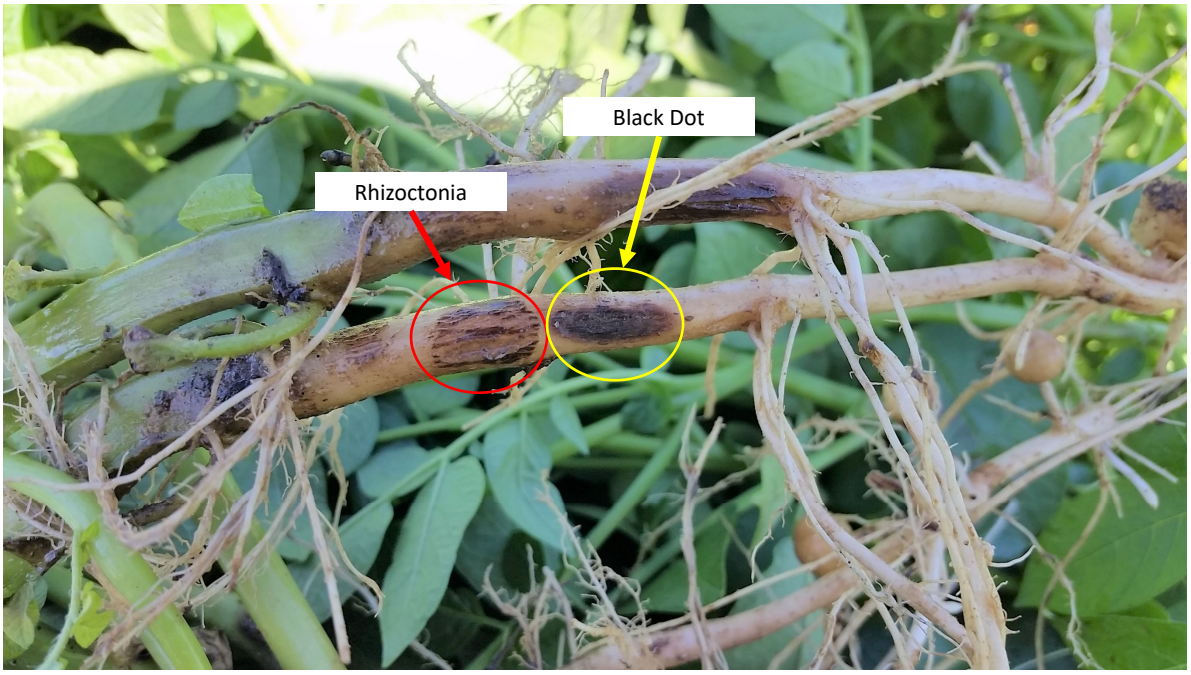
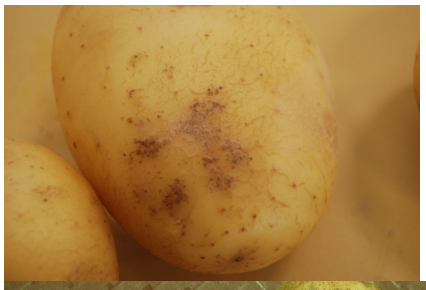
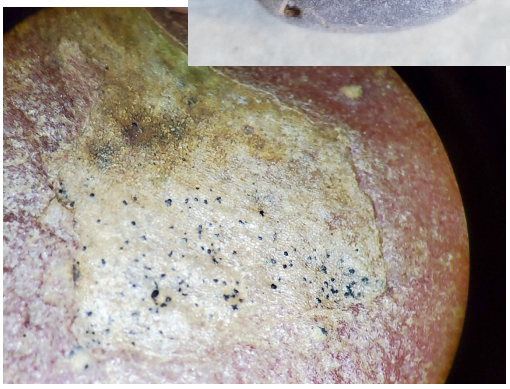
Black Dot: What Works and What Doesn't

