Celebrating
The Department of Agronomy & Plant Genetics
100 Years of Improving Plants & the Lives of People

http://agronomy.cfans.umn.edu/

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LET 'EM SAY WE GOT ALLOT TO LEARN ABOUT AGRICULTURE—THE DEAL WE MADE ON THE MINNEAPOLIS SITE—BUYING IT FOR $8,500 THEN SELLING IT FOR $150,000—PROVES WE KNOW OUR "AGRICULTURAL ECONOMICS."

UNIVERSITY FARM
Pendergast Hall was built in 1889, as a boys’ dormitory for the School of Agriculture. The building had rooms for 65 students, two classrooms, an assembly room, and a recreation area.

The Home Building, built in 1867-1868, was the center of activities for the new School of Agriculture. It had dorm rooms, a small library, some small classrooms, and offices. At the time it was razed in 1952, it was the oldest building still in use on the St. Paul campus.
The farm house was built in 1884-1885 at a cost of $25,000. It was a beautifully landscaped frame building with apartments for the professor of agriculture and farm foreman, and rooms for laborers and students. One wing served as laboratories and offices for the plant breeders.

It was located on the site where Snyder Hall and the Gortner Laboratories stand today.

By 1937 it no longer served as living quarters and its unheated passageways and fireplace heated rooms contributed to it being deemed "a rickety fire trap" by campus planners.
Drill Hall was built in 1893. It had a gym, several classrooms for military tactics training and several dorm rooms in the attic. In 1913, after remodeling, it was assigned to the Division of Plant Pathology & Botany to house the state seed lab, USDA/ARS cereal rust laboratory, along with offices and labs of the plant physiologists. The name was changed to Agricultural Botany. It was razed in 1970-71 to make room for the Classroom Office Building (COB).
The extension service was to develop publications and demonstrations of the new research results and provide instruction on the value of these improved practices or technologies in agriculture, home economics, and rural energy to persons not attending the college.

A trio of national legislative acts enacted in 1862 (land grant act), 1887 (Hatch Act) and 1914 (Smith-Lever Act) provided funds to establish a college of agriculture and mechanic arts, an agricultural experiment station, and an agricultural extension service, respectively.

The A & M colleges were to teach the branches of learning related to agriculture and the mechanic arts, without excluding other scientific and classical studies.

The experiment stations were to conduct original research on the physiology of plants and animals and their diseases, chemical composition of useful plants at different stages of growth, advantages of different kinds of crops, value of grasses and forage plants, scientific and economic questions about the production of butter and cheese, and any other experiments bearing directly on agriculture

In the early 1900's special trains (Better Farming Specials) operated over seven railroads in Minnesota.

These trains were staffed by extension and farmer's institute instructors. Some focused only on animal production and others on seed grains and crop production.

Some of the cars on the trains had displays to be viewed as visitors passed through. Other cars were transports for the animals which were unloaded for presentations.

At the regularly scheduled stops hundreds of people were often waiting patiently for the trains to arrive. Stops varied in length from a couple of hours to all day.
Service to the Land
These photographs (taken in the 1920’s) document some of the important roles that horsepower played in the work on the University Farm until 1959, when the last team was sold.
The agronomy and plant pathology buildings under construction in 1940-1941. The actual cost of these identical four story concrete and brick buildings was reported to be $307,411.

In the distant background of the photograph on the left you can see the horse barn, agronomy seed house, and the farm house (L to R). In the far distant background you can see the white 4H building on the state fair grounds.
In the fall of 1941 the once beautiful and well-used farm house was dismantled in order to salvage as much of the lumber as possible. This work was done by 23 young men on a national youth administration project who attended classes in the school of agriculture three days a week and worked three days on the dismantling. Some of this lumber was obtained by Don Harvey (an agronomy plot worker) to build a house at 1965 North Cleveland Avenue. This house is still occupied today.
Alfalfa

