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Evolving agriculture

CITRUS SKIN STRATEGY

Trial Program 2021

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agreya™ Sustainable Agriculture

INTRODUCTION

The Stop Drop (2,4-D) application at initial color brake is critical to minimize ageing, maintain fruit condition, reduce fruit drop and to preserve green buttons at harvest. However, the reduction of the MRLs of 2,4-D (Stop Drop) to 0.05 ppm in China (and other destination countries) show the need to find a way to reduce, and even eliminate, the 2,4D dependence.

Servalesa, in collaboration with Agreva (Australia) and Fitogar (Spain), has developed a trial program to assess an alternative to reduce the application rate of 2,4D close to harvest and/or any second applications.

This trial program assesses the synergistic effect of **SERGOMIL® L60** (copper monogluconate+ galacturonate) and **TEMPLARIO® PLUS** (unsaturated organic acids) with 2,4-D to reduce the application rate close to harvest and accomplish the abovementioned critical parameters.

Neoestim

SERGOMIL® L60

SERGOMIL® L60 is a plant biostimulant based on a liquid formulation of monogluconic acid, galacturonic acid and systemic copper for use with fertilisers, plant protection products or as a stand-alone product. The main function of **SERGOMIL® L60** is to enhance the strength of the plant through the activation of the plant self-defence mechanisms, strengthening the cell-wall and improving the availability of nutritional and systemic copper (Cu) in the plant, resulting in improvements in yield and quality.

SERGOMIL® L60: AIMED TO STRENGTHEN FRUIT SKIN

Cu benefits in the plant

- Promotes synthesis of key enzymes.
- Improved photosynthesis.
- Reduces certain physiopaties (such as dieback in citrus) linked to the deficiency of Cu.

Cell-Wall Strength

- Promotes synthesis of lignin.
- Improved firmness of fruits and leaves.
- Improved shelf-life of harvest.
- Improved resistance to biotic and abiotic stress.

Plant self-defence mechanisms

- Improved general strenght and health of the plant.
- Promotes synthesis of phytoalexins.
- Synthesis of PR proteins.
- Complements the strategy and efficacy of fungicide sprays based on its biostimulant effect.

Específicos

TEMPLARIO® PLUS

TEMPLARIO® PLUS is a plant biostimulant based on a liquid formulation of unsaturated organic acids, carboxylic acids and potassium salts for use with fertilisers, biostimulants, plant protection products or as a stand-alone product. **TEMPLARIO® PLUS** enhances the strength of the plant through the activation of the plant self-defence mechanism, stimulating the antioxidant activity of the plant and reducing the excess of surface moisture, alleviating stress in critical moments of the cycle, resulting in improvements in yield and quality.

TEMPLARIO® PLUS: AIMED TO PROTECT AND IMPROVE SKIN QUALITY

Fruit skin and leaf protection

- Improved plant overall strength through stimulation.
- Mitigation of stress conditions produces by excess of moisture.
- Maintenance of turgor and osmotic balance.
- Stimulation of plant self-defence mechanism.
- Recovery after hailstorm.
- Complements the strategy and efficacy of fungicide sprays based on stimulation + protection.

Fruit Aging

- Improved firmness.
- Reduces oxidative stress produced on the cell-wall.

TRIAL PROGRAM

OBJECTIVE

- Determine if it is possible to obtain higher quality and lower fruit drop, trials are carried out on citrus combining the application of 2-4D, **SERGOMIL® L60** and **TEMPLARIO® PLUS**, at different doses. Fruit quality is closely related to skin firmness and lower fruit drop will increase the rentability of our crops. For these reasons, it is important to carry out trials to obtain the best treatment for our crops.
- The objective of this trial is to evaluate the firmness, decay and fruit drop in 4 orange varieties in 3 different areas with different spray application.

MATERIAL AND METHODS

- **Treatments** are divided into 6 applications. The first block with a full dose of 2,4D and the second block with a half dose. Applying 2,4D alone, 2,4D + **SERGOMIL® L60** and 2,4D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**.

