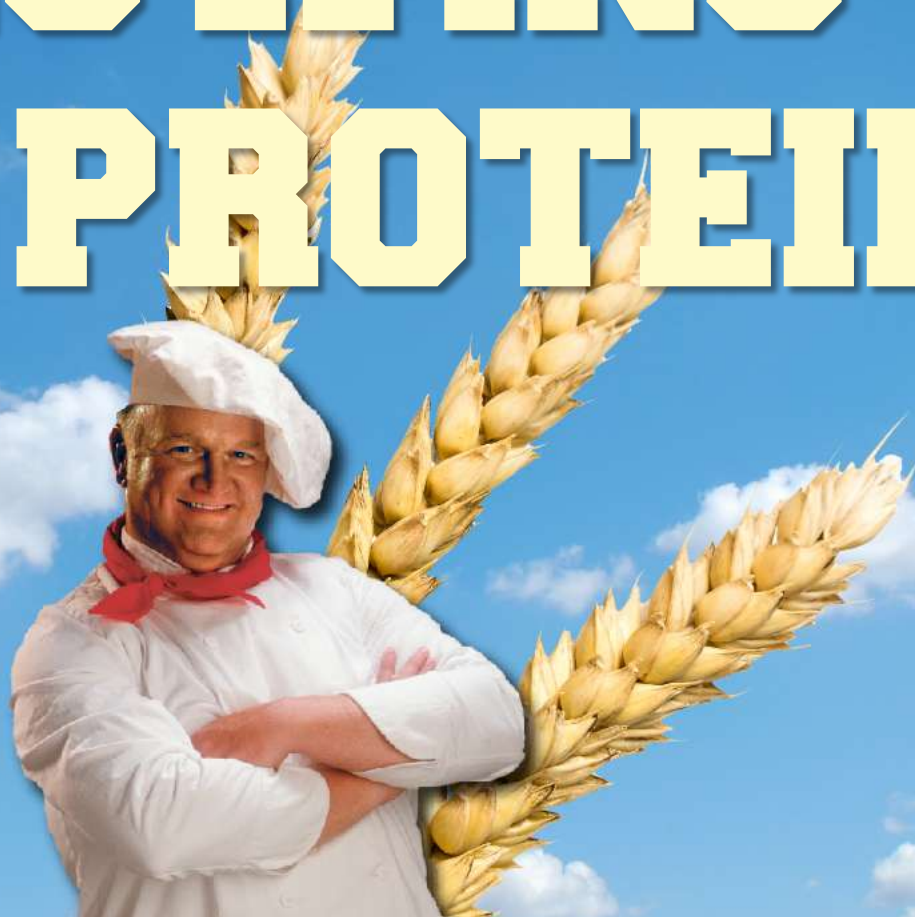


GROWING FOR PROTEIN



The Protein Mystery

- Why is it important?
- Bakers and millers care about protein in wheat
- Protein affects gluten content and loaf volume during the baking process
- Western Canada and the Western United States
- Ontario wheat producers have a huge opportunity to access this market, if they can consistently deliver high protein hard wheat

Influences on Protein

- Numerous factors influence protein content in wheat.
- Largest - nitrogen available during heading and grain fill
- Protein consists of amino acids and nitrogen is part of the basic structure of all amino acids
- nitrogen available to plant - influenced by both environmental conditions and management practices

Affects on Nitrogen Mineralization

- Organic matter content of the soil
- Manure application history
- Weather conditions
- Protein is NEVER a guarantee
- Above factors release more nitrogen to wheat

- Warm and wet soil conditions will maximize soil microbe activity, increasing available nitrogen
- 2012 was warm and dry – not ideal

Yields Go Up – Protein goes Down

- We have been increasing average yields in Ontario
- Using more of the N to create yield (early applied)
- Less remaining for plant to create protein
- Need more N to compensate, because of higher yields

The Mystery of Protein

- Make N Available at the appropriate times

----- ADDING N -----

----- Increases number of tillers and kernels per head -----
Grain protein made from remobilized N

----- Affects weight per kernel -----
N goes to protein



----- GROWTH STAGE -----

Varieties

- Varieties can vary with Protein content
- Stanford was low yield, high protein
- FTHP Redeemer – low yields, higher protein

