

Secondary and Emerging Insect Pests

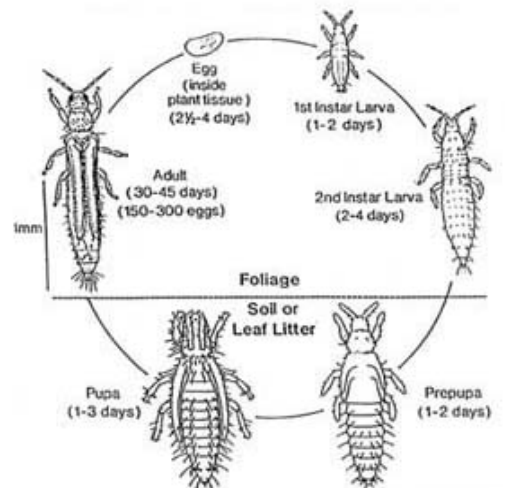
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Potato growers deal with a very long list of potential pests and diseases. The primary insect pests of concern in Washington are green peach aphid (*Myzus persicae*), wireworm (primarily *Limoniusspp.*), and Colorado potato beetle (*Leptinotarsa decemlineata*). There are however, many other herbivorous insects found in Washington potato fields, and some of these can reach damaging populations. Below we picture and briefly discuss several of these occasional and poorly known pests.

Thrips (mostly *Frankliniella occidentalis*)

Very little is known about thrips biology on potatoes in the Pacific Northwest. Thrips are minute, slender bodied insects (0.5-1.0 mm in length). Wings may be present or absent, and are unlike normal insect wings; thrips wings are essentially thin rods lined with long hairs. Thrips feed on potato leaves by rasping plant cells and sucking out their contents. Thrips feed on leaves and flowers, but are most commonly found on the underside of leaves. Use of a hand lens will aid in their detection and identification. Populations of thrips are low in the early spring and build up over time and can become very dense. Damage on potato leaves looks somewhat like mite damage - there are often small patches of damaged leaf tissue that are paler than surrounding healthy tissue. Thrips have a complex life cycle in which the last two immature stages are quiescent and non-feeding.

Thrips are difficult to control in a number of crops. Insecticides will not kill all of the population and due to short generation time, thrips numbers will rebound quickly. Some years are worse than others-partly due to overall insect management programs; thrips often seem to be less of a problem when growers have deployed a beet leafhopper control program in the first half of the season. The critical issue is that the cumulative damage done by thrips feeding on the leaves becomes a drag on plants' ability to photosynthesize. We currently have no science-based treatment threshold. We do know that waiting too long can lead to uncontrollably large populations.



Caterpillars (a.k.a. “worms” – several species mostly of Noctuidae)

Increasingly, Washington potato growers consider “worms” a major insect pest of potatoes. The term “worms” is used loosely to cover a group of species of moth larvae (caterpillars) found on potatoes. These include cutworms, loopers, armyworms (all belong to the family Noctuidae), and sometimes leaf tiers (Pyrallidae). There is less known about this group of insects than any other major pest of potatoes in the Pacific Northwest. We believe that shifts away from broad spectrum organophosphate and carbamate insecticides to the neonicotinoid and other narrower spectra of control classes of insecticides (e.g. Fulfill) has allowed these species to flourish. We have little or no information on the abundance, diversity, pattern of occurrence, host suitability, economic threshold or other basic information on these pests. However, growers routinely face scenarios where management decisions must be made for these species. These caterpillars are commonly targeted with insecticides without knowledge of the species involved or their true pest potential.



Alfalfa looper, adult and larva (Photos: OSU)



Cabbage looper, adult and larva (Photos: OSU)



Armyworm on arugula



Larva of a leaf tier on potato

Like all the insects discussed here, there is no science-based treatment threshold for these caterpillars. The bigger problem is we know very little about pest biology and we do not sample correctly for this pest. It is not unusual for a grower to treat based on the appearance of damage—when this happens it is highly likely that most of the damage has already occurred and the insect is probably either a large larva or has pupated. Large caterpillars are very difficult to control. When using insecticides, coverage is critical. Application by ground is best, chemigation is better, and aerial application can be questionable in terms of efficacy.

Lygus bugs (*Lygus* spp.)

Small sucking bugs, brown to green and less than ¼ inch long. They cause minor damage of unknown economic significance. Damage commonly consists of flagging of leaflets, leaves, or small stems. Chemical treatment for lygus bugs in potatoes probably is rarely needed, and should be undertaken with care. Alfalfa seed growers learned an important lesson about lygus control. Pyrethroid insecticides were their primary tool until lygus developed resistance and growers lost the use of that class of chemistry. Lygus can, however, reach very high populations in potatoes and may cause economic damage at those high levels.



Lygus adult.



Immature lygus (a.k.a. nymph)



Example of leaf damage associated with lygus.



Lygus bug on potato leaf.

Stink bugs (e.g. *Chlorochroa* spp.)

Stink bugs that damage potatoes are usually large (about ½”), green, shield-shaped bugs. They feed by sucking plant sap. Stink bug damage is usually a flagging of leaflet, leaf, or stem. For example, feeding at the base of a leaf seems to cause the entire leaf to wilt. Stink bugs are pests of potatoes in isolated pockets in the Pacific Northwest. The widespread use of neonicotinoid insecticides (Admire and Gaucho, Platinum and Cruiser) has probably allowed stink bugs to become a problem. There is no known treatment threshold, but it is possible that 4 to 5 adults per plant could cause significant disruption to plant physiology. Stink bug problems are usually associated with fields next to unfarmed, desert land. Stink bugs migrate into the field mid and late season and they can build up in a potato field.



Chlorochroa stink bug eggs on a leaf, nymphs hatching, and a very young nymph.



Adult stink bugs are about ½ inch long and can be green, light green, or even brownish.

Blister beetles (e.g. *Epicauta* spp.)

An uncommon pest of potatoes is the blister beetle. There are many species of blister beetles, all with similar biology, but the most common species feeding on potatoes are *Epicauta* pictured here. Adults feed on the leaves, causing a ragged appearance. Adults are about ½ inch long, gray to black, narrow and elongate, with conspicuous heads and necks. Larval blister beetles live in the soil in uncultivated land, and are predators of grasshopper and bee eggs. Adults feed on the foliage of many different kinds of plants. The problem occurs near unfarmed land, usually associated with the year following a grasshopper outbreak. These beetles can cause complete defoliation of affected areas, but because they are extremely clumped within a field, little total damage normally results. Treatment of an entire field would rarely be appropriate.



White grubs (various beetles in Scarabeidae)

The white grubs are a group of common beetles also known as scarabs. As larvae these beetles live in the soil and feed on roots of many plants. When they are in potato fields they can also feed on developing tubers. Tuber feeding by white grubs usually causes broad, relatively shallow holes that are often healed over by harvest. They can, however, cause damage that is fresh at harvest, and even be present with the harvested tubers.

