Endowing Future Generations

RENEWING OUR FOCUS ON SOIL FERTILITY

IN THE 21ST CENTURY

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FARMER TO FARMER: FERTILE GROUND -CONNECTING FARMERS TO FARMERS TO PROMOTE HEALTHY SOIL, FOOD AND COMMUNITY HEALTH

NEW ENTRY SUSTAINABLE FARMING PROJECT

DEC 9, 2010



Our Soils as a Foundation of Health and Wealth

- Endow: to furnish with an income; *especially*: to make a grant of money providing for the continuing support or maintenance of <*endow* a hospital> (www.merriam-webster.com, dec 10)
- Soils are far too important to be neglected
- Aim should be to create and maintain soils which grow healthy crops and therefore can avoid expensive use of pesticides and herbicides (who profits in this scenario? Ideally the farmer if we focus on soils...)
- Human health and future financial implications (diabetes, etc.)
- Raw material or primary wealth production
- Soils are far too important to be neglected

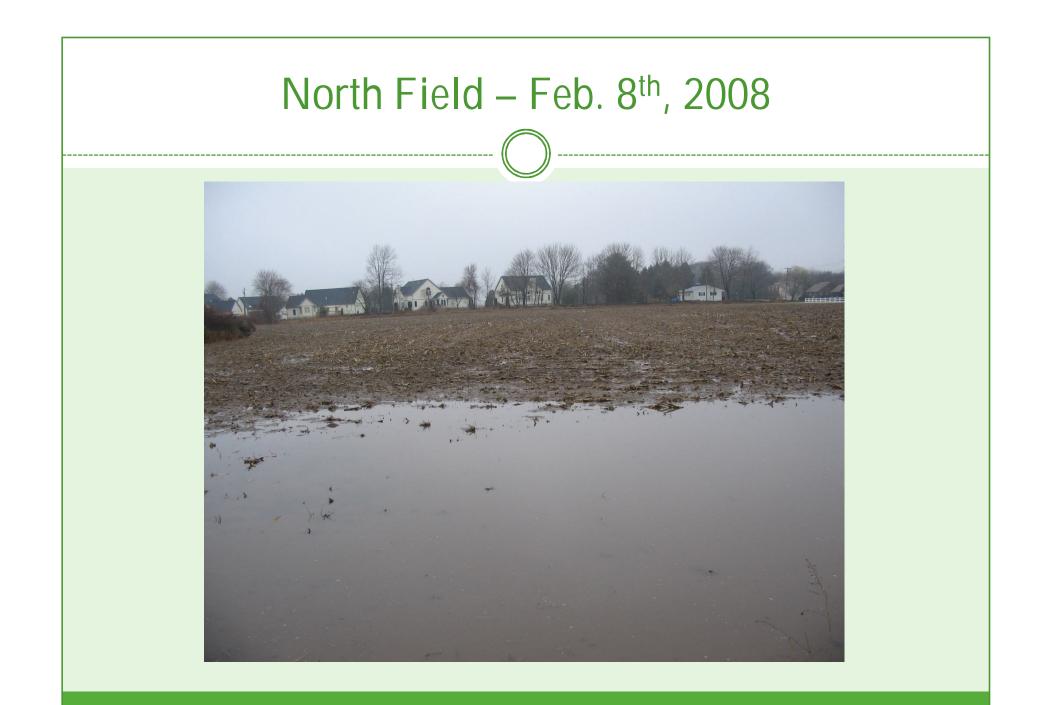
Folks Who Provide Insight Into Fertility