Jeff Miller




Black Dot
Rhizoctonia





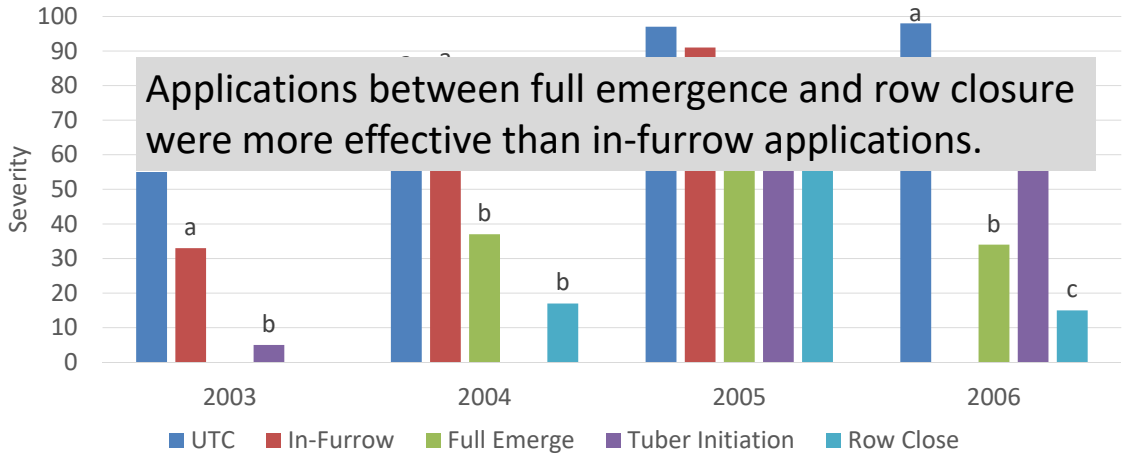
Silver Scurf and Black Dot

Black Dot Overview

- Soil levels can be estimated using PCR.
- Soil levels relate to disease development.
- Seed inoculum of low importance compared to soil.
- Symptoms can increase with time in the ground and in storage.

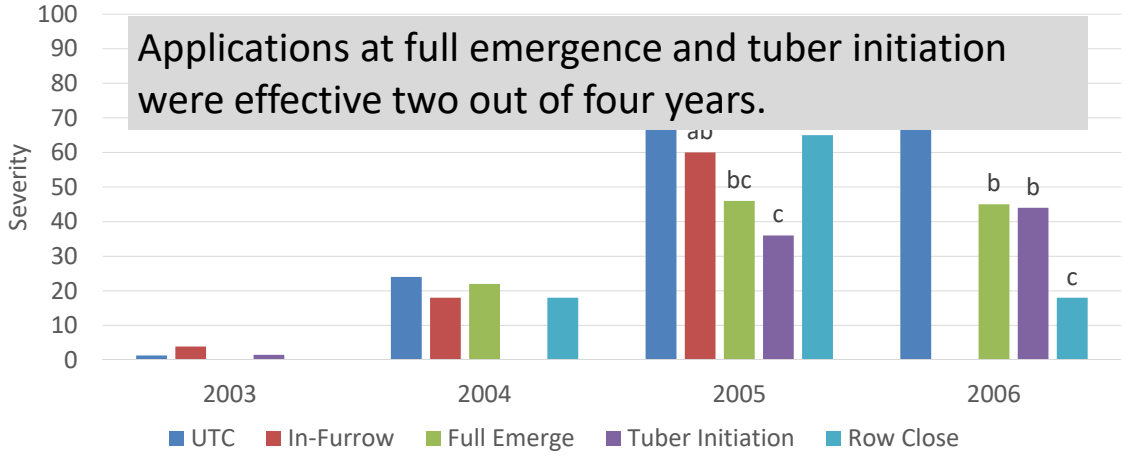
cv. Maris Piper through 10 months of storage. Adapted from Sanzo-Miró et al., 2023, Am J Potato Res 100:326-370

