

Off-Station Small Grain Research At The Williston And Dickinson Stations

Ernest W. French and Thomas J. Conlon

Small grain variety trials have always had an important place in the research work at the branch experiment stations in Dickinson and Williston. In recent years this work has been expanded to include an off-station testing program at nine locations in western North Dakota.

Off-station testing programs certainly are not something that originated in North Dakota. Some of our neighboring states have had off-station, or what sometimes is called out-state, testing programs for many years. In North Dakota, formal off-station variety trials were first tried by the Willis-

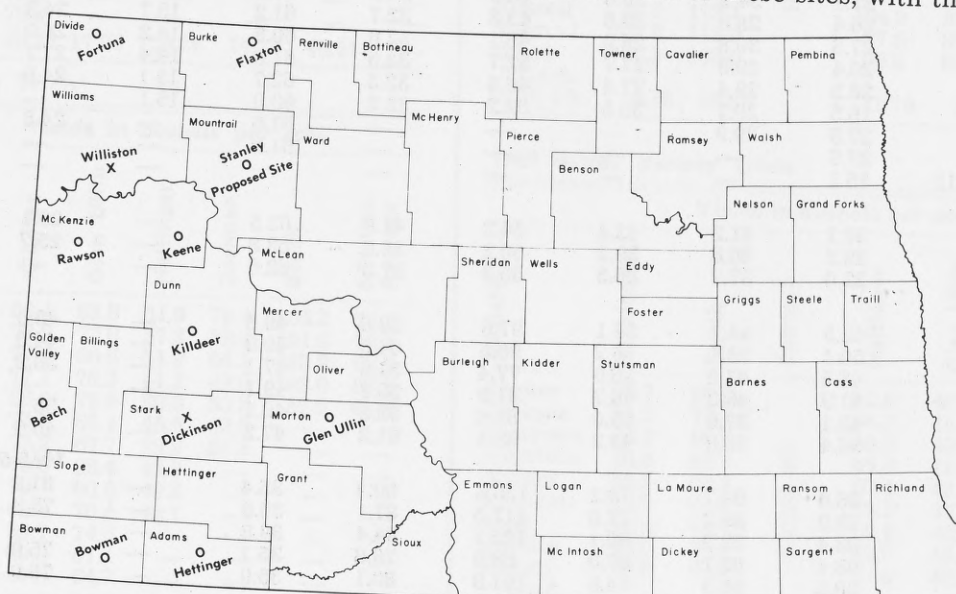
ton Experiment Station.

Off-station testing greatly extends the area covered by the small grain variety testing program at the branch stations. It provides a much wider base for interpretation of yield data as related to the growing conditions in western North Dakota.

The Williston Station has off-station sites located at Fortuna, Flaxton, Keene and Rawson. In 1970 plans are to have a site in Mountrail County in the Stanley area.

The Dickinson station's off-station sites are located at Beach, Bowman, Hettinger, Killdeer and Glen Ullin. All of these sites, with the exception of

French is superintendent of the Williston Branch Station and Conlon is superintendent of the Dickinson Branch Station.



X Branch Stations
O Off-Station Sites

the Killdeer site, are about 60 miles from Dickinson. Killdeer is about 35 miles from Dickinson.

The trials on the off-station sites are conducted with the same care and diligence given those at the branch stations. The planting at all sites is done in good season and when the majority of the farmers in the area are seeding.

The data collected have been very satisfactory, as indicated by the coefficients of variability for the various trials. Farmers living some distance in any direction from the branch stations find the combined results of two or more stations located in the general vicinity of their farming operations more acceptable than just the results from one of the branch stations.

Field days on the off-station sites are arranged for by the county extension agents. These have been held either in the evening or on Sunday, and response has been excellent at every location.

The off-station trials provide a hedge against loss of all variety data to hail storms or other violent weather conditions. Hail storms destroyed all crop trials at Dickinson in 1962 and again in

1966. This was before the off-station work was started, and no data were available for those years to help provide variety recommendations for this region. In 1969 the trials at Bowman were destroyed by hail, but the results from all other sites help to minimize the loss.

