

PROFESSIONAL STAFF
AGRICULTURAL EXPERIMENT STATION
NORTH DAKOTA STATE UNIVERSITY
of AGRICULTURE and APPLIED SCIENCE
(as of January 1, 1977)

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AGRICULTURAL ECONOMICS: Frederick R. Taylor, Ph.D., Professor and Chairman⁵⁰; Donald E. Anderson, Ph.D., Professor⁶⁰; Gary M. Bedker, M.S., Research Associate⁶⁵; David W. Cobia, Ph.D., Professor⁵⁰; Randal C. Coon, M.S., Research Assistant¹⁰⁰; Norman L. Dalsted, M.S., Research Associate¹⁰⁰; Edward V. Dunn, M.S., Associate Professor⁵⁵; Gordon W. Erlandson, Ph.D., Professor⁴⁰; Delmer L. Helgeson, Ph.D., Associate Professor⁷⁰; Thor A. Hertsgaard, Ph.D., Professor⁴⁰; Jerome E. Johnson, Ph.D., Professor⁶⁰; Roger G. Johnson, Ph.D., Professor⁶⁰; F. Larry Leistritz, Ph.D., Associate Professor⁵⁸; Jay A. Leitch, M.S., Research Assistant¹⁰⁰; Noel B. Nelson, B.A., Research Assistant¹⁰⁰; William C. Nelson, Ph.D., Associate Professor⁷⁰; Louis A. Ogaard, M.A., Research Assistant¹⁰⁰; Thomas K. Ostenson, M.S., Associate Professor⁶⁰; Timothy A. Petry, M.S., Assistant Professor⁷⁰; George H. Pfeiffer, Ph.D., Research Associate¹⁰⁰; Damian A. Runge, B.S., Research Assistant¹⁰⁰; LeRoy W. Schaffner, M.S., Associate Professor¹⁰⁰; Donald F. Scott, Ph.D., Assistant Professor⁶⁰; Arlyn R. Staroba, M.S., Research Assistant¹⁰⁰; Donald E. Thomson, M.S., Instructor⁹⁰; Norman E. Toman, M.S., Research Assistant¹⁰⁰; Harvey G. Vreugdenhil, M.S., Research Associate¹⁰⁰; William G. Hamlin, M.S., Assistant Agricultural Statistician, USDA¹¹; Wallace McMartin, M.S., Agricultural Economist, USDA⁰; John R. Price, M.S., Agricultural Statistician, USDA⁰; Robert Tosterud, Ph.D., Director Upper Great Plains Transportation Institute⁰; Stanley W. Voelker, M.S., Agricultural Economist, USDA⁰.

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ANIMAL SCIENCE: Clayton N. Hauge, M.S., Professor and Acting Chairman⁶⁰; Paul T. Berg, Ph.D., Assistant Professor⁷⁰; Russell B. Danielson, M.S., Assistant Professor⁷⁰; William E. Dinussen, Ph.D., Professor⁷⁰; Charles G. Edgerly, M.S., Associate Professor⁶⁰; Duane O. Erickson, Ph.D., Professor⁶⁰; Robert L. Harrold, Ph.D., Associate Professor⁷⁰; Robert L. Johnson, M.S., Assistant Professor⁷⁵; Verlin K. Johnson, Ph.D., Professor⁶⁰; John N. Johnson, M.S., Associate Professor³⁰; Merle R. Light, M.S., Professor⁷⁰; Wesley R. Limesand, B.S., Instructor⁷⁰; Martin J. Marchello, Ph.D., Associate Professor⁶⁰; Bert L. Moore, Ph.D., Assistant Professor⁷⁰; William D. Slangner, Ph.D., Assistant Professor¹⁰⁰; Frank O. Thetford, Jr., Ph.D., Assistant Professor¹⁰⁰; James E. Tilton, Ph.D., Professor⁶⁰; Ronald E. Wollmuth, B.S., Instructor⁷⁰; Ronald C. Zimprich, B.S., Instructor⁷⁰; Peter W. Aschbacher, Ph.D., Adjunct Professor, USDA⁰; Kenneth L. Davison, Ph.D., Adjunct Professor, USDA⁰; Jerome C. Pekas, Ph.D., Adjunct Professor, USDA⁰; Edward J. Thacker, Ph.D., Adjunct Professor, USDA⁰.

