



Effects of Pentakeep-V on Sweet Pepper

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1 Effects of Pentakeep-V on sweet peppers

1.1 Materials and Method

1.1.1 Crop

292 sweet pepper plants cultivar 'Sopora' from Plantenkwekerij Nuijten BV were delivered in week 19 on May 11th and planted onto the mats. Two-thirds of the plants were treated with Pentakeep-V during the propagation phase and these plants were used in the Pentakeep-V treatments in the experiment. One third of the plants was not treated and these were used for the control treatment.

1.1.2 Climate conditions

The average temperature during the crop was 24.6 °C (range minimum 16.6 °C early morning to maximum 27 °C for a short period on some afternoons). The relative humidity was on average 76.1% but this varied from 60% during the temperature peaks to 90% in the early morning. The average CO₂-level was 335 ppm and the range was 250 to 750 ppm.

1.1.3 Treatments and plan of greenhouse

The plan of the treatments in the greenhouse is shown in figure 1. There are two Pentakeep-V treatments; in the treatments numbered 3 and 4 the Pentakeep-V is applied once a week via the irrigation water at a concentration of 0.02% in the first irrigation round of the day; in the treatments numbered 5 and 6 the Pentakeep-V is applied every day via the irrigation water at a concentration of 0.0029% in the first irrigation round of the day. The treatments numbered 1 and 2 did not receive any Pentakeep-V in the irrigation water and are the control treatments.

1.1.4 Irrigation and fertilization

The drainage water was recycled. The pH and EC values in the drain water during the crop are in the appendix

1.1.5 Crop protection and cultivation

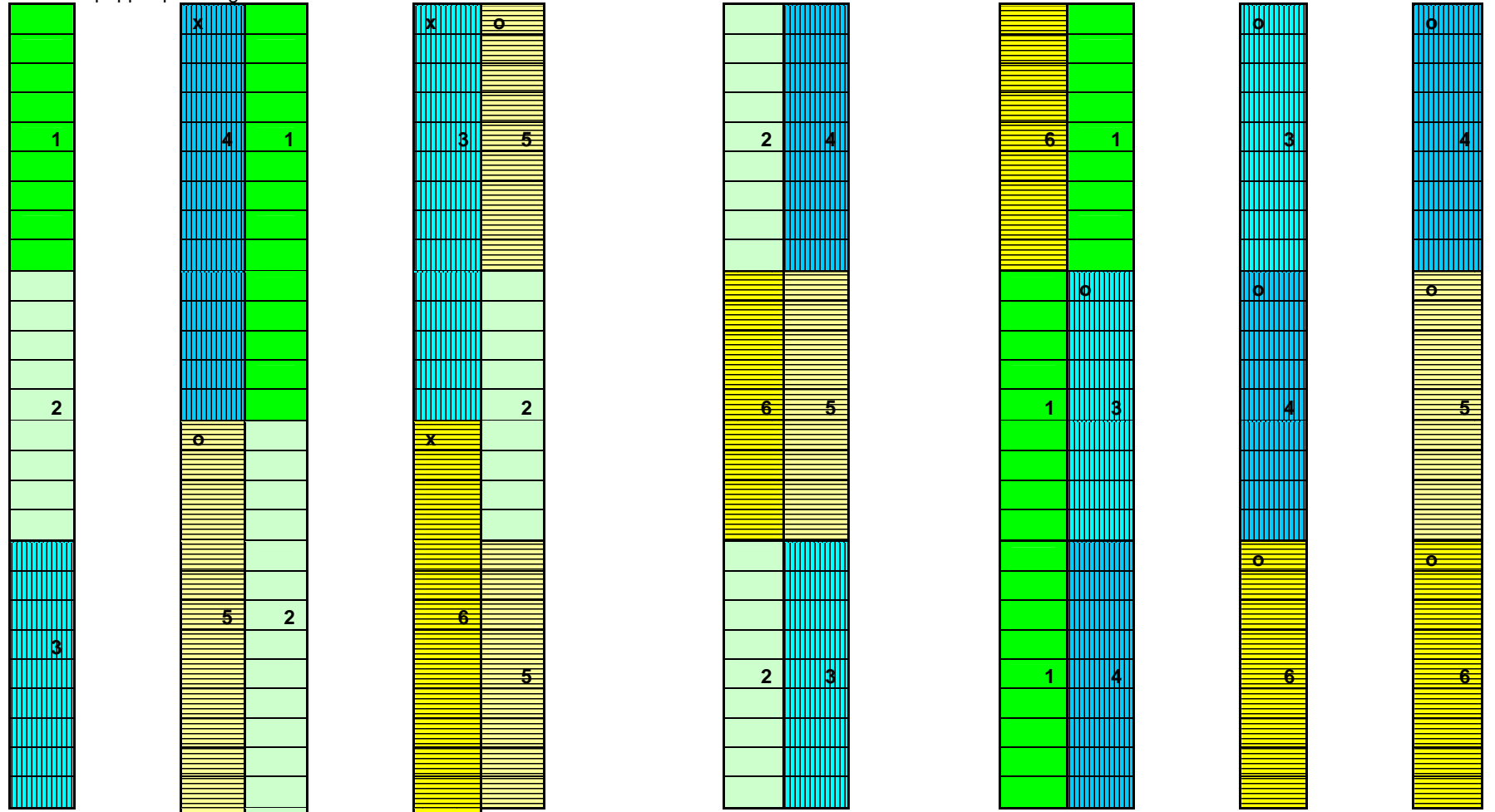
In the appendix is a list of the biological and other control measures used in the sweet pepper crop.

