

# Corn Row Spacing at Hettinger, North Dakota

Eric Eriksmoen, Research Agronomist

Research on corn production conducted at the Hettinger Research Extension Center in 1998 – 2001 showed maximum grain yields were achieved when corn was seeded in wide rows (28" or greater) and at higher plant populations (24,000 vs. 18,000 plants per acre). It is believed that wider row spacing provide corn plants with more area from which to draw soil moisture during dry periods and higher plant populations allow for increased yield potential.

<b>Row Spacing 1998 – 2001 Combined Means*</b>		
Row Spacing	Test Weight	Grain Yield
inches	Lbs/bu	Bu/Ac
14	56.1	49.7
28	56.7	55.2
42	56.2	55.7
LSD .05	NS	3.9

\*Combined means of 3 hybrids and 4 plant populations over 3 years.

In 2003, research was conducted on "twin row" configurations, a concept where two rows are seeded relatively close together with a wider row spacing between twin rows. This type of row configuration provided for wider in-row spacing between plants while maintaining a wide between-row spacing. The 2003 growing season was marred by a severe drought resulting in very poor yields, however, the twin row configuration out yielded the conventional row spacing by 16%. Area growers expressed interest in the concept, however could not justify the cost of the specially designed planter.

<b>2003 Twin Row Configurations Combined Means*</b>		
Row Spacing	Test Weight	Grain Yield
inches	Lbs/bu	Bu/Ac
7" twin rows	54.6	24.8
14" twin rows	54.2	21.0
Conventional 28" rows	53.8	21.4
LSD .05	NS	2.2

\*Combined means of 2 hybrids and 2 plant populations.

In 2004, research was initiated on a "skip row" configuration, where rows are seeded at a conventional row spacing but every third row is left blank. This configuration gives each planted row an adjacent wide row spacing (56") and is achieved with the use of existing conventional corn seeding equipment. The 2004 growing season was marred by a hard frost on June 18 and relatively cool and dry conditions throughout the rest of the shortened season. Grain maturity was not achieved, resulting in very poor yields and light test weights. Despite the adverse growing conditions, grain yields were

almost 60% higher for corn grown with the skip row configuration compared to the conventional row configuration.

<b>2004 Skip Row Configurations</b>		<b>Combined Means*</b>
Row Configuration	Test Weight	Grain Yield
	Lbs/bu	Bu/Ac
Skip Row	41.5	16.1
Conventional 28" rows	42.6	10.2
LSD .05	NS	1.3

\*Combined means of 2 hybrids and 2 plant populations.

In 2005, research was expanded on this concept to include four different row configurations: two planted rows with one skipped row (2 x 1), one planted row with one skipped row (1 x 1), two planted rows with two skipped rows (2 x 2) and a conventional 28" row configuration. The trial was seeded with one hybrid at a population of 24,000 plants per acre. The 2005 growing season was generally warm and dry, and grain maturity was achieved. The 2x1 and 1x1 row configurations out yielded the conventional row configuration by 39% and 26% respectively. The 2x2 row configuration yielded considerably less than the other row configurations. This may be due to detrimental in-row plant competition caused by corn plants being spaced too close together (as row spacing increases, in-row spacing between plants narrows).

<b>2005 Skip Row Configurations</b>		<b>Means</b>
Row Configuration	Test Weight	Grain Yield
	Lbs/bu	Bu/Ac
Conventional 28" rows	53.5	32.2
2 planted x 1 skipped	53.3	44.9
1 planted x 1 skipped	54.2	40.6
2 planted x 2 skipped	52.6	22.8
LSD .05	NS	10.9

In conclusion, the use of wide row spacing is an important management decision for optimizing grain yields in the Western Dakota's where late season moisture stress is typical. Relatively high plant populations (20,000 plants/acre or higher) need to be maintained, regardless of row spacing, to optimize grain yield potential. Some skip row configurations appears to have merit, but additional research needs to be conducted to further verify and refine this concept.

**2005 Hybrid Corn Trial - Continuously Cropped - No-till**

**Hettinger**

Brand	Hybrid	GDU's to BL	Trait	Days to S i l k	Ear Height	Test Weight	Grain Yield
		*	**		inches	Lbs/bu	Bu/Ac
Dekalb	DKC35-02	2250	RR, Bt	83	30	52.9	39.9
	DKC35-51	2250	RR, Bt	84	28	54.4	41.5
	DKC37-14	2270	RR	84	30	55.1	36.8
	DKC40-05	2310	Con, Bt	90	29	54.4	37.3
Dyna-Gro	51P33	2100	RR, Bt	86	32	56.6	43.6
	CX04179	1960	RR	85	28	56.2	34.2
IntegraSeed	Int6183	2172	RR	88	31	54.7	57.8
	Int6688	2165	RR	88	33	50.2	42.3
	Int6385RR	2085	RR	86	27	55.8	63.5
	Int6680RR	1880	RR	85	29	55.5	28.8
Pioneer	39F61	1790	Con, Bt	82	29	58.4	61.5
	39D82	2040	Con, Bt	83	31	55.0	54.7
Proseed	RRET83Bt	--	RR, Bt	86	22	55.1	51.3
	RRS83Bt	--	RR, Bt	85	30	53.9	49.3
	RR585	--	RR	83	28	54.9	53.4
	RRXES86Bt	--	RR, Bt	90	31	48.0	47.4
	RR586	--	RR	89	27	53.1	40.4
Seeds 2000	2821RR/Bt	2060	RR, Bt	86	31	55.9	72.3
Trial Mean				86	29	54.4	47.6
C.V. %				1.3	8.2	3.5	10.7
LSD 5%				2	4	3.1	8.4
LSD 1%				3	5	4.2	11.3

\*Growing Degree Units to Black Layer.

\*\*Trait: RR = Roundup Ready, Bt = Corn Borer Tolerance, Con = Conventional.

Planting Date: May 3, 2005

Harvest Date: October 3, 2005

Seeding Rate: 26,500 seeds / acre, thinned to 24,000 plants / acre.

Row Spacing: 28"

Previous Crop: Oat

Growing Season Heat Units May 1 – Sept. 30 (GDD): 2234

Precipitation Sept. 04 – Sept. 05: 16.86 inches

**2005 Hybrid Corn Trial - Continuously Cropped - No-till, Regent**

Cooperators: August and Perry Kirschmann

Brand	Hybrid	GDU's to BL	Trait	Ear Height	Test Weight	Grain Yield
		*	**	inches	Lbs/bu	Bu/Ac
Dyna-Gro	51P33	2100	RR, Bt	30	55.2	101.4
Pioneer	39T66	1840	RR, Bt	30	58.1	80.4
	39H83	1890	RR	31	56.8	68.5
	39D80	1940	RR	29	55.1	69.0
Proseed	RRET83Bt	--	RR, Bt	25	56.3	76.7
	RRS83Bt	--	RR, Bt	30	52.0	92.4
	RR585	--	RR	30	52.5	72.7
	RRXES86Bt	--	RR, Bt	31	47.8	91.0
	RR586	--	RR	30	54.0	88.0
Trial Mean				29	54.2	82.2
C.V. %				11.4	2.3	9.1
LSD 5%				NS	1.8	11.0
LSD 1%				NS	2.5	14.9

\*Growing Degree Units to Black Layer.

\*\*Trait: RR = Roundup Ready, Bt = Corn Borer Tolerance.

NS = no statistical difference between hybrids.

Planting Date: April 28, 2005

Harvest Date: October 3, 2005

Seeding Rate: 26,500 seeds / acre, thinned to 24,000 plants / acre.

Row Spacing: 28"

Previous Crop: HRSW