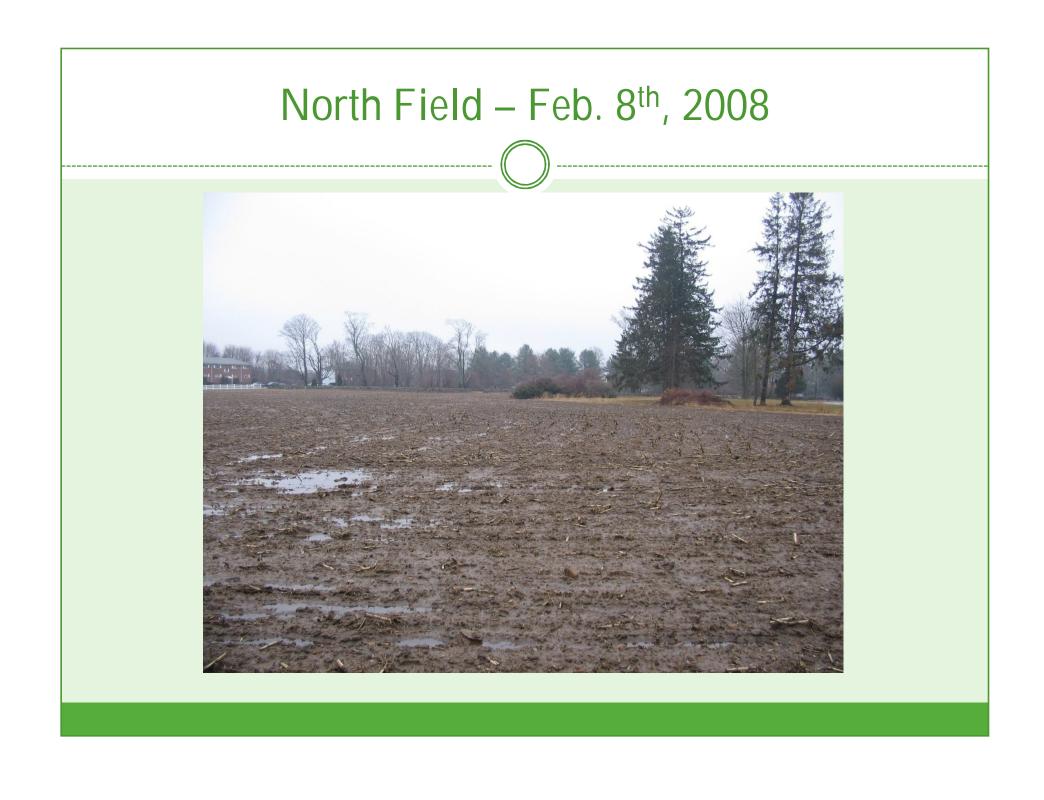
- William Albrecht Soil Scientist at U. of Missouri, focused on percent base saturation of nutrients
 Neal Kinsey – follows Albrecht methods
- Eliot Coleman "The New Organic Grower"
- Sir Albert Howard "An Agricultural Testament"
- Carey Reams Reams Biological Theory of Ionization
 Arden Andersen, Dan Skow building on Reams's work
- Rudolf Steiner Lectures formed foundation of Biodynamic Agriculture
- And... a growing network of growers, labs, and scientists

