




Agriculture Division of DowDuPont

# Mealybug - Grapes

## Table Grapes

Jeanne de Waal, Kosie Human, Liaan Janse Van Vuuren  
 SASEV/SATI, South Africa  
 August 2020

1

## Agenda

1. Mealybug Biology – Dr Jeanne de Waal
2. Mealybug Control – Liaan Janse Van Vuuren
3. Application Technology related to Mealybug Control – Kosie Human



CORTEVA



RovicLeers



VIKING



2

2

## Introduction

- Vine Mealybug, *Planococcus ficus*
- Longtail Mealybug, *Pseudococcus longispinus*
- Spherical Mealybug, *Nipaecoccus viridis*



3

3

## Damage Symptoms

- Direct damage to foliage and berries
- Honey dew → Sooty Mould
- Attracts ants and others



4

4

## Scouting

- Visual scouting – identify infested vines
- Yellow delta traps – Grapevine mealybug
- Economic threshold, crawler movement



5

5

## Control Strategy



6

6

### Cultural Control Options

- Ant management
- Weed management
- Dust management
- Bark stripping for dormant applications



7

### Biological Control Options

Photo Credit: Koppert



8

### Microbial Control Options



Beauveria sp.



Metarhizium sp.



9

**Mealybug**

"...a crawling problem..."



10

### Current chemical options are limited...

acetamiprid	carbaryl	chlorpyrifos	clothianidin	dichlorvos
dimethoate	imidacloprid	lavandulyl seneciolate	methidathion	mevinphos
mineral oil	natural pyrethrum	non-ionic surfactant + orange oil	profenofos	spirotetramat
	sulfoxaflor [syn. isoclast]	thiamethoxam		



11


### Current chemical options are limited...

acetamiprid	carbaryl	chlorpyrifos	clothianidin	dichlorvos
dimethoate	imidacloprid	lavandulyl seneciolate	methidathion	mevinphos
mineral oil	natural pyrethrum	non-ionic surfactant + orange oil	profenofos	spirotetramat
	sulfoxaflor [syn. isoclast]	thiamethoxam		



12

# Full system approach

- 
**Monitoring**
Trap & Vine Inspections
- 
**Biological**
Beneficial insects and registered biological products
- 
**Physical**
Removal of the bark – no place to hide!
- 
**Chemical**
Dominant applications  
Spring / Summer applications  
Post Harvest

VIKING

13

## Optimal Droplet Size

(Air-assisted spraying)

### Droplets < 150 Micron

Droplets penetrate in and behind bunches and back of leaves

### Droplets > 150 Micron

Deposit in front of bunch or past the target.

### Recommended Droplet Spectrum(VMD)

High Volume(1x) : 100 – 175 micron VMD  
 Winter sprays : 200 – 250 micron VMD  
 Low Volumes (Concentrate): 50 – 175 micron VMD



RovicLeers

15

15

## Balance of Air Momentum / Spray Speed

- Open of target area
- Carry in of droplet spectrum
- Movement of leaves / fruits to increase catching efficiency.



RovicLeers

17

17

## Application factors to consider in table grapes

- ◊ Optimal Droplet Size
- ◊ Balance of Air Momentum / Spray Speed
- ◊ Litre per hectare applied
- ◊ Final sprayer adjustment
- ◊ Maintenance

RovicLeers

14

14

## Optimal Droplet Size

(Air-assisted spraying)

Two different ways to atomize water, or break it up into droplets

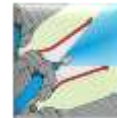
### 1. Nozzle

Force water with high pressure through small opening



### 2. Venturi

Air speed increases in venturi area (600km/h), which breaks up water into small droplets



RovicLeers

RovicLeers

16

16

## Litre per hectare applied

Cima with adjustable fishtails in the higher position.



2000 L/Ha  
4,2 km/h

1500 L/Ha  
4,2 km/h

1000 L/Ha  
4,2 km/h

500 L/Ha  
4,2 km/h



RovicLeers

18

18

**Litre per hectare applied**

Cima with adjustable fishtails in the lower position

1000 L/Ha  
2,4 km/h



500 L/Ha  
2,4 km/h



**Final adjustment of venturi spray head**

Cima sprayer with adjustable fishtails in the higher position.



Cima sprayer with 5+5 venturi



Cima sprayer with adjustable fishtails in the lower position.



Rovic sprayer with hollow cone nozzles



**Basic Maintenance**

Factors that can influence accurate spray application

- ◊ PTO (540, Economic or normal)
- ◊ Pressure gauge
- ◊ Pressure regulator
- ◊ Fan belt settings
- ◊ Grease points
- ◊ Nozzles
- ◊ Tractor gear
- ◊ Tank agitation
- ◊ Air distribution
- ◊ Sprayer controls (manual/electric)



**Conclusions**

- Numerous mealybug species in commercial table grape orchards
- Monitoring
- Timely execution of necessary control actions
- Integrated approach
- Optimize application technology
- Do more with less

