

Saratoga Spittlebug

Aphrophora saratogensis (Fitch)

Hemiptera: Cercopidae

Wilson, L. F. 1971. Risk-rating Saratoga spittlebug damage by abundance of alternate-host plants. Res. Note NC-10. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 4 p.

Objective: To describe a risk-rating system for *A. saratogensis* damage based on the abundance of alternate host plants.

Abstract: Saratoga spittlebug, *Aphrophora saratogensis* (Fitch), is a pest of red pine, *Pinus resinosa* Ait, in the Great Lakes region of North America, and occasionally of jack pine, *Pinus banksiana* Lamb., and Scots pine, *Pinus sylvestris* L.. Adult *A. saratogensis* feed on host pine shoots, favoring young trees under 5 m tall. Feeding injury results in dead branches, deformed trees, topkill, and mortality. Nymphs feed on alternate hosts near host pines, with sweet fern, *Comptonia peregrina* (L.), being the favored host plant (Table 1).

Potential damage by *A. saratogensis* on red pines can be predicted by the abundance of sweet fern and alternate host plants within the stand. Stands can be evaluated either before planting or after establishment. Young host trees are more susceptible to damage, and trees >3 m tall are considered resistant to damage by *A. saratogensis*. Protect stands rated as moderate or heavy in areas where *A. saratogensis* occurs by removing sweet fern and other alternate host plants.

Sampling Procedure: The risk-rating procedure assumes that *A. saratogensis* is either present in the stand or in the surrounding areas, that the stand is stocked with >500 trees per hectare, and the site index is ≥ 50 . In general, stands with red pine >3 m tall are not susceptible to damage by *A. saratogensis*.

Stands with uniform vegetative ground cover can be rated as one contiguous patch. Stands with very patchy vegetation should be divided into smaller areas for rating; in such cases, consider rating each 0.2 hectares. Estimate the percentage of ground in the stand covered by sweet fern. Estimate the percentage of ground covered by other hosts accepted by *A. saratogensis* (Table 1). Do not include non-host plants or bare soil. To determine the risk of feeding injury by *A. saratogensis* in the rated area, compare the percentage of ground in the stand covered by sweet fern to the percentage of ground covered by other host plants using Figure 3. Stands can be classified as having light, moderate or heavy potential injury, which are described below:

Potential injury rating	Extent of potential injury
Light	No visible symptoms of feeding other than scars beneath bark.
Moderate	Some stunting and deformation, with occasional flagging.
Heavy	Most pines stunted and deformed; many with flagging, topkill, or dead.

Stands can be rated before planting or after establishment. Reduce or remove the alternate host plants in stands rated as moderate or heavy as soon as possible before populations of *A. saratogensis* reach outbreak levels. Once outbreaks occur, damaging populations of *A. saratogensis* may persist for up to 10 years. Densely planted, vigorous stands of red pine should be less susceptible to *A. saratogensis* damage as the closing canopy will produce too much shade for most of the alternate host plants.

Note: This risk-rating method was developed for use in the Great Lakes region of North America and may not be applicable in other areas. Use with caution until validated in other regions.

Figure and Table

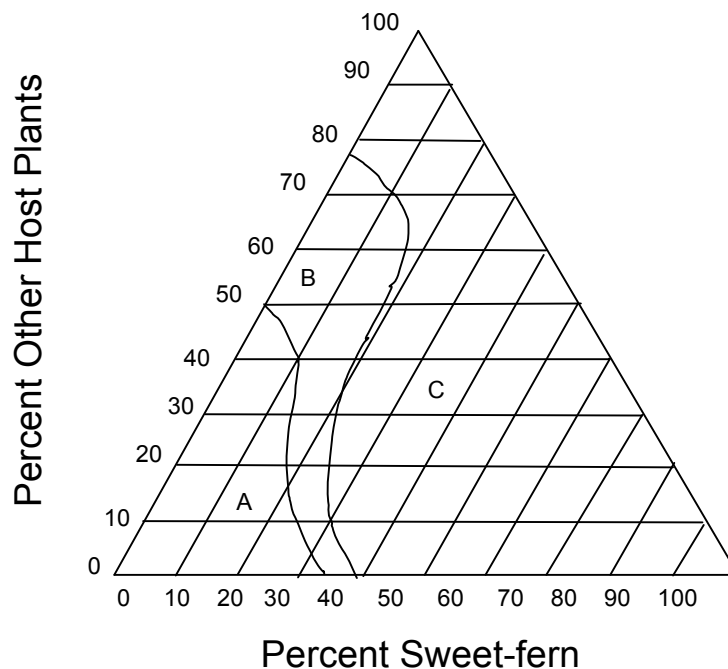


Figure 3. Spittlebug risk-rating triangle showing regions of light (A), moderate (B), and heavy (C) risk. To determine potential injury level, plot the percentage of ground occupied by sweet-fern against the percentage of ground occupied by other suitable hosts. (Modified from the original figure in the publication.)

Table 1. Spittlebug nymphal hosts and non-hosts commonly found in Lake States red pine plantations.

Vegetational group	Common name	Scientific name
Primary host	Sweet fern	<i>Comptonia peregrina</i> (L.) Coul.
Secondary hosts ¹	Blackberry, raspberry	<i>Rubus</i> spp.
	Orange hawkweed	<i>Hieracium aurantiacum</i> L.
	Strawberry	<i>Fragaria virginiana</i> Dus.
	Bracken fern	<i>Pteridium aquilinum</i> (L.) Kuhn
	Blueberry	<i>Vaccinium</i> spp.
	Sand cherry	<i>Prunus pumila</i> L.
	Goldenrod	<i>Solidago</i> spp.
	Sheep sorrel	<i>Rumex acetosella</i> L.
	Cinquefoil	<i>Potentilla</i> spp.
	Wintergreen	<i>Gaultheria procumbens</i> L.
	Sumac	<i>Rhus</i> spp.
Non-hosts	Grasses	Gramineae
	Sedges	<i>Carex</i> spp.
	Mosses	<i>Lycopodium</i> spp.
	Lichens	<i>Cladonia</i> spp.

¹This group contains perhaps 200 species of plants that include herbs, ferns, woody shrubs, and young broadleaf trees.