

Tasmanian IPM trials

Lionel Hill - DPIWE, Tasmania

Entomology staff at DPIWE, Tasmania are working with major iceberg and loose-leaf lettuce growers to test IPM in southern Tasmania. Six iceberg and twelve loose-leaf sequential plantings were grown at two farms in southern Tasmania.

Undrenched icebergs were planted from late January to late March 2006 which meant that spring plantings could not be trialled. Results with the iceberg lettuce have been good but not perfect. Waterlogged sections of the third iceberg IPM planting (cut 12th April at 57 days after planting) were rejected commercially because of lettuce aphid infestation but the majority of this planting went to market successfully. The next two plantings will probably also have very low infestations except once again at the waterlogged ends of beds.



One of Tasmania's lettuce IPM trial sites

Loose-leaf lettuces were planted from early November 2005 to May 2006. The first six plantings were good or passable but the seventh and eighth plantings were heavily infested when ready for cutting although these infestations declined as these plantings further matured. One extra week produced a substantial decline in some cases. However, several basic IPM tools were not used in this trial. No pirimicarb or pymetrozine was used to restore the balance between predators and aphids. These selective aphicides were not used in an attempt to see if the predator population would 'catch up' with the aphids in autumn plantings. Almost no habitat was provided outside the crop for aphid predators so that once the countryside dried off in summer there was little immigration of supplementary predators. In contrast the very successful IPM trial near Devonport in 2004-05 had more such habitat available in close proximity for a longer period and the current iceberg trial also had beds of oats specially planted either side of the trial area.



Planting lettuces at an IPM trial site

Thrips and the tomato spotted wilt virus that they vector did not become an issue in the current loose-leaf lettuce IPM trial in southern Tasmania, although that was anticipated to be the

major difference between this and the

2004-05 Devonport iceberg trial (the virus has historically never been an issue near Devonport in contrast to southern Tasmania). What has proved to be a problem is the short duration of loose-leaf crops compared to iceberg lettuce - say five weeks versus eight in the Tasmanian summer. Extra time certainly gave better results in the loose-leaf lettuce but judicious use of selective aphid sprays and strategically placed plantings of nursery plants for predators will probably be necessary before reliable results can be achieved in fast loose-leaf crops.

Hungry predatory mites in lettuces: what IPM role might they play?

Greg Baker - SARDI

As part of a search for biological control agents of lettuce pests and reduced reliance on pesticides, a survey of arthropod populations in soils collected from lettuce fields is being conducted in three states (SA, Vic and NSW). To date the populations of soil arthropods have generally been very low at all sites. The low populations of arthropods in these fields is likely due to the combined pressures of regular disturbance, multiple pesticide applications and low soil organic carbon levels.

At one site (Murray Bridge, SA) a species of predatory mite, *Pachylaelaps australicus*, was present in soil samples. It appears to hunt only in soil and not on the plant itself, which limits its potential for controlling pests such as aphids. This mite is known to feed on nematodes and its role in controlling soil-pupating thrips in citrus is currently being investigated. It may be able to contribute to the control of western flower thrips pupae in soils of lettuce fields.



A close-up of a small predatory mite similar to those found in lettuce (Dr David Walter)

More importantly, at two sites, Murray Bridge and Werribee (VIC), predatory mites (*Pergamasus* spp.) have been collected from both plant and soil samples. The Murray Bridge site is managed with a conventional pesticide spray program, whereas the Werribee site is managed with a reduced frequency, 'soft' pesticide spray (IPM) program. *Pergamasus* are large (2mm), dark brown mites that are fast moving, highly mobile hunters known to feed on other small arthropods. While further evaluation of these mites is needed, the apparent tolerance to pesticides (at the Murray Bridge site) and their presence in the outer leaves of lettuce plants suggests that these mites are potential biological control agents of pests such as thrips, aphids, small grubs and pest mites. It is likely that these beneficial mites are able to persist in the soil between crops feeding on small arthropods such as other soil mites and springtails.

Currant-lettuce aphid: South Australian update

Greg Baker - SARDI

Currant-lettuce aphid (CLA) was detected and confirmed for the first time in South Australia on 8th May, 2006. The initial detection was on hydro and field-grown loose-leaf lettuce at a Northern Adelaide Plains (NAP) property. Comprehensive surveying of SA commercial lettuce properties has subsequently detected CLA infestations at a further two NAP properties (on bunch-line endive in both cases) and at an Adelaide Hills property on head lettuce. In all four instances the infestations were of low to moderate density.

The SA lettuce growers group met with State Quarantine authorities on 22nd May, 2006 at the Virginia Horticulture Centre, and agreed that action to revoke the current State restrictions on the importation of all CLA host material be initiated.

