

SIXTY-EIGHTH ANNUAL REPORT

Agricultural Experiment Station
University of Minnesota

JULY 1, 1960 TO JUNE 30, 1961



UNIVERSITY OF MINNESOTA

ST. PAUL CAMPUS

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LETTERS OF TRANSMITTAL

University of Minnesota, Minneapolis, Minn.

July 1, 1961

*To His Excellency, Elmer L. Andersen,
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, 1961.

Respectfully transmitted,

O. MEREDITH WILSON,
President of the Board of Regents

University of Minnesota, Minneapolis, Minn.

July 1, 1961

*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, 1961.

Respectfully transmitted,

O. MEREDITH WILSON,
President of the University of Minnesota

University of Minnesota, St. Paul, Minn.

July 1, 1961

*O. Meredith Wilson,
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, 1961.

Respectfully transmitted,

H. J. SLOAN,
*Director of the Agricultural Experiment
Station*

SIXTY-EIGHTH ANNUAL REPORT

July 1, 1960 to June 30, 1961

H. J. Sloan, Director

M. F. Kernkamp, Assistant Director

FOREWORD

THE PHYSICAL ASPECTS of the building program discussed in last year's report have progressed to where the new facilities will soon be available. The crop research laboratory building will be available in 1961-62. The remodeling of Haecker Hall has been completed and the rearrangement of space aids both the Department of Dairy Husbandry and the Department of Agricultural Economics. Additions to the Branch Stations have been made available.

Two isolation buildings, necessary for certain work in Veterinary Medicine, were dedicated this year. Also the new diagnostic laboratory, important to service and research, was dedicated in December 1960 and made available.

While the appropriation for general maintenance was less for the biennium than requested, there was a slight increase for the second year 1960-61 over the previous year. This helped stabilize our salary program that is so important in recruiting and maintaining a high quality staff.

There was also a modest increase in the maintenance fund for the new Southwest Agricultural Experiment Station because it is now in full operation.

The General Agricultural Research Fund was increased slightly. This helped maintain the salary schedules for those employed on this fund. This was true also for the Legume and Grass Seed Fund but there was no increase in the Agricultural Research Fund at Rosemount or in the Hardwood Timber Fund.

The funds available for rehabilitation also made it possible for the Rural Sociology group to move into remodeled quarters in the Old Dining Hall building. This should add to the effectiveness of this group's operation.

Occasionally progress is marked by the disappearance of facilities that are no longer useful. The old Dairy Hall which housed

Rural Sociology and the Student Center is gone. It served since 1891. The Music Hall, built about the same time, has also disappeared. The Cold Storage building was replaced by an improved facility.

Work in Home Economics will be improved by the remodeling of a room now available for laboratory work in the area of household equipment.

The research program continually changes as the need for introducing new work arises. The number of projects had a net increase of 16 with 18 closed and 34 new projects initiated. Many of the new projects concern Agricultural Economics. This reflects an increased need for study in agricultural adjustment. Most closings attempted to bring some work to fruitful conclusion.

Another measure of progress is in the publications of the Station. These increased this year, particularly in the scientific series. Total publications increased from 334 to 400. While this is not the only criterion of increased productivity, it represents a serious attempt to make available research results at the earliest possible time. As use of research results grows, we find it more important to make new research findings available. Details of the publications are found on pages 16 to 35 which summarize the various types of information releases available from the Institute of Agriculture.

Some research results become available in the form of new varieties and introductions. The regular publication Extension Folder 22 lists recommended varieties. No change was listed for oats, barley, or spring wheat. The variety Ramsey of durum wheat was removed from the recommended list. A new variety Strähl of field peas is recommended for this year. For details on the many varieties of farm crops, the above folder should be consulted.

Two new varieties of apricots, "Moongold" and "Sungold," are now available to people in Minnesota. They are being grown successfully at the Fruit Breeding Farm. Other introductions of the Department of Horticulture are the chrysanthemum "Wayzata" and a variety of parsley "Minncurl." These add to the long list of new introductions of horticultural crops for Minnesota.

Fortunately, the Experiment Station was not heavily hit by retirement this year. In each case well qualified people were available for replacement. Therefore, the program should move ahead without disruption.

We continue to face the regular flow of requests for additional research beyond our resources. Pressure on utilization research decreased this year. However, the demands for research in such areas as horticultural crops, soils, marketing, agricultural adjustment, sugar beets, potatoes, soybeans, and many others are great. Some adjustments have been made within departments by the discontinuance of certain research projects and a substitution of more urgent work. This program of modernizing research activities must progress, but at a more rapid pace.

The increased tempo of change suggests not only that we must give attention to immediate new problems but must also greatly expand the basic studies to provide information for future problems. For many years it has been difficult to make a strong case for basic research. However, the rapid and dramatic results of fundamental studies in the physical sciences helped create a sympathy for basic research that is beginning to reflect itself in an increased support for research in the agricultural sciences.

Some Federal granting agencies that before made few, if any, grants to research workers in agriculture are now making grants for basic studies to scientists in agriculture. This supports the contention that our agricultural scientists can do basic research. This source of funds has been one reason why it has been possible to initiate more projects than have been terminated. These funds are circumscribed with certain limitations such as time and lack of permanence. Nevertheless they have stimulated good research in departments with personnel who can carry on basic work, particularly in the areas of Agricultural Biochemistry, Plant Physiology, Veterinary Medicine, Plant Pathology, and Soils. We should point out, however, that these new studies on basic problems are in addition to, rather than a replacement of, the studies aimed at current problems. These must be continued and strengthened by the more basic work.

