

## 1990s crop data: what can we learn from the numbers?

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I have been looking at a lot of crop production numbers lately, focusing on available data in northwest Minnesota for the 1990's – more specifically, 1990-98. Making sense of all the numbers can be a challenge, but I have summarized key data in the following table.

**Crop Production Data from Northwest Minnesota: 1990-1998\***

Crop	Average Acres/yr	Average Yield	Average Yield During Highest Yielding Year	Average Yield During Lowest Yielding Year	Average Loss vs. Highest Yield	Coefficient of Variation (%)	Long Term Average Price	Loss - Million \$/Yr
Corn	112,511	72 Bu/A	102 Bu/A	37 Bu/A	25 Bu/A	36	\$2.41/Bu	\$6.8
Soybeans	298,467	27 Bu/A	35 Bu/A	21 Bu/A	7.2 Bu/A	17	\$6.19/Bu	\$13.3
Wheat	1,689,689	35 Bu/A	50 Bu/A	25 Bu/A	15.25 Bu/A	28	\$3.89/Bu	\$100.2
Barley	483,989	57 Bu/A	76 Bu/A	50 Bu/A	20.25 Bu/A	16	\$2.10/Bu	\$20.5
Sugarbeets	254,600	17.4 T/A	21.8 T/A	13 T/A	4.7 T/A	11	\$38/T	\$45.5
Dry Beans	53,633	1293 lb/A	1683 lb/A	800 lb/A	443 lb/A	23	\$0.19/lb	\$4.5
Sunflower	209,233	1340 lb/A	1782 lb/A	1058 lb/A	508 lb/A	22	\$0.12/lb	\$12.8
	<b>3,102,122</b>							<b>Total \$ Impact/yr = \$203.7**</b>

\*Source: Minnesota Agricultural Statistics: Northwest Minnesota

\*\*Average Loss = \$65.64/A

Interpreting the data can be somewhat subjective. For example, the table does not account for quality losses. As well, note that losses can be influenced by the acreage amount. Losses for wheat, for example, are magnified by the fact that about 1.2 million more acres are factored into the estimates as compared to other crops. Nevertheless, the following are my own observations combined with what I have been hearing from area farmers about it:

**Average acres/yr:** We grow a lot of wheat in the region, although not as much as we did a few years ago. Trend data shows that acres of soybeans and dry beans have increased dramatically, while acres of barley and sunflower have decreased dramatically.

**Average yield:** Nothing to brag about. The 90's were not friendly to production.

**Average yield during highest yielding year:** I call these "attainable yields" for the region. We know they are attainable because we have achieved them. This is what we should shoot for as a realistic production goal. Again, the 90's weren't overly friendly to the region, so these are truly "attainable" yields.

**Average yield during lowest yielding year:** We certainly can have (did have) some disastrous yields during the 90's.

**Average loss vs. highest yielding year, and coefficient of variation:** These columns show us which crops had the highest and lowest yield variation during the 90's. Higher variation means higher risk, lower variation means lower risk. Sugarbeets were a very stable crop. Corn, wheat, sunflower, and dry beans were higher risk crops.

However, improved genetics and improved management practices are helping us reduce this risk. For example, we have better tools for managing scab in wheat now than in the early 1990s. It's worthwhile to identify the causes of this variation, because then we can implement practices that may reduce it.

The two major causes of low yields during the 90's:

1. Excess water. Most farmers in the region indicate that excess water was far and away their #1 yield limiting factor during the 90's. Sugarbeet and soybeans appeared to tolerate excess water better than the other crops, because of lower yield variability.
2. Disease. Scab had a major impact on wheat yields, and white mold and other diseases significantly impacted sunflower and dry beans.

Why were yields of some crops less variable? My educated guesses:

**Sugarbeets:** Since it is a higher-value crop, there's a higher level of management. Excellent management can go a long way to overcoming production challenges. Sugarbeets have a large number of production challenges – diseases, weeds, insects, stand establishment. Sugarbeet producers overcome these challenges by scouting, timely application of inputs, crop rotation, and a host of other management methods. Sugarbeets also seem to tolerate excess water better than most other crops.

**Soybeans:** Soybeans are a generally hardy crop with strong genetic characteristics for pest resistance. Consistent yields suggest that soybeans also appeared to tolerate excess water better than most other crops.

**Barley:** Barley is also a hardy crop, and consistent yields suggest barley has some tolerance to excess water. Barley yields tend to be less affected by scab compared to wheat, although barley quality is more affected by DON, the byproduct of scab.

**Loss – Million \$/Yr:** The cost in the region of not getting the 'attainable yield' is about \$204 Million/year. That is equivalent to over \$65/A per year. With an additional \$65/A per year we would not have an "ag crisis" in the region.

Here's what we can learn from the numbers: *Crop production success is a search and destroy mission - searching out and destroying yield limiting factors.* Start with the biggest ones and move down the list. The list may include a change in crops, land, or management practices ranging from production methods to water management. (For more information on "Tile Drainage for Profitable Crop Production," see the web site: <http://www.smallgrains.org/drainage/home.html>).

There will always be some degree of crop production that cannot be managed due to weather. But if you look at it, weather management is a lot of what crop production is all about—to do what we can to insulate ourselves from weather-related crop production problems. It isn't easy, but doing what we can to minimize yield-limiting factors is the key to profitably grow commodities in this part of the world.