## PREV-AM®

**PREV-AM IS BENEFICIAL FRIENDLY**  
4

**PREV-AM SIDE EFFECTS RATING ACCORDING TO IOBC SCALE**  
5

**EFFICACY EVALUATION OF COPPER AND PREV-AM AGAINST DOWNY MILDEW**  
6

**TESTING THE EFFICACY OF PREV-AM AGAINST DOWNY MILDEW**  
7

**EFFICACY EVALUATION OF SULPHUR AND PREV-AM VS. POWDERY MILDEW**  
8

**EVALUATION OF PREV-AM TOXICITY ON PREDATORY MITES IN GRAPEVINE**  
9

**EVALUATION OF PREV-AM FOR THE CONTROL OF MEALYBUG**  
10

**EVALUATION OF THE EFFECT OF PREV-AM ON BLOOM STRUCTURE OF GRAPES**  
11

**EVALUATION OF THE EFFICACY OF PREV-AM ON BOTRYTIS IN GRAPEVINE**  
12

**THE EFFECT OF PREV-AM FOR THE CONTROL OF GRAPEVINE MEALYBUG**  
13

**EFFICACY AND SELECTIVITY EVALUATION OF PREV-AM AGAINST AMERICAN GRAPEVINE LEAFHOPPER**  
14

**STUDY ON THE EFFECTS OF PREV-AM ON VINIFICATION OF CABERNET SAUVIGNON GRAPES**  
15

**STUDY ON THE EFFECTS OF PREV-AM ON VINIFICATION OF CHARDONNAY WINE GRAPES**  
16

## WETCIT™

**COMPARING THE EFFECT OF QUINOXYFEN AND WETCIT COMBINATIONS VS. POWDERY MILDEW**  
17

**COMPARING THE EFFECT OF TRIFLOXYSTROBIN AND WETCIT COMBINATIONS VS. POWDERY MILDEW**  
18

**COMPARING THE EFFECT OF SULPHUR AND WETCIT COMBINATIONS VS. POWDERY MILDEW**  
19

**POWDERY MILDEW CONTROL ON CHARDONNAY GRAPES USING WETCIT**  
20

**TEST THE EFFICACY OF DOWNY MILDEW CONTROL PROGRAMS WITH AND WITHOUT WETCIT**  
21

**EVALUATION OF WETCIT IN TANK MIXTURES FOR THE CONTROL OF MEALYBUG**  
22

**EVALUATION OF WETCIT IN TANK MIXTURES FOR THE CONTROL OF MEALYBUG**  
23

**EFFICACY OF MEALYBUG CONTROL APPLICATIONS WITH AND WITHOUT WETCIT**  
24

**EFFICACY OF BUD MITE CONTROL APPLICATIONS WITH AND WITHOUT WETCIT**  
25

**EFFICACY OF BUD MITE CONTROL APPLICATIONS WITH AND WITHOUT WETCIT**  
26

**THE EFFICACY ON ERIOPHYID MITE CONTROL APPLICATIONS WITH AND WITHOUT WETCIT**  
27
TOXICITY FOR HONEY BEES

Tatsuya Sekine (Agronomist), IBACON GmbH • Germany • 2013

→ ACUTE ORAL TOXICITY OF PREV-AM FOR HONEY BEES (Apis mellifera L.)
LD₅₀ (oral, 24, 48, 72 and 96 hours) > 326 µg/bee (OECD 213).

→ ACUTE DORSAL CONTACT TOXICITY OF PREV-AM FOR HONEY BEES (Apis mellifera L.)
LD₅₀ (contact, 24, 48 hours) > 200 µg/bee, with a dose response at 252,3 µg/bee after 48 hours (OECD 214).

These acute tests showed some behavioural impairments such as loss of movement coordination (apathy), and intensive cleaning (the most sensitive organ of bee is the respiratory tract). These observations are consistent with the impact of the less toxic natural oils already used for Varroa treatments in hive.

Considering the low persistence of PREV-AM on the treated plants, the ubiquity of orange oil components in the environment i.e. citrus orchards pollinated by bees, the chronic impact on bees, supported by field studies does not appear as relevant.

TOXICITY FOR NON-TARGET TERRESTRIAL ARTHROPODS

D. Juan, Enigma • France • 2008

Predatory mites: LR₅₀ (Thyphlodromus pyri) = 1746.18 ml of PREV-AM/ha with a spray volume of 200 l/ha.
Parasitic wasp: LR₅₀ (Aphidius rhopalosiphi) = 3153.51 ml of PREV-AM/ha with a spray volume of 200 l/ha.
PREV-AM is of low risk to in-field and off-field habitats for terrestrial arthropods.

TOXICITY ON PREDATORY MITES

UNDER FIELD CONDITIONS, ON STRAWBERRY
Dr. Michael Nelson, Plant Sciences, Inc. • California • 2003

The application of PREV-AM did not reveal a significant decrease in predatory mite (Phytoseiulus persimilis) motile counts in comparison with the Untreated Control. In contrast, motile counts in the Acramite® (bifenazate) treatment were significantly lower than those of the control at two of the evaluations on September 5 (14 DAA) and September 18 (27 DAA).

Predatory mite eggs were less for PREV-AM treatments at the first evaluation on August 28 compared with the control, but subsequent evaluation dates only showed insignificant decreases. The Acramite (bifenazate) treatment, used as the reference item, however showed relevantly lower counts compared with the control at three of the five evaluations.

IMMEDIATE CONTACT EFFECT ON ADULT PREDATOR LADYBUGS

BY MIST APPLICATION
W. van de Pyeekamp, OMS agri Sciences • South Africa • 2010

Mineral oil caused a significant decline in the Cryptolaemus montrouzieri numbers at 2 and 4 DAA whereas PREV-AM did not. In the case of the Chilocorus nigritus neither PREV-AM nor mineral oil resulted in a statistically significant decrease compared to the UTC.

When used as directed, PREV-AM is safe to honey bees.

Im. contact effect. Image courtesy of Ben Welling.
### Side Effects Rating

According to IOBC (International Organization of Biological and Integrated Control) scale

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>PRODUCT</th>
<th>g/l or kg</th>
<th>CAT.</th>
<th>TEST SPECIES</th>
<th>SPECIES GROUP</th>
<th>CAT. OF TEST</th>
<th>DOSE TESTED (% v/v product)</th>
<th>IOBC TOX. CLASS</th>
<th>PREDATOR / PREY RATIO</th>
<th>REMARKS</th>
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<tbody>
<tr>
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### IOBC STANDARD CLASSIFICATION:
- Harmless
- Slightly harmful
- Moderately harmful
- Harmful
EFFICACY EVALUATION OF COPPER AND PREV-AM® AGAINST DOWNY MILDEW ON MOSCATO GRAPES

BASIC INFORMATION
TARGET: Downy mildew (Plasmopara viticola)
CROP: Wine grape, cv. Moscato (Vitis vinifera)
SPRAY VOLUME: 1000 l/ha
LOCATION: Alba, Piedmont • Italy
TRIAL DATE: May – October 2005
RESEARCHER(S): T. Hoppe, BioEco

FIELD SITUATION
The experimental plot size was 30 m² and a randomized complete block design was used with 4 replications. There were 4 treatments including King NEW (copper), King (tribasic copper sulphate) and PREV-AM. 11 applications were made in the disease control program at 7 – 10 day intervals, starting on 20 May 2005 and ending on 1 August 2005. The percentages of leaves and clusters infected with downy mildew were evaluated 11 days after the last application.

