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Forest Health Alert

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Forest Health Protection
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Western spruce budworm (*Choristoneura occidentalis* Freeman) populations are once again on the rise. Large areas of moderate to heavy defoliation of Douglas-fir have been reported across southern Idaho. The last outbreak ended in 1987 after defoliating millions of trees over more than 20 years. During a prolonged outbreak, tree mortality occurs most frequently among small Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), Engelmann spruce (*Picea engelmannii*), and subalpine fir (*Abies lasiocarpa*).

Figure1.

Western spruce budworm (WSB) is the most widely distributed and destructive forest defoliator in western North America. Buds and current year foliage (Fig 1), including flowers and developing cones are fed on voraciously.

Eggs are laid in masses of 25-40 on the underside of needles from late June to early August (Fig 2). Eggs hatch in approximately 10 days. The newly hatched larvae move to crevices under bark or lichen to overwinter in a silken hibernaculae. In late April or May the following year, the larvae migrate to the foliage where they mine old needles or feed on flowers. In 1-2 weeks they enter developing buds (Fig. 3), feeding as new needles lengthen. New foliage is webbed together as protection against predators. Budworms pupate within the webbed foliage from late June to mid-July. Adults (Fig. 4) emerge 8-12 days later and initiate the cycle over.

Figure 2.

Figure 3.

Figure 4.

Figure 5.

Figure 6.

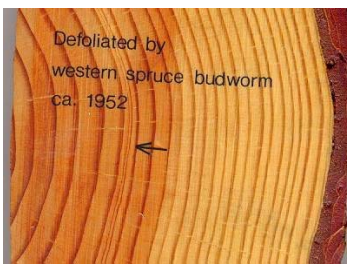

Figure 7.

WSB defoliation (Figs. 5 & 6) can severely affect seed production reducing regeneration by host trees. Several consecutive years of defoliation of larger trees may result in growth loss (Fig 7), tree deformity, top-kill, or mortality. Some observations suggest that historically, low intensity budworm outbreaks repeatedly thinned shade tolerant trees in the understory. In combination with more frequent surface fires, these less severe outbreaks probably reduced the likelihood of catastrophic, stand replacing fires or high intensity insect outbreaks. Decades of fire suppression and selective harvesting of non-host species may have modified forest conditions leading to more severe budworm outbreaks.