



Why Pesticide Use?

Washington State Crop Production



Major Crops: Washington



- Potatoes
- Onions
- Wheat
- Blueberries
- Apples
- Asparagus
- Pears
- Raspberries
- Cherries
- Strawberries

(Pesticides used on >90% of the acres of these crops annually)



Harvesting Raspberries



- 95% of Washington raspberries are harvested mechanically.
- Any insects present are harvested as well.



Spraying Raspberries



- **Washington raspberries are treated with a insecticide shortly before harvest.**

Consumers Have No Tolerance for Insects in Raspberries



Fig. 31. Contamination of berries by various insects.



Asparagus Aphid



- **First noted in Washington in 1979**
- **In 1980, destroyed 35% of the asparagus ferns in Washington**



Insecticide Use Washington Asparagus



- **90% acres treated**
- **Aphid populations in fields reduced by 99%**



Onion Thrips



- **Reduce Plant Productivity**
- **Can Vector Iris Yellow Spot Virus**
- **Reduce Storage stability of onions**
- **97% of onion acres in Washington Sprayed**





Economics of Insecticide Sprays: Onion Thrips (5 Spray Program)



- **Cost** **\$300/A**
- **Net Over
Untreated** **\$3400/A**



Washington Blueberries



Botrytis Infected Blueberries.

- **Botrytis is present in 95% of the fields in Washington**
- **Uncontrolled yield loss:35-40%**



Cherry Fruit Fly



- 5000 adult flies can emerge from the soil below each tree
- Each female may deposit 100-200 eggs under the fruit skin



Cherry Fruit Fly



- **Zero Tolerance for maggots in cherries**
- **A single larva will cause rejection of entire shipment**
- **95-98% of Washington cherry acreage treated**



Drosophila suzuki



- First found in Washington in 2009
- Prefers soft ripening fruit to lay eggs in
- Has serrated egg layer
- The only control option is insecticide spraying





Drosophila suzuki



Healthy blueberry.

Infested blueberry.



Potential Revenue Losses in Washington from *D.suzuki*



(Assuming 20% Yield Loss)

(million \$)

• Strawberries	2.0
• Blueberries	8.7
• Raspberries /blackberries	18.4
• Cherries	57.8
• Total	\$86,900,000



Washington Organic Farm Area



*Certified + Transition; includes all land area but no double crop 2005-2013.
WSDA only 1995-2003; OTCO, QAI, ICS added in 2004; CCOF added 2006.*



Constraints on Organic Farming in Washington

- **Shortages of Workers to Hand weed fields**
- **Lack of control of key pests**



Hand weeding Onions



- 100 hours/acre



Hand weeding organic onions



Non-use of Herbicides: All Crops, Washington



- **Hand weeding**

14 million hours

- **Workers Needed**

87,000

Gianessi & Sankula, 2003



Herbicides and Tillage



- **Herbicides have made it possible to reduce and eliminate tillage.**
- **As a result, wind and soil erosion have been reduced**



Key Pests: Washington Pears



- **Codling Moth**
Larvae Bore to Core and Feed
- **50-90% of the pears can be damaged**
- **With Insecticide Sprays, less than .25% damage**



Key Pests: Washington Pears



- Pear Psylla suck plant juices
- They excrete sugars
- Mold Grows on the Sugar

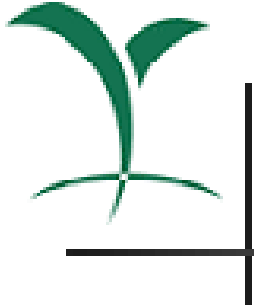


Pear Psylla Damage



UC Statewide IPM Project
© 2000 Regents, University of California

- **Sooty Mold Reduces Value of Pears by 50-90%**



Apple Scab



- **100% Infestation in East Coast Orchards**
- **50% Infestation in Washington Orchards(Dryer)**
- **Uncontrolled, 25% Yield Loss**



