price, quality, and value are key factors in retail sales. Automation and computerization are currently playing key roles, but the world is constantly changing and new innovations are always being sought. Still, if the past is indicative, Minnesota floriculture should have a good future, provided a continuously dedicated, cooperative effort is faithfully applied.

Currently, Minnesota growers are expanding to fill the public's demand for high quality floral products efficiently produced locally. This appreciation of the local product should help limit imports of bedding plants and potted flowering plants from other states. Unfortunately, university administrators throughout the United States have significantly curtailed important one-on-one contacts between university personnel and greenhouse operators. The University of Minnesota must, however, strive to continue to operate as efficiently and effectively as possible despite continuing budgetary retrenchments, while industry must continue to cooperate as it has in the past. Recent changes leave a big void which will sometimes need to be filled by commercial producers, with hired consultants where available and when economically feasible.

Finally, it must also be noted that floriculture, through its products, artistry and gardening activities, provides mental and physical therapeutic benefits beyond those that can
be measured in dollars. Florists can be proud of their industry and its efforts to improve the quality of life. Minnesota floriculture has been a bright spot recognized on the national and international floricultural scene. A continued, unified effort will maintain a vibrant industry. Past success has not been an accident, and future success will likely be a similar product of hard work, intelligent planning, ingenuity, investment and cooperation.
Appendix A

Minnesotans Who Served as National Officers of FTD and SAF

FTD

1914 to 1917  Olaf J. Olson, Director
             Holm and Olson, St. Paul

1924 to 1927  Olaf J. Olson, Director
             Holm and Olson, St. Paul

1932 to 1935  Charles Siebrecht, Director
             Central Greenhouses, Winona

1938 to 1941  Hans Rosacker, Director
             Hans Rosacker Co., Minneapolis

1951 to 1954  Harald Thompson, Director
             Holm and Olson, Rochester

1954 to 1956  Harald Thompson, Treasurer
             Holm and Olson, Rochester

1957 to 1960  Ralph Bachman, Director
             Bachman's, Inc., Minneapolis

1962 to 1963  Ralph Bachman, President
             Bachman's, Inc., Minneapolis

1964 to 1967  Ralph Bachman, Director/Interflora
             Bachman's, Inc., Minneapolis
1966 to 1969  Marvin Saline, Director  
Hans Rosacker Co., Minneapolis

1968 to 1969  Marvin Saline, Treasurer  
Hans Rosacker Co., Minneapolis

1975 to 1978  Donald Lindskoog, Director  
Lindskoog Florist, Minneapolis

1981 to 1984  Frank Renning, Director  
Renning's Flowers, Inc., Rochester

1990 to 1993  Alan Bachman, Director  
Bachman's, Inc., Minneapolis

SAF

Theodore Wirth, Superintendent of Parks in Minneapolis was the only Minnesotan ever elected President of SAF (1914). A list of persons who served in other positions was not available from SAF.
Appendix B

Chrysanthemum and Rose Cultivars
Introduced by the
University of Minnesota
Agricultural Experiment Station

NOTES:
Heights, where given, are designated as low (up to 12 inches), medium (12 to 18 inches) or tall (more than 18 inches). These measurements refer to first year plants properly spaced and grown in full sun.

Time to bloom is referenced to the Minneapolis-St. Paul area and, where given, is designated as early (before September 1), midseason (September 1-15), or late (after September 15).

GREENHOUSE CHRYSANTHEMUMS

1934  Hiawatha — (na)
1935  Fawn — fawn color flowers
      Northstar — yellow
      Snowflake — white
1940  Daisymum — white, single
      Sioux — single, aster purple
      Winona — single, lemon chrome

GARDEN CHRYSANTHEMUMS

1941  Boreas — 2-inch, white, double
      Duluth — 2-inch, lemon-yellow, semi-double
      Harmony — 2.25-inch, yellow to red, double
Moonglow — 1.75-inch, lemon-chrome, double
Redwing — 1.75-inch, red, semi-double
Welcome — 1.75-inch, mallow-purple, semi-double

1942
Chippewa — 2.75-inch, aster purple, semi-double, tall, midseason to late
Purple Star — 2-inch, purple, double, midseason
Redgold — 2-inch, bright reddish-bronze, early
Sunred — 3-inch, Brazil-red, semi-double, wide spreading

1943
Pipestone — 2.75-inch, Brazil-red, semi-double
Waterlily — 2.5-inch, white

1944
Butterball — 2.5-inch, lemon-chrome, pompon, early
Glacier — 2-inch, early, decorative, white, early
Redhawk — 2-inch, red, quilled
Redwood — 2-inch, carmine, semi-double
Snowball — 1.5-inch, white, double

1945
Aurora — 2.25-inch, blood-red, double
Maroon’n Gold — 3.5-inch, red to maroon and gold, double, low, early
Dee Dee Ahrens — 2-inch, white, double
Violet — 3-inch, purple, double, low, midseason

1947
Brilliant — cushion, 2.5-inch, Brazil-red, double
Silver Pink — 2.5-inch, pink with silvery sheen, double

1948
Bountiful — 2.5-inch, carmine, double

1949
Dr. Longley — 3-inch, rose-pink, decorative, early to midseason
Moonlight — 3-inch, white, pale yellow center, reflexed, midseason

1952
Harvest Bronze — 3-inch, apricot-bronze, double, low, early
Prairie Sunset — 3.5-inch, bright rose-pink and gold, double, medium, early

1955
Wenonah — 2.25-inch, lavender, double, medium-tall, early
Vulcan — 2.5-inch, dark red, decorative, early

1956
Mesabi — 2-inch, copper-red, double
Wanda — 3-inch, raspberry-pink, double, early

1957
Golden Fantasy — 2-inch, golden yellow, fringe tipped, decorative, midseason
Minnbronze — cushion, 1.5-inch, vivid bronze, double, midseason to late