Off-station trials help to measure small but important local climatic differences throughout this area of North Dakota. This is noticeable in the work being done at both stations. At Dickinson, trials with winter wheat have been conducted for more than 40 years, but the results were not impressive. Results from the off-station winter wheat trials at Bowman and Beach, combined with the trials at Dickinson, are more acceptable to growers in a larger area of southwestern North Dakota where winter wheat has been successfully grown. At Williston the spring wheat trials in 1969 average about 25 bushels per acre while in Divide County the yields were about 49 bushels per acre. There also was a difference in yield performance of some of the spring wheat and durum varieties at each of the two sites.

SMALL GRAIN VARIETY TRIALS
Williston and Off-Station Sites
1969 and three-year Average Yields

Variety	1969 Yield - Bushels/Acre				Avg. Yield	Avg. Test Wt.	Avg. % Protein	1967-69 Average Yield		
	Williston	Keene	Flaxton	Fortuna				Keene	Flaxton	Fortuna
Hard Red Spring Wheat										
Neepawa	28.2	33.4	30.8	56.3	37.2	61.5	15.5	—	—	—
Manitou	28.1	31.5	36.0	49.7	36.3	61.1	15.4	27.7	27.7	30.8
Chris	27.1	34.3	30.8	46.9	34.8	61.8	15.2	28.0	28.2	29.3
Justin	26.4	28.8	29.8	45.8	32.7	61.2	15.7	24.3	25.0	28.6
Thatcher	27.5	30.8	26.9	45.1	32.6	60.8	14.2	26.9	25.2	30.6
Fortuna	20.4	29.0	27.7	52.7	32.5	61.8	14.4	27.7	26.1	34.2
Polk	26.2	29.4	27.4	46.4	32.3	62.7	15.1	24.9	25.4	30.5
Waldron	16.5	29.7	30.5	52.2	32.2	60.9	16.1	—	—	—
Canthatch	27.5	29.9	—	—	—	61.6	—	24.8	—	—
Crim	27.6	—	—	—	—	61.8	—	—	—	—
World Seeds 1812	15.1	—	—	—	—	—	—	—	—	—
Durum										
Wells	30.1	41.2	42.4	54.3	42.0	62.5	—	29.1	31.1	29.3
Leeds	28.2	40.6	39.2	50.2	39.6	63.8	—	25.7	26.7	27.9
Hercules	22.0	37.2	36.5	55.3	37.8	62.6	—	—	—	—
Barley										
Larker	42.5	44.1	54.1	97.6	59.6	49.8	—	40.6	41.3	50.7
Dickson	50.1	55.1	56.2	96.5	64.5	49.0	—	44.6	43.1	52.4
Conquest	48.2	44.0	36.0	77.4	51.6	47.1	—	38.2	35.0	49.0
Paragon	47.9	48.2	44.7	81.9	55.7	49.1	—	—	—	—
Unitan	43.1	37.6	45.0	85.4	52.8	46.1	—	36.1	38.2	49.6
Jubilee	56.4	55.8	49.2	83.4	61.2	47.2	—	49.6	43.4	46.5
Oats										
Kelsey	96.6	64.7	73.2	126.6	90.3	35.4	—	81.2	73.9	68.4
Sioux	93.9	59.2	77.8	117.5	87.1	35.9	—	73.8	77.0	64.9
Cayuse	93.4	72.3	86.1	125.7	94.4	33.8	—	—	—	—
Garry	93.4	69.1	67.0	88.9	79.6	35.1	—	75.0	74.6	50.3
Russell	88.2	66.0	64.5	101.8	80.1	35.9	—	76.9	67.5	57.8

SMALL GRAIN VARIETY TRIALS
Dickinson and Off-Station Sites
1968 Wheat Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	6-Station Average
Fortuna	32.6	52.3	40.4	27.3	46.9	51.4	41.8
Red River 68	33.0	47.8	38.1	27.7	46.8	54.3	41.3
Waldron	29.2	43.4	33.1	27.6	40.9	58.9	38.9
Sheridan	28.6	44.3	34.8	20.1	49.5	55.4	38.8
Polk	34.6	42.6	39.0	23.9	48.7	43.1	38.7
Manitou	33.3	41.5	32.7	25.8	43.3	48.7	37.6
Tobari 66	34.9	42.9	37.1	17.9	45.2	45.9	37.3
Justin	33.3	36.9	33.3	21.3	42.0	49.9	36.1
Valley	25.3	38.7	34.9	18.7	39.7	47.7	34.2
Chris	24.9	35.1	31.7	22.8	39.4	48.1	33.7
Thatcher	27.2	38.1	27.6	22.9	36.5	48.2	33.4
Pembina	—	35.0	25.3	23.1	42.5	46.6	34.5*
Canthatch	28.4	34.2	32.0	24.4	39.3	40.0	33.1
Crim	—	36.1	31.9	19.2	36.9	40.7	33.0*
Selkirk	24.8	35.0	24.9	20.6	40.9	42.8	31.5
L.s.d. @ 5%	5.29	5.80	6.68	6.16	7.57	6.50	—

