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# Mikrobiologiske midler - jordbær og hindbær

Borregaard Bioplant ApS
Nina Jørgensen


Jordbærkonferencen 2022


Pejsegården Brædstrup

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## Biofungicider

- Lalstop G46

  *Gråskimmel & rodsygdomme*

- Prestop Mix

  *Gråskimmel*

## Biopesticider:

- Lalguard M52 GR

  *Øresnudebiller og trips*

- Botanigard

  *Mellus*

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**LALSTOP G46 WG**

**LALGUARD M52 GR**

**LALGUARD M52 OD**

**LALSTIM OSMO**

**LALSTOP CONTANS WG**

LALLEMAND

LALLEMAND PLANT CARE

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# LALSTOP G46 WG - *Biofungicid*

- Aktiv mikroorganisme: *Clonostachys rosea* J1446 (>1x$10^9$ cfu/g)
  - tidligere *Gliocladium catenulatum* J1446
- Formulering: Vandopløseligt granulat (WG)
- Pakkestørrelse:  100 g og 1 kg
- Opbevaring og holdbarhed:
  - I uåbnet emballage 18 mdr under +4°C
  - I åbnet og genlukket emballage 1 mdr under +4°C



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# LALSTOP G46 WG - *Biofungicid*

Nyttesvampen ***Clonostachys rosea* j446** (syn. *Gliocladium catenulatum*)
har i mere end 20 år vist dokumenteret effekt mod svampesygdomme som:

- **Gråskimmel *Botrytis***
- ***Fusarium sp.***
- ***Pythium sp.***
- ***Phytophtora sp.***
- ***Rhizoctonia***

Det er samme nyttesvamp, som findes i produkterne:
**Prestop WP** som har været brugt i mange år i DK i væksthuse.
**Prestop Mix** som er formuleret til udbringning med bier ('Flying Doctors')

**Lalstop G46 :**
10 x mere koncentreret end Prestop WP.
1 kg Prestop WP = 100 g LALSTOP G46 WG

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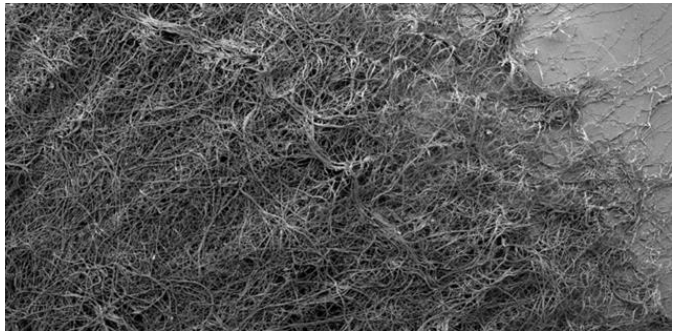
# LALSTOP G46 WG - *Sådan virker det*

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**1.** Koloniserer behandlede plantedele og konkurrerer med de skadelige svampe om adgang til næring og plads.

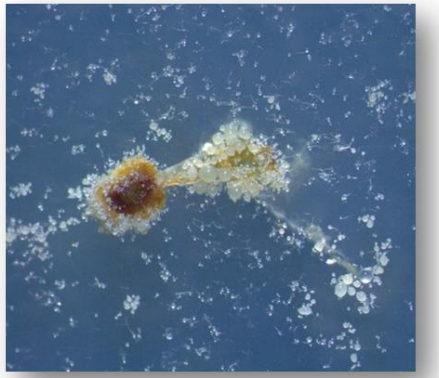
**2.** Fungerer som en hyperparasit, der vokser rundt om de patogene svampe.

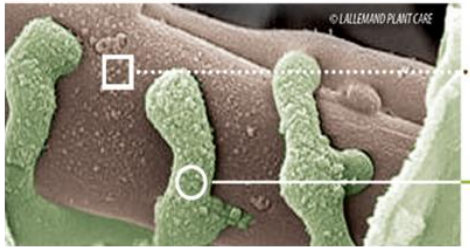
**3.** Producerer enzymer, der nedbryder de patogene svampes cellevægge.



*Clonostachys rosea* mycelium

Støvdrager fra jordbærblomst koloniseret af *Clonostachys rosea*






Mycelium of the pathogenic *Rhizoctonia* fungus

*Clonostachys rosea* J1446

**Risikoen for udvikling af resistens er meget lille** grundet produktets mange virkemåder overfor de patogene svampe.

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# LALSTOP G46 WG - *Anvendelse*

**1. Sprøjtes på plantens overjordiske dele**
- mod gråskimmel *Botrytis*

**Prestop® Mix** med bier



**2. Iblandes/sprøjtes på jord**
- mod jordbårne sygdomme som: *Rhizoctonia, Fusarium, Pythium, Phytophthora*



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# LALSTOP G46 WG

*- Godkendt anvendelse*

## *Gråskimmel - Botrytis*

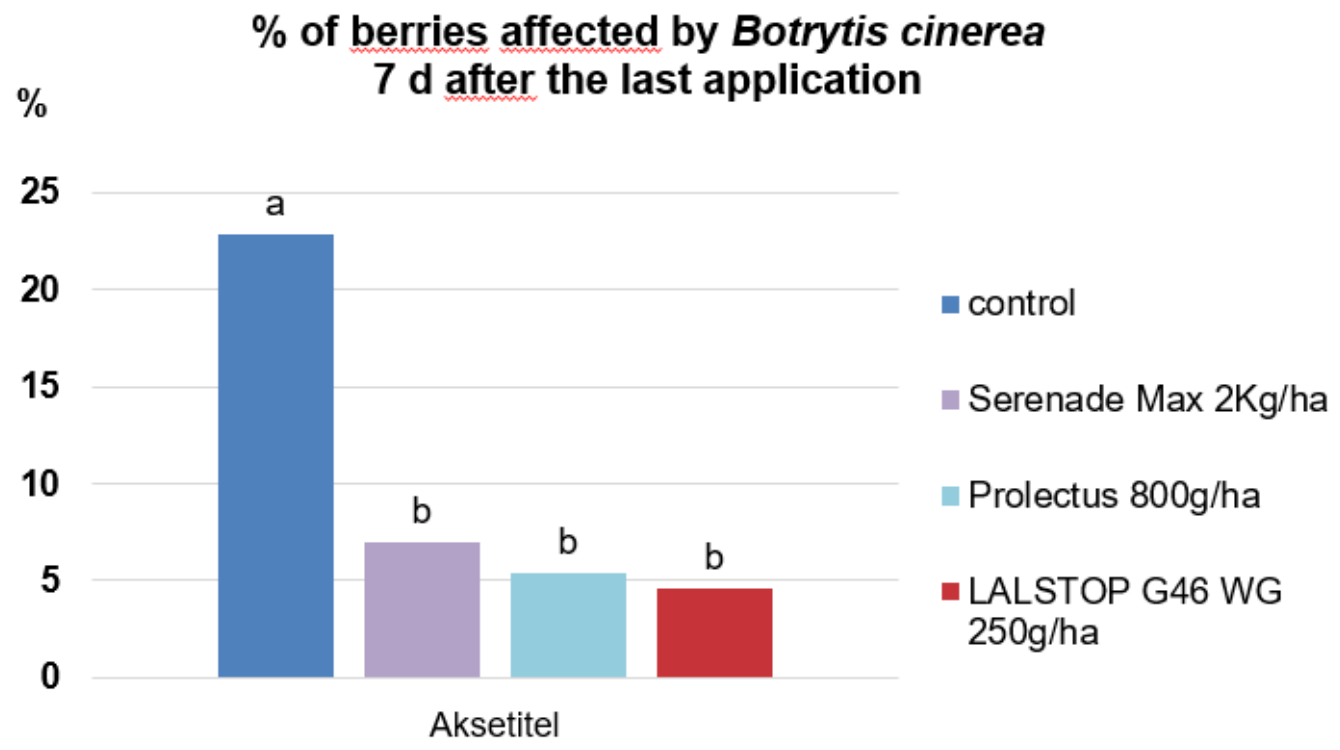
Metode: sprøjtning

| **Afgrøde** | **Tidspunkt for behandling** | **Antal behandlinger per vækstsår el. sæson** |
|---|---|---|
| Jordbær (friland/tunnel) | ballonstadie, begyndende til slut blomstring | 1-4 |
| Jordbær (væksthus) | blomstring | 1-2 |
| Hindbær (friland/tunnel) | blomstring | 1-3 |
| Hindbær (væksthus) | Efter plantning; ved blomstring | 1-4 |



