

Breeding beneficials - cereal

Sandra McDougall, Katina Lindhout and Tanya Shaw – NSW DPI

Over winter-spring 2007 we ran an IPM trial in Sydney that found the winter planted lettuce was readily colonised by Currant Lettuce Aphid (CLA) but struggled to attract beneficial insects until the warmer spring weather. To find a solution we wanted to assess the potential of cereals to host cereal aphids and be a source of beneficial insects for lettuce. Paul Horne and Jessica Page had encouraged their IPM growers in Victoria to plant rye as a source of beneficials and we wanted to see if the concept would work in the Sydney Basin.

In autumn-spring 2008 two replicated small plot trials investigated whether planted cereals would attract and breed beneficial insects particularly those who feed on aphids. One trial was planted at Somersby in the north of the Sydney basin and another at Yanco in the Riverina. Each trial had three planting dates and on each date five plots of a variety of wheat (Ventura), rye (Ryesun), barley (Tantangara) and oats (Echidna) was planted. At the Somersby site alternative varieties were planted in single plots in each planting date. Every three weeks the plots were monitored using a suction-blower to vacuum a 0.5m² quadrant.

The results showed that in the milder wetter coastal conditions cereal aphids readily colonised the cereals and were present all winter, whereas only small numbers of aphids colonised the cereals in the colder drier conditions at Yanco. At Somersby the oats were the most consistent host for aphids and beneficial insects and at Yanco the barley attracted most aphids and beneficials. Rust infected the cereals at both trial sites.

Table 1. Average total aphid and beneficial numbers per sampling quadrat (0.5m²)

| Cereal | Variety | Somersby | | Yanco | |
|--------|------------|----------|-------------|--------|-------------|
| | | Aphids | Beneficials | Aphids | Beneficials |
| Barley | Tantangara | 19.17 | 6.12 | 3.84 | 7.30 |
| Oats | Echidna | 36.52 | 5.76 | 1.46 | 2.38 |
| Rye | Ryesun | 7.74 | 4.37 | 0.86 | 3.11 |
| wheat | Ventura | 7.13 | 3.73 | 0.86 | 4.48 |

Other pests included thrips and mirids in both areas and leafhoppers at Yanco. Common beneficials included ladybeetles, nabids, spiders, hoverflies, lacewings and parasitoids (particularly at Yanco).

Where to next?

Soon we will be planting a trial assessing whether the oats (Somersby) and barley (Yanco) do result in better pest management of lettuce. It will again be a replicated trial that compares lettuce with neighbouring planting of a cereal to lettuce with a neighbouring planting of lettuce.

Lettuce Aphid & Beyond

Paul Horne & Jessica Page – IPM Technologies Pty Ltd

Lettuce aphid was discovered in Tasmania in 2004 and then was found in all mainland States over the next few years. When it arrived in Tasmania it caused serious problems for growers and a very heavy insecticide approach was implemented – often with little success in the first instance. Drenching seedlings with Confidor® at a very high rate became the standard method of dealing with lettuce aphid, and in many cases on the mainland was required by State regulation for the movement of harvested crops interstate.

Since then, beginning in 2005, we (Paul Horne and Jessica Page) have demonstrated that control of lettuce aphid can be achieved without the use of any insecticides if an IPM strategy is adopted. We demonstrated this first in Tasmania at Forthside Research Station in collaboration with Lionel Hill from DPIE (Tas). At this time lettuce aphid had not been detected on mainland Australia. We showed that lettuce aphid would be controlled by a range of native Australian predators and that no losses would result.

Following that trial lettuce aphid was found in Victoria. We conducted trials in collaboration with commercial growers in Victoria in commercial crops to show that lettuce aphid could be dealt with without insecticides and certainly without seedling drenches of Confidor®. This was not enough to convince the industry that an IPM approach was capable of dealing with lettuce aphid.

Since that trial, every year since then up to and including this year, we have demonstrated in commercial lettuce crops that an IPM approach can be used to deal with lettuce aphid. Growers involved with IPM Technologies will attest to the results achieved using IPM versus the seedling drench approach.

The information is available to lettuce growers. Whether lettuce growers adopt IPM or not will depend on a range of different factors, but not just on the entomology advice that is offered. We suggest that no further demonstrations are necessary unless requested by growers specifically interested in adopting IPM.

In the last couple of years we have been interested in the occurrence of other pests, particularly thrips, in lettuce. We have been counting thrips of all types (including predatory species) in lettuce and we are particularly interested in the numbers of Western Flower Thrips in Confidor® drenched lettuce versus non-drenched lettuce. We hope to publish these results soon.

CLA?

Fortnightly planting of susceptible varieties planted in Sydney that have been monitored on a weekly basis have not shown any CLA since spring 2008. Similar plantings in WA have also not hosted any CLA. CLA has been found in some plantings in Victoria.

Permit update from APVMA

PER11395 – Marlin, Lannate-L (methomyl) – Helicoverpa, Cluster caterpillar and Western Flower Thrips / field grown lettuce. NOT for hydroponic or covered situations.
Valid 15/04/09 to 28/02/10; Valid for all states (except Vic)

PER7416 – Confidor 200SC (imidacloprid) / lettuce, chicory, endive & radicchio – Lettuce aphid
Valid 24/03/04 to 31/12/09; Valid for all states (except Vic)
DO NOT apply more than one application per crop

PER8140 – Confidor Guard Soil (imidacloprid) / lettuce, chicory, endive & radicchio – Lettuce aphid
Valid 31/12/08 to 31/12/09; Valid for all states (except Vic)
DO NOT apply more than one application per crop or if seedlings have previously been treated (PER7416)

PER10678 – Chess (pymetrozine) / cucurbits, eggplant, tomato, lettuce & broccoli – silverleaf whitefly (SWF): lettuce, chicory, endive & radicchio – lettuce aphid.
Valid 03/02/09 to 30/04/10; SWF – Valid for NSW, QLD, NT & WA only (except Vic); Lettuce aphid - Valid for all states (except Vic)

PER7935 – Acrobat fungicide (dimethomorph) / leafy field grown lettuce – Downy Mildew. NOT for hydroponic or covered situations. Head lettuce is already on chemical label.
Valid 30/01/09 to 30/09/11; Valid for all states (except Vic)

Full details of all permits are available on the APVMA website, <http://www.apvma.gov.au/permits/permits.shtml>

Evaluation of CLA resistant iceberg lettuce varieties

Tony Napier – NSW DPI & Jorian Millyard – MIA Rural

CLA (*Nasonovia ribis-nigri*) is now a major pest of lettuce and it is endemic across all Australia. Many seed companies are developing and releasing new varieties which are resistant to this aphid. Ten variety trials were conducted on a commercial vegetable farm at Hay, NSW to evaluate most of the CLA resistant iceberg lettuce varieties currently available. The trials were sequentially sown following a weekly schedule with the first trial sown on 25 January 2008. The last of the trials were sown nine weeks later on 27 March 2008. Harvest commenced on 20 March 2008 and continued to 01 July 2008. The aim of the trial was to determine the most appropriate sowing window for the majority of the CLA resistant iceberg lettuce varieties now available.

All lettuce varieties are adapted to specific planting periods and planting them out of their timeslot will result in a less than desirable product. The most difficult periods for selecting varieties are when the seasons are changing. This is the situation faced by Hay lettuce growers when the season first starts at the end of January. Variety selection will change quickly as day length shortens and average maximum temperatures drop from a hot 33°C in mid January to a cool 15°C in mid July.

Six different seed companies supplied 16 varieties for evaluation. The majority were supplied with a suggested sowing window by the seed company with the remainder sown every second week (on average) throughout the trial period. The main criteria during this evaluation for determining if a variety was suitable were bolting, head size, plot uniformity and heart firmness. There are many other traits that lettuce

plants must exhibit to produce a marketable product which were not considered in the evaluation. These traits include disease resistance, rib discolouration, tip burn resistance, shape, colour and other cosmetic defects and these all should be considered if a grower is to adopt the variety.

Table 1 summarises the performances of all the varieties evaluated. The shaded area indicates the optimum timeslot for sowing each variety. The suggested timeslot for each variety was made if the variety performed well or was close to producing a marketable heart for two successive evaluations.

Table 1: Summary of 2008 CLA resistant lettuce variety trial at Hay

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Date of sowing | 25 Jan | 01 Feb | 08 Feb | 15 Feb | 22 Feb | 27 Feb | 06 Mar | 12 Mar | 19 Mar | 27 Mar |
| Raider | | | | | | | | | | |
| Cartagenas - Rijk Zwaan | ? | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| LEC 7687 - Lefroy Valley | X | ✓ | ✓ | X | ✓ | - | - | - | - | - |
| Target | | | | | | | | | | |
| Argentinas - Rijk Zwaan | ✓ | X | ✓ | ? | ✓ | - | - | - | - | - |
| Ribenias - Rijk Zwaan | - | X | ✓ | ✓ | ✓ | - | - | - | - | - |
| Dover - Nunhems | X | - | ? | | ? | | ✓ | | ✓ | - |
| Kong - SPS | - | X | X | X | ? | ✓ | ✓ | ✓ | ✓ | ? |
| Costanza - Seminis | - | - | - | - | ✓ | ✓ | ✓ | ✓ | X | X |
| Magnum | | | | | | | | | | |
| Albanas - Rijk Zwaan | - | - | X | X | X | ✓ | ✓ | - | - | - |
| LEC 7862 - Lefroy Valley | - | - | - | - | X | ? | | ? | - | X |
| Kestral - Terranova | - | - | - | ? | X | ✓ | ✓ | ✓ | ✓ | ? |
| 2302 - Seminis | - | - | - | - | X | - | ✓ | | ? | - |
| Centry | | | | | | | | | | |
| NUM 0120 - Nunhems | X | - | X | - | X | X | | ✓ | | ? |
| Alpinas (45-30) - Rijk Zwaan | - | - | - | X | X | X | ✓ | X | ✓ | ✓ |
| Lily - SPS | - | - | - | - | X | X | ✓ | X | ✓ | ✓ |
| Gitanas - Rijk Zwaan | - | - | - | - | X | | X | X | ? | ? |
| Foxtrot - SPS | X | X | ? | X | ✓ | - | - | - | - | - |

KEY

| | |
|--|---|
| Control variety | |
| Performed well in this time slot | ✓ |
| Very close to producing a marketable heart | ? |
| Did not produce a marketable heart | X |
| Not evaluated in this time slot | - |

For more information or a copy of the trial report, contact Tony Napier at Yanco Agricultural Institute on 02 6951 2796.