Optimizing Plant Health Through Micronutrient Management

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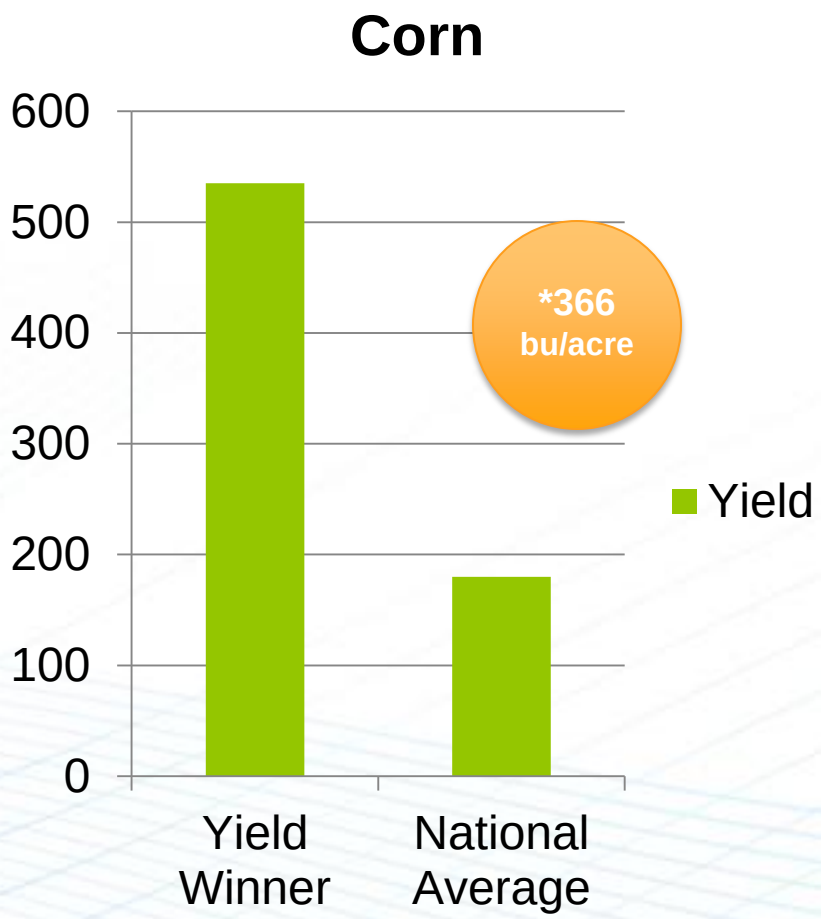
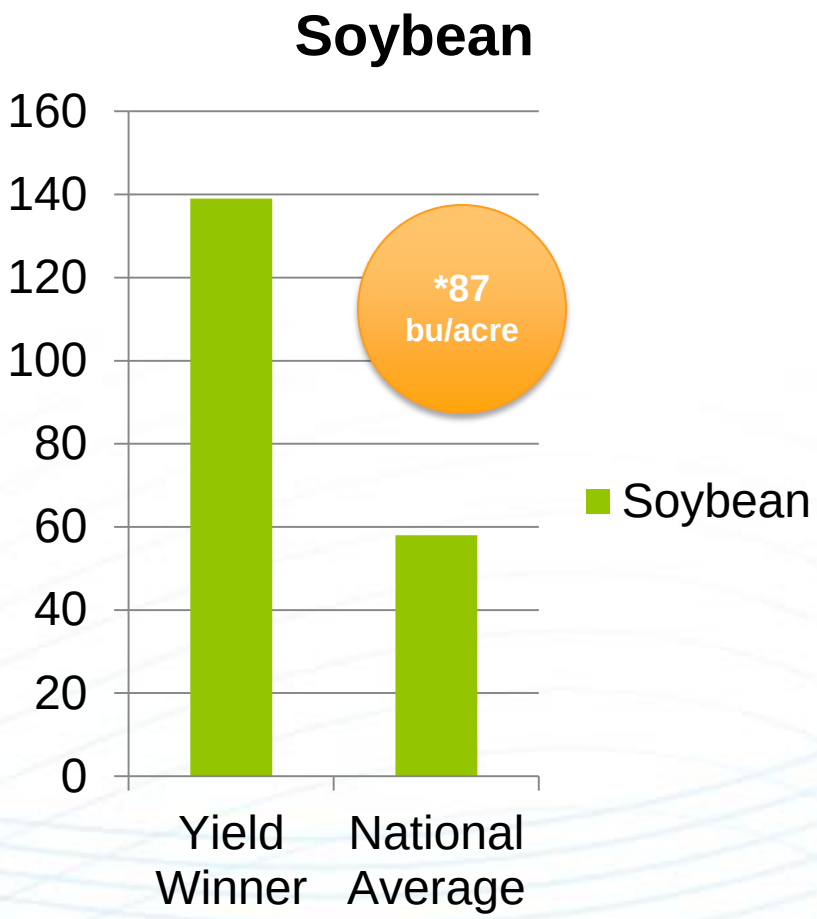
Overview of Learning Objectives