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BOTANY: Harold Goetz, Ph.D., Professor and Chairman¹⁵; William T. Barker, Ph.D., Associate Professor⁴⁰; Murray E. Duysen, Ph.D., Professor⁵⁰; Donald S. Galitz, Ph.D., Professor⁵⁰; Paul E. Nyren, M.S., Assistant Botanist¹⁰⁰; Warren C. Whitman, Ph.D., Professor⁷⁵.

CEREAL CHEMISTRY AND TECHNOLOGY: Orville J. Banasik, M.S., Professor and Chairman⁶⁰; Charles W. Baker, Ph.D., Assistant Professor⁹⁰; Bert L. D'Appolonia, Ph.D., Associate Professor⁹⁰; Brendan J. Donnelly, Ph.D., Associate Professor⁹⁰; Clarence E. McDonald, Ph.D., Professor⁹⁰; Leonard D. Sibbitt, Professor¹⁰⁰; Joel W. Dick, M.S., Food Technologist, USDA⁰; William C. Shuey, Ph.D., Adjunct Professor, USDA⁰; Clifford A. Watson, Ph.D., Research Chemist, USDA⁰.

ENTOMOLOGY: John T. Schulz, Ph.D., Professor and Chairman⁷⁰; Albin W. Anderson, Ph.D., Assistant Professor⁹⁰; Edward U. Balsbaugh, Jr., Ph.D., Associate Professor⁶⁰; Robert B. Carlson, Ph.D., Professor⁷⁵; Richard D. Frye, Ph.D., Professor⁶⁵; Hendrik J. Meyer, Ph.D., Assistant Professor⁹⁰; Gregory B. Mulkern, Ph.D., Professor⁵⁰; Christian Y. Oseto, Ph.D., Assistant Professor⁷⁰; Terrance S. Adams, Ph.D., Adjunct Professor, USDA⁰; Robert A. Bell, Ph.D., Adjunct Professor, USDA⁰; Leo E. LaChance, Ph.D., Adjunct Professor, USDA⁰; Edwin P. Marks, Ph.D., Adjunct Professor, USDA⁰; Ian C. McDonald, Ph.D., Adjunct Professor, USDA⁰; David T. North, M.S., Adjunct Professor, USDA⁰; John G. Riemann, Ph.D., Adjunct Professor, USDA⁰; Dale E. Wagoner, Ph.D., Adjunct Professor, USDA⁰.

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PLANT PATHOLOGY: Richard L. Kiesling, Ph.D., Professor and Chairman⁸⁰; Robert M. Hosford, Ph.D., Professor⁹⁰; Joseph E. Huguette, Ph.D., Professor⁹⁰; Larry J. Littlefield, Ph.D., Professor⁹⁰; Vernyl D. Pederson, Ph.D., Professor⁹⁰; Robert Stack, Ph.D., Assistant Professor⁹⁰; Glen D. Statler, Ph.D., Associate Professor⁹⁰; James Venette, Ph.D., Assistant Professor⁹⁰; Glenn Wehtje, B.S., Research Assistant¹⁰⁰; William M. Bugbee, Ph.D., Adjunct Professor, USDA⁰; James D. Miller, Ph.D., Adjunct Professor, USDA⁰; Roland G. Timian, Ph.D., Adjunct Professor, USDA⁰; David E. Zimmer, Ph.D., Adjunct Professor, USDA⁰.

SOILS: Charles M. Smith, Ph.D., Professor and Chairman⁷⁰; James W. Bauder, Ph.D., Assistant Professor⁶⁰; Lynn J. Brun, Ph.D., Assistant Professor⁶⁰; William C.

