

## **Survey of blueberry canker and dieback diseases in New York plantings**

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**Project location(s):** Tioga, Niagara, and Orleans counties in New York

**Abstract:**

Canker diseases are challenging to manage since management relies exclusively on proper pruning and plant health maintenance. Knowing which of the canker fungi are prevalent in NY blueberry plantings will allow growers to improve IPM practices aimed at maintaining plant health. A survey was begun to ascertain which canker fungi are most common. On seven farms surveyed, *Fusicoccum* canker was found to be more prevalent than *Phomopsis* canker. *Botryosphaeria* canker was found for the first time in NY. Other diseases that impact blueberry production in New York were also found and included mummy berry, *Botrytis* blight, and micronutrient deficiency. Two nematode-transmitted, soil-born viruses, tomato ringspot virus and tobacco ringspot virus, were found in one planting. This work will be continued and expanded into other regions of NY.

**Background and justification:**

New York ranks 10<sup>th</sup> in the nation in blueberry production, with 700 acres producing 1.5 million pounds valued at \$1.96 million in 2005. This survey was undertaken primarily to determine the prevalence of canker pathogens in blueberry plantings, but also to survey for other problems impacting blueberry production in NY. Carroll had worked in the Plant Disease Diagnostic Lab, Cornell University, where samples of blueberry cankers were the most commonly received for this crop, and included *Fusicoccum* canker and *Phomopsis* canker. Knowing which of the canker fungi are prevalent in New York blueberry plantings will allow growers to improve IPM practices aimed at maintaining plant health. With better knowledge of the diseases affecting blueberries in NY, growers will be able to apply targeted IPM practices for improved yields.

Canker management relies exclusively on proper pruning and plant health maintenance. These diseases can be associated with winter injury, occurring on weakened branches, but can be serious primary causes of plant decline, reducing planting longevity. Other diseases that affect blueberry include anthracnose, which has emerged as a major threat to berry crops, *Botrytis* blight, mummy berry, and viruses. A canker disease found in states to the south, *Botryosphaeria* canker, had not been previously reported from NY on blueberry, although the pathogen occurs on other woody plants in NY. Virus diseases can be propagated along with systemically infected cuttings and lead to serious decline of plantings. Viruses have been suspected in blueberry plantings in NY, though few have been confirmed. Carroll contacted extension educators in the southern tier, the lake Ontario and northeastern NY regions to set up tours of blueberry plantings in order to conduct surveys.

## Objectives:

1. Survey blueberry plantings in New York State for canker and dieback diseases.
2. Identify other prevalent pest problems impacting blueberry production in New York State.

## Procedures and Results:

### 1. Survey blueberry plantings in New York State for canker and dieback diseases.

A survey was begun this year in blueberry plantings in New York for canker diseases. Samples were collected June 19 and 21 from seven farms, four in Tioga county, two in Orleans county and one in Niagara county. The focus was to find out the prevalence of *Phomopsis* canker and *Fusicoccum* canker in blueberry plantings. Also, to look for *Botryosphaeria* canker since this disease has not been reported on blueberry from NY.

Samples were kept on ice in a cooler and brought back to the lab. A total of 30 twig and branch samples were incubated in moist chambers and the resulting fungal fruiting bodies were microscopically identified after several days' incubation. Putative identity of the fungi was based on morphology of the fungal fruiting bodies and characteristics and size of the spores. If no species is given, more than one species might have been involved. Results of the canker survey are given in Table 1.

**Table 1.** Prevalence of canker diseases found on blueberry in June in a preliminary survey of seven farms in south central and north western NY.

Canker Disease	Samples with Disease	Farms with Disease
Fusicoccum canker, <i>Fusicoccum putrefaciens</i>	13	5
Phomopsis canker, <i>Phomopsis vaccinii</i>	8	3
Anthracnose on twigs, <i>Colletotrichum</i>	7	1
Botryosphaeria canker, <i>Botryosphaeria dothidea</i>	2	1

Evidence of *Botryosphaeria* canker was found on one farm, most likely *Botryosphaeria dothidea* based on the botryose, stromatic fruiting body and large elliptical hyaline spores (Fig 1).