- Why plant health through micronutrients?
- How application timings impact efficiencies and effectiveness
- Product Label “101”
- Tips on how to have progressive conversations with your retail sales-person

Closing the Yield Gap





Closing the Yield Gap

- **Factors Effecting the Yield Gap**
  - Climate
  - Rainfall
  - Sub-Optimal Genetics
  - Poor Plant Fertility
  - Poor Soil Health
  - Environmental Pressures
    - Insects, Diseases, Weeds

Goal is to provide producers with the right tools for effective, efficient, and sustainable agriculture!

Micronutrient Overview

Macronutrients (9)	Micronutrients (11)
Carbon	Iron
Hydrogen	Manganese
Oxygen	Boron
Nitrogen	Zinc
Phosphorous	Copper
Potassium	Molybdenum
Magnesium	Cobalt
Calcium	Nickel
Sulfur	Chlorine
	Sodium
	Silicon

Plant Health Impact From Key Micronutrients

Zn

- Improvement of cold stress tolerances
- Increase drought stress tolerances
  - *Mitigates intake and rate of water absorption*
- Root hair formation
- Auxin production
- Key in chlorophyll production = plant growth regulation
- Phosphorous assimilation

Right Time: Multiple Application Points

Plant Health Impact From Key Micronutrients

Mn

- Aids in photosynthesis & respiration
- Regulates supply of growth hormones*
- Regulates uptake of other nutrients
  - *Phosphorous, Boron, Magnesium*
- Helps plant metabolize nitrogen
- Lignin formation
  - *prevent lodging in certain crops*
- Helps develop nematode tolerance
  - *Harder roots*

Right Time: Post – Herbicide Application

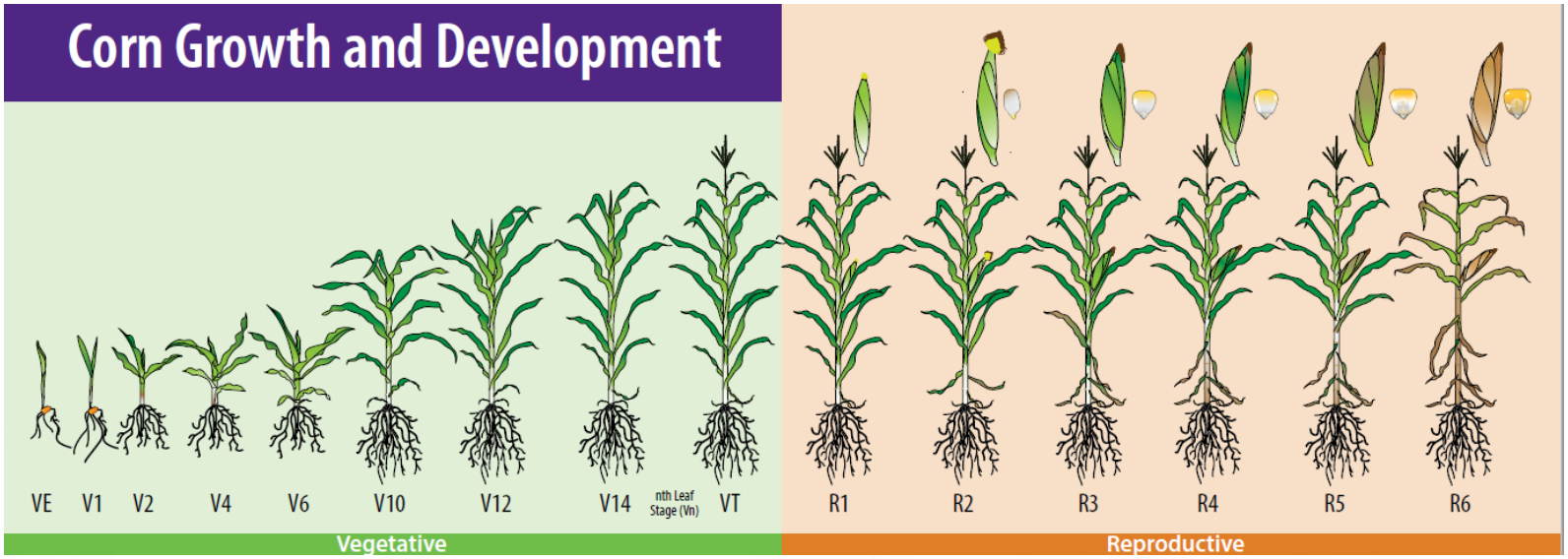
Plant Health Impact From Key Micronutrients