Minnpink — cushion, 1.5-inch, rose-pink, decorative, early

1958 Minnehaha — 2.5-inch, rose-tinted, salmon, double, tall, midseason

Princess — 2-inch, salmon, double, medium, early

1959 Prairie Moon — 4-inch, creamy-white, double, tall, midseason

Tonka — 3-inch, yellow, double, tall, midseason

1961 Wayzata — 3-inch, bright yellow, decorative, tall, early

1962 MinnAutumn — cushion, 2.5-inch, brilliant reddish-bronze, decorative, midseason

1963 Tenstrike — 1.5-inch, bright lavender, pompon, early

1964 Goldstrike — 2-inch, golden yellow, pompon, medium, early

Zonta — 2.5-inch, apricot-bronze, pompon, tall, midseason

1965 Superior — 3-inch, bright orange, decorative, tall, midseason

1966 Cream Top — 3-inch, white with yellow centers, double, tall, midseason

Minnrose — cushion, 1.5-inch, rose-pink, pompon, midseason

1968 Minnwhite — cushion, 2-inch, white, decorative, early

Sunny Glow — 2.5-inch, orange-gold, decorative, tall, early

1969 Royal Pomp — 2-inch, bright purple, pompon, medium, midseason

Yellow Glow — 2.75-inch, rich yellow, decorative, tall, midseason

1971 Golden Jubilee — 3-inch, deep gold, decorative, early

1972 Minnglow — cushion, 2.25-inch, light lemon-yellow, decorative, midseason

Minnyellow — cushion, 2-inch, rich lemon-yellow, decorative, late

1974 Lindy — 5-inch, lavender-pink, quilled, double, tall, midseason

Minnruby — cushion, 2.5-inch, ruby-red, double, decorative, midseason

Wendy Ann — 4.5-inch, fawn-yellow, double, semi-spoon, medium, early

1977 Autumn Fire — 4-inch, glowing burnt orange, double, decorative, tall, midseason

Golden Star — 3.5-inch, yellow, spoon, duplex, early
Minnogopher — cushion, 2.5-inch, ruby-red, decorative, similar to but 10 days later than Minnruby

1979 Minnqueen — cushion, 3-inch, rose-pink, flat decorative, midseason
Royal Knight — 3.5-inch, velvety burgundy, with silver underside, decorative, tall, midseason

1982 Centerpiece — 4-inch, rose-lavender, quilled, tall, early to midseason

1983 Gold Country — 4.5-inch, peachy to rich yellow, double, decorative, tall, midseason
Mellow Moon — 5-inch, cream, semi-incurved, double, decorative, midseason

1985 Centennial Sun — 1.5-inch, bright golden yellow, pompon, early

1987 Rosy Glow — 4-inch, deep rose-pink, incurved, double, medium, midseason

1988 Burnt Copper — 3-inch, orange-bronze to orange, pompon, tall, midseason
Grape Glow — 3.75-inch, bright rosy-purple, decorative, medium, midseason
Lemonsota — 1-inch, lemon-yellow with darker centers, pompon, low, midseason

1989 Maroon Pride — 3.5-inch, dark red, double, flat decorative, medium, early
Snowsota — 1.5-inch, white with yellow centers, pompon, medium, early

1993 Rose Blush — 3-inch, mauve to rose-pink, double, flat decorative, medium, early

GARDEN ROSES

1949 Pink Rocket — Single, pink flowers, repeat bloom
Red Rocket — Single, red flowers, repeat bloom
White Dawn — Double, white flowers, climber

1959 Prairie Fire — Single, vivid pink-red flowers, repeat bloom

1963 Viking Queen — Double, pink flowers, climber
A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

Appendix C

Past Presidents, North Central Florists Association

The Twin City Florists' and Gardener's Club formed in 1907, became the Minnesota State Florists' Association in 1908. The Minnesota Florists' Public Relations Committee established in 1950, merged with the Minnesota State Florists' Association to create the Minnesota Allied Florists' Association in 1960. In 1969, the name was changed to the North Central Florists Association.

<table>
<thead>
<tr>
<th>Period</th>
<th>President</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1908-1911</td>
<td>Theodore Wirth</td>
<td>Minneapolis Park Board</td>
</tr>
<tr>
<td>1911-1913</td>
<td>Hugh Will</td>
<td>Will Brothers Co.</td>
</tr>
<tr>
<td>1913-1915</td>
<td>O.J. Olson</td>
<td>Holm and Olson</td>
</tr>
<tr>
<td>1915-1917</td>
<td>W.D. Desmond</td>
<td>a greenhouse operator</td>
</tr>
<tr>
<td>1917-1918</td>
<td>LeRoy Cady</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1918-1919</td>
<td>Hans Rosacker</td>
<td>Hans Rosacker Co.</td>
</tr>
<tr>
<td>1919-1924</td>
<td>Max Kaiser</td>
<td>Merriam Park Floral Co.</td>
</tr>
<tr>
<td>1924-1926</td>
<td>Hans Rosacker</td>
<td>Hans Rosacker Co.</td>
</tr>
<tr>
<td>1926-1927</td>
<td>Hugh Will</td>
<td>Will Brothers Co.</td>
</tr>
<tr>
<td>1927-1930</td>
<td>C.N. Ruedlinger</td>
<td>Ruedlinger's</td>
</tr>
<tr>
<td>1930-1932</td>
<td>Henry Rosacker</td>
<td>Hans Rosacker Co.</td>
</tr>
<tr>
<td>1932-1935</td>
<td>F.W. Topel</td>
<td>F.W. Topel Conservatory</td>
</tr>
<tr>
<td>1935-1936</td>
<td>Warren D. Olson</td>
<td>—</td>
</tr>
<tr>
<td>1936-1937</td>
<td>Carl I. Linskoog</td>
<td>Linskoog Florist</td>
</tr>
<tr>
<td>Years</td>
<td>Name</td>
<td>Organization</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>1937-1941</td>
<td>Louis Sando</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1941-1943</td>
<td>F.W. Topel</td>
<td>F.W. Topel Conservatory</td>
</tr>
<tr>
<td>1943-1946</td>
<td>Ralph W. Bachman</td>
<td>Bachman's, Inc.</td>
</tr>
<tr>
<td>1946-1948</td>
<td>Joseph Bilski</td>
<td>Merriam Park Floral Co.</td>
</tr>
<tr>
<td>1948-1950</td>
<td>George H. Olson</td>
<td>Holm and Olson</td>
</tr>
<tr>
<td>1950-1951</td>
<td>Ralph W. Bachman</td>
<td>Bachman's, Inc.</td>
</tr>
<tr>
<td>1952-1953</td>
<td>Joseph Connolly</td>
<td>Connolly Flowers</td>
</tr>
<tr>
<td>1953-1955</td>
<td>Ewald N. Hermes</td>
<td>Hermes Floral Co.</td>
</tr>
<tr>
<td>1955-1958</td>
<td>Stanley F. Bachman</td>
<td>Bachman’s, Inc.</td>
</tr>
<tr>
<td>1958-1959</td>
<td>Arthur Lange</td>
<td>Lange’s Florist</td>
</tr>
<tr>
<td>1959-1960</td>
<td>Stanley Hampl</td>
<td>Holm and Olson</td>
</tr>
<tr>
<td>1960-1961</td>
<td>Lloyd A. Bachman</td>
<td>Bachman’s, Inc.</td>
</tr>
<tr>
<td>1961-1962</td>
<td>Donald C. Lindskoog</td>
<td>Lindskoog Florist</td>
</tr>
<tr>
<td>1962-1963</td>
<td>Fred Busch, Jr.</td>
<td>Busch Brothers</td>
</tr>
<tr>
<td>1965-1966</td>
<td>Tom D. Wright</td>
<td>Twin City Florist Supply, Inc.</td>
</tr>
<tr>
<td>1966-1967</td>
<td>Roger O. Schnabel</td>
<td>St. Anthony Floral Greenhouses</td>
</tr>
<tr>
<td>1968-1969</td>
<td>Clarence Engwall</td>
<td>Engwall Florist &amp; Greenhouse</td>
</tr>
<tr>
<td>1973-1975</td>
<td>Robert W. Busch</td>
<td>Busch Brothers</td>
</tr>
<tr>
<td>1975-1977</td>
<td>Jerry Palmer</td>
<td>Jerry Palmer Florist</td>
</tr>
<tr>
<td>1981-1983</td>
<td>Marcia Schaff **</td>
<td>Schaff Floral, Inc.</td>
</tr>
<tr>
<td>1983-1985</td>
<td>James Dey</td>
<td>Dey Brothers Greenhouses</td>
</tr>
<tr>
<td>Years</td>
<td>Name</td>
<td>Company</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1985-1987</td>
<td>Todd Bachman</td>
<td>Bachman’s, Inc.</td>
</tr>
<tr>
<td>1987-1989</td>
<td>Wally Peterson</td>
<td>Crown Floral</td>
</tr>
<tr>
<td>1990-1992</td>
<td>Leonard Busch</td>
<td>Len Busch Roses</td>
</tr>
</tbody>
</table>