- Keldin and Princeton can combine great yields with Protein premiums

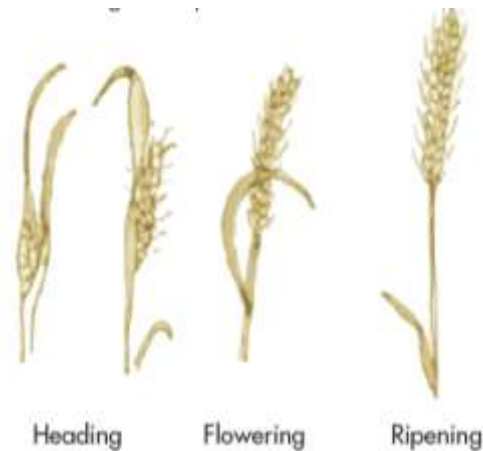
- Must be managed for protein

N Timings

- Yield = vegetative growth stage.



- Protein = grain fill.



Techniques to Consider

- There has been success with Yield + Protein
- Following Slides will go through techniques that can lead to higher protein content

Growing for Protein

- Sulphur – Leads to building chlorophyll – greener
- Less acid rain – wheat uses sulphur .1 lbs/bu
- Example – 90 bu wheat = 9 lbs. sulphur

- Yield goal of 110 bu/acre = 11 lbs sulphur available

- Ammonium Sulfate – dry
- Ammonium Thio sulfate – liquid

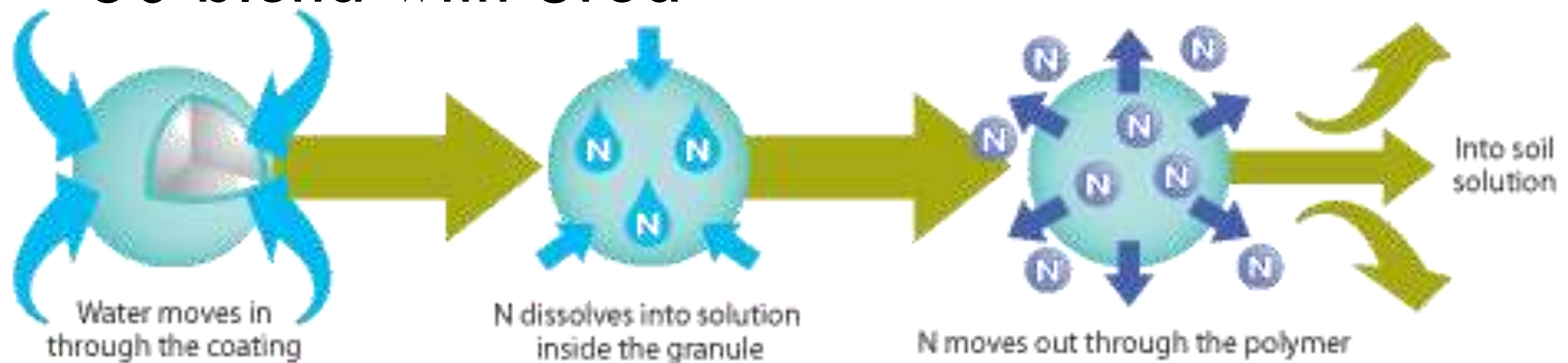
Liquid UAN

- 28% @ 45-50 Gal (134-150 Total actual N)
- 20-25 gal early
- Remainder of UAN on later in Second Application

- Releases quickly to make N available to plant
- Downside – burn the flagleaf
- Try putting it on just before flag – GS32
- -OR- apply during heavy dew or after light rain if during flag
- Am-Thio can be added to get sulphur