CONCLUSIONS
• PREV-AM 0.4 % had a similar level of performance against downy mildew as copper based fungicide formulations.
• PREV-AM applied every week as preventive fungicide provided a good efficacy against downy mildew.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td>-</td>
</tr>
<tr>
<td>2 King NEW (copper)</td>
<td>200 ml/100 l</td>
</tr>
<tr>
<td>3 King (tribasic copper sulphate)</td>
<td>200 ml/100 l</td>
</tr>
<tr>
<td>4 PREV-AM at 0.4 %</td>
<td>400 ml/100 l</td>
</tr>
</tbody>
</table>

All brand names and trademarks are the property of their respective owners and are used here only for description.
TESTING THE EFFICACY OF PREV-AM® AGAINST DOWNY MILDEW ON BARRANTES WINE GRAPES

BASIC INFORMATION

TARGET
Downy mildew (Plasmopara viticola)

CROP
Wine grape, cv. Barrantes (Vitis vinifera)

SPRAY VOLUME
820 l/ha

LOCATION
Corbillón-Villanova de Arousa, Galicia • Spain

TRIAL DATE
June – July 2004

RESEARCHER(S)
Joaquín Soler Álvarez, AgroSoler S.L.

FIELD SITUATION

A trial to determine the efficacy of PREV-AM for downy mildew control in wine grapes was established on a vineyard in Corbillón-Villanova de Arousa (Pontevedra), an area in the North-West of Spain where downy mildew in grapes is endemic.

Curzate® C (Cymoxanil 3 %, Copper 22,5 %) was used as a comparative standard treatment.

Four spray applications were made on 9 June, 17 June, 28 June and 8 July respectively, with four replicates per treatment and intervals of between 8-11 days between applications.

Treatments were applied using a motorized backpack sprayer operating at 18 bar that delivered a final spray volume of 820 litres of water per hectare.

Evaluations were made on 8 and 19 July (10 DAA-3 and 11 DAA-4, respectively). The first symptoms of downy mildew were detected on leaves of the untreated plots after the third application.

CONCLUSIONS

• The efficacy level of PREV-AM was excellent and provided outstanding disease control, comparable to the performance of the Curzate® spray.
• The spray interval of 8-11 days was adequate to provide control.
• The application of PREV-AM when the disease pressure is particularly high resulted in a good control of the pathogen.

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<tr>
<td>2 Curzate® C (Cymoxanil 3 %, Copper 22,5 %)</td>
<td>4 kg/ha</td>
</tr>
<tr>
<td>3 PREV-AM 0,4 %</td>
<td>400 ml/100 l</td>
</tr>
</tbody>
</table>

FIGURE 1

Incidence of downy mildew on Barrantes grape leaves after indicated spray treatments

APPLICATION DATES 9, 17, 28 JUNE; 8 JULY 2004, SPAIN

CONCLUSIONS

• The efficacy level of PREV-AM was excellent and provided outstanding disease control, comparable to the performance of the Curzate® spray.
• The spray interval of 8-11 days was adequate to provide control.
• The application of PREV-AM when the disease pressure is particularly high resulted in a good control of the pathogen.
Efficacy Evaluation of Sulphur and PREV-AM® Against Powdery MildeW on Blaufränkisch Grapes

Basic Information

Target: Powdery mildew (Erisyphe necator)
Crop: Grape, cv. Blaufränkisch (Vitis vinifera)
Spray Volume: 1000 l/ha
Location: Brno, Southern Moravia • Czech Republic
Trial Date: June - August 2016
Researcher(s): Tomáš Richter, Ekovin

Field Situation

There were 4 replications with plots of 82m². A total of seven applications were made weekly from June to August using a backpack sprayer.

Dose rates of tested products used within this trial were:
- PREV-AM 0,4 %
- PREV-AM 0,6 %
- Kumulus® WG (sulphur 80 %) 3 kg/ha

Damage was monitored on 100 leaves. The incidence and severity of infection were evaluated.

Treatment Table

<table>
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<tr>
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<tr>
<td>1 Untreated control</td>
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<tr>
<td>2 Kumulus® WG (Sulphur 80 %)</td>
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<td>3 PREV-AM 0,4 %</td>
<td>400 ml/100 l</td>
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<tr>
<td>4 PREV-AM 0,6 %</td>
<td>600 ml/100 l</td>
</tr>
</tbody>
</table>

Conclusions

- PREV-AM showed a good level of efficacy, mainly at dose rates of 0,6 %, compared to sulphur treatment.
- The application of PREV-AM when the disease pressure is particularly high resulted in a good control of the pathogen.
- The use of PREV-AM instead of sulphur, especially close to the harvest, means less sulfur dioxide during the vinification process.

FIGURE 1

Powdery mildew severity
on Blaufränkisch leaves

FOLLOWING A SPRAY PROGRAM WITH 7 DAY INTERVALS FROM JUNE TO AUGUST

FIGURE 2

Powdery mildew incidence
on Blaufränkisch leaves

FOLLOWING A SPRAY PROGRAM WITH 7 DAY INTERVALS FROM JUNE TO AUGUST
**EVALUATION OF PREV-AM® TOXICITY ON PREDATORY MITES IN GRAPEVINE**

**BASIC INFORMATION**

**TARGET**
Predatory mite (Typhlodromus pyri)

**CROP**
Wine grape, cv. Blauer Portugieser (Vitis vinifera)

**SPRAY VOLUME**
500 l/ha

**LOCATION**
Pavlov, Brno • Czech Republic

**TRIAL DATE**
May - August 2009

**RESEARCHER(S)**
Markéta Broklová, Biocont Laboratory

**FIELD SITUATION**

A spray program with PREV-AM 0.4 % + Kocide® 2000 (Copper 53.8 %) 1.5 kg/ha and a standard program were applied on a vineyard. The standard program also included Kocide® 2000 at the same rate and the same timings. Other products applied in the standard treatment were VitiSan®, Myco-Sin®VIN, AquaVitrin K and Sulikol K. There were 4 replications with 10 plants per plot. In total 7 spray applications were made from May to August 2009. Evaluation of 30 leaves per plot was performed 5 times during the season. This was compared to an Untreated Control.

**CONCLUSIONS**

- Only slight and statistically not significant decreases of the populations were found in the treatments with PREV-AM + Kocide® 2000 compared to untreated control. This treatment was therefore classified as non-toxic.
- It can be concluded that the treatment with PREV-AM is compatible with the use of Typhlodromus pyri.

