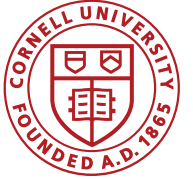


Cornell Cooperative Extension
Cornell Vegetable Program

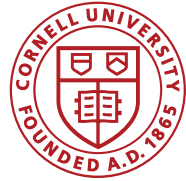


2018 Eriophyid Mite Control Trial Results

Christy Hoepting, CCE Cornell Vegetable Program

2019 Garlic School
Batavia, NY: March 20, 2019

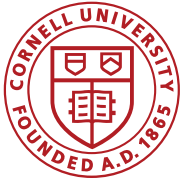
Eriophyid Mites - Diagnosis



- Symptoms show up after curing in storage
- Light-weight shrunken bulbs
- Cloves have dull surface, powdery, dusty (not shiny)
- E. mite feeding is often associated with *Penicillium* and/or *Fusarium*



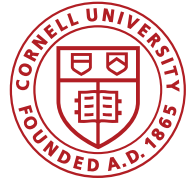
Eriophyid Mites - Diagnosis



Eriophyid Mites - Diagnosis



Eriophyid Mites - Diagnosis



10 x magnification



32 x magnification

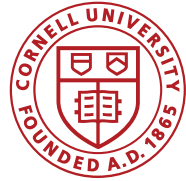


400 x magnification



Photos: Frank Hay

Eriophyid Mites - Diagnosis



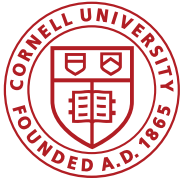
Shrunken bulbs



Scales fall off cloves



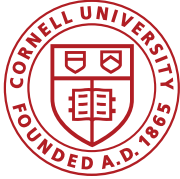
Eriophyid Mites - Diagnosis



- If E. mite-infested bulbs survive the winter, early growth may be stunted, twisted and streaked.
- Does *Fusarium* spp. “chase” E. mite damage?

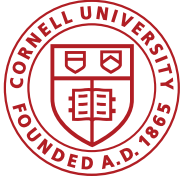


Eriophyid Mites – Favorable Conditions



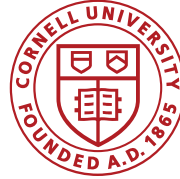
- Maximum population growth occurs at 77° and 80-95% RH
- Reproduction slows as temperatures drop
- No reproduction below 43°F
- 1 hour of 113 °F will kill the eggs
- Survive in the soil
- Not favored by field saturation – more of a problem in dry years?
- Conifers, shrubs and bedding plants are also hosts

Eriophyid Mites: Control Measures in the Literature



- Soak seed stock for 24 hours immediately prior to planting in a 2% soap and 2% mineral oil water bath (Jepson and Putnam, 2008 – Oregon State)
- Heat garlic to between 113° and 119° F for 1 hour (Courtin et al., 2000).
 - Do not exceed 120°F, at which point waxy breakdown occurs.

Eriophyid Mite 2018 Control Trial - Albion Treatments



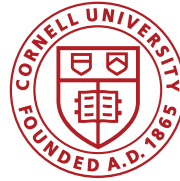
All E. mite-infested cloves except Trt. #3

No.	Application	Product and Rate per Acre
1		Untreated - infested cloves
2		Untreated - clean cloves from infested bulbs
3		Untreated - clean seed (large bulbs)
4	seed treatment	Avicta 500 FS 0.05 mg abamectin per seed
5	seed soak (4 hour)	Agri-Mek SC 4 hour soak @ 0.072 g a.i abamectin/L
6	seed soak (24 hour)	2% soap + 2% v/v mineral oil 24 hour soak
7	heat treatment	heat garlic to 113-115 F for 1 hour
8	dip (2 min)	Terraclean (1:250 dilution) 0.4% v/v Mixing error: actual 1% v/v
9	foliar app ABC	Agri-Mek SC 3.5 fl oz + Dyne-Amic 0.25% v/v
10	foliar app ABC	Zeal WSP 3 oz + Dyne-Amic 0.25% v/v



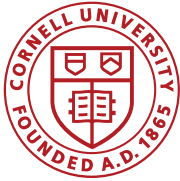
ABC: Jun 17, 22, Jul 1 – CO₂ backpack sprayer

