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The Efficacy of EzyFlow Nano Calbud in Enhancing the Quality of Roses and Resistance to Botrytis Cinerea

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2018

Introduction

Calbud is a highly concentrated fully water dispersable liquid fertiliser containing optimally synergistic ratios of calcium, zinc, nitrogen and magnesium with trace elements to ensure strong early plant development.

Calbud contains the following elements:

Element	Composition (w/v%)
Calcium	20
Zinc	4.5
Nitrogen	4.5
Magnesium	4.5
Boron	0.5

Major benefits of using Calbud include:

- Synergistically formulated to ensure essential crop nutrition and can be used from pre-bud stage right through to post-harvest
- **Calcium:** Required for the synthesis of cells in the growing pollen tube and determines pollen tube growth direction
- **Magnesium:** Improves chlorophyll production in new leaf
- **Zinc:** Improves pollination as well as levels of growth hormones, also helps relieve environmental stress
- **Boron:** Assists pollen tube development and enhances calcium absorption

Objective

The objectives of the experiment were to:

- Test the efficacy of Calbud in enhancing the quality and quantity of rose stem produced
- Test the efficacy of Calbud in combination with pesticides targeting Botrytis Cinerea in enhancing the resistance of roses against *Botyris Cinerea*
- To test any phytotoxicity/ negative effects on roses treated with a combination of Calbud and various pesticides

Compatibility

Compatible with a wide range of acgricultural chemicals except for ammonium sulphate (AMS).

Methodology

Before the experiment commenced, phytotoxicity tests were conducted on various rose varieties. The experiment was conducted at Chemirei Farm in greenhouse H56 planted with rose variety *Tropical Amazon*. This variety was chosen since it is very susceptible to *Botrytis Cinerea* infection. Calbud 2mL/ L was compared to Caltrain 2mL/ L (grower standard practice), each sprayed in combination with *Bayer Scala®* 1mL/ L and *Syngenta Switch®* 1g/ L as shown in table 1 below.

Each trial was 8m2 beds. These treatments were compared with an untreated control (water only). Treatments were applied every two weeks for a period of one flush. The following parameters were measured, yield of marketable stems, stem length and the number of flower petals infected by *Botrytis Cinerea*. This was an observational trial with no replication. The experiment was conducted for a period of one flush.

Table 1: Pesticides combined with Caltrain and Calbud during the trial

Week No.	Treatment
Week 1	Calbud 2mL/ L + Scala 1mL/ L
	Caltrain 2mL/ L + Scala 1mL/ L
Week 2	Calbud 2mL/ L + Switch 1g/ L
	Caltrain 2mL/ L + Switch 1g/ L
Week 3	Calbud 2mL/ L + Scala 1mL/ L
	Caltrain 2mL/ L + Scala 1mL/ L
Week 4	Calbud 2mL/ L + Scala 1mL/ L
	Caltrain 2mL/ L + Scala 1mL/ L
Week 5	Calbud 2mL/ L + Scala 1mL/ L
	Caltrain 2mL/ L + Scala 1mL/ L