Natural Fertility and Climatic Impact on Soils

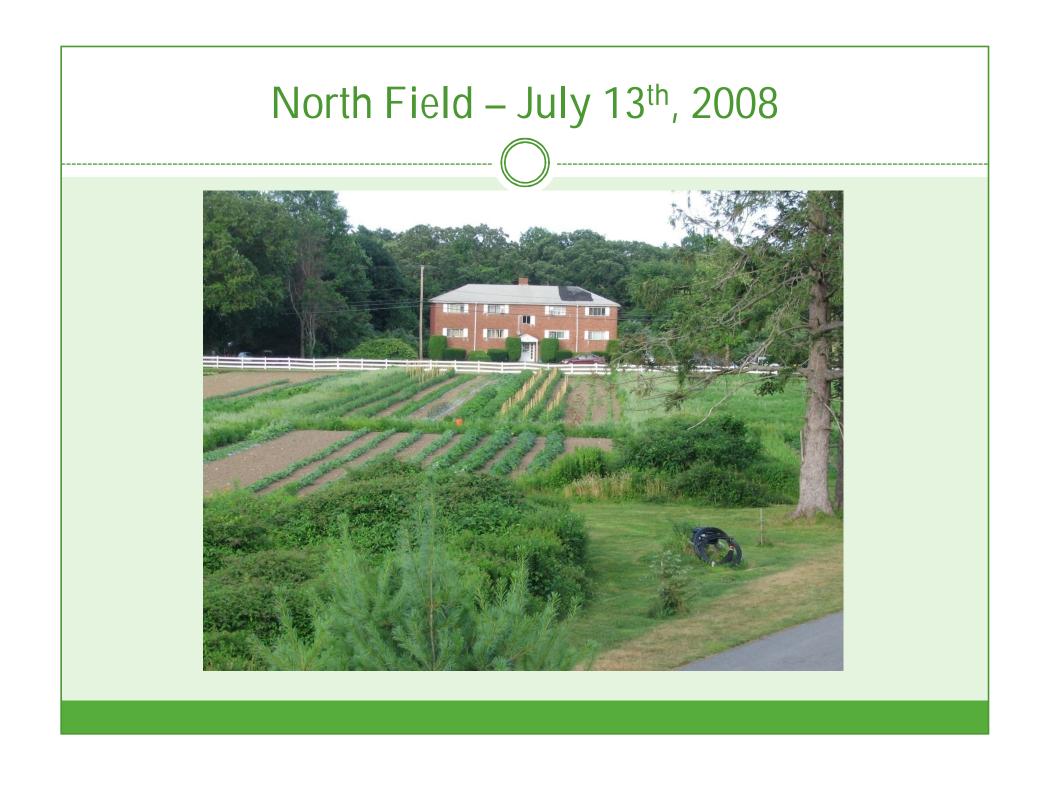
- The Big 3
 - o Glaciers
 - Volcanoes
 - o Siltation
- Weathering of parent material and climate impact on soils
- Soils in the Northeast > Acidic overtime (cation leaching)
 Lower pH fungally dominant soils vs. bacterially dominant soils (higher pH)
- Kansas and the breadbasket Albrecht's work examining protein in wheat vs. rainfall amounts (West to East)

Brix Bounty Farm, Dartmouth, MA Growing Food with Respect for the Earth & **Future Generations** Founded in 2008 Fresh Vegetables & Community Education a catalyst











Wet Soils > Lack of Oxygen/Aeration > Crop Failure Summer Squash – Aug. 7th, 2009 Summer Squash - June 21st, 2009









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- Agricultural Management of our Soils > Future Impact









Industrial Ag vs. Biological/Organic Theory

- Industrial agriculture (often referred to as "conventional agriculture) – focus on limiting cost of inputs, with an emphasis on "feeding the plant" – i.e. using water soluble fertilizers, reliance upon fertilizers often from "fossil fuel" sources.
- Biological/Organic agriculture focus on the health of the soil; feed the soil and let the soil feed the plant. Often focus on using "organic" materials and rock minerals.
- Trophobiosis (Francis Chaboussou) crop health with a focus on protein synthesis, limiting "free amino acids".

Flavor, Nutrition, and Value

- "Superb Taste" as a critical component in developing healthy diets in our children.
- Soil Fertility > High Quality Flavor and High Yield

