

Nya betningsmedel mot jordburna svampsjukdomar i sockerbeter

**New seed treatments against soil borne fungi
in sugar beet**

2007

SBU Projektkod 2007-1-2-487

**SBU Sockernäringsens BetodlingsUtveckling AB är ett
kunskapsföretag som bedriver försöks- och odlings-
utveckling i sockerbeter för svensk sockernäring.**

SBU ägs till lika delar av Danisco Sugar och Betodlarna.

Kontaktperson:

Åsa Olsson

tel +46 (0)709 53 72 62

asa.olsson@danisco.com

Borgeby Slottsväg 11, 237 91 Bjärred

Nya betningsmedel mot jordburna svampsjukdomar i sockerbetor 2007

Sammanfattning

Syftet med denna försöksserie var att prova effekten på rotbrandssvampar av två doser hymexazol, 18 och 30 g. Resultaten jämförs med den svenska standardbetningen 14 g hymexazol.

Svampbetning bidrar till att behålla ett jämnt och tillräckligt högt plantantal på infekterade fält. Doserna 18 g och 30 g hymexazol ger ett något längre skydd mot *A. cochlioides* än standarddosen 14 g.

I genomsnitt över 12 försök 2004-2007 gav svampbetning ett merutbyte på ca 3-4 procentenheter. Även kvalitetsparametrarna förbättras av svampbetning, K+Na var signifikant lägre i svampbetade led, medan blåtalet visade en tendens att vara lägre i svampbetade led.

I försöksserien jämfördes också 6 g fludioxonil och 10 g tolylfluanid som komplement till 14 g hymexazol. Det genomsnittliga plantantalet, sundhet och radtäckning (3 försök 2007) var inte signifikant skilda åt mellan 6 g fludioxonil och 10 g tolylfluanid. På en av försöksplatserna, Kvistofta, var sjukdomsindex signifikant lägre i ledet med 10 g tolylfluanid jämfört med för 6 g fludioxonil. Då sjukdomsindex även var lågt i kontrollen, samtidigt som plantantalet var lågt både i kontrollen, 6 g fludioxonil och 10 g tolylfluanid, kan resultatet möjligen tolkas utifrån rotbrandsangrepp orsakade av *Pythium* spp. Denna svamp angriper det groende fröet och fröplantan kommer aldrig upp, därav det låga plantantalet. Fludioxonil har troligen något bättre effekt på *Pythium* spp. än tolylfluanid.

Summary

The purpose of this investigation was to compare the effect on soil borne fungi of two different doses of hymexazol, 18 and 30 g. The results were compared with the standard dose of hymexazol, 14 g.

Seed treatment with hymexazol protects the sugar beet seedlings during early growth against *A. cochlioides* and maintains a high and even plant number also on fields with a high risk of infection. The two higher doses of hymexazol, 18 and 30 g, provides a somewhat longer protection to the sugar beet seedlings than the dose 14 g.

The average sugar yield in 12 trials 2004-2007 was significantly higher (3-4%) for the fungicide treatments compared to the untreated control. Also the quality parameter K+Na was significantly lower than in the untreated control. There was also a tendency that the amino-N value for the seed treatments was lower than in the untreated control.

As a complement to the standard treatment 14 g hymexazol, 6 g fludioxonil and 10 g tolylfluanid was also compared in the trials.

The average plant number, vigour and row coverage (three trials 2007) in the treatments with 6 g fludioxonil (treatment 2) and 10 g tolyfluanid (treatment 5) were not significantly different. At one location, Kvistofta, the disease severity index for 10 g tolyfluanid was significantly lower than for 6 g fludioxonil. Because of the low disease severity index also in the control, pre-emergence damping off caused by *Pythium* spp. may explain the difference between the seed treatments, with fludioxonil being more effective than tolyfluanid against *Pythium* spp.

Introduction

A number of soil borne fungi may cause substantial damage in sugar beet fields. One of the most important fungi in Sweden is *Aphanomyces cochlioides*. Particularly in warm and wet soils, *A. cochlioides* infect young seedlings two to three weeks after emergence. The hypocotyl (region between root and cotyledons) rots and the seedling dies. Early seedling infections of *A. cochlioides* can result in low plant numbers in the field. The disease also exists in a chronic form that appear later in the growing season, often following periods with heavy rains. The symptoms of this stage of the disease are a general reduction of the growth and often a severely and typically deformed tap roots.



Picture 1. Beets with severe symptoms of chronic root rot caused by *A. cochlioides*. Location Kvistofta 2007.

Another soil borne fungus is *Pythium* spp. (preemergence damping-off). *Pythium* spp. attack young seedlings within the first week after emergence. Recent inventories in Sweden have indicated that *Pythium* spp. is less common than *A. cochlioides* (L. Persson, SBU, pers. comm.).

It is important to protect the seedlings during emergence by treating the seed with hymexazol, the active ingredient of Tachigaren. The standard dose used on all seed in Sweden is 14 g. The seed treatment remains effective for four to six weeks. On highly infested fields it is important to use a tolerant variety in combination with hymexazol.

Hymexazol is the only registered product that is effective against *A. cochlioides*. On all commercially sold sugar beet seed in Sweden, Tachigaren has previously been combined with 10 g Euparen to obtain a broad spectrum protection of the seedlings to several soil

borne fungi. However, the registration for Euparen in Sweden was withdrawn during 2007 because harmful metabolites were suspected to form in the soil. Euparen was therefore exchanged with 6 g fludioxonil, the active ingredient in Maxim tech, in this trial. In treatment five, the original combination of 14 g Tachigaren and 10 Euparen was included for comparison.

Fludioxonil is a broad spectrum, non systemic fungicide with effect against several soil borne fungi such as some *Fusarium* spp., *Rhizoctonia* and *Sclerotinia* (Olaya and Barnard, 1994; Mueller et al., 1999; Munkvold and O'Mara 2002; Dorrance et al., 2003; Broders et al., 2007).

Material and methods

In late autumn 2006, soil samples were taken from a number of different locations in the south of Sweden. The soil samples were analysed for infestation level of soil borne fungi. The soil tests were carried out by Syngenta Crop Protection (Maria Nihlgård). Sugar beet seeds were sown in pots with test soil and then put in greenhouse under conditions favourable for infection. The seedlings were evaluated every week for symptoms of damping-off (dead seedlings were removed from the pots). A soil index was then calculated according to the method by Ewaldz (1993):

$$\text{Index} = (3 * as_7 + 3 * (as_{14} - as_7) + (as_{21} - as_{14}) + 0,5 * (as_{28} - as_{21}))/3$$

where as = number of attacked seedlings at 7, 14, 21 and 28 days.