# Decrease in the share (%) of strawberries affected by grey mould (*Botrytis*)

- Promovert, Spain, 2019
- Strawberry variety: Rociera
- « Open » Tunnel
- First application at the beginning of flowering
- Weekly applications for as long as plants were flowering




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# Control of grey mould (*Botrytis*) on strawberry in open field

Finland, 2020
Variety: 'Polka', 2nd year of production
Open field, commercial production

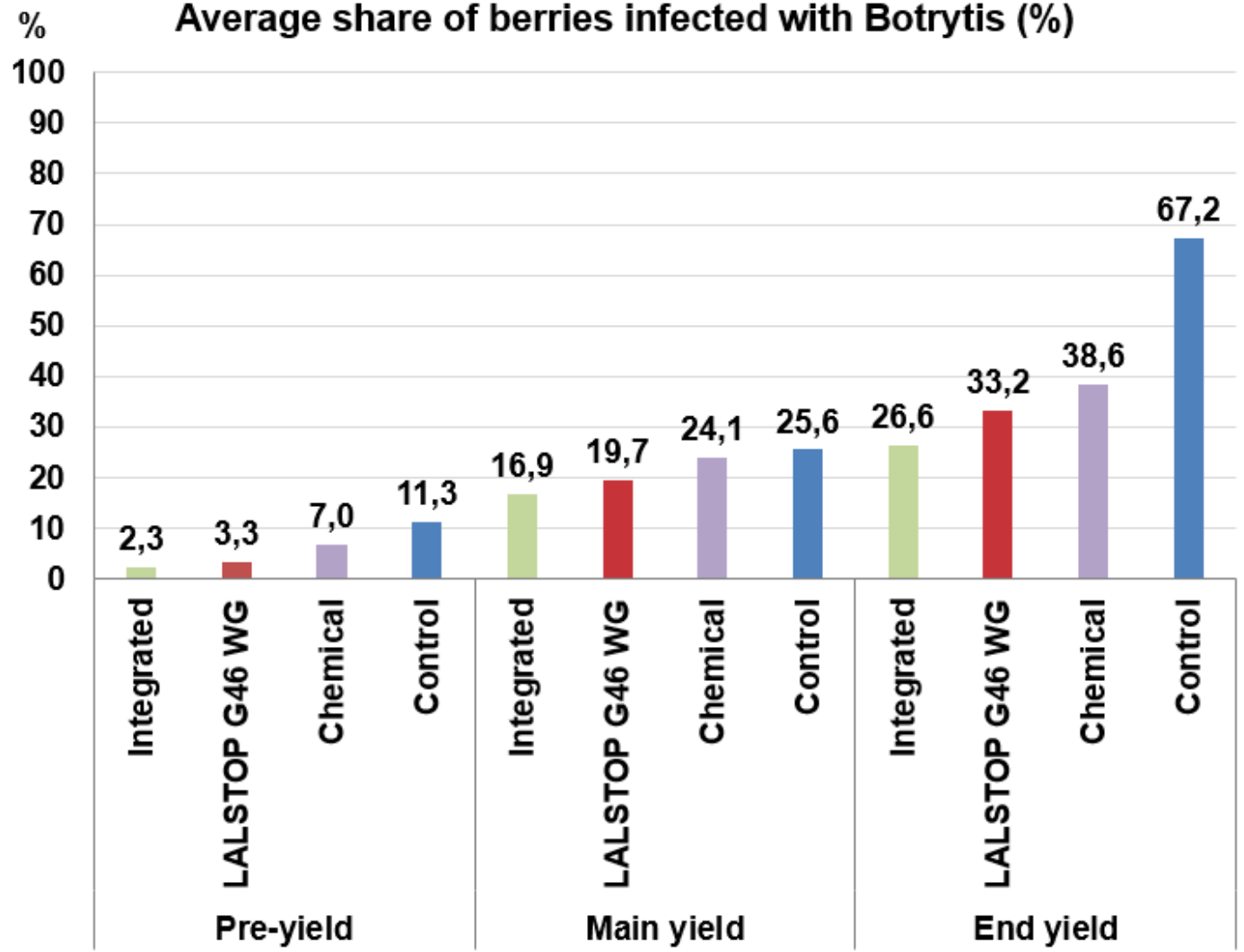
Spraying with a tractor sprayer (Rocha Mittos AC mist blower), 15 bar, spraying volume 400 l/ha

Applications in the beginning of flowering, at main flowering and in the end of flowering:

- Integrated control program: LALSTOP G46 WG 0,3 kg/ha + Frupica + LALSTOP G46 WG 0,3 Kg /ha
- 3 x LALSTOP G46 WG 0,3 kg/ha
- Standard chemical (Frupica)
- Untreated control

- Adjuvant Silwet Gold was added in all product applications

- 4 repetitions
- Observations of berry yield in 3 picking times
  - Healthy and mouldy berries




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# Control of grey mould (*Botrytis*) in organic strawberry production

Finland, 2020
Variety: 'Polka' 1st year of production
Open field, organic production

Spraying with a tractor sprayer (3,5 bar) in the beginning, middle and end of flowering:

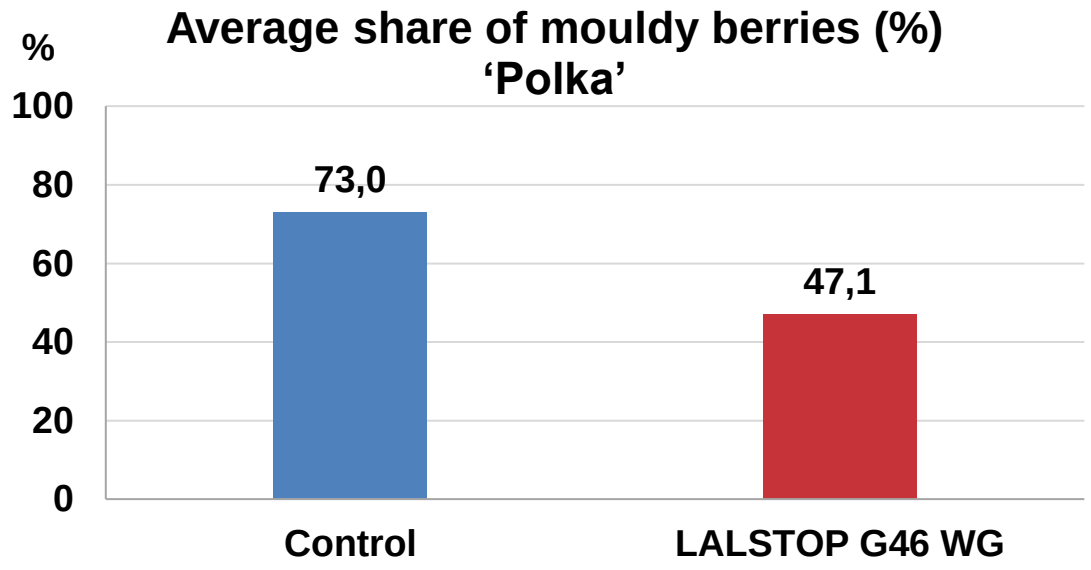
- Control
- LALSTOP G46 WG 0,3 kg/ha (0,05 %, 650 l/ha)

Observations of berries from 4 replicates in the end of picking period

- Healthy/mouldy berries

Excellent *Clonostachys* colonization in the flowers

- *13,9 % of stamens of the untreated control flowers were colonized → bees and other pollinators most probably transported *Clonostachys* from the treated area




| Colonization (%) in stamens after the 2nd spray application | |
|---|---|
| **Treatment** | **Colonized stamens (%)** |
| LALSTOP G46 WG | 95,0 |
| Untreated control | 13,9* |

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# LALSTOP G46 WG

*- Praktisk anvendelse*

Lalstop G46 kan anvendes alene (også til **øko**) eller som led i et **integreret plantebeskyttelsesprogram** hvor det erstatter 1-3 kemiske behandlinger.

