

The Marshfield Agricultural Research Station 1912–2012



Excellence in Agricultural Research



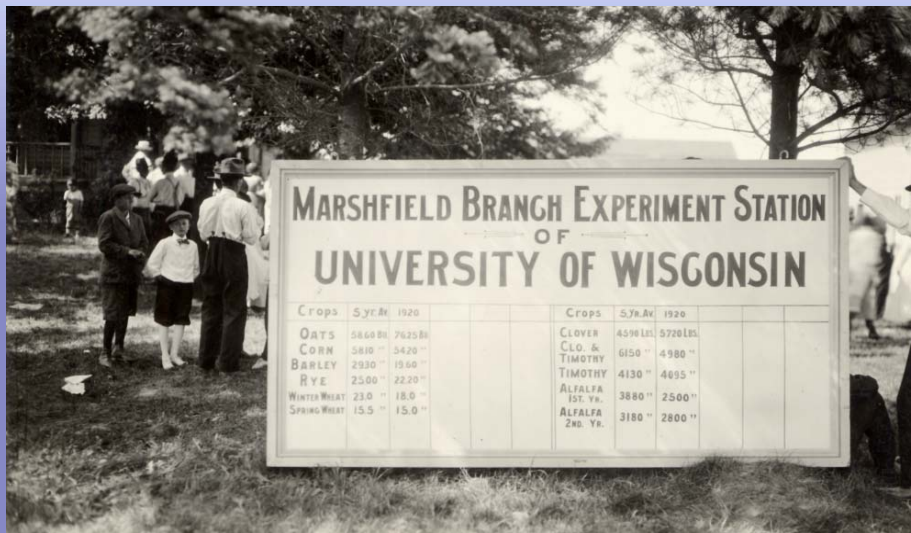
College of
Agricultural & Life Sciences
UNIVERSITY OF WISCONSIN-MADISON

Forward

In the summer of 1911, a group of agricultural researchers from the University of Wisconsin College of Agriculture arrived in Marshfield to inspect a site for one of five new branch agricultural experiment stations. The Wisconsin Legislature had authorized these purchases so that University scientists could test their ideas under a variety of growing conditions—different soils and climates—across the state. Wood County farmers wanted to be part of this new initiative. The visitors were shown a site at the edge of town, and they liked what they saw. In early February 1912 local newspapers announced that local farmer “John Hoffman had deeded 40 acres and another 40 acres of land had been sold by the Wood County Hospital farm to the University of Wisconsin Board of Regents for the purpose of developing an Experimental Farm.” On March 5, 1912, the work on the Marshfield Branch Experiment Station began. It was the beginning of a research and education program that would change farming practices in Central Wisconsin and around the world.

Today, the 1,250-acre Marshfield Agricultural Research Station supports a wide range of research related to crops, livestock and environmental protection. Part of the UW Integrated Dairy, the research herd for the world’s leading dairy science program, is based there. The station is also home to the U.S. Department of Agriculture’s Institute for Environmentally Integrated Dairy Management and the UW Soil and Forage Analysis Laboratory.

In 2012, knowledge discovered at the Marshfield Agricultural Research Station continues to benefit agricultural producers in Central Wisconsin and around the world. The centennial anniversary of the Marshfield Agricultural Research Station celebrates the vision of the local farmers who helped start it, those who enhanced its mission, and the dedicated agricultural producers who have used its information to bring new innovations to Wisconsin agriculture.



Above left: The Marshfield Branch Experiment Station sign in 1920. Above right: The Hein family of Maple Ridge Dairy at Stratford, Wisconsin, have learned from and partnered with the Marshfield Agricultural Research Station for its entire 100-year history.