* Served as president during the transition from a state to a regional floral organization.

** The first female president.
A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

Appendix D

Past Presidents, Minnesota Commercial Flower Growers Association

1955-1957  Lloyd A. Bachman          Bachman’s, Inc.
1957-1959  Roger O. Schnabel         St. Anthony Floral Greenhouses
1959-1961  Fred Busch                Busch Brothers
1965-1967  Nick Lebens II            Lebens Flowers, Inc.
1971-1973  Leonard Busch             Len Busch Roses
1973-1975  Todd Bachman              Bachman’s, Inc.
1975-1976  Jim Dey                   Dey Brothers Greenhouses
1977-1978  Nick Lebens III           Lebens Flowers, Inc.
1983-1984  Rainer Pensky             Buffalo Floral and Greenhouse
1985      George Lucht               Malmborg’s, Inc.
1986      Bob Cashman                Cashman Greenhouses, Inc.
1988      Ron Wagner                 Wagner Greenhouses
1989      Dave Linder                Linder’s Greenhouses, Inc.
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>Carol H. Thuening*</td>
<td>Earl Holasak Greenhouses</td>
</tr>
<tr>
<td>1991</td>
<td>Scott Carbonneau</td>
<td>Hans Rosacker Co.</td>
</tr>
<tr>
<td>1992</td>
<td>Mark Wittman</td>
<td>Len Busch Roses</td>
</tr>
<tr>
<td>1993</td>
<td>Steve Maslowski</td>
<td>Malmborg's, Inc.</td>
</tr>
<tr>
<td>1994</td>
<td>Dave Hallstrom</td>
<td>Hallstrom and Son, Florist</td>
</tr>
<tr>
<td>1995</td>
<td>Randy Reed</td>
<td>Len Busch Roses</td>
</tr>
</tbody>
</table>

*The first and only female president in 40 years.*
A Chronicle of People and Events Significant to the Commercial Growth of Minnesota Floriculture, University of Minnesota Contributions to the Industry, and Minneapolis-St. Paul Parks Developments

References


*Minnesota Science.* 1975. Special Centennial Issue. 31(1).


# Index

## Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-800-FLORALS</td>
<td>186</td>
</tr>
<tr>
<td>1-800-FLOWERS</td>
<td>186</td>
</tr>
</tbody>
</table>

## A

- A. Johnson and Sons 54
- Aaron Johnson Florist 54
- Addison 90-91
- Aderhold 115
- AFS (see American Floral Service) 112
- Agricultural College at Glencoe 9
- Agricultural Experiment Station 9, 93-94, 102, 119, 138
- Agricultural Extension 78, 79, 146
- Ahrens 64
- Ahren's range 92
- Albert J. Lauer, Inc. 60, 184, 192, 193
- Alderman 2, 28, 39, 79, 114, 116, 130
- Alex Laurie Award for Research and Education 138, 151
- All American Awards 57
- Allen 113
- Allison Floral 30
- Ambergate Gardens 129
- American Carnation Society 35, 75
- American Floral (Florists) Endowment 124, 139, 176-177, 185
- American Floral Marketing Council 90
- American Floral Services (AFS) 186
- American Florists (Floral) Endowment 124, 139, 176-177, 185
- American Rose Society 70
- American Society for Horticultural Science (ASHS) 27-28, 61, 114, 138
- Ames 3
- Amlings 58, 125
- Anderson, A. 37, 42
- Anderson, Brian 128
- Anderson, Bruce 64
- Anderson, George 56
- Anderson, Gerald 67-69
- Anderson, R. 66-67, 73
- Anderson Floral 30
- Arboretum (see Minnesota Landscape Arboretum) 94
- Archer-Daniels-Midland 91
- Arneson 58
- Ascerno 117, 124, 159
- Austin Ladies Floral Club 3

