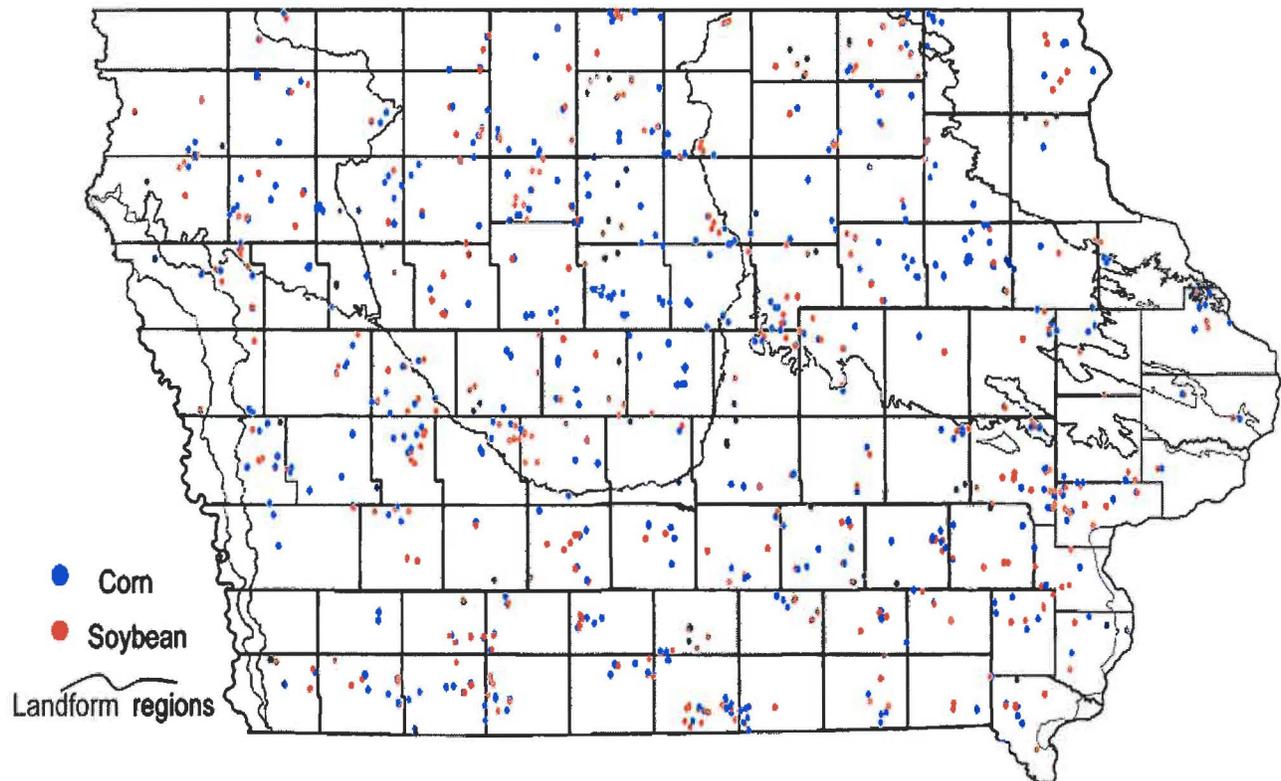


Locations of Nutrient Testing

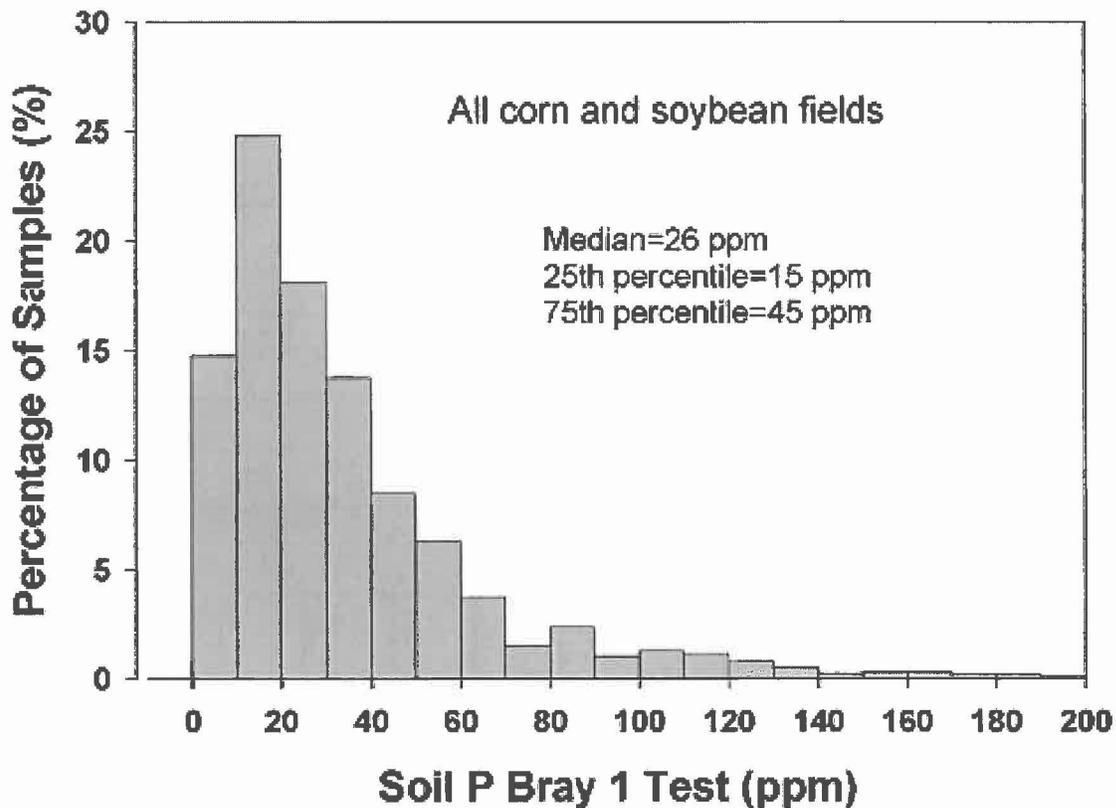
We were able to include fields from most of Iowa's counties, representing most of the different regions and soil groups in the state.



While much of the On-Farm Network® focus has been on nitrogen, growers working with this