CHANGES IN STAFF

Appointments

D. W. Anderson, M.E., instructor, Northwest School and Experiment Station, September 16, 1960.

Doreen Ashhurst, Ph.D., research fellow, Department of Entomology and Economic Zoology, October 1, 1960.

E. V. Caruolo, M.S., instructor, Department of Dairy Husbandry, September 1, 1960.

Margaret S. Collins, Ph.D., research fellow, Department of Entomology and Economic Zoology, September 16, 1960.

R. M. Collins, Ph.D., assistant professor, Southern School and Experiment Station, December 1, 1960.

D. C. Dahl, M.S., instructor, Department of Agricultural Economics, July 1, 1960.

S. M. Dennis, B.V.Sc., instructor, College of Veterinary Medicine, September 14, 1960.

W. R. Dukelow, M.S., instructor, North Central School and Experiment Station, July 1, 1960.

F. D. Enfield, Ph.D., assistant professor, Department of Animal Husbandry, July 1, 1960.

E. I. Fuller, M.S., instructor, Department of Agricultural Economics, July 1, 1960.

L. I. Harmon, M.S., soil scientist, Soil Conservation Service, USDA, August 21, 1960.

R. A. Heckman, B.A., instructor, Northwest School and Experiment Station, September 16, 1960.

L. W. Johnson, D.V.M., research fellow, College of Veterinary Medicine, July 1, 1960.

R. W. Kramer, Ph.D., research fellow, Department of Entomology and Economic Zoology, February 16, 1961.

H. J. Kurtz, D.V.M., instructor, College of Veterinary Medicine, August 1, 1960.

K. G. Magnuson, D.V.M., instructor, College of Veterinary Medicine, July 1, 1960.

R. E. Meisenholder, B.A., instructor, Northwest School and Experiment Station, September 16, 1960.

H. W. Moon, D.V.M., instructor, College of Veterinary Medicine, July 1, 1960.

W. E. Moore, D.V.M., instructor, College of Veterinary Medicine, July 1, 1960.

J. C. Murphy, D.V.M., instructor, College of Veterinary Medicine, June 16, 1961.

J. A. Newman, D.V.M., research fellow, College of Veterinary Medicine, June 12, 1961.

D. R. North, M.S., research fellow, Department of Agronomy and Plant Genetics, July 1, 1960.

J. D. Olson, D.V.M., instructor, College of Veterinary Medicine, June 20, 1961.

N. E. Olson, D.V.M., research fellow, College of Veterinary Medicine, July 1, 1960.

W. A. Olson, M.S., research fellow, Department of Dairy Husbandry, July 1, 1960.

T. L. Oyloe, M.S., research fellow, Department of Agricultural Economics, August 1, 1960.

F. J. Siccardi, D.V.M., research fellow, College of Veterinary Medicine, March 6, 1961.

Sara C. Steensland, M.S., instructor, School of Home Economics, September 16, 1960.

E. I. Sucoff, Ph.D., assistant professor, School of Forestry, November 16, 1960.

C. A. Tervola, D.V.M., research fellow, College of Veterinary Medicine, September 1, 1960.

J. R. Tester, Ph.D., instructor, Department of Entomology and Economic Zoology, September 16, 1960.

J. C. Theurer, M.S., research fellow, Department of Agronomy and Plant Genetics, February 1, 1961.

T. W. Thorson, B.A., instructor, Northwest School and Experiment Station, September 16, 1960.

R. W. Weik, M.S., instructor, Department of Dairy Industries, September 6, 1960.

C. J. Weiser, Ph.D., assistant professor, Department of Horticulture, December 16, 1960.

S. B. Whipp, D.V.M., research fellow, College of Veterinary Medicine, July 1, 1960.

J. C. Wilk, M.S., instructor, Department of Dairy Husbandry, July 1, 1960.

C. W. Young, Ph.D., assistant professor, Department of Dairy Husbandry, July 1, 1960.

Promotions

E. R. Allred, M.S., professor, Department of Agricultural Engineering, July 1, 1960.

N. A. Anderson, Ph.D., assistant professor, Department of Plant Pathology and Botany, July 1, 1960.

H. N. Benson, Ph.D., research fellow, College of Veterinary Medicine, July 1, 1960.

R. A. Briggs, Ph.D., professor and superintendent, West Central School and Experiment Station, July 1, 1960.

R. C. Callstrom, Jr., D.V.M., instructor, College of Veterinary Medicine, July 1, 1960.

H. G. Croom, M.S., associate professor, West Central School and Experiment Station, July 1, 1960.

W. J. A. Culmer, Ph.D., assistant professor, Department of Agricultural Engineering, July 1, 1960.

L. K. Cutkomp, Ph.D., professor, Department of Entomology and Economic Zoology, July 1, 1960.

K. D. Fezer, Ph.D., assistant professor, Department of Plant Pathology and Botany, July 1, 1960.

D. F. Fienup, Ph.D., associate professor, Department of Agricultural Economics, July 1, 1960.

B. C. Fuller, M.S., assistant professor, Southern School and Experiment Station, July 1, 1960.

A. C. Hodson, Ph.D., head, Department of Entomology and Economic Zoology, July 1, 1960.

R. F. Holt, Ph.D., research associate, director, North Central Soil and Water Conservation Research Laboratory, Agricultural Research Service, USDA, Morris, Minnesota, March 27, 1961.