- Major research effort since 1946
- Joint UMN-LSI since 1965
- U.S. leader in breeding disease resistance & winter hardiness
- 58 germplasm releases
- 6 varieties released
- Mainstay of dairy industry
- Alfalfa makes soil nitrogen from atmospheric nitrogen
- New varieties, specific uses
- Biomass for electricity
- Pollution abatement
- Ethanol production
- Functional genomics tools transfer specific traits
- U of M making genetic map of Medicago, 3rd plant in world to be sequenced
COMMORATING
WENDELIN GRIMM
RESIDENT OF MINNESOTA 1857-1891
WHO ORIGIONATED
GRIMM ALFALFA
ON THIS FARM
ERECTED JUNE 1924 BY
GRIMM ALFALFA GROWERS ASSOCIATIONS

Left to right in this photograph:
U of M President, L.D. Coffman,
Maes Director, W.C. Coffey &
Agronomy Head, A. Boss
Examining a stand of Grimm
Alfalfa near the dedication site.

Grimm’s Carver County Farm Home
Site of the dedication ceremony.

Many dignitaries, friends and neighbors attended the ceremony.

Wendelin Grimm’s granddaughter
unveiling the commemorative plaque.
Barley

U of M Varieties

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<th>Year</th>
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<td>1965</td>
</tr>
<tr>
<td>Melrose</td>
<td>1962</td>
</tr>
<tr>
<td>Selma</td>
<td>1926</td>
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<tr>
<td>Shelly</td>
<td>1926</td>
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<tr>
<td>Robard</td>
<td>1960</td>
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<tr>
<td>Clarion</td>
<td>1969</td>
</tr>
<tr>
<td>Royal</td>
<td>1971</td>
</tr>
<tr>
<td>Mars</td>
<td>1985</td>
</tr>
<tr>
<td>Forest</td>
<td>1977</td>
</tr>
<tr>
<td>Clete</td>
<td>1977</td>
</tr>
<tr>
<td>Mandan</td>
<td>1974</td>
</tr>
<tr>
<td>Matrix</td>
<td>1978</td>
</tr>
<tr>
<td>Rodger</td>
<td>1983</td>
</tr>
<tr>
<td>Excels</td>
<td>1990</td>
</tr>
<tr>
<td>Spark</td>
<td>1993</td>
</tr>
<tr>
<td>Rascal</td>
<td>1994</td>
</tr>
<tr>
<td>MN 985</td>
<td>1998</td>
</tr>
<tr>
<td>Fas</td>
<td>2000</td>
</tr>
<tr>
<td>Expt 2928</td>
<td>2008</td>
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<tr>
<td>Quest</td>
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K.P. SMITH

D.C. RASMUSSEN
Early 1960s: developed outstanding inbred lines, the foundation for hybrids that followed. ANN 13 became most popular northern variety, moved corn belt 30 miles north in one decade.

Late 1920s: experimental hybrids released, genetic studies define 'combining ability.'


1920s-present: over 100 inbred lines given to commercial breeders.

1970: discovered location of genes responsible for protein synthesis.

1975: 1st to regenerate corn from tissue culture, first in any cereal crop.

2005 - today: over 100 radiation-hybrid lines created, supplied to over 60 labs worldwide; mapping the maize genome.
H. Rines (left) and R.L. Phillips (right) discussing their corn/oat hybrid research.

J. L. Geadleman
CORN BREEDING PROJECT LEADER
1972-1987

B. Gengenbach (front) &
C.E. Green (rear) examine corn cell/tissue cultures.

R.N. Bernardo
CORN GENETICS & BREEDING
Forage Legumes and Turf Grasses

- Breeding new varieties of turf grasses
- Improved winter survival
- Faster establishment
- Improved quality
- Breeding new varieties of forage legumes
- Improved establishment
- Better winter survival
- Higher quality
- Weakened files
- Seed production
- New varieties
- New species
- More efficient fertilizers & weed control
Wheat U of MN Varieties

Preston 1895
Reliance 1926
#163 1899
#189 1902
#188 1903
Glyndon 1913
Minard 1915
Mindrum 1917
Speltz 1917
Minturk 1919
Minhardt 1920
Marquado 1921
Thatcher 1941
Marin 1941
Newthatch 1953
Minter 1944
Leo 1952
Willet 1954
Crim 1962
Chris 1965
Folk 1968