Azoxystrobin Timing – Black Dot on Stems



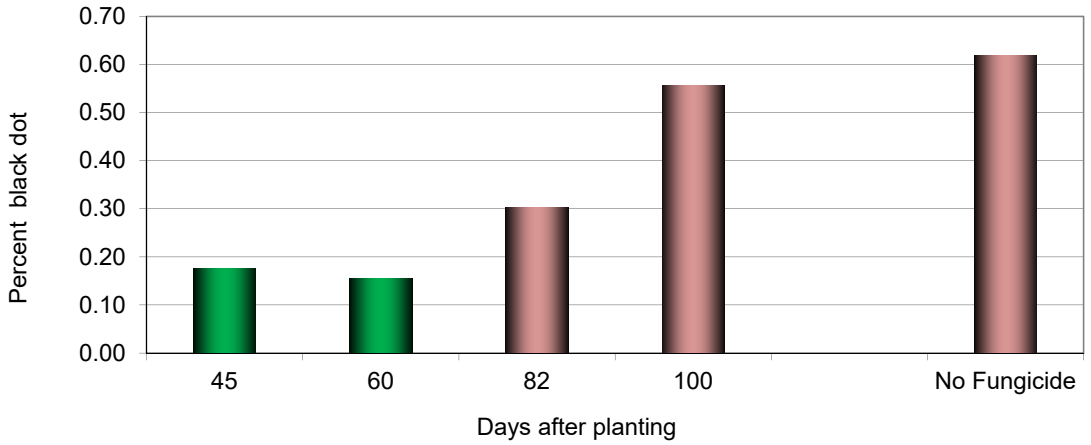
Severity on 2-inch stem segments.
Cummings and Johnson, Am. J. Potato Res. 85:422-431

Azoxystrobin Timing – Black Dot on Tubers (Internal)



Vascular infection in tubers.
Cummings and Johnson, Am. J. Potato Res. 85:422-431

Black Dot Incidence on Upper Stems

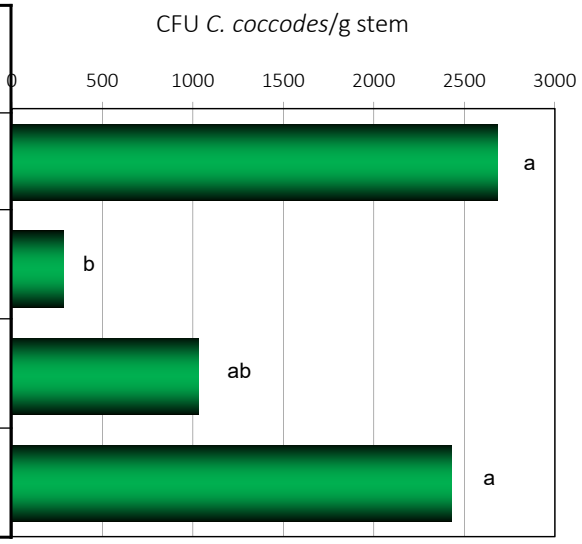


A single application of Quadris (9 oz)
Data from 3 fields x 4 reps, RB &RR, Othello WA, 2007)

Black Dot Fungicide Trial

Russet Burbank; Aberdeen, ID, 2006

8" Tall Plants	Row Closure +14 +14
Headline	Endura Headline Dithane
	Endura Headline Dithane
	Dithane Dithane Dithane



Black Dot Fungicide Trial

Aberdeen, ID, 2006; cv. Russet Burbank

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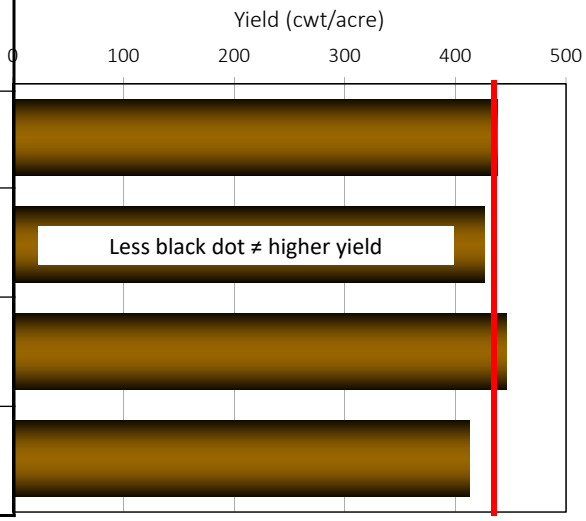
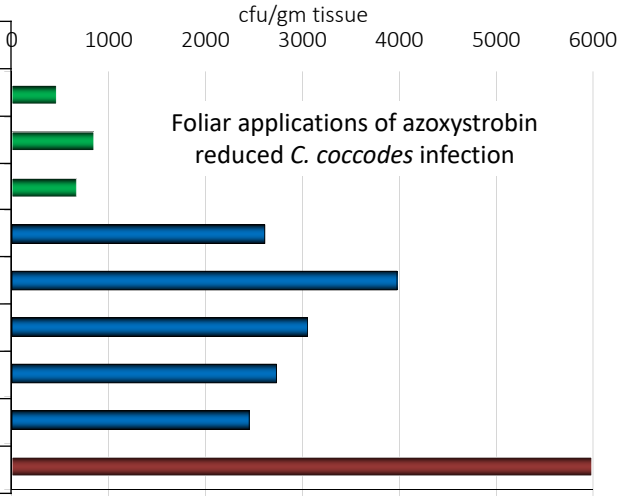


