

The effect of different treatments on pear psyllid (*Cacopsylla pyri*) in organic pear growing

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Abstract

In 2008 and 2009 we did experiments with different treatments on the second generation of pear psyllid in June. Treatments in 2009 were potassium bicarbonate with and without the surfactant Trifolio S-forte, Agricolle and the experimental insecticidal fungus PAI 08 005. All treatments were ineffective on infestation in the field, but pears treated with potassium bicarbonate plus additive Trifolio S-forte had less sooty mould after harvest.

Keywords: Pear psyllid, *Cacopsylla pyri*, potassium bicarbonate, surfactant, sooty mould

Introduction

In the Netherlands pear psyllid causes problems in some organic pear orchards. Not all orchards have problems, due to natural enemies. In 2007 pear psyllid was a problem, for the first time in 25 years, in almost all organic pear orchards. Not only the sucking of the insect on leaves and fruits is a problem. Also honey dew exudations and sooty mould grown on honey dew causes problems, resulting in filthy pears. Growers try different methods to control the insect, none of them very effective. In 2007 we saw in an orchard in a trial with armicarb on scab no filthy pears. In 2008 experiments were conducted with potassium bicarbonate without surfactant in a very small experiment in June on the second generation. No result on pear psyllid was found. Growers did not find any result in their orchards either. This was the reason to repeat the experiment more in detail in 2009, to include a variant with the additive Trifolio S-forte, and to try other treatments as well. We choose the experimental insecticidal fungus PAI 08 005 because there is an effect on psyllids according to the description of this product. And we choose Agricolle because in other experiments it showed some effect. Agricolle is a product based on seaweed/algae. Both products were approved by Skal, the Dutch control inspection on European organic standards.

Material and Methods

The experiment in 2009 was conducted in an organic pear orchard in Biddinghuizen on five year old trees of Concorde on Kwee Adams. Each plot consisted of five trees, the middle three trees were used for observations. In each tree 10 shoots were observed, five on each side. There were four repetitions. The treatments were sprayed with a knapsack sprayer until dripping. Observations were made on: amount of eggs and nymphs of pear psyllid and on sooty mould. Observations on shoots were made on 27 May, 5 June, 12 June, 19 June and 1 July. A visual observation was made on 27 August. Observations on harvested pears were made on 14 October. Treatments were conducted with potassium bicarbonate with and without the additive T S-forte, with PAI 08 005, and with Agricolle.

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Table 1: Experiment pear psyllid 2009

| object | Treatment | Timing | Dosage/ha |
|--------|-----------------------------------|------------------|--------------------|
| 1 | Untreated | - | |
| 2 | Potassium bicarbonate | L1 | 7,5 kg/ha |
| 3 | Potassium bicarbonate + T S-forte | L1 | 7,5 kg/ha + 3 l/ha |
| 4 | PAI 08 005 | L1 | 0,125%=1,25 l/ha |
| 5 | Agricolle | 30% egg hatching | 3 l/ha |

Table 2: Data of treatments

| | Treatment | 29-5 | 2-6 | 8-6 | 13-6 | 17-6 | 23-6 | 2-7 |
|---|----------------------------------|------|-----|-----------------|------|------|------|-----|
| 1 | Untreated | - | - | - | - | - | - | - |
| 2 | Potassium bicarbonate | +* | + | + | + | + | + | + |
| 3 | Potassium bicarbonate +T S-forte | +* | + | + | + | + | + | + |
| 4 | PAI 08 005 | - | + | + | + | + | + | + |
| 5 | Agricolle** | - | - | ½ PAI 080050 | + | + | + | + |

* potassium bicarbonate was used on 29 May because of possible effect on eggs

** Agricolle was used for the first time on 13 June due to late approval of Skal

Table 3: Classification pear psyllid on shoots and sooty mould on fruits

| | Pear psyllid on shoots | | | Sooty mould on pears | |
|--------|-------------------------------|-------|-------|--|-------|
| | | Class | Value | | Class |
| 0 | No eggs, no nymphs | 0 | 0 | No sooty mould | 0 |
| Light | Eggs and < 5 nymphs per shoot | 1 | 1 | Light sooty mould in nose | 1 |
| Middle | 5-10 nymphs per shoot | 2 | 3 | Sooty mould in nose and on the surface | 2 |
| Heavy | > 10 nymphs per shoot | 3 | 5 | - | - |

Results

On the 27th of May adult pear psyllid are in the orchard, there are also a few eggs, no nymphs. The infestation develops during the month of June. On 1 July the first sooty mould is seen on leaves and pears. At the end of August many shoots and fruits have sooty mould.

