Issue No. 30 **Lettuce Leaf** September 2007
National Vegetable Industry Centre Newsletter

Lettuce Training Days a great success!

Gordon Rogers, AHR

Lettuce training days held across six states were a great success. The opportunity to learn about recent research findings was taken up by 187 growers, processors and others involved in the lettuce growing industry.

Trainers Jenny Jobling, Mike Titley, Brad Giggins and Gordon Rogers from AHR Training presented the information in a variety of ways including interactive training sessions. These focused on how to manage inputs to maximise both yield and quality of Head Lettuce and Cos for fresh market or processing and risk management.

Feedback from the training sessions was very positive. Participants found the information very beneficial and easy to follow. The standout sessions were postharvest management, crop nutrition and crop scheduling. There was a very high endorsement of the course as "valuable to anyone involved in the lettuce growing industry".

Participants came away from the training with strategies they can use to minimise the impact of sub-optimal growing conditions which are common in Australia and to maximize their crop potential with good postharvest management.

The training was an initiative of AHR Training and aimed to get the results of a recent research project to the 'grass roots' of the industry and was jointly funded by HAL and the leafy vegetable growers through their research levy.

Much of the technical input for the training came form a three year research project funded by jointly OneHarvest and HAL. The research was conducted on commercial lettuce suppliers' farms across some of the main lettuce growing regions in Australia. The postharvest trials were run at OneHarvest lettuce processing facilities in Wacol (Queensland) and Bairnsdale (Victoria).

The results have significant value for suppliers of lettuce for the fresh market industry especially as the market moves towards wrapped whole head and sleeved Cos lettuce.

AHR Training acknowledges the considerable support of all participants in the original research project and to the many people who have contributed to the success of the Lettuce Training Project especially the funding bodies.

Copies of the publication containing the key research findings presented during training can be obtained from AHR Training by telephoning 02 9527 0826 or by emailing lynn@ahr.com.au.

European Strain of CLA Broken Nas Resistance Gene

This European summer CLA have been found in Nas resistant lettuce. Cases have been reported from Germany, Holland and France. Effort is going into biotyping the CLA strain.

This confirms what we already know – CLA is good at developing new strains of itself that overcome insecticides and now plant resistance. Our message remains to reduce reliance on a single control method, that is: **an integrated approach is the best long term strategy**. However given this new development it would be pertinent as an industry to discuss all management strategies to reduce the likelihood of developing a new CLA strain here that breaks the plant resistance.

State Roundups

Western Australia -Sonya Broughton, DAWA
Western flower thrips (WFT) have started to appear in lettuce and other crops in the northern Perth area. So far the virus that WFT transmit, tomato spotted wilt virus (TSWV) has not been detected. Year round monitoring suggests that there is a six week period from the start of October to mid November when WFT numbers start to rise, with TSWV occurring from the last week of October and peaking late November.

Rather than spray preventatively in case thrips are present in the crop, growers should monitor for WFT on at least a weekly basis. For further information on how to monitor, contact David Cousins at DAFWA on 0427 447 632.

Queensland –Austin McLennan QDPIF
Last week CLA was confirmed in the Lockyer Valley present in a sample from a lettuce planting treated with Confidor® in the nursery, which had worked well except for a few individual plants.

CLA populations were also noticed this week in a lettuce variety trial at the Gatton Research Station. Thee aphids were noted in the non-resistant varieties. These plants had not been treated with imidacloprid.

The message from both these instances is to remain vigilant against currant lettuce aphid and utilise the full range of strategies available, including farm hygiene and the use of resistant varieties or insecticide treatments where appropriate. Currant lettuce aphid is now well and truly established in the Queensland growing districts - growers are encouraged to seek assistance from DPI&F in confirming the presence of lettuce aphid if it is suspected.

South Australia –Greg Baker & Peter Crisp, SARDI
Spring 2007 surveys have detected lettuce aphid (CLA) near Virginia on the Northern Adelaide Plains (NAP) in crops that are beyond the Confidor protection window. Application of

Pirimor controlled the outbreaks but aphids were found on lettuce that remained after harvest at the crop edge. The Pirimor spray may have missed these plants allowing a small population to persist. The biggest concern is that the aphids on the unharvested plants will infect newer plantings as the protection provided by the Confidor drench decreases. Untreated sentinel trap plants are being placed in lettuce crops to assess how widespread CLA are in SA lettuce crops.

There are few known alternate hosts for CLA in the NAP and South Australian lettuce growing areas, confirmed by searching weeds adjacent to crops. Therefore, it is likely that populations are persisting on unharvested lettuce heads. Quick effective cleanup of remnants may help limit the persistence of CLA in production systems.