## B

- Bachman, Herman 58
- Bachnik 76
- Backes 58
- Baerman 57
- Bailey, G. 80, 125-126
- Bailey, L. 11
- Bailey, R. 125-126
- Bailey, V. 115
- Bailey Nursery (see J.V. Bailey Nursery) 6
- Baker Greenhouse and Gardens 6
- Barr 56
- Barr's Flower Shop 56
- Bartz 138
- Bauer 76
- Bauer's Greenhouses 76, 180
- Bazinet 90
- Beal 63
<table>
<thead>
<tr>
<th>Company</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beal's Greenhouses</td>
<td>63</td>
</tr>
<tr>
<td>Beck</td>
<td>182</td>
</tr>
<tr>
<td>Bedding Plants Foundation</td>
<td>124, 132</td>
</tr>
<tr>
<td>Bedding Plants Inc.</td>
<td>132</td>
</tr>
<tr>
<td>Beeklen</td>
<td>107</td>
</tr>
<tr>
<td>Behrens</td>
<td>14</td>
</tr>
<tr>
<td>Belden Plastics</td>
<td>88, 153</td>
</tr>
<tr>
<td>Bellows</td>
<td>14</td>
</tr>
<tr>
<td>Bengston</td>
<td>69, 115</td>
</tr>
<tr>
<td>Bennett</td>
<td>54</td>
</tr>
<tr>
<td>Beresford</td>
<td>94</td>
</tr>
<tr>
<td>Bergen</td>
<td>59, 157-158</td>
</tr>
<tr>
<td>Bergen's Greenhouses</td>
<td>59, 88, 157-158, 192</td>
</tr>
<tr>
<td>Bergen's Truck Farm</td>
<td>59</td>
</tr>
<tr>
<td>Bergen's Wholesale Florists</td>
<td>59</td>
</tr>
<tr>
<td>Bergum</td>
<td>44</td>
</tr>
<tr>
<td>Betzold</td>
<td>21</td>
</tr>
<tr>
<td>Beugen</td>
<td>25, 86</td>
</tr>
<tr>
<td>Biery</td>
<td>27</td>
</tr>
<tr>
<td>Biester</td>
<td>14</td>
</tr>
<tr>
<td>Bilski</td>
<td>31, 47, 65, 85, 207</td>
</tr>
<tr>
<td>Binnie</td>
<td>59</td>
</tr>
<tr>
<td>Binnie Floral</td>
<td>59</td>
</tr>
<tr>
<td>Blair</td>
<td>46</td>
</tr>
<tr>
<td>Bliss</td>
<td>58</td>
</tr>
<tr>
<td>Bob's Produce Ranch</td>
<td>100</td>
</tr>
<tr>
<td>Boeglin</td>
<td>58</td>
</tr>
<tr>
<td>Boock</td>
<td>8, 104-105</td>
</tr>
<tr>
<td>Borbeleta Gardens</td>
<td>103-104</td>
</tr>
<tr>
<td>Boyd</td>
<td>102</td>
</tr>
<tr>
<td>Bradley</td>
<td>108</td>
</tr>
<tr>
<td>Brainerd Vocational Technical Institute</td>
<td>65, 85</td>
</tr>
<tr>
<td>Brainerd/Staffs Technical College</td>
<td>85</td>
</tr>
<tr>
<td>Brand</td>
<td>4-5, 46</td>
</tr>
<tr>
<td>Brand Nursery</td>
<td>5, 46</td>
</tr>
<tr>
<td>Brand Peony Farms</td>
<td>46</td>
</tr>
<tr>
<td>Brant and Noe</td>
<td>19</td>
</tr>
<tr>
<td>Brodin</td>
<td>87</td>
</tr>
<tr>
<td>Broman</td>
<td>89</td>
</tr>
<tr>
<td>Brookside Bulb and Azalea Farm</td>
<td>21</td>
</tr>
<tr>
<td>Brostrom</td>
<td>84</td>
</tr>
<tr>
<td>Brown</td>
<td>111</td>
</tr>
<tr>
<td>Bryant</td>
<td>54</td>
</tr>
<tr>
<td>Bryant Orchids</td>
<td>54</td>
</tr>
<tr>
<td>Buckendorf</td>
<td>3, 4</td>
</tr>
<tr>
<td>Buffalo Floral and Greenhouse</td>
<td>209</td>
</tr>
<tr>
<td>Bunde</td>
<td>6</td>
</tr>
<tr>
<td>Burson</td>
<td>78</td>
</tr>
<tr>
<td>Busch</td>
<td>7, 35, 36, 58, 86-87, 115, 130, 152-153, 171, 180, 184, 207, 208, 209</td>
</tr>
<tr>
<td>Busch Brothers</td>
<td>35, 47, 86, 130, 207, 209</td>
</tr>
<tr>
<td>Busch Greenhouses</td>
<td>15, 35 (see also Len Busch Greenhouses)</td>
</tr>
<tr>
<td>Busse</td>
<td>105</td>
</tr>
<tr>
<td>Busse Garden Center and Nursery</td>
<td>105</td>
</tr>
<tr>
<td>Busse Perennial Center</td>
<td>105</td>
</tr>
<tr>
<td>Bussjaeger</td>
<td>16</td>
</tr>
<tr>
<td>Butterfield</td>
<td>44, 69, 108, 111, 190</td>
</tr>
<tr>
<td>Butterfield Floral</td>
<td>69</td>
</tr>
<tr>
<td>Butterfield's</td>
<td>44, 108</td>
</tr>
<tr>
<td>Byerly's Supermarkets</td>
<td>154</td>
</tr>
<tr>
<td>Caddy</td>
<td>26-27, 39, 50, 206</td>
</tr>
<tr>
<td>Campbell</td>
<td>104</td>
</tr>
<tr>
<td>Carbonneau</td>
<td>210</td>
</tr>
<tr>
<td>Care of House Plants</td>
<td>147</td>
</tr>
<tr>
<td>Carew</td>
<td>56</td>
</tr>
<tr>
<td>Cargill</td>
<td>37</td>
</tr>
<tr>
<td>Carik Services Inc.</td>
<td>186</td>
</tr>
<tr>
<td>Carlson</td>
<td>19</td>
</tr>
<tr>
<td>Cary</td>
<td>50, 61</td>
</tr>
<tr>
<td>Case</td>
<td>74, 88</td>
</tr>
<tr>
<td>Cashman</td>
<td>8, 35, 207, 209</td>
</tr>
<tr>
<td>Cashman Greenhouses</td>
<td>35, 207, 209</td>
</tr>
<tr>
<td>Castle Rock Orchids</td>
<td>151</td>
</tr>
<tr>
<td>Cedar Lake Floral</td>
<td>56</td>
</tr>
<tr>
<td>Central City Farmers' Market</td>
<td>16</td>
</tr>
<tr>
<td>Central Floral Company</td>
<td>30, 64</td>
</tr>
<tr>
<td>Central Greenhouses</td>
<td>17, 200</td>
</tr>
<tr>
<td>Central International Agriculture Tropical (CIAT) research station</td>
<td>117</td>
</tr>
<tr>
<td>Central Minnesota Vegetable Growers Association</td>
<td>60</td>
</tr>
<tr>
<td>Chappuis</td>
<td>101</td>
</tr>
<tr>
<td>Chastek</td>
<td>83</td>
</tr>
<tr>
<td>Chenoweth</td>
<td>45, 182</td>
</tr>
<tr>
<td>Chicago Avenue Floral</td>
<td>37</td>
</tr>
</tbody>
</table>
Chicago Avenue Greenhouses 46
Chicago Floral Company 37
Christian 56, 187
Christopherson 86
Chrysanthemum breeding 96, 142, 159, 202
Clark 57
Cleveland 5-6, 11
Clinton Falls Nursery 8
College of Agriculture 9, 11, 78
College of Forestry 27
College of Home Economics 38
College Park 28
Colonial Gardens 57
Como Conservatory Restoration Society 122
Como Conservatory Planning Advisory Committee 122
Como Park and Conservatory 5, 11-12, 29, 32, 40, 45, 62, 82, 93, 122, 162-163
Connolly 207
Connolly Flowers 207
Corbett 28
Cornelius 22-23, 128
Crombie 128
Crown Floral 208
Crystal Lake Floral Design and Orchids by Murphy 158
Cutkomp 80, 117