Treatment 1A:	(Only 2,4-D at full rate). Current standard treatment (1/3 tank)
	2,4-D. Rate: 10 ppm (Label rate). Non-ionic wetter: Label rate.
Treatment 1B:	(Full rate of 2,4-D + **SERGOMIL® L60**) (1/3 tank and add **SERGOMIL® L60**)
	2,4-D. Rate: 10 ppm (Label rate). Non-ionic wetter: Label rate.
	SERGOMIL® L60. Rate: 5 L/ha or 170 mL/100L if used 3000 L/ha.
Treatment 1C:	(Full rate of 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**) (1/3 tank add **TEMPLARIO® PLUS**)
	2,4-D. Rate: 10 ppm (Label rate). Non-ionic wetter: Label rate.
	SERGOMIL® L60. Rate: 5 L/ha.
	TEMPLARIO® PLUS. Rate: 5 L/ha or 170 mL/100L if used 3000 L/ha.
Treatment 2A:	(1/2 rate of 2,4-D + **SERGOMIL® L60**) (1/3 tank)
	2,4-D. Rate: 5 ppm (1/2 Label rate). Non-ionic wetter: Label rate.
Treatment 2B:	(1/2 rate of 2,4-D + **SERGOMIL® L60**) (1/3 tank and add **SERGOMIL® L60**)
	2,4-D. Rate: 5 ppm (1/2 Label rate). Non-ionic wetter: Label rate.
	SERGOMIL® L60. Rate: 5 L/ha or 170 mL/100L if used 3000 L/ha.
Treatment 2C:	(1/2 rate of 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**) (1/3 tank add **TEMPLARIO® PLUS**)
	2,4-D. Rate: 5 ppm (1/2 Label rate). Non-ionic wetter: Label rate.
	SERGOMIL® L60. Rate: 5 L/ha or 170 mL/100L if used 3000 L/ha.
	TEMPLARIO® PLUS. Rate: 5 L/ha or 170 mL/100L if used 3000 L/ha.

- **Varieties and Regions**.

TRIAL 1	Grandview Farm	Dareton (NSW)	Leng Navel
TRIAL 2	Grandview Farm	Dareton (NSW)	Washington Navels
TRIAL 3	Pardo Farm	Nangiloc (VIC)	Barnfield Late Navels
TRIAL 4	Chetwynd Park	Tooleybuc (NSW)	Late Lane Navels

CITRUS SKIN STRATEGY

TRIAL PROGRAM 2021

TRIAL 1: GRANDVIEW – LENG NAVEL

Objective:
Improve the fruit firmness in **Leng Navel**

Methodology:
Measuring fruit hardness (Kg/cm²)

Treatments:
1C: 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**
2C: ½ rate of 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**
Untreated: UTC

Fruit evaluations:
First date: 21.6.2021
Second date: 23.8.2021

CONCLUSIONS

According to the first evaluation:

- Treatments **1C** (2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**) and **2C**, (½ rate of 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**) are similar in number of firm and soft fruits
- There is a difference in the soft fruits, being 0 in the **2C** treatment and 4% in **1C**
- **1C** and **2C** have firmer and less soft fruit than **UTC** fruit.

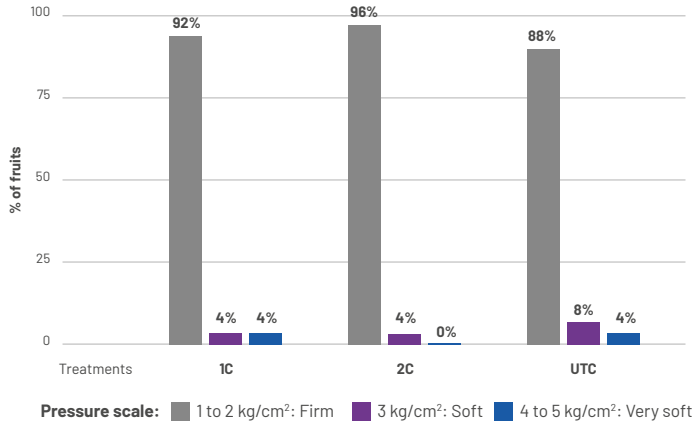
On the second evaluation:

- A slightly higher firmness is observed in treatment **1C**
- **1C** is also the treatment with the lowest number of soft fruits