ESN

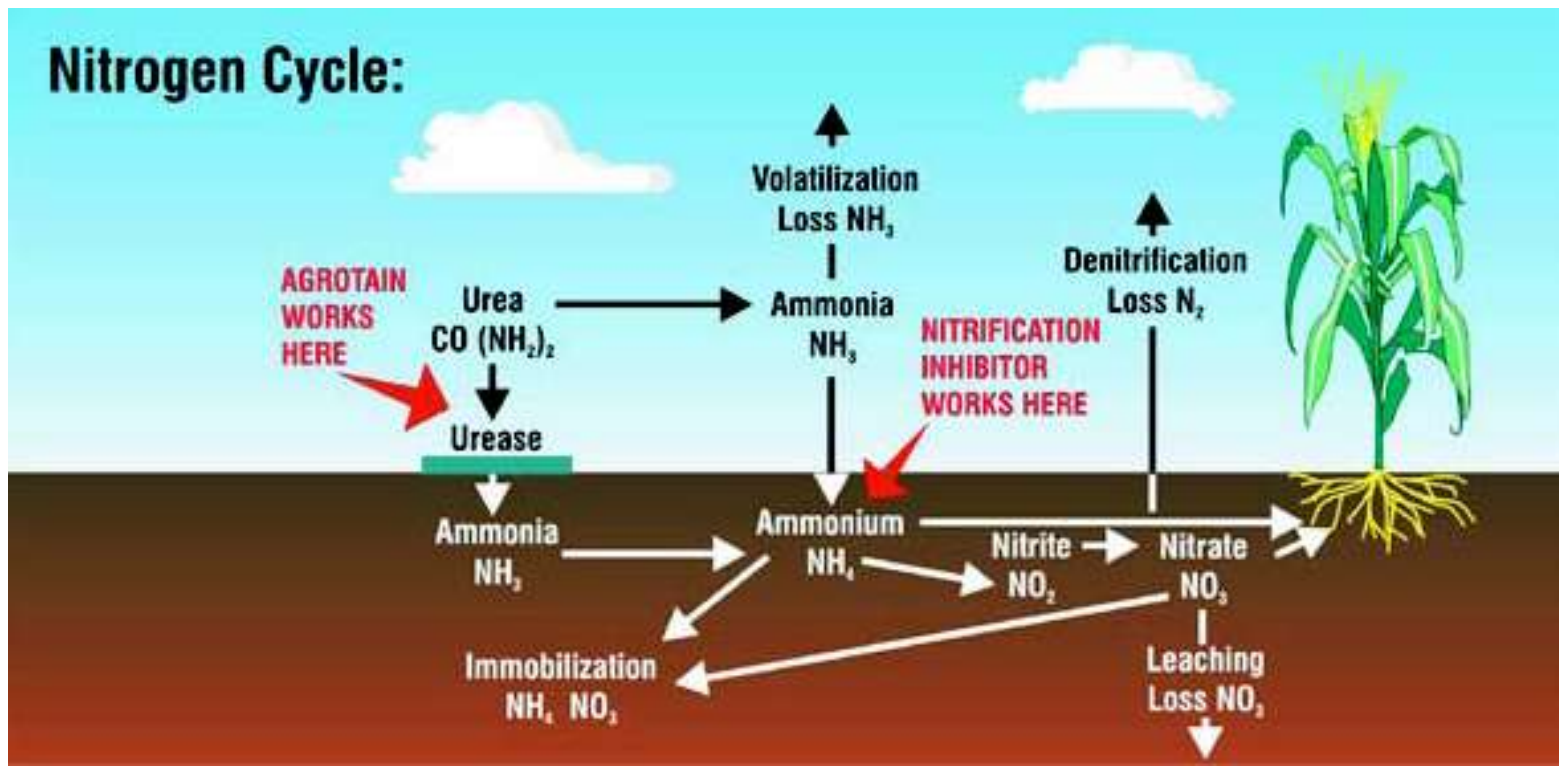
- Polymer Coated Urea
- Delays release of N – needs moisture to release
- 50 – 50 blend with Urea



- One application, performs similar results to applying 2 apps of 28%
- Can blend Am-Sul into blend to add sulphur

Urease Inhibitors (Agrotain, N-Serve)

- Slows Volatilization, Denitrification, and Leaching of N
- Slows the release of the N
- Applied to UAN or Urea (most commonly UAN)



OTHER OPTIONS

- Ammonium Nitrate at heading – 50 lbs actual N
- Potential to burn leaf

- Liquid Urea – Urea dissolved in water – at flag leaf or heading
- Safe for the plant (minimal burn)

Things to Consider

- Push actual N levels higher
- Up to 150 lbs/acre actual
- Use split apps or ESN or Urease Inhibitors
- Make more N available at Grain Fill timing
- Protein is achievable with higher yielding wheat!