**TREATMENT TABLE**

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<th>GROWTH STAGE</th>
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<tbody>
<tr>
<td>1</td>
<td>May 20th 2009</td>
<td>(EL 17) Inflorescence fully developed</td>
</tr>
<tr>
<td>2</td>
<td>June 12th 2009</td>
<td>(EL 25) Late flowering</td>
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<tr>
<td>3</td>
<td>June 24th 2009</td>
<td>(EL 27) Fruit setting</td>
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<tr>
<td>4</td>
<td>July 3rd 2009</td>
<td>(EL 29) Berries small</td>
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<tr>
<td>5</td>
<td>July 13th 2009</td>
<td>(EL 31) Berries pea-size</td>
</tr>
<tr>
<td>6</td>
<td>July 24th 2009</td>
<td>(EL 33) Berries touch</td>
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<tr>
<td>7</td>
<td>August 4th 2009</td>
<td>(EL 34) Cluster closing</td>
</tr>
</tbody>
</table>

**Reduction in predatory mite numbers**

in comparison with untreated control (all evaluations)

<table>
<thead>
<tr>
<th></th>
<th>STANDARD TREATMENT</th>
<th>PREV-AM + Kocide® 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction VS untreated control (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 DAYS AFTER APPLICATION ONE</td>
<td>12.74 %</td>
<td>1.05 %</td>
</tr>
<tr>
<td>12 DAYS AFTER APPLICATION TWO</td>
<td>22.36 %</td>
<td>19.6 %</td>
</tr>
<tr>
<td>11 DAYS AFTER APPLICATION FIVE</td>
<td>38.89 %</td>
<td>10.69 %</td>
</tr>
<tr>
<td>14 DAYS AFTER APPLICATION SEVEN</td>
<td>37.85 %</td>
<td>22.6 %</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>27.96 %</td>
<td>13.49 %</td>
</tr>
</tbody>
</table>

According to IOBC scale all PREV-AM treatments were considered 1 (not harmful) whereas the standard treatment was considered 2 (slightly harmful).
EVALUATION OF PREV-AM® FOR THE CONTROL OF MEALYBUG ON PINOT GRIGIO GRAPES

BASIC INFORMATION

TARGET: Mealybug (Planococcus ficus)
CROP: Wine grape, cv. Pinot grigio (Vitis vinifera)
SPRAY VOLUME: 1280 l/ha
LOCATION: Lodi, California • USA
TRIAL DATE: July - August 2010
RESEARCHER(S): D. Dunbar, R3 Ag Consulting LLC
B. Bauer, Two Bees Agricultural Research

FIELD SITUATION

The spray program consisted of PREV-AM®, Movento® SC (spirotetramat) and Applaud® 70WP (buprofezin).

Although the mealybugs were later to develop this year due to the cool weather, the infestation was considered moderate to heavy. At the time of the application the mealybugs were just moving across the cordon and beginning to infest the grape bunches.

Spray application was done on 24 July 2010 using a mistblower sprayer. There were 4 replicates with 3-4 vines per plot.

Dead and live mealybugs were counted 6 days after application and the percentage dead were calculated.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td>-</td>
</tr>
<tr>
<td>2 Movento® SC (spirotetramat)</td>
<td>440 ml/ha</td>
</tr>
<tr>
<td>3 Applaud® (buprofezin)</td>
<td>840 g/ha</td>
</tr>
<tr>
<td>4 PREV-AM® (0.4 % v/v)</td>
<td>5 l/ha</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- PREV-AM® applied at 0.4 % provided a numerically higher mortality of mealybug than Movento® and Applaud®.
- The result showed as PREV-AM® has a high knock-down effect against mealybug.
EVALUATION OF THE EFFECT OF PREV-AM® ON THE BLOOM STRUCTURE OF GRAPES ON MERLOT VINEYARDS

BASIC INFORMATION

<table>
<thead>
<tr>
<th>TARGET</th>
<th>Bloom structure (cuticle and epicuticular wax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROP</td>
<td>Wine grape, cv. Merlot (Vitis vinifera)</td>
</tr>
<tr>
<td>SPRAY VOLUME</td>
<td>500 l/ha</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Somerset West, Western Cape • South Africa</td>
</tr>
<tr>
<td>TRIAL DATE</td>
<td>January – February 2014</td>
</tr>
<tr>
<td>RESEARCHER(S)</td>
<td>M. Matthew, ORO AGRI SA (Pty) Ltd</td>
</tr>
</tbody>
</table>

FIELD SITUATION

Two rows of a Merlot vineyard in Somerset West were used in this trial. One row was treated with PREV-AM 0.4 % and one row was kept as the Untreated Control. Two applications were conducted, 2 weeks and 1 week before harvest.

During berry growth and ripening, the cuticle and epicuticular wax (bloom) passes through various developmental stages. This serves as a protective barrier against water loss and pathogen attack.

The most common genera of wild yeasts found on grape skins include Metschnikowiaceae, Pichia, Candida and Zygosaccharomyces. Wild yeasts can produce high-quality, unique-flavored wines; but they are often unpredictable and may introduce less desirable traits to the wine.

Few wild yeast, lactic and acetic acid bacteria naturally live on the surface of grapes. Traditional wine makers, particularly in Europe, advocate use of wild yeast as a characteristic of the region’s terroir; but many winemakers prefer to control fermentation with predictable cultured yeast.

CONCLUSIONS

- No significant differences could be seen on any photos for the Untreated or PREV-AM treated. The waxy layer was present at the 250x magnification as lighter streaks across the surface for both treatments. The photos with a brushed off bloom looked significantly different.
- We conclude that PREV-AM applied at 0.4 % does not wash off the bloom.

FIGURE 1
Grape bunches just before harvest on 24 February 2014. No significant differences were observed.

FIGURE 2
Light microscope photos of the berry skin on the same day as harvest. No significant differences were seen.

FIGURE 3
Field photo of the bloom which has been brushed off by leaves on the top of the bunch. Significant difference was seen when the bloom was removed.

FIGURE 4
Electron Microscope photos (Stellenbosch University) one day after harvest using the Variable Pressure method.
EVALUATION OF THE EFFICACY OF PREV-AM® ON BOTRYTIS IN GRAPEVINE

BASIC INFORMATION

TARGET: Grey mould (Botryotinia fuckeliana)
CROP: Wine grape, cv. Neuburger (Vitis vinifera)
SPRAY VOLUME: 1000 l/ha
LOCATION: Brno, Southern Moravia • Czech Republic
TRIAL DATE: September 2015
RESEARCHER(S): Tomáš Richter, Ekovin

FIELD SITUATION

Applications were carried out 3 times during BBCH 85 (first application was carried out on 8.9.2015), using a backpack sprayer on Neuburger grapes which is a very sensitive variety.

Dose rates of tested products used within this trial were:
• PREV-AM 0,4 %
• PREV-AM 0,6 %
• Switch® 62,5WG 0,96 kg/ha

Damage was monitored on 50 bunches. Evaluation was done on observation of SEVERITY, because all applications were made after sufficient level of infestation of Botryotinia fuckeliana across the trial area.

