

ERINOSE MITE

**Joseph Soler Vineyard – Hastings
2007/2008**

**Evaluation of Sulphur with surfactant rates of Protector, in high and low water rates for control of Erinose Mite.
(Verdelho)**

**Evaluation of three soft insecticides as well as two rates of sulphur (with and without surfactant rates of Protector) applied once for control of Erinose Mite after infection had occurred.
(Gewürztraminer)**

Executive Summary

The Verdelho results (a program):

- Improvement in control of erinose mite with an increase in the rate of sulphur.
- Improvement in control of erinose mite with an increase in the water rate. It is estimated the difference in efficacy between high and low water rates used would be approximately 0.75kg S per application.

The Gewürztraminer results (a single application):

- Improvement in control of erinose mite with an increase in the rate of sulphur.
- Efficacy of Sulphur against erinose mite is improved with the addition of a surfactant rate of Protector.
- BioCover and Pyradym have measurable greater efficacy against erinose mite with one application, compared with a 4kg S and Protector mix.
- All products used had some effect against Erinose Mite with the exception of DCTron Plus Mineral Oil and 2kg S alone.

Introduction – Verdelho

A large replicated trial was undertaken in 2006/2007 in the Verdelho block at Joseph Soler Vineyard looking at various soft treatments for the control of powdery mildew. No account was taken of how these treatments affected control of erinose mite.

The powdery mildew study continued in 2007/2008 in the Verdelho block again with a block wide trial involving various rates of sulphur with a surfactant rate of Protector using high and low water regimes undertaken by conventional spray equipment.

Verdelho is a variety that is moderately susceptible to erinose mite infection and as part of the above trial, efficacy of erinose control was measured in each of the treatments.

Verdelho Trial

Background and Layout

In the 2006/2007 season there were two DMI applications and five sulphur applications (mostly in the range of 3 to 4 kg/ha). Erinose mite was present throughout the block to varying degrees but mostly not epidemic. No oils were used.

The Verdelho block is an area of 2.5ha. Of the 52 rows, 48 were used for this years trial. The 4 rows excluded were the previous year's trial site.

Each treatment was replicated 4 times through the block (4 x 2 rows).

Trial Treatments

There were 6 treatments:

- a low water rate with 2kg S, 3kg S and 4kg S: and,
- a high water rate with 1.5kg S, 2kg S, and 3 kg S.

The surfactant rate of Protector was common to all treatments at 0.5% of the water volume.

No crop was left untreated.

Sprayer Settings

The sprayer used in the trial was a tow behind, over row Sylvan G2 (air shear-large fan model). The sprayer's output was managed by a Farm Scan 2400 controller.

The sprayer was tuned to provide emphasis to the bunch line by slight additional air, orientation of nozzles and slightly more generous jetting. The nozzles were backward facing at about 30 degrees, the tips 700mm from the centre of the canopy.

It was operated at 540 PTO rpm with speeds over ground for all treatments approximately 6.5km/hr except for the first application of the low water rate which went on at approximately 8.5km/hr. The water pump pressure was approximately 80psi (5.5bar).

Application Dates and Water Rates

The application dates and water rates are shown below, along with the spray interval.

Date	Low Water Rate	High Water Rate	Spray interval
26 October	150 l/ha	200 l/ha	
13 November	150 l/ha	300 l/ha	18 days
23 November	200 l/ha	400 l/ha	10 days
11 December	300 l/ha	600 l/ha	18 days
3 January	300 l/ha	600 l/ha	23 days

The method of varying the concentrations of sulphur in the spray tank proved to be very efficient and resulted in only small amounts of sprayer downtime. It also ensured the spray tank volume remained high enough to ensure reliable outputs. Water rate details are provided in Appendix 1.

Assessment

Erinose Mite infection was assessed in the first week of May 2008 (after harvest and before leaf drop had commenced) by attaching a wire mesh frame to the top tucking wire and centering it on the plant.



Six random leaves were taken from within each of the four quarters of the frame with one additional leaf to make a total of 25 leaves per plant. Four plants per bay brought the total leaves to 100 leaves per bay (if a plant within the bay was not representative then the next representative plant was used).

Five bays were assessed through 2 complete double row replicates, bringing the total of 1000 leaves assessed per treatment.

The leaves were randomly selected without regard to their erinose infection, removed and the erinose infections were counted.