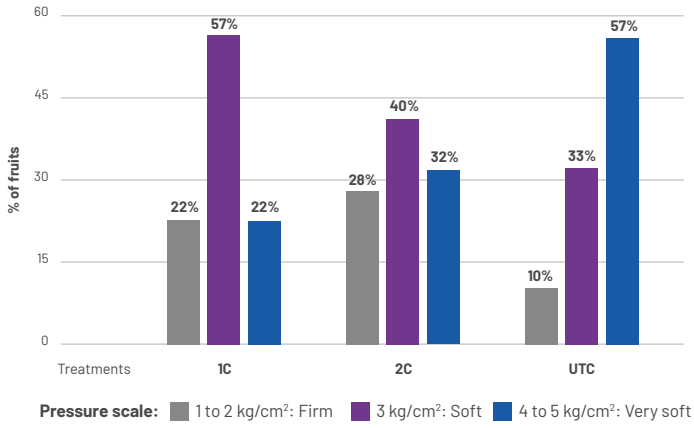
As for fruit with split / albedo breakdown and fungal decay:

- Treatment **1C** and **2C** the results are quite similar
- Both have fewer fruits with decay and albedo breakdown than **UTC**

FRUITS PRESSURE IN GRANDVIEW LENG NAVEL IN **21.6.2021**



FRUITS PRESSURE IN GRANDVIEW LENG NAVEL IN **23.8.2021**



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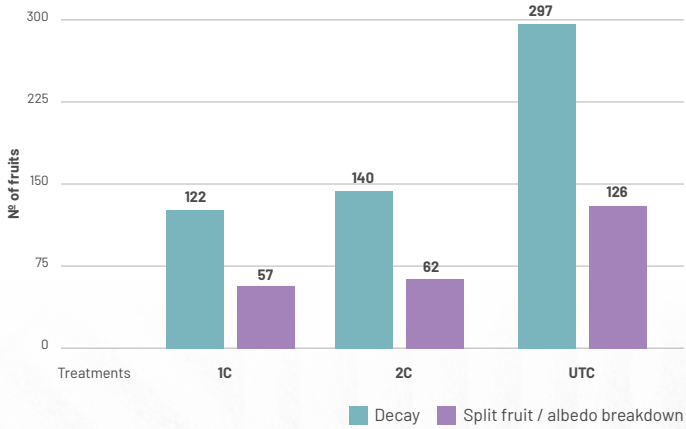
FRUIT WITH SPLIT / ALBEDO BREAKDOWN AND FUNGAL DECAY



TRIAL 2: GRANDVIEW - WASHINGTON NAVEL

Objective:
Improve the fruit firmness in **Washington Navel**

Methodology:
Measuring fruit hardness (Kg/cm²)

Treatments:
1A: Full rate 2,4-D
1B: 2,4-D + **SERGOMIL® L60**
1C: Full rate of 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**
2A:1/2 rate of 2,4-D
2B: 1/2 rate 2,4-D + **SERGOMIL® L60**
2C: 1/2 rate 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**

Fruit evaluations:
First date: 23.6.2021
Second date: 23.8.2021
Third date: 14.10.2021

CONCLUSIONS

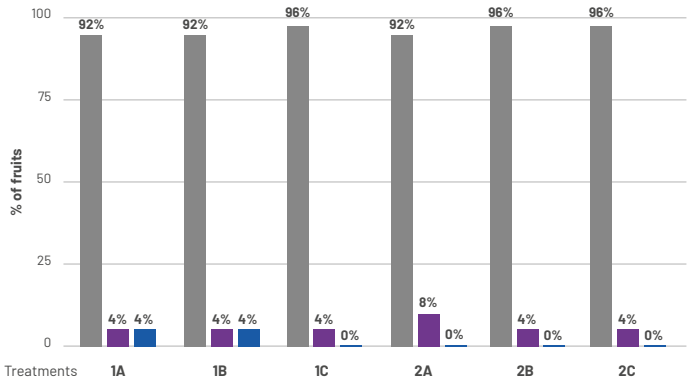
According to the first evaluation:
- The firmest fruit corresponded to treatments **1C**, **2B** and **2C**. This coincides with the treatments with less soft fruits.
- This treatments also has the lowest soft fruits
- It's possible to reduce the rate of 2-4,D and use **SERGOMIL® L60** + **TEMPLARIO® PLUS** to achive firmness

