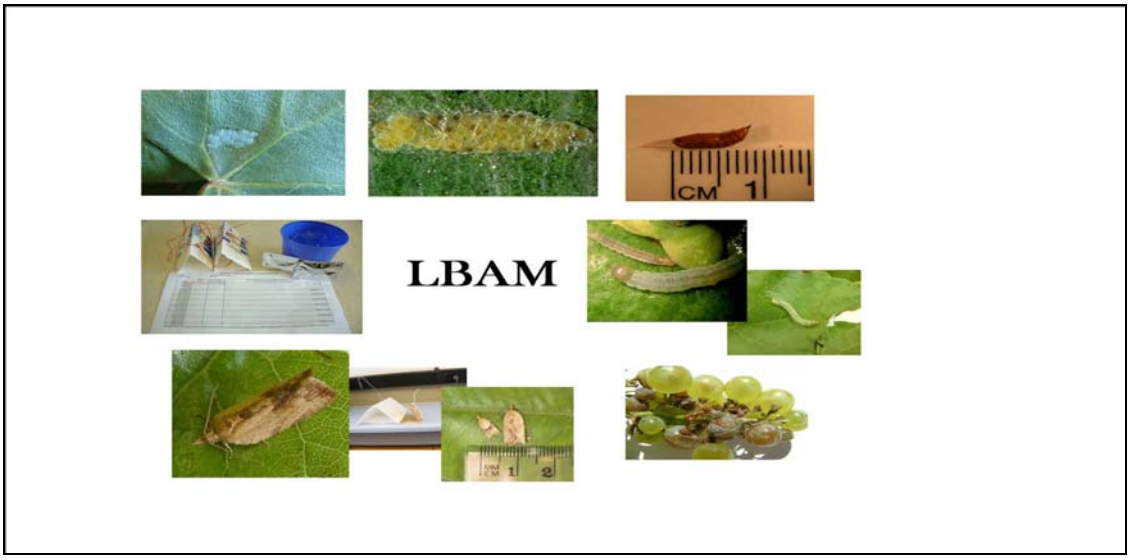
Riverina
WINEGRAPE GROWERS

Australian Government
Grape and Wine Research and Development Corporation

Riverina Light Brown Apple Moth Monitoring Network



FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: **RITA Project 03/02-1**

Principal Investigator: **Ms Emma Jamieson**

Research Organisation: **Riverina Viticulturalists via the Wine Grapes Marketing Board**

Date: **30th August 2004**

Executive Summary

Lightbrown apple moth (LBAM), *Epiphyas postvittana*, is a serious insect pest of wine grapes in many regions of Australia. The Riverina through the RITA project RT 03/02-1 are aiming to further develop information available to growers on LBAM activity & affect on fruit quality, monitoring in the vineyard and from this the effective control of the pest.

The Wine Grapes Marketing Board (WGMB) in conjunction with the Riverina Viticulturalists (RIVIT) facilitated a regional Light brown Apple moth (LBAM) monitoring program in the Riverina amongst winegrape growers.

This project involved 24 vineyards monitoring pheromone traps and being provided with feedback on regional moth flights and expected egg hatching through the 2003-2004 season. Feedback from their involvement during the season indicated that growers became more aware of the pest and they were able to apply timely application of their LBAM control products with good results.

The program commenced the 18th September 2003 with monitoring running from the 25th September 2003 until the 26th February 2004 .Final information and LBAM update to growers has just been presented with an information seminar on the 2nd of September 2004.

Background

Wine grape production in the Riverina is threatened annually by LBAM, which causes damage to fruit and increases the incidence of bunch rot diseases such as Botrytis. At significant levels LBAM has a detrimental effect on the quality of harvest for growers and the quality of wine for wineries. Grapevines and citrus are the main hosts of LBAM in the Riverina. Currently the citrus industry has a monitoring program in place coordinated by NSW Department of Primary Industries (DPI) Entomologist Jianhua Mo, which monitors LBAM. For the past 3 years Jianhua has collected monitoring information, then using weather data and monitoring data completes interpretation and redistributes this to growers so that they can initiate preventative measures against LBAM. The RIVIT group spoke to Jianhua Mo and Andrew Loch (Field Entomologist at the NWGIC with NSW DPI) and devised a plan for LBAM monitoring for wine grapes in the Riverina.

