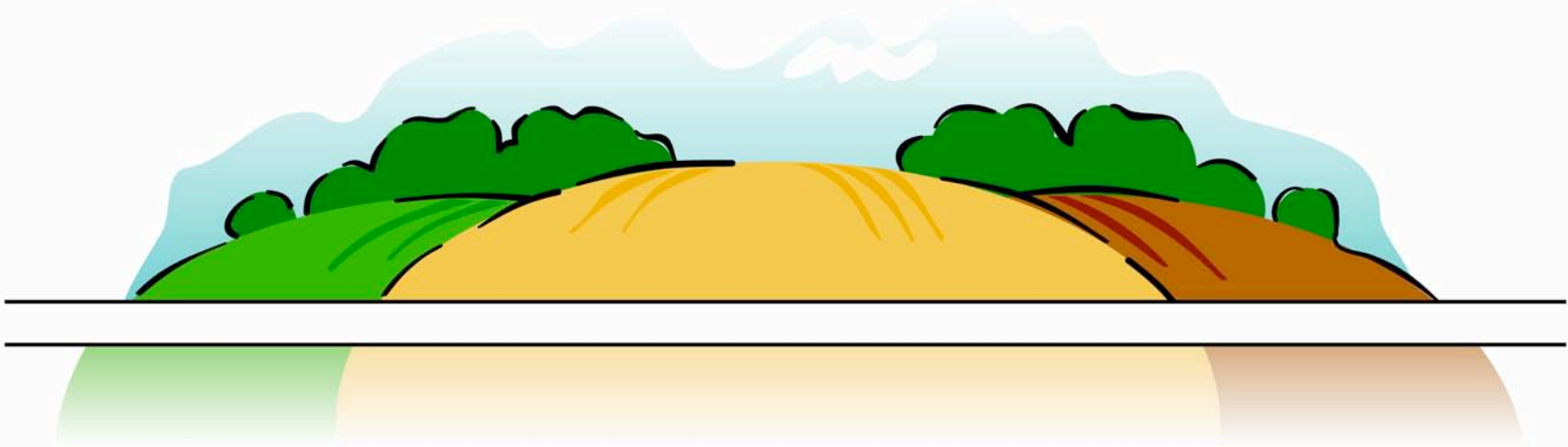


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# Evaluation of Compost Teas for Disease Management of Wild Blueberries in Nova Scotia

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*Bringing Innovation to the Farm*



# Background

**In Nova Scotia wild blueberries are the #1 fruit crop in terms of acreage, export sales and total value to the economy.**

**Organically produced berries garner a premium price in a currently under-supplied market.**



# Background

- Disease can significantly impact crop yield and quality.
  - *Monilinia*
  - *Powdery mildew*
  - *Septoria leaf spot*
  - *Leaf rust*



# Compost Teas

- **Compost teas are the aqueous solutions obtained from compost that has been mixed with water and allowed to ferment.**
- **Compost teas contain bacteria, fungi, protozoa, nematodes and soluble nutrients from the compost.**
- **Exact composition varies.**

# Compost Teas

- While results are often conflicting, aqueous spray application of compost teas have been demonstrated to reduce severity of foliar leaf disease in a variety of fruit crops.
- *Alternaria*, *Botrytis*, powdery mildew, downy mildew, in tomato, strawberry, apple and grape.

# Compost Teas

- **Disease suppression has been postulated to be the result of:**
  - **competition between the beneficial microbes applied to the leaf surface and the pathogens**
  - **secretion of secondary metabolites**
    - **antibiotic properties**
    - **stimulation of natural plant defense**
  - **parasitizing pathogens**

# Objective

- To evaluate compost tea application as an alternative management tool for control of foliar disease in organic blueberry.
  - *Monilinia*
  - *Powdery mildew*
  - *Septoria leaf spot*
  - *Leaf rust*



Septoria on stem

Hildebrand (AAFC)

# Methods

- **Four commercial organic wild blueberry fields in Nova Scotia**
- **Two compost teas:**
  - **certified organic compost of animal manure**
  - **certified organic compost of plant material**

## Methods continued

- **Two controls: conventional management and water application**
- **Six replications at each site**
- **Plots were 1.5 m X 6 m**
- **Soil drench of compost tea was applied in the fall and spring**
- **Foliar applications of compost tea were applied every two weeks beginning at the time of leaf bud opening**

## **Methods continued**

- **Soil samples were taken prior to initiation of the experiment and microbial content of the soil was determined by Soil Foodweb lab.**
- **Samples of compost tea were also analyzed by Soil Foodweb lab to determine microbial content.**

# Methods continued

- **Plots were monitored for disease incidence and severity:**
  - **Monilinia:** 40 stems per plot were collected and the total number of buds and total number of infected buds were counted
  - **Septoria and leaf spot:** 40 stems were collected from the control plots and the infection rate determined by microscopic analysis
  - **Powdery mildew:** was not present in any of the fields

## Results: Monilinia

- During the two years of this study weather and plant growth favored the blueberry plant and incidence of Monilinia infection was limited.
- Only 2-3 % of vegetative buds were infected and 1-2 % of flowering buds when considered over all sites



## Results – Monilinia continued

<b>Percent of vegetative buds damaged by Monilinia</b>		
	<b>2006</b>	<b>2007</b>
<b>Treatment</b>	<b>%</b>	<b>%</b>
<b>Control</b>	<b>2</b>	<b>2</b>
<b>Water</b>	<b>2</b>	<b>3</b>
<b>Plant compost</b>	<b>1</b>	<b>3</b>
<b>Manure compost</b>	<b>2</b>	<b>3</b>

# Results – Leaf Rust

- In both 2006 and 2007 leaf rust was observed but only on a limited number of leaves.

Visual ratings of leaf rust infection		
Date	Visual Rating Score*	
2007 / 2008	2006	2007
July 11 / July 18	0	0
July 25 / Aug. 8	.1	.3
Aug. 9 / Aug. 25	.35	.7

\*0 = 0% leaf area infected; 1 = 1% leaf area infected

# Results – Septoria

- In 2006 and 2007 Septoria was present in all fields

Visual ratings of Septoria infection		
Date	Visual Rating Score*	
2007 / 2008	2006	2007
July 11 / July 18	2.0	1.8
July 25 / Aug. 8	2.7	2.3
Aug. 9 / Aug. 25	2.8	2.9
*0 = 0 spots; 1 = 1-30 spots; 2 = 31-60 spots; 3 = > 60 spots		

# Results – Defoliation in 2006

Percent leaf loss during the 2006 growing season (%)			
Treatment	July 11	July 25	August 9
Control	3	3	2
Water	4	7	3
Plant Compost	4	9	4
Manure Compost	3	6	4

# Results – Defoliation in 2007

Percent leaf loss during the 2007 growing season (%)			
Treatment	July 8	August 2	August 22
Control	18	21	36
Water	16	22	35
Plant Compost	17	23	35
Manure Compost	16	21	37

# Conclusions

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- **There was no observable powdery mildew at the four sites used for this study**
- **The level of infestation for Monilinia and leaf rust were too low for proper assessment of the compost tea spray as a potential disease control mechanism**

# Conclusions

- **Septoria was present at significant levels in both years**
- **More defoliation was observed when measured later in the season in 2007**
- **The defoliation is thought to be due to Septoria as it was the only disease present in significant amounts**
- **There was no apparent effect of the compost tea sprays on level of defoliation**
- **Additional research is required to confirm this result**

## Special Thank You to our Cooperators

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- **Av Singh, AgraPoint International**
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