



NITROGEN NINJA



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For a college soils class, we were given a blank piece of paper and on the blank paper we had to replicate the exact nitrogen cycle shown in Figure 1, including each and every chemical equation. Even if the negative charge was left off NO_2^- ; we would have to retake it with a new blank paper at a later date. Once we passed the exam without a single mistake, we became what our college agronomy department

called a "Nitrogen Ninja." We were given a Nitrogen Ninja card and I'll admit, I carried it in my wallet for quite some time!

Nitrogen is the most limiting nutrient in non-legume crops worldwide (e.g. corn, milo, wheat). Nitrogen deficiency symptoms start with the oldest leaf yellowing at the tip, followed by the midrib in a v-shaped pattern, then out to the edge of the leaf (see figure 2). The leaf tissue in the older leaf will die while the second oldest leaf will begin yellowing, then the third oldest leaf, etc. This is because nitrogen is deficient in the soil, thus forcing the

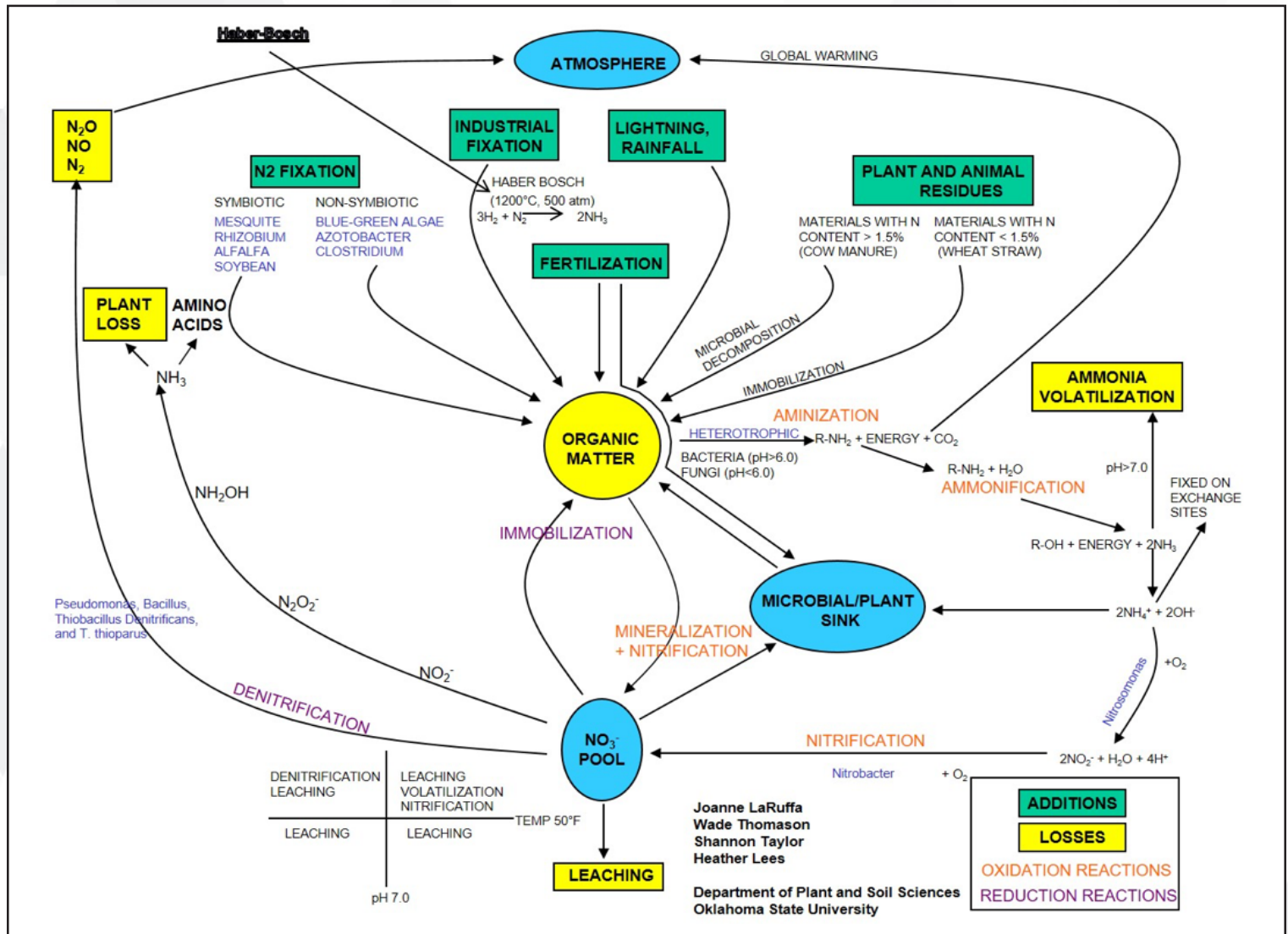


Figure 1. Shows nitrogen additions and losses to the nitrogen cycle. Additions of nitrogen include industrial fertilizer plants, legumes and lightning. Losses of nitrogen include volatilization, leaching, denitrification and plant loss/removal.

plant to move nitrogen from the lower leaves to continue new growth.



Figure 2. Nitrogen deficiency symptoms in corn over a period of time. Yellowing starting at the tip of the oldest leaf, followed by the midrib in a v-shaped pattern, then out to the edge of the leaf.

Did you know there are about 1,000 lbs/acre of nitrogen for every 1% of organic matter in the soil? Since organic matter in our trade area averages 3%, then on average our soil has 3,000 lbs/acre of nitrogen. Unfortunately, all of that nitrogen is unavailable to the plant. However, the mineralization process can convert 1-3% of organic nitrogen to plant available nitrogen. The amount of nitrogen mineralization greatly depends on the environmental conditions, which vary from year to year as shown in Figure 3.