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1912

Getting Started

When the Marshfield Agricultural Research Station was established in 1912, Wisconsin was becoming the dairy state. Farms were small—a few cows, some pigs, chickens, sheep, a big garden and an orchard. Agricultural chemist Steven Babcock had only recently invented the butterfat test, and dairy farmers mostly sold cream rather than milk. The British passenger liner RMS Titanic would sink on April 15. The Boston Red Sox would win the World Series that fall and World War I was looming on the horizon. The automobile was still new and roads were rough. Local farmers were pleased to hear that the University of Wisconsin planned to establish five branch experimental farms across the state to supplement work at the campus farm in Madison. But the first two UW farms, located in Ashland and Spooner, were too distant and difficult for Wood County farmers to get to in a day. *Central Wisconsin farmers wanted an experimental farm nearby, so that they could get a first-hand look at ideas that could help them improve their operations. This made sense to UW agricultural scientists. They picked Marshfield for the third experimental farm.*



Early views of the Marshfield station



The 1920s

The first superintendent

For the farmers of the 1920s, the Marshfield Branch Experiment Station and Professor Frederick L. Musbach were one and the same. The station's first manager was born in Ozaukee County in 1876 and graduated from Milwaukee Normal School in 1906. He began his career at the University of Wisconsin in 1909. His specialty was soil chemistry. Under his care, the Marshfield Station was improved and enlarged. In 1919 it grew by 100 acres through a purchase from neighboring landowner Charles Meyers.

Musbach undertook countless experiments and spoke to thousands of farmers at station field days, farm institutes and meetings throughout Wisconsin. He also traveled widely to study agricultural methods across the United States and in many European countries. Every vacation was a busman's holiday: He couldn't resist making an extensive study of the agriculture of whatever region he happened to be visiting.

Musbach's associates and farmer friends expressed their affection and respect for the superintendent at a Station Day on July 17, 1936, when they surprised him by unveiling a monument to his long service. Sadly, the Musbach era ended in tragedy. On Sept. 15, 1939, while on his way to Madison to confer with colleagues about a cranberry research project, the 63-year-old professor was killed in a traffic accident near Sun Prairie.



Marshfield Branch Experiment Station.
University of Wisconsin

The 1930s

Growing what grows best

In the 1930s, under Professor Musbach's guidance, research at the Marshfield Branch Experimental Farm focused on crop production. Musbach was a soil expert, and he conducted research on problems pertinent to the Spencer silt loam soil. He determined that Central Wisconsin soils had a higher need for lime and potash fertilizers compared to land elsewhere in the state. He also led the research effort to improve cranberry production in Central Wisconsin.

Small grain and corn varieties were a key focus of early research at Marshfield, and this line of research continues today. The station is used extensively for evaluating varieties for their adaptability to Central Wisconsin soils. Some of the early variety work was done by agronomist E.J. Delwiche, the University's director of northern research stations. Delwiche did considerable work with canning peas at the Marshfield station. In the 1930s canning peas were a high value economic crop in Central Wisconsin. Many local towns, including Marshfield, had their own canning factories.



WISCONSIN FARMERS' INSTITUTES
**MAINTAINING THE SOIL FERTILITY ON WISCONSIN
DAIRY FARMS**
F. L. Musbach, in Charge of Marshfield Branch Station,
Marshfield, Wisconsin



Archive photos of liming research, the dairy barn and the weather station that is still in operation today.

The 1940s

Soils take center stage



Left: A.J. Wojta developed a simple and effective system of land forming for the economical removal of excess water from upland and low lying fields. Above: Improving forage production was a high priority at Marshfield. Below: Area farmers attend a soils research field day in the 1940s.

A.R. Albert was appointed as the second superintendent of the Marshfield station on January 19, 1940. He continued to lead the Hancock station, a position he held from 1922 – 1947. An experienced scientist, Albert was also put in charge of soils research at the Spooner and Ashland stations. After graduating from the University of Wisconsin in 1915, he did his graduate work in Minnesota conducting experiments on muck soils in South Dakota and supervised soils experiments at the new UW Peninsular Branch Station near Sturgeon Bay. His expertise was much needed. College of Agriculture Dean Chris L. Christensen had made it a priority to strengthen UW soils research, “so as to secure information on the behavior and needs of types of soils not represented at any of the branch stations.”

“It is becoming increasingly evident,” he said, “that the agriculture of the state requires for its progress and prosperity a wiser use and more careful management of our soils, for upon them rests the whole industry of crop and livestock production. We no longer have a virgin soil, but must now conserve and build up the soil resources which we have.”



