



Anaerobic Soil Disinfestation and Biofumigation in Perennial Strawberry Systems:

Will It Help?

New England Vegetable and Berry Growers
Northhampton, Massachusetts
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- Why is this topic important?
- What are the specific problems?
- How can growers improve the situation?
- Where do we get information and support?
- Who should consider these approaches?



“12 year effect”

Not New!



Root problems are caused by:

- Disease
- Nematodes
- Insects
- Cultural problems



Stress can make problems worse!

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





How can farmers improve the situation?

- Move to annual culture
- Rotate fields intensively
- Incorporate cover crops
- Utilize predator species
- Chemical fumigants/fungicides
- Biofumigation
- Tarping
- Anaerobic Soil Disinfestation



Fumigation

- Expensive and hard to find
- Scale limiting
- Incomplete control
- Unsustainable

Biofumigation

- Timing issues in strawberry systems
- Not a 'quick fix'
- Commitment to cover crops is necessary



Anaerobic Soil Disinfestation

ASD 3 weeks/clear



Untreated/clear



9 ton/ac rice bran used in ASD

- Showing great promise in warm soil regions and in high tunnels
- Expensive
- Limited testing in cold regions

Hypothesis for northeast plasticulture and matted row JB strawberries:

- ASD will control
 - soil borne disease fungi
 - nematodes
 - weeds
- ASD will have no negative impact on soil health
- Carbon source will impact pest control.
- Cost vs. benefit of ASD should not discourage adoption





Methodology

- 4 Farms
 - 2 matted row - conventional
 - 1 plasticulture – conventional
 - 1 plasticulture, high tunnel - organic
- 3 carbon types
 - Alfalfa Meal (9 T/a)
 - Brassica Seed Meal (4.5 T/a)
 - Dried Molasses (9 T/a)
- Three varieties – Jewel, Cavendish, Galletta
- Additional treatments
 - Biofumigation – ‘Caliente’ Mustard
 - Chemical fumigant
 - Fungicide – Mefanoxam
- 3 years of plant and soil data
- 2 years of yield data