A culture of CLA has been established to assess a range of weedy and native plants common in the NAP to confirm the host range and provide guidelines for management of non-crop areas.

NSW –Tanya Shaw & Sandra McDougall NSW DPI

CLA have been present throughout the winter on some farms in the Sydney basin. The common beneficials that feed on aphids were present in very low numbers but have increased with the warmer weather. Weekly sampling of weeds, including weed species listed as CLA hosts have only recently found colonies of CLA. Two colonies were found under hydroponic tables on Dock and on Cudweed. Further investigation is needed to confirm that these are hosts.

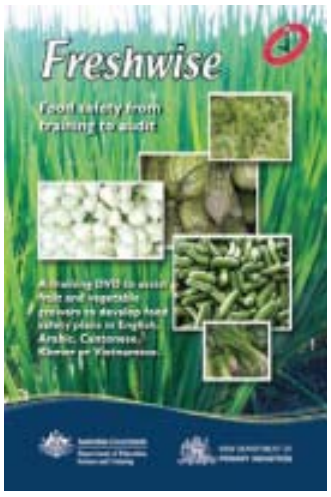
CLA does not yet appear to have arrived in Hay. *Heliothis punctigera* have arrived with the spring warmth.

New Lettuce Permit

PER9778 – Ecocarb (potassium bicarbonate) / lettuce / Powdery mildew Valid 6/09/07 to 5/09/12

FreshWise DVD

Virginia Brunton NSW DPI Gosford



The *FreshWise food safety from training to audit* resource consists of a DVD that includes a food safety self audit checklist in Arabic, Cantonese, Khmer and Vietnamese. The resources have been developed to provide farmers with basic food safety information and assist them in developing food safety record keeping plans for fresh produce.
This DVD describes and shows all the practices that need to be in place to pass FreshCare audit. It walks the farmer through and audit and shows what it is like to have an auditor check your food safety procedures. It is designed for vegetable and fruit growers and for those whom English is not their first language.

WFT Management

Sonya Broughton, DAWA

It is particularly important to spray for WFT only when needed since they develop insecticide resistance. For example, six years after spinosad was first released onto the Australian market, populations resistant to spinosad have been detected in WA, NSW and Queensland.

Monitoring involves either direct visual inspection of plants or the use of sticky traps. Cleaning up broadleaf weeds is also particularly important to reduce the chances of harbouring Tomato Spotted Wilt virus, which WFT so effectively transmits.

Newly Funded Projects

In March 2007 two lettuce projects were recommended to HAL for funding by the Vegetable IAC:

New Strategies to be developed for western flower thrips in hydroponic lettuce (NSW DPI 3 years)

This new project will see strategies developed for the management of WFT in hydroponic lettuce. Leigh Pilkington will lead the project and will be examining the role of cultural practices in hydroponic lettuce growing, reduced-risk pesticides and also the role of established and novel biological control agents. The project, just started, will deliver interim management options, followed by complete management strategies by the closure of the project.

Lettuce IPM (NSW DPI 2 years)

A 2 year continuation of the 2 year national lettuce IPM project was recommended to allow IPM demonstrations to be conducted in QLD and WA with the State collaborators, Paul Horne and an instate consultant. This project is also continuing funds for the SARDI work investigating the potential of soil predatory mites as predators of thrips and aphids, the Lettuce Leaf newsletter and will endeavour to work with the market end of the chain on IPM.

Extraordinary-round Pathology Projects

In July 2007 the Vegetable IAC recommended to HAL the following projects: [Lead agency, title, duration]

QDPI&F

Review of "Diseases of Vegetable Crops" 1 year
Integrated Viral Disease Management in Vegetable Crops 3 year
Integrated management of foliar diseases in vegetable crops 2 year

Vic DPI

Enhancing the plant immune response for improved disease control 3 year
IPM for foliage diseases 3 year
Best practice production models (lettuce, brassicas) 2 year
Best-practice IPM Strategies for Control of Major Soilborne Diseases of Vegetable Crops throughout Australia 3 year
Integrated management of soilborne pathogens 3 year

NSW DPI

Adoption of preventative disease management practices 2 years
Identification and monitoring of fungicide resistance in vegetable crops in Australia 2 years

Xeron

Development of effective pesticide strategies compatible with IPM management used on farm 1 year

"This project is 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." For editorial comment contact: Sandra McDougall, NSW DPI, Ph (02) 6951 2728, Fax (02) 6951 2692
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Pest management in Central Western NSW

In the NSW central western district lettuce is grown in the spring and autumn. Most of the growers have mixed enterprises; market prices and drought has seen a number of growers move out of lettuce in favour of their other crops in recent years. As part of the lettuce IPM project we interviewed two self-identified IPM growers and one 'conventional' grower.

