

Soil, Water, and Climate Research by the Soils Department — Locations in 1977

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Personnel of the Soils Department, North Dakota State University, are involved in research and educational activities pertaining to the understanding and wise utilization of the natural resources — soil and water. Soils differ widely across the state as to physical and chemical characteristics which affect production of food and fiber. And because available water supply and climate vary as well, it is necessary to study many of the problems where they occur. Soils staff members at Fargo, Mandan, and Williston, work throughout the state.

The accompanying map of North Dakota shows locations of research activities. The legend identifies sites as to general types of activities and the table provides names and locations of cooperators, the responsible researchers, and more information about the experiments. Success of these programs in Soils is enhanced by the excellent cooperation of farmers, mine operators, County agents and other Extension and research personnel, Soil Conservation Service and Science and Education Administration of USDA, Bureau of Reclamation, N.D. Soil Conservation Committee, and other private, state, and federal agencies.

An examination of the map and table shows a widespread involvement by Soils researchers in 31 counties of North Dakota and 2 in Minnesota. This ranges from soil surveys of areas tentatively designated for irrigation, fertilizer requirements for crop production, soil compaction, reclamation of strip-mined land, saline seeps, remote sensing, water runoff and erosion, climate characteristics and effects, tillage, micro-climate, lysimeters, crop residue and snow management. Most crops grown in the state

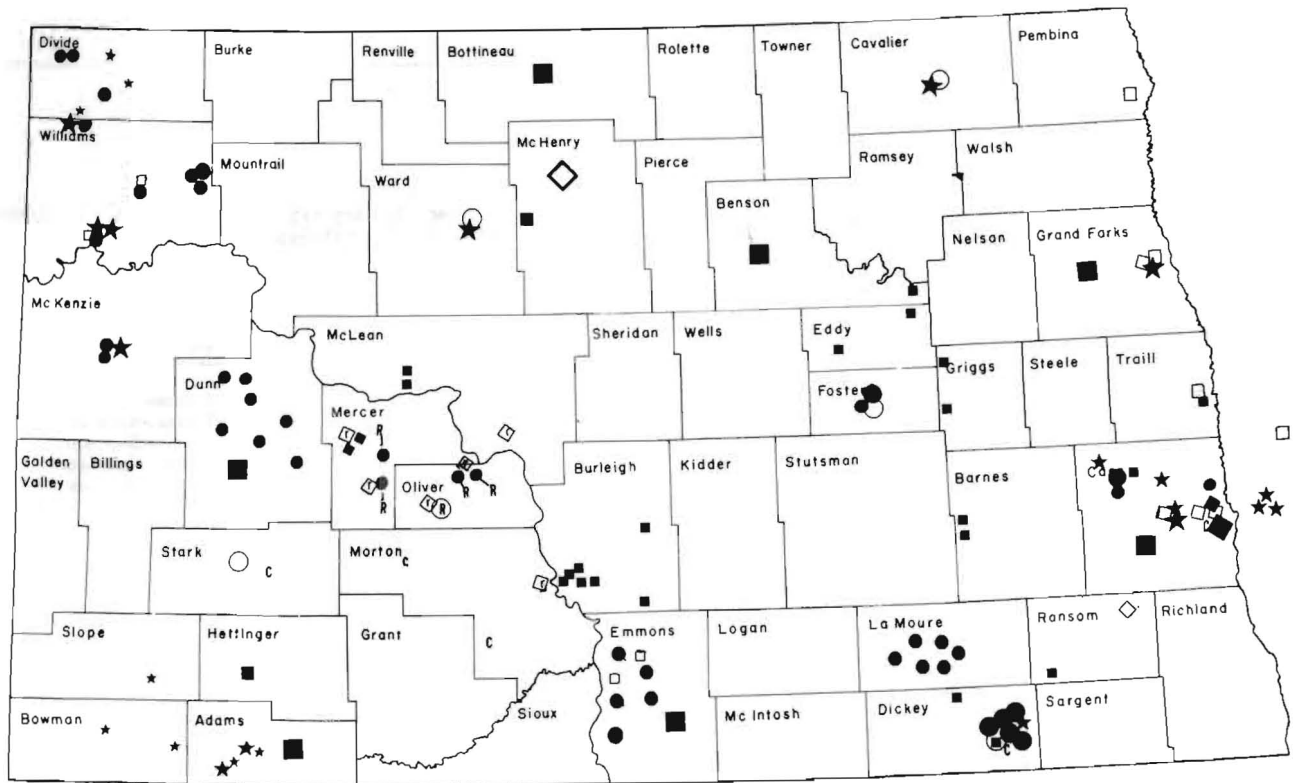
are included in various of the studies with field, laboratory, and greenhouse approaches being used.