Anvend lille dråbestørrelse (f.eks. 50-75 microns) for bedre spredning og fordeling på svært tilgængelige steder.

Anvend forebyggende ved begyndende, midt- og slut blomstring.

Behandl sen eftermiddag/aften for at minimere unødig eksponering for UV-lys.

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## Flying Doctors

- Prestop mix (*Clonostachys rosea*)
- Bragt ud med humle- eller honningbier
- Jordbær og hindbær







# Managing Bees for Delivering Biological Control Agents and Improved Pollination in Berry and Fruit Cultivation

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Over 20 forsøg med Prestop® Mix leveret med honningbier (primært) og humlebier i jordbær på friland i perioden 2006-2014 i Estland, Finland, Italien, Slovenien og Tyrkiet.

| Country | Site | Year | Grey mold proportion[1] Untreated | Fungicide | Biocontrol | F:cide+Bio | % reduction by Biocontrol | Sign. | Citation |
|---|---|---|---|---|---|---|---|---|---|
| **Light mold attack** | | | | | | | | | |
| Turkey | 1 | 2013 | 2.6 | | 0.8 | | 69 | | 1 |
| Turkey | 1 | 2014 | 3.5 | | 0.9 | | 74 | | 1 |
| Estonia | BB 1 | 2012 | 3.9 | | 0.2 | | 95 | | 2 |
| Finland | 3 | 2006 | 5.8 | | 3.2 | | 45 | | 3 |
| Estonia | HB 1 | 2011 | 6.0 | | 3.0 | | 50 | | 2 |
| Finland | 5 | 2007 | 8.5 | | 3.0 | 1.8 | 65 | | 3 |
| Finland | 2 | 2006 | 9.5 | 2.5 | | 0.8 | | | 3 |
| Average | | | 5.7 | 2.5 | 1.8 | 1.3 | 66 | | |
| **Moderate mold attack** | | | | | | | | | |
| Finland | 4 | 2007 | 11.9 | | 7.8 | | 34 | | 3 |
| Finland | 2 | 2007 | 12.0 | 4.0 | 7.0 | 4.2 | 42 | | 3 |
| Estonia | BB 1 | 2013 | 14.5 | | 6.5 | | 55 | | 2 |
| Finland | 3 | 2007 | 17.0 | | 9.1 | | 46 | | 3 |
| Estonia | BB 2 | 2012 | 17.5 | | 5.5 | | 69 | | 2 |
| Slovenia | 1 | 2014 | 19.0 | | 17.0 | | 11 | ns | 4 |
| Finland | 1 | 2009 | 22.1 | 2.6 | 9.6 | 3.3 | 57 | | 3 |
| Estonia | HB 1 | 2012 | 23.0 | | 15.0 | | 35 | | 2 |
| Finland | 3 | 2008 | 24.0 | 9.0 | 8.0 | 3.0 | 67 | | 3 |
| Finland | 3 | 2009 | 24.2 | | 14.9 | | 38 | | 3 |
| Average | | | 18.5 | 5.2 | 10.0 | 3.5 | 45 | | |
| **Heavy mold attack** | | | | | | | | | |
| Finland | 1 | 2007 | 26.3 | 6.0 | 7.8 | 1.0 | 70 | | 3 |
| Finland | 2 | 2009 | 38.5 | | 19.6 | | 49 | | 3 |
| Italy | 1 | 2012 | 39.4 | 25.8 | 13.3 | 10.5 | 66 | | 5 |
| Finland | 2 | 2008 | 40.0 | | 20.0 | | 50 | | 3 |
| Finland | 1 | 2008 | 45.0 | 10.0 | 35.0 | 1.0 | 22 | ns | 3 |
| Estonia | HB 1 | 2010 | 48.0 | | 38.0 | | 21 | ns | 2 |
| Finland | 4 | 2009 | 50.3 | 46.0 | | | | | 3 |
| Slovenia | 1 | 2013 | 55.0 | | 27.0 | | 51 | | 4 |
| Finland | 1 | 2006 | | | 10.5 | 9.0 | | | 3 |
| Average | | | 42.8 | 22.0 | 21.4 | 5.4 | 47 | | |

Citation: 1 = Eken, 2014; 2 = Mänd et al., 2014; 3 = Hokkanen et al., 2014; 4 = Bevk, 2014; 5 = Maccagnani,

- Stort smittetryk (>25% angrebne bær i ubehandlet kontrol), gav Prestop Mix bragt ud med bier i gns. 47% reduktion i forekomsten af gråskimmel (= program med kemi).
- Ved lavt smittetryk: i gns. 66% reduktion sammenlignet med ubehandlet.
- Prestop mix med bier gav en signifikant reduceret forekomst af gråskimmel i 20 ud af 23 markforsøg

Hokkanen *et al.* 2015

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# LALSTOP G46 WG - *Anvendelse*

**1. Sprøjtes på plantens overjordiske dele**
- mod gråskimmel *Botrytis*



**2. Iblandes/sprøjtes på jord**
- mod jordbårne sygdomme som: *Rhizoctonia, Fusarium, Pythium, Phytophthora*



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# LALSTOP G46 WG - *Godkendt anvendelse*

Mod rodsygdomme: *Phytophthora, Pythium, Fusarium, Rhizoctonia*

**Jordbær og hindbær på friland/tunnel og væksthus**

Behandlingsmetoder:

- Dypning ved plantning og udplantning (f.eks. frigo planter)
- Udvanding eller sprøjtning før plantning (småplanter)
- Udvanding, drypvanding eller sprøjtning efter plantning (gentag efter 4 uger)

# Dyp-behandling af jordbærplanter inden plantning

- Hele frigo planten, inkl. rødder og krone, dyppes i en 0,05 % LALSTOP G46 WG opløsning.
- Alternativt: dyp hele bakken i en 0,05 % LALSTOP G46 WG opløsning.
- En hurtig behandling på ca. 1-minuts tid er tilstrækkelig.
- Det har ingen betydning for effekten at opløsningen bliver beskidt.











*Clonostachys* kolonisering af rødder på en jordbær plante efter en hurtig dyp-behandling.

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# LALSTOP G46 WG

Effektiv kolonisering af rødder i forskellige jord og substrat typer:

- Jord på friland, spaghnum, rockwool, perlite mfl.
- Clonostachys rosea er aktiv i min. 4-6 uger efter behandling

