

FIFTY-THIRD ANNUAL REPORT

Agricultural Experiment Station  
University of Minnesota

JULY 1, 1945 TO JUNE 30, 1946



UNIVERSITY FARM, ST. PAUL



LETTERS OF TRANSMITTAL

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

July 1, 1946

*To His Excellency, Edward J. Thye,  
Governor of Minnesota.*

SIR: I have the honor to transmit to you herewith the report of the Agricultural Experiment Station of the University of Minnesota for the fiscal year ending June 30, 1946.

Respectfully transmitted,

JAMES L. MORRILL,  
*President of the Board of Regents*

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

July 1, 1946

*To the Honorable Board of Regents,  
University of Minnesota.*

GENTLEMEN: I have the honor to transmit herewith the report of the Director of the Agricultural Experiment Station of the University of Minnesota for the fiscal year ending June 30, 1946.

Respectfully transmitted,

JAMES L. MORRILL,  
*President of the University of Minnesota*

UNIVERSITY FARM, ST. PAUL, MINN.

July 1, 1946

*James L. Morrill,  
President of the University of Minnesota.*

SIR: I have the honor to submit herewith the report of the Agricultural Experiment Station for the fiscal year ending June 30, 1946.

Respectfully submitted,

C. H. BAILEY, *Director*

## CONTENTS

	Page
Foreword .....	5
Changes in staff .....	7
Appointments .....	7
Promotions .....	8
Leaves of absence .....	9
Resignations .....	10
Retirements .....	12
Deaths .....	12
Publications .....	12
General bulletin series .....	12
Technical bulletin series .....	13
Minnesota Farm and Home Science .....	13
Postwar Agriculture in Minnesota .....	13
Report series .....	13
Agricultural extension service .....	13
Bulletin series .....	13
Pamphlet series .....	14
Folder series .....	14
Boys' and girls' club series .....	15
Newsletters .....	15
Scientific journal series papers .....	15
Miscellaneous journal series papers .....	19
Summary of publications .....	22
New experiment station projects .....	22
Agricultural engineering .....	22
Agronomy and plant genetics .....	22
Animal and poultry husbandry .....	23
Dairy husbandry .....	23
Entomology and economic zoology .....	23
Home economics .....	23
Summary of projects .....	23
Financial statement .....	24
Experiment station staff .....	25

FIFTY-THIRD ANNUAL REPORT  
MINNESOTA AGRICULTURAL EXPERIMENT STATION  
JULY 1, 1945 TO JUNE 30, 1946

C. H. Bailey, Director

FOREWORD

The year 1945 will be remembered as the time when armed conflict ceased in Europe and in the Pacific, and 1946 as the beginning of the postwar period. The six years of war had made great demands upon the farmers of this country. They responded magnificently with a display of patriotism, high intelligence, and a miraculous application of manpower under most difficult conditions. The men and women on the farms of this country labored long hours to produce the food necessary to supply our armed forces and millions of hungry people throughout the world. Their accomplishments merit the acclaim of all our people. The goals were reached despite a shortage of manpower and many other difficulties. The application of scientific principles to the production of food was most outstanding throughout the entire period of the war.

The Minnesota Agricultural Experiment Station was called upon to solve many problems, both old and new. The investigators brought forth new knowledge which made it possible for the farmer to increase his production both quantitatively and qualitatively to such a degree that all records were broken. During 1945 and 1946 new varieties of disease-resistant and superior crops, as well as improved livestock, were developed and introduced. The control of plant and animal pests was advanced as a result of agricultural research in the Experiment Station. New methods for the prevention and control of plant and animal diseases were made known. Leadership was exhibited by agricultural economists in matters pertaining to the organization, financing, and operation of agricultural enterprises and industries which found wartime adjustments necessary. Other fundamental research in the fields of agricultural engineering, dairy husbandry, agricultural biochemistry, nutrition, forestry, home economics, horticulture, soils, and related sciences yielded results which furthered the cause of agriculture and the welfare of our people.

The postwar demands upon the Minnesota Agricultural Experiment Station for an extended program of research have become tremendous. The people of this country are convinced, as a result of the remarkable developments during the war, that we are living in a world of science

and that additional support must be given to the promotion of scientific investigation to solve many of the perplexing problems which now confront us. The Experiment Station is well aware of this situation and is making every effort to meet the challenge. The fields of investigation are becoming more extensive and are being studied more intensively. With the return of members of the staff who have been in service and with new recruits who are now being trained, the solution of the problems of agriculture will be accelerated. Increased funds to support the research will be required from state, federal, and private sources in order that the investigators may have the facilities with which to pursue their studies. The responsibility is large but the staff of the Experiment Station is ready and eager to attack the problems in order to ascertain the facts which will make it possible for agriculture to move forward in the years ahead with more confidence and assurance of success.

**CHANGES IN STAFF****Appointments**

Arnold M. Flikke, M.S., as assistant in agricultural engineering, Division of Agricultural Engineering, effective May 20, 1946.

Virgil H. Johnson, B.A.E., as assistant in agricultural engineering, Division of Agricultural Engineering, effective March 1, 1946.

H. H. Kramer, M.S., as assistant in plant genetics, Division of Agronomy and Plant Genetics, effective October 1, 1945 to December 31, 1945 and February 4, 1946 to March 23, 1946.

Jean W. Lambert, Ph.D., as assistant plant geneticist, Division of Agronomy and Plant Genetics, effective January 1, 1946.

C. F. Sierk, M.S., as research fellow, Division of Animal Husbandry, effective April 1, 1946.

C. W. Bice, M.S., as research fellow, Division of Agricultural Biochemistry, effective April 1, 1946.

Paul D. Boyer, Ph.D., as assistant agricultural biochemist, Division of Agricultural Biochemistry, effective July 1, 1945.

C. E. Calverley, Ph.D., as assistant agricultural biochemist, Division of Agricultural Biochemistry, effective October 16, 1945.

L. H. Evans, Ph.D., as research associate, Division of Agricultural Biochemistry, effective November 5, 1945.

R. A. Larsen, M.S., as research fellow, Division of Agricultural Biochemistry, effective October 1, 1945.

P. P. Noznick, B.S., as research associate, Division of Agricultural Biochemistry, effective February 6, 1945.

Max O. Schultze, Ph.D., as agricultural biochemist, Division of Agricultural Biochemistry, effective June 16, 1946.

David Siminovitch, Ph.D., as assistant in agricultural biochemistry, Division of Agricultural Biochemistry, effective September 16, 1945.

Thomas P. Singer, Ph.D., as assistant agricultural biochemist, Division of Agricultural Biochemistry, effective April 1, 1946.

R. J. Stenberg, B.S., as research fellow, Division of Agricultural Biochemistry, effective January 1, 1946.

L. K. Crowe, M.S.Agr., as research associate, Division of Dairy Husbandry, effective September 1, 1945.

A. S. Kitzes, M.S. in Ch.E., as research associate, Division of Dairy Husbandry, effective September 16, 1945.

Elmer L. Thomas, M.S., assistant in dairy husbandry, Division of Dairy Husbandry, effective July 1, 1945.

J. S. Cass, M.S., as research fellow, Division of Entomology and Economic Zoology, effective September 1, 1945.

L. K. Cutkomp, Ph.D., as research associate, Division of Entomology and Economic Zoology, effective August 1, 1945.

Richard H. Daggy, Ph.D., as assistant entomologist, Division of Entomology and Economic Zoology, effective October 1, 1945.

