

1977 Williston, North Dakota Agriculture Experiment Station  
Remote Sensing Experiments

SPRING WHEAT EXPERIMENT

Plot No.	Rep 2															Rep 1										15.3 m									
	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11		10	9	8	7	6	5	4	3	2
	Winter Wheat	N <sub>2</sub>	N <sub>2</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>1</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>2</sub>	N <sub>2</sub>	Winter Wheat
		V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>1</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>2</sub>	V <sub>1</sub>	Winter Wheat	
		D <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub>	Bare Soil	Winter Wheat

Fallow in 1976

Wheat in 1976

Nitrogen

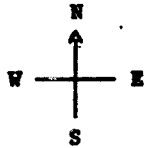
N<sub>1</sub> = 0 kg N/ha  
N<sub>2</sub> = 44 kg N/ha

Variety

V<sub>1</sub> = Waldron (awnless)  
V<sub>2</sub> = Olaf (awned)

Planting Date

D<sub>1</sub> = May 9, 1977  
D<sub>2</sub> = May 23, 1977



SMALL GRAINS EXPERIMENT

Plot No.	Rep 2															Rep 1										15.3 m																									
	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46		45	44	43	42	41	40	39	38	37	36															
	Winter Wheat	Kando	Durum Wheat	Olaf	Spring Wheat	Waldron	Spring Wheat	Crosby	Durum Wheat	Beacon Barley	Lain Oats	Hector Barley	Kelsey Oats	Lain Oats	Olaf	Spring Wheat	Hector Barley	Kelsey Oats	Kando	Durum Wheat	Crosby	Waldron	Spring Wheat	Beacon Barley	Border	Crosby	Durum Wheat	Olaf	Spring Wheat	Waldron	Spring Wheat	Lain Oats	Kelsey Oats	Kando	Durum Wheat	Beacon Barley	Hector Barley	Kando	Durum Wheat	Beacon Barley	Kelsey Oats	Olaf	Spring Wheat	Crosby	Durum Wheat	Hector Barley	Waldron	Spring Wheat	Lain Oats	Bare Soil	Winter Wheat

Fallow in 1976

Wheat in 1976

Figure 62.1 Design for 1977 Other Crops Experiment

77100215, 77104215

Level of Factor Codes for  
 1977 North Dakota Agriculture Experiment Station  
 Remote Sensing Experiments

Experiment Name - Other Crops ND

Experiment Number - 77100215, 77104215

<u>Factor</u>		<u>Level</u>	
<u>Code</u>	<u>Description</u>	<u>Code</u>	<u>Description</u>
1:	Experiment	3:	Other Crops
2:	Soil Moisture	1:	Fallow
		2:	Recrop
3 & 4:	Species, Variety	51:	Winter Wheat, Rough Rider
		61:	Bare Soil
5:	Nitrogen Treatment	0:	Isn't Applicable
		2:	39 lbs/acre
6:	Planting Date	0:	Isn't Applicable
		3:	September 9, 1976
7:	Block or Replication	1:	First Block
		2:	Second Block

Illumination Conditions for Spectral Data Collection

Date	Day of Year	Time Period (GMT)		Solar Zenith Angle Range (degrees)	Solar Azimuth Angle Range (degrees)	Cloud Cover (%)
		Start	Stop	max-min-max		
6/1	152	15:56	23:27	44 - 26 - 60	111-270	0
6/18	169	16:24	21:15	39 - 25 - 37	116-240	1-30
6/23	174	19:01	20:04	25 - 28	182-214	?
7/3	184	16:40	17:22	37 - 32	120-134	5
7/4	185	15:07	16:35	52 - 38	98-119	3-30
7/7	188	17:16	17:33	33 - 31	132-138	?
7/14	195	14:46	22:50	57 - 26 - 52	94-261	10
7/20	201	17:09	20:54	35 - 28 - 36	131-229	30-40
8/5	217	15:21	21:45	54 - 31 - 46	105-241	0-10
8/8	220	16:20	18:09	46 - 34	120-157	30

Dates Data Collected:

Number of Observations Collected

<u>Plot</u>	<u>5/31</u>	<u>6/18</u>	<u>6/19</u>	<u>6/28</u>	<u>7/1</u>	<u>7/3</u>	<u>7/4</u>	<u>7/13</u>	<u>7/14</u>	<u>7/20</u>	<u>7/22</u>	<u>8/5</u>
1	1	2	-	-	1	-	1	-	1	1	-	-
2	1	1	-	-	2	-	2	-	2	1	-	2
35	2	1	-	-	1	1	-	-	1	1	-	-
36	2	1	-	-	1	-	-	-	1	-	-	-
37	1	2	-	-	2	-	-	-	2	-	2	1
70	-	-	1	2	1	-	1	-	2	-	-	-
Stubble Wheat	-	-	-	-	-	-	-	-	-	-	-	3
Windrow Wheat	-	-	-	-	-	-	-	-	-	-	-	4
Bare Soil	-	-	-	-	-	-	-	9	-	-	-	-

Dates Spectral Data Collected:

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Number of Observations Collected

Plot Number	6/1	6/18	6/19	6/23	7/3	7/4	7/7	7/14	7/20	8/5	8/8
1	16	8	2	-	4	4	2	12	8	-	-
2	16	8	2	2	4	4	2	12	8	10	4
35	12	6	-	2	-	2	2	10	4	-	-
36	-	4	-	-	-	2	-	8	2	-	-
37	-	4	-	2	-	2	-	6	2	6	4
70	-	6	-	2	-	2	-	8	2	-	-

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