An IPM Program for
Leafrollers on Ornamental Plants

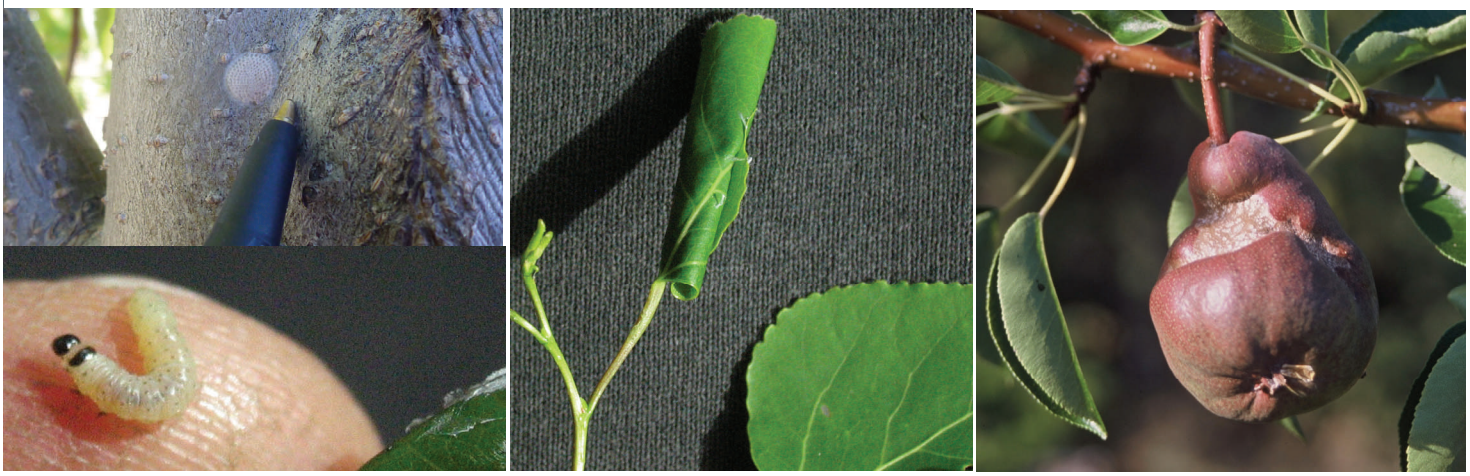
For landscape pest managers

KEY POINTS

- Different species of leafrollers are found on most ornamental plants and fruit trees.
- The larval stage will feed on leaves and developing fruit, causing visible damage later in the season.
- Many plants can tolerate a low level of leafrollers, depending on a number of factors.
- A well-designed IPM program can effectively manage leafrollers with minimal pesticide use.

Most broadleaf plants are susceptible to damage by leafrollers with fruit trees being commonly affected. The insect will roll leaves to hide during the day and comes out at night to feed on foliage or developing fruit.

It is important to manage populations early in the season when the larvae are small. Older larvae are well-protected in tightly-rolled leaves and more difficult to control.



From left to right: A winter egg mass, a young larva, a rolled up leaf and a mature pear with scarring from leafroller feeding.

KNOW YOUR LEAFROLLERS

Leafroller adults are night flying moths. The young stage is a caterpillar. Four species can cause damage in British Columbia. European Leafroller and fruittree leafroller have one generation per year and are found mostly in the spring. The obliquebanded leafroller and three-lined leafroller have two generations per year and are found in spring and again in late summer.

All leafrollers roll up leaves in which they hide to feed. Damage is usually noticed later in the season: leaves have missing parts and large holes while fruit shows scarring or other feeding damage.

A number of low-risk pesticides are available to control leafrollers. These products must be ingested by the young caterpillar; thus it is important to have correct spray timing and good coverage of the plant.

Designing an IPM program for leafrollers

The following table presents a sequence of actions at key times of the year. The emphasis is on plant health and rational pest management. Use it to develop an IPM program for your sites.

Season (Phenological event)	Approximate time of year	Action
Winter (dormant)	November to March	While pruning, be on the look-out for masses of leafroller winter eggs. Egg masses are visible to the naked eye on trees infested the previous year. They are light coloured (white, light green or gray) and found on small branches.
Late winter (before bud breark)	March to April	Flag the egg masses located in the warmest locations with exposure to sunlight. These eggs are the first to hatch and are used to determine timing of the first spray. Spray when pin-point black holes appear, indicating first emergence of larvae.
Spring (after bud break)	Early to mid May	Look for new leaves that stay attached together rather than unfolding normally. Young leafrollers may be found inside the attached leaves. Hand-pick the rolled leaves to control small infestations as they start.
Spring (early plant growth)	May	Apply spinosal or *B.t.k.* where monitoring indicates a leafroller problem. These products must be applied early to target young caterpillars. Effectiveness is much reduced for all pesticides when spraying older caterpillars.
Early summer (active plant growth)	June to early July	On fruit trees, many commercial products are registered to manage leafrollers. Use the pesticides spinetoram, methoxyfenozide or chlorantroniliprole. Codling moth sprays applied on fruit trees will also help control leafrollers.
Summer (reduced plant growth)	August	Look for small caterpillars dropping on threads from the trees. These are the summer generation of leafrollers. They will feed until fall. Hand-pick small infestation or use spinosad or *B.t.k.* to control young caterpillars.
Late summer (leaves turning colour)	September to October	Evaluate the IPM program for properties where leafrollers were a problem. A spray program should eliminate this problem in a landscape after 2 or 3 years. Eventually, replace the spray with another service (pruning, fertilization, etc.).

Reduced-risk pesticide products registered for aphids on ornamental plants (as of January 2014)

Product name	Active ingredient	Label	Rate in water	Notes
Dormant oil (various products)	mineral oil	Fruit trees All ornamentals	1 to 2 L / 100 L	Limited effectiveness on leafrollers Low toxicity, safe to beneficials
Dipel 2X DF	*B.t.k. Bacillus thurin-giensis k.*	Fruit trees All ornamentals	31.3 to 62.5 g / 100 L	Apply when larvae are small Short residual, plan 2 applications Low toxicity, safe to beneficials
Success 480SC **Entrust 80W**	spinosad	Fruit trees Ornamental plants	2.5 ml / 100 L 1.5 g / 100 L	Very good efficacy and residual Low toxicity, safe to beneficials Entrust is approved for organic
Delegate WG	spinetoram	Fruit trees	210 to 420 g / ha	Contact insecticide with residual Also labelled for codling moth
Altacor WG	chlorantroniliprole	Fruit trees	145 to 285 g / 450 L / ha	Contact insecticide with residual Also labelled for codling moth
Intrepid 240F	methoxyfenozide	Fruit trees	75 ml / 100 L	Insect growth regulator Best when applied early in season Also labelled for codling moth