D

D.A. Baker Greenhouse and Gardens 6
Dale Street Greenhouses 16, 59
Dan and Jerry Greenhouses 107-108, 180, 192
Danheim 105
DaRe 132
Davidson 17
Davis 105, 157
Day 62, 162
Dayton-Hudson Corporation 72, 85, 190
Decorah Gardens 57
DeGrood 84
'Department 56' 90, 130, 153, 155

Department of Agriculture 1
Department of Horticultural Science 114, 115
Department of Horticultural Science and Landscape Architecture 116, 130, 131, 145
Department of Horticulture 32, 78, 79, 80, 83, 87, 93, 94, 114
Desmond 7, 206
Day 49, 75, 111, 207, 209
Day Brothers Greenhouses 49, 207, 209
Dirks 85
Division of Agricultural Education 38
Division of Horticulture 2, 9, 27, 28, 38-40, 50-51, 61, 78
Division of Horticulture and Forestry 9, 10, 27
Dodd 21
Donahue 56, 100-101
Donahue's Greenhouses 100-101, 180, 192
Donald 49
Donaldson 4, 7
Donaldson's Greenhouses 25, 31
Dooley 76
Dooley Gardens 76
Dorsey 28
Dosedall 80
Dramm 125
Dries 6
Dudek 76
Dudek Supply Company 76, 193
Dunbar 16
Duncan 113-114, 116
Dundee Floral 88, 180
Dundee Nursery and Landscaping Company 87-88
Duos 125
Dwyer 125

E

Earl Holasek and Son 76
Earl Holasek Greenhouses 157, 210
East Side Floral Company 21
Eckhardt 29, 42, 50
Edmonds 19, 74
Eidsmoe 84
Eisele 64, 156
Elliott 4
Elmquist 57
Elson 27
Emil Rieple Greenhouses 49
Engwall 53, 106, 111, 207
Engwall Florist & Greenhouse 53, 106, 151, 207
Ennenga 150
Environmental Protection Agency (EPA) 102, 110, 188
Erickson, L. 42-43
Erickson, P. 8, 103
Erickson Greenhouses 103
Erwin 139-140, 151, 159, 160
Etzel 192
European Flower Markets 89, 130, 154
Eveleth Floral Company 43
Everton Growers 129, 153

F
F.W. Topel Conservatory 29, 206, 207
Faribault Nursery 4
Farmer's Nursery and Garden Center 46
Farmer's Seed Company 13-14
Farmers Seed and Nursery Company 14
Federated Garden Clubs 189
Ferris 139
Flitsdal 66
Flitsdal Flowers 66
Fischer 56-57
Fischer's Nursery 56
Fisher 107
Flipse 90
Flora-Stats, 185
Florafax 75, 186
Floricultural Hall of Fame 108, 132
Florists' Convention 69, 78
Florists' Public Relations Committee 71
Florists' Telegraph Delivery Association (FTD) 29, 30, 33-34, 52, 58, 75, 200-201
Florists' Transworld Delivery (FTD) 186, 200-201
Florists' Wholesale Credit Association 52
Flower Farm 108
Flower Show Fund 155
Flowers by Bachman 72, 154
Flowers, Inc. 59, 74-75, 106
Ford 2-3
Forest Lake Floral and Garden Center 187
Forest Lake Greenhouse 53, 107, 187
Forsman-Little 154
Four Seasons Greenhouses 180
Frampton 89
Franklin 25
Frank's Nursery and Crafts 100
Fransen 58
Fratzke 20
Fred C. Gloeckner Foundation 124
Fredericks 42
Frickland 56
FTD (see Florists' Telegraph Delivery Association or Florists' Transworld Delivery)

G
Gale 3, 16
Ganapes 57
Gang 72
Gardener's Paradise 125
Gentry 46
George Butterfield Greenhouse 44
George McComber Nursery 67
Gerdin 43
Gerten 72, 80, 191
Gerten Greenhouses 182, 191
Gibbs 31, 50
Gibbs Florist 31
Gibbs-Nelson Florist 32
Gibbs-Nelson range 32, 65, 93, 110, 160
Goldstein 59, 74-75, 106, 190
Goodlund 25
Gould 17
Grabski 131
Granovsky 80
Grava 117
Graves 104
Green 2, 9, 11, 26, 27, 28, 39
Green Giant Home and Garden Center 100
Green Valley Greenhouses 105, 157, 180, 182
Groveland Garden and Nursery 2-3
Groves 6
Gustafson 84

