



Why Can't I Grow Strawberries Anymore?

Results of Eastern NY Strawberry Survey

Eastern NY Fruit and Veg Conference

February 20, 2018

Laura McDermott – ENYCHP Small Fruit Specialist



What is the “12 year effect”?





- Winter damage
- Poor vigor
- Poor nutrition
- Poor site selection
- Poor pest management



Stress can make
problems worse!

Root problems are caused by:

- Disease
- Nematodes
- Insects
- Cultural problems



Diseases caused by fungi

- Verticillium
- Black Root Rot (fusarium, Pythium, Rhizoctonia)
- Red Stele (Phytophthora)
- Anthracnose – not actually a root disease



Diseases

- **Verticillium Wilt**
- resembles drought stress
- occurs primarily in 1st year
- interveinal and marginal leaf necrosis
- inner leaves retain green color plants **wilt** under stress
- randomn distribution in field



Black Root Rot – Rhizoctonia, Pythium spp., Fusarium

- •Fine feeder roots dry up
- •Dark lesions develop and the outside of root turns black
- •Interior root core eventually turns brown
- •Severely infected plants collapse
- •Partially infected plants wilt during drought, or while plant is fruiting or rapidly growing



Red Stele – *Phytophthora fragaria*

- Infected plants are stunted
- New leaves are bluish-green and wilted
- Roots rot from tip to crown
- Lateral roots disintegrate resulting in the “rat-tail” taproot
- Interior core or “stele” appears red surrounded by healthy white cortex tissue



Phytophthora at crown
level – ‘Wendy’



Anthracnose - *Colletotrichum fragariae*, *C. acutatum*, *C. gloeosporioides*

- may cause daughter plants to die
- outer leaves die prematurely
- the plant may collapse from crown rot





Strawberry Viruses

- Strawberry Mild Yellow Edge Virus
- Strawberry Vein Banding Virus
- Strawberry Mottle Virus

Nematodes

Symptoms

Reduced growth
Yellow foliage
Excessive wilting
Reduced yields

May predispose plant to invasion of soil fungi
such as *Fusarium*, *Pythium*, *Rhizoctonia*, *Verticillium*

Stubby-root nematodes
Root-knot nematodes
Lesion nematodes



Insects – White Grub Complex

- June Beetles, Japanese Beetles and Chafers
- Adults nocturnal
- larvae are C-shaped, with six legs
- Stunted growth and plant dieback
- First year plantings most susceptible



Strawberry Rootworm

- Adults are nocturnal and shy
- Larvae are white and can be found in soil – root feeders
- Adults do the foliar feeding damage resulting in **distinctive**, ragged appearance



Root weevils – strawberry and black vine

- Light colored, C-shaped larvae found in soil around the plant or imbedded in the crown - larvae are legless.
- Adults beetles have characteristic weevil snout
- Adults feed on strawberry leaves causing **characteristic c-shaped notches** on the leaf edge
- Foliar feeding is not the problem – larvae feeding on roots