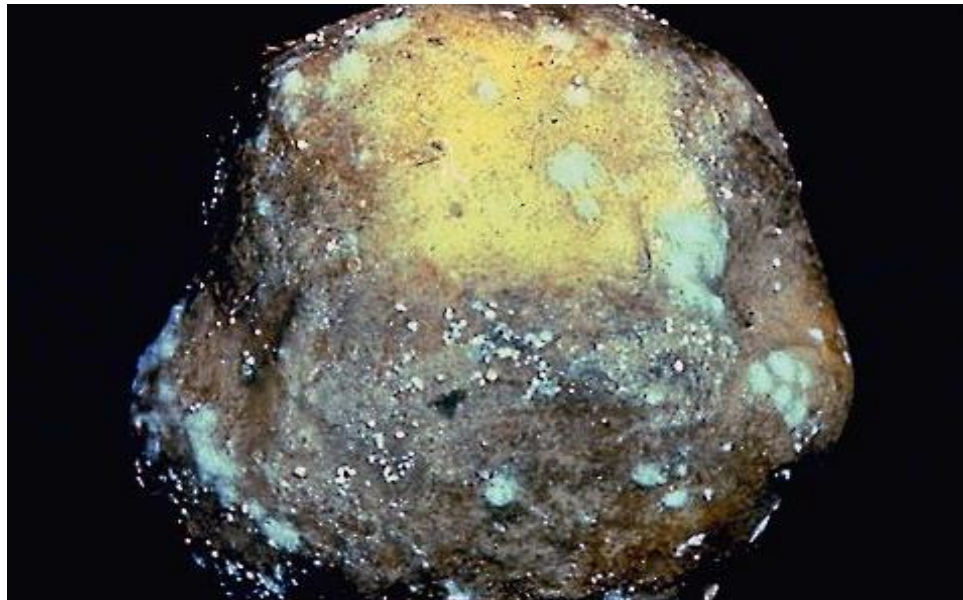
Apple Powdery Mildew



- **40% Infestation in East Coast Orchards**
- **50% infestation in Washington Orchards (Dryer)**
- **Uncontrolled, 65% Yield Loss**



Potato Late Blight



- Cause of Irish potato famine, 1845-1846.
 - Underwent sex change in 1980s.

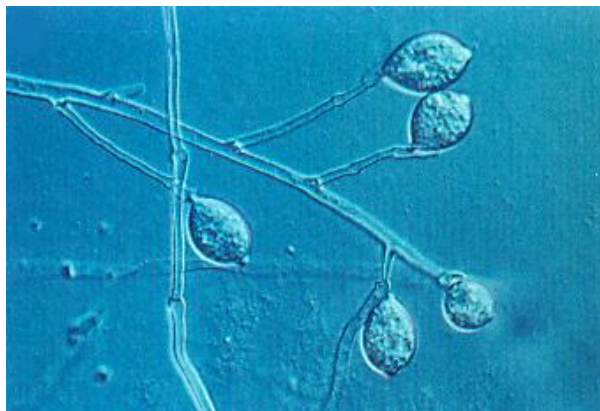


Potato Late Blight Strains



OLD

- A1 mating type
- asexual reproduction



NEW

- A1 and A2 mating types
- Sexual reproduction
- More aggressive
 - faster lesion expansion
 - requires more frequent fungicide application





Potato Late Blight: Washington



healthy potato stand

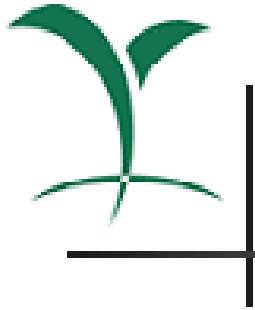


infected potato stand

- In 1980s, 70% of acres treated.
- Starting in 1990's, 90-100% acres treated.



**Pesticides are Essential
for High Yield Crop
Production in Washington.**



Certified Crop Adviser Program



UNITED STATES

13,330

NORTHWEST REGION

495

(WA, ID, OR, UT, NV, AK, BC-CANADA)



What's it take to be a CCA?



