Replicated Strip Testing

To fine-tune assessment of their crop production practices including nitrogen rates and timing, growers can test two management practices, with precision in a single field.

Accurate testing requires that trials be properly marked and that yields be accurately measured. Since many growers have GPS and yield monitors in their combines and already understand how to compare the newest corn hybrid or soybean varieties, it's not a long stretch to begin comparing nitrogen rates, application methods or timing in the same way.

For results to be most reliable, growers must set out replicated strips across a field to make these comparisons. Comparing one field to another or half a field to the other half doesn't result in credible data on which to base decisions, except under extreme scenarios.

The basic premises for replicated trials used in the Iowa Soybean Association On-Farm Network™ studies are:

1. Keep it simple. Just compare two management practices in a given trial.
2. Keep all other practices the same (i.e., same hybrid, seed treatment, planting date.)
3. Replicate it at least three times, in side-by-side strips across the field at least the width of your combine header. More replications are better!

Below is an example of one field with five sets of replicated strips, as seen in aerial imagery.

The following table is a yield summary for the strips shown above, broken down by soil type.

Soil Name	Label	% of Field	125# Yield (Bu/a)	Soil Name	Label	% of Field	75# Yield (Bu/a)	Yield Difference
Webster	107	0.0	N/A	Webster	107	0.2	150.2	N/A
Clarion	138B	2.1	181.2	Clarion	138B	4.0	160.5	20.8
Marna	383	15.6	182.0	Marna	383	19.9	163.8	18.3
Guckeen	385	0.0	N/A	Guckeen	385	0.6	159.1	N/A
Canisteo	507	16.3	179.9	Canisteo	507	17.2	106.2	19.7
Nicollet	55	3.6	185.5	Nicollet	55	4.2	173.4	12.1
Okoboji	6	7.3	180.1	Okoboji	6	9.0	161.1	19.0

	125#	75#
Average Yield (Bu/a)	181.2	162.6
Yield Difference	18.6 bu/a	

When you look at the summary of data you can see that there was an 18.6 bu. yield difference between the two nitrogen rates. Depending upon the value of grain and the cost of fertilizer, it usually takes 4 bu. of corn to buy 50 lbs of nitrogen. Assuming that the grower's normal rate was 125 lbs. of nitrogen per acre, from this example, it's obvious that he lost money by reducing the rate to 75 lbs. per acre.

"Last year was abnormally wet in the spring, and we suspect that a higher than normal amount of nitrogen was lost from both treatments. As is the case with most agronomic topics, trials should be repeated over several years," says Tracy Blackmer, Iowa Soybean Association director of research.

One of the most powerful uses of strip testing is to coordinate with other growers in a locality. When several growers test the same idea or practice, they can compare results to further fine tune a topic of interest.

From the data collected in the West Buttrick Creek watershed, shown on pages 6-7, there was evidence that the fall applied anhydrous ammonia did better than the spring UAN liquid that was broadcast. "This is believable because spring broadcast liquid that is not incorporated is highly prone to loss, especially in a wet spring," Blackmer adds.

What was missing in previous years was a good comparision between fall anhydrous and spring anhydrous or a sidedressed application. There simply weren't enough fields in the survey for a good comparison.

Last fall, however, a number of growers agreed to put out replicated strips for two different comparisons. The first was comparing the same nitrogen application rate in a fall vs. spring preplant or sidedress application.The second trial, put beside the first, was to apply either preplant or sidedress applications at their normal rate vs a rate that was 50 lb. per acre less than the normal rate.

Those two sets of trials look like this.