H

Haeger 129
Hafner 67
Hale 12
Hallstrom 8, 76, 210
Hallstrom and Son, Florist 76, 210
Hamp 20, 24, 55, 89, 207
Haney 75
Hans Rosacker Company 19, 21, 47, 48, 64, 65, 74, 84, 102, 151-152, 182, 200, 201, 206, 207, 209, 210
Hansen, C. 15, 49
Hansen, D. 189
Hansen Greenhouses 15, 49
Hanson, C. 58
Hanson, W. 4
Harrison 8, 12
Hartman 7
Haupt 7, 50
Hector 57
Heins 140
Heiserer 63, 125
Henrikson 49, 101-102
Hermanson 67
Hermes 23, 78, 90, 102-103, 111, 156-157, 207, 208
Hermes Floral 61, 65, 102-103, 126, 127, 156-157, 176, 182, 193, 207, 208
Hertog 44-45, 84, 145, 152, 153, 192, 207, 209
Hertog Floral 45, 84, 128-129, 145, 152, 207, 209
Hiebert 56, 187
Hiebert Greenhouses 56, 187
Hill 8
Hillig 85
Hilliker 7
Hilltop Florists 20
Hillyer 8
Hix 151
Hoffman 79
Holasek 76, 107, 157
Holiday Growers 105
Holland 100
Holm 16, 50
Holm and Olson 16, 19, 20, 24, 34, 41, 49, 50, 52, 53, 54, 55, 84, 89, 152, 182, 200, 206, 207
Holst 70
Hopper 30
Hueg 112
Hunt, E. 39, 68, 69, 108
Hunt, R. 105
Hurias 83-84, 182

I

Intercollegiate Flower Judging Contest 79, 114, 115, 138-139
Irvine 1
Irvine Park 1
Island Orchids 75, 106
Island Tropicals 106

J

J.R. Johnson Floriculture Research Fund 88-89, 129, 151, 152, 155-156
J.R. Johnson Greenhouses 38, 44, 128-129, 153, 176
J.R. Johnson Supply 38, 64, 88, 131, 151, 193, 207, 209
J.R. Johnson Wholesale Florist 38, 84, 88
J.V. Bailey Nursery 125-126, 181, 182, 192
<table>
<thead>
<tr>
<th>Name</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.W. Perry</td>
<td>64</td>
</tr>
<tr>
<td>Jacobsen</td>
<td>14</td>
</tr>
<tr>
<td>James J. Hill Estate greenhouses</td>
<td>49</td>
</tr>
<tr>
<td>Janisch</td>
<td>43</td>
</tr>
<tr>
<td>Jansen</td>
<td>50</td>
</tr>
<tr>
<td>Jansen Brothers</td>
<td>65, 103</td>
</tr>
<tr>
<td>Jap</td>
<td>16-17</td>
</tr>
<tr>
<td>Jerry Palmer Florist</td>
<td>207</td>
</tr>
<tr>
<td>Jewel Nursery and Greenhouse</td>
<td>5</td>
</tr>
<tr>
<td>Jim's Flower and Gift Shop</td>
<td>43</td>
</tr>
<tr>
<td>John</td>
<td>153</td>
</tr>
<tr>
<td>John W. Vasatke Greenhouses</td>
<td>7, 46</td>
</tr>
<tr>
<td>Johnson, Aaron</td>
<td>54</td>
</tr>
<tr>
<td>Johnson, Alfred</td>
<td>23</td>
</tr>
<tr>
<td>Johnson, C.</td>
<td>106</td>
</tr>
<tr>
<td>Johnson, D.</td>
<td>139</td>
</tr>
<tr>
<td>Johnson, H.</td>
<td>71, 80</td>
</tr>
<tr>
<td>Johnson, J.</td>
<td>37-38, 72, 74, 80, 88, 139, 151, 153, 207, 209</td>
</tr>
<tr>
<td>Johnson, R.</td>
<td>53</td>
</tr>
<tr>
<td>Johnston</td>
<td>50</td>
</tr>
<tr>
<td>Johnstone</td>
<td>49, 80, 102</td>
</tr>
<tr>
<td>Juenemann</td>
<td>88</td>
</tr>
<tr>
<td>Kaiser</td>
<td>31, 42, 44, 50, 58, 64-65, 206</td>
</tr>
<tr>
<td>Kakach</td>
<td>87</td>
</tr>
<tr>
<td>Karlsted</td>
<td>86</td>
</tr>
<tr>
<td>Keane</td>
<td>20</td>
</tr>
<tr>
<td>Keller</td>
<td>111</td>
</tr>
<tr>
<td>Kersten</td>
<td>45</td>
</tr>
<tr>
<td>Kiekenapp</td>
<td>14</td>
</tr>
<tr>
<td>Kinsman</td>
<td>12</td>
</tr>
<tr>
<td>Kinsman's Greenhouses and Flower Shop</td>
<td>41, 57, 66, 88</td>
</tr>
<tr>
<td>Kirkpatrick</td>
<td>39</td>
</tr>
<tr>
<td>Knandel</td>
<td>85</td>
</tr>
<tr>
<td>Knuckey</td>
<td>76</td>
</tr>
<tr>
<td>Koehler and Dramm</td>
<td>125, 192, 193</td>
</tr>
<tr>
<td>Koenenkke</td>
<td>44</td>
</tr>
<tr>
<td>Kohler</td>
<td>103</td>
</tr>
<tr>
<td>Koranski</td>
<td>116, 124, 138</td>
</tr>
<tr>
<td>Kovanda</td>
<td>192</td>
</tr>
<tr>
<td>Kozlowski</td>
<td>13</td>
</tr>
<tr>
<td>Kraus</td>
<td>54-55</td>
</tr>
<tr>
<td>Kueker</td>
<td>13</td>
</tr>
<tr>
<td>L.L. May and Company</td>
<td>6</td>
</tr>
<tr>
<td>Ladies Florist Club of St. Paul</td>
<td>50</td>
</tr>
<tr>
<td>Lafave</td>
<td>16</td>
</tr>
<tr>
<td>Lakeland Florist Supply</td>
<td>63, 125, 193</td>
</tr>
<tr>
<td>Lakewood Cemetery</td>
<td></td>
</tr>
<tr>
<td>Landscape Alternatives</td>
<td>131-132</td>
</tr>
<tr>
<td>Landscape Arboretum (see Minnesota Landscape Arboretum)</td>
<td></td>
</tr>
<tr>
<td>Lange</td>
<td>207</td>
</tr>
<tr>
<td>Lange's Florist</td>
<td>207</td>
</tr>
<tr>
<td>Larson</td>
<td>28, 75, 79</td>
</tr>
<tr>
<td>Latham</td>
<td>25</td>
</tr>
<tr>
<td>Lauer</td>
<td>59-60, 127</td>
</tr>
<tr>
<td>Law</td>
<td>80</td>
</tr>
<tr>
<td>Le May</td>
<td>86</td>
</tr>
<tr>
<td>Lebens</td>
<td>45, 75, 209</td>
</tr>
<tr>
<td>Lebens Flowers</td>
<td>45, 182, 208, 209</td>
</tr>
<tr>
<td>LeBorius</td>
<td>17</td>
</tr>
<tr>
<td>Lehman</td>
<td>54-56</td>
</tr>
<tr>
<td>Lehman Gardens</td>
<td>54-56, 100-101, 180</td>
</tr>
<tr>
<td>Lelpnitz</td>
<td>64</td>
</tr>
<tr>
<td>Lemke</td>
<td>108</td>
</tr>
<tr>
<td>Lemke Brothers</td>
<td>6</td>
</tr>
<tr>
<td>Len Busch Greenhouses</td>
<td>64, 86-87, 182, 184-185</td>
</tr>
<tr>
<td>Len Busch Roses</td>
<td>176, 192, 193, 208, 209, 210</td>
</tr>
<tr>
<td>Lerman</td>
<td>115</td>
</tr>
<tr>
<td>Lester Park Florist and Greenhouses</td>
<td>16-17, 67</td>
</tr>
<tr>
<td>Levin Horticultural Research Center</td>
<td>138</td>
</tr>
<tr>
<td>Linder</td>
<td>22, 87, 93, 101, 209</td>
</tr>
<tr>
<td>Linder's Greenhouses</td>
<td>22, 87, 101, 182, 187, 191, 209</td>
</tr>
<tr>
<td>Lindig</td>
<td>63</td>
</tr>
<tr>
<td>Linder's Greenhouses</td>
<td>22, 87, 101, 182, 187, 191, 209</td>
</tr>
<tr>
<td>Lindig</td>
<td>63</td>
</tr>
</tbody>
</table>
Lindig Manufacturing Company 63
Lindsay 16
Lindskoog 25, 50, 86, 201, 206, 207
Lindskoog Florist 25, 201, 206, 207
Lindskoog-Goodlund Florist 25
Lindskoog-Latham Flowers 25
Linney 94
Lins 57
Little Falls Greenhouses and Floral 69
Little Falls Greenhouses, Inc. 69
Longley 50-51, 61, 68, 70, 79
Lorentz 8, 21
Lorentzen 90
Lorentzen Greenhouses 90
Lorenzen 62
Loring 4
Louiselle 64, 86
Lucht 19, 101, 151, 152, 209
Lumry 42
Lund 14, 46
Lyndale Farmstead 26
Lyndale Fruit and Vegetable Market 72-73, 125
Lyndale Garden Center 125, 180
Lynde 15
Lynde Greenhouse and Nursery 182, 190, 192
Lynes 58

