



Pest Common Name

Pea Aphid

Pest Scientific Name

Acyrtosiphon pisum (Harris)

Host Plants

Legumes such as field pea, chickpea, alfalfa, clover, lentil, and leguminous weeds

Integrated Pest Management of Pea Aphids in Legumes

Description

Aphids are small, soft-bodied insects with piercing-sucking mouthparts. Adult aphids can be either wingless (Figure 1) or winged (Figure 2), whereas nymphs (immatures) are always wingless. Aphids have cornicles (small, rear-facing “tailpipes” near the end of the abdomen), a key trait in distinguishing them from other small arthropods.



Figure 1. Adult pea aphid (*Acyrtosiphon pisum*). Courtesy of Brad Stokes, University of Idaho.



Figure 2. Winged pea aphid (*A. pisum*). Courtesy of Brad Stokes, University of Idaho.

Pea aphids are usually a bright shade of green, similar in color to host leaves, though a pink form can arise under certain conditions. Fully grown adults are larger than those of many other aphid species, around 1/8 inch (3 millimeters) long, with notably long legs. Though aphids can be difficult to identify, pea aphids are the only ones found in significant numbers in legume crops in most production areas in the Pacific Northwest (PNW). For more useful information on the identification of aphids in legumes, see the [University of California IPM website](#).

Biology

Unlike many aphids that are pests in cropping systems, pea aphids only feed and reproduce on leguminous host plants.

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On these legume hosts, they go through a complex life cycle that includes both asexual and sexual reproduction, with asexual reproduction occurring throughout the majority of the season.

Pea aphids overwinter as eggs. In the spring, the eggs hatch into wingless females that give live birth without mating. Host-plant cues, population density, and chemical cues initiate the development of winged females in later generations. Individuals in this generation can disperse great distances, moving on prevailing winds from central Washington and northern Oregon to eastern Washington, Idaho, and beyond. Early in the season they colonize feral vetch or legume crops that have emerged. Subsequent generations of pea aphids disperse more locally, meaning they can colonize fields at any point during the growing season.

As days shorten in the fall, sexual forms of pea aphids are produced and move from legume crop hosts to perennial legume hosts, where they mate and lay eggs that will overwinter. In some parts of the PNW, or when drought occurs in the fall, most pea aphids die in the fall, and the eggs are unable to overwinter. In these regions, new infestations must come from warmer regions each spring.

Damage

Pea aphids inflict direct damage to their host plant by feeding on plant sap, reducing the host plant's health and growth, and hindering nitrogen fixation. Severe infestations of pea aphid can kill host plants and severely reduce yield (Figure 3).



Figure 3. Pea aphid damage to alfalfa. Courtesy of Bruce Bosley, Colorado State University, bugwood.org.

Pea aphids also inflict indirect damage by vectoring a number of viruses. Notable viruses transmitted by pea aphid in legumes include *Pea seed-borne mosaic virus* (PSbMV), *Pea enation mosaic virus* (PEMV), *Bean leafroll virus* (BLRV), and *Pea streak virus* (PeSV). Yield reductions of 50% or more have been documented in years of heavy pea aphid infestation.

PSbMV can cause significant losses, particularly when infection occurs before or during bloom. Plant symptoms include stunting and delayed maturation, as well as shortening of internodal lengths (known as terminal resetting) (Figure 4). Leaves may show swollen or cleared veins and mottling or mosaic discoloration. Seeds are often malformed, discolored, and shriveled. PSbMV can be transmitted by infected seed, or aphids. PSbMV can infect legumes as well as alfalfa, sugar beets, and many weeds (e.g., black medic and shepherd's purse). Pea aphid and green peach aphid both transmit PSbMV relatively effectively.



Figure 4. A *Pea seed-borne mosaic virus*-infected plant, showing terminal rosetting. Courtesy of Lyndon Porter, United States Department of Agriculture (USDA).



Figure 5. *Pea enation mosaic virus*-infected leaflet. Courtesy of Lyndon Porter, USDA.