Kolonisering af rødder



# LALSTOP G46 WG Control of root diseases on strawberry

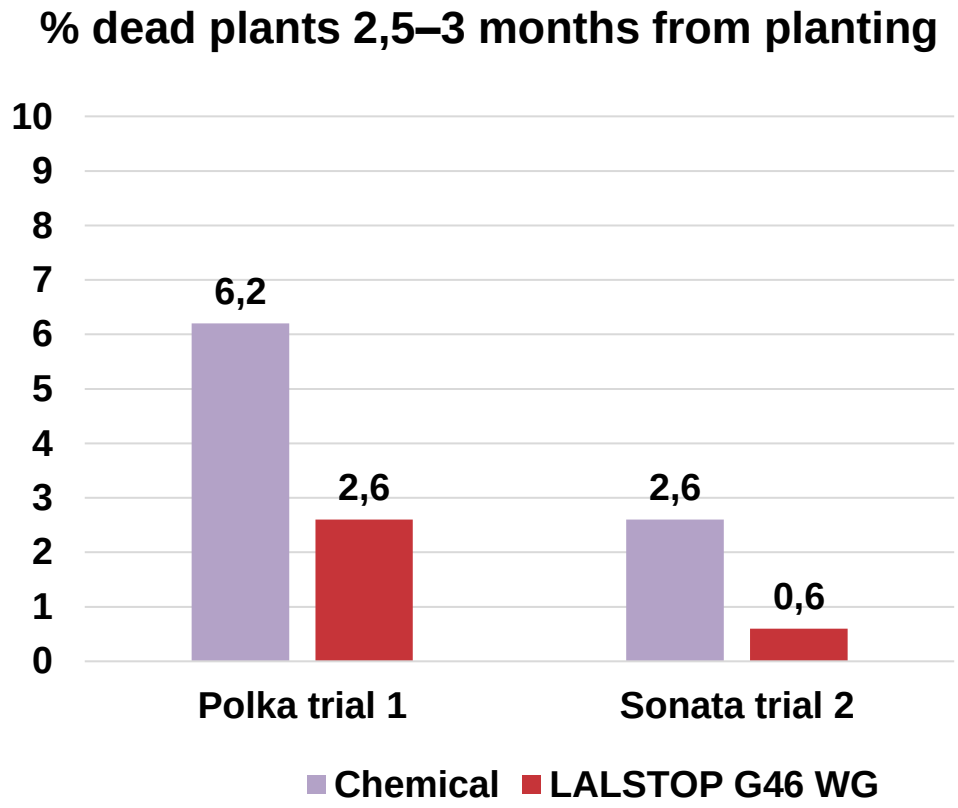
- Commercial farms, Finland 2020
- Open field

- The trials were conducted in cooperation with the Finnish Natural Resources Institute and ProAgria Advisory Services

- Varieties:
  - ‘Polka’ A+ frigo plants
  - ‘Sonata’ A++ frigo plants

- Treatments:
  - LALSTOP G46 WG dipping (0,05 %)
  - Soaking in chemical product (Aliette)

- Pathogen isolations (Eurofins DNA multiscan):
  - ‘Polka’: *Pythium, Pestalotia*
  - ‘Sonata’: *Fusarium, Pythium*, *Rhizoctonia, Verticillium*




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# Control of root diseases on strawberry, mortality of plants during winter period

- Commercial farm, Finland 2020-2021
- Open field

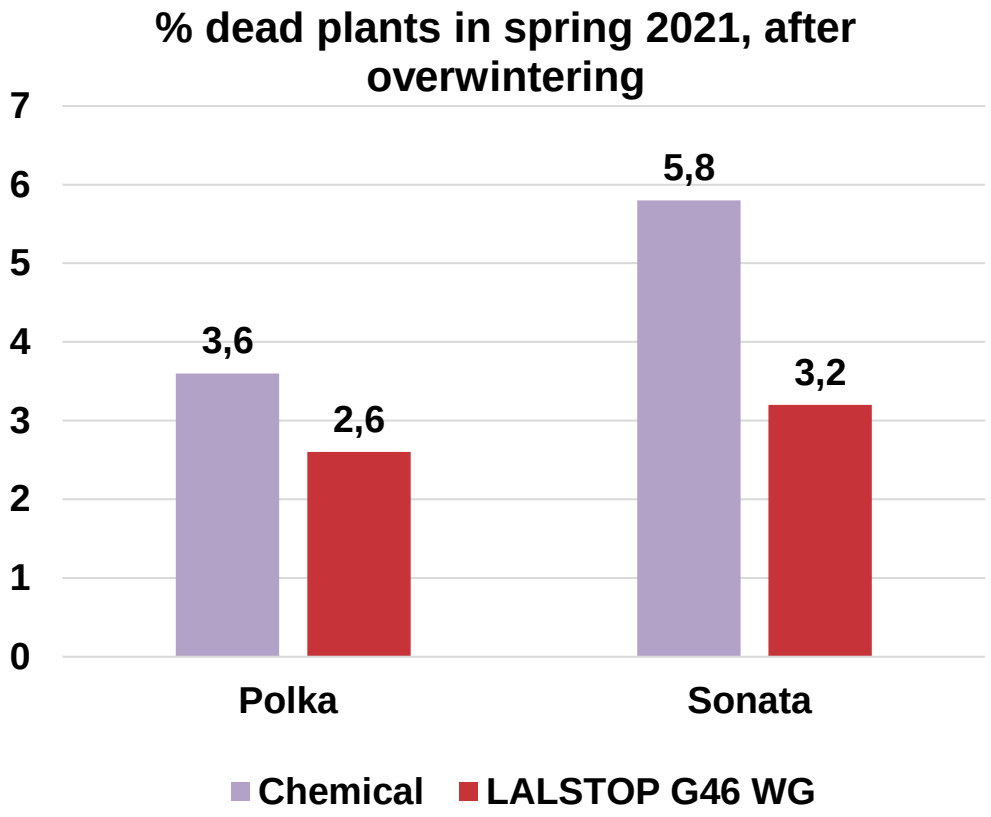
- The trials were conducted in cooperation with the Finnish Natural Resources Institute and ProAgria advisory services

- Varieties:
  - ‘Polka’ A frigo plants
  - ‘Sonata’ A++ frigo plants

- Treatments at planting in spring 2020
  - LALSTOP G46 WG dipping (0,05 %)
  - Soaking in chemical product (Aliette)

- Mortality of the plants was observed in spring 2021

- Pathogen isolations (Eurofins DNA multiscan):
  - ‘Polka’: *Pestalotia, Verticillium, Fusarium*
  - ‘Sonata’: *Fusarium, Pythium*, *Rhizoctonia*




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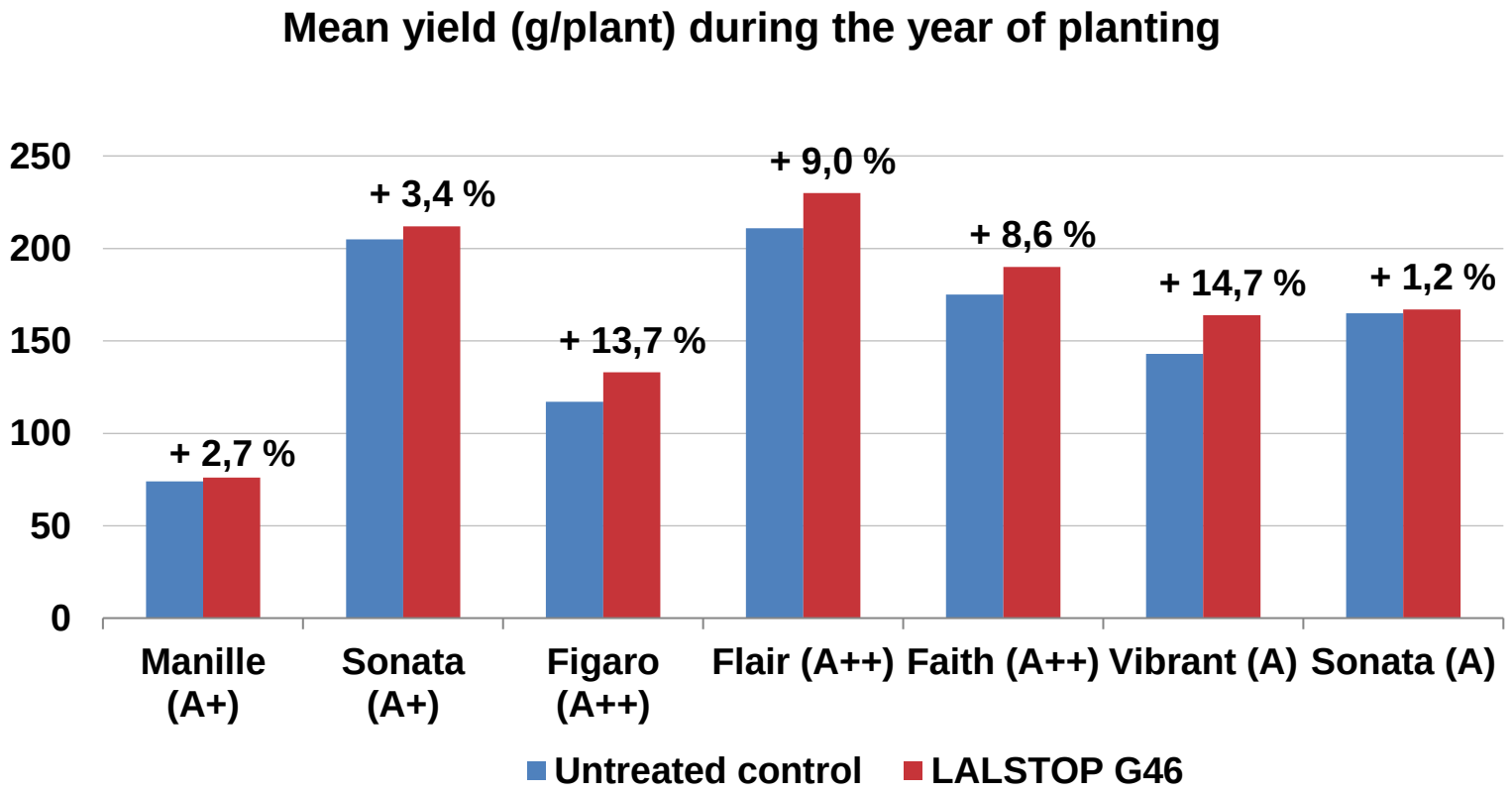
# Control of root diseases on strawberry, effect in yield

