

Corn Earworm Control in Lettuce – January 2005

Improving Lettuce Insect Pest Management (Vegetable Levy HAL Project VG 01038)

ISBN 1 74146 952 X

Corn earworm (*Helicoverpa armigera*) has been a major pest of lettuce crops over recent seasons, particularly in the summer of 1999/2000. Corn earworm has some resistance to a wide range of chemical groups including carbamates, synthetic pyrethroids and organophosphates. This means that large larvae in particular are very difficult to control.

The Native budworm (*Helicoverpa punctigera*) which is controlled by most registered pesticides are generally most active in spring/early summer, while the activity of corn earworm starts to increase in summer with the highest pest pressure in February/March.

There are new chemistries available that will provide control but if they are not used carefully and strategically, resistance will develop rapidly and these will also become ineffective. It is essential that all growers adopt a strategic method of pest control and in particular for corn earworm.

What to do?

Monitoring is the key – this is critical, frequent monitoring will allow larvae to be targeted when they are small and easier to kill.

- It is essential to monitor crops frequently, particularly when moth catches in pheromone traps are high.
- Look for eggs and larvae especially small larvae – larger larvae are more difficult to kill.
- Monitor young crops – it will be impossible to control larvae once they are inside the lettuce heart.
- Monitor moth activity using Scentry® Pheromone traps.

Non-Chemical Controls

- Make sure seedlings are clean and free of eggs and small larvae.
- **CULTIVATE TO A DEPTH OF 10 CM AS SOON AFTER HARVEST AS POSSIBLE.**
- Cultivate crop residues as soon as practicable to kill the pupae, which are in the ground. This will prevent the crop residues acting as a reservoir for the pest and will disrupt the emergence of the next generation.
- Use soft chemicals to encourage activity of beneficial organisms, such as parasitic wasps and predatory insects.

Chemical Application Strategy

- Apply sprays when larvae are small.
- Preferably apply sprays in the evening.
- It is important when applying sprays to allow sufficient time for spray to dry before watering.
- When determining spray intervals take into account weather conditions. In hot weather (including nights) eggs can hatch in 3-4 days, but if the temperature is cold, egg hatch may be extended to 10 days.
- Do not spray more frequently than required.
- When pest pressure is extreme use application rates at the high end of the scale of those on the product label. Do not use high rates when pressure is low.
- Other chemical groups such as synthetic pyrethroids and carbamates can still be effective on very small grubs.



The Effect of Lettuce Aphid

When Lettuce aphid (*Nasonovia ribis-nigri*) arrives in Victoria its impact will be significant but it will be important to manage the response to get the best control of this new pest.

- The use of broad-spectrum insecticides will not provide effective control of the aphid but beneficial insects will definitely be killed which will make control of the aphid harder and will also lead to poorer control of other pests such as *Helicoverpa spp.*
- Treatment of seedlings using a systemic aphicide may also have a negative effect on some beneficial arthropods. For a systemic aphicide there should be only one application via a spray or drenching equipment (this should be applied in a sufficient volume of water to ensure complete coverage/drenching of the cell, seedling and soil).
- Scouting for pests such as *Helicoverpa spp.*, other aphids, thrips and other pests is crucial and it is important to continue to use soft pesticides to help maintain beneficial populations such as lacewings which will also aid Lettuce aphid control. *Nasonovia* resistant lettuce varieties are available from several seed companies.

Seedlings to Pre-hearting

- Up until pre-hearting a biological pesticide such as Bt (*Bacillus thuringiensis*) or Nuclear Polyhedrosis Virus (NPV) should be used. These biological pesticides are ideal to apply to young plantings of lettuce for they will not affect beneficial arthropods (eg lacewings, predatory bugs, spiders and parasitic wasps) which can provide some additional control.
- If pest pressure is extreme then use one of the new insecticides, such as spinosad (Success[®], Entrust[®]), emamectin benzoate (Proclaim[®]) or indoxacarb (Avatar[®]) with no more than two consecutive sprays of each before alternating.

Pre-Hearting to Harvest

Based on pest pressure if control is necessary:

- Spinosad or emamectin benzoate should be applied in 2 consecutive sprays then alternated with 2 consecutive sprays of the other or indoxacarb.
- Spinosad and emamectin benzoate, are least harmful to beneficial arthropods while indoxacarb is slightly harder on beneficials. To protect beneficial arthropods, it is important not to use a broad-spectrum pesticide until necessary.
- To control aphids while using the softer insecticides, an aphicide such as pirimicarb (Pirimor[®]) should be used in order to protect beneficial arthropods.
- Other chemical groups such as synthetic pyrethroids and carbamates can still be effective on small larvae. These are broad-spectrum insecticides and can be used for clean up sprays if necessary but remember these will also kill the beneficial insects.
- Alternate pesticide groups after every two successive sprays

Registered Chemicals for corn Helicoverpa spp on Lettuce include:

Chemical Group	Product
Nuclear Polyhedrosis Virus	Gemstar, Vivus, Vivus Gold
bacillus thuringiensis	Dipel DF
spinosad	Success, Entrust
emamectin benzoate	Proclaim
indoxacarb	Avatar
carbamates	Lannate, Methomex, Marlin, Nudrin
synthetic pyrethroids	Fastac, Dominex, Alpha, Alpha Duop, Alpha-Scud, Alphasip, Buzzard, Astound, Alpha-cypermethrin, Alpha – C, Ken-Tac, Dictate, Antares

Chemicals registered for other insect pests on Lettuce include:

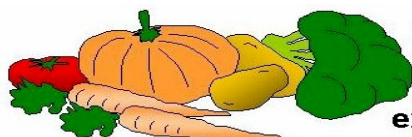
Chemical Group	Product
carbamates	Pirimor, Aphidex
organophosphate	Diazinon, Fyfanon, Hy-Mal, Unidime, Dimethomax, Fenitrothion, Sumithion, Rotam, Danadim, Rogor, Romethoate, Dimethoate, Centaur

Remember: Read the label and observe withholding periods. All restricted chemicals (which include Schedule 7 Poisons and other restricted chemicals) must be used strictly in accordance with label directions and require an Agricultural Chemical User Permit.

Disclaimer:

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purpose and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

For more details contact: Rob Dimsey or Lavinia Zirnsak, DPI Bairnsdale Ph (03) 51520 600,
Slobodan Vujovic DPI Knoxfield Ph (03) 9210 9222,



VegCheque
extension for the vegetable industries