Training of growers and regional viticulturalists (including viticultural advisors) was carried out on the monitoring program. This training was run by Jianhua Mo and Andrew Loch. Background information on the LBAM life cycle, monitoring benefits, project aims and distribution of monitoring trap equipment was covered in the training session.
Monitoring of LBAM levels in vineyards was conducted by those who underwent training for the program through the growing season of 2003/04. The vineyards monitored were chosen so as to cover the area of the Riverina and not double-up on areas already monitored by the citrus industry. Traps were provided at no cost to growers monitoring.
Interpretation of data collected through the program was completed by Andrew Loch. The information on moth counts and LBAM advice for monitoring further activity was redistributed to the monitoring network, WGMB weather data distribution network, winery viticulturalists & grower liaison officers, and viticultural advisors in the Riverina.

Objectives

To have a functional monitoring program in the Riverina for LBAM, operated by growers and other associated people, which produces information that can be fed back to the main wine grape industry and used as an effective management tool for LBAM and its associated problems.

Method

- An information and training day was conducted in August 2003 to brief growers on LBAM biology and pheromone trap use.
- Growers were provided with a pheromone trapping kit, which comprised of several triangular cardboard (milk carton) traps, string to hang traps in the vine canopy, Tanglefoot insect trap coating, several pheromone caps to place in traps, and a datasheet to record moth counts.
- A total of 24 vineyards directly participated in the pheromone trapping program. Participating vineyards were spread throughout the greater Griffith area including Bilbul, Beelbangera, Hanwood, Tabbita, Nericon, Whitton and Yenda, with one participating grower in Hillston.

- Traps were first placed in vineyards on the 19th September 2003 (around budburst) and checked on a weekly basis until the 26th February 2004 (end of Chardonnay harvest). Each vineyard used 1-3 traps with most traps placed in the most susceptible varieties of Chardonnay and Semillon.
- Weekly moth counts per trap were recorded by growers and sent to Andrew Loch at the National Wine and Grape Industry Centre in Wagga Wagga. Moth count data was then compiled, analysed, interpreted and redistributed to the Riverina grower network.
- Information details relating to the distance of trap placement to citrus crops, vineyard activities & environment (i.e. midrow management & spraying activities) and weather conditions were reported to Andrew also to help build information relating to LBAM movement and populations.
- A half-day seminar follow up was held on the 2nd of September 2004 presenting growers with results from the 2003/04 monitoring data. This involved the use of information for the coming season, presentations of effective control products from manufacturers and the launch of the monitoring program for a second season which is to be supported and funded by the Wine Grapes Marketing Board, National Wine and Grape Industry Centre (NWGIC) and Chemical companies.
- Information was presented for several control products including biological and chemical products providing growers with specific details how the product works, what it controls, its benefits to non target species and correct use of the product to increase efficiency, efficacy and environmental management. With many new products available and continual update we believed it was necessary for growers to receive this information from the manufacturers to help improve product use efficiency and control. It also integrated with the monitoring program as many of the products would work to control the pest if populations reach economic threshold levels at the times the results showed major activity.

