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May/June Beetles on Christmas Trees

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The larvae (grubs) of May/June beetles can cause substantial damage to young Christmas trees. The grubs are found in the soil and may be numerous on land that was recently in old grass sod. Ten-lined (*Polyphylla decemlineata*) and brown May/June (*Phyllophaga* species) beetles are present in British Columbia. Adults are attracted to bright lights and can fly in June hence the name June beetles.

June beetle larvae (grubs)

Hosts

Grubs feed on the roots of all pines, firs, spruces, grasses and other plants and can cause severe damage. Adults feed on the leaves of trees and shrubs without causing noticeable damage.

Ten-lined June beetle adult

Identification

Grubs are large, 30-40 mm long and C-shaped. They have a cream-coloured body, brown head and 3 pairs of legs. Adults are large, 20-35 mm long robust beetles. The adult ten-lined June beetle has eight long white stripes and two short stripes down its back and emits a hissing sound when handled.

Brown June beetle adult

Damage

Grubs feed on roots and can cause yellowing of needles and stunted trees. Young trees may die as a result of destruction of roots by grubs. Grubs cause greatest damage in their second year of development. Grubs are primarily a pest of young trees but older trees can also be damaged.

Damaged trees with yellowing and dying needles

Life History

June beetles require about three years to develop. They overwinter as grubs and adults. Adult females lay 60-70 eggs in the soil within 7 cm of the surface in late May or early June. Eggs hatch after 2-3 weeks and grubs feed on organic matter and roots near the soil surface until fall when they move down in the soil as frost approaches (18-36 cm deep). In the spring of the second year grubs return to near the surface to continue feeding on roots and in the fall they again go deep in the soil. In the spring of the third year, grubs return to feed near the surface and mature by mid-season. They pupate in earthen cells 15-20 cm below the surface and adult beetles emerge from pupal cells in late May or early June when mating and egg laying occur.

Root damage by ten-lined June beetle grubs

Monitoring

Look for dead or dying trees. Sample several trees that appear to be stunted or water stressed. Dig up an area around the tree, a foot deep and sift through the soil and roots for grubs. With older trees, dig a trench in the herbicide strip in the tree's root zone and look for grubs. Severely affected trees can sometimes be easily pulled from the ground because there are no longer enough roots to anchor them.

Adult males are attracted to lights at night and can be trapped in a blacklight trap. In highly infested areas, large numbers can be found around lights in mid-late summer.

Control

- Avoid planting trees in soil that has been used for pasture, sod production, native grassland or other permanent grass production. Trees in light, sandy soil are more prone to attack.
- If planting into former grassland in the spring, check for white grubs in the summer or fall before planting. Select five locations at random in a 1-2 acre field or in areas where grubs are suspected such as poor stands of grass, wild strawberries, or where moles, crows and other animals have been feeding on grubs. Dig a square foot hole, 6-8 inches deep, sift the soil through your fingers and look carefully for grubs. Record the number of grubs for each of the 5 holes and find the average number of grubs per hole. If you find an average of more than 1 grub per hole, the land will need treatment before planting.
- Any measure promoting rapid growth in the spring will reduce the severity of damage.
- Remove severely damaged trees and grubs.
- Manage weeds with a herbicide to prevent beetles from laying eggs in treated areas in May/June. Females prefer laying eggs in weedy or mowed grassy areas.
- Where feasible, tilling the soil when grubs are near the surface in spring and summer will help expose them to predators such as birds, bats, skunks and parasites.
- Apply insecticides under high infestations to prevent further root damage. Insecticides work best when grubs are small and feeding near the soil surface, usually in late spring (end of May through June - adult flight through peak hatch) or July - August. Use high spray volumes and direct sprays to the root zone. Rain or irrigation (a half to 1 inch) is needed to move the insecticide down to where the grubs are. Sevin T&O (carbaryl) is registered on pines for control of June beetles in Canada.

References

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Adult brown June beetles