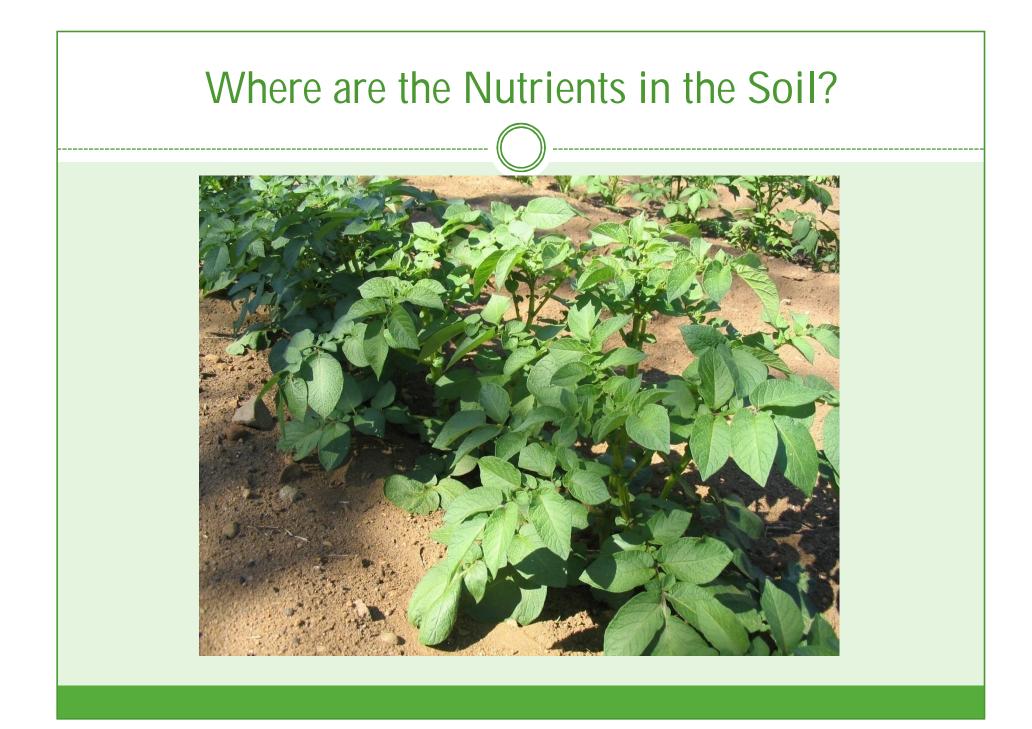


Nutrients for the soil, plant, animal, and human

- CALCIUM (Ca⁺⁺)
- Magnesium (Mg⁺⁺)
- Potassium (K⁺)
- Nitrogen (N) NH₄⁺ and NO₃⁻
- Phosphorous (P)
- Sulfur (S)
- Carbon (c) and Hydrogen (H)
- Sodium (Na)
- Trace Minerals: Boron (B), Copper (Cu), Iron (Fe), Manganese (Mn), Zinc (Zn)...Cobalt(Co), Iodine (I) Molybdenum(Mo), Nickel (Ni), Selenium (Se), Silica (S)...

Reviewing Soil Analysis

- Soil testing can be an important tool in determining fertility needs and making sound amendment choices.
- Strong Acid, Weak Acid and Saturated Paste Analysis
- Field Sampling Depth 6'' if tilled, 4'' if pasture/hay.
- Soil pH: As pH goes down, soil becomes more acidic. More H⁺ ions in the soil; replacing Ca, Mg, K, etc. which are "cation" nutrients the plant needs. It's important to look at calcium and magnesium levels before using lime to amend the soil; otherwise may end up with Mg excess.



Chemical, Physical, Biological

- Soil health is a function and result of interrelated processes including biological, chemical, and physical characteristics.
- Chemistry influences Biology and Physics
 Ca vs. Mg and soil flocculation
- Physical influences Chemistry and Biology
 Oxygen necessary for soil biology
- Biology influences Chemistry and Physics
 Myserrhized functions Clemetin
 - Mycorrhizal fungi producing Glomalin

Types of "Organic" Fertilizers/Amendments

- Rock Minerals i.e. lime, sul-po-mag, soft rock phosphate.
- Organic Fertilizers soybean meal, alfalfa meal
- Assisting Products: e.g. Humates, Sugars (Molasses)
- Biologicals Bacteria, Fungi, BD Preps, Inoculants, etc.
- Compost and Organic Matter
- Animal Manures chicken, sheep, goat, cow, etc.
- Fish and Seaweed
- Cover Crops green manures (legumes), bio-accumulators (oats, buckwheat)
- Air and atmospheric deposition...

