

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

Tomatoes – June 27th, 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
 - Glaciers
 - Volcanoes
 - 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

North Field – Feb. 8th, 2008



North Field – Feb. 8th, 2008



North Field - June 1st, 2008



North Field – July 13th, 2008



Summer Squash - June 21st, 2009



Wet Soils > Lack of Oxygen/Aeration > Crop Failure



Summer Squash - June 21st, 2009

Summer Squash – Aug. 7th, 2009



Soil Crust & Slime – Aug 7th, 2009



The Difference a Year Makes...



Summer Squash – June 21st, 2009



Summer Squash – June 4th, 2010



June 27th, 2010



June 27th, 2010



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- Agricultural Management of our Soils > Future Impact

North Field March 31st, 2010



North Field April 30th, 2010



Tomatoes – July 14th, 2010



Valley Girl Tomatoes – July 14th, 2010



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) – NH_4^+ and NO_3^-
- 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.

Where are the Nutrients in the Soil?



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
 - 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. KCl 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)
- [Fedco – Organic Growers Supply](#) (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):
 - 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 - <http://www.attra.ncat.org/>
 - MOFGA – Maine Organic Farmers & Gardeners Association Fact Sheets - <http://www.mofga.org/>

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 - www.realfoodcampaign.org

Nutrient Dense Crop Production Courses - 2011

Vermont

- **[Shelburne Farms](#) 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

- **[White Gate Farm](#) 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



You Can't Eat Dollar Bills – A More Delicious Endowment for Future Generations



Thank You for Building our Future Endowment



For more information on this presentation contact:

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