1.1.6 Measurements

The first sweet peppers were harvested on June 26th and subsequently the fruits were harvested once a week up to September 22nd. The harvest was grouped into first and second quality and the fruits with blossom end rot and for each of these categories the number of fruits and the total weight per field were recorded. The fields had different numbers of plants and all the measurements were calculated as average per plant per field.



Figure 1 - Sweet pepper plan of greenhouse



- 1
- 2 control
- 3
- 4 weekly
- 5
- 6 daily

Numbers are treatments
 o = missing plant
 Every number has one longer field + 4 short fields.
 1 and 2 = control
 3 and 4 = weekly
 5 and 6 = daily

Number of measured plants

- 1 = $4 \times 9 + 14$ 50
- 2 = $4 \times 9 + 14$ 50
- 3 = $4 \times 9(-2) + 14$ 48
- 4 = $4 \times 9(-2) + 14$ 48
- 5 = $4 \times 9(-4) + 14$ 46
- 6 = $4 \times 9(-2) + 14$ 48

1.2 Results

The weekly cumulative number of kilos per plant and number of sweet peppers per plant is shown in figures 2 and 3. The weekly Pentakeep-V application increases the number of kilos and the number of fruits significantly when the cumulative values of all the harvests are compared (table 1). The weekly Pentakeep-V application gave a higher number of kilos (8%) and fruits per plant (6%) than the control and the treatment with the daily Pentakeep-V application. There is also a noticeable trend between the treatments when averaged for all the harvest dates (see table 2). Blossom end rot was also present in the sweet pepper and the cumulative % blossom end rot is shown in figure 4 and the average per harvest in figure 2. Again there is a clear trend with the Pentakeep-V treatments showing a lower percentage of blossom end rot than the control treatment, both in numbers of fruits per plant as in weight per plant.

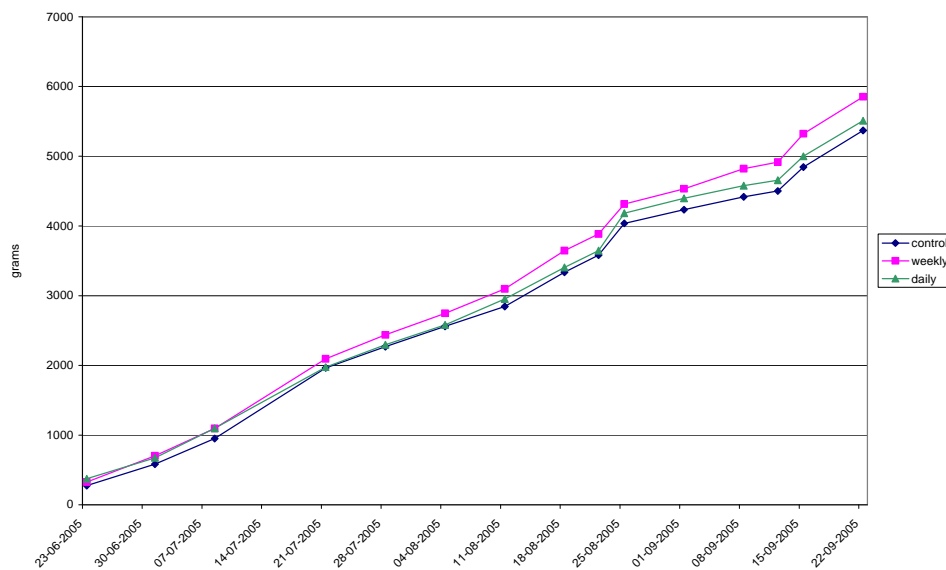


Figure 2 – Cumulative production of sweet pepper plants in grams per plant. Standard error = 161.2