The 1950s

Dairy cows, lime and alfalfa

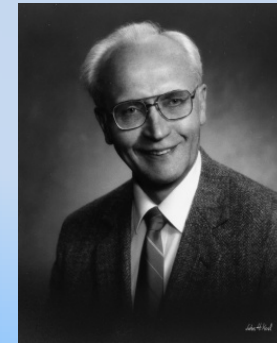
In 1944, UW soils researchers established long-term field research plots in Wood County to introduce a powerful new concept in field studies: Applying lime and fertilizer based on soil tests to bring soil to optimum levels of pH, phosphorus and potassium. The new approach brought spectacular results in the form of higher-yielding, longer-lived stands of alfalfa, which had become the major high-protein roughage for dairy cattle in Wisconsin. These studies laid the foundation for a revolution in the production of forage for dairy cattle across north central Wisconsin. UW soils specialists promoted the new approach as the Surefire Alfalfa Program. Local lenders helped out. Marshfield banker John Stauber promoted the availability of credit to farmers to manage soil fertility and acidity in order to produce alfalfa as the principal forage for their cows. In 1951 fifty farmers were reported to have adopted this method.



Russell Johannes was named superintendent of the Marshfield station in February 1948. The war was over and a new era of agricultural research had begun. Johannes was a dedicated supporter of soil scientist's efforts to promote the Surefire Alfalfa Program and the development of formal dairy research at the Marshfield station.



The 1950s brought major expansions to the dairy herd at the Marshfield station.
Above: towels are being dried for use in milking.
Left: area farmers viewing farm equipment.



Dairy Science comes to Marshfield.

In 1955 Howard Larsen was hired as an assistant professor and placed in charge of dairy research at the Marshfield station. He immediately took on a long term project to evaluate summer forage feeding strategies.

The 1960s

Calf hutches, dairy feeding and UW-Extension

In the mid 1950s, the Wood County Board appropriated \$16,000 for construction of a service building with an office, meeting room and kitchen. An addition, housing a soil testing laboratory and other research space, was built in the late 1950s. Wood County contributed \$7,500 for the project, and the City of Marshfield added \$2,500. Rapid growth of the station's dairy extension program spurred more construction. By the 1970s, the facility had nearly doubled in size with the addition of a forage testing laboratory and a large meeting facility.



Above: The calf hutch was developed out of necessity by dairy scientist Howard Larsen and UW agricultural engineers. Today, Hampel Corporation in Germantown manufactures calf hutches and has sold more than 400,000 of them world-wide. Below: Area farmers learn of new calf housing and dairy feeding strategies developed at the Marshfield station.



Above: The first office complex built in 1954 with the adjoining soil testing lab in 1957. Middle: The 1970s addition of a forage testing laboratory and a large meeting facility. Left: Area dairy producers evaluate new forage harvesting equipment.



The 1970s

Stored feed and improved crop management

Ensiling forages and high moisture corn was a research focus during the 1970s. The Marshfield station was instrumental in developing the practice of feeding high moisture corn to dairy cows.



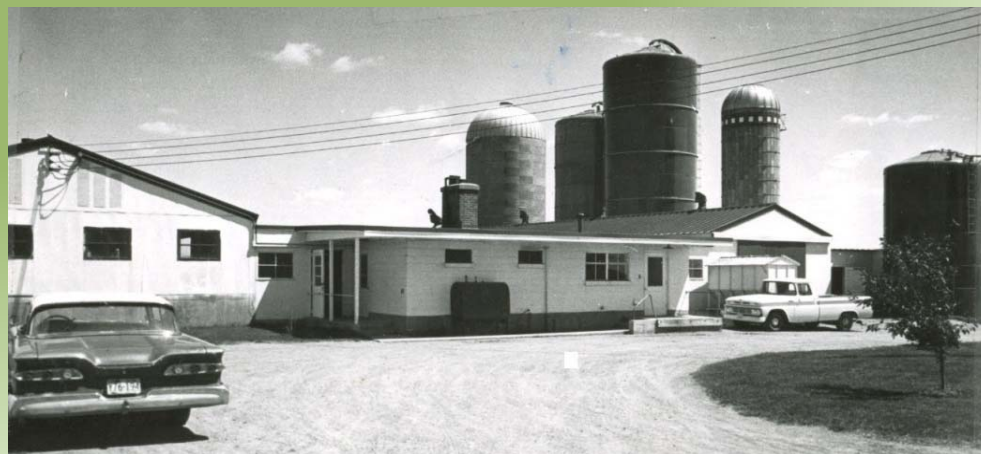
Left: Superintendent Garit Tenpas discusses corn production.
Upper right: Area farmers look to station field days to learn about new crop production and improved soil fertility practices.



