

### 37. Monilinia Blight

**Latin name:** *Monilinia vaccinii-corymbosi* (Reade) Honey

**French name:** La pourriture sclérotique

Monilinia blight, also known as mummy berry, often occurs in poorly drained parts of blueberry fields, especially in years when wet weather favours its development. At the end of spring it affects the leaves and flowers of young shoots. Crop losses can range from slight to severe from one year to the next, one field to the next and even within the same field. Between infestations, often several years go by.

#### DESCRIPTION

##### Symptoms

In the spring, infected leaves turn brown starting from the base of the leaf (Figure 1), eventually becoming entirely dark brown and collapsing. These brown leaves wither but remain attached to the plant (Figure 2). Though hard to make out with the naked eye, the fungus appears as a low, dense down, beige or whitish in colour, along blossom stems and the midrib of leaves.

Usually, the disease manifests as sharply delimited zones of infestation in the fields. It may attack individual fruit-bearing stems or entire plants. As the season progresses, the damage is masked by the green growth from healthy buds. The destruction of some of the flowers can reduce yield, but the plants do not suffer permanent damage. Not all infected flowers will wither and die. Some produce normal-looking fruit that subsequently shrivels and takes on a salmon colour, eventually dropping to the ground before harvest. These are called “mummy berries” (Figure 2), and in severely infested areas can represent 2 to 3% in lost production.

Note that other types of damage, including frost, herbicides and Botrytis blight, can resemble Monilinia blight.



Figure 1. Leaves infected from the point of attachment

Source: Kelvin Lynch, NBDAAF



Figure 2. Withered leaves still attached to the plant, and mummified berries

Source: Kelvin Lynch, NBDAAF

### Life cycle

The fungus produces primary spores during a short period in May, from mummified berries left on the ground after previous seasons. Flowers and leaves can become infected at any time from budbreak to the start of the blooming period (Figure 3). For an infection to occur, rain or constant humidity or fog are necessary. In mild weather the period of risk is shorter, while cold weather and frost stress increase the susceptibility of plant tissues to infection. The perfect conditions for this disease to develop are a frost followed by four days of warm, wet weather (Table 1).



Figure 3. Period of susceptibility  
Source: Kelvin Lynch, NBDAAF

Table 1. Severity of infection in different weather conditions

Severity of infection in different weather conditions	AVERAGE TEMPERATURE DURING INFECTION PERIOD				
	2 °C	6 °C	10 °C	14 °C	18 °C
2 hours	None	None	None	None	None
4 hours	None	None	None	Slight	AVERAGE
6 hours	None	Slight	Slight	SEVERE	SEVERE
8 hours	None	AVERAGE	SEVERE	SEVERE	SEVERE
10 hours	AVERAGE	SEVERE	SEVERE	SEVERE	SEVERE
15 hours	AVERAGE	SEVERE	SEVERE	SEVERE	SEVERE
24 hours	SEVERE	SEVERE	SEVERE	SEVERE	SEVERE

Source: MAPAQ, 2000

Depending on the weather, symptoms appear around 10 to 20 days after infection. By the time the disease is visible in the fields, most of the primary spores have been released from the mummified berries and the plants' susceptible period is almost over. Secondary spores produced on infected tissues will go on to infect other young shoots, whose flowers will give rise to mummy berries. The mummy berries (i.e. the fungus inside them) will mostly germinate the following year, but some don't germinate until two or even three years later. Wind-borne spores from mummy berries in one field can infect blueberry plants in other fields nearby.

## PREVENTION

Spreading a mulch can prevent the propagation of Monilinia blight by covering over the mummified berries.

Unlike mowing, burning destroys mummy berries and reduces the amount of inoculum present. In fields where pruning is normally done using a flail mower, and where Monilinia blight is a problem, burning will bring the disease under control but cannot eliminate it. To be effective, burning must be sufficiently intense to destroy the mummified berries. The disease tends to be worse in the second crop year because of mummy berries germinating from the previous year.

Outbreaks of Monilinia blight are more frequent and severe on wet terrain and in frost pockets. A management strategy of improving drainage and creating air outlets can help prevent this disease.

## CONTROL

Predicting the potential for infection is essentially a matter of observing and estimating crop losses in previous years. To evaluate those levels and whether intervention with fungicides is warranted, you should seek the help of an agricultural consultant. The decision as to whether to take action will depend on the history of the field, the cost of preventive measures, the current price for blueberries, and potential losses due to the disease.

