Verdera infoletter

7/2015
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Prestop® Mix delivered by pollinators for the control of grey mould on strawberry and raspberry

1. An antagonist against grey mould

Prestop® Mix biofungicide based on *Gliocladium catenulatum* fungus is very effective against grey mould caused by *Botrytis cinerea*. The fungal antagonist delivered by pollinators colonizes flowers and especially stamens inhibiting the pathogen from penetrating the flower bottom and the developing fruit. *G. catenulatum* survives its activity on the plant for 4 weeks, which is a sufficient time to protect from mould from flowering until harvest. The application of *Gliocladium* decreases the number of mouldy berries and increases the marketable yield. Also the spoilage of berries after harvesting is reduced.

Gliocladium treatment (on the right) prolongs the storage life of strawberry fruits. Untreated reference on the left.

2. Pollinator assisted treatment

The biofungicidal powder is disseminated either by honeybees or bumblebees. Hives equipped with a microbial dispenser are located beside the field at the start of flowering. The dispensers are daily supplied with 5-10 g of Prestop® Mix powder. It is used over the whole flowering period and the total application rate is 300-500 g/ha. Two honeybee hives per hectare are needed and in the case of bumblebees 2-3 multi hives are needed per hectare in open field. In greenhouses and tunnels 1-2 bumblebee hives are recommended for 1000 m^2. The microbial powder is not sensitive to air moisture, so, it does not make lumps, not even in open field use. The powder adheres to the hairs of pollinative insects and will be carried to flowers. The micro-organism colonizes the wilting flower, thereby preventing *Botrytis* infection.

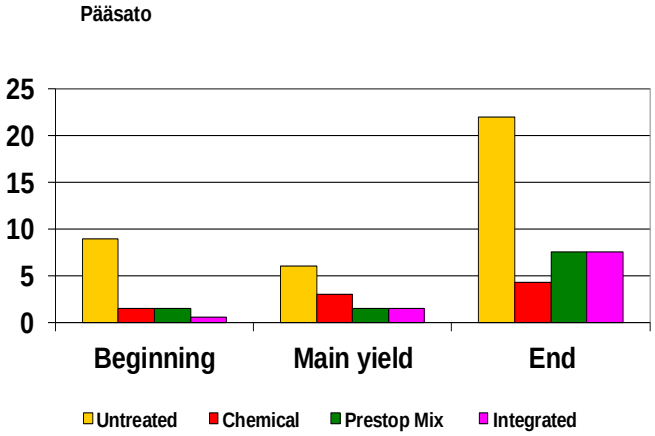
BeeTreat® dispensers attached to hives.

Gliocladium catenulatum – the active substance of Prestop® Mix.

3. Precision treatments - good efficacy

Besides Finland, field trials were carried out in several other countries like Estonia, Belgium and Slovenia. The results were very similar with those from Finnish strawberry farms. It was shown that in the beginning of the harvest period and during the main harvest biocontrol reduces grey mould to less than half of the amount in untreated reference. When integrated control was used, the disease level was decreased to one third. Test results were good in spite of different weather conditions.

Prestop® Mix and bees on strawberry. Results are mean values of three conventional farms.



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BeeTreat® microbe dispenser for bee hives is developed in Finland by Aasatek Oy.

4. Widely used

In Finland the delivery of Prestop® Mix into berry flowers in the help of bees has been commercial during several years and the application has increased year by year. Nowadays also the use of bumblebees for this precision treatment is commercialized. Besides Finland, pollinator assisted mould control is until now officially accepted in Belgium, Denmark, Estonia, Holland (only protected crops) and Sweden.

Pollinator assisted control (entomovectoring) is approved both for strawberry and raspberry in open field, tunnels and in greenhouses as well. The method is allowed also in organic farming. Under very high disease pressure, mould control can be intensified in traditional cultivation with integrated pest management combining bee assisted treatments with 1-3 chemical sprayings. Treatments with chemical fungicides should be carried out late in the evening or early in the morning, when pollinators are not flying. The combined use of microbes and chemicals can also delay the development of resistant pathogens to chemical fungicides.

Bumblebees coming out of a commercial microbial dispenser installed in the hive.

5. Advantages of biological control

The biological precision method with Prestop® Mix is safe for waterways and for the whole environment. There is no requirement for pre-harvest intervals and there is not either risk for resistant pathogen strains. The use of Prestop® Mix does not harm the production of honey. Concerning both efficacy and application costs this method provides a competitive alternative in the control of grey mould on berry plants.

Prestop® Mix and bees on raspberry. Results are mean values of two organic farms.

Harvest time	Mouldy berries (%)	
	Reference	Biocontrol
1	8.2	3.7
2	7.0	3.4
3	11.9	6.2

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