TUMBARUMBA VIGNERONS ASSOCIATION

Australian Government
Grape and Wine Research and Development Corporation

Understanding and Managing Early Bunch Stem Necrosis (EBSN) in the Tumbarumba Wine Grape Growing region





FINAL REPORT to
GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: RT 08/01-4

Principal Investigator: **Leo Quirk**

Research Organisation:
National Wine & Grape Industry Centre

Date: **25 June 2009**

Executive Summary

This GWRDC funded project allowed a scoping study and workshop to be conducted on Early Bunch Stem Necrosis (EBSN), a phenomenon which was leading to significant yield losses in the Tumbarumba region of NSW. The aims of the project were to:

1. Conduct a workshop for affected grape growers in the region that addressed possible causes of EBSN and increased grower's understanding of EBSN and possible causes;
2. Conduct a survey of growers to identify the extent of the problem and quantify the economic losses being incurred;
3. Determine most likely causes of EBSN and develop a research proposal to investigate the problem.

The Tumbarumba Vignerons' Association in conjunction with the NWGIC developed a workshop seminar program to address the issue of Early Bunch Stem Necrosis (EBSN) and possible causes. Topics addressed by the workshop seminar included, Managing fruit-set in vineyards, Relationship between carbohydrate dynamics and reproductive development, Physiological disorders of Grape: Bunch Stem Necrosis and Early Bunch Stem Necrosis and Infection of grapevines with *Pseudomonas syringe* in frost prone region. Tumbarumba growers found the workshop seminar program to be very informative, enabled constructive discussion of the topic, and provided future directions for research into management of the problem. The consensus from the workshop is that *Pseudomonas syringae* appears to be the most likely cause of EBSN in the Tumbarumba region. Growers also wished to pursue research investigations into *P. syringae* and its role in EBSN in Tumbarumba wine grapes.

Background

Early bunch stem necrosis (EBSN) is a widespread disorder affecting many grape growing regions worldwide. EBSN affects pedicels, rachis and peduncles from very early up to and including flowering. Symptoms include the formation of necrosis on the peduncle, rachis or peduncle of the inflorescences or bunch, leading to flower drop in the case of EBSN. Possible causes include a physiological disorder caused by environmental conditions, a nutrient disorder, or due to pathogens.

For the past five growing seasons the Tumbarumba region has experienced severe yield losses from EBSN. One grower reported total losses of over $100,000 from EBSN in the last three

seasons. A second grower reported losses of $50,000 over past three growing seasons. Other growers have stated that EBSN has significantly reduced yield quality and quantity by reducing berry size and berry numbers. As a result of the reduced quality and yields, EBSN has been estimated to cost the Tumbarumba region $250,000 annually.

EBSN is not variety specific as we have reports of Chardonnay, Pinot Noir, Sauvignon Blanc and Riesling all showing symptoms. Symptoms have occurred on both frost protected sites and unprotected sites. Symptoms have also been expressed on cane pruned vines and spur pruned vines.

The GWRDC approved funding of $5,000 for a scoping study on EBSN as it was unclear what was causing the significant yield loss in the Tumbarumba region. Upon completion of the scoping study Tumbarumba growers would have a better understanding of what may be causing EBSN. The Tumbarumba Vignerons' Association, in conjunction with the NWGIC, developed a seminar program addressing the issue of Early Bunch Stem Necrosis (EBSN). The seminar program investigated some of the possible causes of EBSN and delivered current knowledge and best practices to growers.

Objectives

Project objectives were to promote discussion, awareness and understanding of EBSN within the Tumbarumba region and also within climatically similar regions such as Canberra Districts, Orange and the King Valley. A survey was also completed by growers prior to the seminar to gain further information on the distribution of EBSN and the extent of the problem.

Outcomes

The seminar program titled “What’s causing my poor fruit-set?” was conducted on Tuesday 18th of November at the Tumbarumba Bowling Club. This was attended by 38 growers coming from the Tumbarumba, Young, Riverina, Canberra and Orange wine grape growing regions of NSW.

Dr Cassandra Collins’ talk discussed what poor fruit-set is and how it differed to EBSN. Cassandra also presented findings from trial work carried out in the Adelaide Hills in South Australia. These trials investigated the use and timing of shoot topping and the exogenous application of (2-chloroethyl) trimethyl-ammonium chloride (CCC) to improve or control fruit-set.

Dr Bruno Holzapfel explained how carbohydrates and nutrients can have a negative affect on fruit-set and discussed some of the management options available to combat these effects.

Dr Andrea Pickering's presentation was titled 'Physiological disorders of Grape: Bunch Stem Necrosis and Early Bunch Stem Necrosis'. The presentation provided growers with an update of current research knowledge of physiological disorders that may be affecting vines in the Tumbarumba region.