## COMPLEMENTARY LEAFLETS

15. *Integrated Pest Management in Wild Blueberry Production*

17. *Pruning as a Method of Protection against Blueberry Pests*

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### PROJECT COORDINATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### ADAPTATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### REVISION

Gaétan Chiasson, Agronomist, Development Officer, New Brunswick Department of Agriculture, Aquaculture and Fisheries, Bathurst

Gérard Gilbert, Agronomist-Phytopathologist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Québec

Laurier Tremblay, Agronomist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Bergeronnes

### PUBLISHING

Chantale Ferland, M.Sc., Publishing Project Officer, CRAAQ, Québec

Lyne Lauzon, Publications Coordinator, CRAAQ, Québec

### TRANSLATION

Rod Willmot, M.A.

### LAYOUT AND GRAPHIC DESIGN

Sylvie Robitaille, Computer Graphics Technician, CRAAQ, Québec

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### 38. Septoria Leaf Spot

**Latin name:** *Septoria* spp.

**French name:** La tache septorienne

Septoria leaf spot is present in most Québec blueberry fields, and its incidence is increasing. It is generally found in one or more sections of a field, often in association with other leaf infections such as powdery mildew and leaf rust. It has a growing tendency to spread throughout a field where it is present. It infects fields both in growth years and crop years.

#### DESCRIPTION

The fungus of Septoria leaf spot overwinters on leaves and stems that were infected the previous season. Spore production occurs in wet weather from May till the end of July, peaking in June. When spores fall onto new leaves and shoots, or are washed onto them by rain, new infections result.

The start of an infection is indicated by the presence of small, translucent blisters on the underside of leaves. These develop and merge into larger infected areas with tan to dark brown centres. On the upper leaf surface, infected areas have a diffuse red margin (Figure 1). Whether in a growth year or a crop year, the infected leaves gradually turn chlorotic and drop off.

#### PREVENTION

Pruning by burning, once in every two or three production cycles, can reduce the inoculum rate of Septoria leaf spot, without however eliminating the disease (NBDAAF, 2009).

#### CONTROL

Because it affects fields both in growth years and crop years, and is usually associated with other diseases such as powdery mildew and rust, the impact of Septoria leaf spot on yield is hard to assess. When it is discovered in a blueberry field you should seek the help of an agricultural consultant, who will evaluate the situation with regard to other infections present and determine whether fungicide treatment is required.



Figure 1. Leaves infected by Septoria leaf spot  
Source: Kelvin Lynch, NBDAAF

## COMPLEMENTARY LEAFLETS

15. *Integrated Pest Management in Wild Blueberry Production*

17. *Pruning as a Method of Protection against Blueberry Pests*

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Yarborough, D. 2008. *Organic Wild Blueberry Production*. Fact Sheet No. 304. The University of Maine. Cooperative Extension. 25 pp. [Online]. <http://umaine.edu/blueberries/factsheets/organic/304-organic-wild-blueberry-production/> (Page consulted on March 14, 2010).

### PROJECT COORDINATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### ADAPTATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### REVISION

Gaétan Chiasson, Agronomist, Development Officer, New Brunswick Department of Agriculture, Aquaculture and Fisheries, Bathurst

Gérard Gilbert, Agronomist-Phytopathologist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Québec

Laurier Tremblay, Agronomist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Bergeronnes

### PUBLISHING

Chantale Ferland, M.Sc., Publishing Project Officer, CRAAQ, Québec

Lyne Lauzon, Publications Coordinator, CRAAQ, Québec

### TRANSLATION

Rod Willmot, M.A.

### LAYOUT AND GRAPHIC DESIGN

Sylvie Robitaille, Computer Graphics Technician, CRAAQ, Québec

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### 39. Blueberry Leaf Rust

**Latin name:** *Naohidemycetes vaccinii* (Wint.) Sato, Katsuya et Hiratsuka (*Thekopsora minima*, *Pucciniastrum vaccinii*)

**French name:** La rouille

Blueberry leaf rust is present in most Québec blueberry fields, and its incidence seems to be increasing. It is generally found in one or more sections of a field, often in association with other leaf infections such as powdery mildew and Septoria leaf spot. It has a growing tendency to spread throughout a field where it is present, and infects fields both in growth years and crop years. It is characterized as rust-coloured pustules on the underside of leaves.

So far in Québec, no infection of blueberry leaf rust alone has required fungicide treatment.

