

Terminal Weevils – Biology & History

Adults of both species excavate feeding niches and lay eggs in the phloem of the current (lodgepole terminal weevil) or the previous year's growth (spruce weevil). The eggs hatch and the larvae mine the phloem tissue, eventually girdling and killing the terminal shoot.

Mature fourth instar larvae form depressions in the sapwood (spruce weevil) or the pith (lodgepole terminal weevil), where pupation occurs. Adult weevils emerge by chewing holes through the bark and then disperse to overwintering sites.

There are important differences between the spruce weevil and lodgepole terminal weevil life histories (see table). These differences are important in timing treatments. The spruce weevil lays its eggs in the phloem tissue of one-year-old growth, whereas the lodgepole terminal weevil lays its eggs in the newly expanding terminal shoot. Spruce weevils develop from egg to adult in one summer.

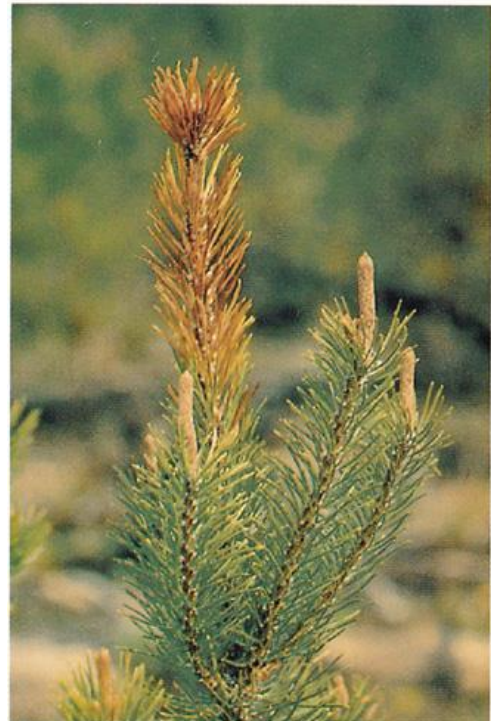
Lodgepole terminal weevil suffers high egg and larval mortality, often with no weevils emerging from an attacked terminal.

Although egg laying by the lodgepole terminal weevil may not result in successful adult emergence, the terminal shoot is usually killed by the larvae mining. Both spruce weevil and lodgepole terminal weevil may attack more than one terminal each summer. General descriptions of lifestages are:

- Egg – pearly white, 1 mm long
- Larva – stout, legless yellowish-white grubs, up to 1.2 cm
- Pupa – white, resembles adult; spruce weevil pupae found in chip cocoons dug into the sapwood; lodgepole terminal weevil pupae found in chamber in pith



Clockwise from upper left: lodgepole terminal weevil feeding puncture with egg and fecal pellet in lodgepole pine terminal; larva in pith; pupa; old attack causing a fork; adult on needles.



- Adult – reddish brown to black with cream markings, long curved snout, body length 0.4 to 1.0 cm

The life history and symptoms following attack by the spruce weevil and lodgepole terminal weevil:

Stage	Spruce weevil	Lodgepole terminal weevil
Egg	<ul style="list-style-type: none"> ▪ Eggs are laid in adult feeding punctures (termed oviposition punctures) just below the bud on the terminal shoot. ▪ Oviposition puncture is capped by a black fecal pellet. ▪ Up to 100 eggs laid per leader. ▪ Egg laying occurs in spring (April–May) season, ▪ Eggs hatch within 2 weeks. 	<ul style="list-style-type: none"> ▪ Usually a single egg (but up to 4) is laid in a feeding puncture (termed oviposition puncture) excavated in the phloem tissue of the new terminal shoot. ▪ Eggs are laid along the length of new terminal shoot. ▪ Oviposition puncture is capped with a fecal pellet. ▪ Female can lay up to 150 eggs per usually spread among several leaders. ▪ Egg laying occurs from May–July. Eggs hatch within 2 weeks.
Larva	<ul style="list-style-type: none"> ▪ First instar larvae feed independently and later instars form a feeding ring. ▪ Larvae feed from the terminal downwards, occasionally feeding into the second or third previous year's leader. ▪ Mature 4th instar larvae stop feeding and form chip cocoons (Figure 1) for pupation. ▪ Larval period lasts from May to mid-July depending on weather adults. 	<ul style="list-style-type: none"> ▪ First instar larvae tunnel randomly in the phloem and cortex. ▪ Second instar larvae feed upwards in a spiral pattern that eventually girdles the terminal shoot. ▪ By late summer, 3rd and 4th instar larvae migrate to the pith and form pupal chambers (Figure 2). ▪ Overwinter first summer as larvae; occasionally overwinter as pupae or
Pupa	<ul style="list-style-type: none"> ▪ Found in chip cocoons formed in the sapwood. ▪ Duration is 2–3 weeks (July). 	<ul style="list-style-type: none"> ▪ Found in chamber in pith. ▪ Duration is 2–3 weeks (June at low elevations; later at higher elevations).
Adult	<ul style="list-style-type: none"> ▪ Emerge from leaders from July through September. ▪ Feed on leaders and laterals and then overwinter in duff, usually below host tree. ▪ On coast, may overwinter as adults in the leader. ▪ Feeding activity resumes in April followed shortly by mating and egg laying season. ▪ Adults may live up to 4 years. ▪ Weevils are strong flyers in spring, weaker flyers in the fall and do not disperse far. 	<ul style="list-style-type: none"> ▪ Emerge from leaders from late June to early September, depending on elevation and seasonal weather. ▪ Newly emerged adults feed on laterals and terminals. ▪ Adults that emerge in early summer (lower elevation sites) feed for 2–3 weeks, mate and begin laying eggs in new terminal shoots. ▪ Adults emerging in late summer feed and do not usually lay eggs in same ▪ Weevils overwinter in duff under or near host tree. ▪ Adults are long-lived. ▪ Feeding by overwintered adults resumes April, followed by mating and egg laying. ▪ Adults deposit eggs in new, expanding terminal shoots from May through July. ▪ Adults can live for two or more years and can attack and kill many terminal shoots throughout their life span.