- Commercial farm, Estonia 2017
- Open field

- The trials were conducted in cooperation with the Estonian University of Life Sciences

- 6 different varieties in the trial

- Treatments:
  - LALSTOP G46 dipping
  - Untreated control




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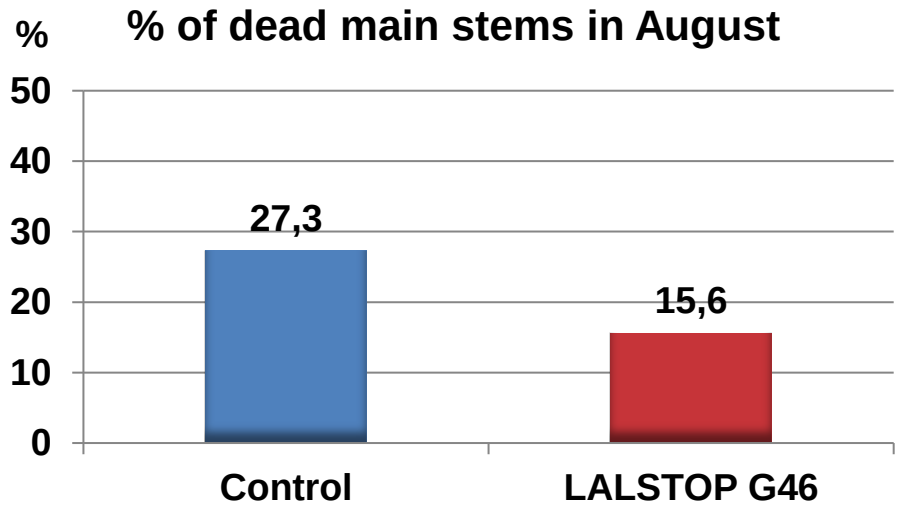
# Control of root diseases on raspberry

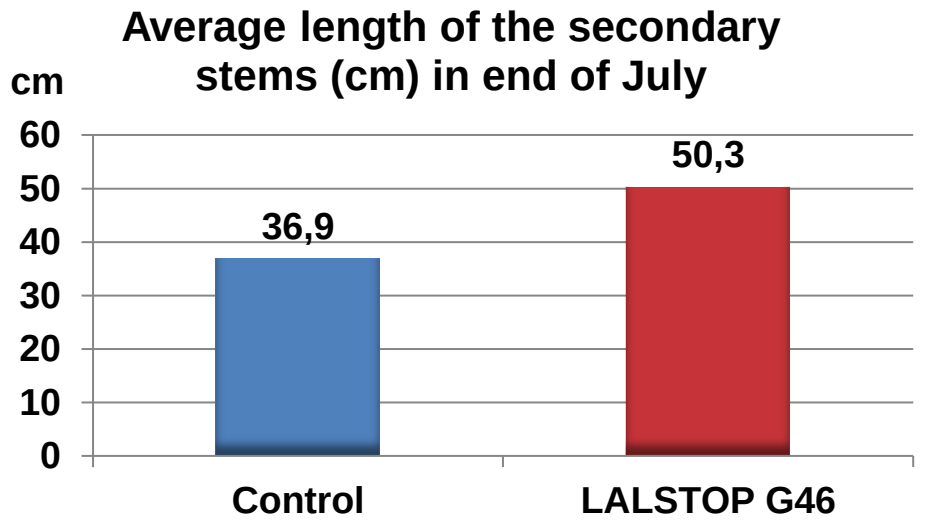
- Finland, 2014
- Commercial production
- Tunnel production

- Variety ‘Glen Ample’

- Treatments:
  - Untreated control
  - LALSTOP G46
    - At planting by drenching
    - 1 month after planting through drip irrigation

- *Phytophthora rubi* and *Fusarium* were isolated from diseased plants




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# LALSTOP G46 WG - i en IPM strategi

| FUNGICIDES | | | |
|---|---|---|---|
| ACTIVE INGREDIENT | RECOMM. INTERVAL (DAYS) | ACTIVE INGREDIENT | RECOMM. INTERVAL (DAYS) |
| Ametoctradin + Dimethomorph | 0 | Mancozeb | 4 |
| Azoxystrobin | 2 | Mepanipyrim | 0 |
| Azoxystrobin + Difenoconazole | 7 | Metalaxyl-M | 2 |
| Benomyl | 4 | Monopotassium phosphonate + Dipotassium phosphonate | 2 |
| Bitertanol | 2 | Myclobutanil | 0 |
| Boscalid + Kresoxim-methyl | 0 | Myclobutanil + Cyclohexanone | 0 |
| Bupirimate | 0 | Myclobutanil + Quinoxyfen | 1 |
| Carboxin | 4 | Penconazole | 1 |
| Cold pressed orange oil + Aromatic Hydrocarbons + Alcohol Ethoxylate | 2 | Potassium bicarbonate | 0 |
| Copper oxychloride | 0 | Potassium iodide + Potassium thiocyanate + Addit (Adjuvant) | 2** |
| Cyazofamid | 1 | Prochloraz | 7 |
| Cyflufenamid | 0 | Procymidone | 0 |
| Cymoxanil | 0 | Propamocarb-HCl | 0 |
| Cymoxanil + Zoxamide | 1 | Propiconazole + Prochloraz | 7 |
| Difenoconazole | 7 | Proquinazid + Tetraconazol | 0 |
| Dithianon | 1 | Pyraclostrobin + Boscalid | 2 |
| Dodemorph-acetate | 0 | Pyrimethanil | 1 |
| Fenhexamid | 0 | Pyriofenone | 3 |
| Fludioxonil | 4 | Quinoxyfen | 0 |
| Fludioxonil + Cyprodinil | 4 | Spiroxamine + Difenoconazole | 7 |
| Fluopicolide + Propamocarb HCl | 1 | Sulphur | 1 |
| Fluopyram | 0 (1)* | Sulphur + Sodium hydroxide | 4 |
| Fluxapyroxad | 0 | Tetraconazole | 3 |
| Folpet + Dimethomorph | 7 | Thiabendazole | 4 |
| Fosetyl + Propamocarb | 0 | Tiophanate-methyl | 2 |

Husk: det er en levende mikroorgansime!

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# LALGUARD M52 GR - *Biopesticid*

- Aktiv mikroorganisme: *Metarhizium brunneum* stamme F52.
- Koncentration: 9 x $10^8$ CFU/g.
- Pakkestørrelse: 1kg og 10kg (i en vakuumpakket pose for længere holdbarhed).
- Formulering: Granulat, sporer på riskorn.
- Opbevaring og holdbarhed: 12 mdr ved ≤20°C, 18 mdr ved 4°C.






