

Evaluation of the efficacy of Trianum (-P and -G) and Vidi Parva for the control of Pythium aphanidermatum in cucumber

2023

Conducted by order of
Koppert

Local trial number: 230484

Verify
Tolweg 13
1681 ND Zwaagdijk-Oost
www.verify.nl

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1. INTRODUCTION

In 2023, VERTIFY carried out a trial by order of Koppert to evaluate the efficacy of Trianum (G and P) and the additional effect of Vidi Parva for the control of soil borne diseases in greenhouse vegetables. In this trial, *Pythium aphanidermatum* was targeted in cucumber.

The treatments were compared to the biological reference Asperello T34 biocontrol and the chemical reference Previcur Energy.

The trial was done for demonstration purposes and therefore conducted at the facilities of Vertify at WHC in Naaldwijk.

2. METHOD

Cucumber transplants were planted on rockwool slabs. The slabs were not drained to avoid that products and inoculum would drain out. Each plot consisted of 21 plants.

A first application was done at transplant. At 5 days after transplant, the slabs were inoculated with a spore suspension of *Pythium aphanidermatum*.

A second application was done at inoculation. A final application was done at 1 week later.

The treatments are summarized in table 1. Applications with Trianum-G were done by spreading the product on the slabs, just before transplant. Applications with Trianum-P, Asperello T34 biocontrol and Previcur Energy were done by dissolving the products in water and poured at the plantfoot, simulation drip application. Untreated plants were treated with water.

The trial was conducted in four replicates.

Table 1: Treatment list.

Treatment	Dose rate	Timing
1 Untreated – not inoculated	Water	ABC
2 Untreated – inoculated	Water	ABC
3 Asperello T34 biocontrol	10 g/m ² substraat	ABC
4 Trianum-G	1 g/plant	A
Trianum-P	30 g/1000 planten	BC
5 Trianum-G	1 g/plant	A
Trianum-P + Vidi Parva	30 g/1000 planten + 5 L/ha	BC
6 Previcur Energy	2 L/ha	ABC

A: At transplant.

B: At inoculation.

C: 1 week after inoculation.

The application and assessment details are summarized in table 2.

Table 2: Trial details.

Location:	NL-2672 ZX Naaldwijk
Crop:	Cucumber
Variety:	Dee Vtiaie
Date of planting:	17-03-2023
Date of inoculation:	23-03-2023
Application dates:	17-03-2023 (A) 23-03-2023 (B) 30-03-2023 (C)
Assessment dates:	24-03-2023 (7 DA-A; before inoculation) 05-04-2023 (6 DA-C) 12-04-2023 (13 DA-C) 18-04-2023 (19 DA-C) 25-04-2023 (26 DA-C)

At each assessment date, height of the plants was measured. Also the numbers of healthy, wilted and dead plants per plot were counted. When lesions at the stem base were found at the last assessment date, the size of stem lesions was measured.

Climate conditions during the trial were recorded by the climate computer.

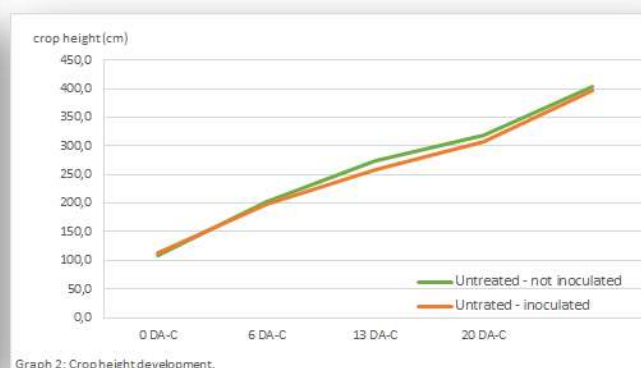
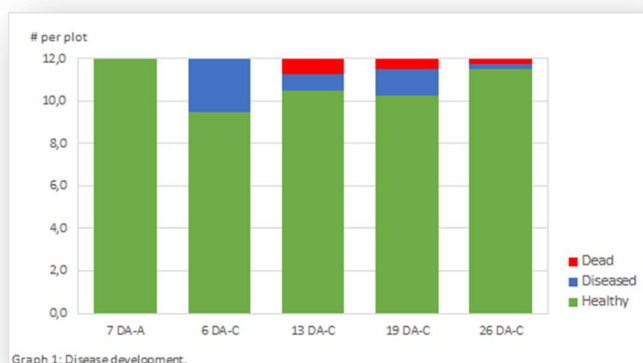
3. RESULTS

Statistical analysis was done with Genstat (LSD test at 95%). In the table P means probability. When P has a value of 0,05 or less, the difference between two treatments is statistically significant. The least significant difference (Lsd) is the smallest difference between significant different treatments at 95% (P = 0,05). Figures with the same letter do not significantly differ (P = 0,05).