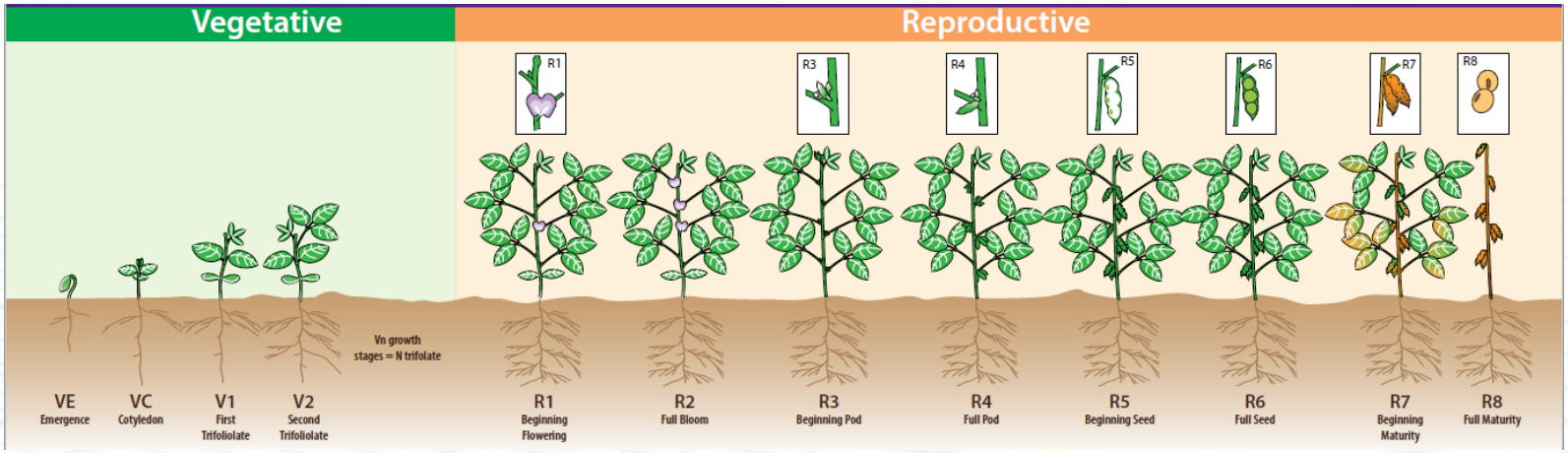
B

- Provides structure to plant cell walls
- Helps form and trans-locates proteins/sugars
- Aids in plant reproductive development & functions
  - *Plant hormones, pollination, kernel/pod fill*