H. Y. Fan, Ph.D., as research associate, Division of Entomology and Economic Zoology, effective April 16, 1946.

A. Glenn Richards, Ph.D., as associate entomologist, Division of Entomology and Economic Zoology, effective July 1, 1945.

John A. Zivnuska, M.S., as assistant in forestry, Division of Forestry, effective January 1, 1946.

Dorothy Day, Ph.D., as research associate, Division of Plant Pathology and Botany, effective December 1, 1945.

Erich O. Mader, Ph.D., as assistant plant pathologist, Division of Plant Pathology and Botany, effective May 24, 1946.

Harold F. Arneman, M.S., as assistant in soils, Division of Soils, effective December 1, 1945.

J. R. Collier, D.V.M., as assistant veterinarian, Division of Veterinary Medicine, effective May 16, 1946.

R. L. Kitchell, D.V.M., as research fellow, Division of Veterinary Medicine, effective April 1, 1946.

H. G. Snoeyenbos, D.V.M., as research fellow, Division of Veterinary Medicine, effective July 1, 1945.

R. A. Hamilton, M.S., as assistant in horticulture, North Central Experiment Station, effective October 26, 1945.

#### Promotions

H. Macy, Ph.D., dairy bacteriologist to dairy bacteriologist and associate director of the Agricultural Experiment Station, effective March 16, 1946.

H. Y. Fan, Ph.D., research fellow to research associate, Division of Entomology and Economic Zoology, effective April 16, 1946.

R. M. Brown, M.F., assistant forester to associate forester, Division of Forestry, effective July 1, 1945.

F. H. Kaufert, Ph.D., associate forester to forester and assistant chief, Division of Forestry, effective July 1, 1945.

L. W. Rees, Ph.D., assistant forester to associate forester, Division of Forestry, effective July 1, 1945.

Isabel Noble, Ph.D., associate home economist to home economist, Division of Home Economics, effective July 1, 1945.

R. E. Nylund, Ph.D., assistant in horticulture to assistant horticulturist, Division of Horticulture, effective July 1, 1945.

O. C. Soine, Ph.D., research fellow, Division of Soils, to assistant agronomist, Northwest Experiment Station, effective September 16, 1945.

B. S. Pomeroy, Ph.D., assistant animal pathologist, to associate animal pathologist, Division of Veterinary Medicine, effective November 1, 1945.

C. H. Griffith, M.S., assistant in agronomy to assistant agronomist, North Central Experiment Station, effective July 1, 1945.



K. P. Miller, M.S., assistant in animal husbandry to assistant animal husbandman, North Central Experiment Station, effective April 16, 1946.

M. J. Thompson, M.S., associate professor to professor, Northeast Experiment Station, effective July 1, 1945.

R. E. Hodgson, M.S., associate professor to professor, Southeast Experiment Station, effective July 1, 1945.

#### Leaves of Absence

Harlow Halvorson, M.S., assistant in agricultural economics, Division of Agricultural Economics, on leave for military service, July 1, 1945 to February 1, 1946.

E. R. Allred, M.S., assistant agricultural engineer, Division of Agricultural Engineering, on leave for military service, August 1, 1945 to May 19, 1946.

C. K. Otis, M.S., associate agricultural engineer, Division of Agricultural Engineering, on leave for military service, July 1, 1945 to January 28, 1946.

J. K. Park, M.S., assistant in agricultural engineering, Division of Agricultural Engineering, on leave for military service, July 1, 1945 to October 15, 1945.

E. L. Pinnell, M.S., assistant in plant genetics, Division of Agronomy and Plant Genetics, on leave for military service, July 1, 1945 to December 1, 1945.

A. R. Schmid, Ph.D., assistant agronomist, Division of Agronomy and Plant Genetics, on leave for military service, July 1, 1945 to April 1, 1946.

H. G. Croom, B.S., assistant poultry husbandman, Division of Animal and Poultry Husbandry, on leave for military service, July 1, 1945 to June 1, 1946.

P. D. Boyer, Ph.D., assistant agricultural biochemist, Division of Agricultural Biochemistry, on leave for military service, August 1, 1945 to March 15, 1946.

H. Macy, Ph.D., dairy bacteriologist, Division of Dairy Husbandry, and associate director, Agricultural Experiment Station, on leave for military service, July 1, 1945 to November 1, 1945.

J. C. Olson, Jr., M.S., assistant in dairy husbandry, Division of Dairy Husbandry, on leave for military service, July 1, 1945 to October 16, 1945.

E. L. Thomas, M.S., assistant in dairy husbandry, Division of Dairy Husbandry, on leave for military service, July 1, 1945 to April 30, 1946.

F. H. Kaufert, Ph.D., forester and assistant chief, Division of Forestry, on leave as technologist at Forest Products Laboratory, Madison, Wisconsin, July 1, 1945 to August 4, 1945.

Yale Weinstein, B.S., assistant in forestry, Division of Forestry, on leave for military service, July 1, 1945 to September 30, 1945.

R. E. Nylund, Ph.D., assistant horticulturist, Division of Horticulture, on leave for military service, September 1, 1945 to April 16, 1946.

R. A. Phillips, B.S., assistant in horticulture, Division of Horticulture, on leave for military service, July 1, 1945 to October 7, 1945.

Harold L. Harris, B.S., bulletin editor, Agricultural Experiment Station, on leave for newspaper work, July 1, 1945 to March 8, 1946.

A. G. Karlson, Ph.D., assistant in veterinary medicine, Division of Veterinary Medicine, on leave for military service, resigned December 31, 1945.

A. F. Sellers, M.S., assistant in veterinary medicine, Division of Veterinary Medicine, on leave for military service, July 1, 1945 to January 16, 1946.

Lowry Nelson, Ph.D., rural sociologist, Rural Sociology, on leave as rural sociologist in the Foreign Service Auxiliary of the State Department to do research in the Caribbean area, July 1, 1945 to June 30, 1946.

K. P. Miller, M.S., assistant in animal husbandry, North Central Experiment Station, on leave for military service, July 1, 1945 to April 16, 1946.

#### Resignations

Victor Dose, field agent, Division of Agricultural Economics, to accept a position with the Perfection Manufacturing Corporation, Minneapolis, effective October 5, 1945.

George Toben, M.S., assistant in agricultural economics, Division of Agricultural Economics, to accept a position as assistant professor, Department of Agricultural Economics, University of West Virginia, Morgantown, West Virginia, effective June 30, 1946.

J. K. Park, M.S., assistant in agricultural engineering, Division of Agricultural Engineering, to accept a position as agricultural engineer with the U. S. Department of Agriculture, effective October 15, 1945.

M. T. Henderson, Ph.D., assistant plant geneticist, Division of Agronomy and Plant Genetics, to accept a position as associate professor, Department of Agronomy, Pennsylvania State College, State College, Pennsylvania, effective September 15, 1945.

Y. S. Tsiang, Ph.D., assistant in plant genetics, Division of Agronomy and Plant Genetics, to return to China to work with Chinese Government, effective November 26, 1945.

H. A. Stewart, Ph.D., assistant animal husbandman, Division of Animal and Poultry Husbandry, to accept a position as associate professor of animal husbandry, North Carolina State College, Raleigh, North Carolina, effective August 15, 1945.

C. E. Calverley, Ph.D., assistant agricultural biochemist, Division of Agricultural Biochemistry, to accept a position as research associate, National Foundation for Infantile Paralysis, Physiology Department, University of Minnesota, effective April 28, 1946.