**Tidligere Met52 fra Novozymes**

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# LALGUARD M52 GR - Godkendelse

## BRUGSANVISNING

| Afgrøde | Skadegører | Dosering |
|---|---|---|
| Jordbær, på friland og i væksthus<br>Solbær, ribs, blåbær og stikkelsbær<br>Hindbær, brombær | Larver af væksthussnudebiller *(Otiorhynchus sulcatus)* | 0,5 kg pr $m^3$ vækstmedie, iblandet før potning/plantning |
| Prydplanter, i væksthus og på friland<br>Planteskolekulturer | | 100 kg pr ha Indarbejdes i rækker/bede før såning/plantning |

Samt godkendelse til **mindre anvendelse mod trip** i jordbær, bær etc på friland og i væksthuse. (mod jordboende puppestadier af trips)

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# LALGUARD M52 GR

*- Hvordan virker det*

Når et insekt får sporer på sig, vil svampen begynde at spire ind gennem dets hud. Gradvist nedbrydes de indre organerne og larven dør efter 5-7 dage ved 20º C. Efterfølgende udvikles der ofte hvide og olivengrønne sporebelægninger udenpå insektet. Det er Metarhizium-svampens sporer der opformeres og medvirker til en fornyet smitte-effekt i jorden.



Foto: Swansea university

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# LALGUARD M52 GR

*- Anvendelse*

**Væksthuse/tunnel:**

- Lalguard M52 GR skal indarbejdes i dyrkningsmediet før potning eller udplantning.
- Bland grundigt. Anvend inden for 30 dage.
- Når planterne ompottes til større potter, bør det nye vækstmedie, som de plantes i, også behandles for at sikre god kontrol.









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# LALGUARD M52 GR

*- Anvendelse*

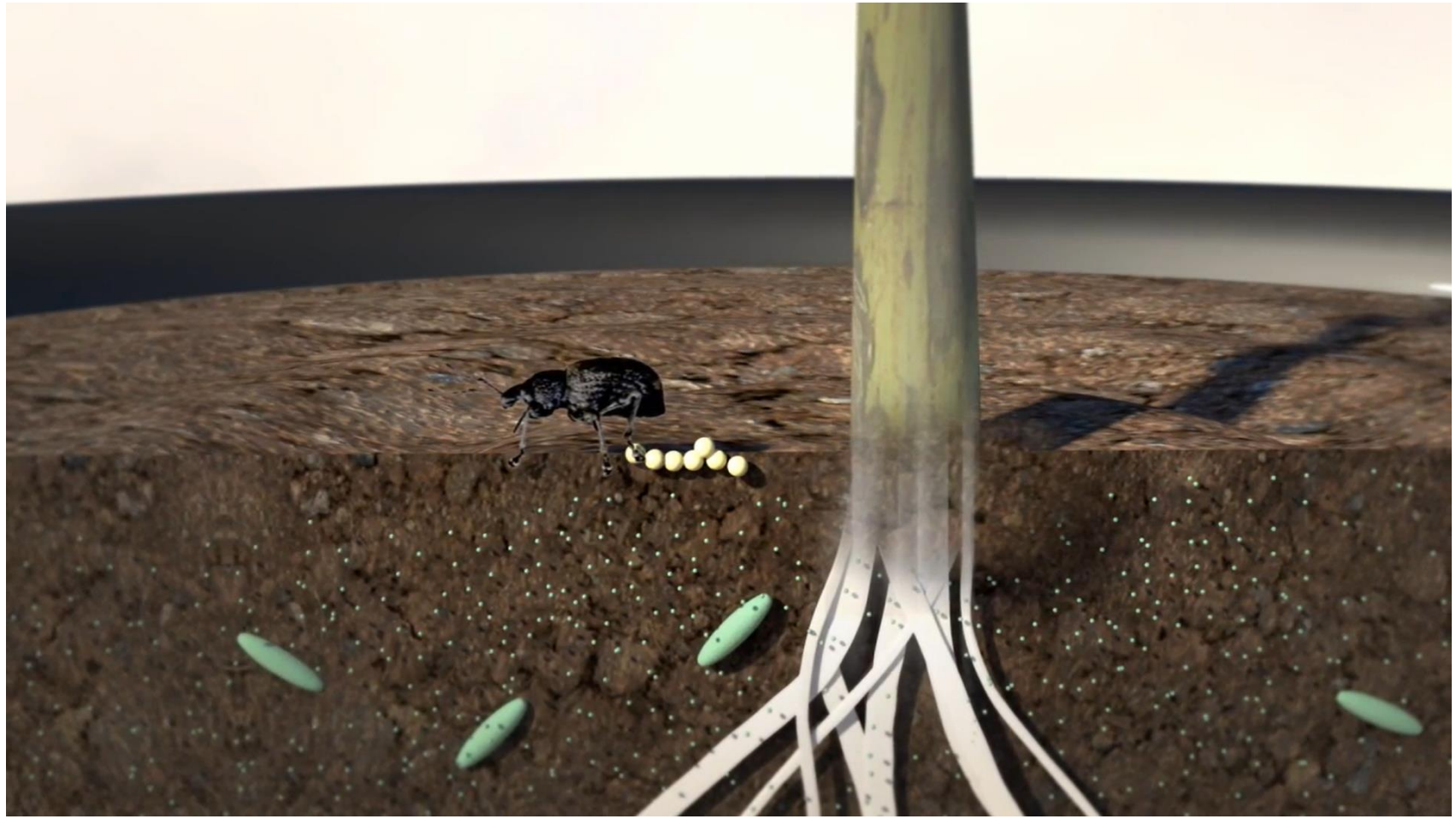
**Friland:**

- Indarbejdes i rækker/bede før såning/plantning.
- LALGUARD M52 GR blandes med jord/substrat og herefter inkorporeres denne jord/substrat lidt i muldjorden eller lægges som topping på jorden i marken.
- Dette kan gøres enten manuelt eller med forskelligt mekanisk udstyr f.eks. såmaskiner eller såmaskiner med monterede skiver til at inkorporere den behandlede jord/substrat i jorden.



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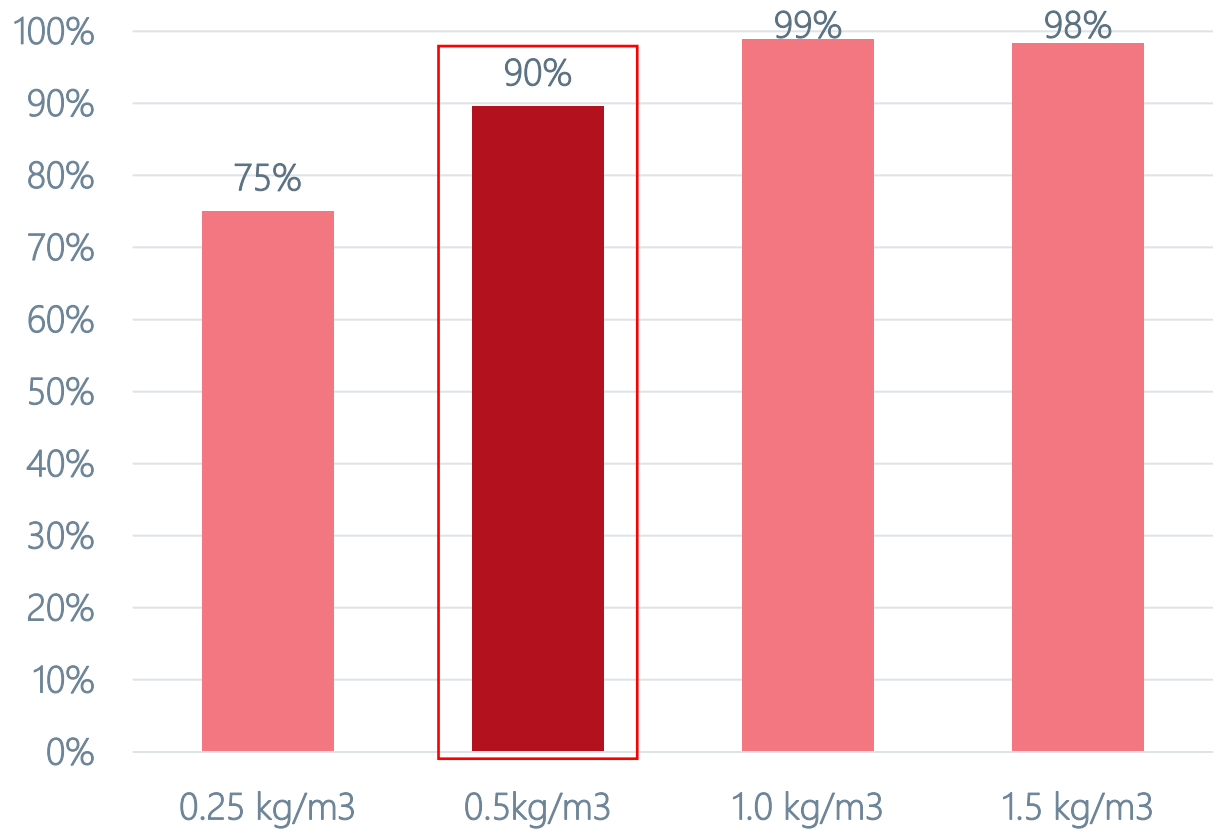