Eriophyid Mite 2018 Control Trial - Albion Treatments – mineral oil & soap soak

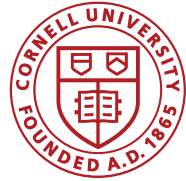


Used wrong kind of soap – dish soap may strip off wax

Eriophyid Mite 2018 Control Trial - Albion Treatments – dip or soak

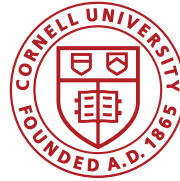


Eriophyid Mite 2018 Control Trial - Albion Treatments – hot water treatment

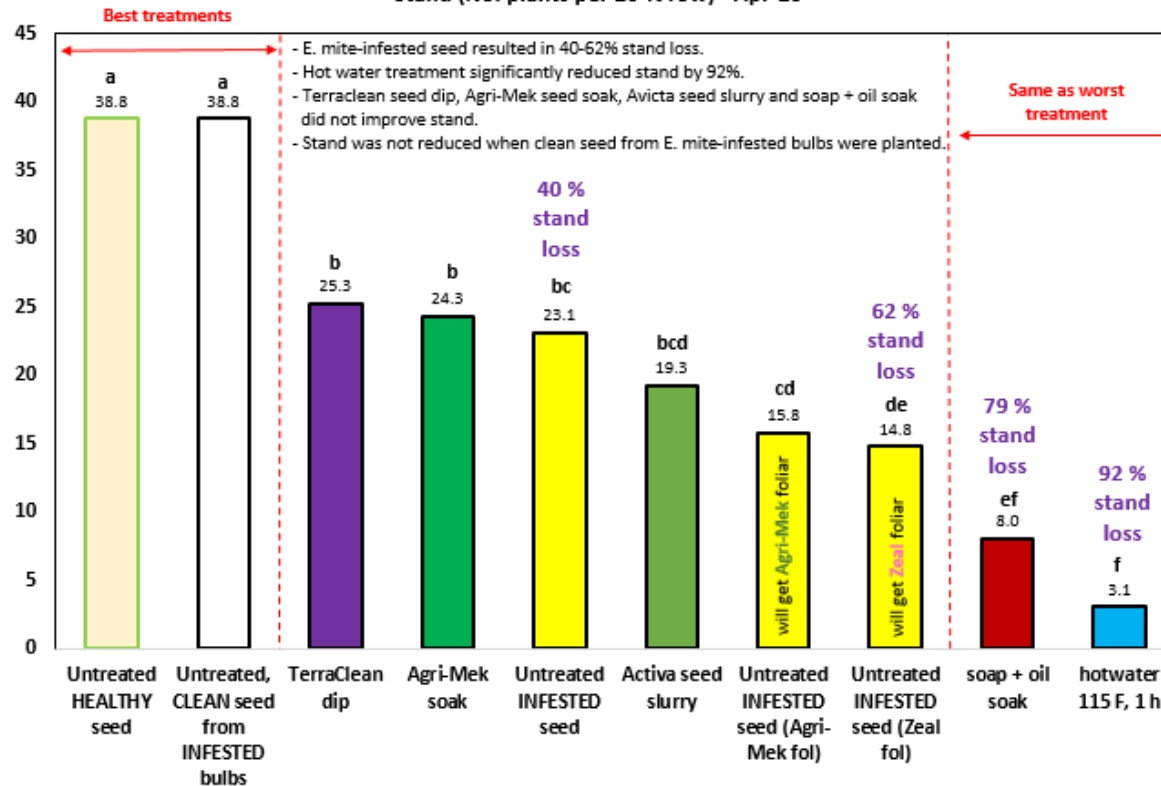


Stove-top

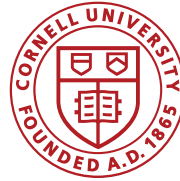
Eriophyid Mite 2018 Control Trial - Albion Results – Emergence/Stand