Dahnke, Ph.D., Associate Professor¹⁰⁰; Glendon W. Gee, Ph.D., Research Scientist¹⁰⁰; Terrance Krueger, B.S., Assistant in Soils¹⁰⁰; Timothy J. Method, B.S., Research Assistant¹⁰⁰; John T. Moraghan, Ph.D., Professor⁸⁰; Delmar Nantt, B.S., Research Assistant¹⁰⁰; Hollis W. Omodt, M.S., Professor¹⁰⁰; Donald D. Patterson, M.S., Associate Professor¹⁰⁰; Juanito M. Ramirez, Ph.D., Associate Professor⁷⁰; Russell P. Schneider, Ph.D., Assistant Professor⁸⁰; Fred W. Schroer, M.S., Associate Professor¹⁰⁰; Dale Shay, B.S., Assistant in Soils¹⁰⁰; Francis J. Sobolik, M.S., Area Extension Agent³⁰; Robert E. Sojka, Ph.D., Assistant Professor¹⁰⁰; Michael D. Sweeney, M.S., Associate Professor¹⁰⁰; Larry J. Swenson, B.S., Assistant in Soils¹⁰⁰; Bruce K. Worcester, Ph.D., Assistant Professor⁷⁰; Joseph C. Zubriski, Ph.D., Professor⁶⁰; James F. Power, Ph.D., Adjunct Professor, USDA⁰ (Mandan); Wayne O. Willis, Ph.D., Adjunct Professor, USDA⁰ (Mandan).

VETERINARY SCIENCE: Myron F. Andrews, D.V.M., Professor and Chairman⁵⁰; Arnold D. Alstad, D.V.M., Associate Professor¹⁰⁰; Ivan E. Berg, D.V.M., Associate Professor¹⁰⁰; Howard H. Casper, Ph.D., Assistant Professor¹⁰⁰; Allan Peterson, D.V.M., Assistant Professor¹⁰⁰; Ithel A. Schipper, D.V.M., Professor⁶⁰; George E. Staples, D.V.M., Associate Professor⁹⁰; Raul Weiss, D.V.M., Associate Professor¹⁰⁰; Donald K. Christian, D.V.M., Adjunct Professor (Private Practice)⁰; Gary R. Christian, D.V.M., Adjunct Professor (Private Practice)⁰; Robert A. Moen, D.V.M., Adjunct Professor (Private Practice)⁰; Meril J. Reinhiller, D.V.M., Adjunct Professor (Private Practice)⁰; Clarence W. Samuel, D.V.M., Adjunct Professor (Private Practice)⁰; Daniel P. Treat, D.V.M., Adjunct Professor (Private Practice)⁰.

BRANCH STATIONS

AGRONOMY SEED FARM: LeRoy A. Spilde, Ph.D., Superintendent¹⁰⁰.

CARRINGTON: Howard M. Olson, M.S., Superintendent and Agricultural Engineer¹⁰⁰; Joseph J. Caroline, B.S., Assistant Agronomist¹⁰⁰; Robert S. Hoffman, B.S., Assistant Agricultural Engineer¹⁰⁰; David W. Rodgers, M.S., Assistant Animal Husbandman¹⁰⁰.

DICKINSON: Thomas J. Conlon, M.S., Superintendent¹⁰⁰; Douglas G. Landbloom, M.S., Assistant Animal Husbandman¹⁰⁰; James Lee Nelson, B.S., Animal Husbandman¹⁰⁰.

HETTINGER: Timothy C. Faller, M.S., Superintendent¹⁰⁰.

LANGDON: Robert E. Nowatzki, B.S., Superintendent¹⁰⁰.

NORTH CENTRAL: Ben K. Hoag, M.S., Superintendent¹⁰⁰.

WILLISTON: Ernest W. French, M.S., Superintendent¹⁰⁰; Neil Riveland, M.S., Assistant Agronomist¹⁰⁰.

The small superscript figure after each title indicates the per cent of the salary paid by the Agricultural Experiment Station. The superscript zero indicates the entire salary is paid by some state or federal agency, usually the United States Department of Agriculture.