CONCLUSIONS

• The late treatment with PREV-AM against Botryotinia fuckeliana in grapes provides a good control.
• Only very few products are registered for the use against Botrytis in grapes later than BBCH 75 (pea-sized berries).
• PREV-AM can therefore be considered a very useful tool to control Botrytis and protect yield quality shortly before harvest.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>TREATMENTS</th>
<th>TREATMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PREV-AM 0,4 %</td>
<td>400 ml/100 l</td>
</tr>
</tbody>
</table>

Efficacy on Botrytis infestation on Neuburger wine grapes

FIGURE 1
THE EFFECT OF PREV-AM® FOR THE CONTROL OF GRAPEVINE MEALYBUG IN MOSCATO VINEYARDS

BASIC INFORMATION

TARGET: Mealybug (Planococcus ficus)
CROP: Table grape, cv. Moscato (Vitis vinifera)
SPRAY VOLUME: 1000 l/ha
LOCATION: Takelsa • Tunisia
TRIAL DATE: June - July 2008
RESEARCHER(S): R. Mansour, National Agronomic Institute of Tunisia

FIELD SITUATION

The spray program consisted of PREV-AM and Movento® 150 OD (spirotetramat).
Each insecticide treatment was applied on June 12, precisely one day after the first summer vine mealybug male presence peak was noted, and when mealybug population consisted of mainly young instar nymphs, the most susceptible stages.
Treatments were replicated 3 times in a randomized complete block design. Each replicate encompassed 13 vines.
Five vines were randomly selected per replicate for mealybug counts.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movento® 150 OD (spirotetramat)</td>
<td>1,2 l/ha</td>
</tr>
<tr>
<td>PREV-AM</td>
<td>2 l/ha</td>
</tr>
</tbody>
</table>

Efficacy (Abbott %)

of insecticide treatments on vine mealybug (L1-L2) nymphs on vine trunks

3, 7, 14 AND 21 DAYS AFTER APPLICATION

CONCLUSIONS

- PREV-AM proved a good control on Planococcus ficus populations, considering L1-L2 and L3 nymphs on vine trunks.
- The timing of the PREV-AM application is important. According to the results, PREV-AM should be applied early in the season, before mealybug population has overlapping generations.
EFFICACY AND SELECTIVITY EVALUATION OF PREV-AM® AGAINST AMERICAN GRAPEVINE LEAFHOPPER IN GRAPEVINE

BASIC INFORMATION

TARGET: American grapevine leafhopper (Scaphoideus titanus)
CROP: Wine grape, cv. Erbaluce (Vitis vinifera)
SPRAY VOLUME: 1000 l/ha
LOCATION: Settimo Rottaro (Turin), Piedmont • Italy
TRIAL DATE: June 2015
RESEARCHER(S): Daniele Ronco, Sagea

FIELD SITUATION

The trial was set up on vineyard (Erbaluce variety) of Settimo Rottaro (Torino district), in Piedmont region, where population of Scaphoideus titanus was medium-high.

Only one spray application was done on 17 July 2015 using a motorized backpack for both thesis:
• Actara® 25WG (thiamethoxam) 200 g/100 l
• PREV-AM 0,5 %

There were 4 replicates per each thesis.

Adults of Scaphoideus titanus were counted 14 days after application and the percentage of efficacy was calculated using Henderson-Tilton method.

Before the treatment, an high presence of individuals of Scaphoideus titanus at young stages was detected (mainly 25 individual per plot).

CONCLUSIONS

• The data of this experimental study showed an high control of Scaphoideus titanus given by PREV-AM, showing a similar performance compared with reference insecticide Actara® 25 WG.

• If applied regularly during the season, starting as soon as the first growth stages of Scaphoideus titanus are observed, PREV-AM will provide a constantly and high control of the leafhopper.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Actara® 25WG (thiamethoxam) 200 g/100 l</td>
</tr>
<tr>
<td>2</td>
<td>PREV-AM 0,5 % 500 ml/100 l</td>
</tr>
</tbody>
</table>

FIGURE 1

Efficacy against Scaphoideus titanus (%)
STUDY ON THE EFFECTS OF PREV-AM® ON VINIFICATION OF CABERNET SAUVIGNON GRAPES

BASIC INFORMATION
TARGET
Vinification in red wine
CROP
Wine grape, cv. Cabernet Sauvignon (Vitis vinifera)
SPRAY VOLUME
250 l/ha
LOCATION
Faenza (RA), Emilia Romagna, Italy
TRIAL DATE
April 2014 - January 2016
RESEARCHER(S)
Nicola Graziani, ASTRA Innovazione e Sviluppo

FIELD SITUATION
A trial in open field conditions was performed in order to evaluate on red grapevine the unintentional effects of PREV-AM on ripeness, on wine-making processes and on the organoleptic characteristics of the red wine. The results obtained were compared with the Untreated control.

The trial considered the following treatments:
1. PREV-AM at 0.8 % (6 applications with 8±1 days of spray interval and 2 days of PHI);
2. UNTREATED CONTROL

The applications were carried out with a special self-moving pneumatic mist-sprayer on plots with 3 repetitions; each plot included 18 plants (59 m²).

LAB & PROCESSING SITUATION
The evaluation of the unintentional effects was carried out with:
• chemical analysis on bunches samples collected at harvest;
• various assessments performed during the wine making process;
• chemical analysis on must and finished wine samples collected during the wine-making;
• tasting tests on young wine (about one month and half after the bottling) and aged wine (about twelve months after the bottling).

CONCLUSIONS
The results of this oenological study performed on red grapevine reveal that the field treatments with PREV-AM did not cause negative effects on:
• the ripeness process of the grapes;
• the fermentation process of the must (the most important phase of the grapes processing into wine);
• the main chemical compounds of must and finished wine;
• the organoleptic characteristics of the finished wine tasted at two different times (about one month and half after the bottling and after about one year of storage at low temperature).

Test results on must

<table>
<thead>
<tr>
<th>ANALYTICAL PARAMETERS</th>
<th>UTC</th>
<th>PREV-AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing sugars (g/l)</td>
<td>166,2</td>
<td>159,4</td>
</tr>
<tr>
<td>pH</td>
<td>3,01</td>
<td>2,97</td>
</tr>
<tr>
<td>Total acidity (g/l)</td>
<td>6,16</td>
<td>6,30</td>
</tr>
<tr>
<td>Volatile acidity (g/l)</td>
<td>0,05</td>
<td>0,05</td>
</tr>
<tr>
<td>Available nitrogen (g/l)</td>
<td>147</td>
<td>148,4</td>
</tr>
<tr>
<td>Potassium (mg/l)</td>
<td>1367</td>
<td>1295</td>
</tr>
<tr>
<td>Total SO₂ (mg/l)</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

