North Dakota State University at the Oakes Experiment Station has shared their results from the 2009 season.

We all understand that the 2009 year was wet and extremely cool providing farmers across the Northern Tier States a season they would rather forget. Dry-down was a nightmare, weight per bushel of grain was light, in some places the lightest ever seen and getting into the field was plain ugly.

This report will be a segment of what Agronomist Walt Albus provided us as cooperators with their research at the station south of Oakes, ND.

……..

To recapture the climatic conditions the two tables below shall set the stage.

Table 1. Precipitation and temperature at the Oakes Irrigation Research Site.

	Precipitation			Average daily temperatures		
Month	2009	15-year average	25-year average	2009	15-year average	25-year average
	inches			°F		
April	1.42	1.34		42	43	
May	0.54	3.31	2.98	56	56	57
June	6.53	4.22	3.72	64	66	66
July	2.30	3.07	3.20	67	71	71
August	4.42	2.28	2.66	67	69	68
September	2.23	3.02	2.66	64	60	59
October	4.73	2.50	1.89	40	46	45

The 25-year average is not available for April.

Table 2. Growing degree units[1] at the Oakes Irrigation Research Site.

Month	2009	10-year average	15-year average	25-year average
May	309	296	291	325
June	434	490	495	497
July	529	648	639	627
August	518	573	586	570
September	438	385	377	360
Total	2228	2392	2388	2379

[1]Growing degree units = $(Temp_{max} + Temp_{min})/2 - 50$. If $Temp_{max}$ is greater than 86, then $Temp_{max} = 86$. If $Temp_{min}$ is less than 50, then $Temp_{min} = 50$. Temperature is in degrees F.

Corn Production:

At the Oakes North Dakota Extension Research site managed by Agronomist Walter Albus in 2009 we have obtained his report after an extremely wet and cool season. Two strip-till studies in continuous corn and in a corn-soybean rotation were completed. The results in the two tables below depict the wet fall conditions that limited timeliness of harvest and dry down. Not much one can do when SE North Dakota received nearly 5 inches of rain in October.

One can ascertain that optimal nitrogen fertilization rate for these studies were between 100 and 150 lbs of applied N. We all hope that Walt and crew will see better weather conditions in 2010.

Strip-Till, Corn on Soybean Nitrogen Rate Study

Fertilizer	Grain	Harvest	Test	Soil Nitrate-N		Chlorophyll Meter Reading		Stalk	Grain			Silk
N Rate	Yield[1]	Moisture	Weight	Fall 2009	Fall[2] 2008	3-Aug	17-Aug	Nitrate-N	Oil	Protein	Starch	Date
lb/ac	bu/ac	%	lb/bu	------lb/ac------				ppm	----------%----------			
14	77.8	30.8	46.7	13	9	28.0	27.7	41	3.97	6.36	73.59	8/1
50	83.4	31.4	46.1	9	9	29.1	29.2	46	4.05	6.55	73.03	8/1
100	137.7	30.7	45.0	9	9	39.9	39.6	59	3.71	6.38	72.75	7/30
150	179.2	32.1	45.8	12	9	47.1	48.4	48	3.53	6.58	72.28	7/30
200	204.1	31.5	47.2	9	9	51.5	55.2	112	3.45	7.29	72.33	7/29
Mean	136.4	31.3	46.1	10		39.11	39.98	61	3.74	6.63	72.79	
CV%	7.6	4.1	2.5	33		5.76	5.40	70	6.08	3.59	0.67	
LSD.05	15.9	NS	NS	NS		3.47	3.33	68	0.35	0.37	0.75	

[1]Yield adjusted to 15.5%
[2]Composite sample from the entire soybean plot.
Planting Date = April 12; Harvest Date = ; Previous Crop = Soybean.
Fertilizer Rate lb/acre = See table for N, 40 P_2O_5, 17 S; Irrigation = 10.3"

Strip-Till, Corn on Corn Nitrogen Rate Study

Fertilizer	Grain	Harvest	Test	Soil Nitrate-N		Chlorophyll meter reading		Stalk	Grain			Silk
N Rate	Yield[1]	Moisture	Weight	Fall 2009	Fall 2008	16-Jul	3-Aug	Nitrate-N	Oil	Protein	Starch	Date
	bu/ac	%	lb/bu					-----ppm---	----------%----------			
14	65.9	21.9	47.7	12	9	23.6	23.4	67	3.67	6.19	73.73	7/31
50	81.1	23.3	46.7	18	8	25.7	27.1	91	3.80	6.15	73.17	7/31
100	127.5	23.7	46.3	18	8	35.6	37.7	67	3.50	6.05	73.73	7/30
150	171.7	22.8	48.4	15	9	38.7	47.3	1120	3.21	6.67	73.65	7/29
200	202.1	20.9	50.1	27	11	41.6	51.5	285	3.01	7.20	73.52	7/27
Mean	129.66	22.5	47.8	18	9	33.0	37.4	326	3.44	6.45	73.56	
CV%	4.37	6.0	1.3	28	19	6.4	4.7	307	5.62	2.32	0.51	
LSD.05	8.822	2.1	1.0	8	NS	3.3	2.7	1559	0.30	0.23	0.58	

[1]Yield adjusted to 15.5%
Planting Date = May 8; Harvest Date = November 18; Previous Crop = Corn.
Fertilizer Rate lb/acre = See table for N, 40 P_2O_5, 17 S; Irrigation = 6.75"

Sugar Beet Production:

Sugar Beet Production:

In the following tables Walt expresses what happened in their sugar beet research with strip-till as part of the program. The full width tillage sugar beets were just a bit better in overall tonnage. It is all about recoverable sugar to the grower because that is where he sees the payment.

