



Cornell University

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Modern Apple Scab Management

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Jedna askospora dospeva na vlažan list. Naročito su osetljivi mladi listovi.



Zrele askospore se pod uticajem kapi kiše izbacuju u visinu i nošene vetrom dospevaju na list jabuke. Izbacivanje askospora traje tokom čitavog proleća.

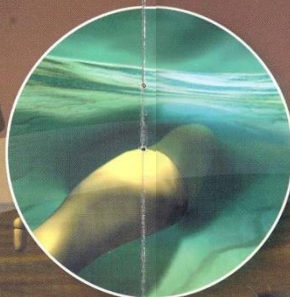


Presek jedne "Peritecijije" u kojoj se nalaze "askusi", svaki sa osam zimskih spora (askospore) koje čekaju proleće da nastave infekcije.



Gljivica *Venturia sp.*, prezimjava u inficiranim opalim listovima na tlu zasada.

"Klijanjem" askospore gljivica dospeva ispod površine lista gde formira "stromu".



Iz strome izbijaju "konidiofore" na kojima se formiraju letnje forme spora i konidije.



Uz pomoć kišnih kapi se ove letnje spore šire po zasadu do kraja vegetacije.



Simptomi na plodu



Stalno formiranje novih spora donosi nove infekcije



Simptomi na listu

Pozadina slike: Površina opalog lista u jesen sa brojnim "peritecijama" u kojima prezimjava gljivica (uvećano 500x)

Apple Scab (*Venturia inaequalis*)

Apple Scab Management

- Cultural Practices -

High-Infection Orchard

- Reduce scab spore dose in leaf litter
 - Promote microbial degrading: urea 40 lb/A urea (100 gal / A)
 - 2.5 ton / A of lime
 - Flail mow

Low-Infection Orchard

- Late leaf infections important source of inoculum
 - Assess 600 shoots (less or more than 53 leaves)

Apple Scab Management

- Models -

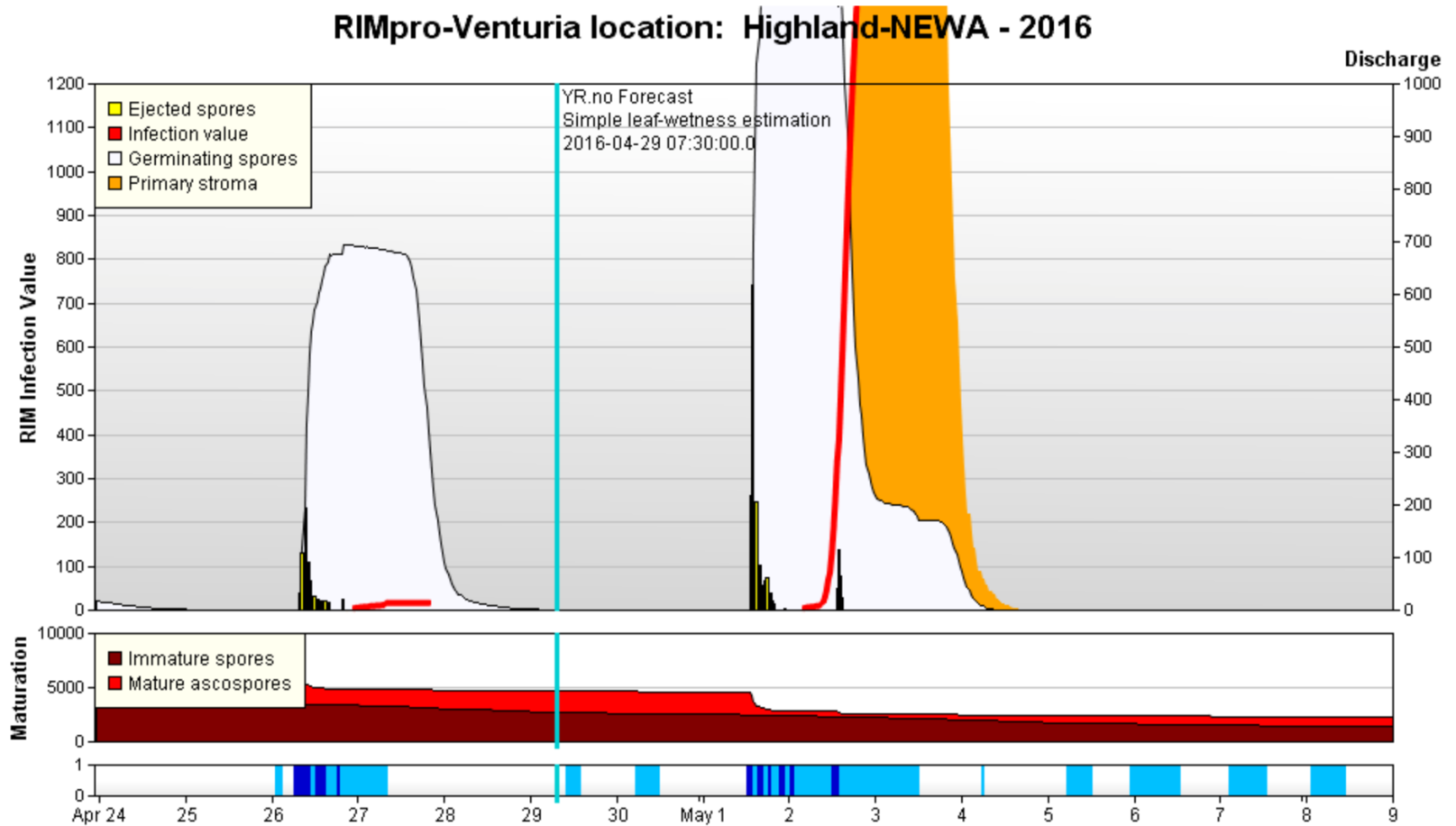
- Timing - prediction models
 - NEWA
 - RIMpro