Figure 7. *Bean leafroll virus*-infected garbanzo bean plant (left) and healthy plant (right). Courtesy of Howard F. Schwartz, Colorado State University, bugwood.org.



Figure 6. *Pea enation mosaic virus*-infected pods (right) and healthy pods (left). Courtesy of Lyndon Porter, USDA.



Figure 8. Pea streak-symptomatic pods. Courtesy of Lyndon Porter, USDA.

PEMV causes plant symptoms such as general stunting and development of unusually dense basal nodes. Leaf symptoms include mosaic coloration and characteristic blister-like outgrowths called enations (Figure 5). Pods may have enations as well, be split open, or be generally malformed (Figure 6). PEMV is not seed-borne and is exclusively transmitted by aphids. It is transmitted by many aphid species, but the pea aphid is by far the most important vector in PNW legumes.

In legumes, BLRV causes severe stunting in plants, chlorosis of young leaves, and downward leaf rolling (Figure 7). BLRV can also cause 50%–90% reduction in pod production. The disease also infects alfalfa, white clover, and vetch, which serve as reservoirs of the virus. Pea aphid is the primary vector of BLRV but many other species of aphid, including black bean aphid, potato aphid, and green peach aphid, also vector the virus.

Many different viruses cause PeSV, but symptoms generally include streaking of the stem in colors

ranging from gray to dark brown to purple (Figure 8). Leaves often wither, with dieback starting from the tip. Pods are sometimes deformed. Alfalfa and red clover are primary sources of inoculum in the PNW.

Monitoring

Visually monitor pea aphids by inspecting an individual plant. Aphids may be present on any plant part (leaves, stems, stipules, and pods). Sweep-net sampling is recommended to estimate aphid density and to guide management decisions. A general threshold above which management of pea aphid may be recommended is an average of 9–12 aphids per 180° sweep during bloom to pod-filling plant-growth stages. However, this threshold should only be used as a guideline.

Visit the [Idaho Pest Monitoring](#) and [Legume Virus Project](#) sites for current information on aphid abundance and viral risk.

Management

Primary Management Tactics

Effective management of pea aphids is largely based on the local and seasonal risk of virus transmission and a careful cost-benefit analysis. Where infection with pea aphid-transmitted viruses is deemed likely, aggressive management is recommended until approximately three weeks after plant emergence. Where infection is deemed less likely, use direct-injury thresholds or abundance rules of thumb (see Monitoring, above). Treatment after symptoms of PEMV and BLRV are observed in the field is ineffective, since fieldwide inoculation likely has already occurred.

Cultural

- Early sowing may allow plants to mature beyond vulnerable stages before aphids reach sufficient numbers to cause economic injury
- Crop rotation between legumes and cereals
- Remove infected plants

Biological

- Avoiding the use of broad-spectrum insecticides help conserve resident predators (e.g., lady beetle larvae and adults, larval syrphid flies, and lacewings) and parasitoids (e.g., *Aphidius ervi*) that help keep pea aphid populations in check (Figure 9)



Figure 9. A convergent lady beetle (*Hippodamia convergens*), consuming a pea aphid. Source: Dennis Schotzko, University of Idaho.

Chemical

- Pea aphid management using insecticides may occur at multiple points in the growing season: seed treatment, early spray, or late spray
- For calculators that help determine if spraying is likely to be economically advantageous, see the [Legume Virus Project](#) website
- Treatment after symptoms of PEMV and BLRV are observed in the field is ineffective, since fieldwide inoculation likely has already occurred
- Viruses transmitted in a nonpersistent manner by aphids can be more difficult to control with insecticides (these include PSbMV and PeSV)
- Viruses transmitted in a persistent manner by aphids are often effectively controlled with insecticides (these include PEMV and BLRV)
- For recommendations for pesticides to use in the management of pea aphid, see the [PNW Pest Management Handbooks](#) website

Caution: Read Pesticide Labels

Pesticide labels override other recommendations.

ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this UI webpage do not substitute for instructions on the label. Pesticide laws and labels change frequently and may have changed since this publication was written. Some pesticides may have been withdrawn or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Trade Names — To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Groundwater — To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.