Apply carbon



Incorporat



Wet soil to field capacity



Tarp for 2-3 weeks



Sustained soil temps of 68-85° F





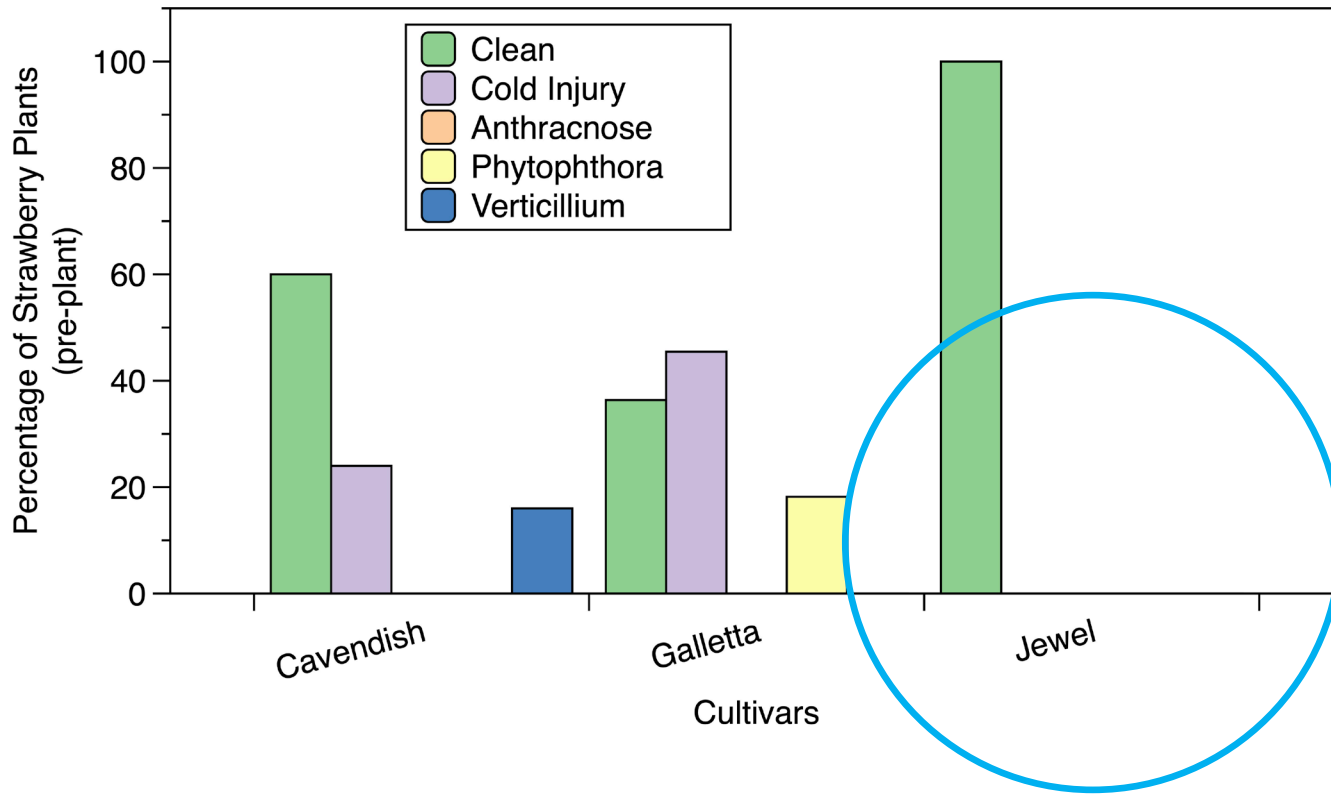
Tarp removed – gas off for several days

Measurements

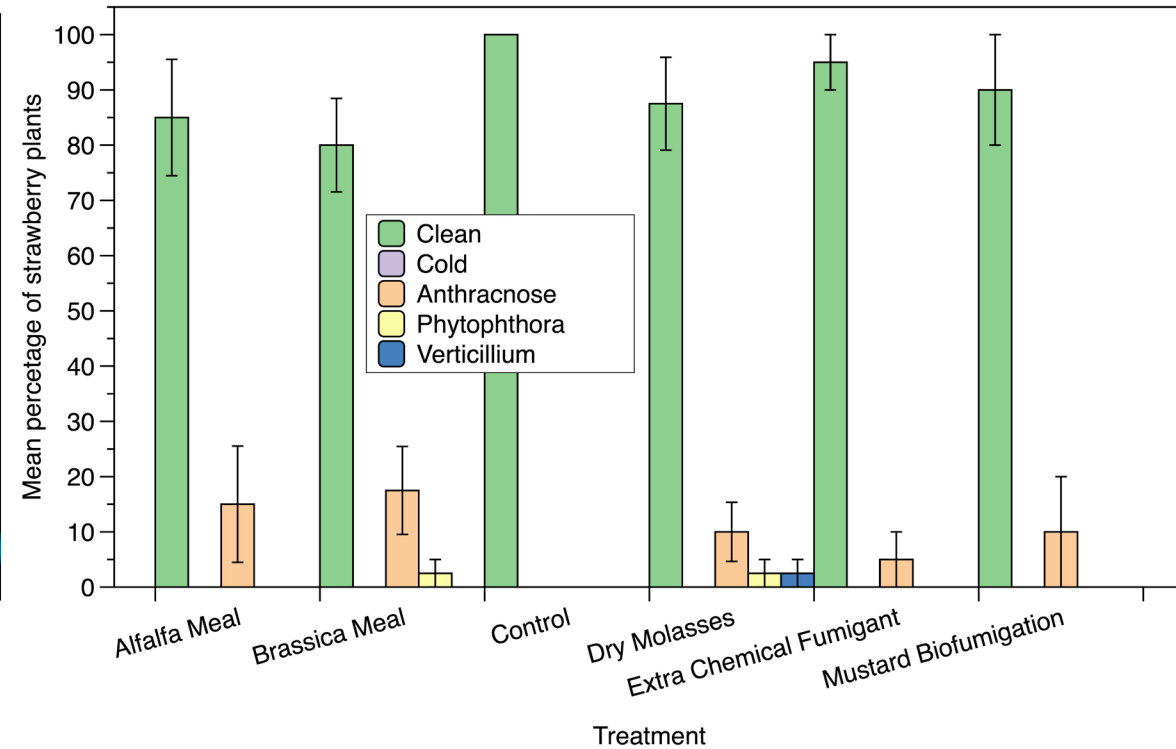
- Soil Health – 1x/year
- Plant vigor – 3x/year
- Yield – 2 years
- Fruit Quality – 2 years
- Weed infestation – 2x/year
- Plant health – 1x/year

