Winter Crops Meeting
Woods Co.

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Precision Nutrient Management
Ok State
Soil Fertility Issues

- Much like a Ladder
  > One Step at a Time.
Steps

- If you have a pH of 4
  - I don’t care what your P, K, S, B, Mg, or anything else looks like.
- The Bottom 3 steps
- The Top 3 steps
  - Interchangeable
  - Producer Dependent
  - Field by field

Multi-Nutrient Variable Application

In-Season Cues
Secondary & Micros
N & S
P & K
Soil pH
1. Right Source
2. Right Place
3. Right Rate
4. Right Time
Tradition?

Soil Fertility
We Solve your problems
with a **Big Stick!!**
Optimum N Rate
Avg. 51 lb N/ac +/- 39

Max Yield
Avg. 44 bu/ac +/- 15

N need determined by N-up 112 – N-up check * 50% efficiency
What: A high rate of N applied in, across, through, over or under each and every field

How Much: Grain only 40 to 60 lbs
Dual purpose 60-100 lbs Above Pre-plant

How and Where: Min 10 ft wide, 100 yds long, anywhere representative.

When: Winter crops; before or after sowing (up to 30 days),
Reference Strips

• Are Very Visual..
• Definite Yes or No
• Risk Aversion?
• Sales and Service?
Optical Sensors

- SBNRC gives you a N rate
- DOES NOT WORK WITH OUT A REFERENCE...........
- Pre-plant best
- Soon After OK
How does it work

- Two Readings
  - N-Rich Strip
  - Farmer Practice
- Predict Yield of Each
  - N-Rich Strip YP 40 bu/ac
  - Farmer Practice YP 30 bu/ac
- Difference 10 Bu/ac
- 2 lbs N per bushel
- Rec is 20 lbs N/ac
Yield Prediction

Lahoma 502, Winter Wheat

Yield Goal, 57 bu/ac

SBNRC (YP0*RI = YPN)
100 Pre (100 lbs N/ac applied preplant)
Use of the N-Rich strip is becoming very commercial.
1 consultant 1st year 8,000 ac 2nd year 30+
Nitrogen Products and Nutrient Stabilizers
Slow Release
- Prevents immediate release into soil where environment and biological’s have impact.
  - Coated
  - Chemistry

Inhibitors
- Prevent the biological activity that impacts the Nitrogen Cycle
- Since early 60’s at least 15 substances thoroughly researched
Advantage of these materials is that one application may provide a uniform supply of N to the plants for several weeks.

S-coated urea (32-36 %N) breakdown of the S coat (physical barrier) Moisture

Polymer Coated Ureas: ESN: Temp and Moist

IBDU (isobutylidene diurea) is synthetic organic. particle size, soil moisture content and pH.

Urea-formaldehyde: microbial & temp

Methylene di-urea -CoRoN, Dura_N: Microbial & temp

Urea-Triazon- N-Pact, N-Sure: Moist & Microbial.

LOOK AT PERCENT SLOW RELEASE

6 to 20%
ESN contains a urea granule nitrogen (N) within a micro-thin polymer coating. This coating allows water within the soil to move into the granule and dissolve the urea inside. The urea solution then moves out through the coating into the soil where it is available to the crop.

The rate at which the urea solution moves out through the coating is determined by soil temperature and moisture. In cool soils when the crop is growing slowly, N release is slow. As the soil warms and crop growth increases, the granules release N more quickly and steadily.
Low Salt Nitrogen

- Yield and Protein Always equal to UAN when used as a fertilizer source.
- Reduced amount of Tissue Damage
- Increased rate w/ seed possible. Using 10-34-0
  - Wheat < 30 lb N i.e. 25 gal/ac
  - Canola < 10 lb N i.e. 8 gal/ac
(NH₂)₂ CO₂

H₂O: Rain, Mist, Dew, Humidity, Soil Moisture

NH₃ (gas) → H₂O → SOIL → NH₄⁺
N Stabilization

- Urease Inhibition
  - Basically prevents/slow urea’s conversion to ammonia
  - If ammonia (gas) is formed in absence of moisture or soil surface it will be lost to the atmosphere
Urease Inhibition

- NBPT: Studied since the 80’s Agrota in
  - 7 Day half life
- (MIC) Maleic Itaconic Coploymer Ca
  binding of nickel ions necessary for the formation and function of the enzyme Nutrishpere
  - Results Consistently show No benefit
When less or not beneficial

- Incorporated
- Rain or irrigation of $\frac{1}{2}$“ or more
- Soil and air temp $<50$
- Dry soil and Air
- Banding
- No rain expected for 14+ days
- UAN vs Urea
To Use or Not to Use

- When **more beneficial**
  - Surface applied
  - No-till
  - High humidity
  - Light rains, heavy dews, mists
  - Soil and air temp $>50$
  - Wet soil
  - Soil with high pH $>7.5$  Lots of OH in soil
  - Rain within 10 days
Nitrification Inhibition

- Basically prevents/slow ammonium’s conversion to nitrate
- Ammonium(+) is immobile in the soil Nitrate(-) is mobile. In high rainfall, irrigated, well drained soil NO$_3$ is easily lost.
- NO$_3$ can be lost by leaching and Denitrification
  - Both Take WATER!!!!
Nitrification Inhibition

- Nitrapyrin - Registered Pesticide, studied since the 60’s N-Serve
- (MIC) Maleic Itaconic Coploymer Ca binding of nickel ions necessary for the formation and function of the enzyme Nutrishpere
- DCD - Suppresses, does not kill nitrosomas
- Ammonium-Thio-Sulfate: Low pH keep NH4 from going to NH3, short lived.
To Use or Not to Use

- When less or not beneficial
  - Arid environments
  - Well drained soils that allow infiltration but have limited leaching
To Use or Not to Use

- When more beneficial
  - Tile Drainage
  - Wet soils
  - Irrigated fields
Avail®, which is marketed as a phosphate enhancing product, contains the same active ingredient as Nutrisphere. The Avail activity is attributed to binding of calcium or iron ions in the soil normally bind phosphate.

AI of Nutrisphere/Avail, the compound is highly negatively charged and would tend to bind with any compound with a positive charge, not distinguishing one ion over another.

Consistent Results showing No benefit.
Thank you!!!

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