M

MacDonald 117
Mackintosh 39
Madsen's Floral and Greenhouses 87
Magnuson 19, 30
Maki 53
Mall of America 125
Malmberg 19, 101
Malmberg's, Inc. 101, 152, 182, 209, 210
Market House 7
Maruska 67
Maskowski 210
Mathes 50
Mazey's Society Florist 29-30
McCarthy 72, 132
McComber-Amasa Florist 8, 67
McGinty 84, 115
McKay 27, 68
McKinnon 114, 138
Mendenhall 4, 7
Merriam Park 3
Merriam Park Floral 31, 47, 65, 85, 206, 207
Merriam Park Greenhouses 64-65
Metro Florist Supply 104, 193
Metropolitan Florists 59
Midwest Florist Supply Company 63
Miller 17
Minneapolis Farmers' Market 3, 60, 127
Minneapolis Floral Company 19-20, 22, 25, 26, 37, 47, 145, 176, 207, 209
Minneapolis Florists' Club 30, 52, 58
Minneapolis Horticultural Society 3
Minneapolis Ladies Florists' Club 30
Minneapolis Park Board 5, 21, 26, 34, 58, 70, 115, 206
Minneapolis Parks 62, 150, 201
Minnesota Agricultural Experiment Station 9, 94, 102, 119, 138
Minnesota Allied Florists' Association 72, 206
Minnesota Commercial Flower Growers' Association 77-78, 83, 129, 136, 140, 151, 192, 193, 194
Minnesota Conservation Foundation 87
Minnesota Department of Transportation 150
Minnesota Distributing and Manufacturing 131, 193
Minnesota Extension Service 138
Minnesota Florists' Public Relations Committee 71-72, 206
Minnesota Flower Show 4
Minnesota Fruit Growers Association 3
Minnesota Garden Flower Society 30
P

P.J. Dries Drugstore 6
Palmer 207
Pan American Plant Company 119
Park Rapids Florist and Nursery 67, 180
Pariball 86
Paul Ecke Poinsettias 124, 139
Pederson, B. 67
Pederson, D. 37
Pellizzer 105
Pensky 209
Perennial Plant Association 105, 129
Perry 44
Peterson, Ed 86
Peterson, Eugene 80
Peterson, G. 16
Peterson, J. 68
Peterson, M. 46
Peterson, V. 56, 103, 115
Peterson, R. 115
Peterson, W. 208
Pfeiffer Nursery 5
Pfleger 115, 117, 124, 159
Phalen Park 5
Phillips 61
Phillips 1-800-FLORALS 186
Pi Alpha Xi 78-79, 115, 139
Pier 7
Pillsbury Company 89
Pioneer Seed Company 102
Pitka 191
Plant Shed, The 156
Pletscher 45-46, 111, 207, 208, 209
Pletscher’s Greenhouses 45-46, 182, 207, 208, 209
Poly Tex, Inc. 128
Poltan 127
Porter 9
Post 61
Poyner 107
Prestigard 57
Prodeehl 14
Professional Plant Growers Association 132, 152
Puleo 45, 208
Puvogel 14-15, 84

Q

Quaal 107-108
Queen City Greenhouse 18

R

R.L. Gould & Company 17, 43, 84
Rachel’s Roses 88
Radio City Florists 59
Raison 23
Ramthun 108
Range Floral 76
Ratterman Brothers 29, 65
Rauenhorst 14
Ray 108
Redbook Florist Services 186
Reed 153, 210
Rehman 56
Reid 50
Reiss 46-47, 209
Reiss Greenhouses 46-47, 209
Reynea 14
Renning 105, 201
Renning’s Flowers 201
Rheinschmidt 69
Rice 1
Rice Brothers 19
Rice Park 1
Rice Creek Gardens 90
Ringlehof 6
Riverside Iris Garden 84
Robb 102
Robert Rosacker rose range 65
Robert Stern Florists 24-25, 158
Roberts, A. 97
Roberts, M. 107, 187
Robertson 2, 3, 4, 9
Robison 131
Rochester Greenhouses 18
Rogowski 131
Rosacker 21, 47, 48, 50, 58, 74, 80, 93, 106, 151, 200, 206, 207, 209
Rose 58
Roses Inc. 74, 84, 124, 129, 158
Rosedown Greenhouses 47
Roseville Greenhouses 90, 127
Ross 152, 153
Roth 25
Rovik 19
Royal Agricultural University of Norway 138
Ruedlinger 58, 206
Ruedlinger’s 206
Ruser 131
Russell 53, 58
Rutman 72-73

