Cost Effective Ways to Maximize Fertility Options

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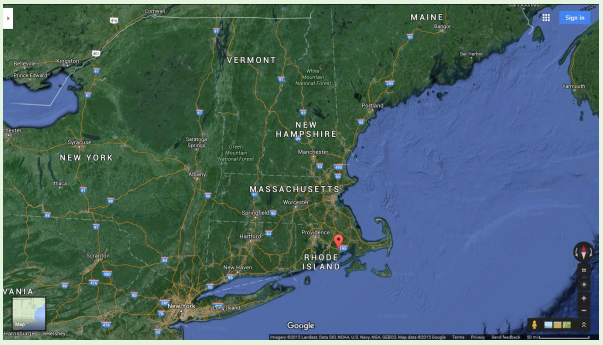
NEW ENGLAND FRUIT & VEGETABLE CONFERENCE

TUESDAY DECEMBER 15, 2015

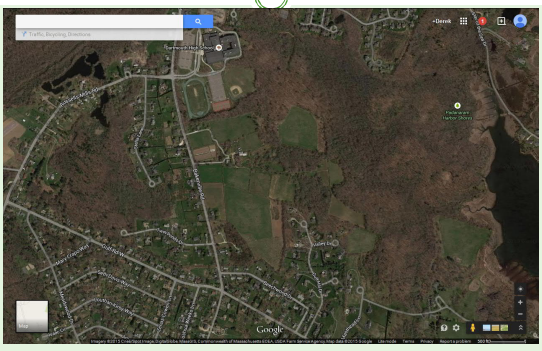
Context – Brix Bounty Farm, Dartmouth, MA

- Dartmouth – population ~35K, New Bedford 90,000
  - Agricultural Community, UMass Dartmouth, Coastal, Summer Population
- Derek Christianson – growing veg in NE since 2002.
- Brix Bounty Started in 2008 – Leased Land
- Moved to larger acreage in 2014 - ~10 acre footprint
- 3 Full-time Farmers "in-season" including myself
- All Produce Direct Marketed - ~$145K in Veg Sales in 2015 – historically moderate prices… slowing raising prices…
  - Summertime CSA - $45K
  - (Honor System) Farmstand - $80K
  - Farmers Market (downtown NB) – $8K
  - Wintertime CSA - $12K

Location: SE Coastal Massachusetts



Google View – Brix Bounty Farm

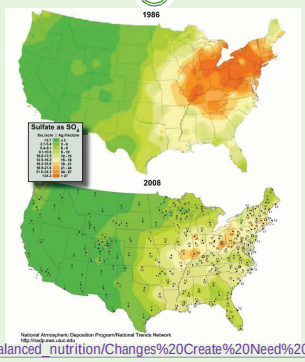


Context - Brix Bounty FY16 Budget Highlights

- Veg Income: $145 K + Other Farm Income: ~ $5K
  ~7-8 acres in production w/ some 2x cropped, 3 full-time farmers in season + a few harvest helpers…
- Expenses (top categories):
  - Personal Salary (Owner's Draw) $40-45K (30%)
    - 3500 hours/year… as many as 90 hours/week + in high season
    - Katie (wife) is primary caretaker for our 3 children, support for long hours
  - Labor $45K – continue to increase wages as farm budget allows (30%)
  - Rent $10K (note: includes hired tractor work)
  - **Fertility $14K (~10%)**
  - Seeds $8K (~5.5%)
  - Supplies $7K (~5%) Capital Improvements – $7K in '16 (5%)

Judging our Production: Quantity & Quality

Sulfur Deposition by Precipitation '86-08 (mosaic)



www.back-to-basics.net/balanced_nutrition/Changes%20Create%20Need%20for%20Sulfur.pdf

Shallots – August 2015

Ask the Right Questions

- What are the Farm's Limiting Factors?
  - Fertility
  - Labor (Quantity & Quality)
  - Markets
  - Weed Pressure
- How are We Building a Foundation or "Endowment "for Future Generations?
- Caring, Honoring, and Dignifying our Biological Systems

Honoring Complexity

Humility & Awe

Major & Secondary minerals are important.

Trace Minerals are also important, we & plants need them

Considering the Fixed Costs (of Labor)

In order to ensure financially viable farming operations, we need to "maximize" our return on labor while improving our natural resource base for the future.

Yield Limiting Factors may include Oxygen, Water, Nutrients

Do You Have Adequate Mineral Levels? Are These Minerals Bio-Available?

Considering Costs – Materials are "in-expensive"

Full Spectrum Fertility in '15 at $1,250 acre for materials

Supercharge a bed at $400/acre for amendments/fertilizer
Sidedress a bed at $100-$200/acre for A&F

At Brix ~1200 sq/ft bed
Yield 600 marketable heads of Lettuce
$1250/acre > $40 per bed or $.06 per head
At 4# per bed foot onions > cost $.05 per pound
Supercharge cost of $12 per bed or $.02 per head

Supercharging a Bed & Stale Bedding (6/5/15)

Framework

Is Fertility a "weak-link"

What is the capacity to increase investments in fertility?

How will you offset these added costs?

- Yield Improvement?
- Quality ?
- Higher Prices ?
- Cooperative Investments ?