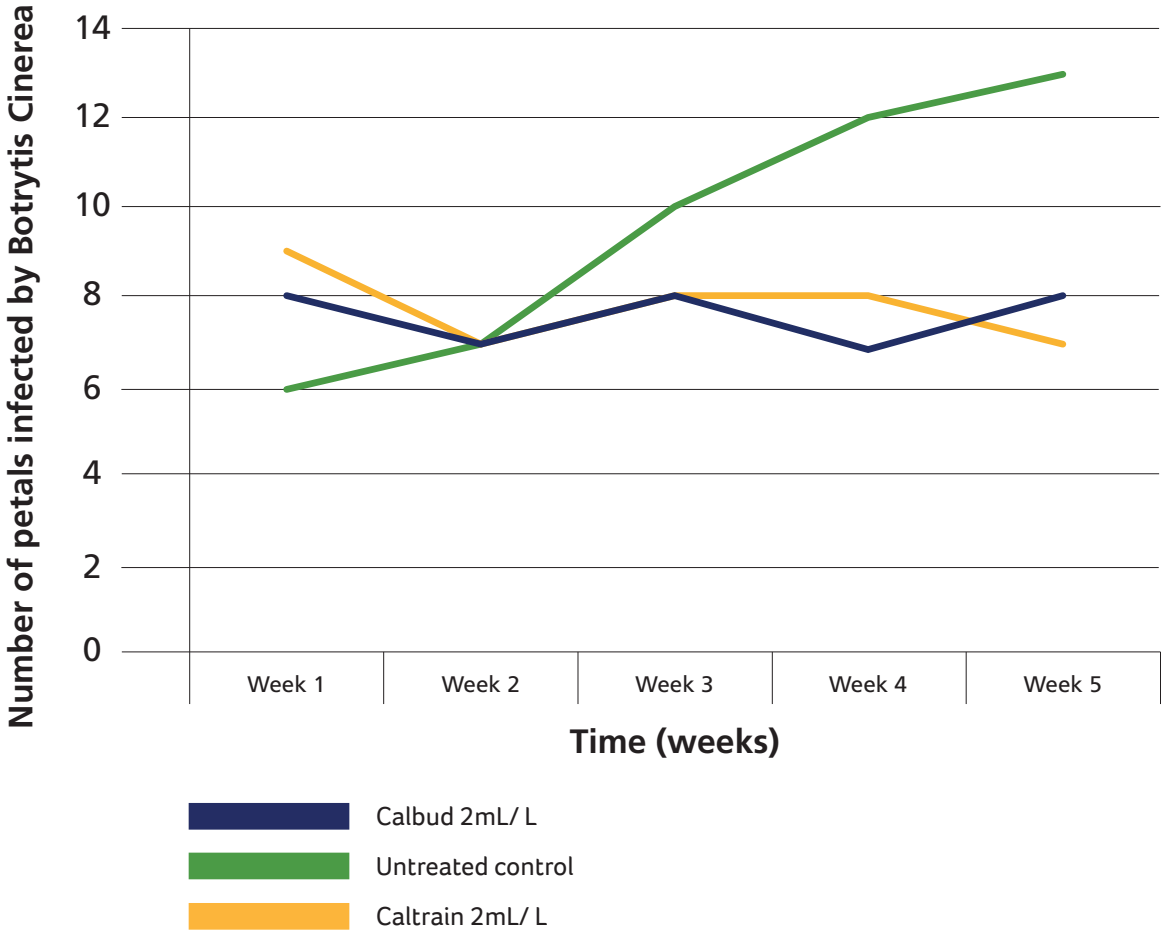
Efficacy Test Results

Results of this experiment are shown in tables 3, 4, 5 and figures 1, 2 and 3 below. Plots treated with a combination of Calbud 2mL/ L + Scala 1mL/ L, Caltrain 2mL/ L + Scala 1mL/ L, Calbud 2mL/ L + Switch 1g/ L, Caltrain 2mL/ L + Switch 1g/ L had fewer numbers of flower petals infected by *Botrytis Cinerea* compared to untreated control plots. In addition to this, plots treated with Caltrain 2mL/ L and Calbud 2mL/ L had a higher yield of marketable stems and stem length compared to untreated control plots.

Table 2: Number of flower petals on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control

	Number of Flower Petals Infected by *Botrytis Cinerea*				
	Week 1	Week 2	Week 3	Week 4	Week 5
Calbud 2mL/ L	8	7	8	7	8
Untreated Control	6	7	10	12	13
Caltrain 2mL/ L	9	7	8	8	7

Figure 1: Number of flower petals on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control



Results and Observations

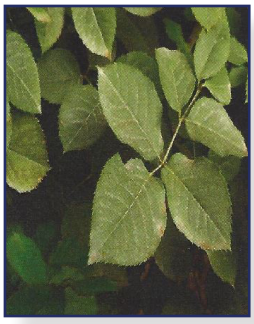
Phytoxicity Tests

Results for this experiment are shown in the table below and pictures A, B and C below. No phytotoxicity symptoms were observed across all the varieties tested and at all concentrations, except for minor residues.

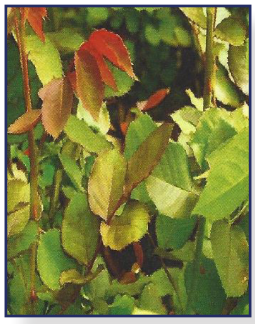
Key:

X - Absence of phytotoxicity
WR - White residues

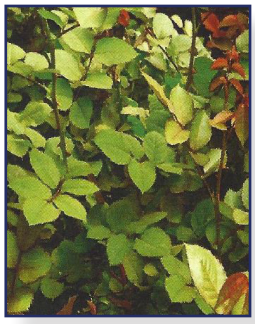
Varieties	Leaf Scorch 2mL/ L	Leaf Puckering 2mL/ L	Chlorosis/ Leaf Rosseting 2mL/ L	Glossy/ Greener Leaves 2mL/ L	Other Observations 2mL/ L
R calypso	X	X	X	X	WR
Furiosa	X	X	X	X	WR
Viva	X	X	X	X	WR
Cerise Success	X	X	X	X	WR
Inka	X	X	X	X	WR
Athena	X	X	X	X	WR
Moonwalk	X	X	X	X	WR
Akito	X	X	X	X	WR
H30	X	X	X	X	WR
Good times	X	X	X	X	WR
Super Akito	X	X	X	X	WR



Picture A
Calbud 2mL/ L
(White residues)



Picture B
Caltrain 2mL/ L
(No residues)



Picture C
Untreated control
(No residues)

Table 4: Yield of marketable stems on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control

Treatment	Yield of marketable stems	Percentage increase
Calbud 2mL/ L	1619	5.6%
Untreated Control	1533	0%
Caltrain 2mL/ L	1575	2.74%

Figure 2: Yield of marketable stems on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control