L. H. Evans, Ph.D., research associate, Division of Agricultural Biochemistry, to start a chemical laboratory on the West Coast, effective March 31, 1946.

H. V. Lindstrom, Ph.D., assistant in agricultural biochemistry, Division of Agricultural Biochemistry, to accept a position as chemist, Squibb Company, New Brunswick, New Jersey, effective June 30, 1946.

Elizabeth Merner, M.A., assistant in agricultural biochemistry, Division of Agricultural Biochemistry, effective June 15, 1946.

P. P. Noznick, B.S., research associate, Division of Agricultural Biochemistry, to accept a position as chemist, Beatrice Creamery Company, Chicago, Illinois, effective June 30, 1946.

Walter L. Slatter, M.S., assistant dairy bacteriologist, Division of Dairy Husbandry, to return to the position of assistant professor, Department of Dairy Technology, Ohio State University, Columbus, Ohio, effective December 31, 1945.

L. K. Cutkomp, Ph.D., research associate, Division of Entomology and Economic Zoology, to accept a position with T.V.A., Wilson Dam, Alabama, effective April 17, 1946.

A. B. Erickson, Ph.D., research associate, Division of Entomology and Economic Zoology, to accept a position with Fish and Wildlife Service, U. S. Department of Interior, at Savannah, Georgia, effective August 31, 1945.

Yale Weinstein, B.S., assistant in forestry, Division of Forestry, to accept a position as forester for the New Mexico Timber Company and manager of the Winslow Timber Company, Bernalillo, New Mexico, effective October 1, 1945.

Eva Donelson, Ph.D., associate home economist, Division of Home Economics, to accept a position as chairman, Foods and Nutrition Department, Ohio State University, Columbus, Ohio, effective April 5, 1946.

E. F. Darley, B.S., research fellow, Division of Plant Pathology and Botany, to accept a position in research department of Firestone Plantations Co., Monrovia, Liberia, West Africa, effective August 31, 1945.

E. G. Sharvelle, Ph.D., assistant plant pathologist, Division of Plant Pathology and Botany, to accept a position as associate pathologist, Purdue University, Lafayette, Indiana, effective May 23, 1946.

L. E. Dunn, Ph.D., research fellow, Division of Soils, to accept a position as associate chemist, Agricultural and Mechanical College of Texas, College Station, Texas, effective June 30, 1946.

C. A. Evans, Ph.D., research fellow, Division of Soils, to accept a position as assistant chemist, University of Kentucky, Lexington, Kentucky, effective November 9, 1945.

A. G. Karlson, Ph.D., assistant in veterinary medicine, Division of Veterinary Medicine, to accept a position with the Experimental Research Institute of the Mayo Foundation at Rochester, Minnesota, effective December 31, 1945.

H. G. Snoeyenbos, D.V.M., research fellow, Division of Veterinary Medicine, to enter into private practice, effective December 31, 1945.

F. J. Weirether, B.S., research fellow, Division of Veterinary Medicine, to accept a position as microbiologist for Merck and Company, Rahway, New Jersey, effective December 20, 1945.

Vernon Davies, Ph.D., lecturer, Rural Sociology, to accept a position as assistant professor, Department of Sociology, University of Mississippi, State College, Mississippi, effective June 1, 1946.

A. L. Richardson, M.S., assistant in horticulture, North Central Experiment Station, to accept a position as superintendent, Montana Horticultural Experiment Station, Corvallis, Montana, effective September 25, 1945.

R. J. Christgau, M.S., assistant animal husbandman, Northwest Experiment Station, to accept a position with the United States Veterans Bureau, effective July 15, 1945.

C. J. Hemming, M.S., assistant poultry husbandman, West Central Experiment Station, effective June 30, 1946.

#### Retirements

A. C. Army, M.S., associate agronomist, Division of Agronomy and Plant Genetics, effective April 7, 1946.

F. E. Haralson, assistant superintendent, Fruit Breeding Station, Division of Horticulture, effective June 30, 1946.

#### Deaths

F. R. Immer, Ph.D., associate director, Agricultural Experiment Station, and plant geneticist, Division of Agronomy and Plant Genetics, February 2, 1946.

R. B. Harvey, Ph.D., plant physiologist and agricultural botanist, Division of Plant Pathology and Botany, November 4, 1945.

### PUBLICATIONS

#### General Bulletin Series

336. (Revised). Artificial insemination of farm animals. W. W. Green and L. M. Winters, Division of Animal Husbandry. 32 pages, 5,000.

389. Capital needed to farm in the Midwest. North Central Regional Publication No. 5. G. A. Pond, Division of Agricultural Economics. 34 pages, 29,000.

390. Supplementary and emergency crops for Minnesota. A. C. Army, R. O. Bridgford, and Ralph Crim, Division of Agronomy and Plant Genetics. 24 pages, 5,000.

391. Yield and nutrient content of sugar-beet tops. L. E. Dunn and C. O. Rost, Division of Soils. 8 pages, 5,000.

392. Principal soil regions of Minnesota. Paul R. McMiller, Division of Soils. 48 pages, 7,500.

#### Technical Bulletin Series

171. Management of the Cloquet Forest. J. H. Allison and R. M. Brown, Division of Forestry. 95 pages, 3,000.

172. An experimental study of convergent improvement and back-crossing in corn. H. K. Hayes, E. H. Rinke, and Y. S. Tsiang, Division of Agronomy and Plant Genetics. 40 pages, 2,500.

173. Potato breeding methods. III. A suggested method for potato breeding. F. A. Krantz, Division of Horticulture. 24 pages, 2,500.

174. Factors affecting productivity in breeding sheep. L. M. Winters, D. L. Dailey, O. M. Kiser, P. S. Jordan, R. E. Hodgson, and W. W. Green, Division of Animal Husbandry. 28 pages, 3,000.

175. Susceptibility of edible soya products in storage to attack by *Tribolium confusum* Duv. Clarence E. Mickel and John Standish, Division of Entomology and Economic Zoology. 28 pages, 3,000.

176. Genetic differences in the biochemistry and physiology influencing food utilization for growth in rats. Leroy S. Palmer, Cornelia Kennedy, Charles E. Calverley, Cecil Lohn, and Paul H. Weswig, Division of Agricultural Biochemistry. 54 pages, 3,000.

#### Minnesota Farm and Home Science

Volume III, Number 1. 16 pages, 16,000.

Volume III, Number 2. 16 pages, 16,000.

Volume III, Number 3. 16 pages, 16,000.

#### Postwar Agriculture in Minnesota

4. Nutrition and the family's food. Alice Biester and Jane M. Leichsenring, Division of Home Economics. 48 pages, 7,500.

#### Report Series

Fifty-second annual report of the Minnesota Agricultural Experiment Station, July 1, 1944 to June 30, 1945. 28 pages, 2,500.

#### Agricultural Extension Service

##### Bulletin Series

246. Planning step-saving kitchens. Mary May Miller, Division of Agricultural Extension. 8 pages, 55,000.

247. Water systems and sewage disposal on the farm. Dennis M. Ryan, Division of Agricultural Extension. 16 pages, 25,000.