F. D. Irving, Ph.D., assistant professor, School of Forestry, July 1, 1960.

J. J. Jezeski, Ph.D., professor, Department of Dairy Industries, September 6, 1960.

A. J. Kenyon, D.V.M., research fellow, College of Veterinary Medicine, August 1, 1960.

E. W. Learn, Ph.D., associate professor, Department of Agricultural Economics, July 1, 1960.

William Matalamaki, Ph.D., associate professor, North Central School and Experiment Station, July 1, 1960.

H. A. Morris, Ph.D., professor, Department of Dairy Industries, July 1, 1960.

R. G. Robinson, Ph.D., associate professor, Department of Agronomy and Plant Genetics, July 1, 1960.

Cherng-Jiann Shiue, Ph.D., associate professor, School of Forestry, July 1, 1960.

R. A. Skok, Ph.D., assistant professor, School of Forestry, July 1, 1960.

R. E. Smith, M.S., assistant professor and principal, West Central School and Experiment Station, September 1, 1960.

O. C. Soine, Ph.D., professor, Northwest School and Experiment Station, July 1, 1960.

A. C. Strafuss, D.V.M., instructor, College of Veterinary Medicine, August 16, 1960.

J. P. Sullivan, D.V.M., Ph.D., assistant professor, College of Veterinary Medicine, August 1, 1960.

D. P. Taylor, Ph.D., assistant professor, Department of Plant Pathology and Botany, July 1, 1960.

D. A. Turner, Ph.D., associate professor and superintendent, Southern School and Experiment Station, July 1, 1960.

E. A. Usenik, D.V.M., Ph.D., associate professor, College of Veterinary Medicine, July 1, 1960.

C. A. Van Doren, Ph.D., professor, Corn Belt branch chief, Agricultural Research Service, USDA, St. Paul, Minnesota, March 27, 1961.

K. E. Winsness, M.F., assistant professor, School of Forestry, July 1, 1960.

B. E. Youngquist, Ph.D., associate professor and superintendent, Northwest School and Experiment Station, July 1, 1960.

Resignations

Mary C. Andrews, M.A., assistant professor, School of Home Economics, March 15, 1961, to devote full time to homemaking.

Charlotte W. Baumgartner, M.S., associate professor, School of Home Economics, June 30, 1961, to accept position at New York State College of Home Economics, Cornell University, Ithaca, New York.

B. H. Beard, Ph.D., assistant professor and research agronomist, USDA, Department of Agronomy and Plant Genetics, December 16, 1960, to accept position as research agronomist, Irrigation Experiment Station, Brawley, California.

Barbara J. Berg, B.A., instructor, Northwest School and Experiment Station, July 13, 1960, to reside with husband in another city.

O. P. Blaich, M.S., research fellow, Department of Agricultural Economics, May 15, 1961, to accept position as associate agriculturalist, Giannini Foundation, Berkeley, California.

R. A. Briggs, Ph.D., professor and superintendent, West Central School and Experiment Station, June 30, 1961, to accept position as dean, University of Minnesota, Morris, Minnesota.

H. G. Croom, M.S., associate professor, West Central School and Experiment Station, June 30, 1961, to accept position of director of student services, University of Minnesota, Morris, Minnesota.

R. H. Dunlop, D.V.M., instructor, College of Veterinary Medicine, April 18, 1961, to return to England.

R. V. Elefson, B.S., instructor, Department of Agricultural Economics, September 15, 1960, to accept position at Wisconsin State College, River Falls, Wisconsin.

L. M. E. Field, B.A., instructor, Northwest School and Experiment Station, August 12, 1960, to teach in Florida.

T. A. Gochnauer, Ph.D., research associate, Department of Entomology and Economic Zoology, June 30, 1961, to accept position at Entomology Research Institute, Central Experimental Farm, Ottawa, Ontario, Canada.

Annette T. Gormican, M.S., assistant professor, School of Home Economics, December 15, 1960, to study for the Ph.D. degree.

R. C. Herschler, D.V.M., instructor, College of Veterinary Medicine, August 31, 1960, to accept position at Purdue University, Lafayette, Indiana.

K. W. Knutson, M.S., research fellow, Department of Plant Pathology and Botany, August 31, 1960, to accept position at University of Idaho, Moscow, Idaho.

L. W. Nystrom, B.S., instructor, Northwest School and Experiment Station, July 15, 1960, to accept work outside teaching field.

A. H. Paschall, M.S., soil scientist, Soil Conservation Service, USDA, August 31, 1961, to accept position at Cornell University, Ithaca, New York.

B. L. Renfro, Ph.D., research fellow, Department of Plant Pathology and Botany, August 31, 1960, to accept position with the Rockefeller Foundation, India.

L. A. Richardson, Ph.D., instructor, Department of Dairy Industries, September 5, 1960, to accept position as instructor, Training Section, R. A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

D. E. Rued, B.S., instructor, West Central School and Experiment Station, March 31, 1961, to accept position as instructor, Southern School and Experiment Station, Waseca.

Earl Ryden, B.S., instructor, Northwest School and Experiment Station, July 15, 1960, to accept other employment.

A. E. Schneider, Ph.D., professor, School of Forestry, June 30, 1961, to accept other employment.

A. F. Sellers, D.V.M., Ph.D., professor, College of Veterinary Medicine, August 31, 1960, to accept position at Cornell University, Ithaca, New York.

R. J. Stadtherr, M.S., instructor, Department of Horticulture, June 30, 1961, to study for the Ph.D. degree.

C. E. Stevens, D.V.M., Ph.D., research associate, College of Veterinary Medicine, May 29, 1961, to accept position at Cornell University, Ithaca, New York.