Strawberry ASD results

Pre-plant: All three cultivars



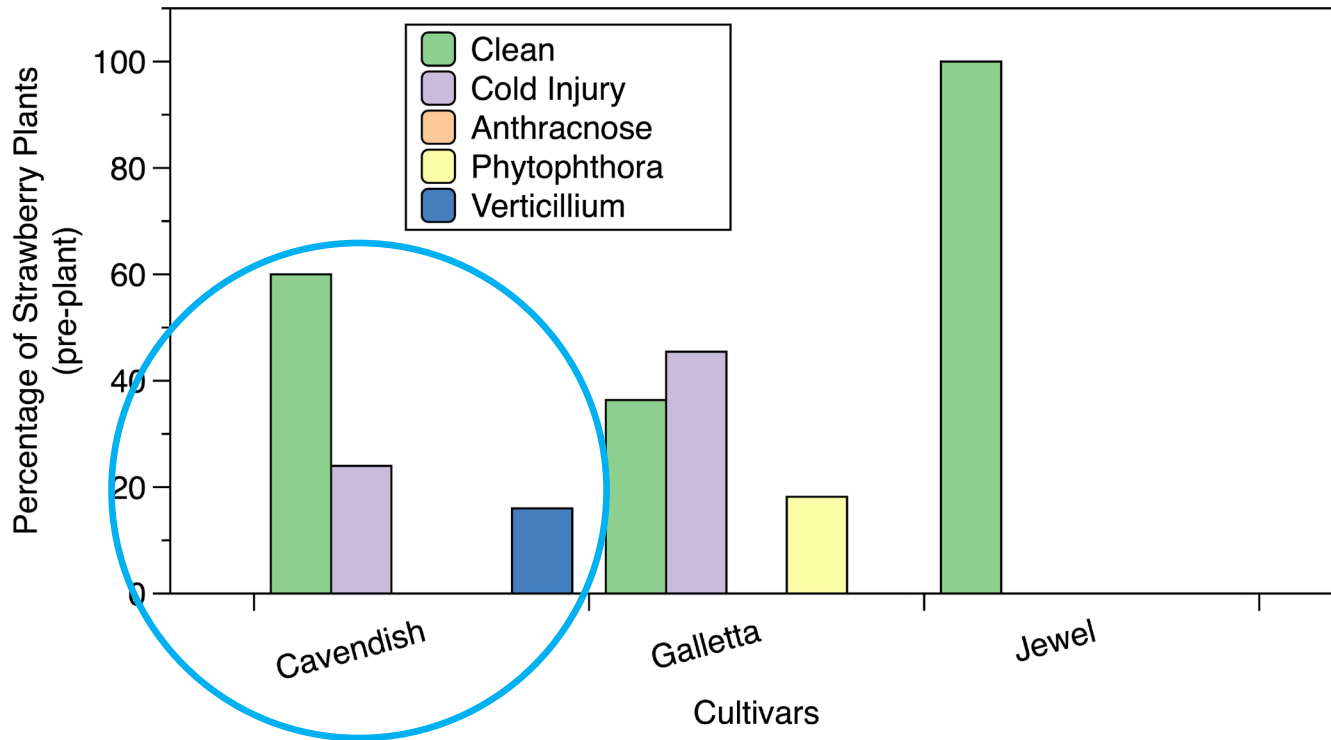
Post-plant: 'Jewel'