This method focuses mainly on early and predominantly lethal attacks and the number of infected plants during the first two weeks is given higher weight in the calculation of soil index. Attacks that occur at a later stage in the seedlings development are regarded as less important since the plants often survive. The evaluation of the risk of damping-off (soil index 0–100) is shown in table 1. The soil test also indicates the most common fungi on each location. Three trial locations were chosen on the basis of the result from the soil tests. The results of the analyses of soil type on each locality are shown in appendix 3.

Table 1. The risk of infection in soils analysed for Ewaldz (1993) index

Index	Risk	Evaluation
0 – 20	No risk	-
20 – 40	Low	Normally no problems
40 – 70	Medium	Growing sugar beets could be hazardous
70 – 100	High	Under favourable conditions, damping-off is highly likely

This trial series included five seed treatments that were compared in three field trials and one experiment in controlled green house conditions.

The field trials were drilled on three locations (Kvistofta in the north west of Skåne, Skiberöd in the central part of Skåne and Skurup in the south of Skåne). The trial design was a randomized complete block design with four replications. To be able to remove plants for analyses, an extra sample area was sown adjacent to the original plot.

Plant number

The number of plants in each plot was counted three times during emergence (20%, 50% maximum and finally after inter-row cultivation (full emergence)). The results are shown in appendix 6.

Plant vigour and row coverage

Plant vigour was evaluated once in each trial using a scale from 0 to 100 where values below 50 indicate plants in severely reduced growth (50% yield reduction), 50–79 indicates somewhat reduced growth that probably will affect yield. Values between 80 and 90 indicates that the plants only show minor damage that seldom has any effect on yield and values above 90 are nearly healthy plants.

Row coverage is measured as the distance (cm) not covered by the beet leaves in the harvest rows. The percentage of row cover was then calculated. The results on plant vigour and row coverage are shown in appendix 7.

Disease severity index

Evaluation of disease severity index was performed twice in early spring. The first evaluation took place when the plants had just developed cotyledons and the second evaluation two weeks later. In the sample area 20 randomly chosen plants were dug up and each plant was evaluated for symptoms of damping-off and classified into one of six groups: 0 (healthy), 10, 25, 50, 75 and 100% (roots totally rotten, plant dead). A disease index (DSI) was calculated using the following equation developed by Larsson and Gerhardson (1990):

$$\text{DSI} = ((n_0 * 0 + n_{20} * 20 + n_{50} * 50 + n_{75} * 75 + n_{100} * 100) / \text{plant number})$$

where n = number of beets in each class.

The plants were also weighed and average plant weight calculated. The results are shown in appendix 8. Pieces of roots were put on agar plates and fungi were determined to genera and species based on morphology. A summary over 12 trials is shown in appendix 9 (DSI1 and 2, plant weight, plant number).

Harvest

After harvest, the beets in each plot were evaluated for symptoms of chronic root rot using a scale from 1 – 7 (table 1, appendix 8). The evaluation of chronic root rot was carried out at the central tare house in Örtofta (Agri Provtvätt, Örtofta Sockerbruk, Danisco Sugar).

Table 1. Evaluation of chronic symptoms of root rot

1 = Weak symptoms on max. 25% of the beets
2 = Weak symptoms on max. 50% of the beets
3 = Weak symptoms on max. 75% of the beets
4 = Strong symptoms on 25% of the beets
5 = Strong symptoms on 50% of the beets
6 = Strong symptoms on 75% of the beets
7 = Severe symptoms on all beets

Green house experiment

Soil was collected from a field naturally infested with soil borne fungi. The soil was divided between six pots per treatment and replication and put in a green house in a randomized complete block design. Ten seeds of the variety Sapporo were sown in each pot. The pots were checked daily for any dying sugar beet plants. After four weeks all remaining plants were washed from soil and inspected for symptoms of root rot. A DSI was calculated according to Larsson and Gerhardson (1990). The results are shown in appendix 10.

Statistical analyses

All variables were analyzed using Proc GLM in SAS, SAS Institute Inc. All shown treatment means are adjusted means (LSmeans) unless otherwise stated. In case of no missing values in the data set, LSmeans are equal to the arithmetic means.

Results and discussion

The results from the soil tests taken the autumn before drilling showed that *A. cochlioides* and *Pythium* occurred on all of the trial locations (appendix 4). The highest soil index was found on Skiberöd (93) and Kvistofta (79). The soil index was 63 on Svenstorp. Isolations of fungi from plants collected in the field showed that *A. cochlioides* was present on the plants from all three locations. In addition, *Fusarium culmorum* was present on the plants collected at Svenstorp and Kvistofta.

Plant number

Sugar yield is closely connected to the number of plants on the field. Below 80 000 plants/ha, yield reductions occur. The most important effect of the seed treatments is that they maintain a high enough plant number so that yield reductions can be avoided. The average plant number (three trials 2007) at full emergence showed that the seed treatments had significantly more plants than the untreated control (figure 1). Delayed emergence was not observed for the treatments in any of the three trials. On average, the plant number in 14, 18 and 30 g was increased with 5 600, 6 300 and 8 900 g compared to the untreated control.

The plant number in the treatments with 6 g fludioxonil (treatment 2) and 10 g tolylfluanid (treatment 5) were not significantly different.

Hymexazol in the doses 14, 18 and 30 g has now been tested in a total of 12 trials 2004-2007. All three doses have significantly more plants (+10 000 plants/ha) than the untreated control (figure 2).

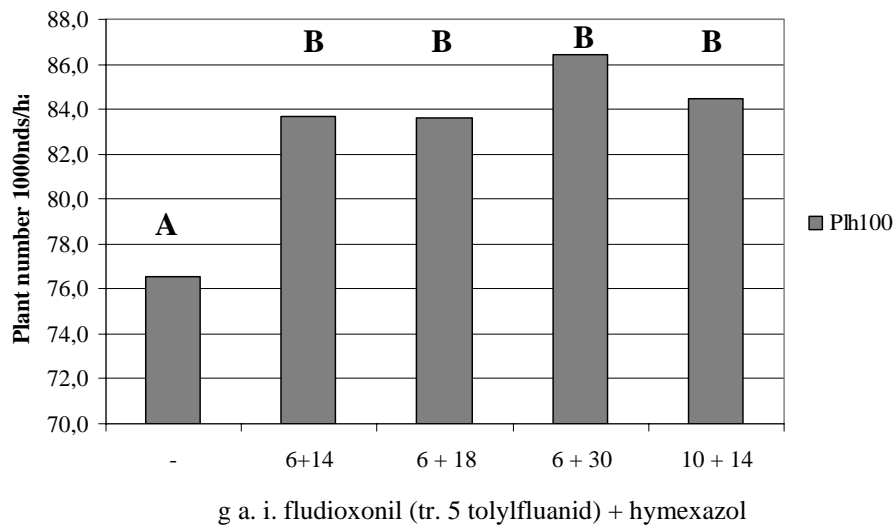


Figure 1. Plant number counted at full emergence 2007. Average over three trials. LSD = 5,6, prob = 0,0111. Bars with the same letter are not significantly different.