A. W. Stinson, D.V.M., instructor, College of Veterinary Medicine, July 31, 1960, to accept position at Cornell University, Ithaca, New York.

M. W. Stromberg, D.V.M., Ph.D., associate professor, College of Veterinary Medicine, July 31, 1960, to accept position at Purdue University, Lafayette, Indiana.

D. W. Sunderman, M.S., research agronomist, USDA, September 1, 1960, to accept position as research agronomist, USDA, Branch Experiment Station, Aberdeen, Idaho.

M. L. Taylor, Ph.D., assistant professor, Department of Sociology, June 30, 1961, to accept position as assistant professor, Louisiana State University, Baton Rouge, Louisiana.

K. W. Tucker, Ph.D., research fellow, Department of Entomology and Economic Zoology, September 30, 1960, to accept position with Department of Biology, Lake Forest College, Lake Forest, Illinois.

W. B. Wallin, Ph.D., assistant professor, School of Forestry, August 16, 1960, to accept position with International Cooperative Administration, Pakistan.

W. F. Wedin, Ph.D., assistant professor and research agronomist, USDA, Department of Agronomy and Plant Genetics, April 30, 1961, to accept position as associate professor, Iowa State University, Ames, Iowa.

D. A. Willigan, D.V.M., Ph.D., instructor, College of Veterinary Medicine, July 15, 1960, to accept position at Michigan State University, Lansing, Michigan.

T. D. Wylie, Ph.D., research fellow, Department of Plant Pathology and Botany, August 31, 1960, to accept position as assistant professor at University of Missouri, Columbia, Missouri.

Retirements

J. N. Campbell, D.V.M., professor, College of Veterinary Medicine, June 30, 1961.

J. J. Christensen, Ph.D., professor and head, Department of Plant Pathology and Botany, June 30, 1961.

R. H. Landon, Ph.D., assistant professor, Department of Plant Pathology and Botany, June 30, 1961.

Leaves of Absence

D. M. Barnes, D.V.M., instructor, College of Veterinary Medicine, July 1, 1960 to June 30, 1961, on leave to carry on special work with anaerobic organisms at Montana State College, Bozeman, Montana.

W. W. Cochrane, Ph.D., professor, Department of Agricultural Economics, August 22, 1960 to November 6, 1960, on leave to serve as adviser on agricultural policy to the Democratic Party nominee for President of the United States; January 25, 1961 to June 30, 1961, to serve as adviser on agricultural policy to the U.S. Secretary of Agriculture; March 15, 1961 to June 30, 1961, on leave to serve as Director of Agricultural Economics, USDA.

D. F. Fienup, Ph.D., associate professor, Department of Agricultural Economics, July 1, 1960 to June 30, 1961, on leave to conduct a study on federal grading on the market structure and pricing of lamb at the request of Congress and by direction of the Secretary of Agriculture.

L. E. Flancher, B.A., instructor, Northwest School and Experiment Station, September 16, 1960 to April 15, 1961, on leave to study at University of Oslo, Oslo, Norway.

Roxana R. Ford, Ph.D., professor and assistant director, School of Home Economics, July 1, 1960 to December 31, 1960, on leave to confer with home economists on adult homemaking education in various areas in Europe and the United States.

N. H. Grimsbo, B.S., instructor, North Central School and Experiment Station, March 15, 1961 to June 15, 1961, on leave to do graduate work at the University of Minnesota.

E. L. Johnson, Ph.D., professor and head, Department of Poultry Husbandry, June 4, 1960 to July 12, 1960, on leave to serve with the Foreign Agricultural Service and Soybean Council of America on a market development program in Italy, Israel, and Spain.

M. F. Kernkamp, Ph.D., professor and assistant director, Agricultural Experiment Station, July 1, 1960 to September 30, 1960, on leave to observe administration of agricultural research in European institutions.

J. M. MacGregor, Ph.D., professor, Department of Soils, June 14, 1960 to September 26, 1960, on leave to study research methods in soil chemistry at McCaulley Institute, Aberdeen, Scotland and Rothamsted Experiment Station, England; May 29 to June 19, 1961, on leave to study x-ray fluorescence analytical methods at the University of Illinois, Urbana, Illinois.

W. H. Marshall, Ph.D., professor, Department of Entomology and Economic Zoology, October 16, 1960 to June 30, 1961, on sabbatical leave to conduct studies of introduced mustelids and their effects on nature, birds, and introduced rabbits in conjunction with the Bureau of Animal Ecology, Department of Scientific Research and Investigation, New Zealand.

M. B. Moore, M.S., instructor, Department of Plant Pathology and Botany, June 16, 1960 to September 15, 1960, to do research at the Agricultural Experiment Station, Alaska.

W. M. Myers, Ph.D., professor and head, Department of Agronomy and Plant Genetics, July 1, 1960 to July 31, 1960, on leave to attend Eighth International Grassland Conference, University of Reading, Reading, England.

P. M. Raup, Ph.D., professor, Department of Agricultural Economics, September 16, 1960 to June 30, 1961, on sabbatical leave to study land value and land use changes associated with rapid urban growth and industrial expansion with FAO in Europe and the United Kingdom.

W. E. Rempel, Ph.D., associate professor, Department of Animal Husbandry, beginning June 10, 1961, on leave to take course work at the Institute of Statistics, Blackburg, Virginia.

A. E. Schneider, Ph.D., professor, School of Forestry, July 1, 1960 to June 30, 1961, on leave to serve as coordinator for the Minnesota Cooperative Project, Korea.

