

Keithia leaf blight of western red cedar

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Keithia leaf blight occurs on Western red cedar throughout its coastal and interior ranges. Cedar seedlings and young cedar trees suffer most, but are only affected under environmental conditions that favour the disease.

Research on Keithia was initiated following its outbreak in B.C. in which 0.5 million and 1.0 million container grown and transplant western red cedar were discarded in 1988 and 1991, respectively.

Objectives

- 1) Develop a fungicide treatment for the disease.
- 2) Determine inoculum sources of Keithia blight.
- 3) Study the effect of nursery-acquired blight on survival of cedar outplanted to reforestation sites.

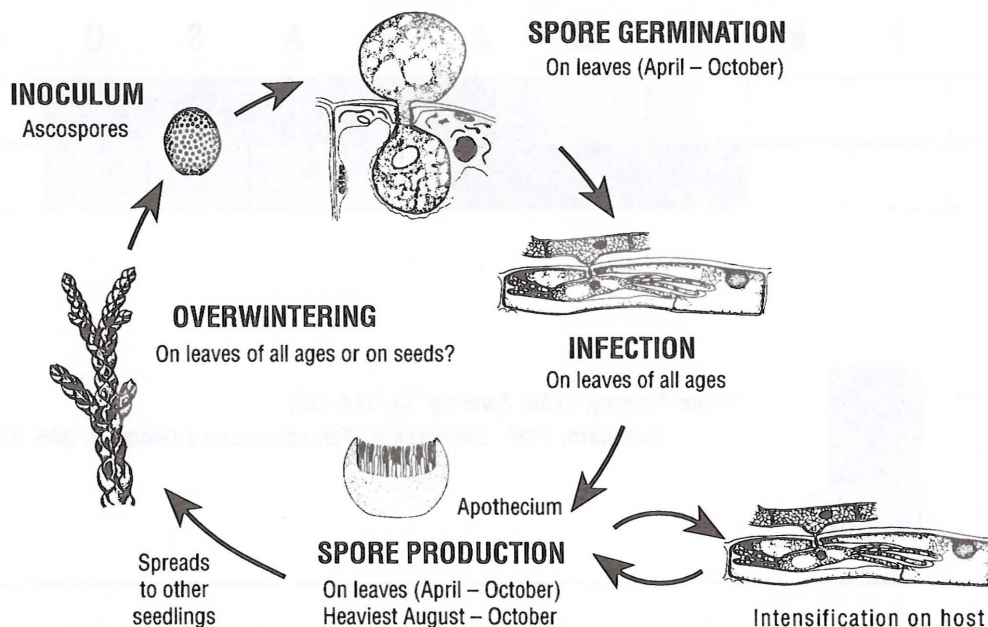
Results

Fungicides for blight control

At Surrey Nursery, fungicides were tested against blight on container-grown and transplant cedar seedlings. Fungicides reduced the number of fruiting bodies on the foliage of both container-grown and transplant seedlings.

For transplant seedlings all fungicides appeared to be equally effective in controlling blight while on container-grown seedlings fungicides apparently needed to be applied every two weeks. To answer environmental concerns, work is now underway to determine the minimal number of applications required for adequate control.

Keithia blight: disease cycle on western red cedar



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Possible sources of inoculum

A recent survey of 10 southwestern nurseries demonstrated that blight occurrence on Western red cedar nursery seedlings was not related to possible inoculum sources on cedar hedges and trees within and around nurseries.

In addition, a cursory examination was also made for *Keithia* spores on seeds from four seedlots. In three of them, light microscope observations revealed that 20% or more of the seeds already carried spores.

Plantation survival of diseased seedlings

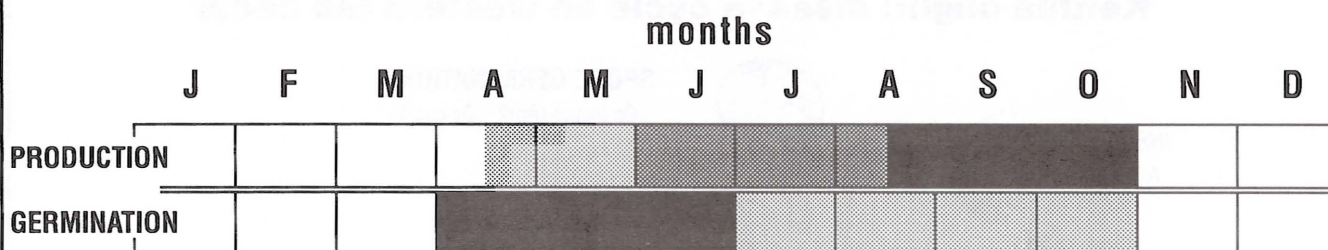
To determine the effect of nursery-acquired blight on seedling survival on reforestation sites, diseased, 1 year-old western red cedar were sorted into high, medium and low disease categories. Seedling survival was then determined.

Regardless of severity of nursery-acquired blight, survival of outplanted cedar was extremely poor. Observations have shown that undetected spore load can act as inoculum when field conditions favour germination and infection.

Recommendations for management of *Keithia* blight on western red cedar

- 1) Only cedar seed that is free of debris should be used.
- 2) Held over nursery stock should be maintained in a disease free condition by roguing infected seedlings. Cedar located near nurseries should be monitored for the presence of *Keithia* and where possible infected trees should be removed.
- 3) Where chemical protection is used, ensure that application times coincide with susceptible life cycle stages of *Keithia* blight.
- 4) Air movement around containerized and bare root seedlings should be increased through proper spacing.
- 5) Manage watering regimes so that high humidity conditions or free water does not remain for long periods on the foliage.

Keithia blight: spore production and germination



Highest
Some
Little



*From: Pawsey, 1960, *Forestry*, 33, 174-186;

Sægaard, 1969, *Det Forstlige Forsøgsvoesen 1 Denmark*, 245, 287-396