program have also studied other nutrients. In 2011, we began a statewide Nutrient Management Benchmarking Survey involving soil and plant tissue testing on nearly 1000 fields.

A Survey of Soil Phosphorus

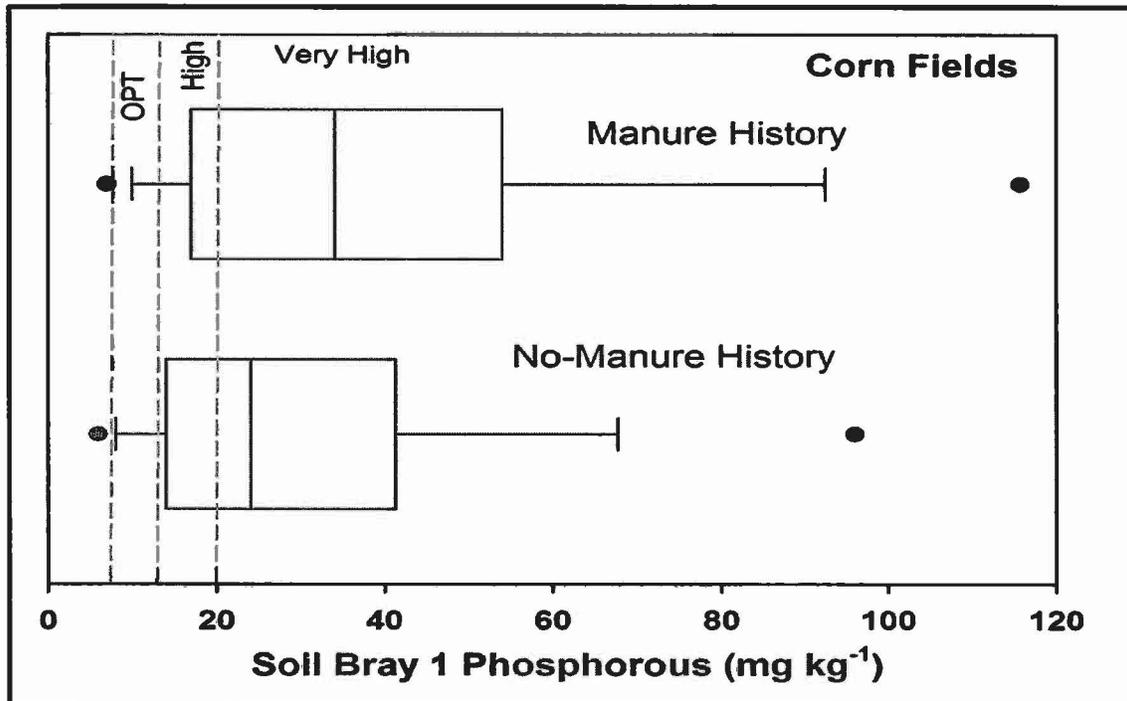
Soil samples for phosphorus show that growers and the industry are doing a pretty good job.