#### DESCRIPTION

The incidence of blueberry leaf rust starts to intensify in mid-July. For this reason it has little effect on fields that are in a crop year, since harvesting normally occurs in August. In a growth year however, leaf rust can cause extensive leaf spotting and premature leaf drop. By early September there can be significant defoliation, and in severely affected fields the production of floral buds can be reduced by 30% or more.

The symptoms are similar to other leaf diseases, consisting of brown spots in a variety of shapes and sizes, accompanied or not by the leaves turning yellow. However, blueberry leaf rust is easily distinguished by the pustules of rust on the underside of leaves (Figure 1).

This fungus produces various types of spores and infections. It has a complex life cycle involving plants other than the blueberry, especially hemlock.

#### CONTROL

To date, pruning by burning has not been found effective for reducing the incidence of leaf rust. When it is discovered in a blueberry field you should seek the help of an agricultural consultant, who will evaluate the situation and determine whether treatment with fungicide is necessary.



Figure 1. Pustules of rust on a blueberry leaf  
Source: Kelvin Lynch, NBDAAF

## COMPLEMENTARY LEAFLET

15. Integrated Pest Management in Wild Blueberry Production

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Lynch, K. 2009. *Leaf Diseases of Wild Blueberry*. Factsheet C.3.3.0. New Brunswick Department of Agriculture, Aquaculture and Fisheries. [Online]. [www.gnb.ca/0171/10/0171100029-e.pdf](http://www.gnb.ca/0171/10/0171100029-e.pdf) (Page consulted on September 15, 2010).



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Yarborough, D. 2008. *Organic Wild Blueberry Production*. Fact Sheet No. 304. The University of Maine. Cooperative Extension. 25 pp. [Online]. <http://umaine.edu/blueberries/factsheets/organic/304-organic-wild-blueberry-production/> (Page consulted on March 16, 2011).

### PROJECT COORDINATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### ADAPTATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### REVISION

Gaétan Chiasson, Agronomist, Development Officer, New Brunswick Department of Agriculture, Aquaculture and Fisheries, Bathurst

Gérard Gilbert, Agronomist-Phytopathologist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Québec

Laurier Tremblay, Agronomist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Bergeronnes

### PUBLISHING

Chantale Ferland, M.Sc., Publishing Project Officer, CRAAQ, Québec

Lyne Lauzon, Publications Coordinator, CRAAQ, Québec

### TRANSLATION

Rod Willmot, M.A.

### LAYOUT AND GRAPHIC DESIGN

Sylvie Robitaille, Computer Graphics Technician, CRAAQ, Québec

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## 40. Powdery Mildew

**Latin name:** *Microsphaera penicillata* var. *vaccinii*

**French name:** Le blanc

Powdery mildew is present in most Québec blueberry fields, and its incidence is increasing. It is generally found in one or more sections of a field, often in association with other leaf infections such as Septoria leaf spot and rust. It has a growing tendency to spread throughout a field where it is present, and it infects fields both in growth years and crop years. The most common symptoms are red specks on the leaves that grow and merge into blotches.

So far, powdery mildew has not required fungicide treatment in any Québec blueberry fields.

### DESCRIPTION

Powdery mildew can be detected in the field by mid-June, both in growth years and crop years. The disease spreads rapidly during July and August. The fungus overwinters on leaves and stems that were infected the previous season, but can be spread by wind-borne spores from neighbouring fields. In combination with other diseases it causes premature leaf drop. On badly infected shoots there will be increased bud mortality over the winter. Fields that are on coarse soil, as is often the case in blueberry cultivation, are more likely to undergo dry periods, and water stress makes the plants more susceptible to powdery mildew. For this reason the disease can be most severe in dry years.

Powdery mildew varies in appearance. The most common symptoms are red specks that grow and merge into blotches (Figure 1). Some clones develop an extensive web of white mycelium on the upper leaf surface, while in others the mycelium is sparse and on the underside. Often the mycelium is washed off by strong rain.

### CONTROL

It has not been shown that pruning by burning reduces the incidence of powdery mildew. If its presence causes concern, you should seek the help of an agricultural consultant, who will evaluate the situation and determine whether treatment with fungicide is necessary.



Figure 1. Spots on blueberry leaves caused by powdery mildew  
Source: Kelvin Lynch, NBDAAF



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15. Integrated Pest Management in Wild Blueberry Production

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Lynch, K. 2009. *Leaf Diseases of Wild Blueberry*. Factsheet C.3.3.0. New Brunswick Department of Agriculture, Aquaculture and Fisheries. [Online]. [www.gnb.ca/0171/10/0171100029-e.pdf](http://www.gnb.ca/0171/10/0171100029-e.pdf) (Page consulted on September 15, 2010).