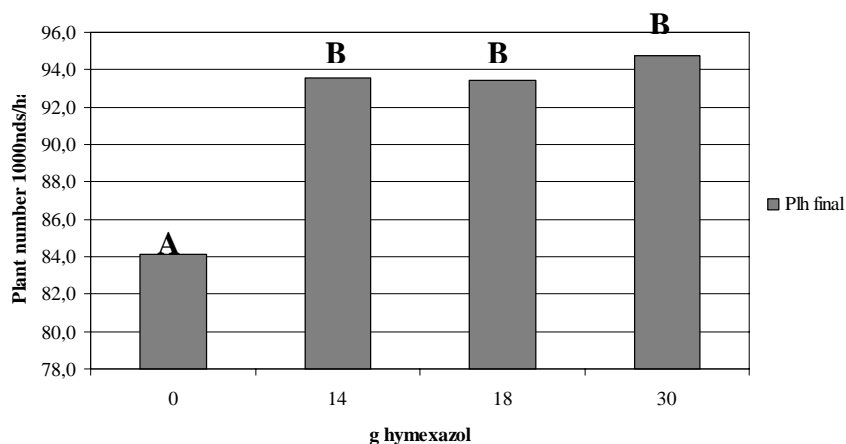


Figure 2. Plant number counted at final emergence in 12 trials 2004-2007. LSD = 2,7, prob = < 0,0001. Bars with the same letter are not significantly different.

Plant vigour and row coverage

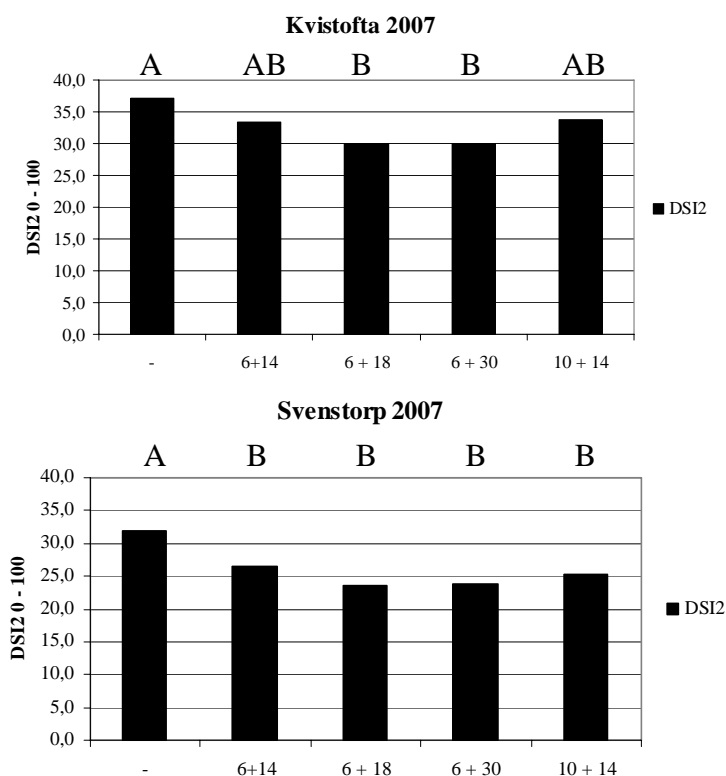
Plant vigour and row coverage were evaluated in the beginning of June. There were no significant differences between the treatments.

Disease severity index

The weather at the time of drilling was generally dry and the majority of the sugar beet fields in the growing area could be sown within one week. The first evaluation of disease severity showed no significant differences between the treatments at Skiberöd and Svenstorp. At Kvistofta there were significant differences between the treatments but the results are not easily interpreted in the view of isolated fungi on that location. The lowest disease severity index was found for the seed treatment with 10 g tolylfluamid and 14 g

hymexazol. The disease severity index was also low in the untreated control. One possible explanation may be that pre-emergence damping-off caused by *Pythium* spp. has caused early death of many seeds. This is supported by the fact that the plant number in the first counting was low in the control and in the treatment with 10 g tolylfluanid compared to the treatments with 6 g fludioxonil and 14 g hymexazol.

Results from the second evaluation of disease severity at Kvistofta and Svenstorp are shown in figure 3. Although there were no significant differences between the seed treatments, both locations show similar results regarding the different doses of hymexazol with 18 g and 30 g having the lowest disease severity indexes. These results indicate that *A. cochliformis* has been the dominating fungi on the sugar beet plants.



Figur 3. Disease severity indexes at Kvistofta and Svenstorp 20070522, second evaluation. Kvistofta: $LSD = 6,0$, $prob = 0,1105$. Svenstorp: $LSD = 4,0$, $prob = 0,0036$. Bars with the same letters are not significantly different.

Disease severity index experiment in green house

The experiment was carried out on a very infected soil from Svalöv in the central parts of Skåne and with a history of severe problems with root rots. *Fusarium. culmorum* and *A. cochliformis* could be isolated from the roots of the plants in the experiment. Both fungi are strongly correlated with high disease severity indexes on sugar beet seedlings under favourable conditions (Persson and Olsson, 2006). The disease severity in this experiment was very high and there were no significant differences between the treatments. The experiment will be repeated 2008 on a second soil to further elucidate the results.

A total of four laboratory experiments with 14, 18 and 30 g hymexazol have been carried out since 2005. The summary of three experiments (excluding the experiment 2007)

shows that all hymexazol treatments are significantly different from the untreated control. Pair wise comparisons show that DSI for 30 g hymexazol is significantly different from DSI for 14 g hymexazol (prob = 0,0373). There was no significant difference between 14 g and 18 g hymexazol.

Yield and root rot after harvest

Seed treatments with a combination of hymexazol and fludioxonil increased sugar yield with between 4–14% on Skiberöd and between 9–17% on Kvistofta. The increase was not significantly different from the control.