Right: UW researchers Art Peterson and Leonard Massie work with land application of whey.



Above: Soil scientist and eventual CALS Dean Leo Walsh discussing nitrogen management for corn at a station field day.
Lower right: Upright silos were common in the 1970s and silos at the Marshfield Agricultural Research Station were the foundation of feed storage research.



The 1980s

Technology boosts research efficiency

Keyboards and keypads became part of ag research in the 1980s. Hand-held calculators were common, personal computers had begun to appear and email was replacing the telephone. This made it simpler for Madison-based scientists to conduct research at the Marshfield station—they could now transfer research designs and data between Madison and Marshfield with ease. As a result numerous UW-Madison scientists conducted research at Marshfield.



Clockwise from top: Cannulated cows came to Marshfield in the late 1980s, allowing more flexibility in developing advanced feed testing technologies. Automated plot harvesters developed at the station allowed for larger research trials and quick data processing. Marshfield station staff aid UW researchers on a daily basis. Laboratory analysis of forage fiber digestibility. Corn population research at the Marshfield station. Mini silo research on high moisture corn. Aerial view of the station in 1980.



UW-Madison researchers working at Marshfield Ag Research Station in the 1980s: Keith Kelling, Larry Bundy, Emmett Schulte, John Peters (Soil Science); Paul Carter, Ed Oplinger, Richard Smith, Dwayne Rohweder (Agronomy); Craig Grau (Plant Pathology); John Wedberg (Entomology); Ric Grummer, Randy Shaver, Dave Wickert, Pat Hoffman (Dairy Science); Jim Converse (Ag Engineering)

The 1990s

Dairy heifers and nutrient management



Above: Marshfield station research technicians work out the details of a dairy heifer nutrition trial. Below: Soil scientist John Peters discusses nutrient management with an international audience. Bottom center: Soil Phosphorus extracts at Marshfield.

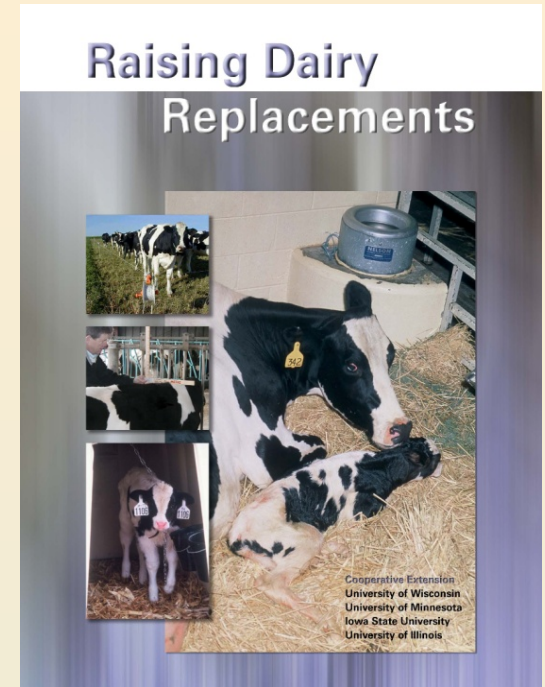


Global impact. In the 1990s, Marshfield-based dairy scientist Patrick Hoffman began a line of research focused on innovations in dairy heifer management. He presented his findings to thousands of Wisconsin dairy producers and ag professionals, but he was surprised to find that his work found a much larger audience—thanks to explosive growth of the internet. An anecdote from Marshfield resident Dr. Paul Gunderson illustrates this. “I stepped off the plane in Australia, met my host and informed them I was from Marshfield,” he recalls. “My host asked, “Do you know the people from Marshfield that are doing the dairy heifer research?”” The world wide web had put Marshfield research on a global stage.