J. R. Thompson, M.S., assistant professor, Southern School and Experiment Station, October 1, 1960 to June 1, 1961, on leave to attend Iowa State University, Ames, Iowa.

P. J. Tichenor, M.S., instructor, Information Service, October 7, 1960 to June 30, 1961, on leave to attend Stanford University, Stanford, California.

Deaths

Reuel Fenstermacher, D.V.M., professor, College of Veterinary Medicine, May 7, 1961.

W. F. Geddes, Ph.D., professor and head, Department of Agricultural Biochemistry, January 7, 1961.

Cherng-Jiann Shiue, Ph.D., associate professor, School of Forestry, June 5, 1961.

PUBLICATIONS

Agricultural Experiment Station

GENERAL BULLETIN SERIES

452. Beef From Grasslands. P. M. Burson, A. L. Harvey, and A. R. Schmid, 36 pages, 10,000.

453. Regulation of Water Use in Minnesota Agriculture. C. O. Nohre and P. M. Raup, 24 pages, 7,500.

454. (NCR 122) Financing Farm Transfers With Land Contracts. R. Vern Elefson and Philip M. Raup, 32 pages, 22,500.

455. An Evaluation of Market Development Projects in West Germany Financed Under Section 104(a) of Public Law 480. Elmer W. Learn and James P. Houck, Jr., 90 pages, 5,000.

456. Expanding the Demand for Farm Food Products in the United States. Martin E. Abel, John M. Wetmore, and Elmer W. Learn, 16 pages, 7,500.

TECHNICAL BULLETIN SERIES

237. Effects of the Interaction of Varying Temperatures and Light Intensities on the Response of Flax to 2,4-D. L. S. Jordan, R. S. Dunham, and A. J. Linck, 28 pages, 3,000.

238. Policies for Expanding the Demand for Farm Food Products in the United States—Part II. Programs and Results. Martin E. Abel and Willard W. Cochrane, 104 pages, 5,000.

239. The Quality of Minnesota Waters for Irrigation. E. R. Allred and R. E. Machmeier, 82 pages, 3,000.

MINNESOTA FARM AND HOME SCIENCE

Volume XVIII, Number 1, 20 pages, 17,500.

Volume XVIII, Number 2, 20 pages, 17,500.

Volume XVIII, Number 3, 24 pages, 17,500.

Reprints of articles (35), 62 pages, 8,800.

REPORT SERIES

Sixty-Seventh Annual Report of the Minnesota Agricultural Experiment Station, July 1, 1959 to June 30, 1960, 48 pages, 2,500.

*Miscellaneous Report 20. Maturity Ratings for Corn Hybrids in Minnesota, 1961-62. E. H. Rinke, R. H. Peterson, N. C. Olmeim, and J. C. Sentz, 16 pages, 8,000.

*Miscellaneous Report 24. Varietal Trials of Farm Crops. R. G. Robinson and agronomy department staff, 40 pages, 20,000.

*Miscellaneous Report 28. 1960 Hybrid Corn Performance Trials. Robert Peterson, 48 pages, 11,000.

Miscellaneous Report 41 (NCR 117). Varietal Trials of Medium Red Clover in the North Central Region. H. L. Thomas, Earle W. Hanson, and C. N. Hittle, 12 pages, 15,000.

Miscellaneous Report 42. Wayzata, New Garden Chrysanthemum. R. A. Phillips and R. E. Widmer, 4 pages, 5,000.

Miscellaneous Report 43. Minncurl—A New Parsley. A. E. Hutchins, 2 pages, 5,000.

Miscellaneous Report 44. New Fruits for Minnesota: The 'Moongold' and 'Sungold' Apricots. A. N. Wilcox, T. S. Weir, and Shirley Trantanella, 4 pages, 5,000.

Miscellaneous Report 45. Minnesota's People and Farms: 1950-1960. A Preliminary Review. Lee Taylor and Glenn Nelson, 36 pages, 3,000.

Miscellaneous Report 46. University of Minnesota Landscape Arboretum—A Report of Progress. Leon C. Snyder, 20 pages, 6,000.

Agricultural Extension Service

BULLETIN SERIES

192. (Reprint) Ropework. J. Grant Dent, 28 pages, 7,500.

244. (Revised) Freezing Foods for Home Use. J. D. Winter, A. Hustrulid, Shirley Trantanella, W. J. Aunan, and Milo H. Swanson, 48 pages, 25,000.

263. (Revised) Insecticides. J. A. Lofgren and L. K. Cutkomp, 70 pages, 3,500.

266. (Reprint) Road to Better Meetings. Charlotte Kirchner and Robert R. Pinches, 16 pages, 5,000.

267. (Revised) Woody Plants for Minnesota. C. Gustav Hard, 36 pages, 15,000.

* Revised annually.

273. (Revised) Grafting Fruit Trees. T. S. Weir, 16 pages, 10,000.
274. (Revised) Care of House Plants. Richard Widmer, 48 pages, 20,000.
279. (Reprint) Pictures—Selecting, Hanging, and Framing. Myra Zabel, 20 pages, 20,000.
282. (Revised) Home Laundering. Elizabeth Rivers, 24 pages, 10,000.
283. (Revised) Landscaping the Home. C. Gustav Hard, 16 pages, 20,000.
289. (Reprint) Window Treatments. Myra Zabel, 20 pages, 20,000.
291. (Reprint) Smooth Surface Floor Coverings. Myra Zabel and Elizabeth Rivers, 8 pages, 15,000.
293. (Reprint) Outdoor Cookery for the Family. Michigan State University, 32 pages, 5,000.
295. (Reprint) Perennials for Minnesota. C. Gustav Hard, 36 pages, 5,000.
299. Sunflower Production in Minnesota. R. G. Robinson and O. C. Soine, 12 pages, 7,500.