About 30% of the soil samples submitted from corn and soybean fields were below or in the optimal agronomic range of 15-20 ppm for Bray P1 test. Also, only a small fraction of the soil samples had a soil P test concentration higher than 100 ppm, meaning there is not much risk of P leaching.

Fields with Manure

The comparison of fields with manure show that our manure management plans are working well.



Fields with a recent history of manure application were more likely to test higher in P, but only a slightly higher percentage of these fields tested more than 100 ppm of P (see graph above). Note that this increase is relatively small and is likely due to a long history of manure application on those fields. The fact that we do not see much difference between fields that have a manure history and those that don't should be viewed as a strong endorsement of the success of manure management planning in Iowa. When compared to other areas with intensive livestock production, the soil P test levels in Iowa should be applauded.

Strip Testing Manure

The field below is an example of a grower checking his N rate on a field where chicken manure had been applied for the current growing season.

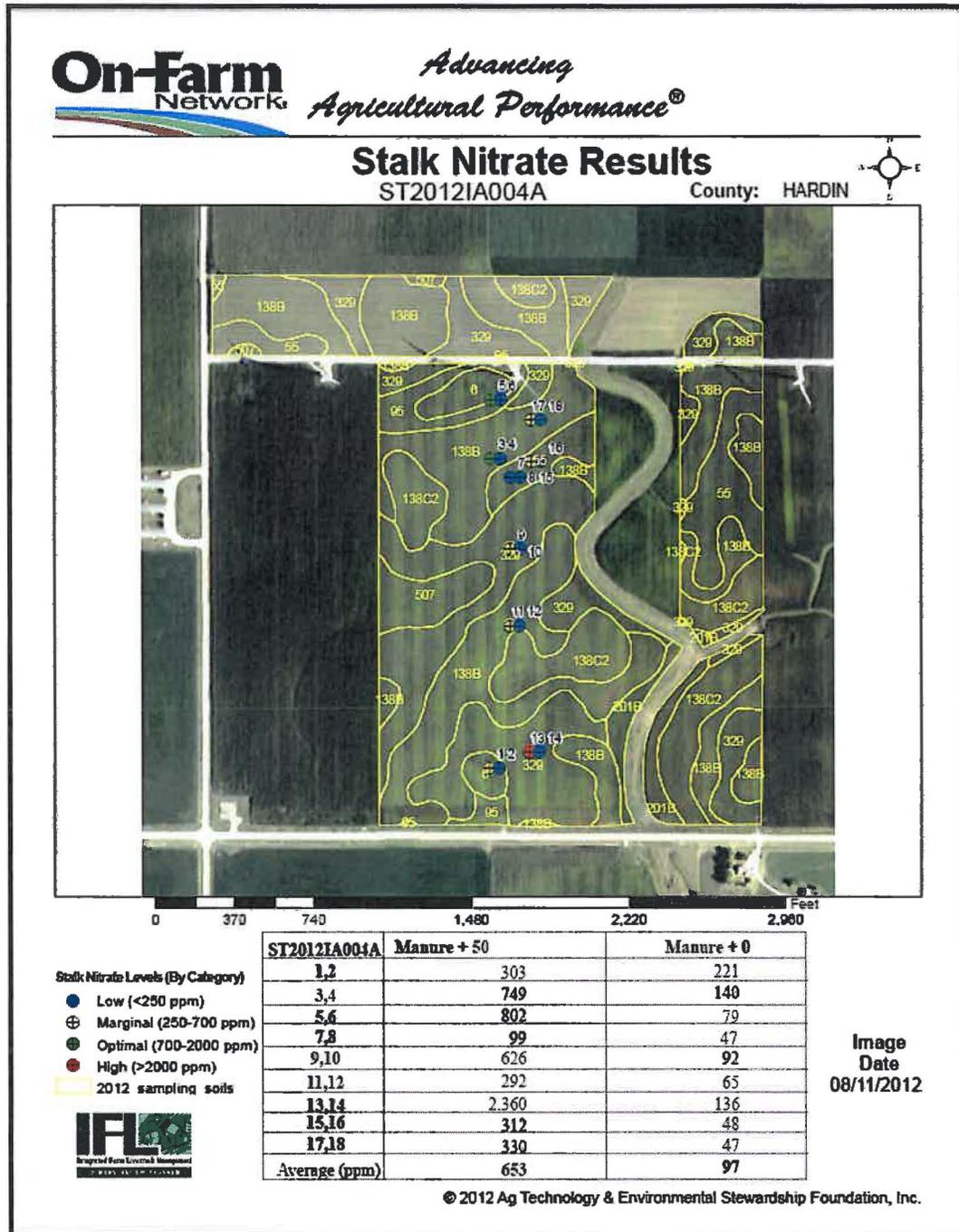
The darker strips in the field are where extra N was applied after a uniform application of manure. When the grower harvested his corn crop, there was a 41 bu/a increase from the strips with the additional N.