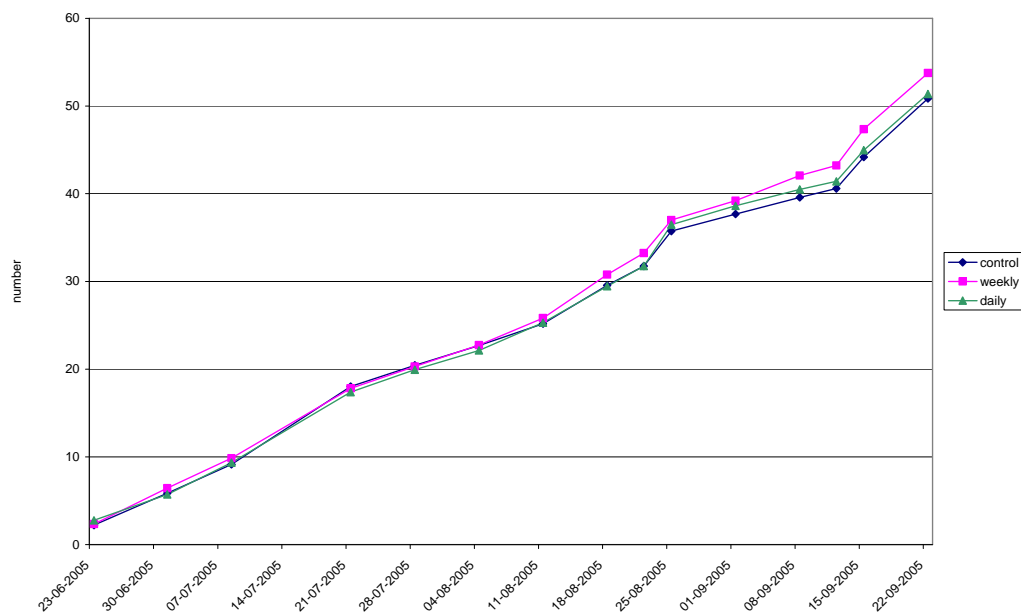


Figure 3 – Cumulative production of sweet pepper plants in number of fruits per plant. Standard error = 1.4

Table 1 – Average weight per plant en number of fruits per plant for the total cumulative value of all the harvests

treatment	Ave. weight per plant (g)	Ave. number of fruits per plant
Control	5415 ^b	51.4 ^b
Weekly application	5883 ^a	54.3 ^a
Daily application	5496 ^b	51.2 ^b

Different letters denote significant differences at 5% level.

Table 2 – Average weight per plant en number of fruits per plant per harvest for all the harvests

treatment	Ave. weight per plant (g)	Ave. number of fruits per plant	Ave. number of BER ¹ per plant (%)	Ave. weight of BER per plant (%)
Control	361.0	3.4	15.0 ^a	13.6 ^a
Weekly application	392.2	3.6	11.7 ^b	10.3 ^b
Daily application	366.1	3.4	12.4 ^b	11.2 ^b

¹ BER = Blossom End Rot, different letters denote significant differences at 5% level.