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### PROJECT COORDINATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### ADAPTATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### REVISION

Gaétan Chiasson, Agronomist, Development Officer, New Brunswick Department of Agriculture, Aquaculture and Fisheries, Bathurst

Gérard Gilbert, Agronomist-Phytopathologist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Québec

Laurier Tremblay, Agronomist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Bergeronnes

### PUBLISHING

Chantale Ferland, M.Sc., Publishing Project Officer, CRAAQ, Québec

Lyne Lauzon, Publications Coordinator, CRAAQ, Québec

### TRANSLATION

Rod Willmot, M.A.

### LAYOUT AND GRAPHIC DESIGN

Sylvie Robitaille, Computer Graphics Technician, CRAAQ, Québec

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## 41. *Valdensinia* Leaf Spot

**Latin name:** *Valdensinia heterodoxa* Peyronel

**French name:** La tache valdensinéenne

*Valdensinia* leaf spot was first observed in 2009 in the Côte-Nord region. It may also be present in Saguenay–Lac-Saint-Jean. It is a disease with very high potential for spreading from field to field. In recent years it has appeared in blueberry fields in Maine and the Maritime provinces, where it is of great concern to producers and is closely monitored by farm advisors.

So far, *Valdensinia* leaf spot has not required fungicide treatment in any Québec blueberry fields.

### DESCRIPTION

*Valdensinia* leaf spot has been found on uncultivated blueberry plants growing beyond the field perimeter. Bunchberry, a common weed of blueberry fields, is a host to the disease. For infection to occur there must be prolonged periods of cold, wet weather.

*Valdensinia* leaf spot is easily distinguished from other leaf diseases by the large size of the spot, which is brown in the centre and reddish around the edges (Figure 1). The disease develops in June and is characterized by extensive leaf drop in July. Defoliated stems switch to producing new leaves, with the result that there are fewer floral buds. The dense white fruiting body (spore) of *Valdensinia* is clearly visible in the centre of the spots, an interesting characteristic that makes it easier to identify.

The infection is readily propagated by spores and infected leaves stuck to plants and equipment.

### PREVENTION

*Valdensinia* leaf spot overwinters on infected leaves from the previous season. Pruning by burning, once in every two or three production cycles, can reduce the inoculum rate of *Valdensinia* but cannot eliminate the disease (NBDAAF, 2009). In New Brunswick, where the disease has been known since 2006, pruning by burning is recommended for affected fields.

Since *Valdensinia* spreads so easily from one field to another, field sanitation practices are critical wherever the disease is present, including restricting access and washing equipment before using it in another field. Weed control is equally important to ensure that host plants are eliminated, especially bunchberry. Proper harvest procedures will also reduce the risk of propagating infection.

### CONTROL

If *Valdensinia* leaf spot is discovered in a blueberry field, you should seek the help of an agricultural consultant, who will evaluate the situation and determine whether treatment with fungicide is necessary.



Figure 1. Spots on blueberry leaves caused by *Valdensinia* fungus

Source: Kelvin Lynch, NBDAAF

## COMPLEMENTARY LEAFLETS

15. *Integrated Pest Management in Wild Blueberry Production*

17. *Pruning as a Method of Protection against Blueberry Pests*

44. *Bunchberry*

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Lynch, K. 2009. *Leaf Diseases of Wild Blueberry*. Factsheet C.3.3.0. New Brunswick Department of Agriculture, Aquaculture and Fisheries. [Online]. [www.gnb.ca/0171/10/0171100029-e.pdf](http://www.gnb.ca/0171/10/0171100029-e.pdf) (Page consulted on September 15, 2010).



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### PROJECT COORDINATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### ADAPTATION

Sophie Gagnon, Agronomist, Project Management Coordinator, Agrinova, Alma

### REVISION

Gaétan Chiasson, Agronomist, Development Officer, New Brunswick Department of Agriculture, Aquaculture and Fisheries, Bathurst

Gérard Gilbert, Agronomist-Phytopathologist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Québec

Laurier Tremblay, Agronomist, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, Bergeronnes

### PUBLISHING

Chantale Ferland, M.Sc., Publishing Project Officer, CRAAQ, Québec

Lyne Lauzon, Publications Coordinator, CRAAQ, Québec

### TRANSLATION

Rod Willmot, M.A.

### LAYOUT AND GRAPHIC DESIGN

Sylvie Robitaille, Computer Graphics Technician, CRAAQ, Québec

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