Trial Type	Plant Nutrition - Manure
Trial Detail	Manure plus Nitrogen
Treatments	Manure + 50 vs Manure + 0
Seed	Champion Seed CSX57A12VI3Pro
Crop Rotation	Corn on Soybeans
Application Details	3 tons of chicken manure (40-40-40) and NH3 applied on 4/2/2012 (application rate error - off by 35%)
County	Hardin

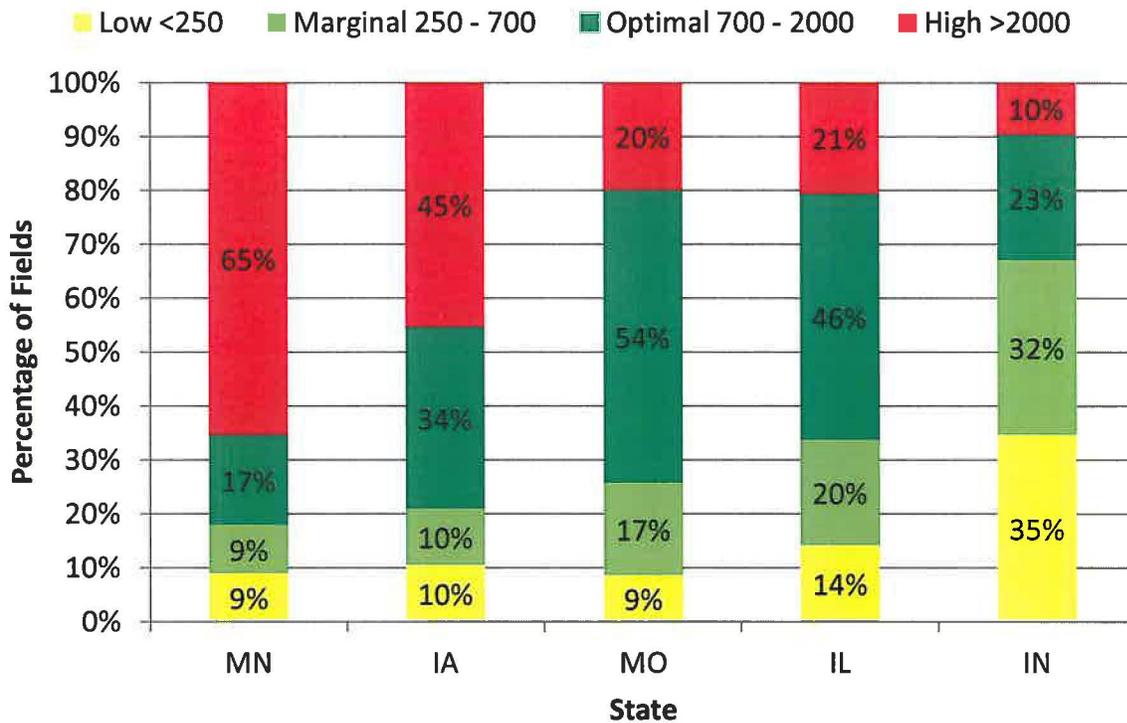
Confirming the Stalk Test

The field shown below is the same field as the field shown on the previous page and shows where stalk nitrate test samples were collected, and the difference in nitrate content at those points.