248. Farm business agreements for father and son. J. B. McNulty, Division of Agricultural Extension. 20 pages, 15,000.

249. Kitchen cupboards. Mary May Miller, Division of Agricultural Extension. 8 pages, 55,000.

250. Landscaping the farmstead. Leon C. Snyder, Division of Agricultural Extension. 24 pages, 25,000.

251. Bathrooms for the farm home. Helen Matheis, Division of Agricultural Extension. 8 pages, 45,000.

252. Recommendations for using DDT. R. H. Daggy, A. A. Granovsky, and A. C. Hodson, Division of Entomology and Economic Zoology. 16 pages, 15,000.

#### Pamphlet Series

142. Saving a soft corn crop. S. B. Cleland, Division of Agricultural Extension. 6 pages, 40,000.

143. A survey of member factories of the Minnesota Cheese Producers Association, 1944. W. H. Dankers, Division of Agricultural Extension. Mimeographed. 18 pages, 1,000.

144. This is the United Nations Organization. D. C. Dvoracek, Division of Agricultural Extension. 8 pages, 12,000.

145. A survey of Minnesota egg and poultry processing and marketing. W. H. Dankers, Division of Agricultural Extension. Multi-graphed. 12 pages, 3,000.

146. Vegetable plant growing reminders. Leon C. Snyder, Division of Agricultural Extension. 8 pages, 2,000.

#### Folder Series

134. What is a good farm house? Mary May Miller, Division of Agricultural Extension. 8 pages, 40,000.

135. Farmstead planning. S. B. Cleland, Division of Agricultural Extension. 6 pages, 40,000.

136. Cankerworm control. A. C. Hodson, Division of Entomology and Economic Zoology. 4 pages, 10,000.

137. Liming soils in Minnesota. Paul M. Burson, Division of Soils. 6 pages, 40,000.

138. What can I pay for a dairy barn? S. A. Engene, Division of Agricultural Economics. 6 pages, 15,000.

139. How to control soil- and seed-borne diseases of vegetables. R. C. Rose, Division of Agricultural Extension. 6 pages, 10,000.

140. Windbreaks for field protection. Parker Anderson, Division of Agricultural Extension. 6 pages, 10,000.

141. Choosing drain tile to fit your soil. Dalton G. Miller, Division of Agricultural Engineering. 6 pages, 5,000.

142. Centralized hog plan. H. G. Zavoral, Division of Agricultural Extension. 6 pages, 20,000.

Boys' and Girls' Club Series

35. ABC's of raising rabbits. Gustav Swanson and Shaler Aldous, Division of Entomology and Economic Zoology. 8 pages, 10,000.

36. Homemaking assistance. Mary May Miller and Margaret Fobes Tabbut, Division of Agricultural Extension. 4 pages, 15,000.

Newsletters

Name of publication	Issues	Pages	Circulation
Bob Hodgson Talks, weekly .....	53	108	1,463
Club Leader Letter, monthly .....	11	48	45,182
Dairy Herd Improvement Letter .....	1	4	1,649
Extension News Digest, semimonthly .....	22	46	14,456
Farm Business Notes, monthly .....	12	48	25,048
Poultry News Letter .....	6	12	1,982
Sheep News Letter .....	3	6	7,124
Turkey News Letter .....	6	12	6,562
Weekly Review .....	51	93	5,466
Market Garden Letter .....	4	10	4,457
Radio Schedule .....	8	16	3,342
Rural Youth News .....	2	8	3,539
Visual Aids Tip Sheet .....	10	20	1,738
	189	431	122,008

Scientific Journal Series Papers

Agricultural Biochemistry

2220. Substances adsorbed on the fat globules in cream and their relation to churning. V. Composition of the "membrane" and distribution of the adsorbed substances in churning. Robert Jenness and L. S. Palmer. *Journal of Dairy Science* 28:611-623. 1945.

2221. Substances adsorbed on the fat globules in cream and their relation to churning. VI. Relation of the high-melting triglyceride fraction to butterfat and the "membrane." Robert Jenness and L. S. Palmer. *Journal of Dairy Science* 28:653-658. 1945.

2231. Studies in ozonolysis. I. Action of ozone on solvents used in ozonization. Fred L. Greenwood. *Journal of Organic Chemistry* 10:414-418. 1945.

2245. Studies on protein denaturation. I. Electrophoretic study kinetics at neutrality of heat denaturation of  $\beta$ -lactoglobulin. Robert Hull and David R. Briggs. *Journal of the American Chemical Society* 67:2007-2014. 1945.

2247. Grain storage studies. I. Influence of localized heating of soybeans on interseed air movements. Max Milner and W. F. Geddes. *Cereal Chemistry* 22:477-483. 1945.

2248. Reaction vessel for maintaining constant pH by continuous electrometric titration during sodium amalgam reductions. Nathan Sperber and D. R. Briggs. *Industrial and Engineering Chemistry (Anal. Ed.)* 18:74-75. 1946.

2249. Grain storage studies. II. The effect of aeration, temperature, and time on the respiration of soybeans containing excessive moisture. Max Milner and W. F. Geddes. *Cereal Chemistry* 22:484-501. 1945.

2250. Staling studies on breads containing waxy maize starch. P. P. Noznick, P. P. Merritt, and W. F. Geddes. *Cereal Chemistry* 23:297-305. 1946.

2251. The distribution of thiamine in wheat seedlings at different stages of germination in the dark. A. Hoffer, A. W. Alcock, and W. F. Geddes. *Cereal Chemistry* 23:76-83. 1946.

2254. Effect of leaf and stem rust on the phosphorus metabolism of hard red spring wheat. A. Hoffer, W. F. Geddes, and M. N. Levine. *Cereal Chemistry* 23:52-64. 1946.

2258. Rapid method for the preparation of samples and evaluation of oil quality in small samples of flaxseed. John Adams Schrickler. *Oil and Soap* 23:91-92. 1946.

2259. Gas-packing dry whole milk. S. T. Coulter and Robert Jenness. *Food Industries* 18:352-355, 468-472. 1946.

2262. Chemical state of phosphorus in starch as indicated by titration curves on electrolyzed starches. D. R. Briggs and Martin Hanig. *Cereal Chemistry* 23:277-287. 1946.

2274. Grain storage studies. III. The relation between moisture content, mold growth, and respiration of soybeans. Max Milner and W. F. Geddes. *Cereal Chemistry* 23:225-247. 1946.

#### Agricultural Engineering

2229. Report on comparative short-time tests for sulfate resistance of 121 commercial cements. D. G. Miller and C. G. Snyder. *American Society for Testing Materials, Proceedings for 1945* 45:165-194. 1945.

#### Agronomy and Plant Genetics

2213. The field reactions of certain oats hybrids and varieties to stem rust. M. B. Moore, H. K. Hayes, and E. C. Stakman. *Phytopathology* 35:549-551. 1945.

2222. Inheritance of coumarin in sweet clover. E. H. Rinke. *Journal of the American Society of Agronomy* 37:635-642. 1945.

2223. Some uses of statistical methods in plant breeding. F. R. Immer. *Biometrics Bulletin of the American Statistical Association* 1:13, 14, 15, and 28. 1945.

2246. The relationship between predicted performance of double crosses of corn in one year with predicted and actual performance of double crosses in later years. H. K. Hayes, E. H. Rinke, and Y. S. Tsiang. *Journal of the American Society of Agronomy* 38:60-67. 1946.

#### Animal and Poultry Husbandry

2196. An appraisal of factors affecting prolificacy in swine. H. A. Stewart. *Journal of Animal Science* 4:250-260. 1945.