Many of the experiments include rates of fertilizer nutrients and data are being used to improve recommendations for soil tests. Recommendations are then made for fertilizer rates to help farmers with their management decisions. The impact of soil testing is large with thousands of fields being sampled each year. Irrigation is increasing in the state and our research on efficiency of water use for production of grain and forage crops provides guidelines for water and fertility management. This includes sunflowers, the acreage of which has increased dramatically along with a changed priority for needing answers to challenging and sometimes perplexing problems of production under varied soil and climatic conditions.

Tillage experimentation is being increased sharply in North Dakota. Several of these efforts are cooperative between Soils Department and Branch Experiment Station personnel. Much interest has developed among farmers for reducing the number of trips across a field to get a crop produced. The effects of tillage, or lack of it, are many. With our increasing understanding of what factors influence plant growth, nutrient availability and absorption, and water storage and losses, more options are opening up to the farmers. Several articles in this issue discuss various aspects of tillage.

The objectives of showing the map and listing experiments and research locations in the table are to provide information about types of research, where it is being conducted and to recognize the assistance of cooperators. The working together of researchers, farmers, Extension personnel, industry, and other federal and state agencies makes our job much more effective in the solution of soil, water, and climate related problems.

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Approximate locations of 1977 research sites of Department of Soils, North Dakota State University, are shown on the map. General identification of symbols is given in the accompanying legend. Additional details of kind of research, crop, cooperators' names and locations, and researchers' names are given in the accompanying table.

LEGEND

Soil Fertility & Plant Nutrition Expts.

- dryland: sp. wheat, w. wheat durum, oats, barley
- ◌ reclamation research: sp. wheat, corn
- irrigated: sp. wheat, corn
- sunflower, safflower, flax
- sugarbeets, potatoes
- alfalfa or grass hay
- Ⓡ reclamation: grass
- ◆ foliar spray — wheat
- ◆ greenhouse: flax, sugarbeets, corn, sunflower, soybeans

Soil Physical & Chem. Expts., Genesis, Survey, Saline Seeps, Mine Spoils

- ◇ crusting, compaction, aeration, freezing
- monitor soil changes by farm irrigation
- soil genesis/classification research
- ◇ irrigable soils survey
- ★ tillage, residue, & stubble heights expts.
- * saline seep research: water table monitor, water use efficiency of cereals
- ★ water use efficiency: sunflower, sugarbeets, alfalfa, flax, barley, corn, soybeans, wheat, beans
- ◆ reclamation: runoff of water & soil, micro watersheds
- ◇ reclamation: physical, chemical, water relations
- c climatic data collection
- soil survey field reviews and correlation

Experiments in 1977 by Soils Department personnel and associated researchers. Included are types of research, variables where appropriate, crops, and cooperators names and locations. These represent many different soil and climate conditions in North Dakota.