Test results on finished wine

<table>
<thead>
<tr>
<th>ANALYTICAL PARAMETERS</th>
<th>UTC</th>
<th>PREV-AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual alcohol (% vol.)</td>
<td>10,6</td>
<td>10,47</td>
</tr>
<tr>
<td>Residual sugar (g/l)</td>
<td>&lt; 1,0</td>
<td>&lt; 1,0</td>
</tr>
<tr>
<td>pH</td>
<td>3,72</td>
<td>3,68</td>
</tr>
<tr>
<td>Total acidity (g/l)</td>
<td>4,74</td>
<td>4,64</td>
</tr>
<tr>
<td>Volatile acidity (g/l)</td>
<td>0,21</td>
<td>0,19</td>
</tr>
<tr>
<td>Total phenol index (d280)</td>
<td>20,6</td>
<td>20,1</td>
</tr>
<tr>
<td>Optical density 420 nm, 520 nm, 620 nm</td>
<td>0,570-0,749-0,098</td>
<td>0,555-0,711-0,091</td>
</tr>
<tr>
<td>Colour intensity Od420 + Od520 + Od620</td>
<td>1,417</td>
<td>1,357</td>
</tr>
<tr>
<td>Colour tonality Od420 + Od520</td>
<td>0,761</td>
<td>0,781</td>
</tr>
<tr>
<td>Total and free SO₂ (mg/l)</td>
<td>118/42</td>
<td>113/42</td>
</tr>
</tbody>
</table>
STUDY ON THE EFFECTS OF PREV-AM® ON VINIFICATION OF CHARDONNAY WINE GRAPES

BASIC INFORMATION

TARGET  Vinification in white wine
CROP    Wine grape, cv. Chardonnay (Vitis vinifera)
SPRAY VOLUME  250 l/ha
LOCATION  Faenza (RA), Emilia Romagna, Italy
TRIAL DATE  April 2014 - January 2016
RESEARCHER(S)  Nicola Graziani, ASTRA Innovazione e Sviluppo

FIELD SITUATION

A trial in open field conditions was performed in order to evaluate on white grapevine the unintentional effects of PREV-AM on ripeness, on wine-making processes and on the organoleptic characteristics of the white wine. The results obtained were compared with the Untreated control.

The trial considered the following treatments:
1. PREV-AM at 0.8 % (6 applications with 8±1 days of spray interval and 2 days of PHI);
2. UNTREATED CONTROL

The applications were carried out with a special self-moving pneumatic mist-sprayer on plots with 3 repetitions; each plot included 20 plants (55 m²).

LAB & PROCESSING SITUATION

The evaluation of the unintentional effects was carried out with:
• chemical analysis on bunches samples collected at harvest;
• various assessments performed during the wine making process;
• chemical analysis on must and finished wine samples collected during the wine-making;
• tasting tests on young wine (about one month and half after the bottling) and aged wine (about twelve months after the bottling).

CONCLUSIONS

The results of this oenological study performed on white grapevine reveal that the field treatments with PREV-AM did not cause negative effects on:
• the ripeness process of the grapes;
• the fermentation process of the must (the most important phase of the grapes processing into wine);
• the main chemical compounds of must and finished wine;
• the organoleptic characteristics of the finished wine tasted at two different times (about one month and half after the bottling and after about one year of storage at low temperature).

Test results on harvested bunches

* data expressed as H₂SO₄

<table>
<thead>
<tr>
<th></th>
<th>ANALYTICAL PARAMETERS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SUGAR (°BRIX)</td>
<td>TOTAL ACIDITY (g/l)</td>
<td>pH</td>
</tr>
<tr>
<td>Thesis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREV-AM</td>
<td>17,27</td>
<td>7,73</td>
<td>2,86</td>
</tr>
<tr>
<td>UTC</td>
<td>17,33</td>
<td>7,56</td>
<td>2,83</td>
</tr>
</tbody>
</table>

Test results on must

ASTRA Innovazione e Sviluppo • Italy

<table>
<thead>
<tr>
<th></th>
<th>ANALYTICAL PARAMETERS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td></td>
<td>UTC</td>
<td>PREV-AM</td>
</tr>
<tr>
<td>Reducing sugars (g/l)</td>
<td>151,5</td>
<td>151,1</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>3,06</td>
<td>3,1</td>
<td></td>
</tr>
<tr>
<td>Total acidity (g/l)</td>
<td>6,34</td>
<td>6,32</td>
<td></td>
</tr>
<tr>
<td>Volatile acidity (g/l)</td>
<td>0,05</td>
<td>0,05</td>
<td></td>
</tr>
<tr>
<td>Available nitrogen (g/l)</td>
<td>289,8</td>
<td>302,4</td>
<td></td>
</tr>
<tr>
<td>Potassium (mg/l)</td>
<td>1241</td>
<td>1332</td>
<td></td>
</tr>
<tr>
<td>Total SO₂ (mg/l)</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Test results on finished wine

ASTRA Innovazione e Sviluppo • Italy

<table>
<thead>
<tr>
<th></th>
<th>ANALYTICAL PARAMETERS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td></td>
<td>UTC</td>
<td>PREV-AM</td>
</tr>
<tr>
<td>Actual alcohol (% vol.)</td>
<td>10,79</td>
<td>10,69</td>
<td></td>
</tr>
<tr>
<td>Residual sugar (g/l)</td>
<td>&lt; 1,0</td>
<td>&lt; 1,0</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>3,28</td>
<td>3,34</td>
<td></td>
</tr>
<tr>
<td>Total acidity (g/l)</td>
<td>4,85</td>
<td>5,01</td>
<td></td>
</tr>
<tr>
<td>Volatile acidity (g/l)</td>
<td>0,17</td>
<td>0,13</td>
<td></td>
</tr>
<tr>
<td>Total phenol index (d280)</td>
<td>3,1</td>
<td>3,4</td>
<td></td>
</tr>
<tr>
<td>Optical density 420 nm, 520 nm, 620 nm</td>
<td>0,028</td>
<td>0,029</td>
<td></td>
</tr>
<tr>
<td>Total and free SO₂ (mg/l)</td>
<td>105/51</td>
<td>106/46</td>
<td></td>
</tr>
</tbody>
</table>
**BASIC INFORMATION**

**TARGET**  
Powdery mildew (*Erisyphe necator*)

**CROP**  
Grape, cv. Chardonnay (*Vitis vinifera*)

**SPRAY VOLUME**  
started at 935 l/ha, increased to 1870 l/ha

**LOCATION**  
Courtland, CA • USA

**TRIAL DATE**  
April 2009

**RESEARCHER(S)**  
W. Douglas Gubler • Christopher N. Janousek • Ian S. Bay  
Dept. of Plant Pathology • University of California, Davis

**FIELD SITUATION**

The quinoxyfen and quinoxyfen plus WETCIT treatments referred to in this document were part of a series of trials performed by the Department of Plant Pathology, University of California, Davis, during the 2009 season.

Trials were laid out as complete randomised designs with 5 replicates.

Treatments were applied with handgun sprayers delivering 935 litres per hectare pre-bloom, increasing to 1870 litres per hectare in the late part of the season.