Effect of Fungicides on *C. coccodes* stem colonization

Russet Burbank; Aberdeen, ID 2003

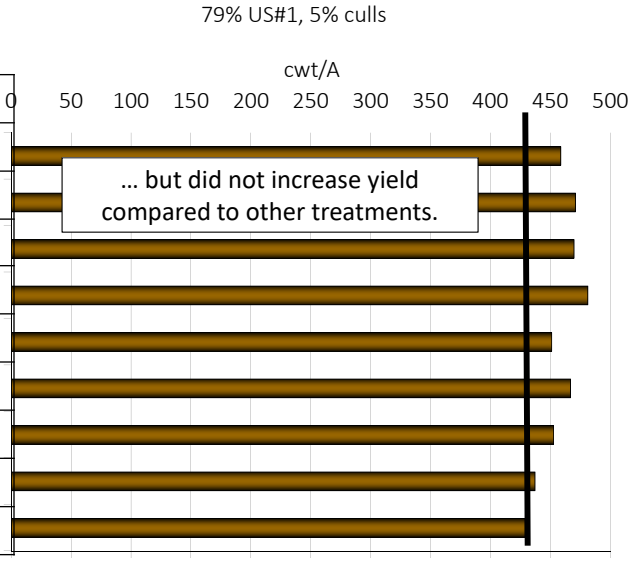
Seed	IF	Hill	Foliar
Maxim MZ	--	Quadris	Quadris/Bravo
Maxim MZ	Quadris	--	Quadris/Bravo
--	--	--	Quadris/Bravo
--	Quadris	Quadris	Bravo
Maxim MZ	Quadris	--	Bravo
--	Quadris	--	Bravo
Maxim MZ	--	--	Bravo
Maxim MZ	--	--	Bravo
--	--	--	--



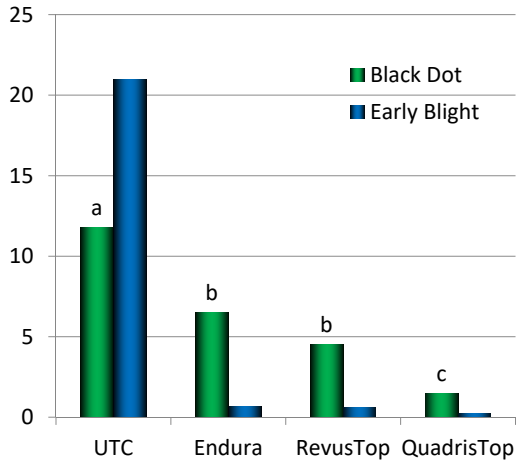
Effect of Fungicides on Total Yield

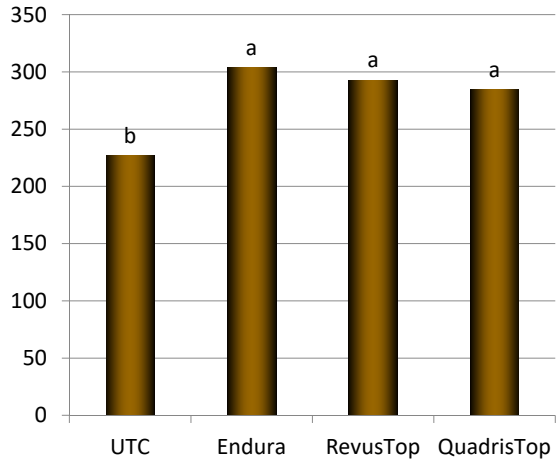
Russet Burbank; Aberdeen, ID 2003

Seed	IF	Hill	Foliar
Maxim MZ	--	Quadris	Quadris/Bravo
Maxim MZ	Quadris	--	Quadris/Bravo
--	--	--	Quadris/Bravo
--	Quadris	Quadris	Bravo
Maxim MZ	Quadris	--	Bravo
--	Quadris	--	Bravo
Maxim MZ	--	--	Bravo
Maxim MZ	--	--	Bravo
--	--	--	--