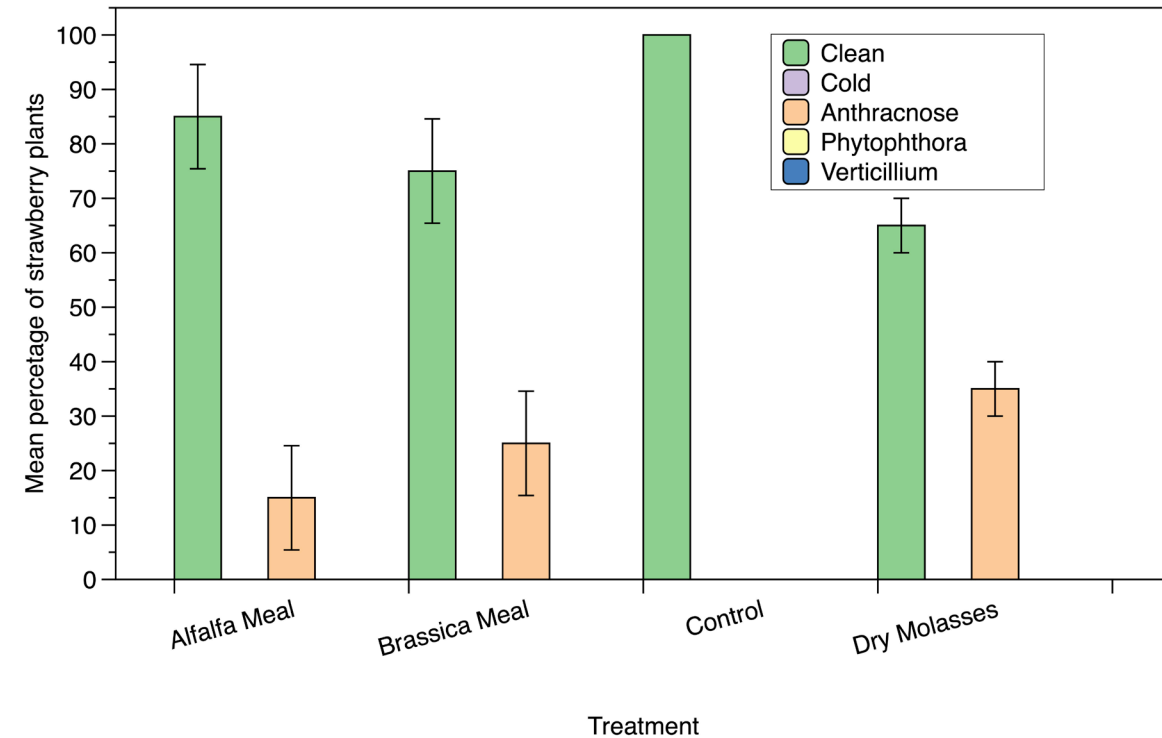
'Jewel' Clean pre-plant, picked up anthracnose in field?

Strawberry ASD results

Pre-plant: All three cultivars



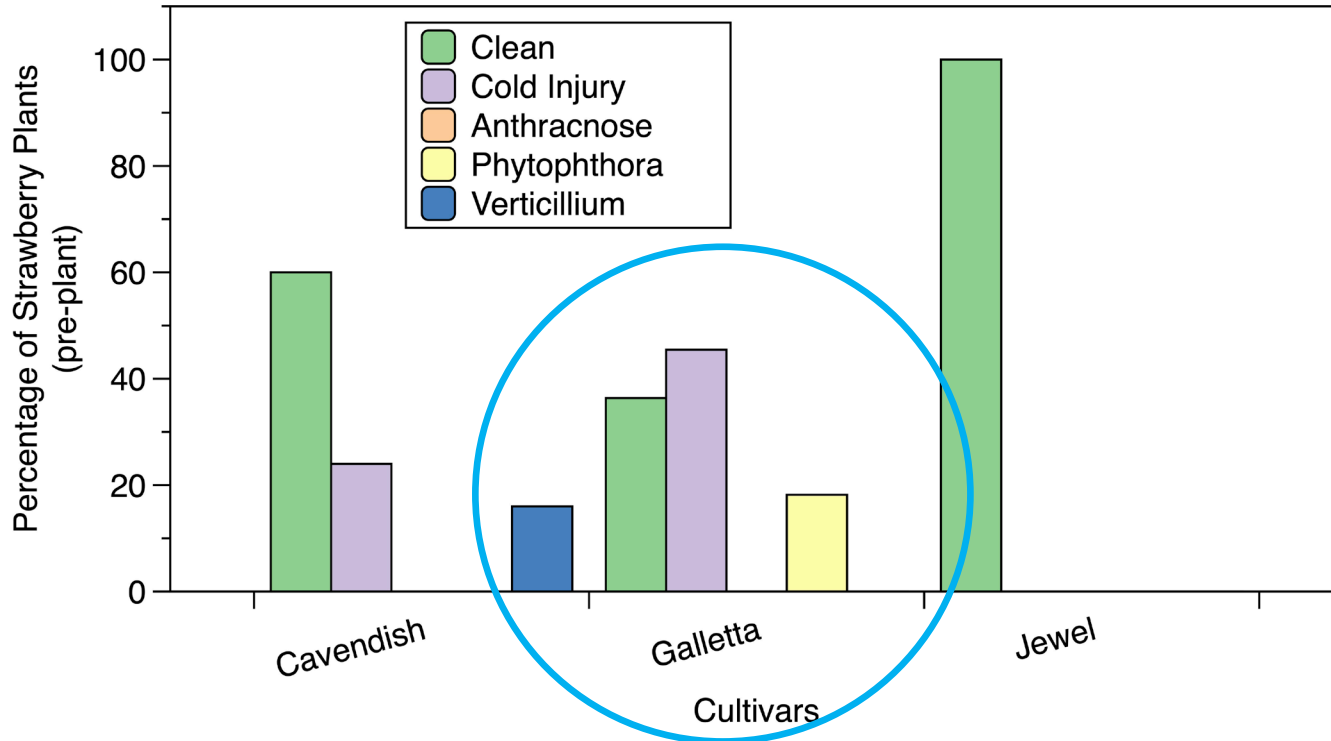
Post-plant: 'Cavendish'