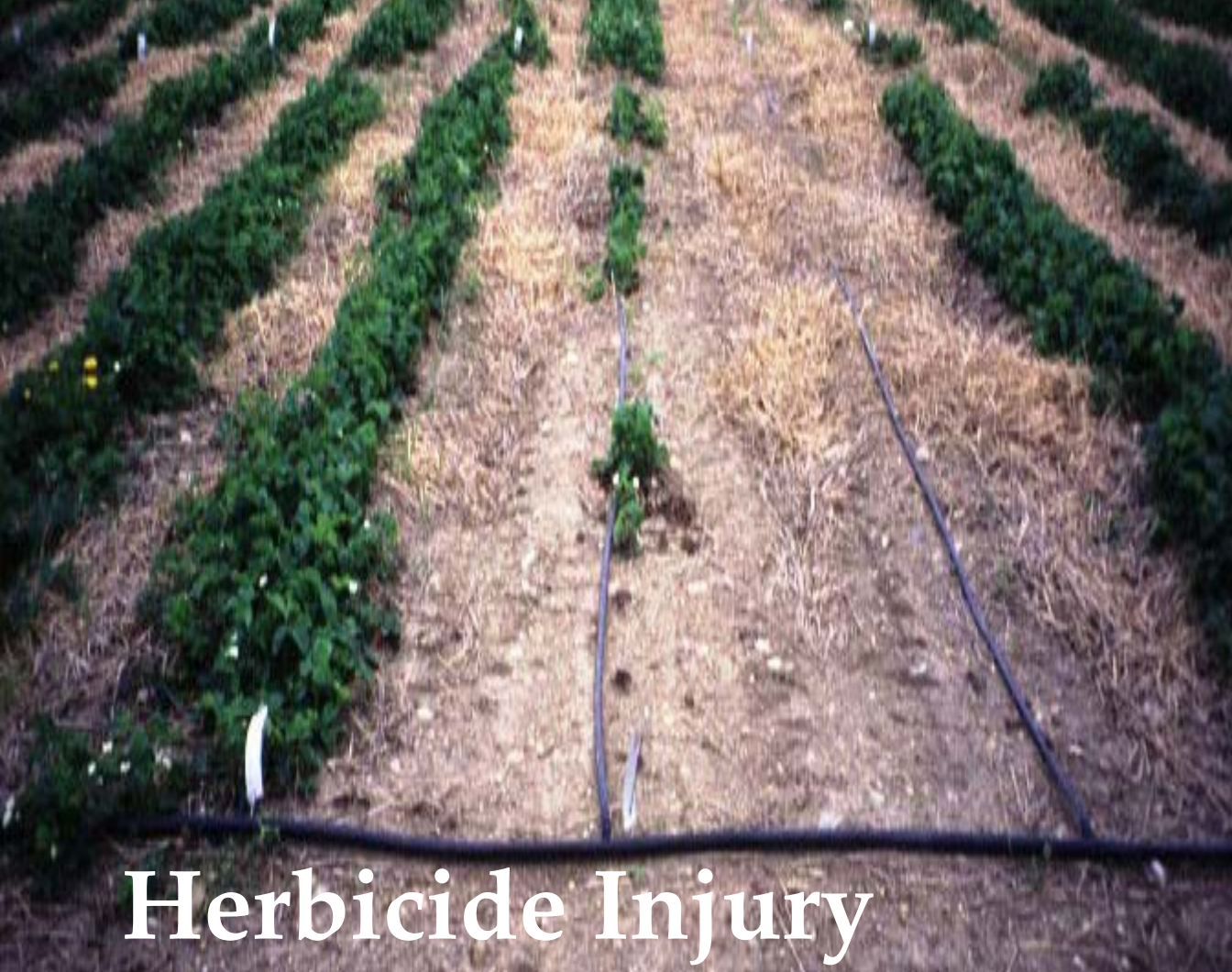
Winter Injury

- Brown flecking highlighted by creamy tissue
- Poor crown regrowth
- No signs of nematode issues
- Can occur at 10 degree F



Fertilizer injury

- Nitrate alone causes poor root growth
- Ammonium fertilizer alone is fine, but may be easily lost
- A mixture of two is best



Herbicide Injury

- Symptoms vary with material
- Most herbicides, if misapplied, will result in poor plant vigor, and poor root growth





Results of Eastern NY Strawberry Survey

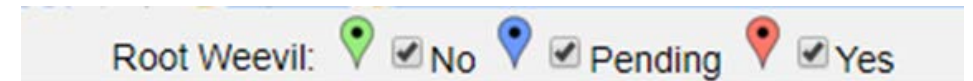


Strawberry Root Weevil Presence

57 Farms Sampled

Presence in Clinton, Essex, Ulster, Columbia

Only 2 farms with major infestation – 3 other farms with presence noted



<https://www.easymapmaker.com/map/af245ec2942e20ca989e899b3ddf52d6>



Other Insects

- White grubs
- Strawberry rootworm
- Sap Beetle



H. Burrack NC State University

Black Root Rot

Caused by several fungi we sampled for during our survey: *Rhizoctonia spp.*, *Pythium spp.*, & *Fusarium spp.*