On the second evaluation:
- The firmest fruits correspond to treatment **2B**, which also has 0 soft fruits
- Treatment **2C** also have firm fruits and fewer soft fruits
- In both cases 2,4-D rater is reduced by half

By the third evaluation:
- Treatment **2C** shows the firmest and least soft fruit
- Treatments **2A** and **1B** show the less firm and softer fruits

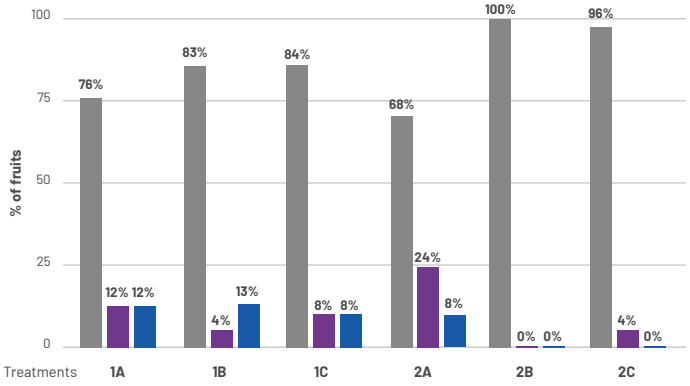
As for drop fruits:
- The lowest number of fallen fruits was found in treatments **1C** and **2B**
- The treatment with more drop fruits is **1A**, that is only trated wih 2,4-D

FRUITS PRESSURE IN GRANDVIEW WASH. NAVEL IN **23.6.2021**



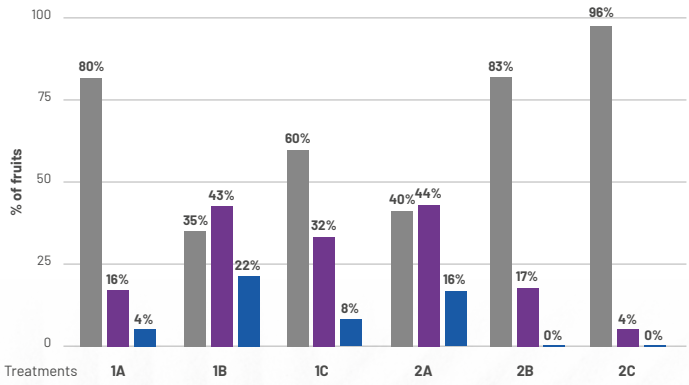
Pressure scale: 1 to 2 kg/cm²: Firm | 3 kg/cm²: Soft | 4 to 5 kg/cm²: Very soft

FRUITS PRESSURE IN GRANDVIEW WASH. NAVEL IN **23.8.2021**



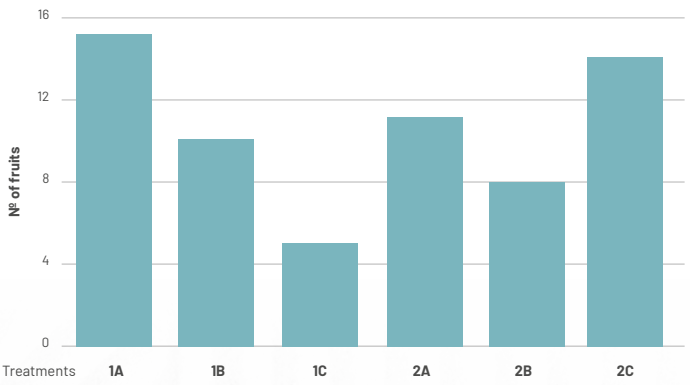
Pressure scale: 1 to 2 kg/cm²: Firm | 3 kg/cm²: Soft | 4 to 5 kg/cm²: Very soft

FRUITS PRESSURE IN GRANDVIEW WASH. NAVEL IN **14.10.2021**



Pressure scale: 1 to 2 kg/cm²: Firm | 3 kg/cm²: Soft | 4 to 5 kg/cm²: Very soft

DROP FRUITS



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TRIAL 3: PARDO-BARNFIELD LATE NAVELS