The evolution of nutrient management. Wisconsin soils were low in phosphorus when the Marshfield station was established, but by the 1990s, P levels in some soils were excessively high, resulting in environmental concerns. UW-Madison scientists intensified efforts to improve nutrient management on Wisconsin farms. Much of this research has been conducted at Marshfield.



Right: Dairy scientist Patrick Hoffman has presented findings from Marshfield dairy heifer research in 37 states and 10 countries.



The 2000s Welcome Marshfield North

Under the leadership of the College of Agricultural and Life Sciences, Agricultural Research Stations and the Department of Dairy Science, the Marshfield Agricultural Research Station was transformed from a regional research station to a modern state of the art research facility. In a land exchange, the City of Marshfield acquired land to expand its industrial park, Wood County doubled its land holdings and the University of Wisconsin acquired three adjoining farms near Stratford, WI to build the Integrated Dairy Research Facility. Immediately thereafter, the USDA Dairy Forage Research Center expanded its operations, opening the Institute for Environmentally Integrated Dairy Management at the Marshfield Agricultural Research Station.



In 2004, the Marshfield Station's dairy research program moved to newly acquired land near Stratford. Located at the North Farm are replacement heifer facilities for the UW-Madison's Integrated Dairy Research Program as well as the USDA's Institute for Environmentally Integrated Dairy Management. By 2012, more than 500 dairy replacement heifers and 128 lactating dairy cows are on site.



Superintendent Tom Drendel led the Marshfield Agricultural Research Station through major land and facilities expansions.



Environmental, land use and dairy research at Marshfield North



The Marshfield Agricultural Research Station in 2012

As it begins its second century, the 1,250-acre Marshfield Agricultural Research Station continues its mission of providing research-based information to Wisconsin farmers. The station includes the replacement heifer research facility for the UW Integrated Dairy Research Program and currently houses 540 heifers and 128 milking cows. About 20 UW-Madison and USDA-ARS researchers conduct 60–80 crop and animal research projects on-site annually. The North Farm serves as an outdoor laboratory and teaching facility. Research there focuses on heifer growth and management, crop production, land drainage, soil fertility, waste management, farm economics, crop storage and environmental stewardship. Scientists at the USDA-ARS Environmentally Integrated Dairy Management Research Unit, with offices and labs at the South Farm and dairy cow and heifer research facilities at the North Farm, work to improve nutrient management systems and reduce nutrient and pathogen transfer from livestock waste to air, water, and soil. The UW Soil and Forage Analysis Laboratory continues to operate at the South Farm.



The century ahead

The Marshfield Agricultural Research Station



Nutrient management



Land use management



Research support



Forage production



Biotechnology



Soil and forage evaluation



Animal well being

The Marshfield station has hosted thousands of students over the years, including summer workers, interns, graduate students, elementary through high school classes, 4-H and FFA members to name a few. Some come to get their first taste of agriculture. Others come to get hands-on experience to prepare for a career in agriculture or research.

Students



1912–2012

Community Support



Facilities and Equipment: Major Donors

- Wood County
- John Wuethrich Foundation
- City of Marshfield
- Steve Miller Foundation
- Clark-Taylor Banker's Association
- Land O'Lakes
- Earth Incorporated
- Wisconsin Federation of Cooperatives
- Marshfield Chamber of Commerce
- Citizens State Bank
- Production Credit Association
- The Banks of Central Wisconsin
- H&S Manufacturing
- A.O. Smith
- Service Motor Company

It's impossible to list all of the organizations, businesses, and individuals that have provided support for facilities, equipment, events and programs at the Marshfield Agricultural Research Station over its 100-year history, but this generosity is not forgotten. To all those who have contributed funds, time or services, we extend our sincere thanks.