Emanuel Azzopardi grows the larger area of lettuce and defines himself as a non-IPM grower. He has a mixed vegetable farm with head lettuce, cauliflowers and watermelons as his main crops, and pumpkins and sweet corn as minor crops. He has 20ha under lettuce which he sells on the fresh market. Although he is a 'conventional' grower, like most growers, he has included softer chemistry into his spray program and he or his brother monitors their crops to determine timing of sprays. They keep spray and sowing/harvest date records but not monitoring data.

Greg Kocanda grows his lettuce organically and ironically was, until recently, an agronomist for a chemical reseller advising most of the lettuce growers in the area. Greg's lettuce enterprise consists of just 2.4 ha of head lettuce for the fresh domestic organic market. He has a mixed enterprise growing brassicas, melons, pumpkins and rhubarb as well has running stock, and growing other field crops. He routinely monitors his crops and keeps monitoring, and agronomy information on all his crops.

Jeff McSpeddan also has a mixed enterprise of vegetables (sweet corn, broccoli, cabbages, radicchio), winter wheat, oats and sheep. He grew 12 ha of lettuce annually until 2 years ago. His lettuces were produced primarily for the domestic fresh market with some going to export and processing markets. Jeff routinely monitored his lettuce crop himself but also used a consultant and an agronomist. He kept spray, monitoring and packout/quality records and thought these were "good for the business."

All the growers considered heliothis their main insect pest. Greg and Jeff both relied on natural enemies for heliothis control while Greg used sprays of Bt and the organic formulation of spinosad, Jeff used the heliothis virus, the conventional formulation of spinosad, Success® when numbers were too high. Emmanual used a both old and new chemistry but not biologicals. Jeff also named thrips, aphids and leafhoppers/ jassids and Emmanual named aphids as occasional insect pests in lettuce.

All three growers looked for downy mildew resistant varieties. Jeff considered sclerotinia his most important disease with tip burn and jelly butt issues at times. Jeff used Sumislex® [prior to it's removal] and Acrobat® where as Emmanual used Ridomil® and Dithane® fungicides.

Greg's main weeds are winter, rye and barnyard grasses and black oats which he controlled through cultivation. Jeff listed datura, milk thistle, pigface, amaranth, and barnyard grass as his main weeds, Emmanual didn't feel he had any problem weeds and both used Kerb®.

Greg adopted the organic approach because it is profitable similarly Jeff chose IPM to save on cost, time and to meet quality assurance standards.

Greg considered that one on one support either from researchers or consultants and a 'market push' essential when he adopted the organic farming system. Whereas Jeff felt quality assurance (QA) was by far the most important factor.

Emmanual has adopted monitoring to manage spray timing and is using some new chemistry. Although he feels that IPM may save him money in the long run and could improve crop quality, he is happy with his pest management strategy and will continue to use some old chemistry. Both Greg and Jeff felt that the main barrier to IPM adoption by non IPM growers is fear of pest outbreaks and having no or few control.

As an organic grower with many restrictions on using pesticides, Greg aims for an 80% packout which is lower than the other lettuce growers. However he felt that his insect and disease damage levels were similar, more predictable and his crop more marketable since he has adopted IPM and that he has reduced his OH&S and residue issues. Greg does concede that he hasn't been tested by a high pest pressure year and that his lettuce crop is distant from any other lettuce producers.

Jeff said that adoption of IPM reduced the number of sprays he applied by about 70%, and thereby reduced his chemical costs, but that it has slightly reduced his yield and crop quality but improved OH&S and reduced residue issues. Insect and disease damage is slightly higher leading to more crop rejections at harvest but not at market.

Both Jeff and Greg rate the availability of new chemistry, biological insecticides, resistant varieties for specific situations as essential for continued success of IPM. Endemic beneficials and cultural control methods were rated by Greg and some endemic beneficials, some cultural controls and thresholds were rated by Jeff as essential or very important. Emmanual similarly rated the above tools as very important for IPM.

IPM vs Non IPM Opinions & Beliefs

Adelle Dunn, NSW DPI

Most lettuce growers have adopted some IPM management practices for dealing with their pests and diseases but adoption of biologically based IPM systems for lettuce production has been slow. To assist in understanding more about why some growers adopt the biologically based IPM strategy and some don't a series of case studies were undertaken. Two regions, Cranbourne and Central Western NSW were selected and four IPM growers and two conventional growers were interviewed. The growers were asked about their general production methods as well as their opinions and beliefs about using a biologically based IPM strategy.

As would be expected many aspects of the production systems were similar. They all nominated Heliothis and aphids as their major lettuce pests and downy mildew as the major disease. All the growers primarily relied on Kerb® for weed management and used the new softer insecticides.

