



## Controlling Insects in Ornamental Plant Production

### Overview

To successfully control insect pests, growers must understand two critical things: pest biology and how insecticides work. When we investigate reports of insecticide failures, we often find a mismatch between the insect’s life stage or feeding behavior and the insecticide’s mode of action. By better understanding these two factors and ensuring alignment, growers can successfully implement their IPM programs.

### Pest Biology

Many growers are familiar with the concept that certain insecticides are most effective on specific life stages. For example, incorporating an ovicide when trying to disrupt a spider mite population with multiple generations present. Just as important as the life stage is how the insect moves and feeds, as this behavior will determine how the insect encounters an insecticide. For example, mites tend to congregate on the underside of leaves, so insecticides with translaminar activity can be particularly effective. As for feeding patterns, it is helpful to know whether the insect feeds by chewing solid plant tissue or by piercing and sucking liquids from the plant’s vascular system.

Target Insect	Mouthparts	Plant Tissue
Caterpillars	Chewing	Whole leaf sections
Foliar feeding beetles	Chewing	Whole leaf sections
Aphids	Piercing-sucking	Phloem
Leafhoppers	Piercing-sucking	Xylem
Mealybugs	Piercing-sucking	Phloem
Mites	Piercing-sucking	Epidermal cells
Thrips	Rasping-sucking	Epidermal cells
Whiteflies	Piercing-sucking	Phloem

### How Insecticides Work

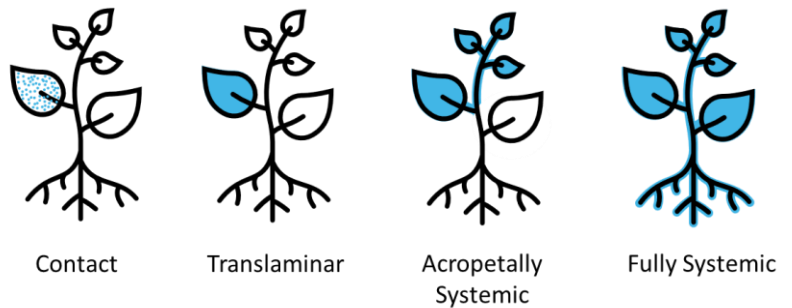
Insecticide activity is categorized as either contact, translaminar, acropetally systemic, or fully systemic.

**Contact:** remains on leaf surface where applied

**Translaminar:** penetrates leaf tissue, but does not move into vascular system

**Acropetally Systemic:** moves upward in the vascular system (xylem mobile)

**Fully Systemic:** moves up and down in the vascular system (xylem and phloem mobile)



For products that need to be ingested, it is important to match the movement of the insecticide in the plant tissue with the feeding site of target pest. For example, you may choose an insecticide with contact activity like Atruvia™ 3.0% SL (azadirachtin) to control foliar feeding beetles because they are ingesting whole sections of leaf tissue and will be exposed to the highest dose. However, for a phloem-feeding insect like aphids, the best results will come from an insecticide that is systemic, moving in the vascular tissue. Quasar™ 8.5 SL (acetamiprid) and Devenir™ (pymetrozine) are good choices. Thrips and mites can be particularly difficult to control because they are hard to contact, but also do not typically feed on the vascular tissue. Translaminar products, such as Fervid™ (abamectin) and Piston™ (chlorfenapyr), will move through layers of epidermal tissue and are good options for these pests.