Results/Discussion

Trapping Results

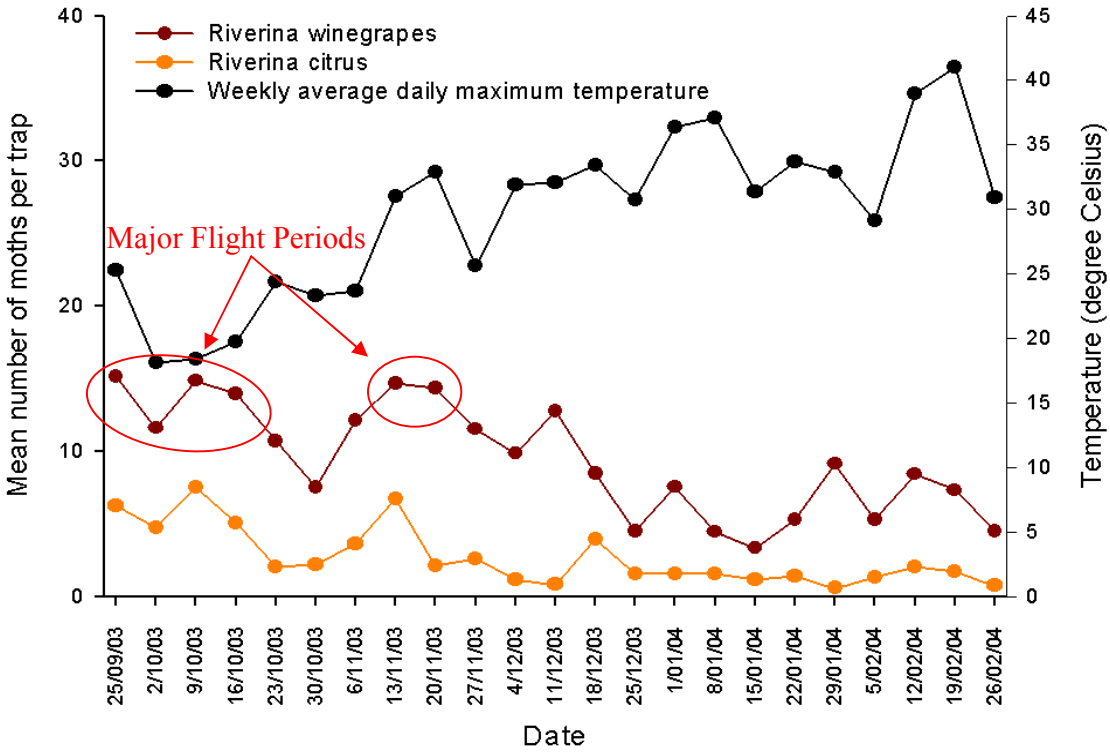


Fig. 1 LBAM pheromone trapping data in Riverina winegrapes and citrus for the 2003/04 season with major flight periods identified for winegrapes. The weekly mean daily maximum temperature from the Griffith airport is also shown.

The following data results has been complied by Andrew Loch.

Moth trap count data from winegrapes indicated that the first major flight occurred at the beginning of the growing season in late September until mid October (Fig. 1). A second smaller flight also appeared to occur in mid November. Trap counts for citrus also showed these two peak flight times. The trend shows winegrapes to have higher LBAM mean numbers than citrus data across the season. Some suggestions for this include the ease of distribution of pheromone from the trap in grapevines compared to citrus trees. Also the texture and make up of grapevine and citrus leaves could influence the population counts. Further study will look to why the mean is higher for winegrapes then citrus with possible reasons for this.

From these peak flight times the times when egg masses would have hatched and young caterpillars present could be identified using the LBAM development calculator (Fig. 2) developed by NSW DPI Entomologist Dr Jianhua Mo. This calculator computes the duration of egg, larval and pupal stages with the input of minimum and maximum temperatures, and is freely available on the NSW Department of Primary Industries website.

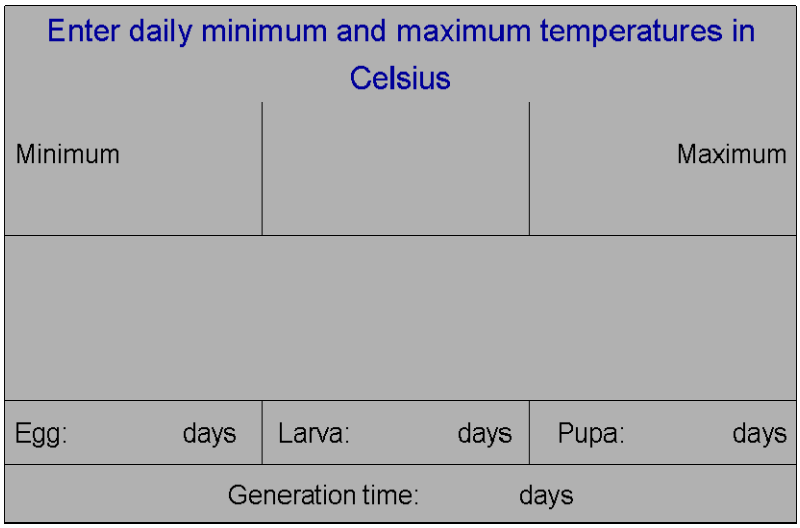


Fig. 2 LBAM calculator developed by Dr Jianhua Mo which will be useful for growers to calculate LBAM activity from weather information and monitoring
http://www.agric.nsw.gov.au/reader/cit-bugs/cit-lbamcalc.htm