Because nitrogen mineralization and nitrogen losses are unpredictable, measuring nitrogen in-season (e.g.

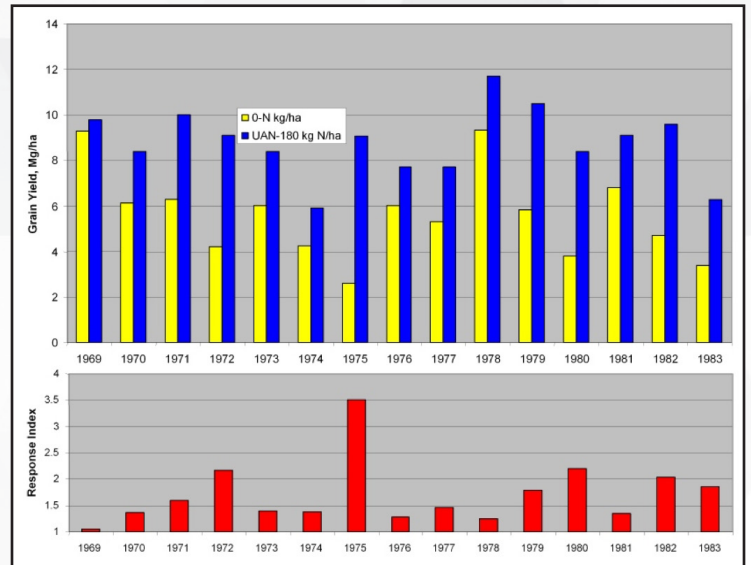


Figure 3. An experiment conducted by the late Professor Robert A. Olson at the University of Nebraska shows the long-term corn grain yields with two nitrogen treatments: 0 lbs/acre of nitrogen (yellow) and 397 lbs/acre of nitrogen (blue). This demonstrates that some years the nitrogen treatments yield similar because of higher nitrogen mineralization.

nitrogen modeling, tissue sampling, remote sensing), in-season nitrogen application, and variably applying nitrogen are ways to help improve nitrogen use efficiency. By utilizing today's technology and the 4R approach (e.g. Right Rate, Right Time, Right Source and Right Place) we can make an informed decision on how much, if any, nitrogen is needed in-season. Like the old saying goes, you can't manage what you don't measure.

Contact your local representative or Wesley Hedges at 402-239-3749 to learn more.

Farmers Cooperative Supports 2019 State FFA Convention

Dennis Kenning, Sales & Marketing Manager

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As an FFA Foundation sponsor, we provide funding for the Nebraska State Fair, sponsor the Ag Sales contest for the Career Development Events at the State FFA Convention, as well as provide several grants to local chapters in our trade area.

During the State FFA Convention, we provided a judge for the Star Finalist, attended the FFA Foundation

Banquet and hosted a booth at the Career Fair. It is our pleasure to support FFA as they represent our future patrons, employees and community leaders.