**PROFESSIONAL
STAFF CHANGES**

(to January 1, 1977)

ADDITIONS TO STAFF

Dale Shay, B.S.	Assistant in Soils	January 1, 1976
James Venette, Ph.D.	Assistant Professor	January 1, 1976
Robert Stack, Ph.D.	Assistant Professor	January 15, 1976
Robert E. Sojka, Ph.D.	Assistant Professor	February 1, 1976
David E. Chandler, M.S.	Research Assistant	March 1, 1976
Lowell A. Disrud, M.S.	Assistant Professor	March 1, 1976
Michael S. McMullen, Ph.D.	Assistant Professor	March 22, 1976
Roy A. Johnston, M.S.	Research Assistant	April 1, 1976
Noel B. Nelson, B.A.	Research Assistant	April 1, 1976
Louis A. Ogaard, M.A.	Research Assistant	April 1, 1976
George H. Pfeiffer, Ph.D.	Research Associate	April 1, 1976
Christiaan E. G. Mulder, M.S.	Research Assistant	June 1, 1976
Glenn Wehtje, B.S.	Research Assistant	June 1, 1976
Leslie F. Backer, M.S.	Assistant Professor	July 1, 1976
Edward U. Balsbaugh, Jr., Ph.D.	Associate Professor	July 1, 1976
Jay A. Leitch, M.S.	Research Assistant	July 1, 1976
Damian A. Runge, B.S.	Research Assistant	July 1, 1976
James P. Haskins, M.S.	Research Assistant	July 12, 1976
Allan Peterson, D.V.M.	Assistant Professor	September 1, 1976
William G. Hamlin, M.S.	Ass't. Agricultural Statistician	September 10, 1976
Kenton R. Kaufman, B.S.	Assistant Professor	November 1, 1976

DELETIONS

Jerry F. Miller, M.S.	Research Assistant	March 26, 1976
A. A. Seyam, Ph.D.	Assistant Professor	May 26, 1976
Merlin D. Breen, Ph.D.	Assistant Professor	May 31, 1976
Arlen G. Leholm, M.S.	Research Associate	May 31, 1976
Richard L. Post, Ph.D.	Professor	June 30, 1976
John E. Gilley, M.S.	Research Associate	August 20, 1976
Armand Bauer, Ph.D.	Professor	August 31, 1976
Marion L. Buchanan, M.S.	Professor and Chairman	September 10, 1976
Robert L. Vossen, M.S.	Ass't. Agricultural Statistician	September 10, 1976
James P. Haskins, M.S.	Research Assistant	October 31, 1976
Jerry L. Sell, Ph.D.	Professor	November 30, 1976

GIFTS AND GRANTS

Numerous grants of money and gifts of equipment, supplies, and other services are provided the North Dakota Agricultural Experiment Station each year in support of its research programs. The station expresses its sincere thanks to the following for the support provided during the year 1976.

Abbott Laboratories
 Agricultural Research Service, USDA
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 United States Department of the Interior
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 Chevron Chemical Company
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 Interstate Seed and Grain Company
 Malting Barley Improvement Association
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 Mobil Chemical Company
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 Montana State University
 Mountain West Research, Incorporated
 NA-CHURS Plant Food Company
 National Crop Insurance Association
 National Macaroni Manufacturers Association
 National Potato Promotion Board
 National Wheat Institute, USDA
 Natural Gas Pipeline Company of America
 Niagara Chemical Company
 Nor-Am Agricultural Products, Incorporated
 North American Coal Corporation

North Dakota Beef Cattle Improvement Association
 North Dakota Beef Commission
 North Dakota Business and Industrial
 Development Department
 North Dakota Livestock Mutual Aid Corporation
 North Dakota Poultry Industries Convention
 North Dakota Power Use Council
 North Dakota State Seed Department
 North Dakota State Wheat Commission
 North Dakota Turkey Federation
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Red River Valley Sugar Beet Growers Association
 Research Corporation
 Rhodia, Incorporated
 Rohm and Haas Company
 Roman Meal Company
 Schafer-Post Series
 Shell Chemical Company
 Sheyenne Valley Grazing Association
 South Dakota State University
 Stauffer Chemical Company
 Stearns-Roger, Incorporated
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 North Dakota and Minnesota
 Sunflower Association of America
 Sun Oil Company of Pennsylvania
 Union Carbide
 UNIROYAL Chemical - Canada
 UNIROYAL, Incorporated
 United States Rubber
 The Upjohn Company
 U. S. Borax Research