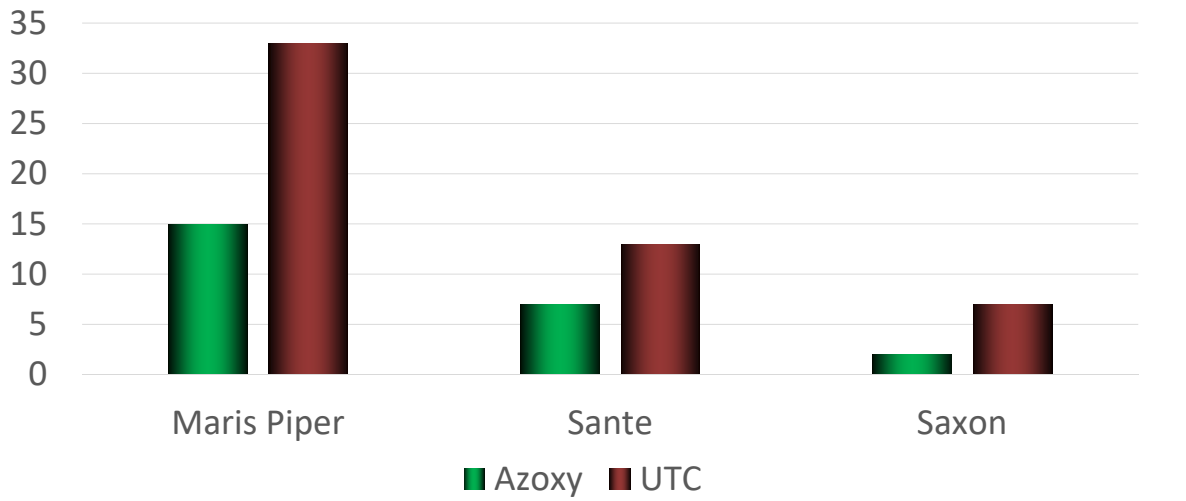
Black Dot Control and Tuber Yield





PDMR 5:V174; Franc and Stump, University of Wyoming (cv. FL1867)

UK Experience – Azoxystrobin at Planting



Adapted from Brierly et al., 2015, Plant Pathology 64:167-177

Why do some tests show IF to work but others don't?

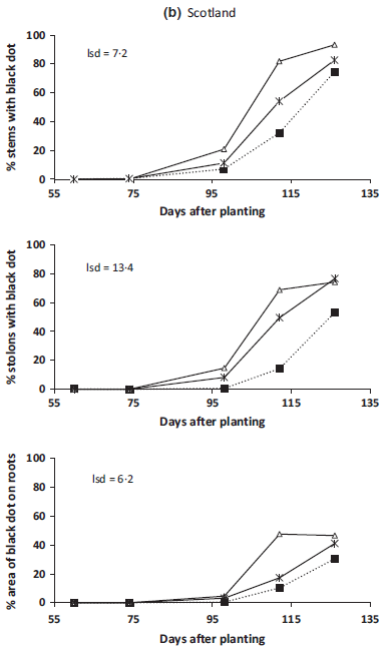
- Level of *C. coccodes* in the soil?
- Environmental factors?

- More research is needed.

Stems

Stolons

Roots

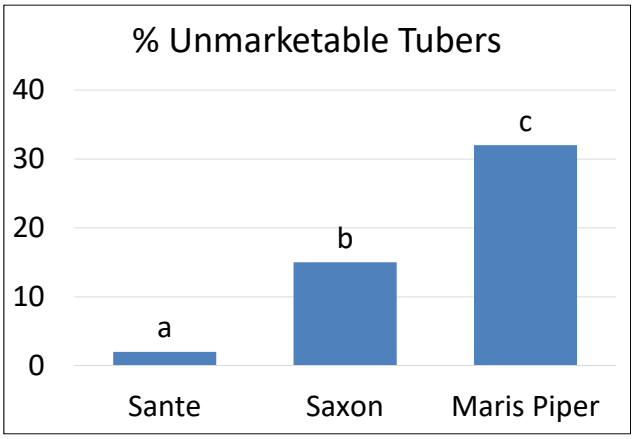


△ Sante

✖ Saxon

■ Maris Piper

The relationship between plant and tuber symptoms is not strong.