Era 1970
Hetcher 1970
Kitt 1973
Angus 1970
Centura 1981
Marshall 1981
Wheaton 1983
Vance 1989
Monyo 1989
Norm 1992
Verde 1995
BackUp 1996
R969 1999
McVey 1999
Oklee 2003
Ulen 2003
Ada 2006
R807 2007
Tom 2008
Sabin 2009

University of Minnesota
Driven to Discover

Wheat Breeding

R.E. HEINER
SPRING WHEAT BREEDER
1965-1977

J.A. ANDERSON
SPRING WHEAT BREEDER
1998-PRESENT
Biochemical & Molecular Genomics Research

G.J. MUEHLBAUER

D.A. SOMERS

D.F. GARVIN
Biochemical & Molecular Genomics Research

B. GENGENBACH & C.E. GREEN

R.M. STUPAR
Field Day Educational Presentations (Crops)
Agronomy’s Seed House Complex

The Seed House building in 1918. Construction cost = $16,466.72.

The field house added in 1932-33, providing dryers, workrooms & storage. (Cost = $27,751.47)

The field house in 2010.

The field and seed house in 1940's

The field and seed house in 2010.
The opening of this new St. Paul campus student center in the spring of 1959 was a significant event. The $1.2 million building brought modern college union facilities to the St. Paul campus.

The antiquated "old" dairy hall, across the street from the first horticulture building had previously served as a men's only student union from 1930 to 1939, when it became co-ed.

The Student Center (shown in this 2010 photo) was extensively updated in 1980.
H. K. Hayes was hired by Andrew Boss to lead Plant Breeding and Genetics research and teaching at the University of Minnesota in 1915. He was the first of a line of scholarly men who were trained by the early geneticists at Harvard, Connecticut Agricultural Station, and the Bussey Institution. In fact E. M. East and Hayes were the first to describe two of the maize genes in 1911. During his thirty seven year career at Minnesota he advised or co-advised 133 research theses (68 M.S. and 65 Ph.D.). These theses were conducted on 32 different crop species, but most focused on corn and wheat. It is remarkable that of the 225 students who completed graduate degrees in the department between 1915-1952, H. K. Hayes advised 133.

In 1937 H. K. Hayes met with then president G. S. Ford and described his frustrations over the years attempting to conduct cytogenetic research on maize, President Ford asked what was needed to change that. Hays replied "sufficient salary and support funding to make a position attractive". Ford told him to put the request in writing and he would approve it.

Hays responded and soon Dr. C. R. Burnham, who was studying at Cornell University, was hired to teach graduate courses in genetics and cytogenetics, conduct research, and direct thesis problems. He was the second product of the eastern cytogenetics group to migrate to Minnesota. During his 34 year (1937-1972) career Dr. Burnham and his students discovered much of what is now known about inversions, translocations and other aberrations related to maize chromosomes. He supervised the research theses of 23 M.S. and 39 Ph.D. students who came from all over the world. Four of his students were later elected to the National Academy of Science.

One of these Ph.D. student advisors was R. Phillips who had recently completed his B.S. and M.S. degrees at Purdue University. Dr. Phillips' thesis title was "Cytogenetic Studies of Recombination in Reciprocal Crosses and Location of Genes in Zea mays L." and was completed in 1966. After post doctoral research at Cornell University, Dr. Phillips returned to the department as a Research Associate and in 1968 was hired as Assistant Professor who would take charge of the cytogenetics program when Burnham retired. He was the third scientist in the line of scholarly descent from the Eastern maize scholars. During his forty two year career he supervised the research of 66 graduate students, 33 post docs, and 29 visiting scientists.
R. L. Phillips Ph.D.
Agronomy & Plant Genetics Most Honored Scholar

During his 42 years of service in the department (1968-2010), he supervised the research of 66 graduate students, 23 post doctoral associates and 29 visiting scientists. He used the basic techniques of plant cytogenetics and molecular biology to enhance our understanding of the basic biology of cereal crops.

