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Efficacy of postharvest treatments by nebulisation of biological control organisms against *Botrytis cinerea* fruit rot on pear

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Storage diseases of pome fruits are caused by different fungal species. Disease management to control storage diseases includes several treatments with different fungicides in the weeks prior to harvest. However, residues on fruits becomes more and more a public and governmental concern. In order to reduce the chemical residue on fruits to a minimum, more research is done on alternative disease management. In this respect, in 2013, a project on 'Nebulisation of biological control organisms in cold storage rooms to control storage diseases', which is funded by Flanders Innovation & Entrepreneurship (vlaio), has started at the pcfruit institute in collaboration with ILVO and the Catholic University of Leuven. Here the efficacy of several biological control organisms (BCOs), which were applied through specific atomization in the cold storage room, was examined against storage diseases. Two fungal pathogens causing storage diseases were monitored. The first comprises the latent fruit rot pathogen, *Neofabraea spp*.. The second are the wound pathogens (*Botrytis cinerea*, *Monilinia spp*., *Penicillium spp*.) that penetrate the fruits through accidental wounds, for example during picking. However, not only the efficacy of the BCOs is important but also the homogeneous distribution of the compounds in the cold storage room. The results of these trials will be presented.

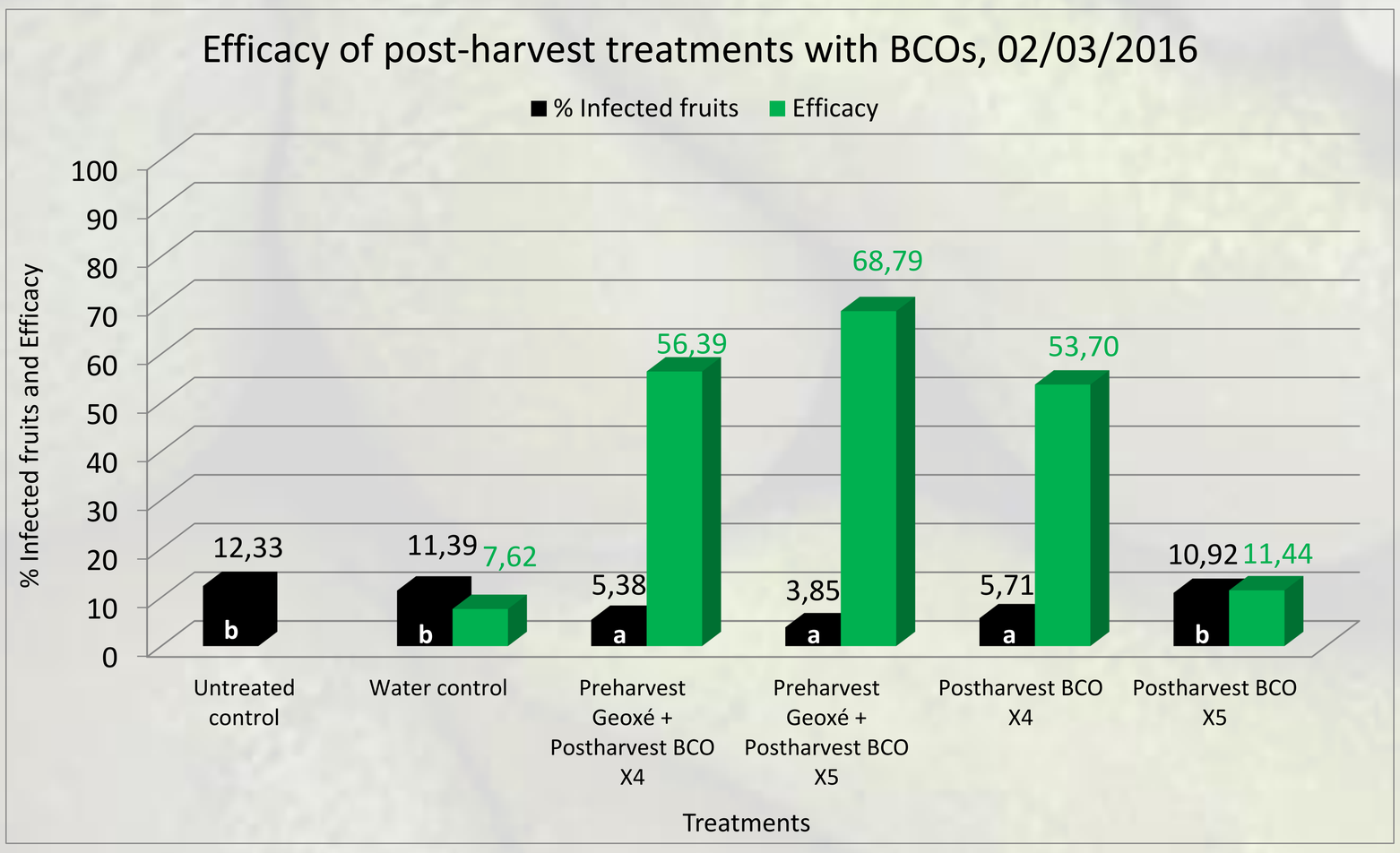
Results

Efficacy of postharvest BCO treatments towards fruit rot on pear

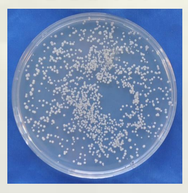
This trial was executed in a small cooling room (80 m^3) at 15/09/15, the day after harvest. Each bin was placed individually in the centre of the cooling room. The nebulisation was performed by using the nebulisation-device 'Swingtec Fontan Starlet'. For each treatment an amount of 1 litre solution (either water or a suspension of the respective BCO) was used for the nebulisation process. After each nebulisation the bin was left for 2 hours inside the cooling room. From each object samples were taken from the upper layer of the bin for recovery tests of the BCOs, 1 day after the treatment. At the moments of evaluation of fruit rot symptoms, a recovery analysis for the applied BCOs was performed on fruits from each layer in the bins.

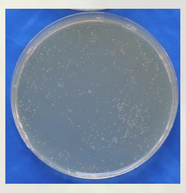
Swingtec Fontan Starlet

Obj.	9/09/2015 1 week	15/09/2015 Harvest	15/09/2015 Post-Harvest	16/09/2015 CFU's/cm² 1 day after treatment	2/03/2016 CFU's/cm² after storage
1	Untreated	Untreated	Untreated	0	0
2	Untreated	Untreated	Water nebulisation	0	0
3	Geoxe 0,25 kg/ha		Nebulisation of BCO X4 20g/l	$1{,}28 \times 10^4$	$1{,}50 \times 10^3$
4	Geoxe 0,25 kg/ha		Nebulisation of BCO X5 9g/l	$6{,}04 \times 10^4$	$2{,}76 \times 10^3$
5			Nebulisation of BCO X4 20g/l	$1{,}65 \times 10^4$	$4{,}71 \times 10^3$
6			Nebulisation of BCO X5 9g/l	$6{,}54 \times 10^4$	$2{,}68 \times 10^3$



BCO X4 **BCO X5**





***Botrytis cinerea* symptoms**

Differences in the amount of infected fruits and obtained efficacies were also seen when the different layers in the bins were taken into account. The upper layer (layer 1) had always the least amount of infected fruits resulting in a higher efficacy than the other layers.

Conclusion

Based on the results obtained it can be stated that BCOs can be applied by nebulisation in the cold storage room as postharvest application to control storage diseases. However, research is still necessary to obtain a homogenous distribution in a cold storage room filled with bins to establish better efficacies.

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