Pear psyllid eggs and nymphs

There is no difference between the treatments (figure 1).

Sooty mould on shoots and leaves

There was no difference between the treatments on sooty mould on shoots and leaves. On 27 August sooty mould was observed on leaves and shoots. Again no difference between treatments was visible (table 4).

Table 4: Infestation by sooty mould on the shoots at 1 July

| Date | untreated | potassium bicarbonate | potassium bicarbonate + T S-forte | PAI 08 005 | Agricolle |
|------|-----------|-----------------------|-----------------------------------|------------|-----------|
| 1-7 | 57 | 61 | 56 | 62 | 63 |

Sooty mould on pears

Pears were harvested and kept in storage. Observations were made on 14 October. There was a difference in results. Fruits which were treated with potassium bicarbonate plus the additive T S-forte were much less filthy, 94% of the fruits did not have any sooty mould at all. Only 6% was light filthy. Sooty mould on untreated pears, pears treated with

potassium bicarbonate without additive or with PAI 08 005 was at the same level. Agricolle showed more filthy pears and in three of the four repetitions fruits were rougher (figure 2). Sooty mould and residue of sucking activities of nymphs and adults was to be seen on the fruits. There is a rough circle where nymphs have sucked and sooty mould was on the fruits. This kind of roughness was found on some pears per treatment (photo 1).

Observations on pear psyllid eggs and nymphs on shoots in 2009

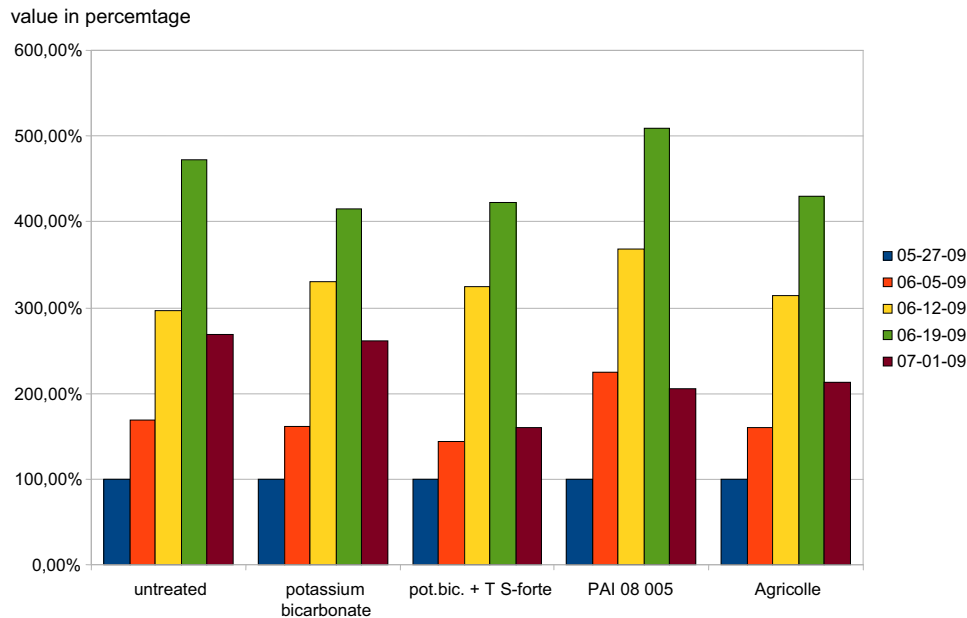


Figure 1: Infestation pear psyllid on shoots, cumulative total according to classification. First observation 27 may is set on 100% for all treatments