RIMpro

- Biofix – first ascospore discharge or GT
- Models biological development of apple scab (ascospore maturity, spore release, infection)
- From biofix to end of ascospore release
- Uses Norwegian world weather forecast
- Predicts when infections a likely 10 days ahead
- Forecast updated 15 min

Apple Scab Management

- RIMpro Graph -



Graph

- NOTE: The red curved line labeled as “infection value” in the largest, top graph represents RIM-values which can be interpreted as the percentage of the total season’s ascospores that are likely to cause infection in any given event multiplied by 100. Thus, a RIM value of 1000 would indicate that 10% of the total season’s ascospore probably caused infections during that event.

Apple Scab Management

- Alternate Fungicides of Different MOA -

Main FRAC Groups:

- DMI (3)
- QoI (11)
- SDHI (7)
- AP (9)
- M3, M4 (Multisite: phthalimides, dithio-carbamates)
- **MBC (1) thiophanate**
- **Guanidines (U12) dodine**



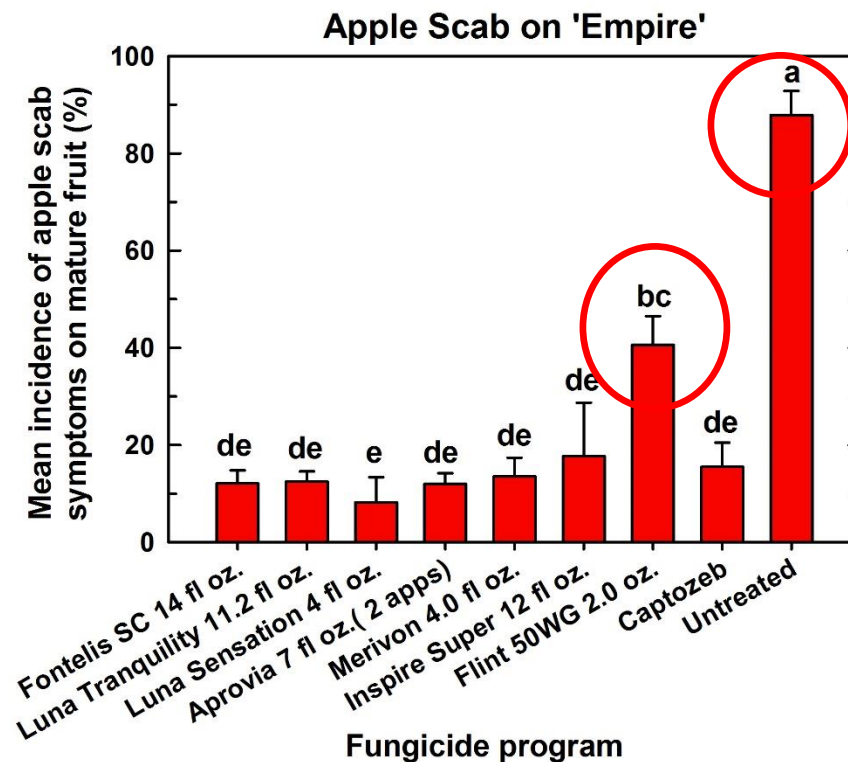
Apple Scab Management

- Fungicides -

- Chemical Control
 - **SDHI:** Luna Sensation (+Qol), Aprovia, Sercadis, Merivon,
 - **Qol-s:** Flint, Sovran, Cabrio
 - **DMI-s:** Inspire Super (+AP), Indar
 - **Pyrimidines:** Vangard, Scala
 - **Multi site:** Captan, Manzate, Koverall, Penncozeb
 - Kick-back, protectant, systemic, local-systemic
 - Rotate with unrelated fungicides (3-4 per year)
 - Tank mix Qol + captan for visible scab lesions
 - Captozeb

