Soft Wheat Quality Lab

a short history

Experimental Mill ~1929

The Soft Wheat Quality Lab has roots going back into the 1920s. The milling industry in Ohio, Michigan, and Indiana began to discuss the lack of scientific research concerning soft wheat. They believed research would stimulate sales and improve quality as it previously had with hard wheats. In 1929, the larger mills in these states formed the Tri-State Soft Winter Wheat Improvement Association and embarked on several studies, including on a five-year project testing nearly 3,000 samples of soft wheat.

Dr. E. G. Bayfield ~1940

In 1934 at the conclusion of the five year study, there was great enthusiasm for the research to continue and expand to a permanent laboratory and staff. Due to the nature of the economic times the milling industry was unable to produce the money for such a venture. A young cereal chemist at the Ohio Agricultural Experiment Station, Dr. E.G. Bayfield, worked with the Ohio Millers Association and the U.S. Department of Agriculture to move the small soft wheat portion of the existing USDA Wheat Quality Lab in Beltsville, MD to Wooster, Ohio, and to expand the research using funding from the Bankhead-Jones Act of 1935. Dr. Bayfield estimated that it would cost $24,000 (Almost $400,000 adjusted for 2012) to set up the lab and an annual operational budget of $12,000.

Home of the Lab until 1967

The Federal Soft Wheat Laboratory did get started in 1937 and Dr. Bayfield became the first head. In a letter in 1971, Dr. Bayfield recounted moving into the first location of the lab:

> ...the proposed space had been unused for ten years and had been used before that for animal experiments. When the former occupant moved out, he apparently just took the animals and walked off with them leaving everything just as it fell on the floor. Boy! Was it a mess!

Miag Mill Delivery—1967

The lab worked with a wide range of collaborators and developed many methods and systems of analysis for soft wheat. In 1954, Dr. C. E. Bode, the "chemist-in-charge", organized the first meeting of an Advisory Committee with individuals from the milling and baking industries. The meeting became the first of the annual Research Review conferences.

Lab Members Harvesting Wheat—1954

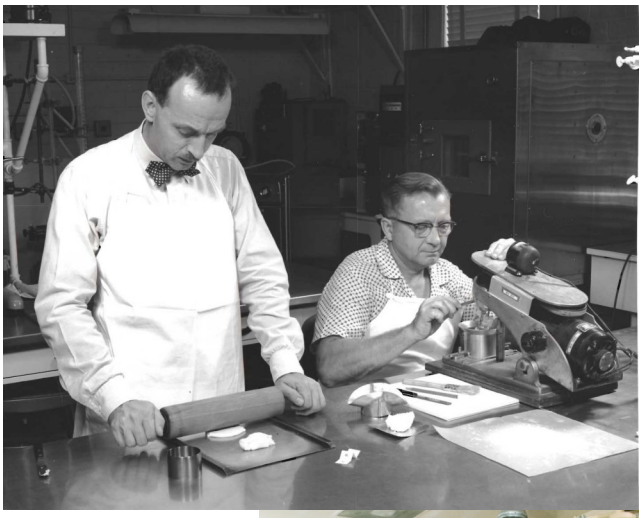
In 1965, plans were drawn up for a new wing on Williams Hall with a large portion of it being dedicated to the Soft Wheat Lab. The lab began to move in and the wing was finally dedicated in April, 1969.

Today, in addition to various research projects, the Soft Wheat Quality Lab processes in excess of 6,000 samples annually for quality assessment, double the number from just two decades ago. Samples for quality evaluation come from 15 states and about 30 different cooperators. Samples come from breeders and researchers both public and private.

Continued ➥

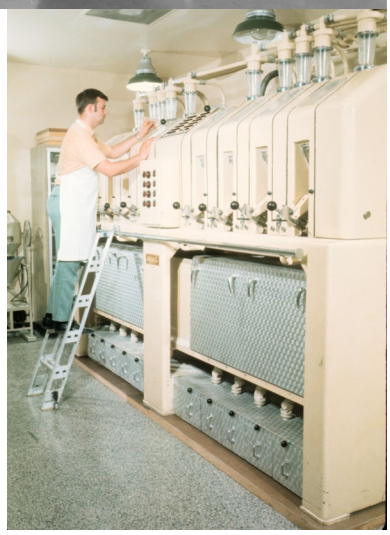
Select 1936 Research Goals

- Characterize soft wheat flour used for various purposes.
- Discover essential quality differences between hard and soft red winter wheat.
- Evaluate the quality of new and promising varieties.
- Develop methods for evaluating small lots of grain.



Select published topics of study over 75 years:

- 1945—The non-uniform distribution of protein, ash, and mineral constituents in wheat kernels.
- 1950—The micro cookie baking test.
- 1955—Relationship between flour water absorption capacity and cookie quality.
- 1959—Layer cake test.
- 1965—Studies on the dynamics of cake baking.
- 1968—Micro tests for soft wheat quality.
- 1975—Protein enrichment of cookie flours.
- 1980—Method to evaluate flour for rotary-molded cookies.
- 1985—Evaluation of cookies from whole wheat flours of soft wheat cultivars.
- 1988—Prediction of damaged starch in straight-grade flour by near-infrared analysis of whole ground wheat.
- 1994—Phospholipid hydrolysate and antistaling amylase effects on retrogradation of starch in bread.
- 1995—Effects of *Septoria* leaf blotch on milling and baking quality.
- 1997—Influence of kernel size and shriveling on milling and baking quality.
- 2000—Various works on soft x hard crosses including quality and genetic testing.
- 2003—Studies with waxy and partial waxy wheats.
- 2006—Studies with low phytic acid wheat.
- 2009—Method for benchtop baking method for chemically leavened crackers.
- 2010—New improved sugar snap cookie method.
- 2011—Various whole grain studies and phenotypic association mapping study.



Over the past 75 years of operation, the Soft Wheat Quality Lab has seen people come and go, old machines refurbished and new ones take their place. The lab has worked with cookies, cakes, crackers, and breads of all kinds. The original focus remains: to improve the quality of soft winter wheat.