At the time of the first flight the mean minimum and maximum temperatures were approximately 7°C and 20°C respectively (Fig. 1.) The LBAM calculator estimates that the duration of the egg, larval and pupal stages at these temperatures will be 19, 57 and 21 days respectively. For the second flight in mid November with a mean temperature range of approximately 13-32°C, the duration of egg, larval and pupal stages decreases by about 50% to 10, 28 and 11 days respectively.

Mid October to early November and late November to early December were identified as the key times to monitor for egg masses and young caterpillars and if necessary to conduct control (Fig. 3). Monitoring of developing egg masses can be conducted prior to these times, and if conducted, egg masses should be marked and monitored so that hatching times can be determined.

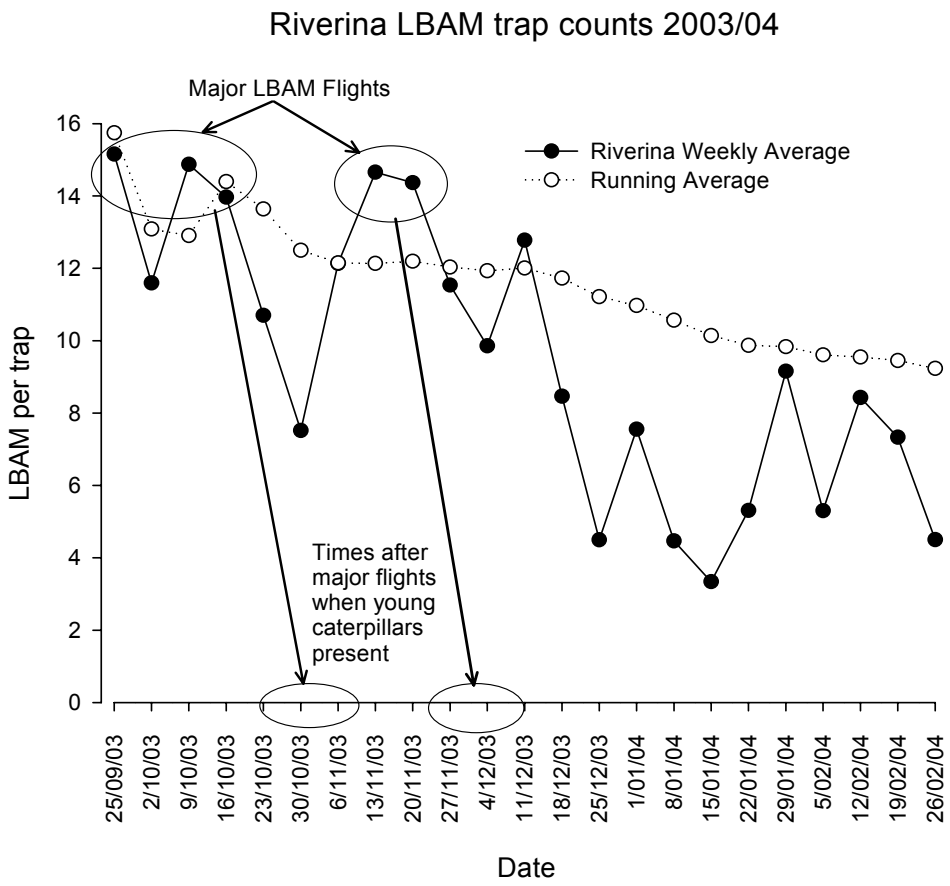


Fig. 3 LBAM weekly average indicating major flight periods and periods identified for monitoring of young caterpillars

Trapping results were supported by reports from several growers of large numbers of small LBAM caterpillars in early November. In addition, these two periods occurred just prior to flowering and bunch closure, which are typically the times when LBAM inflicts serious damage. It is important to note that the window of opportunity for monitoring and control is much narrower for the second flight in November (Fig. 3) because of the quicker development times for eggs and larvae.