Summary of Results - Verdelho

The actual results are tabulated in Appendix 2, a summary of these results are in the following table

Table 1.0

Treatment	Incidence %	Severity	Ranking
High water 1.5kg	42.4	1252	5
Low water 2 kg	50.6	1211	6
High water 2kg	44.6	869	4
Low water 3 kg	33.4	677	3
High water 3kg	23.5	374	1
Low water 4kg	29.2	292	2

The treatments have been ranked for effectiveness - No statistical analysis has been undertaken.

The Verdelho results show:

- an improvement in control of erinose mite with an increase in the rate of sulphur.
- an improvement in control of erinose mite with an increase in the water rate. It is estimated the difference in efficacy between and high and low water regime used would be approximately 0.75kg S per application.

Gewürztraminer Trial

Introduction – Gewürztraminer

The objective of this trial is to look for methods to control Erinose Mite once an infection has established. The aim is to eventually find a soft regime that would require one application to give good efficacy.

Background and Layout

A corner of the Gewürztraminer Conventional block was selected after an erinose outbreak became obvious. The area comprised short rows and was easily isolated from the main block.

Erinose infection was assessed on the 19 October 2007 and the results are shown in Appendix 3. Forty three plants were tagged and individually assessed by counting the number of sites infected (spur pruned), the location and number of leaves infected on those sites counted from the cordon, and the number of infections on all identified leaves.

From this assessment, plants were ranked in terms of 'erinose challenge' and were divided giving a spread of 'challenges' through the treatments. There were 5 replicates per treatment. Each of those plants was tagged with the assigned treatment.

Trial Treatments

There were eight treatments:

- Bio Cover Mineral Oil – 2l per 100l water
- Pyradym – a newly registered soft insecticide -50ml/100l mixed with DCTron Plus Mineral Oil 250ml per 100l water
- DCTron Plus – 1l per 100l water
- 4kg S + 0.5% Protector
- 2kg S + 0.5% Protector
- 4kg S
- 2kg S
- Untreated

Spraying occurred on the 31 October 2007.

The trial received no further sulphur applications or other sprays throughout the season.

Trial Results

An assessment was made of the trial on 2 May 2008. The assessment was made later than it should have been and leaves had begun to fall.

100 leaves per plant were randomly picked from cane ends. There were some instances where there were not enough leaves available and hence some results had to be increased pro rata.

It was also noted that canes of different plants had intermeshed and therefore there is a question of integrity of each plant's erinose staying on that plant.

Overall the result obtained can be regarded as giving strong indications but the trial itself ended up having too many issues to be regarded as pure enough to be scientifically sound.

The raw results are provided in Appendix 4 which has then been sorted and summarized into Appendix 5 to disclose differences between treatments. The results are summarized in the following table.

Table 1.0

Treatment	% increase leaves (incidence)	% increase infections	Rank
BioCover	415	365	2
Pyradym	385	300	1
DC Tron plus	600	800	6
4kg S + 0.5% protector	405	450	3
2kg S + 0.5% protector	380	510	4
4kg S	625	1250	8
2kgS	570	605	5
Untreated	900	555	7

The Gewürztraminer results indicate:

- that the efficacy of Sulphur against erinose mite is improved with the addition of a surfactant rate of Protector;
- that both BioCover and Pyradym have measurable greater efficacy against erinose mite with one application, compared with a 4kg S and Protector mix;
- that all products used had some effect against Erinose Mite with the exception of 4kg S alone.

Suggested Further Areas of Research regarding Erinose Mite

The following are suggested areas for further research:

- to study the effects of varying rates of lime sulphur at bud burst on efficacy;
- to study the effects of varying rates of sulphur with surfactant rate of Protector at bud burst (and slightly after) on erinose mite infections and/or further study when an outbreak has occurred;
- to study further enhancement of Pyradym to improve efficacy as a single or double application after infection has occurred;
- to confirm trial results are transferable to Gisborne and Marlborough.

Appendix 1: Powdery Trial 07/08 - Water Rate Details

Treatments

High Water Rate 200-600 L/Ha

1	1.5kg sulph	plus 0.5% protector
2	2kg sulph	
3	3kg sulph	

Low Water Rate 100-300 L/Ha

4	2kg sulph	plus 0.5% protector
5	3kg sulph	
6	4kg sulph	

Chemical Additions

Application 1

600 L water total plus 3L protector

Treatment	Sulph Add	Spray rate	Spray used	Vol remaining (L)
1	3.6kg	250L/ha	100L	500
2	1kg	250L/ha	100L	400
3	1.6kg	250L/ha	100L	300
4	0.4kg	150L/ha	60L	240
5	1.6kg	150L/ha	60L	180
6	1.2kg	150L/ha	60L	120

Remainder 120L with 4Kg/ha Sulph

Application 2

700L water total plus 3.5L protector

Treatment	Sulph Add	Spray rate	Spray used	Vol remaining (L)
1	3.5kg	300L/ha	120L	580
2	0.9kg	300L/ha	120L	460
3	1.6kg	300L/ha	120L	340
4	1.13kg	150L/ha	60L	280
5	1.9kg	150L/ha	60L	220
6	1.45kg	150L/ha	60L	160

Remainder 160L with 4kg/ha Sulph

Powdery Trial 07/08 cont.