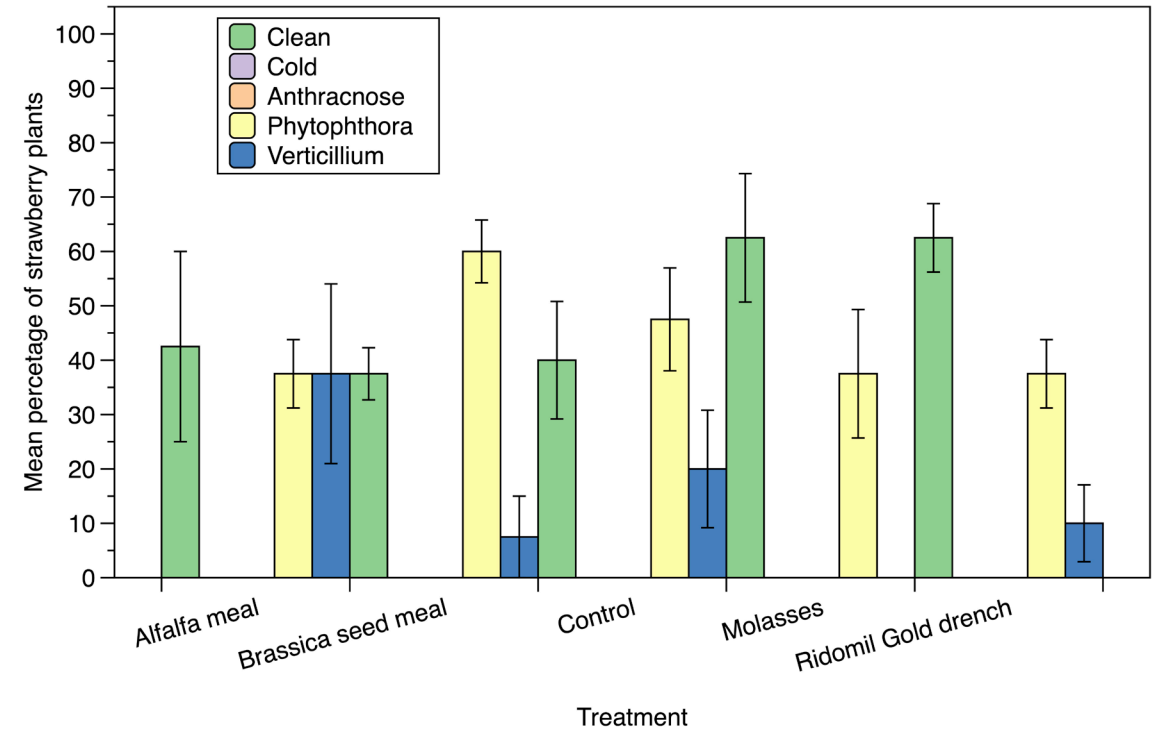
'Cavendish' Clean pre-plant, picked up anthracnose in field?

Strawberry ASD results

Pre-plant: All three cultivars



Post-plant: 'Galletta'



'Galletta' some diseases pre-plant, increased in some treatments, not alfalfa?

With thanks to Cornell Cooperative Extension Student Interns Anita Minnifield and Cameron Fuhr for surveying work. Natasha Field, Chuck Bornt, Lindsey Pashow, Annie Mills, Jim O'Connell and Amy Ivy for support of past and current project(s), Caleb Goossen, Anya Osatuke and Kerik Cox for 'pandemic push' and Cornell Insect and Plant Disease Diagnostic Lab staff for their dedication to the cause!



Questions?

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