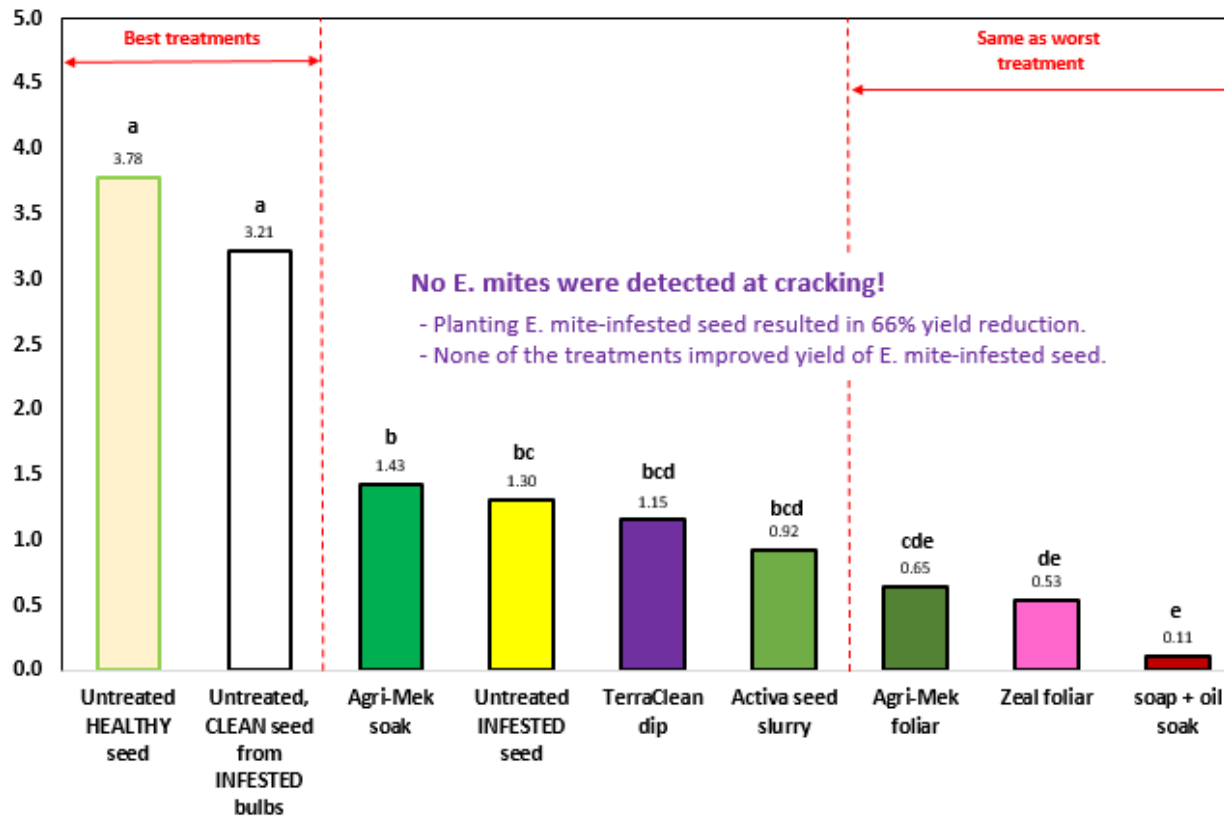
Evaluation of Treatments for Control of Eriophyid Mites in Garlic, Holley, NY, 2018:
Stand (No. plants per 20-ft row) - Apr-23



Eriophyid Mite 2018 Control Trial - Albion Results – E. mite & Yield

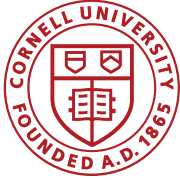


Evaluation of Treatments for Control of Eriophyid Mite in Garlic, Holley, NY, 2018:
Marketable Yield (lbs per 20 ft row)



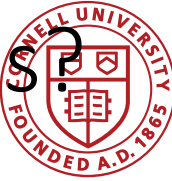
No yield from hot water treatment

Eriophyid Mite 2018 Control Trial - Albion
Results – No E. Mites



Where did the
E. mites go???