Hymexazol in the three doses 14, 18 and 30 g have now been tested in a total of 12 trials in Sweden 2004-2007. Both 14 and 18 g show a significant increase in sugar yield with 4% (around 400 kg sugar/ha). There is also a significant increase in plant number between untreated on the one hand and the seed treatments on the other hand with around 10 000 plants/ha. The quality parameter K+Na is significantly lower for the seed treatments compared with the untreated control. The lower K+Na is connected to the number of plants in the plots. The untreated plots had fewer plants than the treated plots and each plant could therefore use K+Na in excess. There is also a tendency (prob = 0,1307) for lower amino-N content in the seed treatments than in the untreated control.

A summary of the eight most heavily infested trials show that there is a tendency for higher yield with 4–6% in the seed treatments compared to the untreated control (appendix 12). In the four remaining trials with only minor infections, the yield increase was 2% (not significant). There was a significant increase in plant number in the weakly infected trials with around 8 000 plants/ha for the seed treatments.

Conclusions

Seed treatment with hymexazol protects the sugar beet seedlings against *A. cochliformis* during early growth and maintains a high and even plant number also on fields where the risk of infection is high. The two higher doses of hymexazol, 18 and 30 g, provides a somewhat longer protection to the sugar beet seedlings than the dose 14 g.

The average sugar yield over 12 trials 2004-2007 was 4% higher for 14 and 18 g hymexazol and 3% higher for 30 g hymexazol compared to the control. Also the quality parameter K+Na was significantly lower than in the untreated control. There was also a tendency that the amino-N value for the seed treatments was lower than in the untreated control.

The average plant number, vigour and row coverage (three trials 2007) in the treatments with 6 g fludioxonil (treatment 2) and 10 g tolylfluanid (treatment 5) were not significantly different. At one location, Kvistofta, the disease severity index for 10 g tolylfluanid was significantly lower than for 6 g fludioxonil. Because of the low disease severity index in the control, pre-emergence damping off caused by *Pythium* spp. may explain the difference between the seed treatments, with fludioxonil being more effective than tolylfluanid against *Pythium* spp.

References

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GEP-information

Uppdragsgivare / Contractor:

DuPont Sverige AB
Jan-Åke Svensson
Box 839
201 80 Malmö

Planansvarig / Project Manager:

Åsa Olsson, SBU AB

Försöksfrö / Trial seed

Försöksfrö beställdes av SBU AB. / Trial seed was ordered by SBU AB.
Betsort / Variety: Opta

Försöksmetodik / Methodology

RCB. Beskrivning av metoder och bedömningar: se appendix 1 (fältkort) för hänvisning till PM i SBU:s kvalitetshandbok. / Description of methods and evaluations: see appendix 1 (field plan) for references to PM in SBU quality handbook.

Försöksplatser / Trial sites

Svenstorp	Claes Mårtensson, Svenstorp 101, 274 93 Skurup.
Kvistofta	Charlie Svensson, Ormastorps gård, 260 30 Vallåkra
Skiberöd	Sten Olsson, Skiberöds gård, 240 33 Löberöd

Teknisk beskrivning/Technical details:

Produkt / Product	Verksam substans / active ingredient	Dos / dose
Montur	<i>imidacloprid, tefluthrine</i>	15 g, 4 g
Euparen	<i>tolyfluanid</i>	10 g
Tachigaren	<i>hymexazol</i>	14, 18, 30 g
Maxim tech	<i>fludioxonil</i>	6 g

Avvikelser / Nonconformances

Four plots at Svenstorp (block 3: treatment 2 and 4, block 4: treatment 2 and 5) were cancelled from harvest because of very poor growth caused by soil borne fungi.

Styrelsen för ackreditering och teknisk kontroll (SWEDAC)

Försöksstationer ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid försöksstationerna uppfyller för GEP-ackreditering relevanta delar av kraven i SS-EN ISO/IEC 17025 (2000).

Test facilities are accredited by the Swedish Board for Accreditation and conformity Assessment (SWEDAC) under the terms of Swedish legislation. The accredited test facilities meet the relevant requirements for GEP accreditation in SS-EN ISO/IEC 17 025 (2000).

Rapporten får inte utan skriftligt tillstånd från SBU AB återges annat än i sin helhet.

De i rapporten återgivna resultaten gäller enbart de provade produkterna.

This report may not be reproduced other than in full, except with the prior written approval of SBU AB. The results apply only to those products, which have been tested in the investigation.

Borgeby den 7 december 2007

Åsa Olsson
Project Manager, SBU AB

Robert Olsson
Managing Director, SBU AB

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2007-1-4-487

Antal försök 1

Fältkort - Växthusförsök

GEP

Försöksvärd	Odlarnummer	
SBU AB	-	
Gård	Adress	Telefon
Findus, Selleberga	Bjuv	

Syfte: Att prova Tachigaren i tre olika doser mot *Aphanomyces*. Växthusförsök.

Uppdragsgivare: DuPont

Försöksled		Dos fungicid g a.i./unit	Dos insekticid g a.i./unit	
1	Kontroll	DuPont/Syngenta	-	Gaicho 60 g
2	Maxim tech+Tachigaren	DuPont/Syngenta	6+14	Gaicho 60 g
3	Maxim tech+Tachigaren	DuPont	6 + 18	Gaicho 60 g
4	Maxim tech+Tachigaren	DuPont	6 + 30	Gaicho 60 g
5	Euparen+Tachigaren	Syngenta	10 + 14	Gaicho 60 g

Bricknr i försöket:

-

Försökets totala yta, m²:

-

Skördeyta/parcell, m²:

-

Bruttoyta/parcell, m²:

-

Kontaktperson + telefonnr:

För försökets utförande ansvarig person + telefonnr:

Åsa Olsson 0709-53 72 62

Lotta Eriksson 0702 72 49 80

Krav på försöksplats: Jord med högt svampinfektionstryck samlas in.

Växthusförsöket omfattar ett försök på en jord. Blockförsök 4 upprepningar.

Se PM för utförande

Försöksuppgifter:

Sådd, datum	
Plantor/kruka	10 st
Krukor/led	6
Block	4
Sort	Sapporo
Betning, produkt	enligt plan ovan

Försöksåtg.: PM

Rotbrandsbed.	2.5.8	SBU
Observation av fytotox		SBU
Väg plantorna i varje kruka		SBU

Datum/Sign.

20070215/ÅO

Försöksdata kontrollerat (datum+sign.):

PM för växthusförsök med tre olika doser Tachigaren

1. Jord med hög marksmitta samlas in.
2. Placeras ut som blockförsök i växthuset. 3 lådor/ block med 1 eller 2 led i varje, totalt 5 led. Till varje led och block sås 6 krukor, totalt blir detta 30 krukor per led. För alla 5 leden behövs alltså 120 krukor.
3. Vid avläsning väges alla plantorna i varje kruka.
4. Fotografera gärna. Kul att ha i rapporten. Ta så att man kan se skillnader, gärna led 2 jämfört med led 3 på samma bild, led 2 mot 4 osv.