Right Time: R – Staged Applications

Plant Growth & Development Review





Right Time: Key Application Timings

Planting

Zinc & Manganese

Cold Stress Tolerance Improvement

Disease Tolerance

Increased # of Plants Emerged

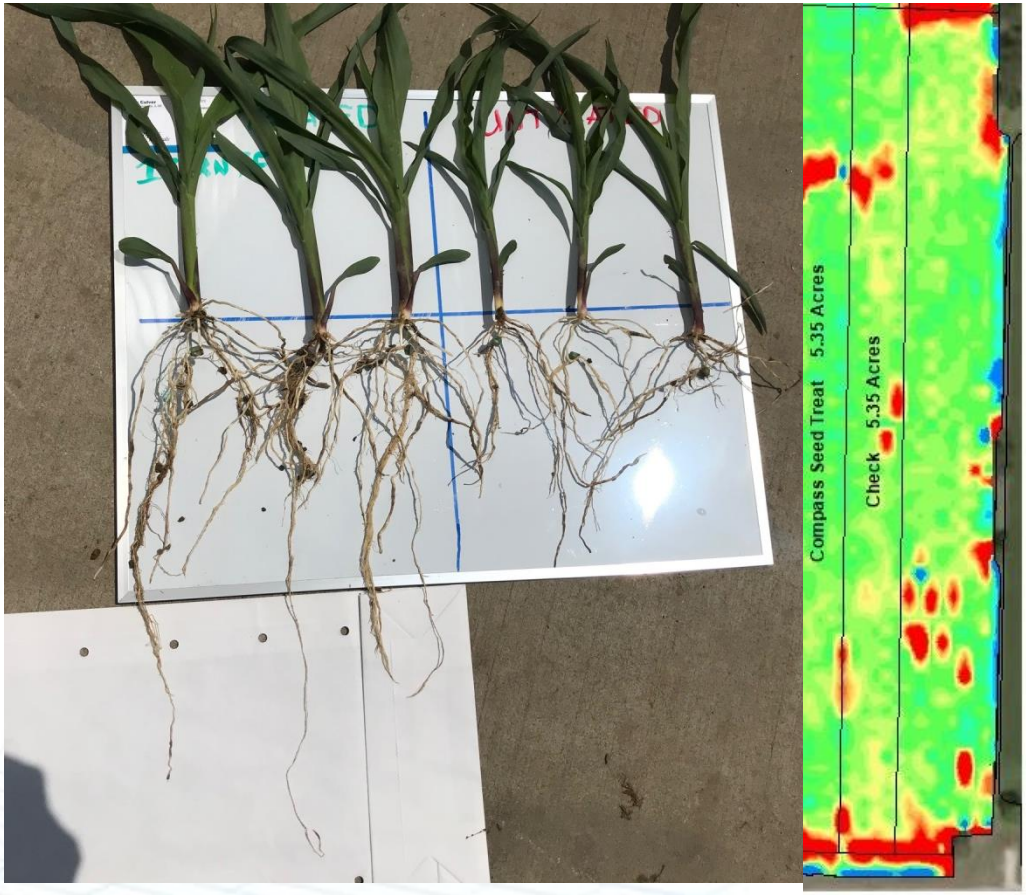
Faster Emergence of All Plants

Methods of Application: Planting

- **Using chelated micronutrients in with starter program**
  - Dry soluble or liquid sources
    - Can be mixed at retailer plant or directly on the farm

- **Implementing a flow-aide + nutritional product as seed treatment**
  - Planter box treatment
  - Blended as a finishing agent by retailer on seed (soybeans)

Test & Results: Planting



Compass Seed Treatment
- **Size: 5.35 Acres**
- **Average Dry Yield: 187.5 bu/ac**
- **Average Moisture: 25.6 %**

East Side Check
- **Size: 5.35 Acres**
- **Average Dry Yield: 184.2 bu/ac**
- **Average Moisture: 25.6%**

+ 3.3 bu

Right Time: Key Application Timings

Herbicide Application

Zn, Mn, B, Co, Mo, Ni,S

Transient Nutrient Deficiencies

Stress Tolerances

Key growth stages impacting yield!!

Methods of Application: Herbicide Application

- **Adding a foliar that aligns with needs**
  - Flexibility of adding into Herbicide, Insecticide, Fungicide applications

- **Maximize profitability without adding another application**

- **Products in the market-place that can be mixed at the retail location or loaded directly at the farm**
  - Dry soluble or liquid formulations

Test & Results: Herbicide Applications

Right Time: Key Application Timings

Fertigation
or
Fungicide

K, Zn, B,
Mn,Cu

Reproduction Stages
(stress management)

Plant Hormone Supply

Combating Diseases

Pod Fill/Ear Fill

Methods of Application: Fertigation or Fungicide Applications

- **Soluble Macro + Micro products.. add into fertigation tank**
  - Mixing with straight water of 32% solutions
  - Can usually be pre-mixed at the retail location or some products can be mixed directly on farm