Application 3

1200L water total plus 6L of protector

Treatment	Sulph Add	Spray rate	Spray used	Vol remaining (L)
1	3kg	600L/ha	240L	960
2	0.8kg	600L/ha	240L	720
3	1.2kg	600L/ha	240L	480
4	0.8kg	300L/ha	120L	360
5	1.2kg	300L/ha	120L	240
6	0.8kg	300L/ha	120L	120

Remainder 120L with 4kg/ha Sulp

Appendix 2: Erinose Efficacy Data 2007-08 - Joseph Soler Vineyard, Hawke's Bay

Low Water - 2 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
811	5	56	86	
810	12	67	151	
811	19	52	92	
810	26	64	117	
811	29	72	182	
787	3	34	87	
786	9	39	178	
787	16	30	92	
786	23	39	113	
787	27	53	113	
Total		506	1211	6

Low Water - 3 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
790	3	23	40	
791	10	23	33	
790	17	21	40	
791	24	28	43	
790	30	36	68	
814	5	44	72	
815	12	32	51	
814	19	40	70	
815	26	26	50	
814	30	61	210	
Total		334	677	3

Low Water - 4 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
818	5	26	31	
819	12	25	39	
818	19	15	17	
819	26	34	43	
818	32	43	82	
794	3	24	35	
795	10	23	39	
794	17	22	31	
795	24	27	39	
794	29	53	107	
Total		292	463	2

High Water - 1.5 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
808	5	81	426	
809	12	57	159	
808	19	51	115	
809	26	50	91	
808	29	70	228	
784	3	21	36	
785	10	16	25	
784	17	31	65	
785	24	35	87	
784	27	12	20	
Total		424	1252	5

High Water - 2 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
789	3	21	35	
788	9	23	39	
789	16	27	45	
788	23	40	73	
789	28	36	77	
813	4	61	163	
812	10	61	120	
813	17	51	93	
812	24	64	144	
813	29	62	80	
Total		446	869	4

High Water - 3 kg S and 0.5 % Protector				
Row	Bay	incidence/100	severity	Efficacy Ranking
817	5	24	32	
816	12	21	33	
817	19	21	44	
816	26	18	24	
817	32	36	60	
792	3	18	20	
793	10	10	14	
792	17	29	39	
793	24	35	65	
792	29	23	43	
Total		235	374	1

Appendix 5: Gewurztraminer - Assessment Summary

Summary of data using all five replicates. Where replicate is missing or is deficient, the value has been adjusted by average

Treatment	Leaves infected 19/10/07	Total infections 19/10/07	Leaves infected 2/05/08	Total infections 2/05/08	% increase leaves	% increase infections
BioCover	60	231	255	869	425	375
Pyradym	66	252	254	758	385	300
DCTron Plus	49	171	321	1416	655	830
4kg S + 0.5%Protector	61	165	312	1008	510	610
2kg S + 0.5% Protector	56	131	270	792	480	605
4kg S	44	108	325	1452	740	1345
2kg S	37	99	239	649	645	655
Untreated	22	93	240	613	1090	660
Totals/Average	395	1250	2216	7557	560	605

Summary of data using the top four values out of the five replicates - the least challenging replicate was removed

Treatment	Leaves infected 19/10/07	Total infections 19/10/07	Leaves infected 2/05/08	Total infections 2/05/08	% increase leaves	% increase infections
BioCover	56	227	231	828	415	365
Pyradym	53	204	203	606	385	300
DCTron Plus	49	171	293	1368	600	800
4kg S + 0.5%Protector	59	163	239	730	405	450
2kg S + 0.5% Protector	56	131	214	670	380	510
4kg S	44	108	276	1351	625	1250
2kg S	37	99	211	601	570	605
Untreated	22	93	198	518	900	555
Totals/Average	376	1196	1865	6672	535	605