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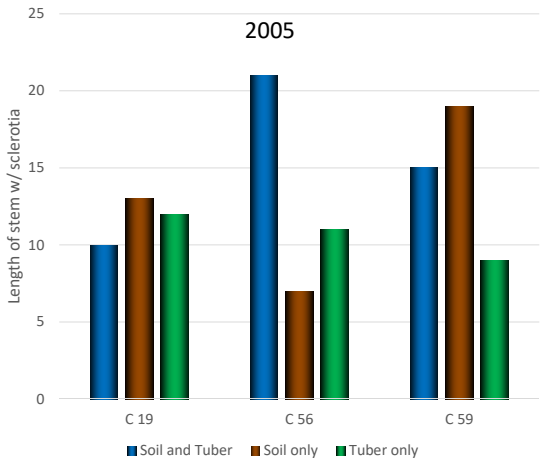
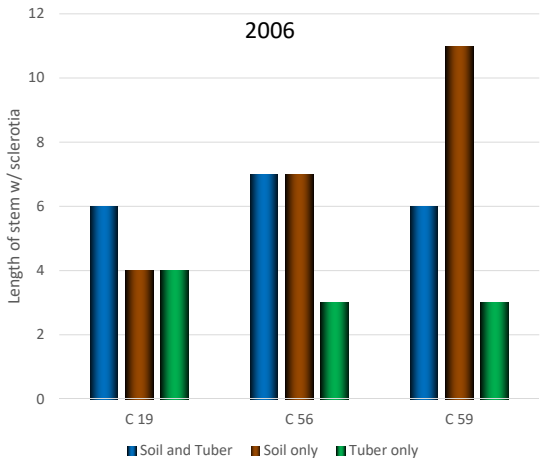
Effect of Seed and Soil on *C. coccodes* infection

Russet Burbank





Nitzan et al., 2008, Plant Disease 92:1497-1502.

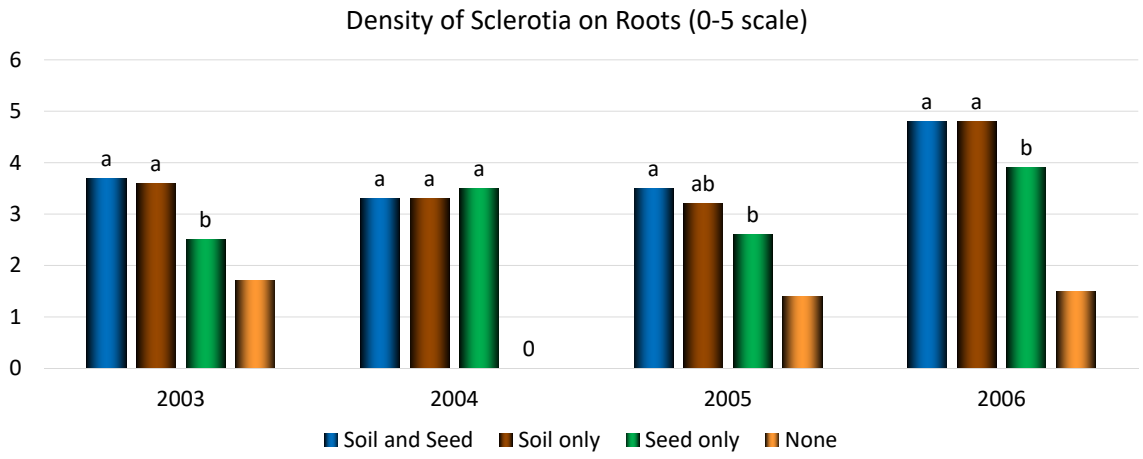
Soil

- Soil pathogen load
  - Low risk = < 100 pg DNA
  - Medium risk = 100-1000 pg DNA
  - High risk = >1000 pg DNA
- Soil type does not appear important
- Damp warmer (>70°F) soils increase infection
- The longer tubers are in the ground, the higher the infection
- No correlation between seed and severity on daughter tubers