- **Fungicide application, pairing Macro + Micro Products**
  - “Hassle-Free” from farm aspect
  - Usually reasonable cost
  - Effective application, increased profitability
    - Adding into an already planned application

Test & Results: Fertigation or Fungicide Applications

INS & OUTS of a Product Label

- **KEY SECTIONS TO NOTE**
  - **Product Name & Manufacturer**
  - **Guaranteed Analysis**
  - **Directions for Usage**
    - Likely different timings, crops, methods of application
  - **Mixing Instructions**
  - **Health Hazards**
    - Prevention (required PPE)
    - Response if contamination occurs
  - **Storage & Disposal**

Session Activity:
Product Label Identification

http://www.cdms.net/LabelsSDS/home/

- **What nutrients are in the guaranteed analysis?**
  - Also important to look at the **derived from sources**
- **What crops can this product be used on?**
  - At what growth stages?
- **Is there anything noted that this product can not be mixed with?**
  - Is a jar test recommended?
  - What are the proper steps to conduct a jar test?
- **What kind of health hazards does this product present?**
  - What are the steps I can take to prevent contamination?
  - What do I do if contamination occurs?

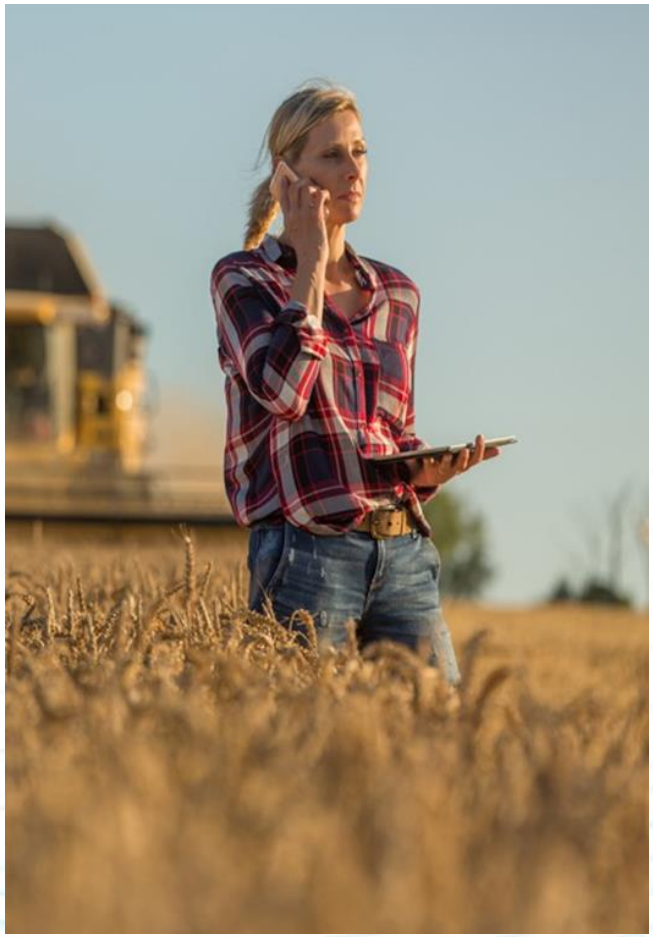
Tips on HOW to have an Informed Discussion with Your Retail Sales-Person

- **WHAT are the limiting issues on the farm?**
  - Know your soil nutrient level basis
    - YOU know your farm better than anyone!

- **WHAT are your budgets and proven yields**
  - Setting S.M.A.R.T Goals! (specific, measurable, **attainable**, relevant and timely)

- **Challenge your salesperson to become an informational source, not only a product provider**

- **Ask the HOW, WHAT, and WHY of products or applications**
  - How do these help you reach your SMART goals for you farm & specific fields



Session Activity: Creating a SMART Goal

Specific

- Provides a clear description of what needs to be achieved.

Measurable

- Includes a metric with a target that indicates success.

Attainable

- Set a challenging target, but keep it realistic.

Relevant

- Keep your goal consistent with higher-level goals.

Timely

- Set a date for when your goal needs to be achieved.

Questions?

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