2232. The inheritance of prolificacy in swine. H. A. Stewart. *Journal of Animal Science* 4:356-366. 1946.
2238. Addition of synthetic nutrients to protein supplemental feeds in swine rations. E. F. Ferrin. *Journal of Animal Science* 5:42-46. 1946.
2242. A dactylolysis mutation in the fowl. R. N. Shoffner. *Journal of Heredity* 36:375-378. 1945.
2263. Cleavage and attachment stages of the pig. W. W. Green and L. M. Winters. *Journal of Morphology* 78:305-316. 1946.

#### Dairy Husbandry

2224. Propionic acid, sodium propionate and calcium propionate as inhibitors of mold growth. I. Observations on the use of propionate-treated parchment in inhibiting mold growth on the surface of butter. J. C. Olson, Jr., and H. Macy. *Journal of Dairy Science* 28:701-710. 1945.
2240. Effect of infused penicillin in the bovine mammary gland. F. J. Wierether, D. E. Jasper, and W. E. Petersen. *Proceedings of the Society for Experimental Biology and Medicine* 59:282-286. 1945.
2253. The effect of increasing the negative pressure and widening of the vacuum-release ratio on the rate of removal of milk from the udder. Vearl R. Smith and W. E. Petersen. *Journal of Dairy Science* 29:45-53. 1946.
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#### Entomology and Economic Zoology

2241. Incidence and transmission of *Sarcocystis* in cottontails. Arnold B. Erickson. *Journal of Wildlife Management* 10:44-46. 1946.

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#### Horticulture

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#### Plant Pathology and Botany

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#### Veterinary Medicine

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#### Miscellaneous Journal Series Papers

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540. Bonda, Mindo and other new oat varieties. H. K. Hayes. *Minnesota Seed Grower* 9(2):1-2. 1946.

##### Animal and Poultry Husbandry

543. Swine breeding in Minnesota. L. M. Winters. *Hoard's Dairyman* 91:496-498. 1946.

##### Entomology and Economic Zoology

524. Your money may be on the ground—a study of fruit drops. A. C. Hodson. *Minnesota Horticulturist* 73:102-103. 1945.

525. The language of the honeybees. Mykola H. Haydak. *American Bee Journal* 85:316-317. 1945.

532. Training wildlife managers. William H. Marshall. *Conservation Volunteer* 9(50):34-35. 1946.
533. Beekeeper's winter and early spring. M. H. Haydak. *Minnesota Horticulturist* 74:28-29. 1946.
534. DDT for home use. Richard H. Daggy. *Everybody's Health* 31(1):2-3, 16. 1946.
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544. The retention of ascorbic acid in boiling onions during cooking by different methods. Isabel Noble and Eudora Waddell. 3 pages. *Progress Notes*. 1946.
545. The retention of ascorbic acid in green peas during cooking by different methods. Isabel Noble and Eudora Waddell. 3 pages. *Progress Notes*. 1946.
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551. The retention of thiamine in green and wax beans during cooking by different methods. Isabel Noble, Florence Turnbull, and Joyce Spear. 5 pages. *Progress Notes*. 1946.

552. The retention of ascorbic acid in green beans prepared for cooking in different ways and cooked by different methods. Isabel Noble and Eudora Waddell. 5 pages. *Progress Notes*. 1946.

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554. The retention of thiamine and riboflavin during the roasting of rolled and standing beef rib roasts. Isabel Noble, Florence Turnbull, and Joyce Spear. 4 pages. *Progress Notes*. 1946.

555. The effect of roasting to different interior temperatures upon the thiamine and riboflavin content of rolled lamb shoulders. Isabel Noble, Joan Gordon, and Dorothy Nelson. 5 pages. *Progress Notes*. 1946.

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522. Transportation of red raspberries in fan equipped freight cars. J. D. Winter. *Ice and Refrigeration* 109(2):21. 1945.

526. Cooling LCL shipments of raspberries with dry ice. J. D. Winter. *Ice and Refrigeration* 109(3):26-27. 1945.

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556. Grape breeding at the Minnesota station. A. N. Wilcox. *Fruit Varieties and Horticultural Digest* 1:31-34. 1946.

536. "Hormones" tested on greenhouse tomatoes. R. E. Nylund. *Minnesota Horticulturist* 74:39. 1946.

#### Plant Pathology and Botany

527. Aerobiology in relation to plant disease. E. C. Stakman and Clyde M. Christensen. *The Botanical Review* 12:205-253. 1946.

539. Control of insects and diseases in Minnesota stone fruits. A. C. Hodson and E. G. Sharvelle. *Minnesota Fruit Grower* 13(2):3, 6, 15, 18. 1946.

559. Plant diseases are shiftly enemies. E. C. Stakman. *Minnesota Farm and Home Science* 2(1):8-9, 12. 1944.

#### Soils

547. A machine for deep fertilizer placement. A. C. Caldwell and C. O. Rost. *Better Crops with Plant Food* 30(6):20, 46-47. 1946.

#### Veterinary Medicine

541. Swine erysipelas. H. C. H. Kernkamp. *Auburn Veterinarian* 2:57, 82-85. 1946.

## SUMMARY OF PUBLICATIONS

July 1945 - June 1946

Kind of publication	Number issued	Number of pages	Number of copies in edition
General Series Bulletins .....	5	34+	51,500
Technical Series Bulletins .....	6	120+	17,000
Minnesota Farm and Home Science .....	3	48	48,000
Postwar Agriculture in Minnesota .....	1	47	5,000
Report Series .....	1	28	2,500
Extension Service			
Bulletins .....	7	100	235,000
Pamphlets .....	5	52	58,000
Folders .....	9	52	190,000
4-H Bulletins .....	2	12	25,000
News Letters .....	189	431	122,008
	228	924+	754,008

Division	Scientific Journal Series		Miscellaneous Journal Series	
	Number issued	Number of pages	Number issued	Number of pages
Agricultural Biochemistry .....	14	122	0	0
Agricultural Economics .....	0	0	0	0
Agricultural Engineering .....	1	30	0	0
Agronomy and Plant Genetics .....	4	31	1	2
Animal and Poultry Husbandry .....	5	40	1	2
Dairy Husbandry .....	9	54	0	0
Entomology and Economic Zoology .....	4	24	12	34
Forestry .....	0	0	2	4
Home Economics .....	2	2	10	47
Horticulture .....	1	1	5	9
Plant Pathology and Botany .....	5	28	3	56
Soils .....	4	41	1	2
Veterinary Medicine .....	8	43	1	7
Rural Sociology .....	1	9	0	0
	58	425	36	163
Total publications .....	322			

## NEW EXPERIMENT STATION PROJECTS

## Agricultural Engineering

141. The Minnesota Valley farm drainage and soils research project.

## Agronomy and Plant Genetics

132. Sorghum investigations. (Cooperative with West Central Branch Station)

**Animal and Poultry Husbandry**

- 428. Raising growing pigs on concrete vs. pasture.
- 429. Feeding growing pigs on varying proportions of corn and oats.

**Dairy Husbandry**

- 217. Tracing mineral elements in the nutrition of cattle.

**Entomology and Economic Zoology**

- 161. The structure and permeability of insect cuticle.

**Home Economics**

- 120. Vitamin C content of bulk sauerkraut.