**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Quintec® (quinoxyfen)</td>
<td>0.3 l/ha</td>
<td>Every 14 days</td>
</tr>
<tr>
<td>3 Quintec® (quinoxyfen) + WETCIT</td>
<td>0.3 l/ha 0.25 %</td>
<td>Every 14 days</td>
</tr>
</tbody>
</table>

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**FIGURE 1**

Severity of powdery mildew  
On Chardonnay clusters at start of veraison  
FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009

**FIGURE 2**

Incidence of powdery mildew  
On Chardonnay clusters at start of veraison  
FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009
BASIC INFORMATION

TARGET: Powdery mildew (Erisyphe necator)
CROP: Grape, cv. Chardonnay (Vitis vinifera)
SPRAY VOLUME: started at 935 l/ha, increased to 1870 l/ha
LOCATION: Courtland, CA • USA
TRIAL DATE: April 2009
RESEARCHER(S): W. Douglas Gubler • Christopher N. Janousek • Ian S. Bay
Dept. of Plant Pathology • University of California, Davis

FIELD SITUATION

The trifloxystrobin and trifloxystrobin plus WETCIT treatments referred to in this document were part of a series of trials performed by the Department of Plant Pathology, University of California, Davis, during the 2009 season. Trials were laid out as complete randomised designs with 5 replicates. Treatments were applied with handgun sprayers delivering 935 litres per hectare pre-bloom, increasing to 1870 litres per hectare in the late part of the season.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Flint® (trifloxystrobin)</td>
<td>140 g/ha</td>
<td>Every 14 days</td>
</tr>
<tr>
<td>3 Flint® (trifloxystrobin) + WETCIT</td>
<td>140 g/ha</td>
<td>Every 14 days</td>
</tr>
</tbody>
</table>

Severity of powdery mildew

On Chardonnay clusters at start of veraison

FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009

Incidence of powdery mildew

On Chardonnay clusters at start of veraison

FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009

All brand names and trademarks are the property of their respective owners and are used herein only for description.
COMPARING THE EFFECT OF SULPHUR AND WETCIT™ COMBINATIONS AGAINST POWDERY MILDEW ON CHARDONNAY GRAPES

**BASIC INFORMATION**

<table>
<thead>
<tr>
<th>TARGET</th>
<th>Powdery mildew (Erysiphe necator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROP</td>
<td>Grape, cv. Chardonnay (Vitis vinifera)</td>
</tr>
<tr>
<td>SPRAY VOLUME</td>
<td>started at 935 l/ha, increased to 1870 l/ha</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Courtland, CA • USA</td>
</tr>
<tr>
<td>TRIAL DATE</td>
<td>April 2009</td>
</tr>
<tr>
<td>RESEARCHER(S)</td>
<td>W. Douglas Gubler • Christopher N. Janousek • Ian S. Bay Dept. of Plant Pathology • University of California, Davis</td>
</tr>
</tbody>
</table>

**FIELD SITUATION**

The micronised sulphur and micronised sulphur plus WETCIT treatments referred to in this document were part of a series of trials performed by the Department of Plant Pathology, University of California, Davis, during the 2009 season.

Trials were laid out as complete randomised designs with 5 replicates. Treatments were applied with handgun sprayers delivering 935 litres per hectare pre-bloom, increasing to 1870 litres per hectare in the late part of the season.

![Image of Chardonnay clusters](image)

**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Microthiol® 80 WG (sulphur)</td>
<td>5.6 kg/ha</td>
<td>Every 14 days</td>
</tr>
<tr>
<td>3 Microthiol® 80 WG (sulphur) + WETCIT</td>
<td>3.4 kg/ha + 0.25 %</td>
<td>Every 14 days</td>
</tr>
<tr>
<td>4 Microthiol® (sulphur) + WETCIT</td>
<td>5.6 kg/ha + 0.25 %</td>
<td>Every 14 days</td>
</tr>
</tbody>
</table>

**Severity of powdery mildew**

On Chardonnay clusters at start of veraison

FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009

![Severity of powdery mildew chart](chart1)

**Incidence of powdery mildew**

On Chardonnay clusters at start of veraison

FOLLOWING 6 DIFFERENT SPRAY TREATMENTS AT 14-DAY INTERVALS, FROM END-APRIL TO MID-JULY 2009

![Incidence of powdery mildew chart](chart2)

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**BASIC INFORMATION**

<table>
<thead>
<tr>
<th>TARGET</th>
<th>Powdery mildew (<em>Erisyphe necator</em>)</th>
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<tbody>
<tr>
<td>CROP</td>
<td>Grape, cv. Chardonnay (<em>Vitis vinifera</em>)</td>
</tr>
<tr>
<td>SPRAY VOLUME</td>
<td>started at 935 l/ha, increased to 1870 l/ha</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Courtland, CA • USA</td>
</tr>
<tr>
<td>TRIAL DATE</td>
<td>April – July 2010</td>
</tr>
<tr>
<td>RESEARCHER(S)</td>
<td>I.S. Bay • J.D. Eynard • A. Sutherland • W.D. Gubler</td>
</tr>
<tr>
<td></td>
<td>Dept. of Plant Pathology • University of California, Davis</td>
</tr>
</tbody>
</table>

**TRIAL AIM AND DESIGN**

A replicated study was conducted on an experimental field at the Department of Plant Pathology of the University of California (Davis) to assess **WETCIT** in a tank mix with Rally® (myclobutanil) alternating with Quintec® (quinoxyfen) against both products as a standalone treatment. Treatments were applied to their pre-defined blocks in between April and July at a 21 day interval using a handgun sprayer.

Spray volumes:
- 700 l/ha  first spray
- 935 l/ha  pre-bloom in mid-April
- 1400 l/ha  pre-bloom to pea-sized berries
- 1870 l/ha  late season

**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>Untreated control</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Rally® (myclobutanil) 350 g/ha alternating with Quintec® (quinoxyfen) 480 ml/ha</td>
</tr>
<tr>
<td>3</td>
<td>Rally® (myclobutanil) 280 g/ha + WETCIT 0.25 % alternating with Quintec® (quinoxyfen) 480 ml/ha + WETCIT 0.25 %</td>
</tr>
</tbody>
</table>

**RESULTS AND CONCLUSION**

In spite of a very high level of disease pressure both treatments performed well. The standard program could achieve a control of 61.7 % on a high infection of powdery mildew in Chardonnay vines. The addition of WETCIT at a rate of 0.25 % improved the efficacy of the products by 19.3 % reaching a good control level of 73.6 %. It has to be specially noted that Rally® (myclobutanil) was applied a reduced rate when mixed with WETCIT.

It can be concluded that the addition of WETCIT results in a better control of powdery mildew when compared to the standard products alone and can be a tool to minimize the input of regular chemistry to the crop.
FIELD SITUATION

Applications were made using air assisted motorized knapsack sprayers applying 620 l/ha to 1142 l/ha spray mixture. The first application was made at 20 – 45 cm shoot length and a total of 5 applications were made. Due to adverse weather conditions the interval between the 1st and 2nd application was 25 days, which is not optimal since the small bunches are extremely sensitive to infection by downy mildew at this stage. An evaluation of percentage bunch infection was done on 12 December, 1 week after the 4th application. A 5th application was made on 20 December, but the trial was abandoned at this stage.