PAMPHLET SERIES

134. (Revised) Custom Rates for Farm Operations. T. R. Nodland and H. G. Routhe, 10 pages, 5,000.
134. *Ibid.* (Reprint) 3,000.
173. (Reprint) The Family Dollar. Home Management, 8 pages, 7,000.
184. (Reprint) Home Fruit Spray Guide. H. G. Johnson, J. A. Lofgren, J. D. Winter, and E. T. Andersen, 8 pages, 5,000.
- *194. (Revised) Crop Production Guide for 1961. William F. Hueg, Jr., Harley J. Otto, Curtis J. Overdahl, Lowell D. Hanson, and Merle Halverson, 2 pages (3 x 2-foot wall chart), 5,000.
198. (Revised) County Government is Your Government. Luther J. Pickrel and Floyd O. Flom, 16 pages, 16,000.
199. (Revised) You Control Your Town Government. Luther J. Pickrel and Floyd O. Flom, 16 pages, 16,000.
201. (Revised) Politics Is Your Job. Luther J. Pickrel and Floyd O. Flom, 16 pages, 16,000.

* Revised annually.

206. How Much Are Your Cows Paying You? Dairy Extension Specialists, 4 pages, 25,000.

FOLDER SERIES

*22. (Revised) Recommended Crop Varieties for 1961. R. G. Robinson and agronomy and plant pathology departments, 4 pages, 25,000.

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40. (Revised) Snacks and Little Lunches. Gwen Bachellor and Verna Mikesh, 36 pages, 20,000.
48. Picnics and Suppers. Verna Mikesh, 32 pages, 8,000.
48. *Ibid.* (Reprint) 15,000.
49. 4-H Career Exploration Handbook (For the Extension Agent). 16 pages, 500.

NEWSLETTERS

Name of publication	Issues	Pages	Circulation
Garden Fact Sheet	4	12	800
Helps for Home Agents	21	89	3,085
Home Garden Tips	7	28	1,695
Our Land	11	48	7,315
Radio Shorts	54	158	11,657
Reaching Rural People and Bulletin Board	13	49	3,745
Visual Aids Tip Sheet	13	23	7,950
4-H Club Leader Letter	2	8	14,500
Dairy Newsletter (DHIA)	5	20	29,125
Dairy Summary	1	67	7,000
Minnesota Florists' Newsletter	6	68	3,000
Nurserymen's Newsletter	5	21	3,350
Rural Youth Newsletter	5	18	4,800
Best Buys	22	85	33,550
Potato Fact Sheet	4	12	10,240
Veterinary Medicine Newsletter	2	12	1,825
Farm Business Notes	12	48	40,915
Minnesota Feed Service	4	26	8,000
Dairy Products Processor	3	18	2,890
Hardwood Forest Products Bulletin	2	6	4,300
Total	196	816	199,742

50. 4-H Agronomy Project—Crops and Soils (Beginners). Bill Hueg and Wayne Bath, 22 pages, 4,000.

51. 4-H Agronomy Project—Crops and Soils (Junior and Advanced). Bill Hueg and Wayne Bath, 22 pages, 3,000.

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Welcome to the St. Paul Campus. (Revised) 8 pages, 2,500.

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Technical Certificate Program in Agriculture. (Reprint) 6 pages, 5,000.

Radiation in Research. 6 pages, 3,250.

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POULTRY HUSBANDRY

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SOILS

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VETERINARY MEDICINE

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4305. The experimental replacement of segmental defects in bone with a plaster of Paris-Epoxy resin mixture. I. M. G. Gourley and J. P. Arnold. *American Journal of Veterinary Research* 21:1119-1122. November 1960.

4364. Thallium toxicity in dogs. G. W. Mather and Donald Low. *Journal of the American Veterinary Medical Association* 137:544-549. 1960.

4379. Pressure events in the bovine esophagus and reticulorumen associated with eructation, deglutition and regurgitation. C. E. Stevens and A. F. Sellers. *American Journal of Physiology* 199:598-602. 1960.

NORTHWEST EXPERIMENT STATION

4093. Frequency of ejaculation in the bovine. E. C. Frederick, W. R. Dukelow, and E. E. Graham. *Journal of Dairy Science* 43:1335-1339. September 1960.

Miscellaneous Journal Series Papers

AGRONOMY AND PLANT GENETICS

1060. Progress in weed control. R. Behrens. *Proceedings of Annual Hybrid Corn Industry-Research Conference (Fifteenth)*, December 7-8, 1960 pp. 24-29. 1960.

1064. Reaching for yield. E. H. Rinke. *Proceedings of Annual Hybrid Corn Industry-Research Conference (Fifteenth)*, December 7-8, 1960 pp. 24-29. 1960.

ANIMAL HUSBANDRY

1071. Nitrate poisoning in livestock. O. E. Kolari and R. M. Jordan. *Minnesota Feed Service* pp. 4-5, 8. March 1961. *Feedstuffs* 33:28, 30-31. June 1961.