**SUMMARY OF PROJECTS**

Division	Total	Active	Inactive	Closed	New
Agricultural Biochemistry .....	15	15	0	1	0
Agricultural Economics .....	17	15	2	0	0
Agricultural Engineering .....	15	12	3	0	1
Agronomy and Plant Genetics .....	22	21	1	0	1
Animal and Poultry Husbandry .....	12	12	0	2	2
Dairy Husbandry .....	15	13	2	1	1
Entomology and Economic Zoology..	22	18	4	0	1
Forestry .....	18	14	4	0	0
Home Economics .....	11	11	0	0	1
Horticulture .....	25	19	6	1	0
Plant Pathology and Botany .....	26	26	0	0	0
Soils .....	8	8	0	0	0
Veterinary Medicine .....	7	7	0	0	0
Rural Sociology .....	6	6	0	1	0
North Central Experiment Station ...	4	4	0	0	0
Northeast Experiment Station .....	6	6	0	0	0
Northwest Experiment Station .....	12	11	1	0	0
Southeast Experiment Station .....	2	2	0	0	0
West Central Experiment Station .....	8	8	0	1	0
<b>Total .....</b>	<b>251</b>	<b>228</b>	<b>23</b>	<b>7</b>	<b>7</b>

FINANCIAL STATEMENT  
Income 1945-1946

Sources of Revenue	University Farm	Branch Stations					Total
		Crookston	Morris	Grand Rapids	Duluth	Waseca	
Federal appropriations:							
Hatch fund .....	\$ 15,000.00						\$ 15,000.00
Adams fund .....	15,000.00						15,000.00
Purnell fund .....	60,000.00						60,000.00
Bankhead-Jones fund .....	62,041.48						62,041.48
State appropriations:							
General University support .....	233,971.41	\$31,871.27	\$31,586.82	\$20,749.48	\$12,566.96	\$-1,868.30*	328,877.64
Special appropriations .....	90,000.00						90,000.00
Endowments, fellowships, and other similar grants .....	68,294.64						68,294.64
Fees, sales, and miscellaneous .....	25,825.62	20,345.05	23,428.88	11,843.32	8,443.18	38,470.14	128,356.19
<b>Total .....</b>	<b>\$570,133.15</b>	<b>\$52,216.32</b>	<b>\$55,015.70</b>	<b>\$32,592.80</b>	<b>\$21,010.14</b>	<b>\$36,601.84</b>	<b>\$767,569.95</b>

Expenditure 1945-1946

Classification	University Farm	Branch Stations					Total
		Crookston	Morris	Grand Rapids	Duluth	Waseca	
Services and labor .....	\$418,828.76	\$34,295.90	\$37,764.04	\$17,643.52	\$11,645.51	\$21,468.65	\$541,646.38
Travel expenses .....	10,509.29	339.12	209.06	369.35	358.02	107.33	11,892.17
Transportation of things .....	1,110.22	167.35	199.62	468.15	29.57	263.91	2,238.82
Communication service .....	3,356.33	565.63	323.67	290.63	175.86	156.23	4,868.35
Rents and utility service .....	4,414.64	1,132.86	930.07	592.47	308.74	577.62	7,956.40
Printing and binding .....	8,602.85	16.67	17.93	58.26			8,695.71
Other contractual services .....	26,411.63	2,745.76	1,678.35	6,723.67	3,408.06	3,015.75	43,983.22
Supplies and materials .....	60,031.60	10,990.08	9,340.52	5,164.27	3,903.49	7,382.16	96,812.12
Equipment .....	29,541.86	1,436.67	2,224.74	1,282.48	1,180.89	3,630.19	39,296.83
Lands and structures (contractual) .....	5,137.04	526.28	2,327.70				7,991.02
Annuities .....	2,188.93						2,188.93
<b>Total .....</b>	<b>\$570,133.15</b>	<b>\$52,216.32</b>	<b>\$55,015.70</b>	<b>\$32,592.80</b>	<b>\$21,010.14</b>	<b>\$36,601.84</b>	<b>\$767,569.95</b>

\* Shown as a minus figure because the income for Waseca exceeded the expenditures.



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<sup>1</sup> Died February 2, 1946.

<sup>2</sup> Appointed March 16, 1946.

<sup>3</sup> On leave July 1, 1945 to March 8, 1946; resigned March 8, 1946.

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<sup>4</sup> Resigned June 30, 1946.<sup>5</sup> Appointed April 1, 1946.<sup>6</sup> Appointed September 16, 1945.<sup>7</sup> Appointed November 5, 1945; resigned March 31, 1946.<sup>8</sup> Appointed February 6, 1945; resigned June 30, 1946.<sup>9</sup> Appointed April 1, 1946.<sup>10</sup> Appointed October 1, 1945.<sup>11</sup> Appointed January 1, 1946.<sup>12</sup> Appointed June 16, 1946.<sup>13</sup> Appointed July 1, 1945; on leave August 1, 1945 to March 15, 1946.<sup>14</sup> Appointed October 16, 1945; resigned April 28, 1946.<sup>15</sup> Resigned June 30, 1946.<sup>16</sup> Appointed September 16, 1945; resigned June 15, 1946.

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H. L. THOMAS, Ph.D., Assistant Plant Geneticist

<sup>28</sup>J. W. LAMBERT, Ph.D., Assistant Plant Geneticist

<sup>17</sup> On leave July, 1, 1945 to February 1, 1946.

<sup>18</sup> Resigned June 30, 1946.

<sup>19</sup> Resigned October 5, 1945.

<sup>20</sup> Appointed March 1, 1946.

<sup>21</sup> On leave July 1, 1945 to January 28, 1946.

<sup>22</sup> Appointed May 20, 1946.

<sup>23</sup> On leave August 1, 1945 to May 19, 1946.

<sup>24</sup> On leave July 1, 1945 to October 15, 1945; resigned October 15, 1945.

<sup>25</sup> Died February 2, 1946.

<sup>26</sup> Retired April 7, 1946.

<sup>27</sup> On leave July 1, 1945 to April 1, 1946.

<sup>28</sup> Appointed January 1, 1946.

<sup>20</sup>M. T. HENDERSON, Ph.D., Assistant Plant Geneticist  
<sup>20</sup>H. H. KRAMER, M.S., Assistant in Plant Genetics  
<sup>21</sup>Y. S. TSIANG, Ph.D., Assistant in Plant Genetics  
<sup>22</sup>E. L. PINNELL, M.S., Assistant in Plant Genetics  
O. E. REECE, M.S., Research Fellow  
R. F. CRIM, B.S., Associate Agronomist and Extension Specialist in Agronomy

*Division of Cereal Crops and Diseases*

*Detailed by the United States Department of Agriculture for Cooperative Work*

E. R. AUSEMUS, Ph.D., Agronomist  
J. O. CULBERTSON, Ph.D., Associate Geneticist  
L. M. STAHLER, Ph.D., Associate Agronomist

*Division of Animal and Poultry Husbandry*

W. H. PETERS, M.Agr., Animal Husbandman  
P. A. ANDERSON, B. S., Associate Animal Husbandman  
A. L. HARVEY, Ph.D., Associate Animal Husbandman

*Section of Animal Feeding*

E. F. FERRIN, M.Agr., Animal Husbandman

*Section of Animal Breeding*

L. M. WINTERS, Ph.D., Animal Husbandman  
W. W. GREEN, Ph.D., Associate Animal Husbandman  
<sup>23</sup>J. N. CUMMINGS, M.S., Research Fellow  
<sup>24</sup>H. A. STEWART, Ph.D., Assistant Animal Husbandman  
<sup>25</sup>C. F. SIERK, M.S., Research Fellow

*Section of Poultry Husbandry*

H. J. SLOAN, Ph.D., Poultry Husbandman  
T. H. CANFIELD, M.S., Associate Poultry Husbandman  
R. N. SHOFFNER, Ph.D., Assistant in Poultry Husbandry

*Division of Dairy Husbandry*

J. B. FITCH, M.S., Dairy Husbandman

*Section of Dairy Production*

J. B. FITCH, M.S., Dairy Husbandman  
W. E. PETERSEN, Ph.D., Dairy Husbandman  
T. W. GULLICKSON, Ph.D., Assistant Dairy Husbandman  
L. O. GILMORE, Ph.D., Assistant Dairy Husbandman

*Section of Dairy Products*

W. B. COMBS, M.A., Dairy Husbandman  
S. T. COULTER, Ph.D., Dairy Husbandman  
<sup>26</sup>E. L. THOMAS, M.S., Assistant in Dairy Husbandry

<sup>20</sup> Resigned September 15, 1945.