Roots turn necrotic and cannot function for water uptake

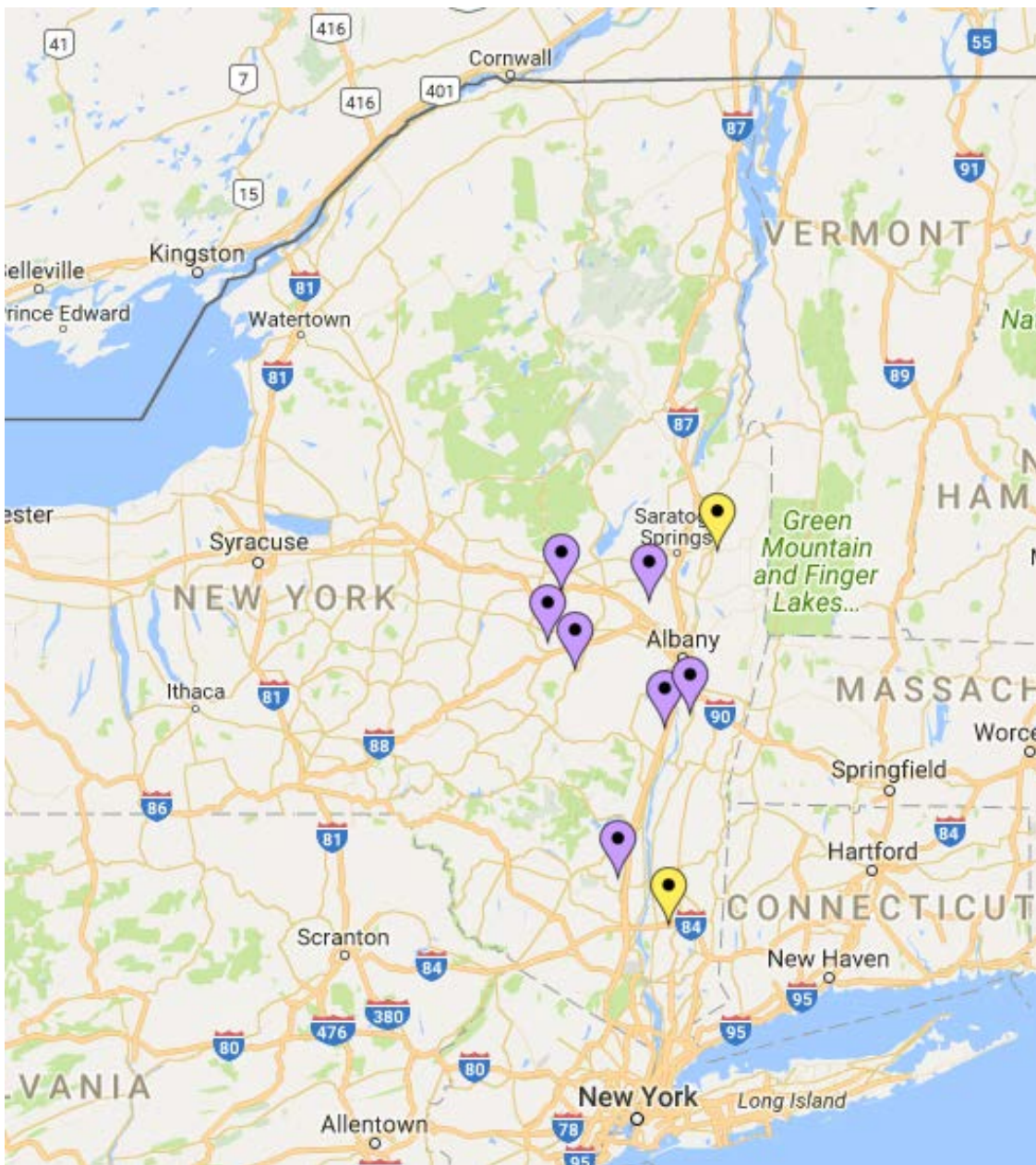
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- Severely infected plants collapse
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Fusarium Presence in Strawberries