Sugarbeet Hybrid Tillage Study

	Yield	Sugar	Sugar Loss	Recoverable sugar	Recoverable sugar	sodium	potassium	amino N
	ton/ac	--------%--------		lb/ton	lb/ac	----------ppm----------		
Tillage								
Conventional	41.3	16.0	1.2	296	12263	92	1885	379
Strip-Till	37.4	15.9	1.2	295	11054	110	1913	346
MEAN	39.4	16.0	1.2	296	11658	101	1899	362
C.V.%	5.3	2.6	15.5	3	4	21	10	26
LSD.05	2.7	NS	NS	NS	624.8	NS	NS	NS
Hybrid								
Crystal R343	38.5	16.1	1.3	295	11369	117	2069	434
1305R	40.3	16.1	1.1	300	12112	96	1813	355
SU46519	39.2	15.7	1.0	293	11495	90	1815	299
MEAN	39.4	16.0	1.2	296	11658	101	1899	362
C.V.%	5.8	3.0	8.3	3	6	21	5	14
LSD.05	NS	NS	0.1	NS	NS	NS	126	64
Tillage x Hybrid								
Conventional, Crystal	41.8	16.2	1.3	297	12378	103	2080	453
Strip-Till, Crystal R434	35.3	16.0	1.3	293	10360	131	2059	414
Conventional, 1305R	42.5	16.2	1.1	302	12833	88	1818	369
Strip-Till,1305R	38.2	16.0	1.1	298	11391	104	1809	341
Conventional, SU46519	39.7	15.6	1.0	291	11580	85	1758	315
Strip-Till, SU46519	38.8	15.8	1.0	295	11411	96	1872	282
MEAN	39.4	16.0	1.2	296	11658	101	1899	362
C.V.%	12.2	2.4	7.3	3	14	28	6	10
LSD.05	NS	NS	NS	NS	NS	NS	NS	NS

Planting Date = May 6; Harvest Date = October 26; Previous Crop = Barley.
Fertilizer Rate lb/acre = 150 N, 43 P_2O_5, 52 K_2O, 22 S; Irrigation = 13.25"

Onion Production:

In the following table Walt completed a tillage trial with onions. Quality, size and number of bulbs harvested in the two medium sizes (2.25 to 4" diameter) that go to the American dinner table was fairly significant. In other locations where onions have been strip-tilled compared to full width tillage,

Onion - Strip-Till vs Conventional

Tillage Treatment	Days to Half Down[1]	Onion Yield by Bulb Size >4"	3 to 4"	2 1/4 to	1 to 2	Culls	Total	Single Center[2]	Total Bulbs
		cwt/ac						%	1000/ac
Conventional Tillage	9/16	176	573	105	13	34	867	80	128
Strip-Tillage	9/7	76	661	234	31	12	1002	78	182
MEAN	11	126	617	169	22	23	934	79	155
C.V.%	19	39	4	21	18	45	3	19	7
LSD.05	5	NS	55	80	9	NS	58	NS	26

[1]Days from planting to when half the onion tops have fallen over. This is an indication of maturity.
[2]Percent of onions with single centers from ten large onions selected at random.
Planting Date = May 4; Harvest Date = September 21; Previous Crop = HRSW.
Fertilizer Rate lb/acre: N = 150, P_2O_5 = 43, K_20 = 52 and Sulfur = 22.
Irrigation = 14" Hybrid = Sedona.

Summary:

We are encouraged with the results of NDSU's research and that strip-till showed solid results even with discouraging weather conditions in the fall. Strip-Till offers so much more than just yield differences at the end of the harvest. Soil Quality improvements which if we listed they would include: soil aggregate stability, soil organic matter, bulk density, soil biota (earthworms, microbial population, etc), infiltration both dry and near saturated, and soil structure independent of soil texture. Soils become more resistant to wind and water erosion when strip-tilled compared to conventional tilled fields. Soils will warm in the tilled zone which is a big plus in the Northern Tier states due to long winters and short growing seasons. Growers want to get their crops into the ground as soon as possible every spring. We have found that strip-till offers 1 to 7°F warmer soil conditions in the tilled strip over what is under the remaining residue. That can mean 4 to 10 days earlier planting.

We encourage those of you to monitor Walt Albus's work at the Oakes Station and communicate with him and his technician if you have further questions. The phone number at the station is 1.701.742.2744, Monday-Friday. We at Orthman will be continuing to work with Walt.