**APPRENTICESHIP (LENGTH DEPENDENT UPON
DEGREE)**

100 QUESTION REGIONAL EXAM

100 QUESTION INTERNATIONAL EXAM

CODE OF ETHICS

CONTINUING EDUCATION

40 HOURS WITHIN 2 YR PERIOD

COMPETENCY AREAS

NUTRIENT MANAGEMENT

SOIL & WATER

PEST MANAGEMENT

CROP MANAGEMENT

PROFESSIONAL DEVELOPMENT



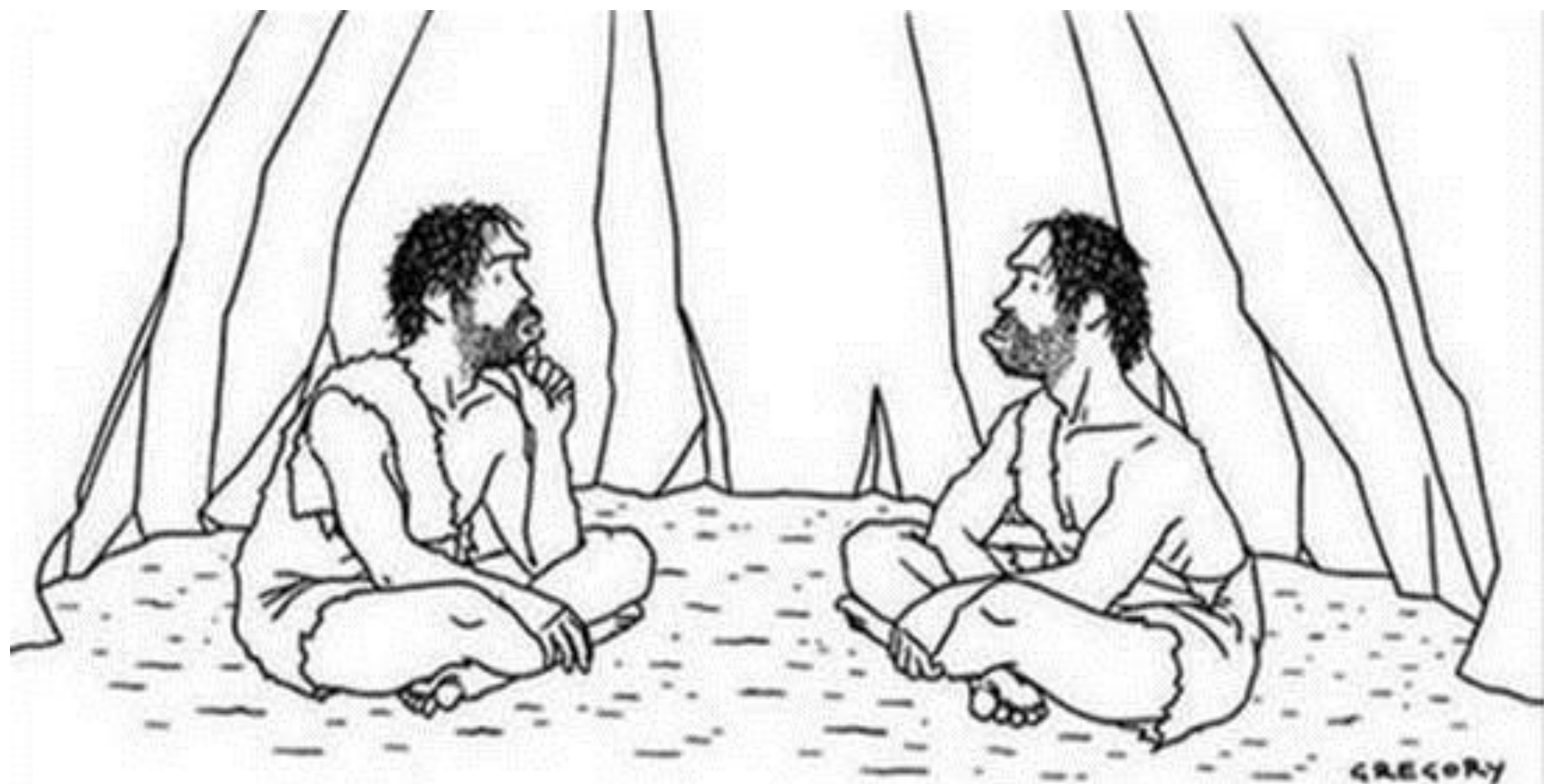
How do you locate a CCA?



[HTTPS://WWW.CERTIFIEDCROPADVISER.ORG/](https://www.certifiedcropadviser.org/)

CLICK ON: [FIND A CCA/CPAG](#)

[WWW.FWAA.ORG](http://www.fwaa.org)



"Something's just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty."