NSW VEGETABLE IPM NEWSLETTER

Integrated Pest Management for Insects and Viruses in Sydney Vegetables

This newsletter is prepared for a project facilitated by HAL in partnership with AUSVEG and is funded by the National Vegetable levy. The Australian Government provides matched funding for all HAL's R&D activities.

Issue 5 – ISSN 1833-007X *Your Levy at Work* April 2008

In this issue

Summer Pest Problems

Sylvia Jelinek

During early summer thrips numbers were increasing steadily in field crops and hydroponic lettuce. The heavy rainfall and mild temperatures experienced throughout December and January have helped to keep populations in check. Although total thrips numbers were low, a few Sydney vegetable farms still recorded damaging numbers of western flower thrips, in turn bringing tomato spotted wilt virus (TSWV) and significant crop losses throughout the summer.

Tomato spotted wilt affected butter lettuce

Image courtesy of Stacey Azzopardi

This should reinforce the key IPM message to rogue diseased plants and eradicate weeds to lessen the severity of the TSWV pest and disease cycle.

The warm and dry conditions during late spring to early summer meant many growers endured swarms of Rutherglen bugs, *Nysius vinitor*, is a sucking pest that causes plant damage and is also a contamination pest in lettuce. Once again, these pests need weeds as habitat nearby before they can cause damage in a lettuce crop – use IPM strategies to keep your farm clean and pest numbers will fall. Destroy old crops and weed reservoirs to avoid a breeding ground for this and many other pests.

Heliothis, another pest found mainly in lettuce and brassicas, were moderately high in numbers over the summer months.

28 spotted ladybird or leaf eating ladybird

Image courtesy of Stacey Azzopardi

Late spring saw many beneficial insects in various crops including brown lacewings, green lacewing larvae, beneficial ladybirds

NSW DPI, Bldg M14, UWS Hawkesbury
Locked Bag 4, Richmond NSW 2753

Ph. 02 4588 2135 Fax. 02 4588 2159
Email: sylvia.jelinek@dpi.nsw.gov.au

and the presence of predatory thrips. All of these insects feed on aphids and other small soft bodied insect pests. While mid to late summer saw high activity levels of beneficial ladybirds. Not to be mistaken for a beneficial insect, the 28 spotted ladybirds *Henosepilachna vigintioctopunctata* were prevalent as well. This ladybird is herbivorous and in large numbers can cause a great deal of leaf damage in a short period of time.

The mild conditions, high humidity and heavy rainfall have created the perfect conditions for some plant diseases to thrive. The main concern has been downy mildew, *Phytophthora* root rot and fruit rot, *Pythium* and *Fusarium*. In lettuce the most recent problems have been *Septoria* and bacterial leaf spot in lettuce.

If you are experiencing disease problems in your vegetables, contact the Plant Health Diagnostic Service at EMAI, Menangle on (02) 4640 6428 or visit www.dpi.nsw.gov.au

Zucchini Virus Summary

Sylvia Jelinek

The zucchini virus season seemed to have started earlier than usual this season, with virus being expressed in the susceptible varieties such as Congo much earlier than previous years. The virus pressure was high in early December prompting growers using IPM strategies to use a resistant variety when planting the next crop.

The most prevalent virus this summer was watermelon mosaic virus 2 (WMV2) followed by zucchini yellow mosaic virus (ZYMV), but papaya ringspot virus (PRSV) was rare this season.

Reducing the impact of zucchini viruses on your farm can be simple. Growing zucchinis only in the early and later parts of the season reduces virus incidence on the farm and prevents virus levels from building up during the peak time. Switching to non-host plants, such as sweet corn is a good rotation in the middle of the zucchini season. Another zucchini IPM measure is to make use of the many resistant varieties in the market as well as aphid control and the removal of any broadleaf weeds from in and around the farm.

If you would like to learn more about zucchini IPM strategies including resistant varieties, contact your IPM project officer on (02) 4588 2135.

Lettuce Symposium Nov 2007

Sylvia Jelinek

Sixty growers, industry and DPI staff attended a symposium and workshop for pest and disease management for field and hydroponic lettuce in November at Richmond. Most of the 16 growers were local hydroponic growers.

The morning symposium set the scene for the afternoon's interactive workshops which highlighted current issues in lettuce IPM. The presenters included NSW DPI research scientists Len Tesoriero, Dr Grant Herron, Dr Leigh Pilkington and Dr Sandra McDougall.

Growers workshop: identifying weeds that host lettuce diseases

Image courtesy of Tehgan Crowe

The five afternoon workshops each illustrated a basic concept relating to pests and diseases in lettuce and were rated highly by the participating growers and industry members. The session included crop health and the IPM spiral, a resistance development exercise, a lettuce disease recognition game, identifying thrips on sticky traps and looking at common weeds that host lettuce diseases, and an aphid quiz.

NSW DPI, Bldg M14, UWS Hawkesbury
Locked Bag 4, Richmond NSW 2753

Ph. 02 4588 2135 Fax. 02 4588 2159
Email: sylvia.jelinek@dpi.nsw.gov.au

Growers had the opportunity to look at new spray systems from Croplands and Tornado that recently demonstrated improved spray coverage when compared with blower or cannon sprayers used by hydroponic lettuce growers. A short talk by Dave Farmer (Croplands) highlighted the importance of spray application, calibrating sprayers regularly and using water-sensitive paper to evaluate spray efficiency.

Dave Farmer with the Croplands sprayer

Image courtesy of Tehgan Crowe

Anyone requiring further information can contact Sylvia Jelinek at NSW DPI for further assistance on (02) 4588 2135.

CLA Bio-type

Sandra McDougall

During the European summer (2007) CLA was found in Nas resistant lettuce. Cases have been reported from seven locations in Germany, Holland and France. Effort is going into biotyping the CLA strain and understanding the origin of the seven known populations. Aphid populations that are difficult to control such as CLA biotypes are happy to feed on Nas resistant lettuce can quickly expand and colonise new areas.

There is an established understanding that CLA develops insecticide resistance easily so the message remains to reduce reliance on a single control method, that is: **an integrated approach is the best long term strategy**. It is also recommended that all lettuce, including Nas resistant varieties, be routinely monitored and growers who find suspect aphids within the lettuce heart to contact their local DPI office to get the aphids properly identified. A scare late last year where it was thought CLA was detected in a resistant variety also confirmed the importance of growers keeping good records of the lettuce varieties that they are growing. Nas resistant lettuce looks very similar to susceptible lettuce and can be easily confused unless the variety is accurately known.

It is not expected that the new CLA biotype that is breaks the Nas resistance will come from Europe to Australia. It is more likely that we will develop our own Nas resistance breaking biotype if we do not manage our crops and our pests in correct manner. Similarly, we may develop an imidacloprid (Confidor®) resistant strain unless we practice adequate resistance management strategies when using pesticides including using multiple methods, other than pesticide use, to manage the aphid.

Currant lettuce aphid colonising on hydroponic grown frillice

Sylvia Jelinek

Consultancy Training

Sylvia Jelinek

Over the coming months we will be conducting training courses and refresher training for IPM consultants, these will include plant pests, viruses and diseases. Short courses will be held by IPM experts within the vegetable industry. The Sydney basin and the greater NSW need more horticultural or agricultural trained consultants that also understand and encourage IPM as a sustainable farming practice.

Biocontrol Conference

Leigh Pilkington

The inaugural IOBC (International Organisation for Biological Control) Australia and New Zealand Biocontrol Conference 2008 was recently held in Sydney

NSW DPI, Bldg M14, UWS Hawkesbury
Locked Bag 4, Richmond NSW 2753

Ph. 02 4588 2135 Fax. 02 4588 2159
Email: sylvia.jelinek@dpi.nsw.gov.au

from Feb 10 – 14. Approximately 120 researchers, extension officers, industry members and growers attended the conference from as far as the USA and throughout Southeast Asia and the Pacific for the three day scientific program as well as the final day involving an interactive workshop targeting the issues involved in making biocontrol successful in the region. The results of the workshop will be published as a needs analysis in the IOBC journal *Biocontrol*. Conference proceedings will be produced as a multimedia DVD as well as being made available on the internet through the IOBC local region's website, http://iobc-aprs.org.

Psyllids in Vegetable Crops

Deborah Kent

Psyllids are sap sucking insects like aphids that feed by inserting stylets into the plant, sucking sap and excreting the excess water and sugar as honey dew. In Australia, psyllids are commonly seen on wattles and eucalypt trees.

Until recently psyllids have not been known to infest or attack vegetable crops in Australia. In 2007 a yet-to-be formerly identified psyllid belonging to an Australian genus called *Acizzia* was found feeding on eggplants in the Sydney Basin. The host plants of this psyllid genus are usually species of *Acacia* or wattles. So why has this psyllid switched to feed on eggplant? We are not sure, but a number of insect species are capable of having multiple hosts of completely different plant types at different times of the year.

The *Acizzia* psyllid has been found two years running in a western Sydney backyard vegetable garden. Both times the psyllids were only noticed in late summer and early autumn. The variety of eggplant grown in 2007 was a 'Long Tom' variety while in 2008 both 'Long Tom' and more traditional 'Black Beauty' were affected.

The adult *Acizzia* psyllids (Fig. 1) are small - roughly the same size as green peach aphids. The adult males have a black and green body with a black head and bright red eyes. The wings are held tent-wise over the body, a bit like a small cicada.

Figure 1. Adult male psyllid

Image courtesy of Deborah Kent

The adult females start out with an all green body and head but later darken to the same colour as the male. Eggs are laid directly onto the underside of leaf surface and are attached by a thin stalk. The newly emerged nymphs are clear to white in colour with numerous spiky hairs (Fig. 2) and unlike young aphids are relatively flat in shape. Both adults and nymphs are found on leaves mainly on the under surface of the leaves or near new growing tips.