PROJECTS ACTIVE FISCAL YEAR 1977
North Dakota Agricultural Experiment Station
North Dakota State University
January 1, 1977

PROJECT	TITLE	INVESTIGATOR(S)	PROJECT	TITLE	INVESTIGATOR(S)
BIOCHEMISTRY					
1212	Comparative Study of Plant Carbonic Anhydrase	George Graf	1353 (NC-102)	The Economics of Institutional Arrangements for Viable Rural Communities in the Great Plains	W. C. Nelson T. A. Hertsgaard D. L. Helgeson
1215	Enzymic Biosynthesis of Gramine in <i>Hordeum vulgare</i>	A. G. Fischer	1354 (NC-139)	Economic Analysis of the U.S. Grain Exporting Systems	D. E. Anderson
1217 (NC-96)	Environmental Implications and Interactions of Pesticide Usage	D. W. Bristol H. J. Klosterman	1355 (NC-123)	Costs, Quality, and Demand for Selected Community Services: The Effect of Organizational Form, Size, and Other Factors	D. L. Helgeson
1218	Uric Acid and Hydrogen Peroxide Formation in Bovine Thyroid	A. G. Fischer	1356	North Dakota Resource Inventory, Information Management, and Monitoring System (RIMS)	J. E. Johnson
1219	Extracellular Nuclease from Cell Suspension Culture of Higher Plants	A. E. Oleson	1357	Marketing of Irrigation Production	D. E. Anderson R. G. Johnson
1220	Degradation of Pesticides in Soil and Sunlight	J. R. Fleeker	1358 (NC-117)	Organization and Control of the U.S. Food Production and Distribution System	D. F. Scott
3201	Cooperative Investigations in Agricultural Biochemistry	H. J. Klosterman	1360	Evaluation of Alternative Rural Freight Transportation, Storage and Distribution Systems	D. W. Cobia
5020	Satellite Laboratory for Minor use Pesticides Research	D. W. Bristol H. J. Klosterman	1361	Economics of Marketing Meat Products in North Dakota	T. A. Petry E. V. Dunn G. M. Bedker
AGRICULTURAL ECONOMICS			3303	Collection and Dissemination of Agricultural Data for North Dakota	F. R. Taylor J. R. Price
1335 (GP-12)	Economics of Farm and Ranch Growth	J. E. Johnson	3306	Service Activities and Pilot Studies	F. R. Taylor
1336	Credit Problems of North Dakota Agriculture	F. R. Taylor	3314	Market Development for Hard Red Spring and Durum Wheat	D. E. Anderson
1337	Dairy Market Efficiency	G. W. Erlandson T. A. Petry	3319	Service Activities Relating to Ownership, Markets, and Use of Farmland	J. E. Johnson
1344	Economics of Crop Production Technology	R. G. Johnson	3328	Economic and Social Impact of Recreational Development of Lake Metigoshe	D. L. Helgeson
1347	North Dakota Agribusiness Marketing Information	D. W. Cobia G. W. Erlandson	3331	Water Quality and Land Use in the Sheyenne River Basin	W. C. Nelson
1348 (NC-97)	Population Redistribution in the North Central Region —Pre- and Post-1970	T. K. Ostenson	3332	Impacts of Coal Development Alternatives	F. L. Leistritz
1350	Livestock and Products Marketing	T. A. Petry G. W. Erlandson			
1351	Economics of Farm Size	R. G. Johnson L. W. Schaffner			
1352	Economics of Livestock Production Technology	F. L. Leistritz L. W. Schaffner T. A. Petry			