A Five-Year Summary of Soybean Production Based on Seeded Row Width

Steve Metzger
Carrington Area Farm Business Management Program

As producers seek out advantages in the production of one crop as compared to another or within the production practices of a single crop, attention must be given to both the production and financial aspects of the crop or crops in question. One production item that appears to directly affect the production of soybeans is the width of the seeded row.

Data for this report was gathered directly from producers enrolled in the Carrington Area Farm Business Management Program. This program is operated in conjunction with the North Dakota Farm Business Management Education Program which is under the direction of the North Dakota Department of Career and Technical Education. The primary geographic area from which the data for this study was collected included an area approximately 20 miles north or south and approximately 60 miles east or west of Carrington, North Dakota.

The data in this study was confined to soybeans grown on cash-rented land only. This specific production group was chosen because it carries a direct land charge as compared to owned or share-cropped acreage. The data collected over the 5-year period was separated into those soybeans planted at less than 10" row spacing and those seeded at 10" to 18" row spacing. Row spacing of less than 10" included those soybeans seeded in 10" rows where the seed is flared out from 2 to 3 inches from the center of the row, resulting in the newly established plants being only 4 to 6 inches apart in row width.

As noted in Table 1, a total of 298 fields containing 89,892 acres were involved in the study. Those fields which were not specifically identified as to seeding row width, involving 9,328 acres, were omitted from the summary data.

The 5-year average yield for the less than 10" row-width spacing group was 26.43 bushels while the wider-spaced group averaged 30.55 bushels for an annual difference of 4.12 bushels per acre. Total per acre expenses favored the narrower row-width group just slightly by the amount of $1.73 less than the wider-seeded group. Government payments were also very similar and varied by only $.18 per acre. Total annual average net return, excluding government payments, favored the wider-rowed group by the amount of $29.61 per acre.

The greatest impact upon this 5-year average occurred in 2003 when a pre-government payment advantage of $75.49 per acre was recorded for fields with the wider row spacing. The least amount of difference occurred in 2004 when the crop was greatly affected by an early frost on August 20 of that year. The narrower-rowed group held a slight yield advantage at 22.91 bushels per acre while the wider-rowed group produced an average yield of 21.42 bushels per acre. With the inclusion of the insurance payments, the wider-rowed group still produced the best pre-government payment profit, coming in at $16.87 per acre or $34.42 higher than the narrow-rowed group, which produced a negative profit of ($17.55) per acre.

Even with the frost factor included, the wider-spaced group produced the highest gross income and net return due to an average insurance payment of $33.46 per acre as compared to only $3.33 for the less than 10" row width group. This may lead to the conclusion that those producers using the wider row width spacing also had established higher yields for insurance purposes.

It should also be noted that if the year of the frost damage, 2004, were to be dropped from the total group, the remaining 4-year average would favor the wider-rowed group by an average yield of 32.84 bushels per acre as compared to the narrower-rowed group at 27.31 bushels per acre, a difference of 5.53 bushels per acre.

In 2002 over 64% of the acreage in the study was seeded to the narrow width. In 2006, just under 23% was still being seeded to the narrower width. This may lead to the conclusion that producers were changing their row seeding width as they learned about the stronger production advantage held by the wider-rowed group.

It should be noted that the 5-year average of all soybeans in the study was calculated to be 28.83 bushels per acre or seven times what the average production gain was in the wider-seeded group. This average gain of 4.12 bushels per acre each year might then be viewed as one extra soybean crop every seven years, with basically no additional expenses tied to it.

As producers search for additional strategies to increase both production and profitability, items as simple as the row seeding width need to be considered for both the immediate and long-term economic gains of the farming unit.

References

Metzger, S.S. Carrington Area Farm Financial and Enterprise Analysis Reports, 2002-2006. Carrington Area Farm Business Management Program, Carrington, ND and Carrington Research Extension Center, NDSU.