Efficacy Trials by Kerik Cox 2012

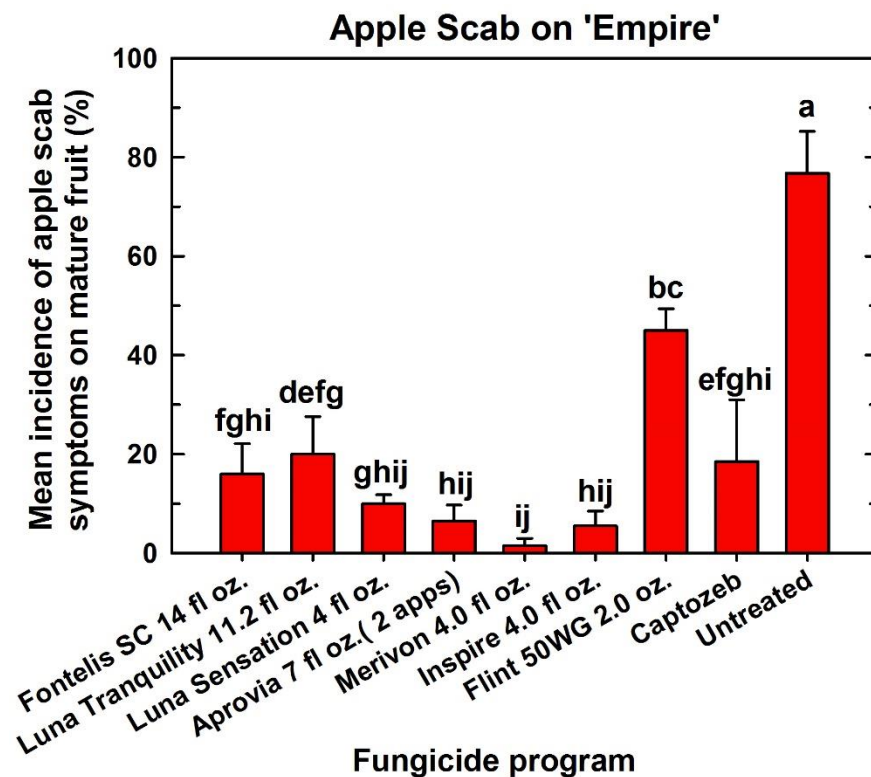
- Resistance -



- SDHIs & QoI+SDHI premixes = Excellent
- Practical resistance Flint

Efficacy Trials by Kerik Cox 2012

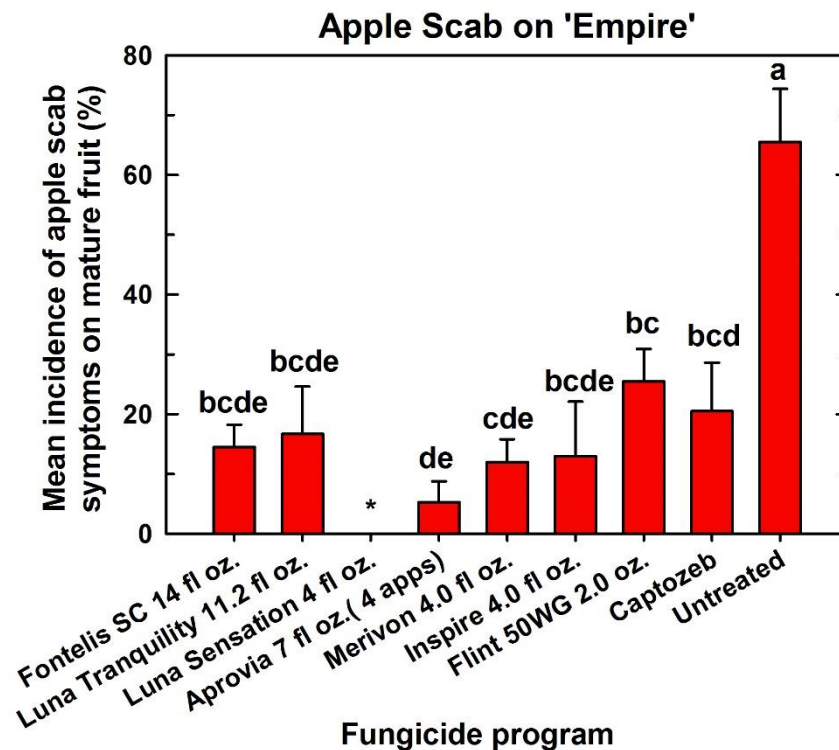
- Resistance -



- Aprovia most consistent control

Efficacy Trials by Kerik Cox 2012

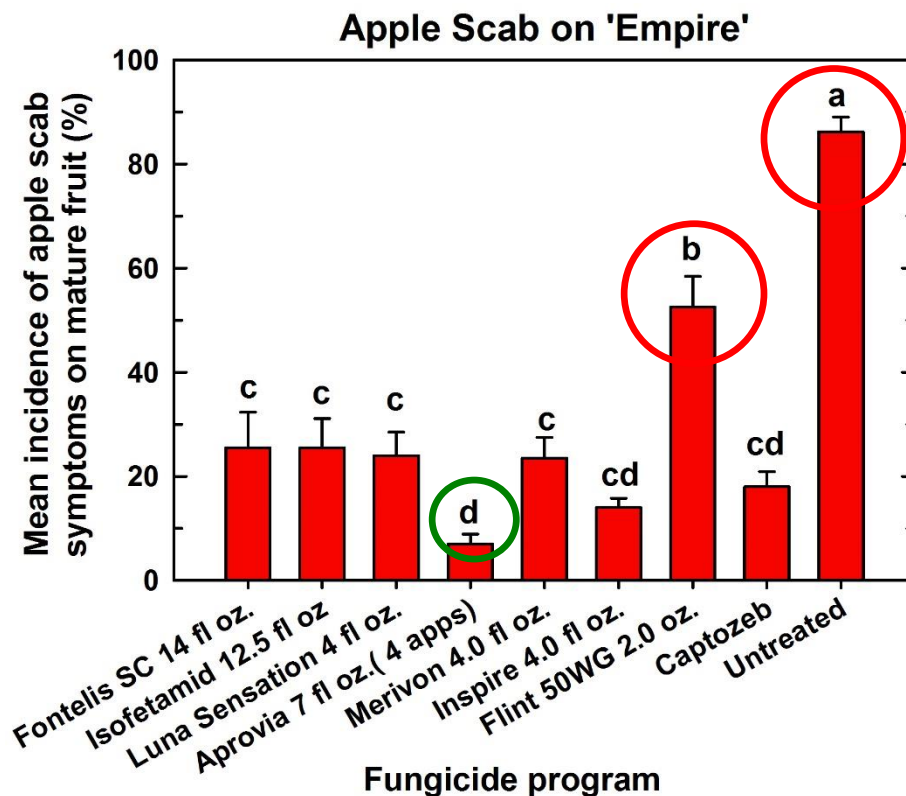
- Resistance -



- QoI+SDHI & Aprovia
- Merivon great

Efficacy Trials by Kerik Cox 2012

- Resistance -



- QoI+SDHI & Aprovia
- Practical resistance to QoI fungicides high: Merivon & Luna Sensation still unaffected

Apple Scab Management

General philosophy:

- GT: copper
- Then 2 or more manzate sprays (depending on weather)
- PK: manzate + Inspire Super (or Flint, Luna Sensation, include product with activity for powdery mildew also)
- Bloom: manzate (depending on the rain and residue lasting)
- PF: fungicide mix (include product with activity for powdery mildew also)
- FC: fungicide mix
- Covers (bare in mind the 77 days PHI limitation for manzate, so switch from manzate to captan according to the estimated time of harvest)

Thank you!

- [**blogs.cornell.edu/acimoviclab/**](https://blogs.cornell.edu/acimoviclab/)

Fire Blight in Champlain Valley 2016 (II) – Management Options in 2016 & 2017

September 12, 2016

Fire Blight in Champlain Valley 2016 (I) – History

August 26, 2016

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