Targeted Investments >>

Towards Greatest Economic Return >>

Allow for Further Investments or Greater Return…

Fertility Costs

- Inputs
- Equipment
- Supplies
- Labor
- "Savings"

Deep Nutrition Share at Brix Bounty

- Average $1500-2500 per year additional farm income from our CSA members for fertility improvements…
- Making the Ask…
- In 2016 – expand fertility campaign for the farmstand customers in August…

Determining Where to Focus Fertility $

- **Gather Information** – Observation of Crops, Soil Tests, Tracking Yields, etc. – Is there an obvious deficiency?
- Often best to trial full spectrum improvements before getting too "crazy"
- **Address macro deficiencies first** then move onto secondary nutrients…

N-P-K, Calcium, Magnesium, Sulfur
Remember Mineral Availability is Variable Through Year

N & K – Critical for Yield Tonnage, but
P and Ca for Quality

B for Ca mobility, S for protein, Zn for water use efficiency, etc., etc.

At Brix Bounty

Include a focus on current season's production – full spectrum plus foliars when possible + steward biology…

Emphasize calcium availability for improved root growth, phosphorous for energy (and sugar production)

Sulfur for proteins, potassium for water use efficiency, etc.

Fresh Market Onions – Ailsa Craig, Cabernet

Keys to Success

Early Season Growth

Managing Pests & Diseases
Onion Root Maggot, Thrips, Purple Blotch, etc.

Clean Cultivation – Minimize Weed Competition

Crop Study – July/Aug Onions

Grow our own starts

Cluster Planted – 4 seeds cell in 98's or 128's

3 rows at 12'' spacing in-row

8'' spacing if concerned about root maggot losses
6'' spacing on our high fertility field

Grown w/o irrigation (at Brix Bounty)

Nitrogen Budgets

What is the Amount of Nitrogen Needed for Your Crop?

Type of Nitrogen? Nitrate / Ammonium

Anticipated Yields? – Heavy – Aim for 6# per bed foot

Length & Timing of Season

Crop: Fresh Market Onions (late July > Aug)

Seeding/TP Date: late april/early may

Growing Days: ~84-105 days

Harvest Date: late july - aug

Cultural Notes: row cover at planting

Row Cover – Encourage Soil Temp – N Release

"Extra Credit" Pre-Plant Fertility

1 Labor Hour for 4 beds – at Brix 3x4 gal solo packs per acre

Boron Field Spray – simplest way to ensure uniform coverage for OG growers

- Cobalt, Moly, Selenium Spray – setting the table for soil biology and human health
- "Bio-Builder" Field Spray – liquid fish, sugar (molasses), inoculants, etc.
- Biodynamic Barrel Compost – Soil Biology Inoculant

Scallions – June 15, 2015

Nitrogen Needed for Onions

Total Nitrogen Needed = 150 # N
Organic Matter Credits = minus 50#N
(~15# per % OM) – 5% OM at Brix
~10# per % OM for non-irrigated conditions

Cover Crop Credits = minus 0#
Crop Residue/Carry Over = minus 0#
Soil Biology Credits = minus 0#
(i.e. azotobacter applications, etc)

Nitrogen Needed to Import = 100#

Addressing N Deficiency

Pre-Plant = 1200# composted chicken manure
(5-4-3) x 1200# = 60# N

& Alfalfa Meal "Spike" 760# at 2.6% N =~20# N
(if alfalfa meal direct from Pennsylvania at $15/50#)

Sidedress #1 = 760# alfalfa meal at 2.6% = 20#

Sidedress #2 = *no late N applications on onions*
Fertigation (if) *= no drip planned*

2015 Onions – Average Yields…

Additional Mineral Mix (per acre rates)

Additional Starter P
100-200# bone char and/or soft rock phosphate
Sul-Po-Mag (K-Mag) for early sulfur and additional K
100# - 200# depending on budget and need
Gypsum (b/c of our high Mg soils)
400#
and copper sulfate, manganese sulfate, zinc sulfate
(5-10# Cu S, 10-20# Mn S, 10# Zn S)
(boron, molybdenum, selenium applied via field spray)
or QB-10 (calcium borate) at 10# per acre

Scallions – August 20, 2015

Sidedressing & Foliar Sprays

- Sidedressing for Onions – not typically sidedressed b/c we want to avoid N late in growth cycle… occasionally we'll boost conductivity with k-mag + other materials…

Foliar Sprays – a multi-purpose crop monitoring tool

Time to apply ~1-2 hours per acre if using backpacks

Material costs – negligible…

Per 4 gallon backpack:

- 4-8 oz. Liquid Fish (Organic Gem) N+P
- Traces (BioLink Micro at 1-2 TBSP/gal)
- Therm X70 - Yucca

Addressing Fertility Deficiencies -

Best option will vary for each farm!

Compost typically doesn't provide balanced fertility…

Large Scale Farms – Custom Blends

Small Scale Farms – Efficiency of Targeted Applications

Trial – Observe & Measure > Inform Future Decisions

Cost Effective Ways to Maximize Fertility Options

Powerpoint .pdf of This Presentation Available at www.brixbounty.com

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