Table 1. Soybean Production Results by Seeded Row Width for 2002-2006 on Cash Rented Land*

Field Data by Year		2002	2003	2004	2005	2006	**Totals or 5 Year Average**
				Frost on 8-20-04			
Number of Fields		38	50	80	67	63	**298**
Number of Farms		20	27	31	36	37	**151**
Number of Acres		7,523	16,269	21,680	21,416	23,004	**89,892**
Yield in Bushels		32.03	31.09	21.84	35.43	23.74	**28.83**
Value per Bushel	$	5.16	6.31	6.02	5.58	5.81	**5.75**
Total Value of Bushels	$	165.34	196.10	131.40	197.66	137.91	**165.68**
Misc. Income per Acre	$	8.00	0.69	26.67	0.85	12.41	**9.72**
Gross Return per Acre	$	173.34	196.79	158.07	198.51	150.32	**175.40**
Seed Cost	$	22.42	25.92	27.74	34.65	35.44	**29.23**
Fertilizer	$	12.59	10.43	9.94	8.94	7.89	**9.96**
Chemical	$	13.77	14.59	14.00	13.44	12.13	**13.59**
Total Direct Costs	$	113.45	117.03	117.85	129.18	132.63	**122.03**
Overhead Costs	$	25.51	27.02	28.84	30.25	28.06	**27.94**
Total Costs	$	138.96	144.05	146.70	159.43	160.69	**149.97**
Net Return without Gov.Pay.	$	34.38	52.74	11.37	39.08	-10.37	**25.43**
Gov't. Payment (Direct, CC)	$	10.11	11.33	10.06	10.73	12.13	**10.87**
Net Return/Acre with Gov.P.	$	44.49	64.07	21.43	49.81	1.76	**36.30**

		2002		2003		Frost on 8-20-04 2004		2005		2006		**Totals or**	**Totals or**
Field Data by Row Width		Row Widths		Row Widths		Row Widths		Row Widths		Row Widths		**5 yr. Avg.**	**5 Yr. Avg.**
		<10"	10"-18"	<10"	10"-18"	<10"	10"-18"	<10"	10"-18"	<10"	10"-18"	**<10"**	**10"-18"**
Number of Fields		22	15	28	21	28	44	12	50	11	40	**101**	**170**
Number of Farms		11	9	20	8	8	18	9	23	8	23	**56**	**81**
Number of Acres		4,734	2,623	8,120	7,629	3,429	15,982	2,533	16,547	4,275	14,692	**23,091**	**57,473**
Yield in Bushels		30.53	34.37	26.00	36.45	22.91	21.42	31.86	36.30	20.85	24.22	**26.43**	**30.55**
Value per Bushel	$	5.21	5.09	6.14	6.45	5.75	6.02	5.44	5.61	5.73	5.82	**5.62**	**5.78**
Total Value of Bushels	$	158.97	174.87	159.58	235.26	131.81	128.98	173.22	203.56	119.45	140.90	**148.61**	**176.71**
Misc. Income per Acre	$	11.22	2.69	1.38	0.00	3.33	33.46	3.75	0.53	10.73	9.90	**6.08**	**9.32**
Gross Return per Acre	$	170.20	177.56	160.96	235.26	135.14	162.44	176.97	204.09	130.18	150.80	**154.69**	**186.03**
Seed Cost	$	23.10	21.28	29.05	22.41	30.31	27.21	32.47	35.78	34.92	35.62	**29.97**	**28.46**
Fertilizer	$	13.47	11.38	8.58	12.28	14.85	9.41	12.29	8.88	6.28	7.67	**11.09**	**9.92**
Chemical	$	13.14	14.79	14.34	15.13	13.70	14.24	10.91	13.03	11.01	12.60	**12.62**	**13.96**
Total Direct Costs	$	119.00	104.05	120.56	112.70	124.40	115.99	128.90	130.05	122.61	134.89	**123.09**	**119.54**
Total Overhead Costs	$	24.92	27.22	24.07	30.75	28.29	29.58	20.52	32.59	24.46	28.58	**24.46**	**29.74**
Total Costs	$	143.92	131.27	144.63	143.45	152.69	145.57	149.42	162.64	147.07	163.47	**147.55**	**149.28**
Net Return without Gov.Pay.	$	26.28	46.29	16.33	91.82	-17.55	16.87	27.55	41.45	-16.89	-12.67	**7.14**	**36.75**
Gov't. Payment (Direct, CC)	$	10.32	9.80	11.80	10.87	9.78	10.13	10.67	10.74	11.60	11.72	**10.83**	**10.65**
Net Return/Acre with Gov.P.	$	36.60	56.09	28.13	102.69	-7.77	27.00	38.22	52.19	-5.29	-0.95	**17.97**	**47.40**

***Source: Carrington Area Farm Financial and Enterprise Analysis Reports, 2002-2006**