Block 1

Låda 1	Led 1	led 2	Låda 3	led 5
	1 2	1 2		1 2
	3 4	3 4		3 4
	5 6	5 6		5 6

Låda 2	led 3	led 4
	1 2	1 2
	3 4	3 4
	5 6	5 6

Block 2

Låda 1	Led 3	led 5	Låda 3	led 2
	1 2	1 2		1 2
	3 4	3 4		3 4
	5 6	5 6		5 6

Låda 2	led 4	led 1
	1 2	1 2
	3 4	3 4
	5 6	5 6

Betningsmedel mot jordburna svampsjukdomar

Block 3

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Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2007-1-4-487

Antal försök 3

Fältkort - Fältförsök

GEP

Försöksvärd Sten Olsson	Odlarnummer
Gård Skiberöds gård	Adress 240 33 Löberöd
	Telefon 0709-367698

Syfte: Att prova Tachigaren i tre olika doser mot *Aphanomyces*. Fältförsök.

Uppdragsgivare: DuPont

Försöksled	Uppdragsgivare	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll	DuPont	-	Gaicho 60 g
2 Maxim tech+Tachigaren	DuPont	6+14	Gaicho 60 g
3 Maxim tech+Tachigaren	DuPont	6 + 18	Gaicho 60 g
4 Maxim tech+Tachigaren	DuPont	6 + 30	Gaicho 60 g
5 Euparen+Tachigaren	DuPont	10 + 14	Gaicho 60 g

	Från	Till	
Bricknr Skiberöd	4601	-	4620
Bricknr Kvistofta	4621	-	4640
Bricknr Svenstorp	4641	-	4660
Skördeyta/parcell, m²:	2 r x 10 m		
Försökets totala yta, m²:			784
Bruttoyta/parcell, m²:			6 r x 17 m

Kontaktperson + telefonnr:

Åsa Olsson 0709-53 72 62

För försökets utförande ansvarig person + telefonnr:

Leif Jönsson 0708-161051

Krav på försöksplats: Platser med högt svampinfektionstryck.

Provtagningsytor till alla parceller. Yta om 10 m läggs mellan block I och II samt block III och IV.

Bevattning efter uppkomst önskas för att få igång infektion.

Försöksuppgifter:

		Försöksåtg.:	PM	Datum/Sign.
Såmaskin, märke	Monozentra SP 12r	Generalprov 6	2.6.1 HS	1/12-05 LJ
Sådd, datum	31/3	Utstakning i fält	2.4.1 HS	30/3 LJ
Radavstånd, cm	48 cm	Parcellvis sådd	2.4.2 HS	31/3 LJ, TB
Antal frö per m	5,1	Svampprov	2.6.1 HS	1/12-05 LJ
Sort	Enl. plan	Planträkning 20	2.5.4 HS	16/4 LJ, TB
Betning, produkt	Enl. plan	Planträkning 50	2.5.4 HS	17/4 LJ, TB
Uppkomst, datum	16-apr	Planträkning max	2.5.4 HS	21/5 LJ, TB
Förfrukt 2006	höstvete	Planträkning slutl	2.5.4 HS	27/6 LJ
År med betor 1994-04:	2003, 1999, 1995	Rotbrandsbed. 1	2.5.8 HS	7/5 LJ, TB
		Rotbrandsbed. 2	2.5.8 HS	21/5 LJ, TB
Gödning	Ifylles på flik "Behandlingsdata"	Sundhet	2.5.20 SBU	5/6 ÅO
Ogräsbekämpning	Ifylles på flik "Behandlingsdata"	Besiktning inför skörd	SBU	22/8 ÅO
Svampbekämpningar	Ifylles på flik "Behandlingsdata"	Lev. provtvätt	2.4.7 HS	11/10 AE
Insektsbekämpningar	Ifylles på flik "Behandlingsdata"	Skörd	2.4.7 HS	10/10 AE, LN
		Svampangr. e skörd	2.5.10 SBU	15/10 ÅO
		Analys	- DS	15/10

20070313 ÅO

Försöksdata kontrollerat (datum+sign.): 20071205 LJ

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2007-1-4-487

Antal försök 3

Fältkort - Fältförsök

GEP

Försöksvärd Claes Mårtensson		Odlarnummer
Gård Svenstorp 101	Adress 274 93 Skurup	Telefon 0705-141494

Syfte: Att prova Tachigaren i tre olika doser mot *Aphanomyces*. Fältförsök.

Uppdragsgivare: DuPont

Försöksled	Uppdragsgivare	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll	DuPont	-	Gaicho 60 g
2 Maxim tech+Tachigaren	DuPont	6+14	Gaicho 60 g
3 Maxim tech+Tachigaren	DuPont	6 + 18	Gaicho 60 g
4 Maxim tech+Tachigaren	DuPont	6 + 30	Gaicho 60 g
5 Euparen+Tachigaren	DuPont	10 + 14	Gaicho 60 g

	Från	Till	
Bricknr Skiberöd	4601	-	4620
Bricknr Kvistofta	4621	-	4640
Bricknr Svenstorp	4641	-	4660
Skördeyta/parcell, m²:	2 r x 10 m		
Försökets totala yta, m²:			784
Bruttoyta/parcell, m²:			6 r x 17 m

Kontaktperson + telefonnr:

Åsa Olsson 0709-53 72 62

För försökets utförande ansvarig person + telefonnr:

Leif Jönsson 0708-161051

Krav på försöksplats: Platser med högt svampinfektionstryck.

Provtagningsytor till alla parceller. Yta om 10 m läggs mellan block I och II samt block III och IV.

Bevattning efter uppkomst önskas för att få igång infektion.