<sup>20</sup> Appointed October 1, 1945 to December 31, 1945, February 4, 1946 to March 23, 1946.

<sup>21</sup> Resigned November 26, 1945.

<sup>22</sup> On leave July 1, 1945 to December 1, 1945.

<sup>23</sup> Appointed April 1, 1946.

<sup>24</sup> Resigned August 15, 1945.

<sup>25</sup> Appointed April 1, 1946.

<sup>26</sup> Appointed July 1, 1945; on leave July 1, 1945 to April 30, 1946.

- <sup>37</sup>L. K. CROWE, M.S.Agr., Research Associate  
 R. W. KUNKEL, M.S., Assistant in Dairy Bacteriology  
<sup>38</sup>A. S. KITZES, M.S. in Ch.E., Research Associate

*Section of Dairy Bacteriology*

- <sup>39</sup>H. MACY, Ph.D., Dairy Bacteriologist  
<sup>40</sup>J. C. OLSON, JR., M.S., Assistant in Dairy Husbandry  
<sup>41</sup>W. L. SLATTER, M.S., Assistant Dairy Bacteriologist

*Division of Entomology and Economic Zoology*

- C. E. MICKEL, Ph.D., Entomologist  
 A. A. GRANOVSKY, Ph.D., Entomologist  
 M. H. HAYDAK, Ph.D., Associate Apiculturist  
 A. C. HOBSON, Ph.D., Associate Entomologist  
 W. H. MARSHALL, Ph.D., Associate Zoologist  
<sup>42</sup>A. G. RICHARDS, Ph.D., Associate Entomologist  
 T. L. AAMODT, B.S., Assistant Entomologist  
<sup>43</sup>R. H. DAGGY, Ph.D., Assistant Entomologist  
<sup>44</sup>J. S. CASS, M.S., Research Fellow  
<sup>45</sup>A. B. ERICKSON, Ph.D., Research Associate  
<sup>46</sup>H. Y. FAN, Ph.D., Research Fellow  
<sup>47</sup>L. K. CUTKOMP, Ph.D., Research Fellow

*Division of Forestry*

- HENRY SCHMITZ, Ph.D., Forester  
 E. G. CHEYNEY, A.B., Forester  
 J. H. ALLISON, Ph.B., M.F., Forester  
<sup>48</sup>F. H. KAUFERT, Ph.D., Forester  
 T. SCHANTZ-HANSEN, Ph.D., Associate Forester and Director Lakes States Forestry and Biological Station  
 R. M. BROWN, M.F., Associate Forester  
<sup>49</sup>L. W. REES, Ph.D., Associate Forester  
<sup>50</sup>YALE WEINSTEIN, B.S., Assistant in Forestry  
<sup>51</sup>J. A. ZIVNUSKA, M.S., Assistant in Forestry

*Division of Home Economics*

- WYLLE B. MCNEAL, M.S., Home Economist  
 JANE M. LEICHSENRING, Ph.D., Home Economist  
 ISABEL NOBLE, Ph.D., Home Economist  
 ALICE BIESTER, M.S., Home Economist  
<sup>52</sup>EVA DONELSON, Ph.D., Associate Home Economist  
 ETHEL PHELPS, M.S., Associate Home Economist

<sup>37</sup> Appointed September 1, 1945.

<sup>38</sup> Appointed September 16, 1945.

<sup>39</sup> On leave July 1, 1945 to November 1, 1945.

<sup>40</sup> On leave July 1, 1945 to October 16, 1945.

<sup>41</sup> Resigned December 31, 1945.

<sup>42</sup> Appointed July 1, 1945.

<sup>43</sup> Appointed October 1, 1945.

<sup>44</sup> Appointed September 1, 1945.

<sup>45</sup> Resigned August 31, 1945.

<sup>46</sup> Appointed July 1, 1945.

<sup>47</sup> Appointed July 1, 1945; resigned April 17, 1946.

<sup>48</sup> On leave July 1, 1945 to August 4, 1945.

<sup>49</sup> On leave July 1, 1945 to January 1, 1946.

<sup>50</sup> On leave July 1, 1945 to October 1, 1945; resigned October 1, 1945.

<sup>51</sup> Appointed January 1, 1946.

<sup>52</sup> Resigned April 5, 1946.

**Division of Horticulture**

W. H. ALDERMAN, B.S.A., Horticulturist, Superintendent, Fruit Breeding Station  
<sup>53</sup>R. B. HARVEY, Ph.D., Horticulturist  
 J. D. WINTER, M.S., Assistant Horticulturist

*Section of Pomology*

W. G. BRIERLEY, Ph.D., Horticulturist

*Section of Fruit Breeding*

A. N. WILCOX, Ph.D., Associate Horticulturist  
<sup>54</sup>F. E. HARALSON, Assistant Superintendent, Fruit Breeding Station  
 T. S. WEIR, M.S., Assistant Horticulturist

*Section of Vegetable Gardening*

F. A. KRANTZ, Ph.D., Horticulturist  
 T. M. CURRENCE, Ph.D., Associate Horticulturist  
 A. E. HUTCHINS, Ph.D., Assistant Horticulturist  
<sup>55</sup>R. E. NYLUND, Ph.D., Assistant Horticulturist

*Section of Floriculture and Ornamental Horticulture*

L. E. LONGLEY, Ph.D., Assistant Horticulturist  
<sup>56</sup>R. A. PHILLIPS, B.S., Assistant in Horticulture

*Detailed by the United States Department of Agriculture for Cooperative Work  
 Bureau of Plant Industry*

PAUL K. YAGYU, B.S., Special Agent

**Division of Plant Pathology and Botany**

E. C. STAKMAN, Ph.D., Plant Pathologist and Botanist

*Section of Plant Pathology*

E. C. STAKMAN, Ph.D., Plant Pathologist  
 J. J. CHRISTENSEN, Ph.D., Plant Pathologist  
 C. J. EIDE, Ph.D., Associate Plant Pathologist  
 HELEN HART, Ph.D., Associate Plant Pathologist  
<sup>57</sup>E. G. SHARVELLE, Ph.D., Assistant Plant Pathologist  
<sup>58</sup>E. O. MADER, Ph.D., Assistant Plant Pathologist  
 C. M. CHRISTENSEN, Ph.D., Assistant Plant Pathologist  
 I. W. TERVET, Ph.D., Assistant Plant Pathologist  
 LOUISE DOSDALL, Ph.D., Assistant Plant Pathologist  
 M. B. MOORE, M.S., Assistant in Plant Pathology  
 F. V. STEVENSON, M.S., Assistant in Plant Pathology  
<sup>59</sup>E. F. DARLEY, B.S., Research Fellow, Firestone Plantations Company Fellowship

*Section of Plant Physiology and Agricultural Botany*

<sup>60</sup>R. B. HARVEY, Ph.D., Plant Physiologist and Agricultural Botanist  
 A. H. LARSON, B.S., Assistant Botanist  
 R. H. LANDON, Ph.D., Assistant in Plant Physiology  
<sup>61</sup>DOROTHY DAY, Ph.D., Research Associate

<sup>53</sup> Died November 4, 1945.