He received many significant awards for his outstanding career contributions including: American Society of Agronomy Fellow, Crop Science Society of America Fellow, American Association for the Advancement of Science Fellow, Dekalb Genetics/Crop Science Distinguished Career Award, Honorary Doctorate degree from Purdue University, member National Academy of Science (1991), University of Minnesota Regents Professor (1993), McKnight Presidential Chair in Genomics (1999), Wolf Prize in Agriculture (2007), Medal of Honor in Science from the University of Bologna, Italy (2010) and the Siehl Prize for Excellence in Agriculture (2010).

Dr. Phillips’ outstanding publication record included 150 refereed journal articles, 355 abstracts, 75 book chapters and editing 6 books.

In late May 2010, 34 former students and post docs returned to the campus for a symposium celebrating Dr. Phillips career and retirement. Nineteen of them presented summaries of the research that they are now involved in and how their experience at Minnesota prepared them for their future careers. These students and post docs represent the next generation in the line of maize research scholars that started on the east coast. They are currently working at 15 universities and 2 companies located in the USA, Canada, England, and Italy.
Our Siehl Prize for Excellence in Agriculture Laureates

D.C. Rasmusson
1996

W.F. Hueg Jr.
2009

R.L. Phillips
2010

The Siehl Prize was established to honor the personal and professional achievements of agriculture's foremost leaders who have turned their love of the land into a lifetime of exemplary work.

Laureates are selected from three categories: production agriculture, agribusiness, and academics.

Each laureate receives a granite and glass sculpture, a label, pin, and a cash award presented by the dean of the College of Food, Agri-cultural, and Natural Resources at a special ceremony.
Some agronomy retirees

Front Row (L to R)
D. Smith, L. Smith, E. Oelke,
R. Andersen, D. Stuthman.

Back Row (L to R)
L. Hardman, R. Busch, G. Marten,
R. Peterson, R. Thompson, R.
Phillips, V. Cardwell, B.
Gegenbach.

"The Fabulous Four"
Agronomy & Plant Genetics
Centennial Celebration
August 27, 2010
STATE of MINNESOTA

Proclamation

WHEREAS: Agronomy was recognized as one of nine undergraduate specialty areas in General Agriculture at the University of Minnesota in 1910-1911; and

WHEREAS: More than 1,000 bachelor's degrees and 850 graduate degrees have been earned from the University of Minnesota's Department of Agronomy and Plant Genetics during the last 100 years; and

WHEREAS: Landmark research has produced benefits for humankind including: the development of durable resistance to diseases in wheat; the production of short-season adapted inbreds and germplasm important in today's corn hybrids; the identification and distribution of winter-hardy and disease-resistant alfalfa; the creation of soybeans adapted to northern growing conditions; the development of maximum production procedures related to planting date, row spacing, and plant density; the development of sunflowers and grass seed commercial crops; and the development of procedures for growing plants from single cells; and

WHEREAS: Innovative management strategies have been developed to minimize environmental and cultural intrusiveness, protecting soil and biodiversity while enhancing harvests for the benefit of all citizens; and

WHEREAS: The Department of Agronomy and Plant Genetics’ research and outreach efforts have aided in yield increases of 52.0 percent for corn, 46.2 percent for wheat, and 29.4 percent for soybeans, over the last 100 years; and

WHEREAS: University-based crop research is foundational to the future of Minnesota’s current $9 billion crop industry, with an estimated annual rate of 45 percent per public dollar invested.

NOW, THEREFORE, I, TIM PAWLENTY, Governor of Minnesota, do hereby proclaim Friday, August 27, 2010, to be:

AGRONOMY AND PLANT GENETICS 100TH ANNIVERSARY DAY

in the State of Minnesota.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Minnesota to be affixed at the State Capitol this 27th day of August in the year of our Lord two thousand and ten, and of the State the one hundred fifty-second.

Mark Dayton
GOVERNOR

SECRETARY OF STATE