Försöksuppgifter:

Såmaskin, märke	Monozentra SP 12r
Sådd, datum	2/4
Radavstånd, cm	48 cm
Antal frö per m	5,1
Sort	Enl. plan
Betning, produkt	Enl. plan
Uppkomst, datum	19-apr
Förfrukt 2006	höstvet
År med betor 1994-04:	2003, 1999

Gödsling	Ifylles på flik "Behandlingsdata"
Ogräsbekämpning	Ifylles på flik "Behandlingsdata"
Svampbekämpningar	Ifylles på flik "Behandlingsdata"
Insektsbekämpningar	Ifylles på flik "Behandlingsdata"

Försöksåtg.: PM

	PM	Datum/Sign.
Generalprov 6	2.6.1 HS	22/3 LJ
Utstakning i fält	2.4.1 HS	22/3 LJ
Parcellvis sådd	2.4.2 HS	2/4 LJ, TB, AE
Svampprov	2.6.1 HS	Hösten-06 UH
Planträkning 20	2.5.4 HS	19/4 LJ, TB
Planträkning 50	2.5.4 HS	23/4 LJ, TB
Planträkning max	2.5.4 HS	18/5 LJ, TB
Planträkning slutl	2.5.4 HS	29/6 LJ
Rotbrandsbed. 1	2.5.8 HS	8/5 LJ, TB
Rotbrandsbed. 2	2.5.8 HS	22/5 LJ, TB
Sundhet	2.5.20 SBU	3/6 ÅO
Besiktning inför skörd	SBU	20/10 ÅO
Lev. provtvätt	2.4.7 HS	26/10 AE
Skörd	2.4.7 HS	25/10 AE, LN, HH
Svampangr. e skörd	2.5.10 SBU	29/10 ÅO
Analys	- DS	29/10

20070313 ÅO

Försöksdata kontrollerat (datum+sign.): 20071205 LJ

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2007-1-4-487

Antal försök 3

Fältkort - Fältförsök

GEP

Försöksvärd Charlie Svensson		Odlarnummer
Gård Kvistofta	Adress Ormastorps gård, 260 30 Vallåkra	Telefon 0709-360290

Syfte: Att prova Tachigaren i tre olika doser mot *Aphanomyces*. Fältförsök.

Uppdragsgivare: DuPont

Försöksled	Uppdragsgivare	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll	DuPont	-	Gaicho 60 g
2 Maxim tech+Tachigaren	DuPont	6+14	Gaicho 60 g
3 Maxim tech+Tachigaren	DuPont	6 + 18	Gaicho 60 g
4 Maxim tech+Tachigaren	DuPont	6 + 30	Gaicho 60 g
5 Euparen+Tachigaren	DuPont	10 + 14	Gaicho 60 g

	Från	Till	
Bricknr Skiberöd	4601	-	4620
Bricknr Kvistofta	4621	-	4640
Bricknr Svenstorp	4641	-	4660
Skördeyta/parcell, m²:	2 r x 10 m		
Försökets totala yta, m²:			784
Bruttoyta/parcell, m²:			6 r x 17 m

Kontaktperson + telefonnr:

Åsa Olsson 0709-53 72 62

För försökets utförande ansvarig person + telefonnr:

Leif Jönsson 0708-161051

Krav på försöksplats: Platser med högt svampinfektionstryck.

Provtagningsytor till alla parceller. Yta om 10 m läggs mellan block I och II samt block III och IV.

Bevattning efter uppkomst önskas för att få igång infektion.

Försöksuppgifter:

Såmaskin, märke
Sådd, datum
Radavstånd, cm
Antal frö per m
Sort
Betning, produkt
Uppkomst, datum
Förfrukt 2006
År med betor 1994-04:

Monozentra SP 12r
5/4
48 cm
5,1
Enl. plan
Enl. plan
20-apr
Malkorn
1998, 2002
Ifylles på flik "Behandlingsdata"
Ifylles på flik "Behandlingsdata"
Ifylles på flik "Behandlingsdata"
Ifylles på flik "Behandlingsdata"

Försöksåtg.: PM

Generalprov 6 2.6.1 HS
Utstakning i fält 2.4.1 HS
Parcellvis sådd 2.4.2 HS
Svampprov 2.6.1 HS
Planträkning 20 2.5.4 HS
Planträkning 50 2.5.4 HS
Planträkning max 2.5.4 HS
Planträkning slutl 2.5.4 HS
Rotbrandsbed. 1 2.5.8 HS
Rotbrandsbed. 2 2.5.8 HS
Sundhet 2.5.20 SBU
Besiktning inför skörd SBU
Lev. provtvätt 2.4.7 HS
Skörd 2.4.7 HS
Svampangr. e skörd 2.5.10 SBU
Analys - DS

Datum/Sign.

1/12-05 LJ
22/3 LJ
5/4 LJ, TB, AE
1/12-05 LJ
20/4 LJ
25/4 LJ
22/5 TB
27/6 LJ
8/5 LJ, TB
22/5 LJ, TB
18/6 ÅO
6/9 ÅO
14/9 AE
11/9 AE, LJ
14/9 ÅO
14/9

20070313 ÅO

Försöksdata kontrollerat (datum+sign.): 20071205 LJ

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

2007-1-4-487

Fältplan 2007

Skiberöd

IV	5	2	3	4	1
III	2	4	5	1	3
II	1	3	4	5	2
I	3	5	1	2	4

Brickplan 2007

Skiberöd

IV	4616	4617	4618	4619	4620
III	4611	4612	4613	4614	4615
II	4606	4607	4608	4609	4610
I	4601	4602	4603	4604	4605

Kvistofta

IV	5	3	1	4	2
III	2	5	3	1	4
II	1	4	2	5	3
I	3	1	4	2	5

Kvistofta

IV	4636	4637	4638	4639	4640
III	4631	4632	4633	4634	4635
II	4626	4627	4628	4629	4630
I	4621	4622	4623	4624	4625

Svenstorp

IV	5	2	1	4	3
III	2	4	3	1	5
II	1	3	2	5	4
I	3	5	4	2	1

Svenstorp

IV	4656	4657	4658	4659	4660
III	4651	4652	4653	4654	4655
II	4646	4647	4648	4649	4650
I	4641	4642	4643	4644	4645

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

2007-1-4-487

Jordanalys / Soil analyses 2007

For definition of soil fractions and soil type see below.