1072. Grain preferences of creep-fed beef calves. Jay Meiske. *Minnesota Farm and Home Science* 18:14. Spring 1961.

DAIRY HUSBANDRY

1055. Sire evaluation methods in artificial breeding. C. L. Wilcox and C. L. Cole. *A. I. Digest* 9:8-9. February 1961.

1057. How early can calves be weaned? W. A. Olson and J. B. Williams. *Minnesota Farm and Home Science* 18:1-15. Fall 1960.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

1054. Radioactive tracer work to determine possible residues in milk and meat from dairy sprays. L. K. Cutkomp. *Proceedings 46th Mid-Year Meeting of the Chemical Specialists Manufacturers Association* pp. 190-192. May 1960.

1059. Honey—the last hundred years. M. H. Haydak. *American Bee Journal* 100:426-430. 1960.

1061. The place of physiology in entomological curricula. A. G. Richards. *Bulletin of the Entomological Society of America* 7:20-21. March 1961.

1068. Bee research at the University of Minnesota (1913-1960). M. H. Haydak. *Minnesota Beekeeper* 13:3-5, 12-16. 1961.

HORTICULTURE

1058. 1960 report on plastic greenhouses. R. E. Widmer. *Minnesota State Florists' Bulletin* pp. 1-7. October 1, 1960.

Summary of Journal Series Papers

Department	Scientific journal series		Miscellaneous journal series	
	Number issued	Number of pages	Number issued	Number of pages
Agricultural Biochemistry	18	126	0	0
Agricultural Engineering	1	3	0	0
Agronomy and Plant Genetics	9	14	2	13
Animal Husbandry	9	39	2	7
Dairy Husbandry	8	7	2	17
Dairy Industries	2	19	0	0
Entomology and Economic Zoology	30	238	4	18
Forestry	20	110	0	0
Home Economics	1	1	0	0
Horticulture	7	3	4	11
Plant Pathology and Botany	18	56	0	0
Poultry Husbandry	8	30	0	0
Soils	4	7	0	0
Veterinary Medicine	9	53	0	0
Northwest Experiment Station	1	5	0	0
	145	711	14	66
Total publications—159				

Summary of Publications

July 1960-July 1961

Kind of publication	Number issued	Number of pages	Number of copies
General bulletin series	5	198	52,500
Technical bulletin series	3	214	11,000
<i>Minnesota Farm and Home Science</i>	4	126	61,300
Report series	10	230	80,500
Agricultural Extension Service			
Bulletins	15	430	188,500
Pamphlets	9	90	98,000
Folders	19	164	365,000
4-H Club bulletins	11	346	88,500
Miscellaneous	6	56	26,750
Fact sheets	70	140	139,250
Information Service series	37	74	31,600
Communications bulletins	15	30	7,850
Newsletters	196	816	199,742
	400	2,914	1,350,492

1066. Some promising new trees and shrubs for Minnesota gardens. L. C. Snyder. *Minnesota Horticulturist* 89:27. March 1961.

1074. Poinsettia cutting production. R. E. Widmer. *Minnesota State Florists' Bulletin* pp. 9-10. June 1961.

1075. Weed control in garden chrysanthemums. R. E. Widmer and R. J. Stadtherr. *Minnesota State Florists' Bulletin* pp. 7-8. June 1961.

New Experiment Station Projects

AGRICULTURAL BIOCHEMISTRY

1522H. Biochemistry of S-(dichlorovinyl)-L-cysteine—Its relation to aplastic anemia.

1523H. The structural basis for enzyme action.

AGRICULTURAL ECONOMICS

1138H. Adjustments of farm production and the structure of farming in Minnesota to economic change.

1139HM. Analysis of farm prices.

1140RM. An analysis of supply control mechanics in the feed-livestock sector.

1141H. An economic study of costs and returns from various systems of beef cattle feeding.

1142HM. Adjustments in the livestock marketing industry in Minnesota and the midwest to changing patterns of production and consumption.

1143HM. An economic appraisal of the soybean industry.

1144RHM. The changing market structure and organization of the Minnesota dairy industry.

1145H. Farm production adjustments in the Red River Valley of Minnesota.

AGRICULTURAL ENGINEERING

1219R. The role of environmental factors in the prevention and control of chronic respiratory disease (sinusitis) in turkeys.

ANIMAL HUSBANDRY

1431H. Dietary requirements of pigs in dry lot.

1432H. The nutrition and management of pigs from birth to weaning.

1433H. Diet as a factor in swine reproduction.

DAIRY INDUSTRIES

1809HM. Investigations on the control of staphylococci in dairy products.

1810. An investigation of the characteristics of psychrophilic bacteria.

1811HM. Factors influencing the manufacture and market qualities of low-fat cheeses.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

1743H. Investigation of year class formation in Northern Pike.

1744. Effect of paper fiber wastes on fish eggs and juveniles.

FORESTRY

1925R. Improvement through selection and breeding of tree species for planting in Minnesota with emphasis on larch.

1926R. Timber products marketing in north central Minnesota.

1927. Watershed values as affected by forest management.

HOME ECONOMICS

2024H. The effect of a dishwasher on space use in different kitchen arrangements with different types of cooking equipment.

PLANT PATHOLOGY AND BOTANY

2230R. Biology of nematodes associated with crops in Minnesota.

2231H. The biology of microorganisms causing diseases of ornamentals.

2232R. The effect of pre- and post-harvest conditions on mechanical damage and germinability of flax seed.

POULTRY HUSBANDRY

2322. Light regulation as a management factor for improving reproduction in turkeys.

2323RM. Physical-chemical properties of egg shells as related to shell quality.

2324. Consumer acceptability of turkey fryer-roasters.

2325. Basic physiological studies on the control mechanism of avian respiration.

RURAL SOCIOLOGY

2710H. Agricultural policy, level of living and value orientations.