Evaluation of Gaucho® against Current Lettuce Aphid

Slobodan Vujovic – DPI, Victoria

In December/January this year, DPI Victoria had carried out field trials to evaluate the effectiveness of Gaucho® (Imidacloprid) insecticide as an option for direct sown open head lettuces (salad mixes) against the Current Lettuce Aphid (*Nasonovia ribis-nigri*) (CLA).

The lettuce industry in Victoria is currently using three management options to manage CLA and these include resistant varieties, drenching with Confidor® and integrated pest management (IPM).

Salad-mix and open head lettuce growers have limited options to manage lettuce aphids. There are a limited number of resistant varieties available to growers. Confidor® is registered as a seedling drench, while most salad-mixes are direct sown.

Five treatments were evaluated using two susceptible varieties (Monaco & Shiraz), two rates of Gaucho® (80 & 120 gram of active ingredient/1000 pellets) and a resistant variety (Carmoli RZ 85-85) as a control. CLA pressure during the field trial was non-existent and data collection was not possible.

Due to the poor field results bioassays were carried out in the laboratory to endeavour to identify whether or not the treatments were effective. Lettuce leaves for bioassays were collected from field trials (7 weeks after plantings), this time untreated iceberg lettuce was used as the control treatment.

All treatments were effective in controlling CLA. There was no significant difference between treatments. All chemical treatments performed well. There was no significant difference between lower (80 gram) and higher rate (120 gram of active ingredient/1000 pellets) of Gaucho®. There was no significant difference between the two cultivars.

Mortality of aphids in resistant variety Carmoli was slightly slower compared with other chemical treatments. The reason for this was that aphids in that treatment died from starvation.

Bioassay results indicated that Gaucho® insecticide as a seed treatment was effective in controlling CLA.

the odd or single foxglove aphid was identified during regular monitoring for CLA by NSW DPI, no colonised or heavy infestations have previously been confirmed in the Sydney basin. Foxglove aphids are frequently found in Victoria and Tasmania but not usually in high numbers.

Foxglove aphids are similar to CLA as they prefer to colonise the young leaf tissues around the growing point of the plant. Foxglove aphid has a short life cycle similar to CLA, which allows it to breed and build-up numbers quickly, particularly under favourable conditions. In the case of the detected site, the aphid had spread in large numbers on lettuce plants up and down the row, from the originally detected plants and also across the rows in just over a week.

Foxglove aphid has been in the USA state of California for about 60 years, but for the last several years has caused problems for lettuce growers in the Salinas area. The aphid has also become more and more of a problem for lettuce growers in the USA state of Arizona. Foxglove aphid numbers have increased each year since its initial detection and it now appears to be an established pest of lettuce in these areas.

Foxglove aphid has the potential to become a serious pest problem because;

- It can feed and breed quickly and produce large numbers unobserved inside lettuce heads, including in NAS resistant varieties;
- It is impossible to eradicate the aphid from the head with foliar aphicides once it has hearted;
- The aphid has a wide crop host range including potatoes, lettuce, spinach, ornamentals, cucurbits, beans, celery, tomatoes, eggplants, capsicums, greenhouse crops and citrus;
- Foxglove aphid also has a wide host range of common weeds in the Sydney basin including shepherd's purse, amaranth, nightshade, sowthistle, dandelion, pigweed and fat hen;
- It is considered to be a vector for many viruses including Cucumber Mosaic Virus in many countries;
- There is a potential risk that foxglove aphid could breed-up producing live nymphs uninterrupted during winter in greenhouses and then heavily infest field grown host crops.

Recommended control practices are similar to those of lettuce aphid and include;

- Regular monitoring of the lettuce crop including NAS resistant varieties, preferably twice a week, to ascertain the extent of infestation, so if beneficial numbers are not responding to the infestation then an effective aphid insecticide spray can be applied for control;
- Those that are already using Confidor® drench treated lettuce seedlings to control lettuce aphid, will also be controlling foxglove aphid.

Sydney region lettuce growers urged to look-out for foxglove aphid

Leigh James - NSW DPI

A few weeks ago, large numbers of winged and wingless foxglove aphids (*Aulacorthum solani* (Kaltenbach)) were found inside the heads of a NAS resistant crisphead variety in a field lettuce crop in the Sydney basin. The winged form are similar to CLA, whilst the wingless aphids resemble green peach aphids. Although, CLA is regarded as a more important pest of lettuce, foxglove aphid has the potential to also become a serious contamination



Wingless foxglove aphids colonising lettuce

pest of head lettuce types. Even though NAS resistant varieties are being grown, it doesn't mean that it is immune from other types of aphid colonisation or attack. While



An adult (winged) foxglove aphid