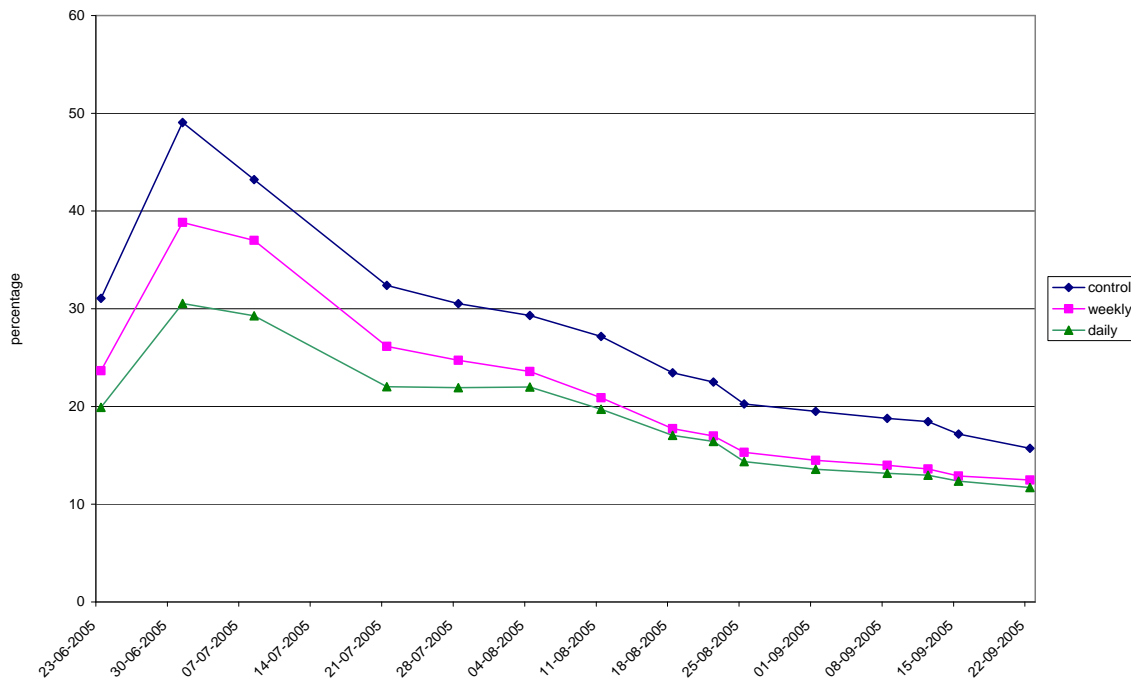


Figure 4 – Cumulative number of fruits with blossom end rot per plant

1.3 Conclusions

In this experiment the weekly application of Pentakeep-V to the first irrigation round significantly increased both the number of kilos (8%) and the number of fruits (6%) per plant when compared to the control and to the daily application of Pentakeep-V. The daily application gave no significant increase in kilos or number of fruits when compared to the control. Both the daily and the weekly application of Pentakeep-V reduced the number of fruits with blossom end rot.

This increase in amount of kilos by 8% during a short summer cropping period (June to September) could mean that during a complete crop an even greater effect could be achieved. The less optimal conditions in the spring and autumn could increase the positive effect of Pentakeep-V in Sweet Pepper.

Appendix

Crop protection

Every week 2 or 4 cards Encarsia formosa and Eretmocerus

14062005

1 container Orius laevigatus + T. swirskii

21062005

50 bags Amblyseius cucumeris

11072005

Spray with Turex against caterpillars

18072005

1 container Spidex (Phytoseiulus persimilis)

1 container Ahipar (Aphidius colemani)

25072005

1 container Spidex (Phytoseiulus persimilis)

1 container Ahipar (Aphidius colemani)

01082005

1 container Spidex (Phytoseiulus persimilis)

1 container Ahipar (Aphidius colemani)

08082005

1 container Spidex (Phytoseiulus persimilis)

1 container Ahipar (Aphidius colemani)

15082005

1 container Spidex (Phytoseiulus persimilis)

1 container Ahipar (Aphidius colemani)

Spray with Turex against caterpillars

22082005

1 container Aphidoletes aphidimyza (moths)

29082005

1 container Aphidoletes aphidimyza (moths)

1 container Ahipar (Aphidius colemani)

Fog with pirimicarb – 2 canisters

05092005

1 container Aphidoletes aphidimyza (moths)

1 container Ahipar (Aphidius colemani)

12092005

Spray with Turex against caterpillars

Spray with Plenum against white fly

19092005

Spray with Turex against caterpillars

Spray with Plenum against white fly

Values of EC and pH in drain

Date	EC	pH
10-jun	3.9	6.7
15-jun	3.1	6.9
20-jun	3.2	7.2
25-jun	3	5.8
13-jul	3	6.6
20-jul	4.3	6.4
25-jul	4	6.4
02-aug	2.8	6.4
05-aug	2.3	6.4
10-aug	2.5	6.8
18-aug	3	6.4
25-aug	3.6	6.2
01-sep	4	6.1
08-sep	4.5	6
15-sep	5.3	6