3.1 Disease development

In graph 1 the development of the disease for the untreated plots is visualized. The numbers of healthy, wilted and dead plants per plot are visualized.

Crop height is visualized in graph 2.



Few wilting of plants was found in the untreated-inoculated plots at 1 week after inoculation (6 DA-C). During the triap period the crop was overgrowing the symptoms. On crop height development, differences between the untreated-inoculated and untreated-not inoculated plots were very small. The overall disease pressure was very low.

3.2 Crop height

Crop height was measured at each assessment date. Results are summarized in table 3.

Table 3: Crop height.

Treatment	Dose rate	Timing	Crop height (cm)				
			7 DA-A	6 DA-C	13 DA-C	19 DA-C	26 DA-C
1 Untreated – not inoculated	Water	ABC	108,8 b	202,8 a	274,0 b	319,6 b	404,4 a
2 Untreated – inoculated	Water	ABC	112,5 b	197,3 a	257,9 a	307,4 ab	396,9 a
3 Asperello T34 biocontrol	10 g/m ² substraat	ABC	113,8 b	191,6 a	258,5 a	306,3 ab	373,2 a
4 Trianum-G	1 g/plant	A	106,3 ab	196,0 a	259,4 a	307,4 ab	380,7 a
Trianum-P	30 g/1000 planten	BC					
5 Trianum-G	1 g/plant	A	97,5 a	194,7 a	255,3 a	299,1 a	387,4 a
Trianum-P + Vidi Parva	30 g/1000 planten+5 L/ha	BC	105,0 ab	188,6 a	248,2 a	292,6 a	378,4 a
6 Previcur Energy	2 L/ha	ABC					
		P					
		LSD	9,4	10,8	13,9	15,3	22,9

Although the disease pressure was low and differences were small, stunting in the untreated-inoculated plots as result of the inoculation was significant.

With none of the treatments increased crop height was measured compared to the untreated-inoculated plots. None of the treatments had prevented growth reduction of the plants as result of the inoculation with Pythium.

3.3 Plant counts

After the inoculation was done, the numbers of healthy, wilted and dead plants were counted per plot. The numbers of healthy plants are summarized in table 4.

Table 4: Healthy plants.

Treatment	Dose rate	Timing	# healthy plants (N=12)			
			6 DA-C	13 DA-C	19 DA-C	26 DA-C
1 Untreated – not inoculated	Water	ABC	12,0 a	12,0 a	11,5 b	12,0 a
2 Untreated – inoculated	Water	ABC	9,5 a	10,5 a	10,3 ab	11,5 a
3 Asperello T34 biocontrol	10 g/m ² substraat	ABC	10,3 a	10,3 a	9,8 a	11,3 a
4 Trianum-G	1 g/plant	A	10,5 a	10,5 a	9,5 a	12,0 a
Trianum-P	30 g/1000 planten	BC				
5 Trianum-G	1 g/plant	A	10,8 a	11,3 a	11,5 b	11,8 a
Trianum-P + Vidi Parva	30 g/1000 planten+5 L/ha	BC	10,8 a	11,0 a	9,3 a	12,0 a
6 Previcur Energy	2 L/ha	ABC				
		P				
		LSD	1,8	1,3	1,5	0,7

As result of the very low infestation, differences on numbers of healthy plants were hardly significant. Significant differences were found only at 19 DA-C.

Only at 19 DA-C, the addition of Vidi Parva to Trianum-P (applied as drip after transplant), resulted in significant more healthy plants compared to the treatment without Vidi Parva.

Only repeated applications with Trianum-P + Vidi Parva, following Trianum-G at transplant, was comparable to the untreated-not inoculated plots.

4. CONCLUSIONS

A very low infestation developed in this trial. Although significant, the inoculation with *Pythium aphanidermatum* had resulted in only few growth reduction of untreated plants, compared to not inoculated plants. Also on above ground disease symptoms, only very small differences were found.

None of the treatments had prevented growth reduction of the plants as result of the inoculation with *Pythium*.

On above ground disease symptoms, significant differences were only found at 19 days after the inoculation. The addition of Vidi Parva to Trianum-P (applied as drip after transplant), resulted in significant more healthy plants compared to the treatment without Vidi Parva.

Only repeated applications with Trianum-P + Vidi Parva, following Trianum-G at transplant, was comparable to the untreated-not inoculated plots.