S

Sackter 87
SAF (see Society of American Florists)
Saline 74, 106, 151, 201
Sams 67
Sams’s Florist and Greenhouses 67
Sando 50, 207
Sandoz Ltd. 101-102, 157
Sauer 21
Savory 65-66
Savory’s Gardens, Inc. 65-66
Schaff 207
Schaff Floral, Inc. 207
Scheidler’s Nursery 100
Schiller 4
Schleyt 50
Schmidt 4
Schnabel 74, 80, 207, 209
School of Agriculture 10, 27, 39, 46, 50, 93, 113
Schreiner 48-49
Schreiner’s Iris Gardens 48-49
Schupp 115
Schuster 38, 42
Schuster’s Nursery and Flower Shop 38
Schutte 6
Schwarze 151, 192
Schweitz 62
Sculpture Garden 34
Seagren 65
Seeger 59
Seekins 17
Seekins and LeBorius 17
Sellinger 126

Service Award, University of Minnesota 112
Shogren 68
Shotwell 42
Siebrecht, B. 42
Siebrecht, C. 17, 200
Siebrecht, F. 42
Siegel 73, 125
Silver 105
Sink 84
Sinkler 151
Slack 162
Smith, C. 7
Smith, R. 1
Smith, T. 4
Smith Park 1
Snyder 39, 69, 79, 80, 113-114
Snyder’s Greenhouses 74
Soderberg 46
Soderberg’s Florist 46
Soil Test Service 78
Solem 16
Solum 56
Soteroplos 56, 86
Souden 50
South Cedar Greenhouses 64, 156, 180, 182
Southway Greenhouse and Floral 57
Squillace 43-44
St. Anthony and Minneapolis Horticultural Society 3
St. Anthony Floral Greenhouses 19, 21, 74, 88, 207, 209
St. Anthony Roses 74
St. Paul City Market 3, 7, 21
St. Paul Farmers’ Market 60, 127
St. Paul Florists’ Club 30, 52
St. Paul Horticultural Society 3
St. Paul Board of Park Commissioners 2, 5, 11, 28, 40
St. Paul Parks 150
Stadtherr 79
Stangler 14
Stansfield 102
State Fair Horticulturist 103, 157
Stems and Vines 84
Sten 24-25, 58
Stienstra 114, 117
Stollar 63-64
Strefeler 139-140, 159, 160
Stromer 59
Strong 57
Summers 57
Summit Avenue Florist 16
Sunnyside Floral 76
Sunnyside Greenhouse 7, 42
Sutherland 30
Swanson 7, 8, 13, 18
Swanson’s Greenhouses 31
Swart 125
Sykora 58

T
T.O. Plastics 153
Target 190
Taylor 80, 117
Team ster’s 58
Teleflora Inc. 186
Terra Products Corporation 105
The Plant Shed 156
Theis 87-88
Thomford 85
Thomford’s Garden Center 85
Thompson 49, 50, 52, 200
Thuening 76, 157, 210
Tischler 46
Tischler Peony Garden 46
Tonkadale Greenhouses 66-67, 73
Topel 16, 29, 50, 206, 207
Tournament of Roses Parade 190
Town and Country Floral 67
Traders’ Edge 86, 193
Traders Supply 86
Trenbeth 76
Tri-State Florists’ Association 42
Tropicals, Inc. 106
Tutushek 107-108
Twin Cities Florists’ and Gardeners’ Club 26, 206
Twin City Florist Supply 43, 57, 193, 207

U
United Minnesota Horticulture 74, 80, 83, 93, 112, 151
University of Minnesota-Waseca 113
U.S. Agriculture International Development (USAID) 117
U.S. Census Bureau 12, 164-165, 168-169, 172-173, 181, 194
USDA 4, 132, 133, 135, 164-169, 177-179, 194-195

V
Valley Floral 125
Van Bloem, Inc. 107
Van Lierop 58
Van’s Floral Products 193
Van’s of Chicago 107
Vantol 20
Vasatka 7, 36-37, 46, 58
Vasatka Brothers 36
Vaughn’s 102
Venzke Brothers 7
Virginia Floral Company 24
Virginia Greenhouse and Floral 23

W
Wadekamper 103-104
Wadena Floral and Greenhouses 56
Wadena Floral Greenhouse 103
Wagner, E. 22-23, 128, 183, 209
Wagener Greenhouses 23, 128, 158-159, 182-183, 197, 209
Wagner, R. 94
Wahl 42
Waldo 53, 107
Wartnick 63-64
Watchburn 7
Wheeber 58
Wheeber Manufacturing 88
Weigelt 4
Weinholzer 46
Weinholzer-McLean 46, 111
Weiser 28, 97
Wenkel 39
Westing 7
West End Greenhouses 125
Whalen 57, 207
Wheelock 2, 11-12
Whiting 54
Whiting's Flowers and Greenhouse 54, 66
Whitney 1
Whitted 18
Wholesale values 77, 99, 131-134, 166, 170, 172-179, 194-195
Wickstrom 27
Widmer, M. 78
Widmer, R. 70, 75, 78, 79, 80, 95, 112, 115, 117, 127, 128, 138, 139, 140, 146
Widmer Floriculture Research Fund 155-156
Widmer Florists' Golf Tournament 151, 152, 155
Wilkins 79, 94, 97, 111, 112, 114, 117, 118, 128, 138, 139-140, 151
Will 206
Will Brothers 206
Williams 72
Windmiller 8, 20
Wirth 26, 30, 33, 34, 58, 62, 201, 206
Wittman 152, 153, 210
Wolf 53
Wolf Greenhouse and Floral Company 53
Woodend Farms 36, 154
Woodlawn Cemetery 17
Worker protection standards (WPS) 193
Wreisner 38
Wright, R. 128
Wright, T. 57, 207
Wunder 8

Y
Yoder Brothers 71, 119

Z
Zachman 29, 45, 59-60
Zitzer 38
Zitzer's Nursery and Floral 38
Zoerb 75
Richard E. Widmer is a Professor Emeritus in the Department of Horticultural Science, University of Minnesota. He has been an active participant in the industry and in many of the events of this account since joining the University faculty in 1949.