Possible Shortfalls of Conventional Fertilizers

Focus on a crop instead of overall soil health. A band-aid approach. Short-term response.

• Production of chemical fertilizers may be deemed unsustainable; reliance on fossil fuels.

 Concentrated industrial fertilizers can have a negative impact on soil biology; e.g. KCI impact on microbes.
 "Oversaturation" may lead to excessive nutrient leaching (nitrates and phosphates)

Resources: Amendment/Fertility Sources

- On the Farm... Green Manures and Composts
- The Atmosphere and Surrounding Environment (coast)
- <u>Fedco Organic Growers Supply</u> (Maine)
- Lancaster Ag (Pennsylvania)
- NOFA-MASS Bulk Order
- Nutrient Density Supply Company (MA)
- Conklin Limestone (Rhode Island) Hi-Cal Lime
- Crop Production Services (South Deerfield, MA)
- Fieldworks (Westport, CT)
- Zuber's Feed and Grain, Marvin Grain (Dartmouth)

Resources: Websites/Organizations

- Books/Publications (just a few):
 - o Acres USA
 - The Albrecht Papers published by ACRES USA
 - Science in Agriculture Arden Andersen
 - The New Organic Grower Eliot Coleman
 - Biodynamics Rudolf Steiner
 - Hands-on Agronomy Neil Kinsey

• Websites:

- Brix Bounty Farm & Garden Resource Page brixbounty.com
- ATTRA <u>http://www.attra.ncat.org/</u>
- MOFGA Maine Organic Farmers & Gardeners Association Fact Sheets - <u>http://www.mofga.org/</u>

NOFA MASS Winter Conference – Jan 15th

A Whirlwind Introduction to Soil Fertility, From a Farmer's Perspective

I believe that renewing our focus on soil fertility will play a critical role in improving returns on our investment of labor on the farm & in the garden. Join us in a whirlwind tour through basic concepts of soil fertility; from testing techniques and cation exchange capacity to application methods and the roles of specific nutrients within our soils.

Beginning Farmer Scholarships Available www.nofamass.org/conferences/winter/newfarmer.php

Nutrient Dense Crops

- Food suitable for human consumption and nutrition
- Moving beyond process to focus on outcomes brix yield and human & animal health
- Emphasis on outcomes focuses our work on soil and crop health
- Consumer demand for taste and nutrition
- New research developing (e.g. blood sugar with mineralized fruits)
- Value vs. cost/price

Real Food Campaign - <u>www.realfoodcampaign.org</u> Nutrient Dense Crop Production Courses - 2011

Vermont

- <u>Shelburne Farms</u> Shelburne, VT Saturdays: Dec 4, Mar 5, Apr 30, June 25, Aug 20
- The Mountain School Vershire, VT Sundays: Jan 23, Mar 6, May 1, June 26, Aug 21

New York

- Hawthorne Valley Farm Ghent, NY Sundays: Jan 16, Mar 20, May 22, July 17, Sep 18
- Stone Barns Center Pocantico Hills, NY Saturdays: Dec 18, Mar 12, May 14, July 16, Sep 17

Connecticut

• <u>White Gate Farm</u> East Lyme, CT Sundays: Dec 19, Mar 13, May 15, July 10, Sep 11

Massachusetts

- Simple Gifts Farm Amherst, MA Saturdays: Nov 20, Feb 12, May 7, July 9, Sep 10
- Brix Bounty Farm Dartmouth, MA Saturdays: Jan 8, Feb 19, Apr 16, June 18, Aug 27
- Jones Farm Chelmsford, MA Sundays: Jan 9, Feb 20, Apr 17, June 19, Aug 28





Thank You for Building our Future Endowment

For more information on this presentation contact:

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FRESH VEGETABLES & COMMUNITY EDUCATION