CONCLUSIONS

Due to downy mildew infection during the extended interval between the 1st and 2nd application it is extremely difficult to make conclusions from data generated in this trial.

Indications are, however, that treatment program 3 (Mancozeb, 2 x Acrobat®, 2 x Cabrio® Top, all with WETCIT 100 ml/hl) resulted in significant reduction of downy mildew when compared with the standard treatment (treatment 1).

Also visible is the influence of WETCIT comparing treatment program 2 and 3, where without WETCIT, treatment program 2, didn’t result in a significant reduction of downy mildew when compared with the standard treatment.

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**BASIC INFORMATION**

**TARGET**
Grapevine mealybug (*Planococcus ficus*)

**CROP**
Grape, cv. Pinot Grigio (*Vitis vinifera*)

**SPRAY VOLUME**
1280 l/ha

**LOCATION**
Lodi, CA • USA

**TRIAL DATE**
2010

**RESEARCHER(S)**
D. Dunbar, R3 Ag Consulting LLC
B. Bauer, Two Bees Agricultural Research

**TRIAL AIM AND DESIGN**

A replicated study was conducted on a commercial field at the Eger Vineyard in Lodi on Pinot Grigio grapes to assess the adjuvant **WETCIT** mixed with standard products compared to the standard products applied alone on the grapevine mealy bug (*Planococcus ficus*). Treatments were applied to their pre-defined blocks one time end of July.

**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>6 DAA</th>
<th>13 DAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movento® SC (spirotetramat) 440 ml/ha</td>
<td>89,2 %</td>
<td>98 %</td>
</tr>
<tr>
<td>Movento® SC (spirotetramat) 440 ml/ha + <strong>WETCIT</strong></td>
<td>96,1 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Applaud® 70WP (buprofezin) 840 g/ha</td>
<td>77,5 %</td>
<td>94,1 %</td>
</tr>
<tr>
<td>Applaud® 70WP (buprofezin) 840 g/ha + <strong>WETCIT</strong></td>
<td>93,1 %</td>
<td>98 %</td>
</tr>
</tbody>
</table>

*All brand names and trademarks are the property of their respective owners and are used hereonly for description.*

**RESULTS AND CONCLUSION**

All tested products provided good to very good control of grapevine mealy bug on Pinot Grigio grapes. The addition of **WETCIT** to the standard products Movento® and Applaud® resulted in a major increase of efficacy 6 and 13 days after the application (DAA). In the case of Movento®, the addition of **WETCIT** provided a total control at 13 DAA.

It can be concluded that the addition of **WETCIT** at 0.25 % is a powerful tool to improve the efficacy of standard products used to control grapevine mealy bug.

**Control efficacy**

On grapevine mealybug

**FIGURE 1**

Control efficacy on grapevine mealybug after different spray programs at six and thirteen days after application, Lodi, CA, 2010.
EVALUATION OF **WETCIT™** IN TANK MIXTURES FOR THE CONTROL OF MEALYBUG ON PINOT GRIGIO GRAPE

**BASIC INFORMATION**

**TARGET**
Grapevine mealybug (*Planococcus ficus*)

**CROP**
Grape, cv. Pinot Grigio (*Vitis vinifera*)

**SPRAY VOLUME**
1280 l/ha

**LOCATION**
Lodi, CA • USA

**TRIAL DATE**
2010

**RESEARCHER(S)**
D. Dunbar, RJ Ag Consulting LLC
B. Bauer, Two Bees Agricultural Research

**FIELD SITUATION**

The spray program consisted of Movento® SC without and with **WETCIT**. Spray application was on 24 July 2010. There were 4 replicates with 3-4 vines per plot. Spray volume was 1280 l/ha and a mistblower sprayer was used. On 16 August, the percentage of infested bunches and the severity of bunch infestation was calculated. The honeydew was also rated.

**CONCLUSIONS**

Both treatments significantly reduced the percentage of mealybug infested bunches compared to the untreated check. Although there was no significant difference between treatments in terms of reduction in the number of infested bunches, Movento® + **WETCIT** was the best treatment with 3 % infested bunches. Movento® + **WETCIT** was clearly the best treatment in this test with a ZERO severity rating. Movento® + **WETCIT** reduced the mealybug infestation to such a low level that there was little or no honeydew in that treatment.

**TREATMENT TABLE**

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated control</td>
<td></td>
</tr>
<tr>
<td>2 Movento® SC (spirotetramat)</td>
<td>440 ml/ha</td>
</tr>
<tr>
<td>3 Movento® SC (spirotetramat) + <strong>WETCIT</strong> (0.25 % v/v)</td>
<td>440 ml/ha + 3.2 l/ha</td>
</tr>
</tbody>
</table>

**Severity of bunch infestation**

With mealybug

**Percentage bunches infested**

With mealybug

**Honeydew rating**

On fruit, leaves and stems

---

PHOTO BY: MARK SMITH

**FIGURE 1**

Severity of bunch infestation
With mealybug

**FIGURE 2**

Percentage bunches infested
With mealybug

**FIGURE 3**

Honeydew rating
On fruit, leaves and stems

---

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TEST THE EFFICACY OF MEALYBUG CONTROL APPLICATIONS WITH AND WITHOUT THE ADDITION OF WETCIT™

BASIC INFORMATION
TARGET: Mealybug (Planococcus spp)
CROP: Grape, cv. Cabernet Sauvignon (Vitis vinifera)
SPRAY VOLUME: 1975 l/ha
LOCATION: Paarl, Western Cape • South Africa
TRIAL DATE: February 2013
RESEARCHER(S): J. Kotze, Oro Agri SA (Pty.) Ltd.

FIELD SITUATION
A trial was done in Cabernet Sauvignon wine grapes suffering from a heavy bunch infestation of vine mealybug (Planococcus spp). A single application with air assisted knapsack sprayers was done and an evaluation done 7 DAA. At application bunches with mealybug infestation were tagged and at evaluation these were evaluated. One or more live mealybugs per bunch resulted in such a bunch being rated as infested. As a result of the high infestation there was a lot of honeydew present, on the leaves as well as on the bunches.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>RATE</th>
<th>ADJUVANT</th>
<th>RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Dichlorvos</td>
<td>1000 g/l</td>
<td>75 ml/hl</td>
<td>-</td>
</tr>
<tr>
<td>3 Dichlorvos</td>
<td>1000 g/l</td>
<td>75 ml/hl</td>
<td>WETCIT 150 ml/hl</td>
</tr>
<tr>
<td>4 Sulfoxaflor</td>
<td>240 g/l</td>
<td>12 ml/hl</td>
<td>-</td>
</tr>
<tr>
<td>5 Sulfoxaflor</td>
<td>240 g/l</td>
<td>12 ml/hl</td>
<td>WETCIT 150 ml/hl</td>
</tr>
</tbody>
</table>

