

Key beneficials associated with strawberries in New Zealand

Predatory mites



- In NZ, four different predatory mites species are commercially available: *Amblydromalus swirskii*, *Phytoseiulus persimilis*, and *Neoseiulus cucumeris* (crop dwelling); and *Stratiolaelaps scimitus* (soil dwelling). Other naturally occurring indigenous species of predatory mites are often also present.
- Predatory mites are less than 0.5mm in size, teardrop or pear-shaped and range in colour from translucent white to pale tan, orange or red, depending on the species.
- The mites and their pale eggs are often found on the undersides of leaves, and the adults of some species are also often found on the flowers and under the calyx of fruit.
- Different predatory mite species often feed on different pest species e.g. different life stages (eggs, nymphs, and adults), and some may also feed on pollen, honeydew, fungi, and leaf sap.
- Phytoseiid predatory mites are often important in management of pest species such as thrips and other mite species (e.g. Two spotted spider mites).

Hoverflies



- Both endemic and exotic hoverfly species are naturally present throughout NZ, the main species being *Melanostoma fasciatum*.
- The larvae (pictured) are usually found on the underside of leaves and are voracious predators of aphids, thrips, and small caterpillars.
- The adults resemble small bees or wasps, and are often seen visiting flowers where they may help pollinate, or hovering around plants.
- Hoverflies are a very common natural enemy in a range of crops, and the adults frequently lay their eggs among or near prey colonies to ensure the larvae have plenty to eat.

Lacewings



- The main species seen in NZ is the Brown or Tasmanian lacewing, (*Micromus tasmaniae*), which is available commercially, but a range of other species also occur naturally.
- Adult lacewings superficially resemble small brown (sometimes green) moths with lace-like wings.
- The larvae (pictured) are specialised predators in many crops, and mainly eat aphids, but will also eat small caterpillars or beetle larvae on the leaves.
- Adults feed on nectar, pollen, and honeydew and are commonly observed on plants during the day, or flying around lights after dark.

Ladybirds



- The majority of ladybird species are considered beneficial insects, as they feed on various pests.
- Most ladybirds feed mainly on aphids, but some species also eat scale insects, psyllids, mealybugs, spider mites, and one species feeds on powdery mildew.
- Some species of ladybird (*Cryptolaemus montrouzieri* and *Scymnus loweii*) are commercially available for controlling on mealybugs, scale, and whitefly.
- The more commonly noticed ladybirds are conspicuously coloured yellow, orange, or red with black marks on their wing covers, but there are many other NZ species that are small and mainly black, or dark metallic blue.
- Young lady birds are usually grey or black with orange or yellow markings.
- Ladybirds will often arrive in crops on their own once pests start to appear.

Spiders



- Spiders are abundant and widespread in most natural and cropping systems in NZ.
- Most are considered generalist predators, and can serve a significant role in keeping populations of many insect pests down.
- Spiders have been shown to prey on aphids, caterpillars, and thrips.
- One species, *Celaenia excavata* (Bird dropping spider) even specialises in catching males moths by mimicking the female moths pheromone.