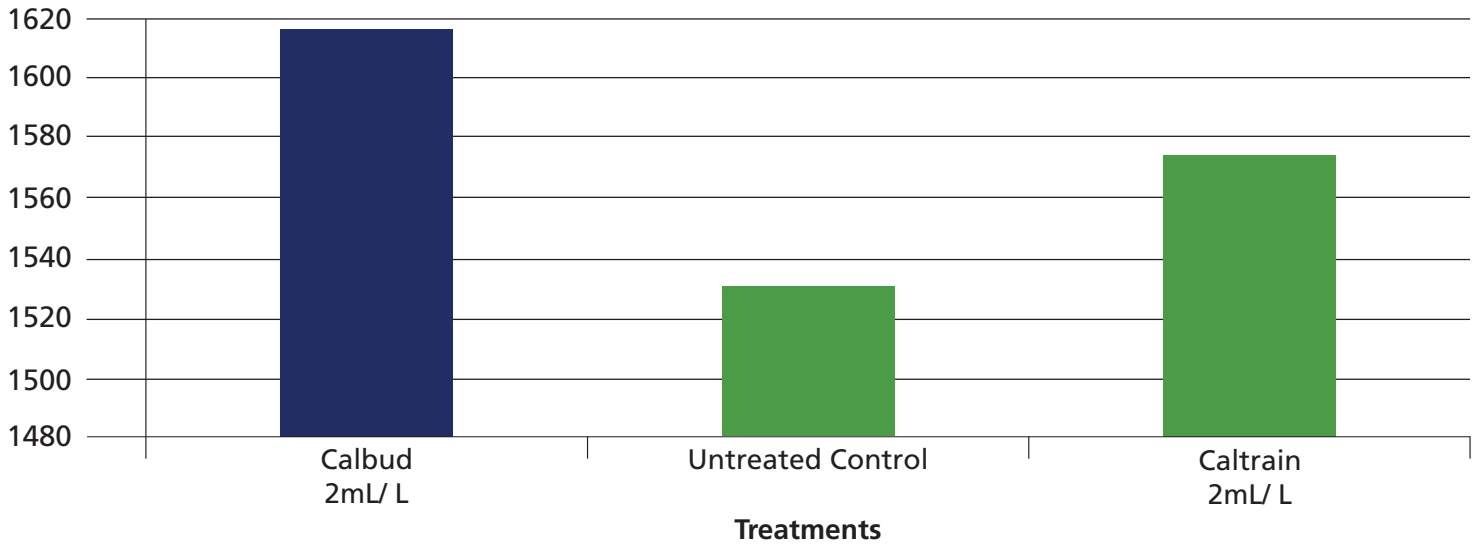
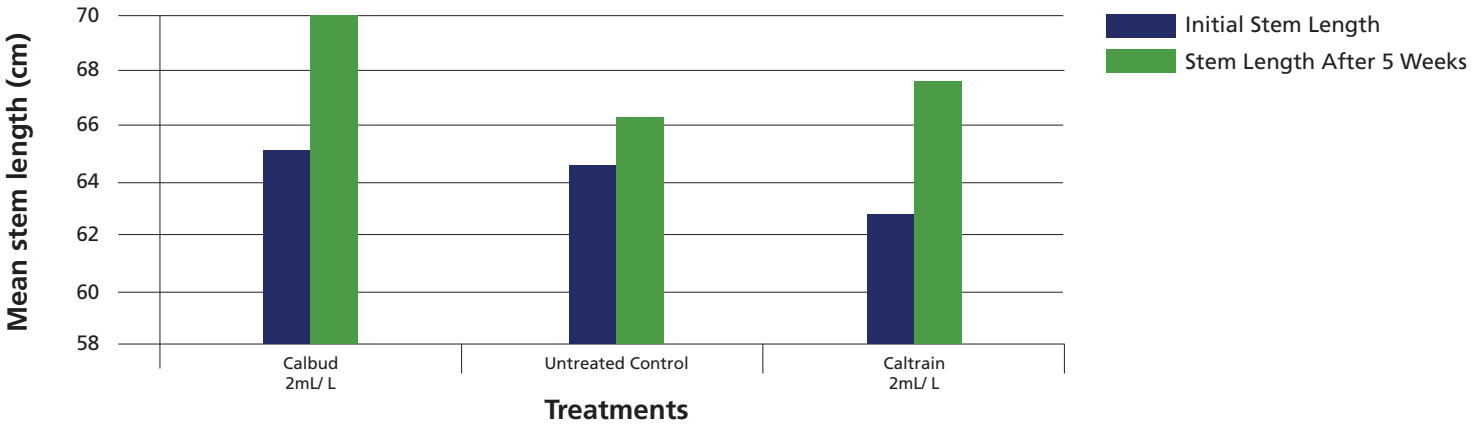


Table 5: Stem length on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control

Treatment	Initial stem length	Stem length after 5 weeks
Calbud 2mL/ L	65.2cm	70.0cm
Untreated Control	64.4cm	66.2cm
Caltrain 2mL/ L	62.6cm	67.6cm

Figure 3: Stem length on plots treated with Caltrain 2mL/ L, Calbud 2mL/ L and untreated control



Conclusions and recommendations

Results show that Calbud 2mL/ L (2L/ ha) effectively improved the quality and quantity of marketable stems. In addition to this, Calbud's efficacy against *Botrytis Cinerea* was as good as or better than plots treated with Caltrain 2mL/ L (2L/ ha).