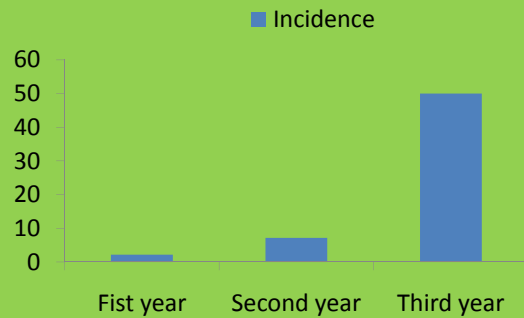


## Cytospora Canker: Incidence and Management



Dr. Ramesh Pokharel,  
Western Colorado Research Center,  
Colorado State University

## Cytospora in a grower's peach orchard



## Causal Pathogen

- *Leucostroma cincta*:
  - New infection at node on branch, especially leaf scar
  - Primary pathogen in peach
  - Grows in lower temperature
  - Two sub-groups
- *L. personii*:
  - Infects through cutting surface
  - Infected pruning tools, birds and borers
  - Higher temperature



## On peach



## Importance of Cytospora canker

- Increases susceptibility to cold damage, high soil pH, nutrient imbalance and other disease and pest
- Kills tree, branch or limb, if not reduces the quality and quantity of fruit
- Decreases tree life

## Field visits in 2010

- 60% field visits were for Cytospora Canker
- 25% visits on Yellow Peach Syndrome
- 5% insect problems
- 2% others

## On Cherry



Plum, canker but no or little gum



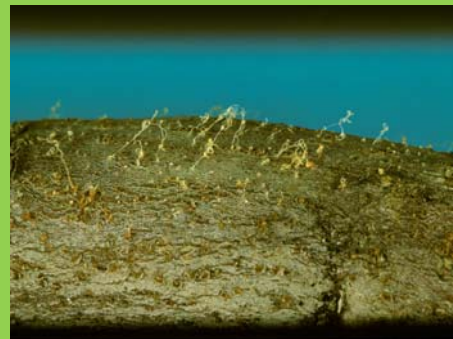
On apple no gums but canker



Cytospora Canker in apricot with some gum exudates



On pear



On apricot only canker margins



### Chemical Control Options

- Captan 50wp; 2lbs/100 gal water
- Rovral 50wp; 2lb/100 gal water
- Topsin M 85WDG; 6oz/100 gal water
- Calcium propionate (1.5 -2.3 lbs anhydrous salt/100 gal
- They were effective in excised peach twig

**BUT WHAT ABOUT IN THE FIELD?**

There are no fungicides registered specifically for control of *Leucostoma* spp., and efficacy trials have produced conflicting results (Bigg et al, 2005).

<http://www.apsnet.org/edcenter/intropo/lessons/fungi/ascomycetes/Pages/LeucostomaCanker.aspx>

### 2007 Cytospora Study

- A. Poultices of soaked Canola (*B. napus*) seed meal + ground leaf material 1:1
  - Brown mustard (*Brassica juncea*),
  - Yellow mustard (*B. hirta*),
  - Horseradish (*Armoracia rusticana*) root and leaf
- B. Terpene based Proprietary materials from Eden International
  - All together six product tested

### 2008 Oils and chemicals

#### Chemical treatments:

Alcohol % in water  
25, 50 and 75

Captan in alcohol: water  
25, 50 and 75

Topsim M in alcohol: water  
25, 50 and 75

Pristine in alcohol: water  
25, 50 and 75

#### Non-chemical treatments:

Mustard oil 10 and 25 %  
Neem Oil 5 and 10%  
Clove oil 2 and 4%  
Cinnamon oil 2 and 4%  
Camphur oil 2 and 4%  
Thyme oil 2 and 4%  
Water -  
Alcohol -

Used pentabark to increase penetration of chemicals inside the bark of a tree.



Gum dried out and the fungus was killed by the application of mustard seed meal mill + horseradish leaf mixture.

Gum dried out and the fungus was killed by the application of canola seed meal mill + yellow leaf mustard leaf poultices.

