

# Harlequin Bug in apple orchards

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## Background

Harlequin bug *Dindymus versicolor* (Herrich-Schaeffer) (Figure 1), is a native Australian plant bug in the family Pyrrhocoridae. Prior to the introduction of synthetic insecticides in the 1950s, harlequin bug was considered a significant pest of a range of cultivated crops including apples, figs, pears, stone fruits and berries. It was first recorded as a serious pest in NSW in the early 1930s (French, 1933).

In apples, the use of synthetic insecticides between 1950 and the mid 1990's for the control of key pests such as codling moth (*Cydia pomonella*) may have suppressed harlequin bug numbers to the point where it was no longer considered a significant pest.

More recently, the increasing adoption of Integrated Pest Management (IPM) and associated decline in the use of broad spectrum insecticides is thought to have resulted in a resurgence of this pest.

A recent survey of twenty apple growers in the Batlow district of NSW showed that Harlequin bug is a significant pest in local orchards, causing damage to fruit. Estimated damage levels (as an average over their entire crop) ranged from 1 to 10% of fruit. However, localised damage on a specific variety or in a particular location was reported to be as high as 75-100% of fruit.

## Identification

The adult bug is about 12mm in length and is very conspicuous. The head and inner margins and tips of the forewings, are black; the thorax and base of the forewings are reddish-orange. The underside of the body is tinged with yellow or green and bears some red and black markings.

Harlequin bug develops through five immature stages or instars and is often found swarming in large numbers on native tree trunks, trellis and hail netting posts and in sheds.

Mating adults can be seen moving in pairs joined at the abdomen and facing in opposite directions.

Figure 1 Adult Harlequin Bug



## Known hosts

A study of food preference in harlequin bug in south eastern Australia identified a wide range of host plant families and species. Common orchard weeds *Malva* spp. (Marshmallow), *Rumex* spp. (Docks) and *Polygonum aviculare* (wire weed) were among those recorded as hosts (Stahle, 1981). Interestingly, this study demonstrated a shift in host preference through the Summer months. As marshmallow plants matured bugs were found to move from this species to others in a sequence which seems to be repeated annually. This observation may help to explain the timing of attack in apples which seems to occur mostly in the latter part of the growing season as ground herbage reaches maturity.

## Damage in apples

Harlequin bug is a sap sucker which uses a proboscis (needle like mouthpart) to pierce the epidermis of the host plant tissue. In apples this feeding damage occurs on the fruit and results in slight depressions on the skin of the apple and is associated with a browning of the underlying flesh.

Harlequin bug damage in apples is sporadic but can be very significant and is thought to be linked to the presence of the host weeds mentioned. The availability of suitable sheltering sites (i.e. cracks in netting or trellis posts) also seems to be a contributing factor. Although the bugs are present in or near orchards from early Spring, damage generally is not seen until the latter part of Summer.

**Figure 2** Mid season feeding damage on Cripps Pink (Pink Lady) caused by harlequin bug, looks very similar to the symptoms of Boron cork disorder



There are often multiple feeding sites on the one piece of fruit giving the apple a lumpy misshapen appearance. These symptoms look very similar to those caused by Boron cork disorder (see AgFact H4.AC.2)

Damage from harlequin bug is particularly noticeable on green or pale varieties and renders the fruit unsaleable.

## Life cycle

The biology of the Harlequin bug is not well documented. The insect overwinters as adults or nymphs (Figure 2) and can commonly be found in large numbers under the loose bark of native trees or amongst leaf litter or other debris around the orchard (such as wooden bins and timber stacks).

In Spring, the overwintering adult females lay 60-80 eggs in the soil or on the leaves of orchard

floor vegetation. Eggs hatch to produce wingless nymphs which seek out preferred plant hosts such as mallows.

There is thought to be two or three generations per year.

**Figure 3** Harlequin bug juveniles are often found swarming on tree trunks and timber posts in or near the orchard.



## Distribution

Harlequin bug is found in South Eastern Australia including Tasmania, but has not been verified in Queensland, Northern Territory or Western Australia. It has been observed as a pest of apples in the Batlow district of NSW.

## Management and control

As there are presently no chemicals registered for the control of harlequin bug in orchards in Australia, management of the pest is dependent on the adoption of cultural practices.

The severity of damage in some orchards seems to be associated with bugs having easy access to the trees either by weed growth within the tree row and/or canopy, low growing branches, nearby trellis post, wires and irrigation tubes.

Due to its association with certain weed species, good weed control in the orchard is key to reducing the likelihood and intensity of infestations. Particular attention should be given to the removal and/or control of the common orchard weeds in the *Malva* (Marshmallow) and *Rumex* (Dock) genera.

Management of Wireweed is also considered important. Maintenance of a weed free strip under the effective tree canopy will help control

associated weeds and will reduce available shelter and protected access to the trees.

Removal of sheltering sites such as timber stacks and other trash from within the orchard should also help reduce bug numbers in the orchard.

## References

French C. Jnr (1933), *New records of plants attacked by native insects*. The Victorian Naturalist June 1933.

Stahle P.P. (1981), Food preference in the harlequin bug *Dindymus versicolor* (Herrich-Schaeffer) (Hemiptera: Pyrrhocoridae), a minor pest of fruit in south eastern Australia.

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