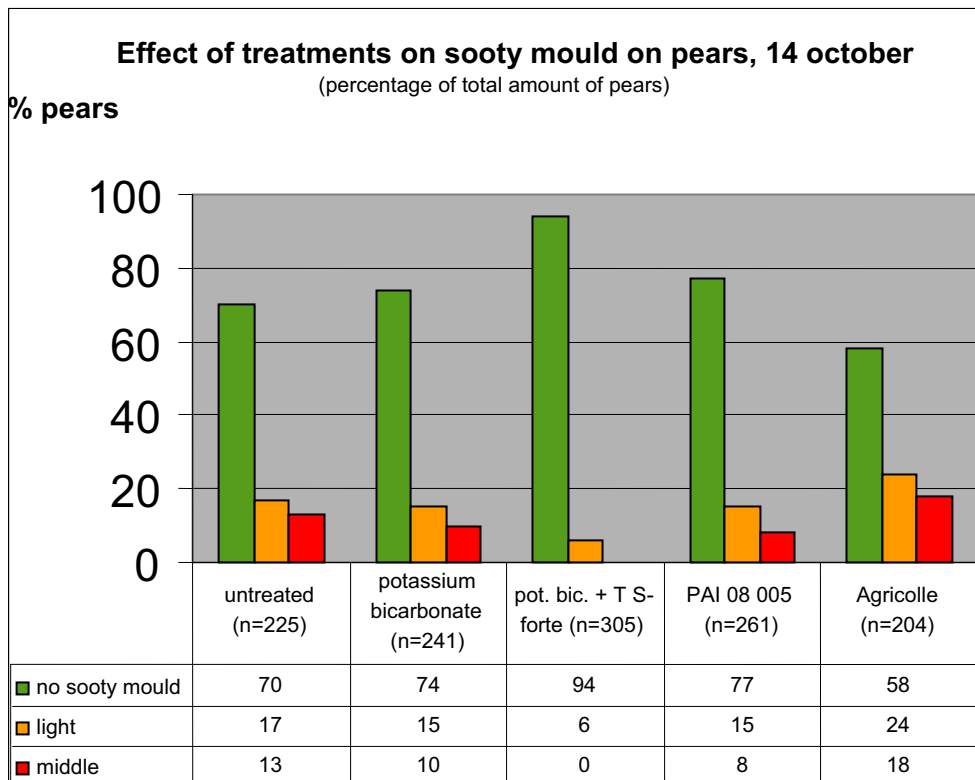
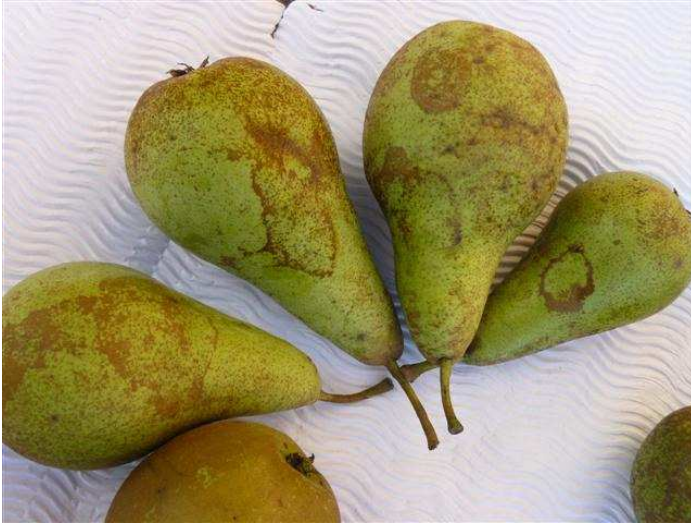


Figure 2. Roughness and sooty mould on pears at 14 October (percentage of total amount of fruits)

Photo 1: Roughness on pears of Concorde by pear psyllid



Discussion

In the season no differences were observed between the treatments. All treatments have no effect on eggs and nymphs of pear psyllid. In the field there were also no effects on sooty mould. Observation on the fruits after harvest show a better result of potassium bicarbonate plus the additive T S-forte. Agricolle has more sooty mould and the pears are rougher. It appears that potassium bicarbonate plus additive is more effective on sooty mould than on the insect. We saw the same result of potassium bicarbonate in 2007 and 2009. There is some confusion about the product that has been used. In 2007 armicarb was used (this includes an additive). Piet Creemers (2009) had the same experience with armicarb. This can be an explanation why we did not see any effect on sooty mould in 2008. It is not clear what the effect is on the insect and the sucking activities and whether sucking damage can be prevented. Supplementary observations on buds and trees would be necessary. Further experiments are needed to define the needed dosage and timing. For the effect on sooty mould it is possible that treatments could be started when sooty mould is visible. It is not known what the effect is of T S-forte alone. As for the effect of PAI 08 005, an insecticidal fungus, on pear psyllid, there could be several reasons why the treatment was ineffective. It is known that the humidity should be high after spraying for good effect of fungus on the insect, and although we applied PAI 08 005 as last spray in the early evening with much water, it could be that it dried too fast. The use of additives could be a solution. The data was not statistically analyzed. This gives not more information: there were no differences in the field, only at harvest and only in one variant there was a difference. Therefore it is an indication to do further work in this direction.

Acknowledgements

I thank Esther Maarssen en Thomas Metselaar, students of Warmonderhof, for their dedication and work in the field. I also thank Lody van Osch organic fruitgrower for the use of his Concorde trees and all fruitgrowers of the working group on organic pear growing.

References

- Brouwer, G. (2008). *Intern verslag perenwerkgroep*, Effect van kaliumbicarbonaat op perenbladvlo 2008. Oriënterende proeven.
- Creemers, P. (2009). *Personal communication*.