The major differences were that the non-IPM growers also used broader spectrum chemistries i.e. Lannate®, Fastac® and Dimethoate®, and Confidor® for pest management which would knockout beneficial insect populations from the crop as well. There was also a marked difference between the regions in the number of spray applications on an 'average' crop with Cranbourne growers applying almost twice as many sprays (both insecticides and fungicides) as Central Western growers, and the IPM growers in each area applied half the number of sprays to the non-IPM grower in each area. The Cranbourne non-IPM grower used a greater range of fungicides than the other growers and one of the IPM growers in the Central West is certified organic so relies on using downy mildew resistant varieties rather than using fungicides.

We asked the IPM growers what had been the most important reasons for their conversion to IPM. The most common reasons given were: increased profit due to reduced costs, reduced time spent spraying and the need for alternative insect control methods due to establishment of a resistant population of insects. Other common influences to motivate conversion were: market push, regulations and perceived improvement upon their own health and that of the consumer.

We asked the two non IPM growers the major reasons for their choice of production methods. They were both open to the benefits of IPM systems, and that they had already adopted a number of IPM-compatible tools but see that risks of undertaking a biologically based IPM system are too great due to the lack of cleanup chemical options if pests or diseases do infest heavily. They also feel that their current

pest control strategies are adequate, and they believe that adopting more biologically based IPM methods would reduce their product quality and increase impact and incidence of secondary pest infestations. However in regards to whether IPM would increase or decrease OH&S concerns, chemical costs or what effect it could have on lettuce quality there was no real trend in opinions. The growers were however, unanimous that IPM would reduce diesel costs and chemical residue issues but that it would not change labour costs or marketable yield.

The IPM growers surveyed noticed that after adoption of a biologically based IPM strategy they have reduced the number of sprays, and that the types of sprays used have changed to more biologically based and softer chemistries. They observed that chemical costs decreased, diesel costs and labour costs didn't change, marketable yield decreased by 5 -10%, crop quality remained the same. Both OH&S and residue issues became less of a concern due to the softer and safer range of chemistries used. None of the growers observed any real changes in incidence of insect damage, disease levels, damage predictability, crop saleability or crop rejections after adoption of an IPM strategy.

The IPM tools the IPM growers found the most important included: crop monitoring, soft chemistry (inc biologicals) insecticides and timing of sprays. Two of the IPM growers surveyed also believed that monitoring and releasing of beneficial insects is also important as well as planning and design aspects i.e. farm design, crop rotation and native plant corridors within the farm that enable establishment and maintenance of effective beneficial numbers.

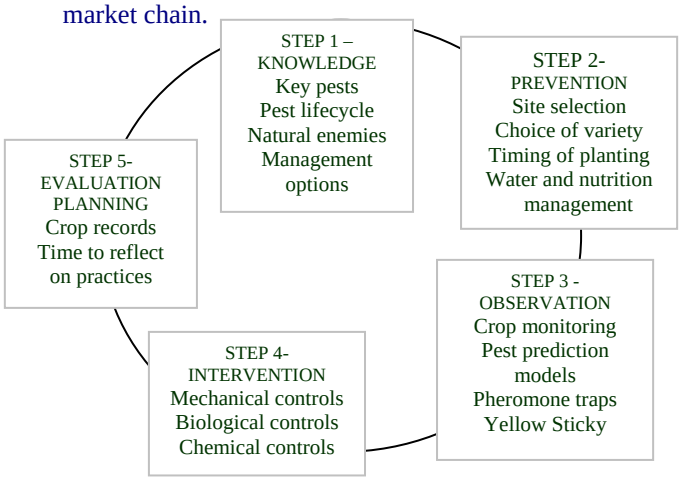
IPM – the basics

Dr Sandra McDougall, NSW DPI

Integrated Pest Management (IPM) is a strategy that draws on a range of management tools with the goal of using the least ecologically disruptive techniques to manage pests to economically acceptable levels.

In practice IPM growers fall in a continuum from "Integrated Pesticide Management" to a biointensive IPM. Integrated Pesticide Management involves routine crop monitoring, appropriate timing of pesticide applications, attention to good spray application technique and following pesticide resistance management strategies. A biointensive IPM strategy relies primarily on beneficial organisms to manage insect pests and when greater pest control is needed interventions chosen are complementary to the survival of beneficials.

IPM is a model of continual improvement (see figure below) both for IPM research and for adoption. They typically focus initially on management strategies of a single key insect pest, usually after 'conventional' insecticides fail to control the pest adequately. As strategies are developed for the target pest, focus moves to other key or minor pests, diseases and weeds. IPM can become part of a fully integrated farm management system and potentially involve the whole market chain.



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