Pheromone trapping is useful in identifying key monitoring/control times but it is possible that serious LBAM infestations will arise at times during the season not predicted by trap counts. Regular surveillance of LBAM susceptible grape varieties for egg masses and caterpillars should still be conducted throughout the growing season, and if large numbers of LBAM are detected, monitoring and possibly control will be required.

Grower participation and interest in the 2003/04 program was excellent although fewer growers sent in data as the 2004 vintage approached. Growers generally reported the

traps to be easy to use and valued their involvement in the program and the information they gained.

A publication article for the Australian Grapegrower and Winemaker will be printed in the October edition detailing the program and results. This has been compiled by Andrew Loch and others involved in the project.

Improvements and refinements to the trapping program were discussed at the follow-up seminar in September 2004 so that the 2004/05 trapping program will be even more successful. During the wrap-up session chemical companies provided first hand, up to date information. Several items of discussion included the effectiveness of the lures with 2 growers reporting high counts after initial placement of fresh baits in the vineyard and then reduced counts after further weeks. This season the region will trial several different baits to identify if this is occurring in vineyards. For this season from the overall information it was not evident that influxes of moths caught occurred after new baits were placed in the traps at 3 weekly intervals.

Many growers who participated in the 2003/04 program are keen to be involved again and many new growers have joined the program for 2004/05. Results from the 2004/05 LBAM trapping program will again be distributed to all growers via the WGMB network.

Outcome/conclusion

The program has become regionally important with benefits evident in improving grower's awareness and involvement with monitoring for pest and disease problems in the vineyard beyond the LBAM pest.

All groups involved successfully achieved to run a functioning monitoring program benefiting the Riverina region growers which will continue to progress and develop over future years.

This monitoring provides grower's with the advantage to control any outbreaks prior to serious damage to fruit and fruit quality resulting in production losses. The information received through the program has been used to show growers and viticultural staff supporting grower's the specific times through the season when monitoring for pest activity is necessary within usual monitoring programs.

Pass control measures included a blanket cover spray done to a schedule similar to years previously. This is now changing towards using targeted control methods and controlling when warranted, as identified through the growers vineyard monitoring. This change in practice also will have local area environmental benefits with reduced chemical input and improvements in beneficial species numbers.

The program has received strong support for all involved with a good level of participation in the program and support from the many contributors especially the local RIVIT group and funding through RITA.

The use of the Australian Grapegrower and Winemaker article will reach the wider wine and viticulture industry displaying the Riverina's regional grower concern of the pest and options that it is using to manage LBAM more effectively and wisely through the monitoring network.

The program has allowed further information and data on LBAM in the region being collected for winegrapes and utilised along with current citrus information. This data will continue to be compiled and developed with continued support from the WGMB, NGWIC, chemical companies, local RIVIT group and growers. For growers this will provide better information and show trends from year to year on the pest's activity in the local region.

Budget reconciliation

Budget	Funding required from GWRDC		Actual Expenditure	Local/Regional Contribution
Training				1,000.00
NSW DPI - Data Interpretation & travel costs	4,745.00		4,745.00	4250.00
Pheromone Traps (Bait) 280 baits	2,341.00		2,087.27	
Pheromone Traps (Cartons & Tanglefoot)	655.00		646.51	
Redistribution of Information				1,000.00
Administration & Coordination Costs				2,200.00
Mid session information workshop				600.00
Total	7,741.00		7,478.78	9,050.00
Add 10 % GST	774.10		747.88	
Total funds requested from GWRDC	**8515.10**	**Total Expended**	**8226.66**	
Remitted To GWRDC			262.22	
Add 10 % GST			26.22	
Total Remitted to GWRDC			288.44	

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Information in this report has also been obtain from

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