

# Nutrient Dense Crop Production

2010-11 Course I

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# Course Objective

- Support students in achieving significant improvements in the vitality, health, yield and nutrient value of the crops they produce.

# Support systems

- Individual consultation with Dan on your soil test and devising a fertility plan
- Newsletters every two weeks with comprehensive information on the topics we cover in class to aid your process as a grower.

# Mode of teaching

- Morning session on principles and theory
- Afternoon session hands on

# Today's topics

- Soil testing and mineral balancing
- Seed and inoculation
- Potting Soil
- Real Food Campaign

# Priorities/Focal Points

- M&M's - Microbes and Minerals
- MOM - Microbes, Organic Matter and Minerals
- HOME - Humus, Organic Matter and Energy
- Don't forget Air and Water.

# Soil Testing

- History and place of Agriculture
- Effect of long term cropping on Soil
- Role of macro and micro minerals in plant health and vitality

# Logan Test

- Base Plus or “Agri-Dyn II” Test
- A Strong Acid test
- Sulfer - 75 ppm
- Phosphorus - 75 ppm
- Calcium - 70-75%
- Magnesium - 15-18%
- Potassium - 3-5%



# Trace Element Levels

- Boron - 3 ppm
- Manganese 80-90 ppm
- Copper - 4 ppm
- Zinc - 8 ppm
- Cobalt - 2 ppm
- Molybdenum - 1 ppm
- Selenium - .5 ppm

# Farm Test

# General recommendations for specific mineral deficiencies

- Sulfer - with Calcium needed, 500 pounds per acre (ppa) gypsum
- Sulfer - with Magnesium and Potassium needed 300-500 ppa Sul-Po-Mag or K-mag
- Sulfer - with Potassium needed 200-300 ppa potassium sulfate.
- Sulfate forms of the trace elements

# Phosphorus

- Phosphorus - with calcium needed, 500-2000 ppa colloidal soft rock phosphate, Tennessee brown rock phosphate, Black hard rock phosphate
- Phosphorus - with potassium needed, Compost.

# Calcium

- Calcium - 500-2000 lbs Calcium Carbonate (Calcite or Hi-cal Lime) Also Aragonite, Coral Calcium, Egg Shells,
- Calcium - with Magnesium needed 500-2000 ppa Calcium Magnesium Carbonate, (Dolomite, or Dolomitice Lime)
- Calcium - with Sulfer needed, 500 ppa gypsum
- Calcium - with Phosphorus needed, 500-2000 ppa Soft Rock Phosphate.
- Calcium - Phosphorus and Traces and Paramagnetic needed 500-2000 ppa Carbonatite

# Magnesium

- Magnesium - with Calcium needed 500-2000 ppa Dolomite
- Magnesium with Sulfer and Potassium needed 300-500 ppa Sul-Po-Mag or K-mag
- Magnesium - with Sulfer needed, 200 ppa magnesium sulfite (epsom salts)

# Potassium

- Potassium - Spread well, clean wood ash
- Potassium - with Magnesium and Sulfer needed, 300-500 ppa Sul-Po-Mag or K-mag
- Potassium - with Sulfer needed, 200-300 ppa potassium sulfate
- Potassium - with Phosphorus needed, Compost

# Boron

- Boron - Depending on level needed, up to 30ppa per year Borax. Apply in split applications. Ideally at least three



# Manganese

- Manganese - 5-20ppa manganese sulfate

# Copper

- Copper - 5 ppa Copper Sulfate. If very low up to 10 ppa

# Zinc

- Zinc - 5-10 ppa Zinc Sulfate.

# Mineral Application Rules of Thumb

- To address deficiencies, fall applications are best. That gives time for minerals to be digested and made bio-available for next year's crop.
- Rock minerals should whenever possible be applied with some form of an organic compound. Some common ones are compost, Humates, Biochar.

# Best Practices for Mineral Application

- Into cover crops in the fall
- Into compost piles at first turn

# Other Minerals

- Glacial Gravel Till
- Granite Dust
- Basalt Dust
- Volcanic Rock
- Alluvial Outwash Clays
- Humates
- High Energy Clays
- Biochar
- Sea Minerals

# Seed

- Sorting by Size
- Yield Potential
- Growth Potential
- SPECIAL REPORT on seed companies coming in RFC newsletter. What companies would you like us to interview?

# Inoculation

- “Digestive Tract” of plants
- Inoculating “gut” at birth
- Bacterial and Fungal Species critical symbiotes.
- Special Report on Inoculants coming in RFC newsletter. Key suppliers across the country, the products they sell, with species, purposes, levels, application rates and price.



# Potting Soil

- Besides Compost, peat, vermiculite and perlite, Consider, Kelp, Alfalfa, Zeolite, Humate, Montmorillonite, Lime, Rock Phosphate, Gypsum, Trace Elements, and critical role of biological inoculants and enzyme stimulants.
- Survey of compost and potting soil producers, their amendments and mineral assays coming in the RFC newsletter. Companies?

# Real Food Campaign

- History
- Mission

# Real Food Campaign

Database

Archive

Profiles

# Real Food Campaign

- Research
  - Blow your mind and share the results
  - Hand held “tri-corder” for consumers

# Real Food Campaign

- Staff
  - Dan - Director, Teacher, Public Face
  - Doug - Course Coordinator, Chief of Staff
  - Eric - Backend Database Wizard
  - Chris - Website Design/Implementation
  - Suzanne - Development
  - Clio - Research/Newsletter
  - You?