

Potato XXII

Potato Psyllid

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Psyllid

Identification (and life cycle/seasonal history)

Potato psyllid adults are approximately aphid sized, but on close appearance more closely resemble a miniature cicada. They are generally dark gray, but have some white markings, particularly white banding on the abdomen. However, such markings are indistinct on adults that have just emerged from the nymphal skin and will be pale colored for about the first three days after emergence.

Psyllid nymphs are flattened and move little, if at all. They are found on the underside of the leaf. Young stages are very pale brown, and older nymphs are more greenish.

The potato psyllid is a migratory insect and does not survive winters in the High Plains. During winter, it survives in the southern US and northern Mexico on several native plants, particularly certain *Lycium* species. It is commonly damaging to early potatoes grown in western Texas, and infestations in that area can be a good predictor of later problems in the High Plains. Migrations into the High Plains typically occur in mid to late June.

Potato psyllid can infest many plants in the nightshade plant family and some in the morning glory family. Along with potato, pepper and tomato are most commonly infested. However, significant damage only occurs on tomato. Peppers show few, if any, symptoms.

Plant Response to Damage

Potato psyllid damages potato by injecting saliva during feeding. The saliva produces toxic effects on the plant. A wide range of symptoms result from psyllid feeding producing a condition collectively known as psyllid yellows.

Above ground symptoms include:

- Leaf color change. Yellowing is common, particularly on white and russet varieties. Red varieties tend to show more reddening or purpling.
- Leaf curling. Leaf curling is common with some varieties. New leaves often are smaller in size.

- Thickened internodes. Thickening at internodes is a common symptom, and is often associated with general plant stunting. In extreme cases conspicuous aerial tubers may form.

Note: Many foliar symptoms of psyllid yellows mimic those of aster yellows ('purple top'), a disease caused by infection with a phytoplasma.

Symptoms on tubers include:

- Rough skin. Tubers are often poorly shaped and have rough skin set.
- Premature sprouting. Dormancy of sprouting is broken and tubers prematurely sprout. A common result of this is production of chain tubers.
- Reduced yield. Yields can dramatically be reduced. This mostly is in the form of reduced tuber size. In some cases, tuber set can be increased, resulting in excessive number of undersized tubers.

Management Approaches

Natural Controls

The most important natural controls are certain general predators found in potato fields, particularly predatory bugs (damselflies, bigeye bugs, minute pirate bugs). Late in the season, parasitism by *Tetrastichus triozae*, a tiny parasitic wasp, can be important. However, biological controls are usually not present in sufficient numbers early enough to prevent damage from occurring during outbreak years.

Cultural Control

Although potato psyllid can develop on all potato cultivars, there is considerable range in susceptibility to the effects of psyllid yellows. Some cultivars are extremely susceptible (e.g., Russet Nugget) while others show much more tolerance (e.g., Yukon Gold).

Sampling

Detection of potato psyllid is critical since outbreaks are irregular because they are dependent on migrations and weather. Perhaps the most effective way to detect the presence of potato psyllid is by sweep net sampling for the winged adults. Sweep net sampling should be done weekly during the period when psyllids are expected to arrive in potato fields - often around mid-June. The adults can be separated from the other insects caught in sweep nets because they are banded on the abdomen and readily jump (much like potato flea beetles). Psyllid nymphs are not detected in sweep net samples.

Adult potato psyllids are also attracted to color, particularly bright yellow and orange. Migrations can be detected by use of water pan color traps.

Presence of adult psyllids may not indicate local establishment of psyllids, as migrations may occur through the area with little egg laying occurring. Local establishment is often best determined by examining indicator plants that psyllids colonize early in the season

and on which they are most easily detected. Green peppers are often the plants on which psyllids can first be found. Formerly, matrimony vine was used for this purpose, but this is now rarely planted.

Sampling for nymphs in potatoes requires extensive leaf sampling. Psyllid nymphs can be difficult to detect. Young stages are small, pale colored and do not move, which requires some training to reliably see. Furthermore, psyllids are highly aggregated in their distribution so that the majority of the psyllids on a plant may be on a leaf or two. This requires that a large number of leaves be sampled to detect the presence of psyllids in a field. Sampling a minimum of 100 leaves is needed to have any confidence whether potato psyllid is present in a potato field.

Because of sampling difficulties and the severe damage that potato psyllid can do to the crop, no economic thresholds have been established. As a general rule, if it can be determined that a potato field has been colonized by psyllid then there is high likelihood of significant yield loss. Yiled loss is particularly likely during infestation early in the season.

Chemical Control

Neonicotinoid insecticides (Admire/Provado, Platinum/Actara, Assail) have been most consistent in providing control of potato psyllid. Planting time treatments of these products should provide control for at least 8 weeks. Soil-applied organophosphates (e.g., Thimet, Disyston) have a shorter period of effectiveness - about one month.

Foliar applications must provide thorough coverage, because potato psyllid is most often found on the underside of leaves in the lower canopy. Therefore, high gallonage applications will be most effective.

Product List for Potato Psyllid on Potatoes:

Insecticide	Product per Acre	Preharvest Interval, remarks
	Planting Time/Soil Treatments	
Platinum	5.8 fl. oz/A	12 hour reentry. Neonicotinoid
Platinum Gold	2.2 fl. oz./1000 row-ft	insecticide (thiamethoxam). Platinum gold includes fungicide metalaxyl. Planting time treatment. High-end rates suggested for potato psyllid.
Admire 2F	0.9-1.3 fl. oz./1000 row-ft	12 hour reentry. Neonicotinoid insecticide (imidacloprid). Planting time treatment. High-end rates suggested for potato psyllid.
Thimet 20G	use high end of labeled rates	72 hour reentry. Planting time band or in-furrow treatment.

		Organophosphate insecticide (phorate). Restricted Use due to acute toxicity to humans
Di-Syston 15G	use high end of labeled rates	(72 hour reentry) Planting time band or in-furrow treatment. Organophosphate insecticide (disulfoton). Restricted Use due to acute toxicity to humans
Foliar Applications ¹		
Provado 1.6F	3.75 fl. oz/A	7 day PHI, 12 hour reentry. Neonicotinoid (imidacloprid) insecticide. Maximum 15 fl. oz/A per season
Leverage 2.7	3.75 fl. oz/A	7 day PHI, 12 hour reentry. Combination neonicotinoid (imidacloprid)/pyrethroid (cyfluthrin). Restricted Use due to toxicity to fish and aquatic organisms
Actara	3.5 oz/A	14 day PHI, 12 hour reentry. <i>Special Local Need label for Colorado.</i> Neonicotinoid insecticide (thiamethoxam). Psyllid is not on current label, but Actara has been effective in CSU trials when used at rates for aphids on potatoes.
Monitor	1 1/2-2 pts/A	14 day PHI, 72 hour reentry. Organophosphate insecticide (methamidophos). Restricted Use due to acute toxicity to humans
endosulfan (Phaser, Thiodan, Thionex, etc.)	as labeled	1 day PHI, 24 hour reentry. Chlorinated hydrocarbon insecticide (endosulfan)

¹ Pyrethroid insecticides that include potato psyllid on the label include Asana XL, Baythroid 2, Mustang, Fury, Ambush and Pounce. Psyllid control with these have been erratic in CSU trials.

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