*5-Station Average

1968 Oats Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Killdeer	Hettinger	Glen Ullin	Bowman	Beach	6-Station Average
Sioux	67.5	121.3	75.2	118.6	104.8	139.8	104.5
Kelsey	65.0	136.3	62.7	122.5	113.4	122.8	103.8
Portal	57.8	113.2	71.2	106.1	103.0	103.6	92.5
Lodi	69.0	119.5	64.7	89.1	103.6	97.4	90.6
Russell	57.6	146.8	74.8	119.5	132.9	—	—
Holden	72.4	108.7	78.7	101.6	—	120.7	—
Burnett	69.9	126.4	59.6	107.2	113.5	—	—
Orley	57.8	120.0	79.0	99.1	86.5	—	—
Garry	51.8	137.6	79.0	105.6	—	—	—
Minton	—	128.2	66.7	107.5	—	—	—
Wyndmere	—	99.2	—	—	—	—	—
Dawn	—	76.6	—	—	—	—	—
L.s.d. @ 5%	6.93	23.23	17.86	19.28	14.70	46.41	—

1968 Barley Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Killdeer	Glen Ullin	Hettinger	Bowman	Beach	6-Station Average
Galt	67.5	80.1	83.8	51.9	70.4	104.2	76.3
Keystone	63.7	73.2	72.0	57.3	52.8	101.6	70.1
Paragon	62.9	77.4	60.8	51.0	64.1	103.2	69.9
Conquest	62.3	77.1	76.3	41.2	49.0	103.0	68.2
Primus	60.5	56.9	75.9	50.0	50.2	87.9	63.6
Betzes	63.6	74.2	68.1	45.5	60.5	—	—
Dickson	63.7	75.2	67.7	39.9	53.2	—	—
Yukon	61.6	78.5	88.4	43.8	—	—	—
Jubilee	—	79.1	80.6	49.2	—	—	—
Hypna	—	62.3	76.4	48.1	—	—	—
Unitan	—	69.7	74.6	—	—	—	—
Trophy	—	69.8	67.1	—	—	—	—
Traill	—	67.8	64.7	—	—	—	—
L.s.d. @ 5%	7.06	13.62	18.08	11.93	7.04	17.16	—

SMALL GRAIN VARIETY TRIALS
Dickinson and Off-Station Sites

1969 Wheat Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	5-Station Average
Thatcher	42.4	31.5	—	43.1	44.0	31.1	38.4
Selkirk	44.0	31.4	—	39.6	43.2	33.6	38.4
Justin	44.0	37.8	—	44.8	41.8	34.1	40.5
Chris	39.8	31.5	—	34.4	39.9	31.1	35.3
Manitou	42.5	32.9	—	42.6	42.9	34.3	39.0
Polk	41.3	37.8	—	40.4	41.5	38.5	39.9
Waldron	42.6	34.8	—	42.5	43.5	33.7	39.4
Neepawa	44.0	37.3	Hailed out	45.7	48.7	36.7	42.5
Ciano 67	34.7	27.6	—	35.8	37.1	30.5	33.1
Sheridan	40.9	34.4	—	36.9	39.9	35.5	37.5
Red River 68	38.2	36.8	—	44.6	45.1	31.9	39.3
Fortuna	32.5	34.4	—	38.2	41.3	23.7	34.0
Wells	39.1	40.7	—	39.6	43.7	45.7	41.8
Leeds	33.8	38.2	—	45.9	42.4	44.6	41.0
Triticale*	41.7	39.7	—	39.4	41.8	39.6	40.4
L.s.d. @ 5%	4.09	6.06	—	2.46	2.66	4.14	—