Experiments	Crop	Cooperators	Location		Researchers
			Town	County	
Soil Fertility, Nutrition, Residue Mgt.					
NPKS rates	Barley	Con Davis	Killdeer	Dunn	Dahnke-Swenson
NPK rates	Sp wheat	Dale Bang	Killdeer	Dunn	Dahnke-Swenson
NPKS rates	Sp wheat	Dale Bang	Killdeer	Dunn	Dahnke-Swenson
NPKS rates	Sp wheat	B. Flaget	Halliday	Dunn	Dahnke-Swenson
NPKS rates	Sp wheat	A. Lazoranko	Killdeer	Dunn	Dahnke-Swenson
NPK rates	Sp wheat	C. Pelton	Dunn Center	Dunn	Dahnke-Swenson
NPK rates	Sp wheat	Matt Neuhro	Dodge	Dunn	Dahnke-Swenson
NPK rates	Sp wheat	P & L Fregien	Jud	LaMoure	Dahnke-Swenson
NPKS rates	Sp wheat	R. Anderson	LaMoure	LaMoure	Dahnke-Swenson
NPKS rates	Sp wheat	H. Lahlum	Marion	LaMoure	Dahnke-Swenson
NPK*	Barley	G. Pueppke	Erie	Cass	Dahnke-Swenson
NPK*	Sp wheat	Carrington Br Exp Sta	Carrington	Foster	Dahnke-Swenson-Olson
NPK*	Sp wheat	Carrington Br Exp Sta	Carrington	Foster	Dahnke-Swenson-Olson
NPKS rates	Sp wheat	D. Liska	Edgeley	LaMoure	Dahnke-Swenson
NPKS rates	Sp wheat	R. Henderson	Dickey	LaMoure	Dahnke-Swenson
NPKS rates	Oats	W. Bauder	Berlin	LaMoure	Dahnke-Swenson
NPK rates	Sp wheat	G. McCrory	Linton	Emmons	Dahnke-Swenson
NPK rates	Barley	Herb Grenz	Livona	Emmons	Dahnke-Swenson
NPK rates	Oats	Rod Grenz	Hazelton	Emmons	Dahnke-Swenson
NPK rates	Sp wheat	L. Schermeister	Livona	Emmons	Dahnke-Swenson
NPK rates	Flax	L. Schermeister	Livona	Emmons	Dahnke-Swenson
NPK rates	Flax	L. Schermeister	Livona	Emmons	Dahnke-Swenson
NPK rates	Sp wheat	L. Schermeister	Livona	Emmons	Dahnke-Swenson
NP & placement	Potatoes	R.R.V. Potato Growers	Grand Forks	Grand Forks	Dahnke-Nelson-Swenson
P & residual	Alfalfa	North Cen Exp Sta	Minot	Ward	Dahnke-Swenson-Hoag
P & residual	Alfalfa	Dickinson Exp Sta	Dickinson	Stark	Dahnke-Swenson-Conlon
P & residual	Alfalfa	Carrington Br. Exp. Sta	Carrington	Foster	Dahnke-Swenson-Olson
P & residual	Alfalfa	Langdon Br Exp Sta	Langdon	Cavalier	Dahnke-Swenson-Nowatzki
NPK rates	Sp wheat	Sherwood Johnson	Page	Cass	Syltie-Dahnke-Swenson
NPK rates	W wheat	R. Davidson	Tioga	Williams	Schneider-Sobolik
NPK rates	Sp wheat	R. Davidson	Tioga	Williams	Schneider-Sobolik
NPK rates	Sp wheat	R. Davidson	Tioga	Williams	Schneider-Sobolik
NPK rates	W wheat	L. Binde	Fortuna	Divide	Schneider-Sobolik
NPK rates	Durum	J. Halvorson	Fortuna	Divide	Schneider-Sobolik
NPK rates	Durum	J. Halvorson	Fortuna	Divide	Schneider-Sobolik
NPK rates	Safflower	C. Faye	Ray	Williams	Schneider-Sobolik
NPK rates	Safflower	C. Faye	Ray	Williams	Schneider-Sobolik
N rates	Barley	Williston Sta	Williston	Williams	Schneider-Sobolik-Riveland
NPK rates	Safflower	Williston Sta	Williston	Williams	Schneider-Sobolik-Riveland
N & residue ht	Sp wheat	Williston Sta	Williston	Williams	Schneider-Sobolik-French
NP residue	Sp wheat	O. Sovig	Rawson	McKenzie	Schneider-Sobolik-Johnson
NP rates	Sp wheat	O. Sovig	Rawson	McKenzie	Schneider-Sobolik
NP rates	Sp wheat	B. Bertinuson	Rawson	McKenzie	Schneider-Sobolik
NP residue	Sp wheat	D. Howe	Hettinger	Adams	Schneider-Faller-Johnson
NP residue	Sp wheat	A. Rose	Hettinger	Adams	Schneider-Faller-Johnson
NP rates	Sp wheat	C. Kylo	Harwood	Cass	Schneider-Johnson
NP residue	Sp wheat	F. Glimm	Zahl	Williams	Schneider-Sobolik-Johnson
NPK rates	Sp wheat	F. Glimm	Zahl	Williams	Schneider-Sobolik
N & cultivars	Sp wheat	Irr Field Sta	Oakes**	Dickey	Zubirski-Albus
N source & rates	Sunflower	Irr Field Sta	Oakes**	Dickey	Zubirski-Albus
Water, N rates & time	Corn	Irr Field Sta	Oakes**	Dickey	Zubirski-Bauder-Albus
Ahn amm & N-serve	Corn	Irr Field Sta	Oakes**	Dickey	Moraghan-Albus
Foliar spray	Sp wheat	Agr Exp Sta	Fargo	Cass	Deibert
K & cultivars	Sugarbeets	M. Chisholm	Gary, MN	Norman	Moraghan
Plant anal - N	Sugarbeets	J. Pulskamp	Hillsboro	Traill	Moraghan
Plant anal - N	Sugarbeets	R. Kemp	Drayton	Pembina	Moraghan-O'Neil
Plant anal - N	Sugarbeets	D. Vistad	Drayton	Pembina	Moraghan-O'Neil
Plant anal - N	Sugarbeets	H & D Puppe	Drayton	Pembina	Moraghan-O'Neil
Plant anal - N	Sugarbeets	Tucker & Green	Drayton	Pembina	Moraghan-O'Neil