# LALGUARD M52 GR RATE RESPONSE ON BVW

BVW = Black Vine Weevil
= Øresnudebille

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## 0.5 kg m$^3$ showed to be efficient enough rate to control BVW




18 Trials run from 2005 -2009

| | |
|---|---|
| Netherlands | 5 |
| Italy | 4 |
| France | 4 |
| UK | 4 |
| Germany | 1 |

| | |
|---|---|
| Ornamentals | 13 |
| Soft fruits (Berries | 4 |
| Grapes | 1 |

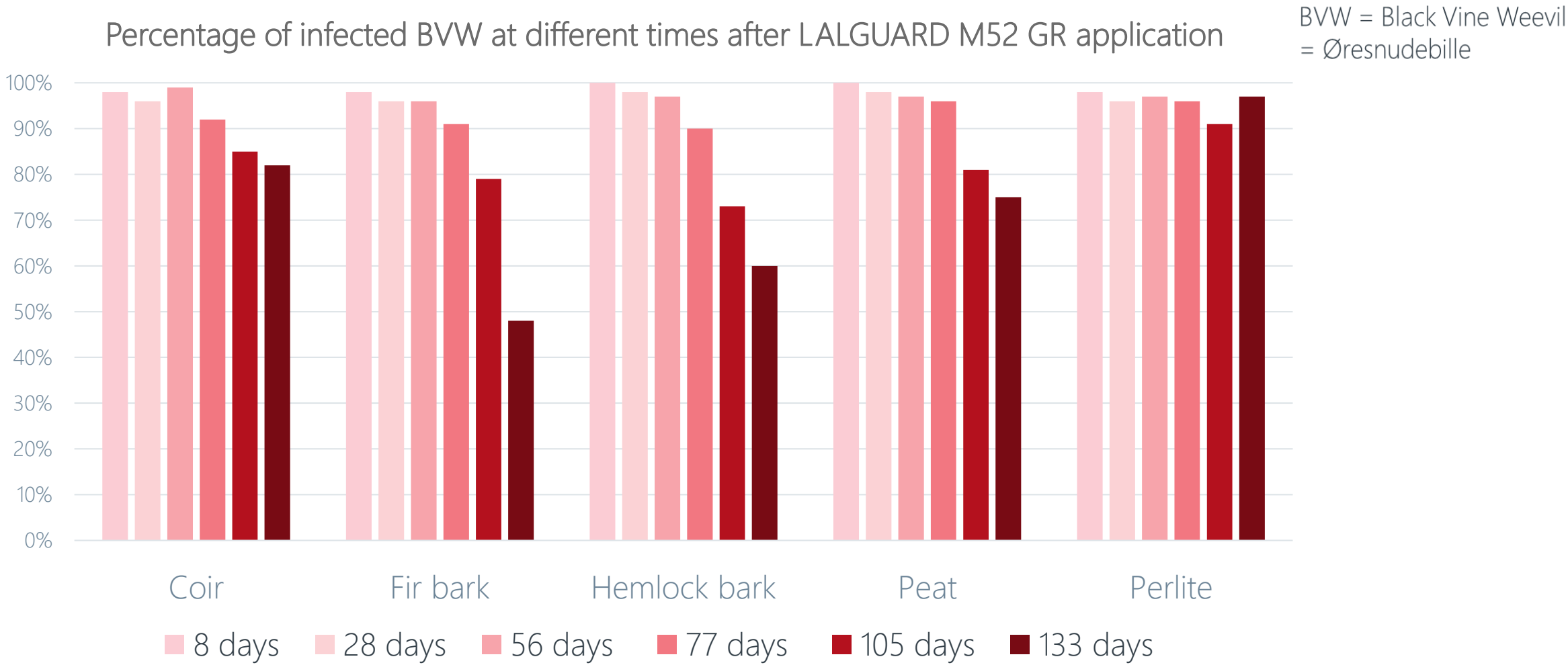
Source: BAD Met52 Gran 2021-09-14. Table IIIM 6.1.3-5 Summary of effectiveness field trials

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# LALGUARD M52 GR PRODUCT DESCRIPTION

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## LALGUARD M52 GR effectiveness can last up to 130 days after substrate treatment




(Bruck (2006). J. Environ. Hort. 24(2):91–94)

# HAS COMPARABLE EFFICACY WITH CHEMICALS





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8 Efficacy trials: LALGUARD M52$^{GR}$ 58% to 100% vs Chemicals 43% to 100%

| Crop | Situation | Region | Application | Product | Rate | Efficacy |
|---|---|---|---|---|---|---|
| Strawberry | Unprotected pots | UK (July-Nov) | Soil incorporation at plant<br>Drench | M52 GR | 0.5 kg/m$^3$ | 83% |
| | | | | Cyren* | 2L/ha (1000L) | 100% |
| Strawberry<br>Trial 1: Sandy loam soil*<br>Trial 2: Clay loam soil** | Field-grown | UK (June-Oct) | Soil incorporation at plant<br><br>Drench | M52 GR | 110 kg/ha | 89%*, 72%** |
| | | | | Cyren * | 2 L/ha (1000L) | 94% |
| Grape | Unprotected pots | France (March-July) | Soil incorporation at plant<br>Drench | M52 GR | 0.5 kg/m$^3$ | 100% |
| | | | | Suxon Vert MG* | 1 kg/m$^3$ | 100% |
| Ornamental<br>Trial 1: Lawsons Cypress<br>Trial 2: Sweet bay*<br>Trial 3: Rhododendrons**<br>Trial 4: Oregon Cypress♣ | Unprotected pots | Italy (March-July)<br>Italy (March-July)<br>France (Aug-Oct)<br>Germany (Sept-Oct) | Soil incorporation at plant<br><br>Spray growing media | M52 GR | 0.5 kg/m$^3$ | 100%; 100%*, 100%**, 90%♣ |
| | | | | Suxon Vert MG* | 1 kg/m$^3$ | 100%; 100%*, 100%** 43%♣ |
| | | | | Reldan 22* | 0.2L/hL | 75%; *100% |
| | | | | Thiacloprid | 5L/hL | 87%♣ |

* chlorpyriphos-ethyl no longer authorize in EU and NA

# PRODUCT USE RECOMMENDATIONS



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## LALGUARD M52$^{GR}$ is compatible with most beneficial insects in the soil

| Species | Exposure of F52 | Mortality vs non treated |
|---|---|---|
| Entonem nematode (Steinernema feltiae) | 2 x $10^9$ CFU/g. 14 days of exposure | 0% |
| Rove beetle (*Dalotia coriaria*)[4] | 5x$10^6$ conidia /g of soil. 12 days of exposure | 5% |
| Hypoaspis mites (*Stratiolaelaps scimitus*)[2] | 1x$10^5$ conidia /g of soil. 12 days of exposure | 18% |
| Gaeolaelaps Mite (*Gaeolaelaps gillespie*)[2] | 1x$10^5$ conidia /g. 12 days of exposure | 28% |
| Gaeolaelaps Mite (*Gaeolaelaps aculeifer)*[4][6] | 5 × $10^6$ conidia/g of soil(4), 2.2×$10^6$<br>12 days exposure | <5%[4], and 0%[5] |
| Earthworm *(Lumbricus terrestris*)[1] | (>1000 mg kg-1 dry soil). 14 days of exposure | No mortality observed |

[1]US Environmental Protection Agency . Office of Pesticide Programs BIOPESTICIDES REGISTRATION ACTION DOCUMENT Metarhizium anisopliae strain F52 (PC Code 029056)

[2]Taro Saito. Biological Control Volume 92, January 2016, Pages 92-100

[5]Met52 EC Application guide. 2017.