*Figured on same basis as wheat

1969 Oats Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	5-Station Average
Holden	97.2	115.7	—	82.0	73.8	46.9	83.1
Kelsey	114.5	136.8	—	111.9	100.1	59.8	104.6
Burnett	106.8	108.2	—	88.2	75.3	38.4	83.4
Brave	97.0	96.0	—	81.3	72.7	31.5	75.7
Lodi	111.9	97.3	—	100.8	86.7	54.4	90.2
Portal	97.5	92.6	—	83.3	70.2	50.8	78.9
Harmon	101.1	108.9	Hailed out	93.4	81.0	52.3	87.3
Russell	98.6	113.1	—	104.2	87.7	44.7	89.7
Sioux	109.9	115.0	—	97.5	89.7	59.7	94.4
Garry	107.3	108.0	—	90.8	80.0	59.8	89.2
L.s.d. @ 5%	9.12	13.66	—	11.78	7.37	5.97	—

1969 Barley Variety Trials

Variety	Yields in bushels per acre						
	Dickinson	Beach	Bowman	Hettinger	Glen Ullin	Killdeer	5-Station Average
Larker	65.7	67.2	—	62.6	49.9	67.2	62.5
Dickson	71.5	79.3	—	64.3	45.7	68.2	65.8
Conquest	65.2	66.0	—	59.3	40.2	71.7	60.5
Keystone	66.5	65.3	—	66.4	49.9	66.4	62.9
Yukon	59.2	69.6	—	57.4	43.4	68.4	59.6
Paragon	70.7	69.0	—	52.6	47.5	68.9	61.7
Galt	57.4	64.7	—	59.6	42.0	66.9	58.1
Jubilee	68.8	59.3	—	62.9	48.1	60.2	59.9
Betzes	70.8	69.0	—	71.9	42.0	58.8	62.5
L.s.d. @ 5%	8.08	11.27	—	7.20	7.31	8.14	—

SMALL GRAIN VARIETY TRIALS

Dickinson and Off-Station Sites

1969 Hard Red Winter Wheat

Variety	Yields in bushels per acre					Average
	Dickinson	Bowman	Beach	1968 Yields Beach Site	1968 Yields Bowman Site	
Minter	Severely damaged by birds. Data at harvest not considered reliable.	Hailed out	39.6	54.5	38.4	44.2
Hume			42.4	48.6	27.9	39.6
Lancer			46.4	55.3	32.4	44.7
Winalta			39.9	56.3	27.3	41.2
Trader			48.4	—	—	—
Trapper			48.2	—	—	—
Scout 66			41.8	—	—	—

Five different soil types are represented at the six southwestern locations. These include Vebar, Morton, Regent, Arnegard and Sen soils. It is very advantageous to have this variety of soil types because there are large acreages of each type in southwestern North Dakota. While the soils at Dickinson represent a large percentage of southwestern North Dakota soils, they are by no means representative of all the soil types being used for crop production in the area.

The Williams Series is the major soil type in northwestern North Dakota, and is representative of the soils on which the off-station sites are located.

The sites at all locations were selected with the assistance of the county extension agent and the local county crop improvement associations.

SMALL GRAIN VARIETY TRIALS

Williston and Off-Station Sites

1969 Hard Red Winter Wheat

Variety	Yield bushels per acre		Avg. Yield	Avg. Test Wt.	Avg. Protein
	Williston	Rawson	Yield	Test Wt.	Protein
Trapper	20.5	20.8	20.6	62.0	13.8
Hume	18.7	21.5	20.1	61.5	14.7
Froid	24.8	23.3	24.1	61.4	14.0
Minter	21.5	23.8	22.6	62.1	15.0
Winalta	22.4	25.1	23.8	63.2	13.5
Cheyenne	23.9	26.3	25.1	61.9	13.8
Trader	20.0	27.1	23.5	62.0	13.6
Winoka	19.6	27.1	23.4	63.4	13.8

Two methods of operation are being used. In northwestern North Dakota the sites are furnished by the landowner at no charge. The farmer-cooperator prepares the land for seeding and sprays the trials for weed control. The experiment station seeds the trials with the same equipment used for similar trials seeded at the station, harvests the trials and reports the yield data in annual progress reports.

In southwestern North Dakota the sites are leased for a small fee, and the branch station is responsible for land preparation, weed control, seeding and harvesting. Both methods are workable.

The cost of conducting the off-station trials is small. There is practically no increase in either machinery or labor cost, and the benefits derived from the program far outweigh the minor expense for travel and effort necessary to get the job done. Present plans are to continue this work and to improve upon it when the opportunities present themselves.