Experiments	Crop	Cooperators	Location		Researchers
			Town	County	
SOILS RESEARCH NOT NECESSARILY SPECIFIC TO CROPS					
Tillage, Water Use, Reclamation, etc.					
Min tillage	Sp wheat	Williston Exp Sta	Williston	Williams	French, Deibert-Schneider-Brun-Sojka-O'Brien
Min tillage	Sp wheat	North Cen Exp Sta	Minot	Ward	Hoag-Deibert-Brun-Sojka-Schneider-O'Brien
Min tillage	Several	Langdon Br Exp Sta	Langdon	Cavalier	Nowatski-Deibert-Sojka-Brun-Schneider
Seedbed prep	Sugarbeets	B. Galegher	Thompson	Cass	Sojka-Arnold
Seedbed prep	Sugarbeets	Seed Farm NDSU	Casseltown	Cass	Sojka-Spilde-Arnold
Aeration-roots	Sugarbeets	Agr Exp Sta	Fargo	Cass	Sojka-Arnold
Compaction	Beets, spuds	Pot Res Farm	Gr Forks	Gr Forks	Sojka-Arnold
Water use-cultivars-roots	Sunflower	Driscoll Fms & Cargill	Glyndon, MN	Clay	Bauder-Ennen
Water use-cultivars-roots	Sunflower	Martin Farms	Arthur	Cass	Bauder-Ennen
Water use-cultivars-roots	Sunflower	P. Horn & Cargill	Dilworth, MN	Clay	Bauder-Ennen
Water use-rooting	Sunflower & other	P. Horn & Cargill	Dilworth, MN	Clay	Bauder-Ennen
Water use-rooting	Sunflower & other	M. Andrews Farms	Mapleton	Cass	Bauder-Ennen
Tillage, Water Use, Reclamation, etc.					
Water use-rooting	Sunflower & other	R. Thompson	Page	Cass	Bauder-Ennen
Water use-rooting	Sunflower & other	Irr Field Sta	Oakes	Dickey	Bauder-Zubriski
Frozen soils	Pasture	Jim Runch	Lynchburg	Ransom	Bauder-Brun
Water movement-soils	Pasture	L. Anderson	Deering	McHenry	Shay-Sweeney-Bauder-Schroer-Bur Rec
Irr effects on soils	Corn, alfalfa	Jim Adams	McKenzie	Burleigh	Schroer
Irr effects on soils	Corn, grain	W. Anderson	McKenzie	Burleigh	Schroer
Irr effects on soils	Corn, alfalfa	Carroll Bros	Moffitt	Burleigh	Schroer
Irr effects on soils	Barley	R. Folmer	Sterling	Burleigh	Schroer
Irr effects on soils	Corn	L. Salter	Menokin	Burleigh	Schroer
Irr effects on soils	Corn, grain	D. Solberg	Bismarck	Burleigh	Schroer
Irr effects on soils	Corn, alfalfa	D. Bohrer	Menchen	Burleigh	Schroer
Irr effects on soils	Alfalfa	N. Dahl	McHenry	Griggs	Schroer-SCS
Irr effects on soils	Wheat	N. Peters	Sutton	Griggs	Schroer
Irr effects on soils	Sp wheat, alfalfa	Sauer Fms	Sanborn	Barnes	Schroer
Irr effects on soils	Alfalfa	Am Crystal	Hillsboro	Traill	Schroer
Irr effects on soils	Sunflower	C. Larson	Fullerton	Dickey	Schroer-SCS
Irr effects on soils	Corn	A. Hammer	Englevale	Ransom	Schroer-SCS
Irr effects on soils	Sunflower	Thompson Bros.	Page	Cass	Schroer-SCS
Irr effects on soils	Alfalfa, sunflower	H. Pare	Tolna	Benson	Sweeney
Irr effects on soils	Wheat	K. Kresbach	Warwick	Eddy	Sweeney
Irr effects on soils	Sunflower	Q. Georgeson	New Rockford	Eddy	Sweeney
Irr effects on soils	Corn	E. Klein	Valley City	Barnes	Hemb-Sweeney-Schroer
Irr effects on soils	Corn	M. German	Oakes	Dickey	Hemb-Sweeney-Schroer
Irr effects on soils	Alfalfa	H. Klabunde	Emmett	McLean	Hemb-Sweeney-Schroer
Irr effects on soils	Corn	J. Inglehart	Emmet	McLean	Hemb-Sweeney-Schroer
SS hydrology	Grain	L. Nelson	Fahl	Divide	Sobolik-Schneider
SS hydrology	Grain	Dahl Bros	Crosby	Divide	Sobolik-Schneider
SS hydrology	Grain	L. Anderson	Crosby	Divide	Sobolik-Schneider
SS hydrology	Wheat, fallow	B. Iszler	Bowman	Bowman	Schneider-Brun-Faller
SS hydrology	Wheat, fallow	L. Czywczynski	Gascoyne	Bowman	Schneider-Brun-Faller
SS hydrology	Barley, fallow	D. Howe	Hettinger	Adams	Schneider-Brun-Faller
SS hydrology	Oats, alfalfa	B. Erickson	Hettinger	Adams	Schneider-Brun-Faller
SS hydrology	Wheat, fallow	B. Erickson	Hettinger	Adams	Schneider-Brun-Faller
Climatic-meteorological tower data collection	N A	State Hwy Dept	Hannover	Oliver	Method-Brun-Ramirez
tower data collection	N A	KDIX-TV	Dickinson	Stark	Method-Brun-Ramirez
Soil Survey & Classification					
Irrigable soils survey	N A	Land owners, SCS, Bur Rec	—	McHenry	Sweeney-Shay-Hemb
Biosequence	Prairie, forest	US Sports F & W	—	Benson	Heidt-Worcester-SCS
Loess soils	N A	Land owners	—	Emmons	Lunde-Worcester-SCS
Sampling-correlation	N A	Land owners	—	Hettinger	Schroer-SCS
Field reviews of soil mapping and classification	Mixed	Land owners	—	Adams, Hettinger	Omodt, SCS
Field reviews	Mixed	Land owners	—	Benson	Omodt-Worcester-SCS
Field reviews	Mixed	Land owners	—	Bottineau	Omodt-SCS
Field reviews	Mixed	Land owners	—	Grand Forks	Omodt-SCS
Field reviews	Mixed	Land owners	—	Cass	Omodt-SCS
Field reviews	Mixed	Land owners	—	Emmons	Omodt-SCS
Field reviews	Mixed	Land owners	—	Dunn	Patterson-SCS