Midwest State Comparison

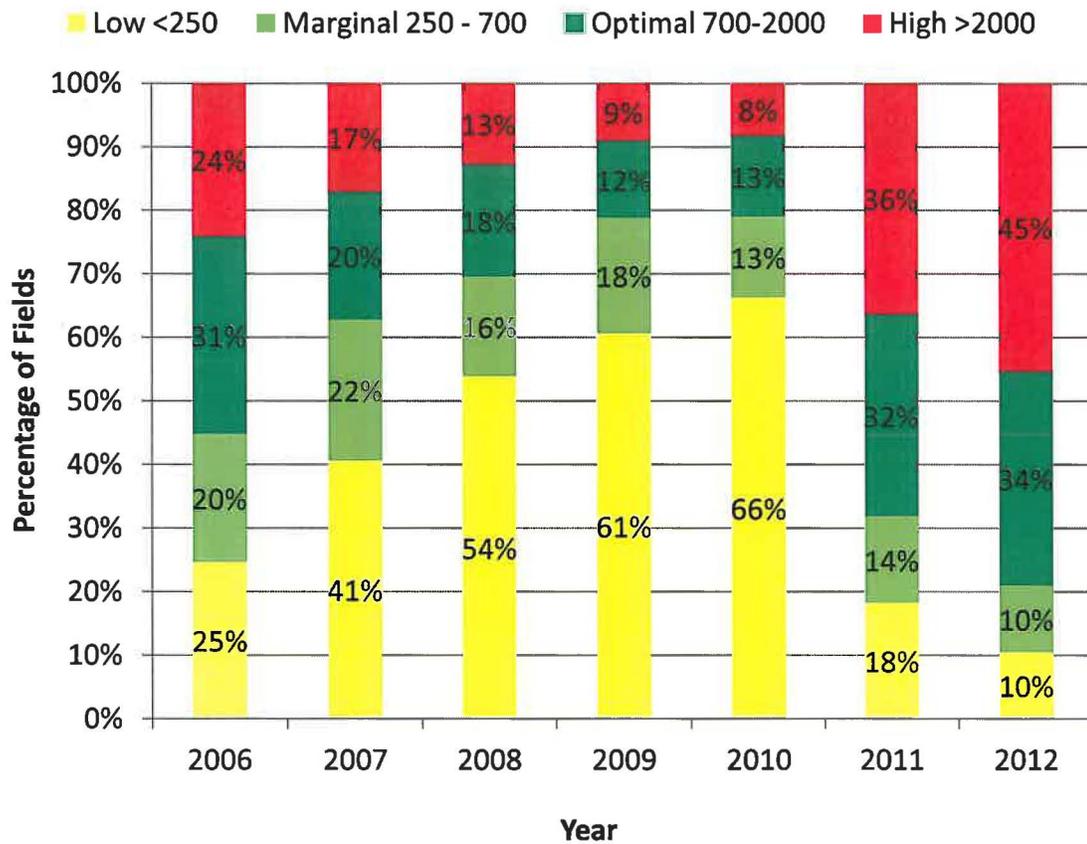
The On-Farm Network stalk nitrate testing program is done in multiple states. In 2012, nitrate test levels in the optimal or high ranges were higher in Iowa than in most of the other states.



Looking at the trends across the states in the bar graph above, we see significant differences. Minnesota, which was the garden spot in the Midwest last year, had the highest stalk nitrate test levels of all the states where there are On-Farm Network programs. While soil moisture was not in excess in Minnesota, there was enough rain during the growing season to dissolve the applied nitrogen into the soil solution for plant uptake. In other states south and east of Minnesota, tests showed more and more nitrogen deficiencies, regardless of the amount of N applied. This was due to increasingly dry soil conditions. Nitrogen was sidedressed on most of those fields, which is usually the optimal time for applying nitrogen, but yield loss because of the drought was higher than in Minnesota, and in Iowa, too.