SOILS

2526H. Soil heat and moisture characteristics related to evaporation from cropped land.

VETERINARY MEDICINE

2636. Diarrheal diseases of newborn pigs.

2637. Relationship of a thrombopenia to the diagnosis and pathogenesis of hog cholera.

Summary of Projects

Department	Active	Closed	New
Agricultural Biochemistry	13	2	2
Agricultural Economics	33	2	8
Agricultural Engineering	15	0	1
Agronomy and Plant Genetics	26	0	0
Animal Husbandry	17	5	3
Dairy Husbandry	11	1	0
Dairy Industries	11	0	3
Entomology and Economic Zoology	30	1	2
Forestry	18	1	3
Home Economics	12	1	1
Horticulture	20	1	0
Plant Pathology and Botany	28	2	3
Poultry Husbandry	18	1	4
Rural Sociology	5	0	1
Soils	22	0	1
Veterinary Medicine	23	1	2
Total	302	18	34

FINANCIAL STATEMENT

Income 1960-61

Sources of revenue	Branch Stations									Total	
	St. Paul Campus	Crookston	Morris	Grand Rapids	Itasca	Duluth	Waseca	Cloquet	Lamberton		
Federal appropriations											
Hatch Fund	\$ 604,782.00										\$ 604,782.00
Regional Research Fund	159,175.00										159,175.00
State appropriations											
General University support	1,483,305.42	\$113,784.63	\$107,216.57	\$61,881.55	\$4,395.06	\$ 88,127.03	\$ 69,359.82	\$30,732.93	\$43,562.09		2,002,365.10
Special appropriations	723,500.00										723,500.00
Endowments, fellowships, etc.	517,958.91										517,958.91
Fees, sales, miscellaneous	377,011.05	35,820.43	33,625.48	18,744.42	2,762.04	44,514.88	65,620.01	10,912.46	8,761.79		597,772.56
Total	\$3,865,732.38	\$149,605.06	\$140,842.05	\$80,625.97	\$7,157.10	\$132,641.91	\$134,979.83	\$41,645.39	\$52,323.88		\$4,605,553.57

Expenditures 1960-61

By Station

Classification	Branch Stations									Total	
	St. Paul Campus	Crookston	Morris	Grand Rapids	Itasca	Duluth	Waseca	Cloquet	Lamberton		
Service and labor	\$2,764,771.73	\$107,430.45	\$ 99,418.52	\$58,776.60	\$4,124.61	\$ 73,027.39	\$ 84,156.49	\$26,440.14	\$25,595.20		\$3,243,741.13
Travel expense	58,321.71	402.64	49.20	192.82	145.50	345.46	832.84	52.26	176.50		60,518.93
Transportation of things	4,067.38	681.83	215.72	584.13	18.80	316.70	57.05	3.00	68.68		6,013.29
Communication service	23,240.37	1,159.63	1,449.07	390.03	9.88	1,065.38	526.95	226.14	491.11		28,558.56
Rents and utility	70,452.57	4,498.20	3,897.26	2,466.09	501.26	6,486.05	5,433.87	2,410.28	7,093.05		103,238.63
Printing and binding	19,849.13	121.37									19,970.50
Other contractual services	270,858.52	10,481.71	13,009.51	3,248.26	295.41	11,594.30	9,759.04		6,286.05		325,532.80
Supplies and materials	407,017.27	19,124.03	17,105.29	11,440.22	1,422.73	29,090.10	25,504.35	3,109.25	7,089.68		520,902.92
Equipment	211,409.27	3,509.41	5,697.48	3,439.31	439.32	8,982.96	8,153.15	3,012.19	5,162.24		249,805.33
Land and structures	24,816.14	2,195.79		88.51	199.59	1,733.57	556.09	6,392.13	361.37		36,343.19
Retirement and OASI	10,928.29										10,928.29
Total	\$3,865,732.38	\$149,605.06	\$140,842.05	\$80,625.97	\$7,157.10	\$132,641.91	\$134,979.83	\$41,645.39	\$52,323.88		\$4,605,553.57

Expenditures 1960-61

By Fund

Classification	Hatch Fund	Regional Research Fund	Nonfederal	Total
01 Service and labor	\$478,324.91	\$123,479.81	\$2,625,754.78	\$3,227,559.50
Administration	16,181.63			16,181.63
02 Travel	15,609.30	6,436.65	38,472.98	60,518.93
03 Transportation	676.27	309.40	5,027.62	6,013.29
04 Communication service	1,044.13	188.00	27,326.43	28,558.56
05 Utilities and rental of building and equipment	257.29		102,981.34	103,238.63
06 Printing and publications	5,398.71	3,682.44	10,889.35	19,970.50
07 Contractual service	12,615.34	2,962.18	309,955.28	325,532.80
08 Supplies and materials	37,632.32	9,557.77	473,712.83	520,902.92
09 Equipment	28,378.43	7,742.70	213,684.20	249,805.33
10 Land and buildings		2,551.43	33,791.76	36,343.19
11 Retirement and OASI	8,663.67	2,264.62		10,928.29
Total	\$604,782.00	\$159,175.00	\$3,841,596.57	\$4,605,553.57

EXPERIMENT STATION STAFF

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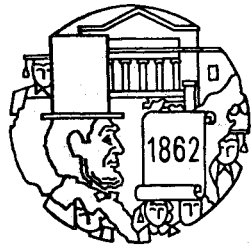
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