1912-2012

Leadership



Superintendents

- Frederick Musbach
- A. R. Albert
- Russ Johannes
- Garit Tenpas
- Tom Drendel
- Mike Bertram
- Nancy Esser

Assistant Superintendents

(Research Specialists)

- John Cliver
- Ivan Block
- John Peters
- Dan Wiersma
- Mike Bertram
- Nancy Esser

Scientists

- Conrad Olsen (Soil Science)
- Howard Larsen (Dairy Science)
- John Peters (Soil Science)
- Pat Hoffman (Dairy Science)
- Bill Jokela (USDA-ARS)
- Wayne Coblentz (USDA-ARS)
- Mark Borchardt (USDA-ARS)

Soil and Forage Analysis

Laboratory Managers

- Conrad Olsen
- Edward Liegel
- Craig Simson
- John Peters

Farm Foremen/Managers

- William McFetridge
- Carl Hanson
- Linus Palecek
- Rudolph Hofmann
- Dennis Wolf
- Scott Fischer

Herdsmen

- Charles Schmitz
- Clarence Nigbor
- John Williams
- Steve Marcis
- Greg Swart
- Paul Abel



1912-2012

Milestones

- 1920s. Use of lime phosphate and potash in forage production. F. Musbach.
- 1920s. Use of backsets and dead furrows to aid surface drainage on Central Wisconsin soils. F. Musbach.
- 1920s. Breeding of superior oat varieties and early maturing corn for Northern Wisconsin. P. Delwich.
- 1940s. Soil pH and fertility corrections for production of alfalfa in Central Wisconsin. E. Truog, R. Muckenhirn and E. Engelbert.
- 1940s. Development of “land forming” practices to aid surface drainage of Central Wisconsin soils. A. Wojta
- 1950s. Evaluation of alfalfa and red clover varieties for persistence. R. Johannes.
- 1950s. Development of soil testing services for Central Wisconsin farmers. C. Olsen.
- 1950s. Evaluation of summer forage feeding systems (pasture, silage or green chop) for dairy cattle. H. Larsen
- 1960s. Use of high moisture corn for dairy cattle. H. Larsen
- 1960s. Development of the calf hutch for rearing dairy calves. H. Larsen.
- 1970s. Evaluation of feed losses in ensiled feeds. H. Larsen.
- 1970s. Introduction of forage testing services in Wisconsin. H. Larsen and C. Olsen.
- 1970s. Development of crop specific lime recommendations for Central Wisconsin. E. Schulte and J. Peters.
- 1980s. Development of Marathon red clover. R. Smith
- 1980s. Introduction of NIRS forage testing in Wisconsin. E. Schulte, D. Rohweder, C. Simson and J. Peters.
- 1980s. Discovery of phytophthora and aphanomyces root rot in Wisconsin alfalfa. C. Grau.
- 1990s. Introduction of NDF digestibility into Wisconsin forage testing.* J. Peters, R. Shaver, D. Undersander and P. Hoffman
- 1990s. Alteration of dairy heifer nutrient requirements for environmental conditions. P. Hoffman.
- 1990s. Classification of dairy heifer growth standards. P. Hoffman.
- 2000s. Introduction of summative corn silage evaluation systems. R. Shaver and J. Lauer.
- 2000s. Introduction of limit feeding strategies for dairy replacement heifers to reduce nutrient excretion. P. Hoffman
- 2000s. Development of national standards for manure evaluation and testing. J. Peters.
- 2000s. Definition of dietary phosphorus requirements for dairy heifers. P. Hoffman and K. Weigel
- 2010s. Introduction of the first commercial test of prolamin proteins in feed grains. P. Hoffman and J. Larson
- 2010s. Definition of high moisture corn chemistry and integrated feed grain evaluation systems. P. Hoffman and R. Shaver

* Numerous UW faculty, USDA-ARS and staff contributions: D. Mertens, D. Combs, N. Martin, J. Lauer, and L. Bauman



Authors: Patrick Hoffman and John Peters.

Contributors: Mike Bertram, Nancy Esser, Tom Drendel, Dennis Wolf, Wayne Coblenz, Tina Seeger, Lisa Bauman, Jodie Budtke, Maureen Kolstad, and Sarah Pleet.

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