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NORTH DAKOTA STATE UNIVERSITY
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 Fargo, North Dakota 58102
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DONALD E. THOMSON

BULK THIRD-CLASS

MORRILL
 AG ECON

Experiments	Crop	Location			Researchers
		Cooperators	Town	County	
Coal Mine Reclamation Research***					
Lysimeters	NA	Falkirk Mining Co	Underwood	McLean	Pole-Brown-Brun
Water use-yields	Sp wheat	Falkirk Mining Co	Underwood	McLean	Pole-Brown
Microwatersheds-lysimeter	NA	North Am. Coal Co	Zap	Mercer	Gee-Mont. State U.-Pole
NP rates, placement	Sp wheat	Consolidation Coal	Stanton	Oliver	Gee-Pole
NP rates, placement	Corn	Consolidation Coal	Stanton	Oliver	Gee-Pole
NP rates, time	Grass	Baukol-Noonan	Center	Oliver	Gee-Pole
Pre-mine characterization	Mixed	Falkirk Mining Co	Underwood	McLean	Brown-Pole-Schroer
Runoff-water and soil	NA	North Am. Coal Co	Zap	Mercer	Gilley
Topsoil, P placement	Sp wheat	Knife River Coal	Beulah	Mercer	Gee-Pole
Topsoil, P placement	Corn	Knife River Coal	Beulah	Mercer	Gee-Pole
Water-neutron access tube network	Mixed	5 companies (above)	—	—	Gee-Brown-Pole

Numerous greenhouse, lab, and other expts. not associated with individual cooperators are not included.

NPKS: nitrogen, phosphorus, potassium, sulfur fertilizers.

* Proprietary formulations.

** Experiments under irrigation monitored for water and nutrient with some instrumented for very detailed and precise measurements.

SS: Saline seep.

*** Greenhouse expts. on overburden also conducted at Mandan.