Lees et al., 2010, Plant Pathology 59:693–702

Effect of Seed and Soil on *C. coccodes* infection

Russet Burbank



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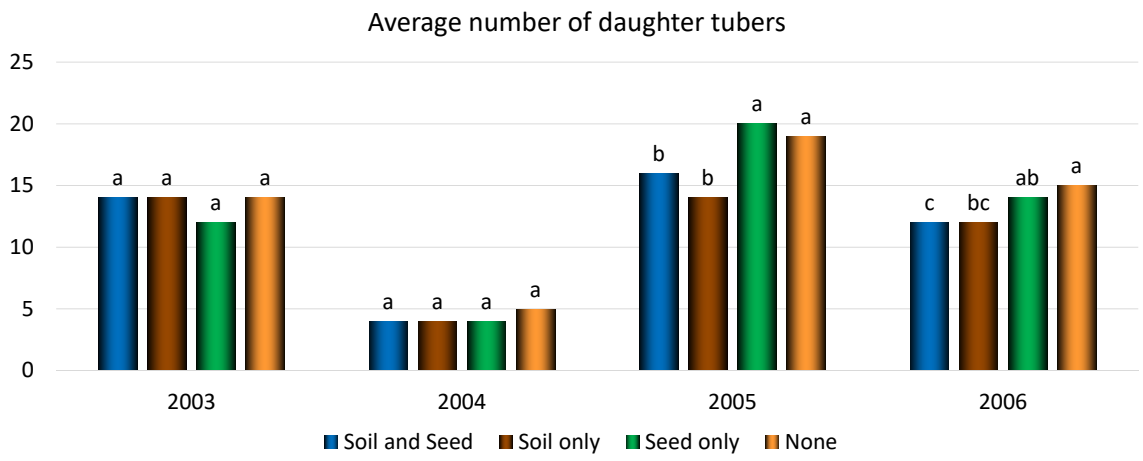

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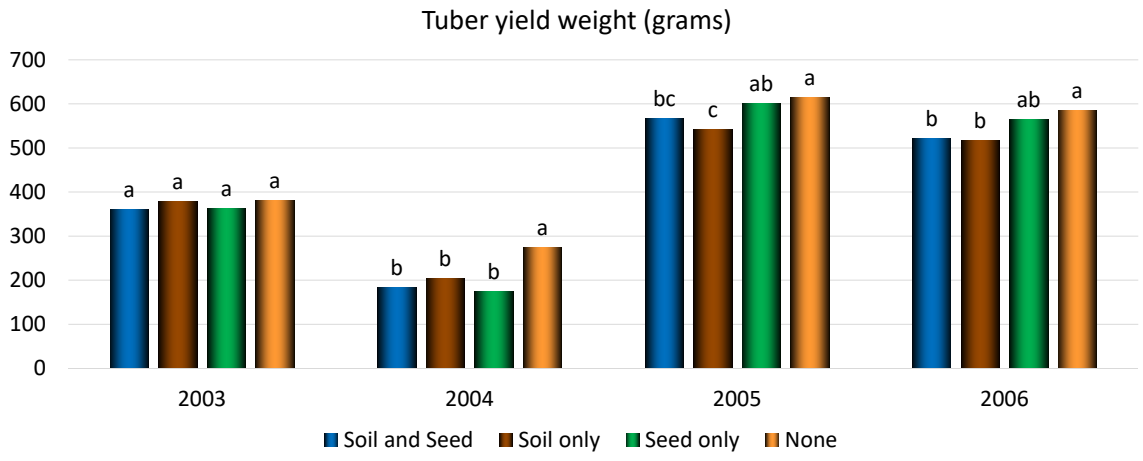

Nitzan et al., 2008, Plant Disease 92:1497-1502.

Other Observations

- Drying tubers at harvest reduces black dot skin blemish.
  - Hide and Boorer, Potato Research 34:122-137.
- Blemish increased when harvesting in moist conditions.
  - Hide et al., Potato Research 37:169-172.
- Rapid temp reduction immediately after loading helps.
  - Cunnington, 2008, Potato Research 51:403–410.

Black Dot Summary

- Cultivar resistance at tuber level, not stems, stolons, or roots
- Disease in the plant may not be related to tubers

- The best way to control:
  - Plant in fields with low inoculum, apply a strobilurin fungicide early, and limit time between vine kill and harvest.