Figure 2. Nymphs

Image courtesy of Deborah Kent

At this stage the only Solanaceous vegetable infested in the Sydney Basin is the eggplant *Solanum melongena*. Tomatoes and capsicums that have been exposed to the psyllids both in a garden situation and in a laboratory greenhouse have not become infested.

Damage to the eggplant seems to be confined to the new leaves at the growing tips and flowers (Fig 3). Severe feeding damage has caused the death of growing tips and the premature loss of flowers (Fig 4). This psyllid has a unique method of disposing of

NSW DPI, Bldg M14, UWS Hawkesbury
Locked Bag 4, Richmond NSW 2753

Ph. 02 4588 2135 Fax. 02 4588 2159
Email: sylvia.jelinek@dpi.nsw.gov.au

excess plant sap, i.e. honeydew. Both the adults and the nymphs package the honeydew within a plastic-like sac which can be seen as silvery globules or threads adhering to the leaves. When a large number of psyllids are present the affected leaves can take on a silvery sheen but eventually develop black sooty mould.

Figure 3. Infested Eggplant

Image courtesy of Deborah Kent

Figure 4. Dead growing tips note black sooty mould on upper surface of leaf

Image courtesy of Deborah Kent

In the garden situation general native predators such as hover fly larvae and adult and larval ladybeetles were observed to actively feed on psyllid nymphs. A small parasitic wasp was found parasitizing large nymphs late in the 2007 season (Fig. 5 and 6) and this supports the belief that the psyllid is a native species rather than an exotic.

Figure 5. Undescribed parasitic wasp
Image courtesy of Deborah Kent

Figure 6. Parasitised psyllid nymph
Image courtesy of Deborah Kent

A single survey of a commercial eggplant grower in the western Sydney Basin during spring 2007 found no psyllids. However, as the infestation in the suburban backyard did not appear until February this year and April last year it is possible that commercial growers may only be affected late in the season.

Growers should also be aware that an exotic psyllid from North America has recently become established in New Zealand. The **Potato/Tomato psyllid, *Bactericera cockerelli*** was initially found in 2006 in an Auckland greenhouse tomato crop using IPM. The psyllid is now considered established in New Zealand. Its method of entry into New Zealand was undetermined. As its name implies the psyllid infests a range of Solanaceous species such as tomatoes, potatoes, eggplant and capsicum. Plants infested by this psyllid are characterized by a solid white deposit on the leaves called 'psyllid sugar', this species particular method of excreting excess honeydew.

In tomatoes, the Potato/tomato psyllid feeding causes plants to produce numerous small fruit of poor quality or prevents fruit forming at all. In addition, the psyllid nymphs inject a toxin into the plants as the feed. The toxin results in conditions called 'psyllid yellow' and 'purple top' where the leaves become discoloured and distorted and

NSW DPI, Bldg M14, UWS Hawkesbury
Locked Bag 4, Richmond NSW 2753

Ph. 02 4588 2135 Fax. 02 4588 2159
Email: sylvia.jelinek@dpi.nsw.gov.au

the plant itself becomes stunted and new growth is retarded.

Figure 7. Adult

Image courtesy of Shaun Bennet

Figure 8. Nymphs

Image courtesy of Shaun Bennet

Due to its similarity to aphid's it may well be overlooked in general IPM monitoring. If any growers see any psyllid-like insect in their Solanaceous vegetable crops such as eggplants, tomato, capsicum or potato;

Please contact Sylvia Jelinek or Deborah Kent from NSW Department of Primary Industries.

Greenhouse Vegetable ID Guide

Sylvia Jelinek

'Pests, Beneficials, Diseases and Disorders in Greenhouse Vegetables: Field Identification Guide' is currently being revised and will include new pest and beneficial insects with a revision and additions of diseases and disorders. This publication is a must for any Greenhouse vegetable grower, but can also be valuable to most vegetable farmers. It is due to be released in the next coming months, so keep an eye out for it. It will be available through the DPI bookshop on 1800 028 374 or email: bookshop@dpi.nsw.gov.au

Further Information

www.dpi.nsw.gov.au for pest and disease management information

www.apvma.gov.au for chemical permits and registrations

Sylvia Jelinek
Vegetable IPM Project Officer
NSW Department of Primary Industries
Phone: 02 4588 2135 or 0437 977 263
Email: sylvia.jelinek@dpi.nsw.gov.au

Leigh Pilkington
Research Scientist
Gosford Horticultural Institute
NSW Department of Primary Industries
Phone: 02 4348 1953 or 0409 77 00 61
Email: leigh.pilkington@dpi.nsw.gov.au

Alison Anderson
NSW Vegetable Industry Development Officer
Phone: 02 9576 5449 or 0409 383 003
Email: alison.anderson@bigpond.com

Deborah Kent
Entomologist
Gosford Horticultural Institute
NSW Department of Primary Industries
Phone: 02 4348 1928
Email: deborah.kent@dpi.nsw.gov.au

Growers interested in IPM demonstrations or pest and disease surveys are encouraged to contact Sylvia Jelinek on 0437 977 263