**Figure 1.** Microscopic view of squashed fruiting body and spores of asexual state of *Botryosphaeria dothidea*. (400X magnification)

Many samples had fruiting bodies embedded in the bark that did not re-sporulate. The morphology of these suggested either *Phomopsis vaccinii* or *Fusicoccum putrefaciens*. Absence of spores suggests that fungal inoculum is being depleted in NY by late June to early July. This coincides with the period of time when shoot elongation is nearing completion and plant resources will go into bud development and fruit ripening.

Preliminary results suggest that *Fusicoccum* canker is more prevalent than *Phomopsis* canker in NY blueberry plantings.

2. Identify other prevalent pest problems impacting blueberry production in New York State.

Other problems found included insect oviposition injury resulting in dieback, Botrytis blight, mummy berry, and viral symptoms. On one farm, chlorosis and red spots on youngest leaves were most likely related to a micronutrient problem.

On three farms evidence of mummy berry foliar and twig blight was found, but only on one farm were infected fruit prevalent and easy to find (Fig 2). Lack of fruit infection might have resulted from dry, hot conditions that followed a wet spring, or from flowering time not coinciding well with production of spores on blighted leaves and twigs, or perhaps from early abscission of infected fruit.



**Figure 2.** Cross-section of mummies developing in immature blueberries.



**Figure 3.** Symptoms on Patriot associated with tomato ringspot virus.



**Figure 4.** Symptoms on Bluecrop associated with tobacco ringspot virus.

On one farm, the cultivar Patriot had been declining for several years and plants showed clear evidence of viral symptoms (Fig 3). The grower had sent samples to Agdia for serological assay which returned positive results for tomato ringspot virus. Another cultivar on this farm, Bluecrop, showed symptoms of poor fruit set as well as viral symptoms on foliage (Fig 4).

Plant samples were collected from these two cultivars in a second visit to this farm with Kerik Cox and Marc Fuchs. These samples were tested for viruses by Fuchs and samples also sent to Robert Martin, USDA ARS, Oregon State University. Tomato ringspot virus was confirmed in cv. Patriot and tobacco ringspot virus was found in cv. Bluecrop. Samples were also tested for blueberry shock and blueberry scorch viruses by Martin, but these were not found. Soil samples from this farm were screened for *Xiphinema* spp., the potential nematode vector, by George

Abawi, but none were found. We will visit this farm again in spring 2008 to obtain better samples for testing of viruses and nematodes.

### **Discussion:**

In general, plantings that are pruned routinely, irrigated, and fertilized appropriately are less prone to serious canker problems. Canker diseases were found in each of the blueberry plantings surveyed. Fusicoccum was found in more samples and on more farms. Botryosphaeria canker was found for the first time on blueberry in NY on one farm in Niagara county. One farm in Tioga county was found to have two soil-born viral diseases tomato ringspot and tobacco ringspot and more research will be done on this farm to try to ascertain if the nematode vector is present and the IPM practices that will prove best. We will continue surveying NY blueberry plantings for canker diseases and other problems in the coming years. A brief report on this study to the NY Berry Growers Association board meeting was received with interest and encouragement to continue.

### **Publications:**

Carroll, J. 2007. Blueberry survey is uncovering viruses in New York. New York Berry News 6(9):6.  
Carroll, J. 2007. Preliminary survey of blueberry cankers. New York Berry News 6(8):11-12.

### **References:**

Anonymous. 2006. New York Agricultural Statistics 2005-2006 Annual Bulletin. 88 pp.  
Caruso, F.L. and Ramsdell, D.C., eds. 1995. Compendium of Blueberry and Cranberry Diseases. 87 pp. APS Press, St. Paul.

### **Photo credits**

Figure 1, Juliet Carroll, NYS IPM Program, Cornell Cooperative Extension  
Figure 2, Molly Shaw, South Central NY Ag Team, Tioga County Cornell Cooperative Extension  
Figure 3, Molly Shaw, South Central NY Ag Team, Tioga County Cornell Cooperative Extension  
Figure 4, Juliet Carroll, NYS IPM Program, Cornell Cooperative Extension