### 2008 System Approach study

- Soil health
  - Mulch
  - Canola meal cake
  - Canola meal cake + Mulch
  - Control
- Plant Health study
  - Actigard
  - Topsin M
  - Actigard+Topsin M
  - Control

### Cytospora on peach

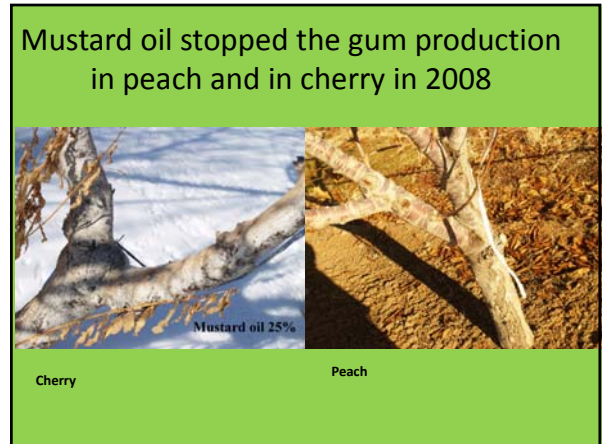
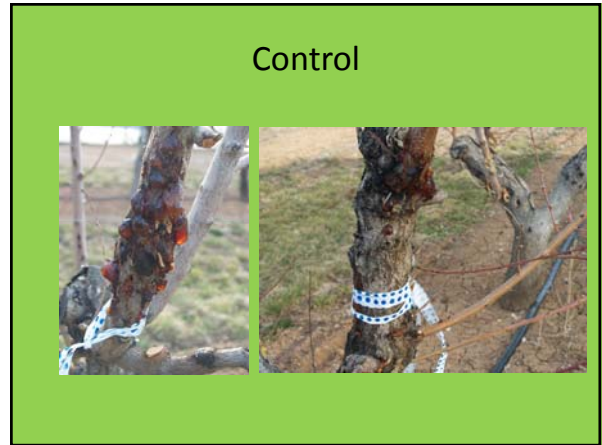


Only one out of six propitiatory oil products was effective against Cytospora infection.





- ### 2009 oils and chemicals
- Castor oil 5%
  - Clove oil 2%
  - Listerine as such
  - Inspire, low con.
  - Inspire, high con.
  - Benlate 50:50 water & alcohol
  - Topsin M 50:50 water & alcohol
  - Cinnamon oil 2%
  - Mustard oil 25%
  - Topsin M water only
  - Inspire, medium con.
  - Water + Latex paint



Mustard oil controlled gum production and killed fungus when applied at scrapped surface but not on gums



### 2010 tank mix of chemicals and oils

- Cinamon Soil
  - Clove Oil
  - Topsin + Benlate
  - Benlate
  - Captan
  - Matran+ Agrifos
- Castor Oil
  - Benlate+agrifos
  - Agrifos
  - Captan +Agrifos
  - Mataran



Benlate



Topsin M

### Results



**Inconsistent results**

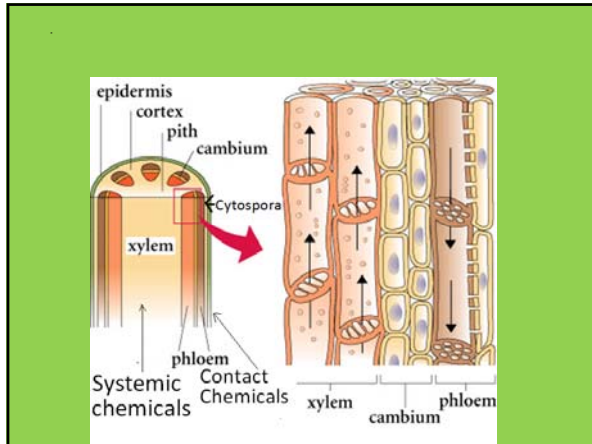
**Tank mix of two chemicals of captan, agrifos and benlate was not effective to Cytospora canker**

Captan controlled fungus when applied in scrapped surface



### Conclusion of 2007-2010 study

- Cytospora canker incidence is associated with cold or frost damage and moist summer days.
- Some of the oils controlled Cytospora canker, the result was not consistent over replications and crops.
- Application of oils and chemicals was effective when applied after removing gums.
- Tropical application of oils and chemicals on top of the gum is not effective.
- Carrier materials such as Pentabark help to penetrate chemicals inside the bark if the gums are removed from the surface.



### Management Cont..

Scrap off the gum and apply Captan + Latex paint + pentabark when the infection starts; organic growers can use Clove oil 6% or mustard oil 25%.



Tag infected trees and prune them at the end.

### Management

- Balanced application of nutrients
- Prune when it is dry (late) after 390 DD
- Tag infected trees and pruned them at the end



Improper cuts invite Cytospora infection



### Future work on Cytospora

- Study the variability of the fungus associated with different crops and environments
- Study Cytospora canker in a holistic approach like targeting all the issues: soil health, plant health, preventive and curative measures
- Continue search of effective chemicals and methods of application
- I have already started use of systemic chemicals in different seasons
- Your support

### Make proper cut