Presence found on 10 farms

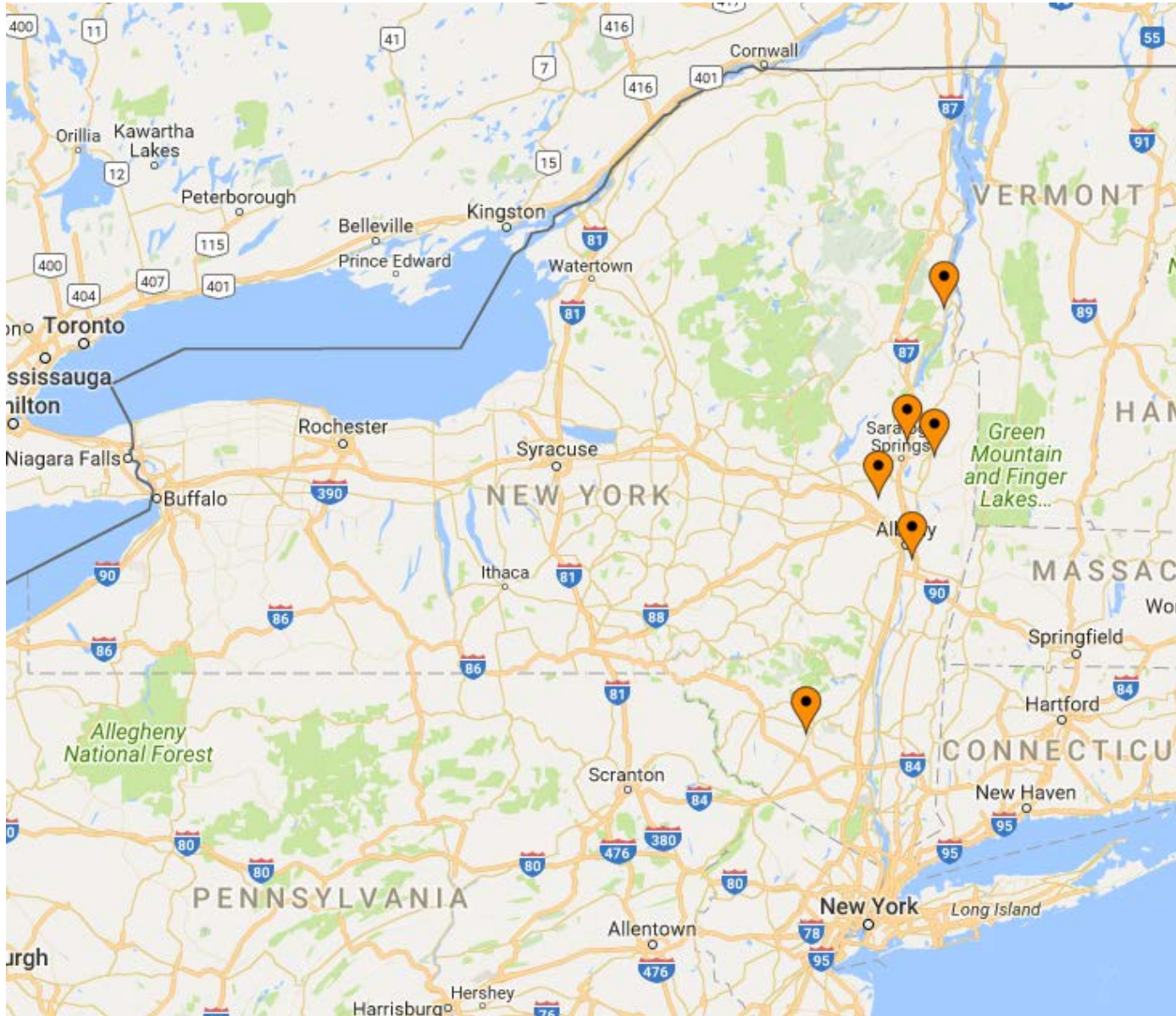
-  Fusarium Crown Rot: Washington & Dutchess County
-  Fusarium sp: Schoharie, Ulster, Columbia, Greene, Schoharie, Schenectady