Curing & Storage Conditions Favorable for E. Mites



Top necks to 4-6-inch

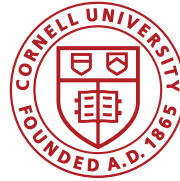


Curing: high tunnel with shade cloth



Storage: inside front door of steel barn in mesh bags

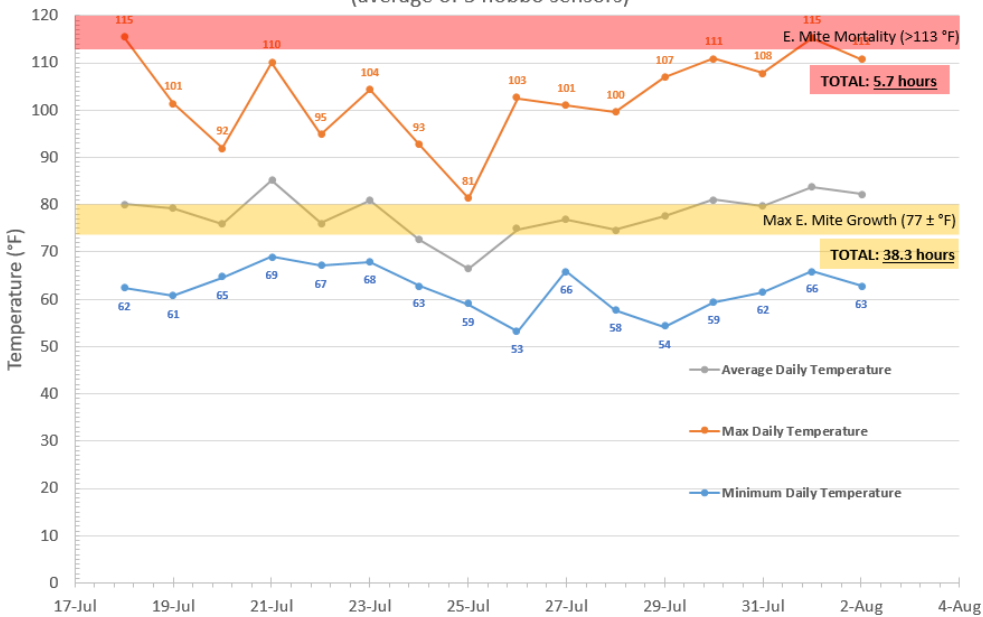
Curing Conditions Favorable for E. Mites?



2017

High Tunnel - No shade cloth

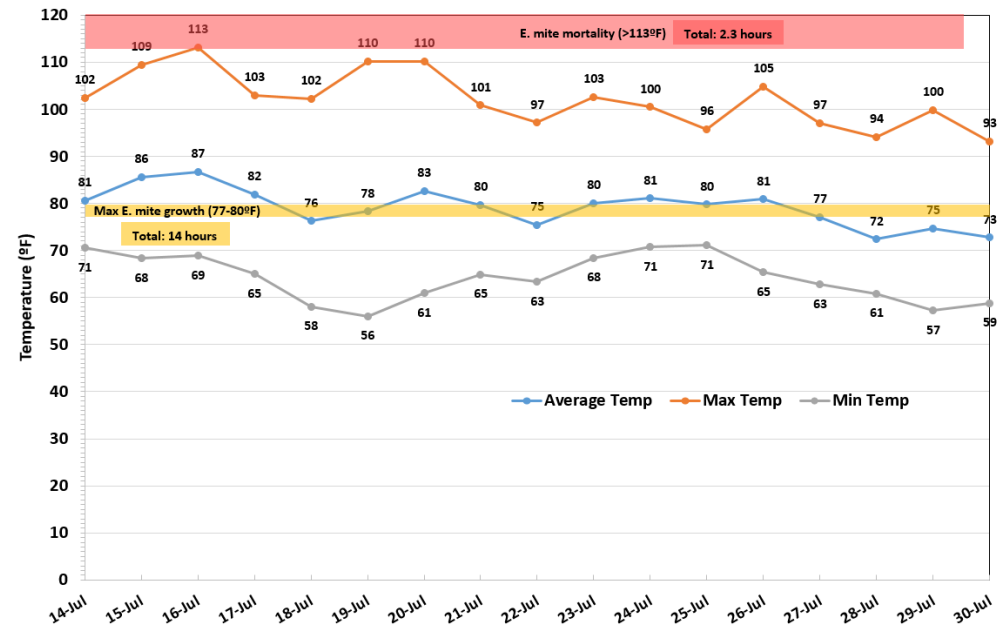
Curing Temperature (°F)
(average of 3 hobbo sensors)



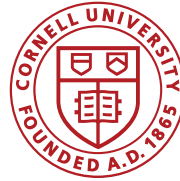
2018

High Tunnel - With shade cloth

Curing Temperature (°F) - High Tunnel with Shade Cloth, 2018
Daily Maximum, Average and Minimum (Average of 3 sensors)