Objective:
Improve the fruit firmness in **Late Navels**

Methodology:
Measuring fruit hardness (Kg/cm²)

Treatments:
1A: 2,4-D
1B: 2,4-D + **SERGOMIL® L60**
1C: 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**

Fruit evaluations:
First date: 19.07.2021
Second date: 14.10.2021

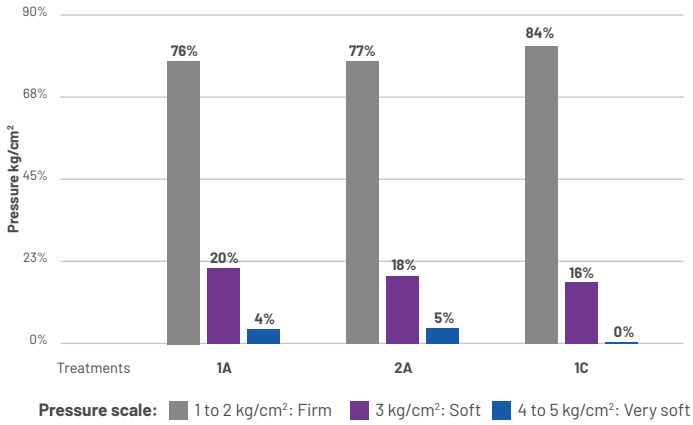
CONCLUSIONS

On the first evaluation:
- All the fruit analyzed were very firm, obtaining a hardness for all of them of 1 kg/cm²

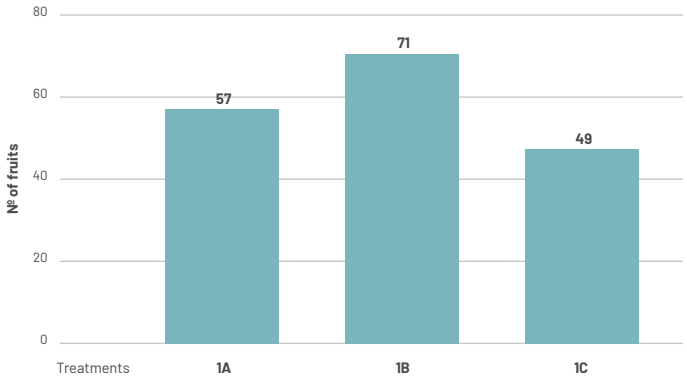
On the second evaluation:
- The firmest and least soft fruits correspond to the treatment **1C**, that includes 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**.

As for drop fruit:
- The lowest number of fallen fruits also corresponds to the treatment **1C**

FRUITS PRESSURE IN PARDO BARNFIELD IN **21.6.2021**



DROP FRUITS



TRIAL 7: CHETWYND PARK

Objective:
Improve the fruit firmness in **Late Lane Navels**

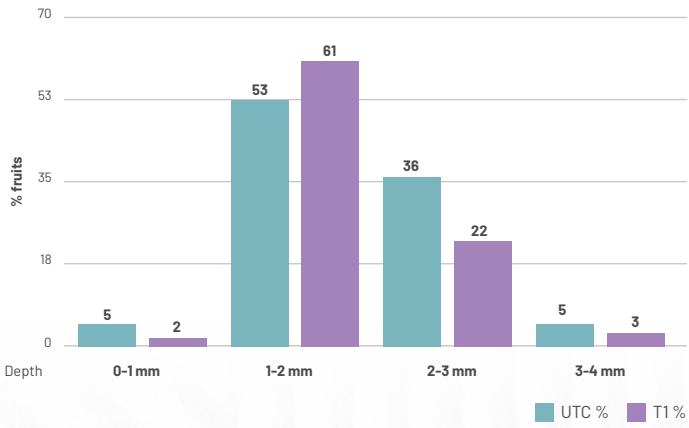
Methodology:
Measurement of fruit hardness (Kg/cm²). 195 fruits per thesis

Treatments:
UTC: 2,4-D
T1: 2,4-D + **SERGOMIL® L60** + **TEMPLARIO® PLUS**

CONCLUSIONS

76% of the fruit treated with T1 was in the range of 0-2 mm compared to 58% of the UTC

EVALUATION PRESSURE IN LEON CACCAVIELLO'S



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