Iowa Comparison over Time

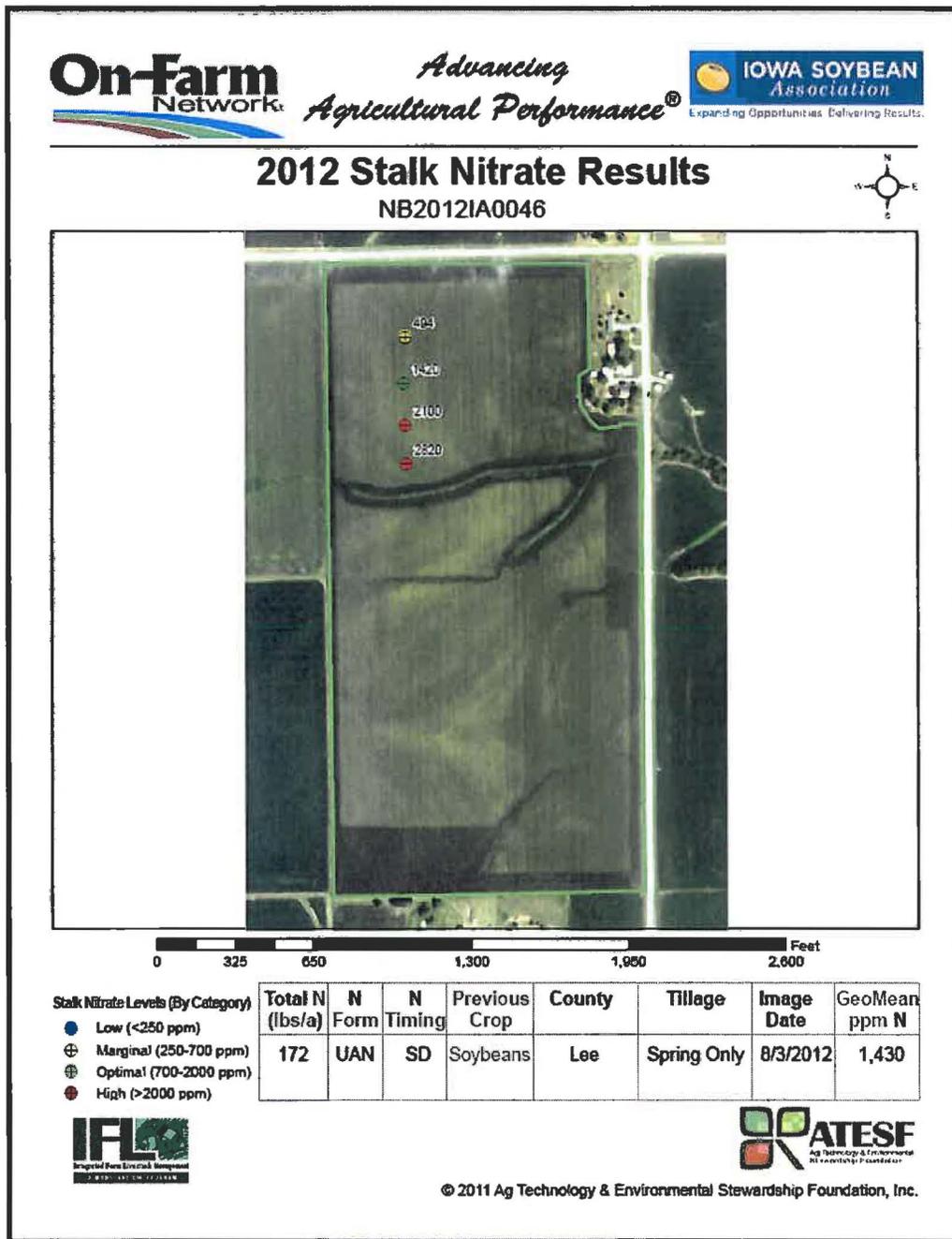
Weather plays a big part in the amount of N available to the corn crop.