Dr Melanie Weckert presented the results from recent pot trials conducted at the NWGIC to evaluate the effect , on inflorescence development of *Pseudomonas syringae*, a plant pathogenic bacterium isolated from diseased Tumbarumba rachises.

Each of the presentations addressed issues that may be causing EBSN. Ample question time was allowed after the conclusion of each presentation. This question time generated useful discussion on the incidence and magnitude of the EBSN problem in the Tumbarumba and surrounding regions. Growers from the regions felt that each presentation was very informative and each presenter showed great understanding of their subject matter. However, Dr Weckert's presentation on *P. syringae* stimulated the most discussion and the pathogen was viewed as the most likely cause of EBSN. Growers also wished to pursue further research into *P. syringae* as a means of solving the EBSN problem in Tumbarumba and possibly in other regions too.

Discussion developing from Dr Weckert's presentation has led to the decision by growers to run some trials in conjunction with the NWGIC investigating:

1. Late pruning, and
2. Copper sprays just prior to budburst

Growers also volunteered to participate in a physical survey to gauge the level of *Pseudomonas syringae* in their vineyards, with samples to be sent to NSW DPI diagnostics services for analysis.

Following the seminar each of the presenters presentations were published in the January/February 2009 edition of Australian Viticulture (Volume 13 no. 1). Publication of these articles has helped develop further awareness of EBSN across all grape growing regions of Australia, and offered possible management solutions to the phenomenon.

The survey (see Appendix) was completed by 10 growers who attended the seminar program. Forteen surveys were also returned prior to the seminar by growers from Tumbarumba, Riverina and King Valley. Results showed that a majority of growers surveyed had some understanding of what EBSN was; however, only growers from the Tumbarumba region had suffered significant yield losses as a result of EBSN.

Growers have continued to correspond with Dr Weckert who has also collected a series of samples from vineyards across the region to gain further insight into the extent of the problem in the Tumbarumba region. Dr Weckert has continued pot and lab experiments to gain further evidence that *Pseudomonas syringae* is the cause of the yield loss problems in the Tumbarumba region.

Budget reconciliation

Budget	Funding from GWRDC	NSW DPI Contribution	Tumbarumba Vignerons Association Contribution
Dr Andrea Pickering			
Travel	1300		
Accomodation	900		
Dr Cassandra Collins			
Travel	1000		
Accomodation	600		
Catering & Booking			785
Qfleet	400		
Inkind DPI		1200	
Administration			135
Total	4200	1200	920

Appendix

Early Bunch Stem Necrosis

Please circle your answers below or provide comment. If more room for comments is required please go to the bottom of the form.

A -

1	Are you aware of what early bunch stem necrosis (EBSN) is?	Yes No
2	Have you experienced significant yield loss due to EBSN?	Yes No
3	What year did you first experience EBSN?	1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
4	If yes what where the varieties affected?	Chardonnay Pinot Noir Riesling Sauvignon Blanc Shiraz Cabernet Sauvignon
5	Were the vines own-rooted or grafted onto rootstock?	Own Rooted Grafted
6	What was the size of the area affected?	Nil < 1 ha 1 – 5 ha 6 to 10 ha 11 - 15 ha 16 to 30 ha > 30 ha
7	Were there major or minor losses?	Yes No
8	If so, approximately what percentage of yield?	Nil < 5% 6 – 20% 21 - 30% 31 – 40% 41 – 50% > 50%
9	Do you use over head watering for frost protection?	Yes No
10	If so, how many times do you use it through out the growing season?	1 2 3 4 5 6 > 7 depending on the season
11	Which of the following chemicals do you use prior to flowering?	Copper Delan Bravo Mancozeb Ridmol Plus
12	How many fungicide sprays are applied?	Nil 1 2 3 4 5 6 >7 depending on the season
13	Have you removed any of the following chemicals out of your spray program?	Copper Delan Bravo Mancozeb Ridmol Plus

14	Do you apply fertiliser prior to flowering?	Yes No
15	Do you monitor temperatures during flowering?	Yes No
16	Do you count inflorescences prior to flowering?	Yes No
17	Do you conduct bunch counts after flowering?	Yes No
18	How often do you monitor for disease during flowering?	regularly sometimes not at all

B – Contact Information

Whether you provide your details below or not, all data is recorded anonymously and will in no way be linked to the respondent. If you would like to provide your details we will provide you with some feedback on the results of this survey.

Name:_____

_____

Address:_____

_____

Town/Postcode:_____

_____

Contact Phone Number:_____

_____

Email Address:_____

_____

I would like to be forwarded feedback on the results of this survey
Yes No

I would like to be involved in further surveys on this topic
Yes No

I would like to participate in future Physical Vineyard Surveys (Vineyard Visit)
Yes No

Thank you very much for taking part in this survey. Please return this survey by email to leo.quirk@dpi.nsw.gov.au. Fax 02 6933 2107

Further Comments: (Feel free to attach further comments)_____

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