		Skiberöd		Kvistofta		Svenstorp	
			Klass		Klass		Klass
pH-värde	pH	6,8		6,9		6,9	
P-AL (mg/100 g jord)		7,6	III	5,0	III	5,8	III
K-AL (mg/100 g jord)		8,5	III	6,0	II	7,0	II
Mg-AL (mg/10 g jord)		5,6		5,2		4,6	
K/Mg-kvot		1,5		1,2		1,5	
Ca-AL (mg/kg jord)		140		270		230	
K-HCl (mg/100 g jord)		92	2	130	3	130	3
Cu-HCl (mg/kg jord)		4,0		8,9		9,7	
P-HCL mg/100 g		58	3	51	3	57	3
Bor (mg/kg jord)	Boron	0,46		1,1		0,57	
Mullhalt (%)	Organic matter	2		3,5		2,6	
Lerhalt (%)	Clay content	10		14		14	
Finler (%)	Fine Clay	8		11		10	
Sand + grovmo (%)	Sand + fine sand	63		52		58	
Jordart	Soil type	nmh1Sa		mmh1Mo		nmh 1Mo	
Basmättnadsgrad		>80		>80		> 80	
S-värde (mekv/100g jord)		7,7		13,4		11,5	
T-värde (mekv/100g jord)		9,6		13,4		11,5	

Particle size

Sand	Sand = 2-0,2 mm
Grovmo	Fine sand = 0,02-0,06 mm
Finmo	Coarse silt = 0,06-0,02 mm
Mjåla	Silt = 0,02-0,002
Lera	Clay = <0,002 mm
Finler	Fine clay = <0,0006

Soil type

nmh1Sa = medium humus rich light sand
mmhmoLL = humus rich loamy soil
mmh1Sa = humus rich light sand
nmh1Sa = medium humus rich light sand
mmh1Mo = humus rich fine sand soil
nmh1Mo = medium humus rich fine sand soil

Betningsmedel mot jordburna svampsjukdomar

Analys av marksmitta och vanligaste förekommande svampar på försöksplatserna 2007

Risk of infection and most frequently occurring fungi on the trial locations 2007

Jordprov tagna december 2006. Analys av svampinfektionstryck är utförd av Maria Nihlgård, Syngenta, enligt Ewaldz metod (1993).
Samples were collected during December 2006. Analysis of infestation risk was performed by Maria Nihlgård, Syngenta, according to the method by Ewaldz (1993).

Plats Location	Sjukdomsindex Disease index	Infektionsrisk Risk of infection	Förekommande svampar (vanligaste först) Fungi (most frequently occurring first) Fungi isolated from plants in the field	
Kvistofta	79	High	<i>Aphanomyces, Pythium</i>	<i>Aphanomyces, Fusarium culmorum</i>
Skiberöd	93	High	<i>Aphanomyces, Pythium</i>	<i>Aphanomyces</i>
Svenstorp	67	Medium - high	<i>Aphanomyces</i>	<i>Aphanomyces, Fusarium culmorum</i>

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

2007-1-4-487

Behandlingsdata / Weed control and fertilization

Ogräsbekämpning m m / Weed control Skiberöd

Datum	Produkt och dos
25/4	1G+1B+0,5olja
12/5	1,5G+2B+0,2T+1olja
2/6	0,5G+1,5P+0,2T+1olja
17/8	0,5 Comet

Gödsling / Fertilization Skiberöd

Datum	Produkt och giva	N	P	K
30/3	Probeta NPK 650 kg/ha	98	26	52

Ogräsbekämpning m m / Weed control Kvistofta

Datum	Produkt och dos
15/4	0,75G+1B+0,01T+0,5olja
26/4	0,75G+1,5B+0,1T+0,5olja
7/5	0,75G+1,5B+0,15T+0,5olja

Gödsling / Fertilization Kvistofta

Datum	Produkt och giva	N	P	K
30-mar	Dansk gödn. NPK 16-4-7 680 kg/ha	109	27	48

Ogräsbekämpning m m / Weed control Svenstorp

Datum	Produkt och dos
27/4	1G+1B+0,1T+0,5olja
15/5	1G+1B+0,1T+0,5olja
31/5	1,3B+25g S+0,5olja

Gödsling / Fertilization Svenstorp

Datum	Produkt och giva	N	P	K
30/3	Probeta NPK 775 kg/ha	116	31	62

Planträknningar / Plant number

Behandling / Treatments			Planträkning / Plant number				Plh slutlig after inter-row cult.
			1000-tal/ha / 1000nds/ha				
			20%	50%	100%	% small	
Skiberöd	Sådd/drilled	070331	070416	070417	070521	070521	070627
1	Kontroll	-	10,7	37,8	69,8	5,5	71,1
2	Maxim tech+Tachigaren	6+14	10,4	34,9	82,6	2,6	81,8
3	Maxim tech+Tachigaren	6 + 18	10,7	38,3	83,9	3,7	84,1
4	Maxim tech+Tachigaren	6 + 30	10,7	40,9	86,7	5,0	87,5
5	Euparen+Tachigaren	10 + 14	9,6	38,0	83,1	4,7	82,3
RSQ %			34,2	42,8	50,0	55,8	49,6
CV			39,6	26,2	10,3	49,8	9,6
LSD 5%			6,4	15,3	12,9	3,3	12,0
Prob.			0,9951	0,9429	0,1016	0,3703	0,0992
Svenstorp	Sådd/drilled	070402	070419	070423	070518	070518	070627
1	Kontroll	-	19,8	49,0	76,8	8,1	78,4
2	Maxim tech+Tachigaren	6+14	15,1	50,8	79,9	7,4	79,4
3	Maxim tech+Tachigaren	6 + 18	15,9	45,3	82,6	5,7	82,0
4	Maxim tech+Tachigaren	6 + 30	15,6	47,9	83,9	5,6	82,6
5	Euparen+Tachigaren	10 + 14	16,4	52,1	84,1	7,8	84,4
RSQ %			36,3	24,5	38,7	41,3	30,5
CV			37,1	19,2	7,0	30,5	6,9
LSD 5%			9,5	14,5	8,7	3,3	8,6
Prob.			0,8267	0,8654	0,3693	0,3420	0,5737
Kvistofta	Sådd/drilled	070405	070420	070425	070522	070522	070629
1	Kontroll	-	13,0	49,0	83,1	4,0	81,3
2	Maxim tech+Tachigaren	6+14	13,5	52,3	88,5	2,4	86,5
3	Maxim tech+Tachigaren	6 + 18	15,4	45,1	84,4	3,7	83,3
4	Maxim tech+Tachigaren	6 + 30	14,1	53,1	88,8	2,9	87,2
5	Euparen+Tachigaren	10 + 14	11,5	46,4	86,2	3,3	84,4
RSQ %			41,1	63,7	47,2	12,6	39,0
CV			43,6	14,9	7,0	78,5	6,9
LSD 5%			9,1	11,3158	9,4	3,9	9,0
Prob.			0,9120	0,4743	0,6140	0,9013	0,6163
3 försök							
1	Kontroll	-	14,5	45,2	76,6	5,8	76,9
2	Maxim tech+Tachigaren	6+14	13,0	46,0	83,7	4,1	82,6
3	Maxim tech+Tachigaren	6 + 18	14,0	42,9	83,6	4,4	83,2
4	Maxim tech+Tachigaren	6 + 30	13,5	47,3	86,5	4,5	85,8
5	Euparen+Tachigaren	10 + 14	12,5	45,5	84,5	5,2	83,7
RSQ %			19,4	25,6	28,6	37,6	23,6
CV			41,9	21,7	8,2	47,7	7,7
LSD 5%			4,6	8,1	5,6	1,9	5,2
Prob.			0,9206	0,8625	0,0111	0,3400	0,0184

