



Temperature and leaf wetness impact blossom blight in alfalfa

CATEGORY [disease](#) | May 16, 2023

The optimum conditions for infection by *Botrytis cinerea*, the most common pathogen causing blossom blight in alfalfa in Canada, was a temperature between 15C and 20C with 12 to 24 hours of surface leaf wetness at flowering.

Alfalfa seed production on the Prairies can be impacted by blossom blight, caused by *Botrytis cinerea* and *Sclerotinia sclerotiorum*. On the northern Prairies, *Botrytis cinerea* is the main pathogen.

The objectives of this research study were to assess the interaction of temperature and leaf wetness on infection of alfalfa flowers by *B. cinerea*, determine whether there were differences in susceptibility to infection among alfalfa cultivars, and to assess the influence of raceme architecture and floret colour on infection.

While the studies were conducted more than 20 years ago, and new cultivars have been introduced, the results are relevant today since blossom blight is still a significant problem. The results were recently summarized in a Canadian Journal of Plant Pathology article in 2021.

In the temperature x wetness duration study, incubation temperatures of 10, 15, 20, 25 and 30C were compared. Leaf wetness duration was 0, 4, 8, 12, 16, 20, 24, or 48 hours. At the mid-bloom stage,

racemes (flower clusters) with open flowers were incubated in chambers, and assessed for *B. cinerea* infection based on visual examination of symptoms.

Twelve registered cultivars with a range of winter hardiness were grown in greenhouse pots to assess susceptibility to *B. cinerea*. Five cultivars were characterized as extremely winter hardy on the Prairies, while the other 7 were mainly from eastern Canada and considered 'hardy'.

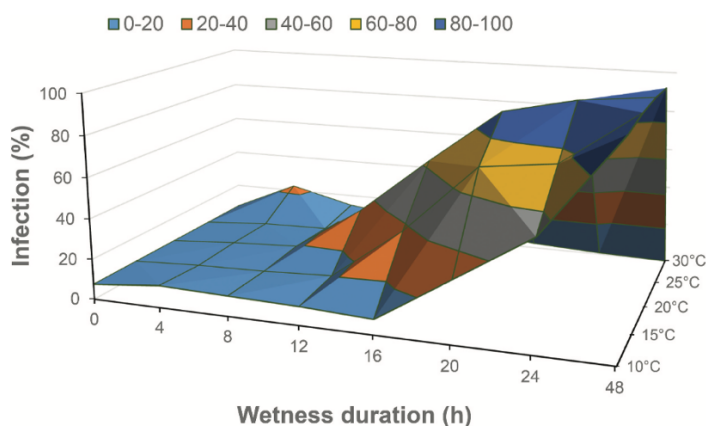
Differences in cultivar infection were assessed by removing 10 racemes from two plants, removing un-opened flower buds, and inoculating with *B. cinerea*. The racemes were incubated at room temperature for 12 or 24 hours, and assessed for infection. Additionally, whole-plant assessments were conducted in the greenhouse, by spraying flowering plants with *B. cinerea* inoculum, and incubating at 20C for 48 hours in a 14 hour photoperiod.

A field trial was also conducted to assess cultivar reaction. Plants were established in small plots, and flowering plants were spray-inoculated 1 day after a heavy rain in mid-August. The plants were subsequently misted for 3 minutes in the late evening for the following 2 days to maintain high levels of humidity overnight.

Optimum infection conditions identified

The highest incidence of infection occurred at 20C and the lowest at 30C. As surface wetness duration increased past 12 hours, infection increased sharply. The optimum conditions for infection was a temperature between 15C and 20C with 12 to 24 hours of surface wetness.

Interaction of temperature and wetness duration on infection of alfalfa florets by *Botrytis cinerea* in detached racemes over time under controlled conditions



Source: Gossen and Lan, 2021.

In all three testing protocols (detached inflorescence, whole-plant, and field assessments), small but consistent differences in flower infection were observed. In the detached floret test after 12 hours of incubation, incidence of infection ranged from 12% to 33% among cultivars. After 24 hours of incubation, incidence was substantially higher ranging from 54% to a high of a 90% average for the most heavily infected group of cultivars. Whole plant assessments also showed differences among cultivars.

Field trials had lower infection levels than greenhouse trials. Floral infection levels ranged from 3% to 22%.

Upward-facing flowers had a lower incidence of infection at 16% compared with downward-facing flowers at 86% in whole-plant assessments in the greenhouse. Also, infection by *B. cinerea* was slightly lower in purple florets than white florets in one cultivar, but not in the two other cultivars studied.

Although the study found consistent differences in susceptibility to *B. cinerea* between cultivars, these differences were low after 24 hours of incubation. This indicated that differences in cultivar susceptibility would likely be overwhelmed if conditions were conducive for disease development. Since this study was conducted, little additional research has been done on cultivar susceptibility to *B. cinerea*.

The results of this study help to better understand the conditions that result in *B. cinerea* infection of alfalfa grown for seed, and can help guide fungicide application decisions.

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Bruce D. Gossen & Zhiwen Lan (2021) Wetness duration, temperature and cultivar affect floral infection by *Botrytis cinerea* in alfalfa, Canadian Journal of Plant Pathology, 43:6, 812-819, DOI: [10.1080/07060661.2021.1922940](https://doi.org/10.1080/07060661.2021.1922940)

Photo courtesy Bruce Gossen