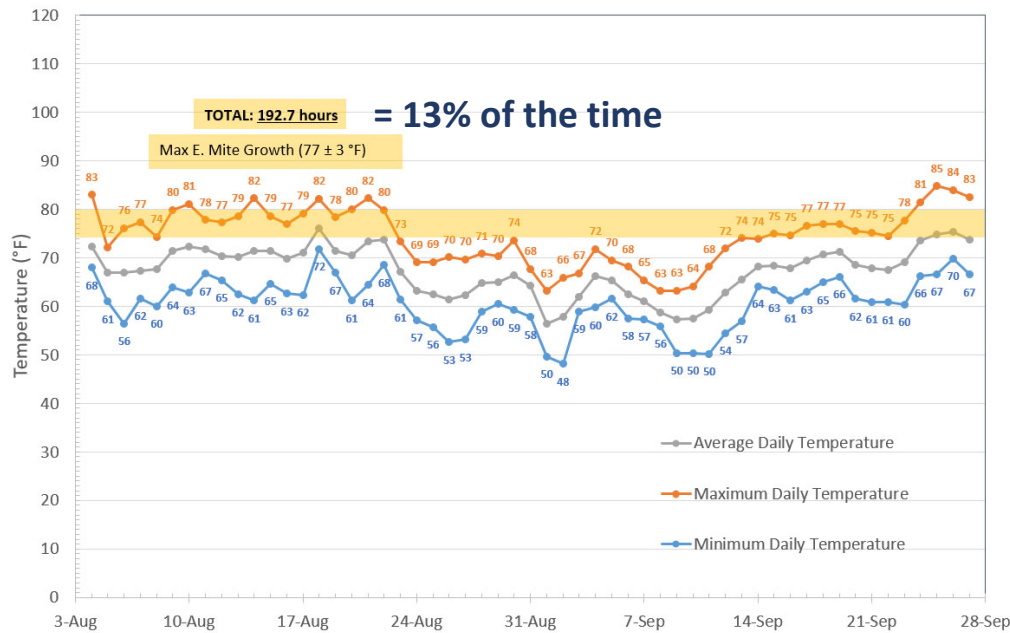


Storage Conditions Favorable for E. Mites?



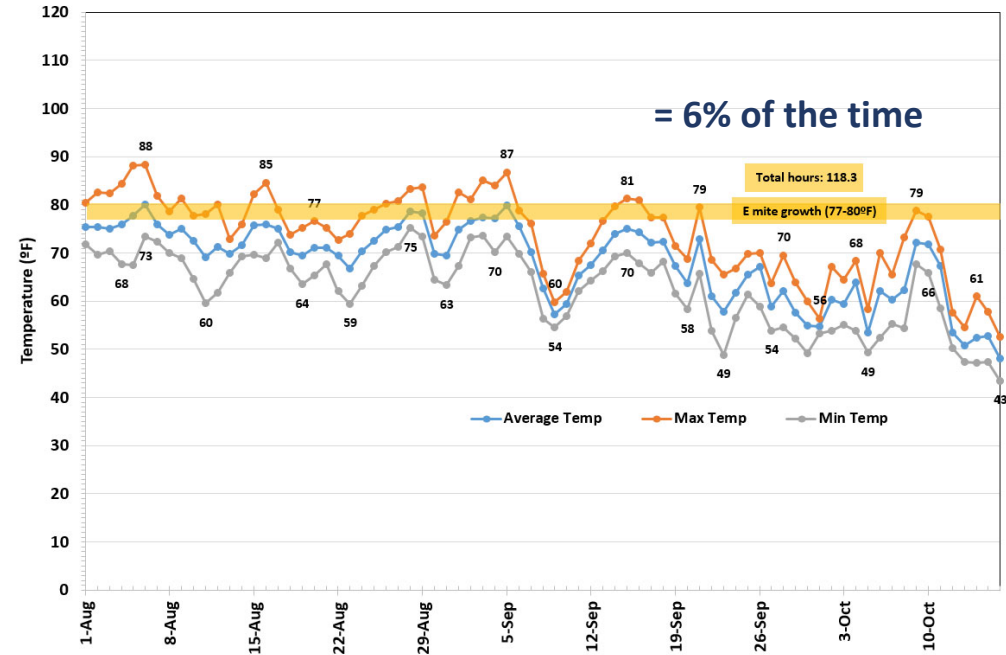
2017

Storage Temperature (°F)
(average of hobbo sensors)

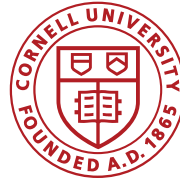


2018

Storage Temperature (°F) - Inside Front Door of Steel Barn, 2018
Daily Maximum, Average and Minimum (Average of 3 sensors)



Post-Harvest Garlic Survey



- Garlic grown in one place
- Harvested, leave tops on
- Distribute to growers to cure and store using their standard practices
 - Six 50-lb mesh onion bags with 10 plants per bag
 - Temperature and relative humidity sensor in one of bags
 - Bulb samples remain in bags with sensors
- Collect samples back in early to mid-October (after storage, at time of cracking)
 - Grade and weigh, quality assessment, etc.
 - Relate quality to curing and storage conditions
- If you are interested in participating, let me know!