Growers involved in this program have learned that in wet years, corn tends to be short on nitrogen. In dry years, stalk nitrate tests suggest there's usually an excess of nitrate in the stalks. This has held true for all of the past seven years in Iowa. Across the state, there were indeed more samples in the excess nitrate category for the drier years (2006, 2011, and 2012) than in the wetter years (2007, 2008, 2009 and 2010).

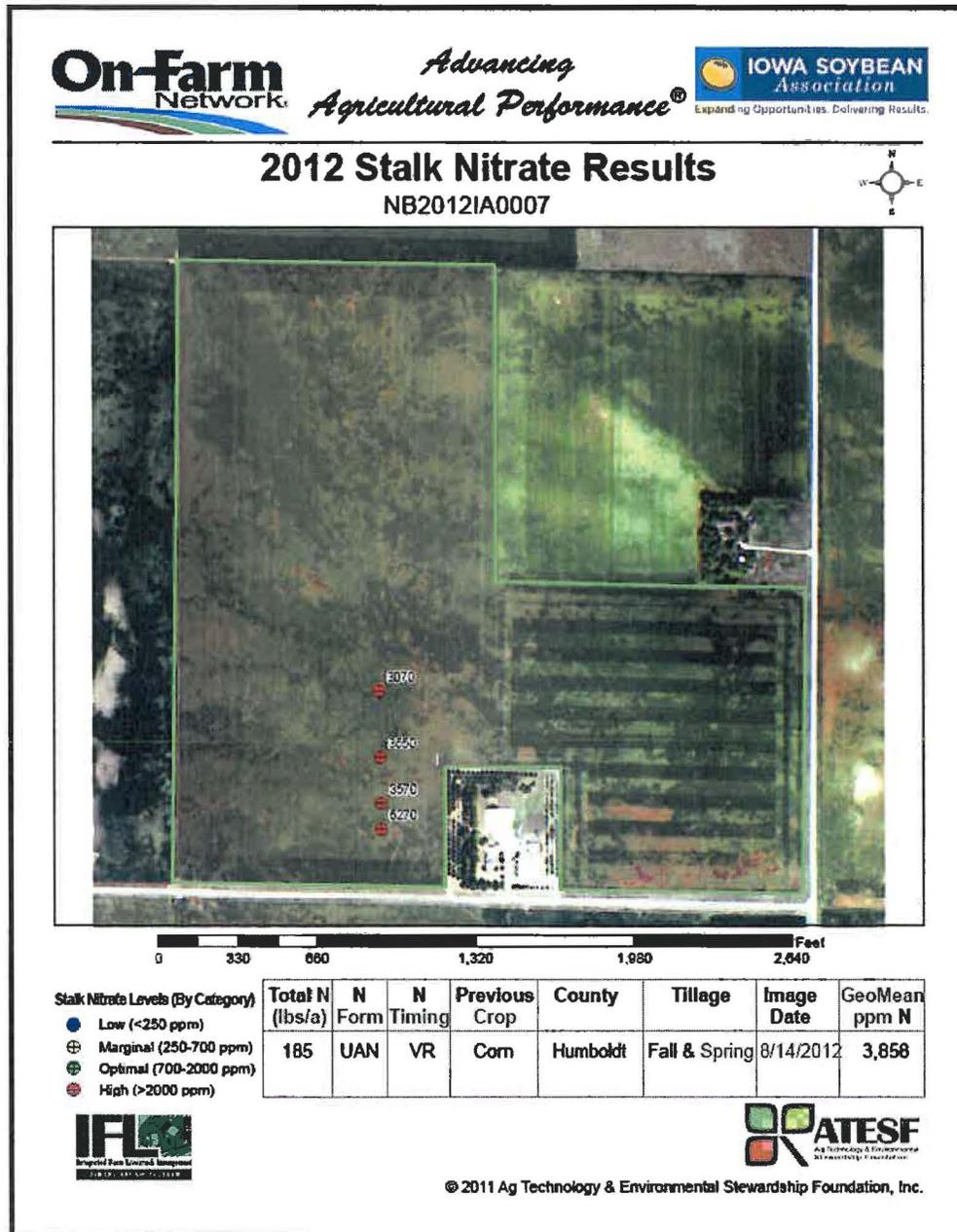
Example Field Near Optimal

Below is an example of a field testing near optimal in stalk nitrate levels.



Example Field Drought

This example shows a field where nitrate levels were high because of the drought.