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Rhizoctonia

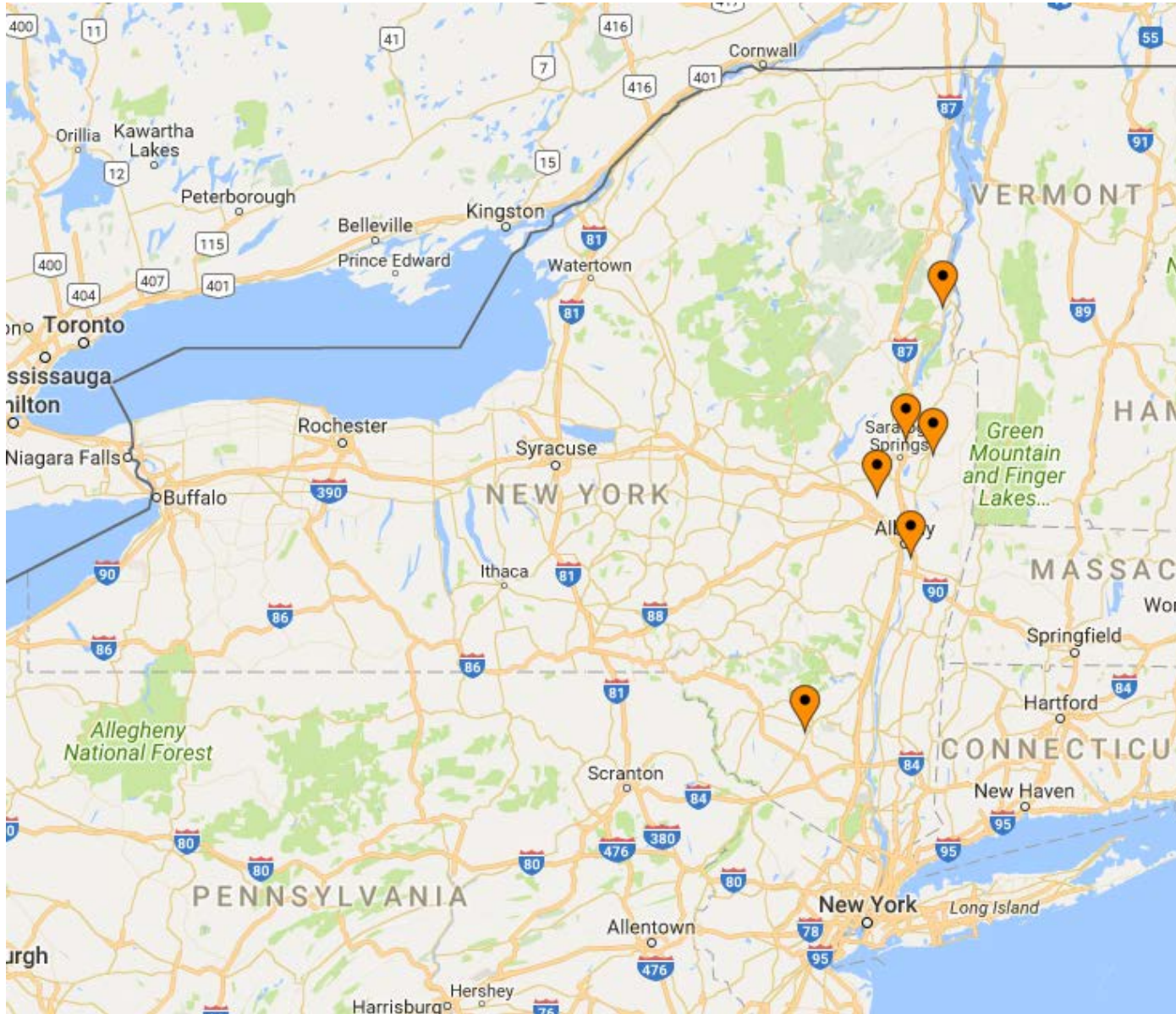
Presence found on 10 farms



Saratoga
Schenectady
Rensselaer
Essex
Ulster
Washington

Misc. Disease

- Pythium
- Mycosphaerella
- Pestalotiopsis
- Botrytis



Verticillium

2 farms tested had
confirmation of infestation.



<http://www.omafra.gov.on.ca/IPM/english/strawberries/diseases-and-disorders/verticillium-wilt.html>



<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=10993>

Soil Testing Results

Measured Soil Textural Class: **fine**

Sand: --% - Silt: --% - Clay: --%

Group	Indicator	Value	Rating	Constraints
physical	Surface Hardness	146	57	Aeration, Infiltration, Rooting, Crusting, Sealing, Erosion, Runoff
physical	Subsurface Hardness	189	84	
physical	Aggregate Stability	10.0	9	
biological	Organic Matter	2.5	5	Nutrient and Energy Storage, Ion Exchange, C Sequestration, Water Retention
biological	Soil Respiration	0.4	22	
chemical	Soil pH	5.8	42	
chemical	Extractable Phosphorus	5.3	100	
chemical	Extractable Potassium	131.0	100	
chemical	Minor Elements Mg: 121.2 / Fe: 6.4 / Mn: 13.6 / Zn: 0.8		100	

Soil quality ranged from medium to excellent on Cornell Soil Health Tests

Common Issue Included:

- Aggregate stability
- Organic matter
- Soil respiration

Overall Quality Score: **58** / Medium

Fumigation



Anaerobic Soil Disinfestation

ASD 3 weeks/clear



Untreated/clear



9 ton/ac rice bran used in ASD



With thanks to Jim O'Connell, Anita Minnifield and Cameron Fuhr for surveying work and Annie Mills for data and presentation support.

Funding support from NYFVI.



Questions?

Contact me at:

lgm4@cornell.edu

518-791-5038