CONCLUSIONS
• The addition of WETCIT to both sulfoxaflor and dichlorvos had a clear beneficial effect on the treatment with a lower level of bunches infested at the time of evaluation.
• As a result of the high infestation there was a lot of honeydew present, on the leaves as well as the bunches. At evaluation treated bunches had a lot less glossy appearance, with most of the honeydew dried up and less sticky. This occurrence was even more evident where WETCIT was added to treatments.
• Dead ladybirds were noticed in the sulfoxaflor treatments.
• Dead sclodothrips were noticed in one of the sulfoxaflor treatments.
TEST THE EFFICACY OF BUD MITE CONTROL APPLICATIONS WITH AND WITHOUT THE ADDITION OF WETCIT™

BASIC INFORMATION

<table>
<thead>
<tr>
<th>TARGET</th>
<th>Bud mite (Colomerus vitis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROP</td>
<td>Table grape, cv. Bonheur (red grape) (Vitis vinifera)</td>
</tr>
<tr>
<td>SPRAY VOLUME</td>
<td>730 - 1300 l/ha</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Paarl, Western Cape • South Africa</td>
</tr>
<tr>
<td>TRIAL DATE</td>
<td>September 2013</td>
</tr>
<tr>
<td>RESEARCHER(S)</td>
<td>J. Kotze, Oro Agri SA (Pty.) Ltd.</td>
</tr>
</tbody>
</table>

FIELD SITUATION

Pre-season bud mite infestation was determined by doing bud analyses (3 buds on each of 6 cuttings per plot) in the dormant period during the winter of 2012. Plots were selected (all had an infestation level of approximately 50% of buds analyzed being infested with bud mite) and treated three times at 14 day intervals, with the first treatment applied shortly after bud burst. A bud infestation analysis was again done on the same plots in the dormant period of the winter 2013.

TREATMENT TABLE

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Untreated</td>
<td>-</td>
<td>Do three applications using motorized knapsack.</td>
</tr>
<tr>
<td>2 Pride® fenazaquin 200 g/l</td>
<td>50 ml/l</td>
<td>Ensure thorough wetting of vines.</td>
</tr>
<tr>
<td>3 Pride® fenazaquin 200 g/l + WETCIT alcohol ethoxylate</td>
<td>50 ml/l</td>
<td>Do first application when last buds break and follow up with 2 more applications at 14 day intervals.</td>
</tr>
<tr>
<td>4 Flo sulphur sulphur 700 g/l</td>
<td>600 ml/l</td>
<td></td>
</tr>
<tr>
<td>5 Flo sulphur sulphur 700 g/l + WETCIT alcohol ethoxylate</td>
<td>600 ml/l</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

Both Treatment 2 and 4 show low control ability over buds infestations at the 2nd evaluation, but the addition of WETCIT in treatment 3 and 5 at 150 ml/l provide an efficacy increase of 28% and 39% over the Pride® and Flowable Sulphur treatments dropping down significantly the population of budmites and buds infestations.

FIGURE 1

Percentage buds infested post treatment

AFTER THREE TREATMENTS AT 14 DAY INTERVALS, PAARL, WESTERN CAPE, SA, 2013

GRAPE LEAF UPPER (L) AND LOWER (R) EPIDERMIS INFESTED WITH ERIOPHYID MITE

PHOTOS BY: ROLF GEBHARDT

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TEST THE EFFICACY OF BUD MITE CONTROL APPLICATIONS WITH AND WITHOUT THE ADDITION OF WETCIT™

BASIC INFORMATION

TARGET
Bud mite (Colomerus vitis)

CROP
Table grape, cv. Sundance (white grape) (Vitis vinifera)

SPRAY VOLUME
730 - 1300 l/ha

LOCATION
Simondium, Western Cape • South Africa

TRIAL DATE
September 2013

RESEARCHER(S)
J. Kotze, Oro Agri SA (Pty.) Ltd.

FIELD SITUATION

Pre-season bud mite infestation was determined by doing bud analyses (3 buds on each of 6 cuttings per plot) in the dormant period during the winter of 2012. Plots were selected (all had an infestation level of approximately 50% of buds analyzed being infested with bud mite) and treated three times at 14 day intervals, with the first treatment applied shortly after bud burst. A bud infestation analysis was done again on the same plots in the dormant period of the winter 2013.

TREATMENT TABLE

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<thead>
<tr>
<th>TREATMENT</th>
<th>RATE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Untreated</td>
<td>Do three applications using motorized knapsack. Ensure thorough wetting of vines.</td>
</tr>
<tr>
<td>2</td>
<td>Pride® (fenazaquin) 200 g/l 50 ml/hl</td>
<td>Do first application when last buds break and follow up with 2 more applications at 14 day intervals.</td>
</tr>
<tr>
<td>3</td>
<td>Pride® (fenazaquin) 200 g/l + WETCIT (alcohol ethoxylate) 150 ml/hl</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

The trial site was very heavily infested with bud mite, with the pre-treatment counts reflecting 90% to 98% infestation.

Although the bud analyses showed a 10% reduction in the Untreated, the standard treatment 2 (Pride® 50 ml/hl) did not reduce the bud mite infestation. In treatment 3, where WETCIT was added to Pride®, the reduction in infestation was improved. The standard treatment with Pride® at 50 ml/hl resulted in a lower increase of bud mite infection than the Untreated, but did not succeed in decreasing the infestation after 3 applications in spring. The addition of WETCIT at 150 ml/hl increased the efficacy of Pride® in 30% on the reduction in infestation.

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**BASIC INFORMATION**

**TARGET**  Eriophyid mite (Colomerus vitis)

**CROP**  Grape, cv. Blaufränkisch (Vitis vinifera)

**SPRAY VOLUME**  250 l/ha

**LOCATION**  Velké Pavlovice • Czech Republic

**TRIAL DATE**  April 2014

**RESEARCHER(S)**  Markéta Broklová, Biocont Laboratory

**FIELD SITUATION**


**CONCLUSIONS**

• The initial population escalated rapidly showing a high intensity of the pest was present.

• The addition of WETCIT to Kumulus® at standard rate and reduced rate had a clear effect on the efficacy of the treatment being also the only treatments where the population didn’t increase over time.

• A reduction of 25 % in the rate of Kumulus® (in combination with WETCIT 0.2%) did not cause a statistically significant reduction in the efficacy of the treatment, compared to Kumulus 2% + WETCIT 0.2%) and the lower rate showed a much higher level of control when compared to Kumulus® alone or Kumulus® plus AquaVitrin K.

<table>
<thead>
<tr>
<th>TREATMENT TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREATMENT</strong></td>
</tr>
<tr>
<td>1 Untreated</td>
</tr>
<tr>
<td>2 Kumulus® 2 %</td>
</tr>
<tr>
<td>2 Kumulus® 1.5 %</td>
</tr>
<tr>
<td>3 Kumulus® 2 %</td>
</tr>
<tr>
<td>3 Kumulus® 2 %</td>
</tr>
</tbody>
</table>

* AquaVitrin K is BASF product containing 8 % of K₂O and 20 % of SiO₂
Due to varietal and climatic differences, ORO AGRI suggest you always test on small scale first to ensure your results are similar to studies portrayed in this brochure.

V10-2017-ENG

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