[5] L. Reinbacher, 2020. Standard non-target tests for risk assessment of plant protection products are unsuitable for entomopathogenic fungi—aproposal for a new protocol. Journal of Soils and Sediments (2021) 21:2357–2368

(4)A.G.C.de AzevedoJ. 2019. Non-target effects of Metarhizium brunneum (BIPESCO 5/F 52) in soil show that this fungus varies between being compatible with, or moderately harmful to, four predatory arthropods. Department of Plant and Environmental Science, University of Copenhagen, 1871 Frederiksberg C, Denmark
https://www.sciencedirect.com/science/article/abs/pii/S1049964419300192

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## LALGUARD M52 GR is compatible with most fungicides

### Application guidance / fungicide compatibility

- Do not apply LALGUARD M52 GR mixed with fungicides
- Compatible fungicides. Apply after planting.
- Non-compatible fungicides. Apply in a minimum of 7-day rotational program
- Microbial fungicides need mores testing

| Fungicide | Compatibility |
|---|---|
| Azoxystrobin | Compatible |
| Dimethomorph | Compatible |
| Etridiazole | Compatible |
| Fludioxinil + mefanox. | Compatible |
| Fludioxanil | Compatible |
| Fosetyl-Al | Compatible |
| Iprodione | Compatible |
| Mefanoxam | Compatible |
| Phosphorus acids / K-salts | Compatible |
| Propamocarb | Compatible |
| Pyraclostraobin | Compatible |
| Quintozene | Compatible |
| Thiophanate-methyl | Compatible |
| Triflozystrobin | Compatible |
| Triflumizole | Not compatible |
| Captan | Not compatible |

** Bruck DJ (2009) Impact of fungicides onMetarhizium anisopliaein the rhizosphere, bulk soil and in vitro. BioControl (2009) 54:597–606*

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# Botanigard 22WP *- biopesticid*




Aktiv mikroorganisme: *Beauveria bassiana – insektpatogen svamp.*

Godkendt til mindre anvendelse mod mellus på jordbær på friland

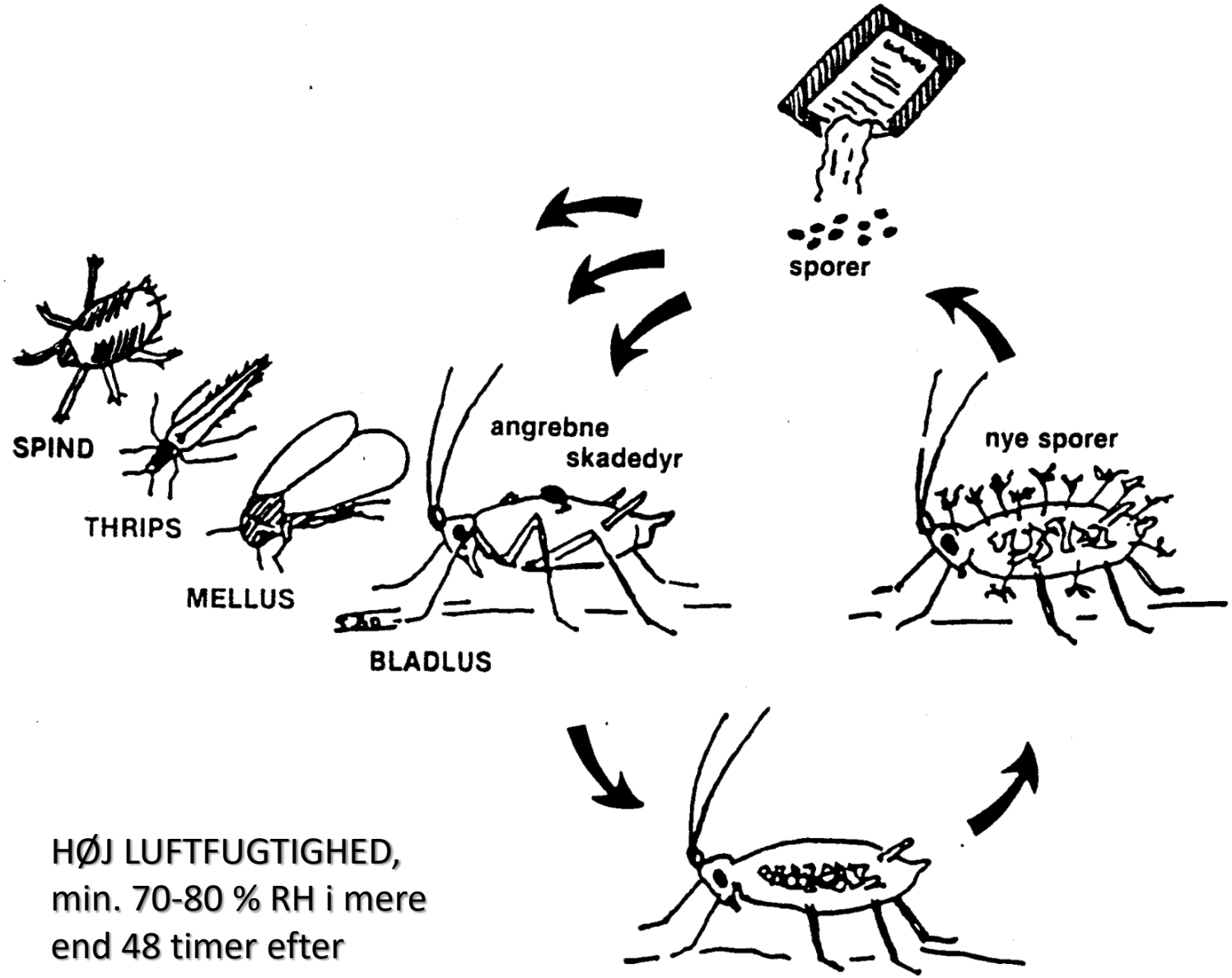
*Afgrøde, skadevolder, dosering, antal behandlinger, interval, behandlingspunkt og sprøjtefrist*

| Afgrøde | Skadevolder | Dosering pr. behandling | Antal behandlinger (interval) | Behandlings-tidspunkt /vækststadier | PHI |
|---|---|---|---|---|---|
| Jordbær | Mellus | 0,0625 % (62,5 g middel pr. 100 liter vand) | 3-12 (5-7) | BBCH 10-59 og BBCH 70-97 | 1 dag |

Må ikke anvendes i blomstrende afgrøder

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HØJ LUFTFUGTIGHED,
min. 70-80 % RH i mere end 48 timer efter behandling

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# Botanigard *- anvendelse*

- Effektivt overfor mellus (larvestadier).
- Kræver høj luftfugtighed for at virke.
- Behandl om aftenen – højere luftfugtighed og ikke skadeligt UV-lys.
- Start behandlinger ved begyndende angreb. Når temperaturen tillader det >18 ºC.
- Foretag hyppige behandlinger for at sikre nok sporer på de behandlede plantedele, samt ramme nye mellus. Min 2-3 behandlinger med 5 dages mellemrum.

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# Tak for opmærksomheden

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