<sup>54</sup> Retired June 30, 1946.

<sup>55</sup> On leave September 1, 1945 to April 16, 1946.

<sup>56</sup> On leave July 1, 1945 to October 7, 1945.

<sup>57</sup> Resigned May 23, 1946.

<sup>58</sup> Appointed May 24, 1946.

<sup>59</sup> Resigned August 31, 1945.

<sup>60</sup> Died November 4, 1945.

<sup>61</sup> Appointed December 1, 1945.

*Detailed by the United States Department of Agriculture for Cooperative Work  
Bureau of Plant Industry*

M. N. LEVINE, Ph.D., Pathologist  
E. W. HANSON, Ph.D., Agent

*Division of Sugar Plant Investigation*

H. W. BOCKSTAHLER, M.S., Assistant Pathologist

*Bureau of Entomology and Plant Quarantine  
Division of Plant Disease Control*

R. U. COTTER, Ph.D., Associate Pathologist  
THAIN STEWART, B.S., State Leader of Barberry Eradication  
W. Q. LOEGERING, Agent

*Detailed by the State Department of Agriculture for Cooperative Work*

A. G. TOLAAS, M.S., in charge, Office of Seed Potato Certification  
J. L. LARSON, Seed Analyst in charge, Seed Germination  
H. C. REGNIER, Deputy, Office of Seed Potato Certification

**Publications**

<sup>62</sup>H. L. HARRIS, B.S., Bulletin Editor  
PAUL C. JOHNSON, B.S., Bulletin Editor  
<sup>63</sup>HAROLD B. SWANSON, B.A., Assistant Bulletin Editor  
KATHLEEN WEBB, B.S., Editorial Assistant

**Division of Soils**

C. O. ROST, Ph.D., Soils Chemist  
P. R. McMILLER, M.S., Associate Soils Chemist  
J. M. MACGREGOR, Ph.D., Assistant Soils Chemist  
A. C. CALDWELL, Ph.D., Assistant Soils Chemist  
<sup>64</sup>O. C. SOINE, Ph.D., Research Fellow  
<sup>65</sup>L. E. DUNN, Ph.D., Research Fellow  
<sup>66</sup>C. A. EVANS, Ph.D., Research Fellow  
<sup>67</sup>H. F. ARNEMAN, M.S., Assistant in Soils Chemistry

**Division of Veterinary Medicine**

W. L. BOYD, D.V.S., Veterinarian  
M. H. ROEPKE, Ph.D., Biological Chemist  
H. C. H. KERNKAMP, M.S., Veterinarian  
R. FENSTERMACHIER, D.V.M., Associate Pathologist  
B. S. POMEROY, Ph.D., Associate Animal Pathologist  
<sup>68</sup>A. G. KARLSON, Ph.D., Assistant in Veterinary Medicine  
<sup>69</sup>A. F. SELLERS, M.S., Assistant in Veterinary Medicine  
L. A. KANEGIS, D.V.M., Research Fellow  
<sup>70</sup>F. J. WEIRETHER, B.S., Research Fellow  
D. E. JASPER, M.S., Research Fellow

<sup>62</sup> On leave July 1, 1945 to March 8, 1946; resigned March 8, 1946.

<sup>63</sup> On leave July 1, 1945 to December 31, 1945.

<sup>64</sup> Transferred to Northwest School and Station, September 15, 1945.

<sup>65</sup> Resigned June 30, 1946.

<sup>66</sup> Resigned November 9, 1945.

<sup>67</sup> Appointed December 1, 1945.

<sup>68</sup> On leave July 1, 1945 to December 31, 1945; resigned December 31, 1945.

<sup>69</sup> On leave July 1, 1945 to January 16, 1946.

<sup>70</sup> Resigned December 20, 1945.

<sup>71</sup>H. G. SNOEYENBOS, D.V.M., Research Fellow

<sup>72</sup>J. R. COLLIER, D.V.M., Research Fellow

<sup>73</sup>R. L. KITCHELL, D.V.M., Research Fellow

J. H. SAUTTER, D.V.M., Research Fellow

W. A. MALMQUIST, D.V.M., Research Fellow

#### Rural Sociology

<sup>74</sup>LOWRY NELSON, Ph.D., Rural Sociologist

<sup>75</sup>VERNON DAVIES, Ph.D., Lecturer

#### North Central Experiment Station

D. L. DAILEY, B.S., Superintendent

<sup>76</sup>J. N. CUMMINGS, M.S., Assistant in Animal Husbandry

C. H. GRIFFITH, M.S., Assistant Agronomist

<sup>77</sup>K. P. MILLER, M.S., Assistant Animal Husbandman

<sup>78</sup>A. L. RICHARDSON, M.S., Assistant in Horticulture

<sup>79</sup>R. A. HAMILTON, M.S., Assistant Horticulturist

#### Northeast Experiment Station

M. J. THOMPSON, M.S., Superintendent

#### Northwest Experiment Station

T. M. MCCALL, M.S., Superintendent

<sup>80</sup>O. C. SOINE, Ph.D., Assistant Agronomist

O. M. KISER, M.S., Assistant Animal Husbandman

A. M. FOKER, Assistant Agricultural Engineer

A. M. PILKEY, Assistant in Poultry Husbandry

H. W. SODERBURG, M.A., Assistant in Agricultural Engineering

O. C. TURNQUIST, M.S., Assistant in Horticulture

#### Southeast Experiment Station

R. E. HODGSON, M.S., Superintendent

#### West Central Experiment Station

T. H. FENSKE, M.S., Superintendent

R. O. BRIDGFORD, M.S., Assistant Agronomist

A. W. EDSON, M.S., Assistant Horticulturist

<sup>81</sup>C. J. HEMMING, M.S., Assistant Poultry Husbandman

P. S. JORDAN, B.S.Agr., Assistant Animal Husbandman

H. G. CROOM, B.S., Assistant Poultry Husbandman

A. C. HEINE, Assistant Agricultural Engineer

<sup>71</sup> Resigned December 31, 1945.

<sup>72</sup> Appointed May 16, 1946.

<sup>73</sup> Appointed April 1, 1946.

<sup>74</sup> On leave July 1, 1945 to June 30, 1946.

<sup>75</sup> Resigned June 1, 1946.

<sup>76</sup> North Central Experiment Station July 1, 1945 to March 31, 1946; Division of Animal

Husbandry April 1, 1946 to June 30, 1946.

<sup>77</sup> On leave July 1, 1945 to April 16, 1946.

<sup>78</sup> Resigned September 25, 1946.

<sup>79</sup> Appointed October 26, 1945.

<sup>80</sup> Appointed September 15, 1945.

<sup>81</sup> Resigned June 30, 1946.