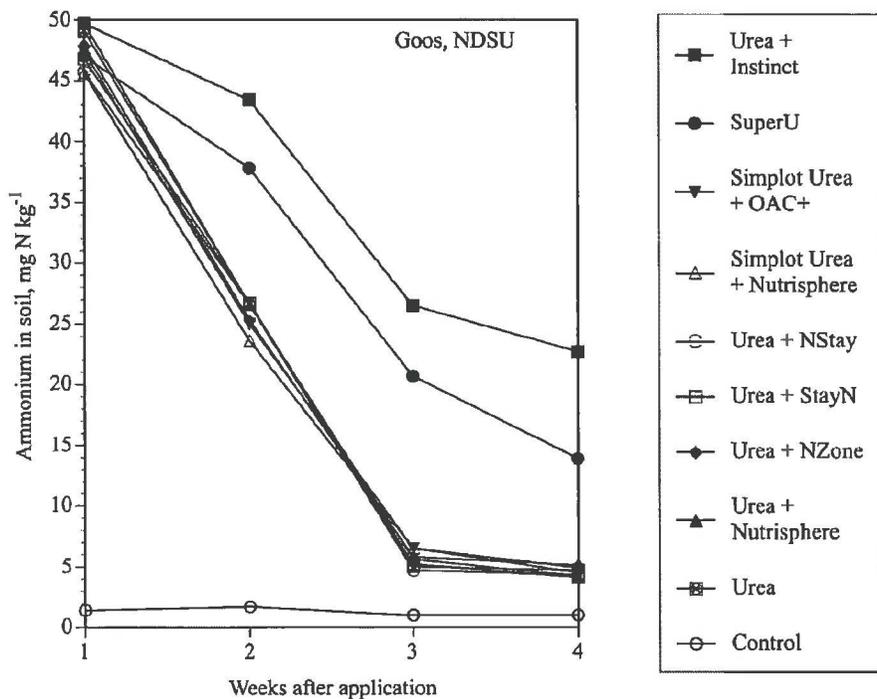


Use of "Stabilizers"

There are many products marketed to help improve N management. Our demonstrations have shown that some have value; some do not.



We have helped with demonstrations that tie into laboratory research to improve the selection of the best possible product for a given situation.



Dry Weather Impacts

Dry weather impacts availability of nitrogen and other nutrients.



Both treatments received the same amount of N. The spring applied ESN (a dry urea product coated with a polymer) in these treatments showed signs of sulfur deficiency on all three test sites and average a lower grain yield.



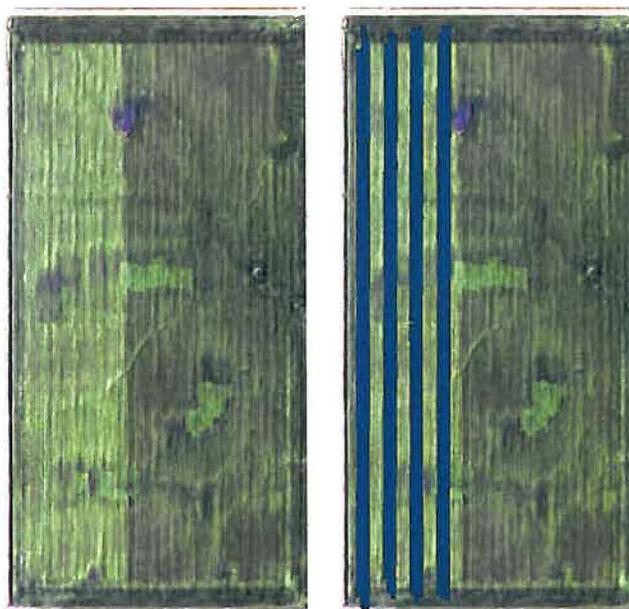
Calculating Risk

Working with Iowa State University to calculate best use and placement of stabilizers

The blue strips represent where Instinct N stabilizer was applied.

No signs of benefit in imagery or yield.

Manure N Rate: 125 lb N/a
 Additional Nitrogen: None
 Manure Application Date: Fall
 Yield Difference: (-1.1 bu/a)



In 2009, there was little benefit on average of using Instinct stabilizer. In 2010, there was more benefit when the seasonal rainfall was more 34 in.