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

Plant vigour and row coverage

Behandling / Treatment	Sundhet Vigour 0-100	Radtäckning Row coverage %
Skiberöd	070605	070605
1 Kontroll -	80	71
2 Maxim tech+Tachigaren 6+14	84	72
3 Maxim tech+Tachigaren 6 + 18	83	73
4 Maxim tech+Tachigaren 6 + 30	84	72
5 Euparen+Tachigaren 10 + 14	81	71
RSQ %	53,8	61,1
CV	6,6	8,8
LSD 5%	8	10
Prob.	0,8346	0,9964
Svenstorp	070603	070603
1 Kontroll -	75	46
2 Maxim tech+Tachigaren 6+14	74	45
3 Maxim tech+Tachigaren 6 + 18	80	53
4 Maxim tech+Tachigaren 6 + 30	78	56
5 Euparen+Tachigaren 10 + 14	76	45
RSQ %	41,5	60,3
CV	8,1	20,0
LSD 5%	10	15
Prob.	0,6341	0,4484
Kvistofta	070618	070618
1 Kontroll -	88	86
2 Maxim tech+Tachigaren 6+14	93	92
3 Maxim tech+Tachigaren 6 + 18	87	84
4 Maxim tech+Tachigaren 6 + 30	85	82
5 Euparen+Tachigaren 10 + 14	89	88
RSQ %	58,5	62,6
CV	5,3	6,0
LSD 5%	7	8
Prob.	0,2158	0,1118
3 försök		
1 Kontroll -	81	68
2 Maxim tech+Tachigaren 6+14	83	70
3 Maxim tech+Tachigaren 6 + 18	83	70
4 Maxim tech+Tachigaren 6 + 30	82	70
5 Euparen+Tachigaren 10 + 14	82	68
RSQ %	39,1	73,9
CV	7,7	14,0
LSD 5%	5,2	7,9
Prob.	0,8699	0,9726

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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Disease severity index and root rot index

Behandling / Treatment	Rotbrand		Plantvikt		Kronisk rottröta	
	Damping-off		Plant	Plant	Root rot	
	DSI 1 0-100	DSI 2 0-100	weight 1 g	weight 2 g	RI 0-3	
Skiberöd		070507	070521	070507	070521	071015
1 Kontroll	-	11,5	26,7	1,00	7,8	4,5
2 Maxim tech+Tachigaren	6+14	10,8	31,9	0,95	8,0	3,0
3 Maxim tech+Tachigaren	6 + 18	9,6	27,3	0,90	6,8	4,0
4 Maxim tech+Tachigaren	6 + 30	15,4	31,5	0,82	6,5	3,5
5 Euparen+Tachigaren	10 + 14	10,1	24,5	0,89	7,7	3,5
RSQ %		44,1	81,5	51,2	68,1	73,0
CV		53,9	22,5	17,4	20,0	30,4
LSD 5%		9,6	9,9	0,2	2,3	1,7
Prob.		0,7031	0,4357	0,5660	0,5535	0,4328
Kvistofta		070508	070522	070508	070522	070914
1 Kontroll	-	26,8	37,1	0,39	3,0	4,8
2 Maxim tech+Tachigaren	6+14	29,2	33,4	0,39	4,1	4,5
3 Maxim tech+Tachigaren	6 + 18	28,4	30,0	0,45	3,4	4,5
4 Maxim tech+Tachigaren	6 + 30	32,2	30,1	0,37	3,4	4,8
5 Euparen+Tachigaren	10 + 14	24,6	33,8	0,48	3,8	4,5
RSQ %		97,3	81,1	72,8	46,3	14,8
CV		8,3	11,7	15,3	21,8	20,7
LSD 5%		3,6	6,0	0,10	1,2	1,5
Prob.		0,0078	0,1105	0,1849	0,3691	0,9862
Svenstorp		070508	070522	070508	070522	071029
1 Kontroll	-	22,7	31,9	0,69	5,2	2,3
2 Maxim tech+Tachigaren	6+14	22,5	26,6	0,46	4,9	2,5
3 Maxim tech+Tachigaren	6 + 18	17,1	23,5	0,66	5,7	2,4
4 Maxim tech+Tachigaren	6 + 30	25,8	23,7	0,51	5,1	2,8
5 Euparen+Tachigaren	10 + 14	26,0	25,3	0,57	5,1	2,9
RSQ %		70,2	95,2	59,0	70,5	60,7
CV		28,9	9,9	20,9	19,9	20,0
LSD 5%		10,2	4,0	0,19	1,6	0,8
Prob.		0,3617	0,0036	0,0875	0,8105	0,4832
3 försök						
1 Kontroll	-	20,3	31,9	0,69	5,3	3,8
2 Maxim tech+Tachigaren	6+14	20,8	30,7	0,60	5,7	3,3
3 Maxim tech+Tachigaren	6 + 18	18,4	26,9	0,67	5,3	3,6
4 Maxim tech+Tachigaren	6 + 30	24,5	28,4	0,57	5,0	3,7
5 Euparen+Tachigaren	10 + 14	20,3	27,8	0,65	5,5	3,6
RSQ %		39,9	11,7	71,2	52,1	35,43
CV		45,4	33,5	22,7	29,8	33,0
LSD 5%		7,8	8,0	0,12	1,3	1,0
Prob.		0,6199	0,7102	0,2105	0,8805	0,8814

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2007-1-4-487

Plant number, disease severity index and root rot index

12 försök / 12 trials 2004-2007

Behandling / Treatment		DSI 1 0-100	DSI 2 0-100	plh20	plh50	plh100	plhfin
1	Kontroll obehandlad / Untreated	32,7	32,2	21,6	50,3	83,9	84,1
2	Tachigaren 10+14	29,8	29,9	21,9	55,3	93,4	93,6
3	Tachigaren 10+18	30,0	29,6	19,6	52,8	92,9	93,4
4	Tachigaren 10+30	31,4	29,8	19,3	52,2	94,0	94,7
RSQ %		73,8	56,9	44,5	36,6	64,6	64,6
CV		25,7	23,7	34,6	18,6	7,5	7,4
LSD 5%		3,2	2,9	2,9	3,9	2,7	2,7
Prob.		0,2709	0,2397	0,1734	0,0901	<0,0001	<0,0001

2006-2007

		Weight/plant gram Vikt per planta gram	
		1	2
		6 försök / 6 trials	
1	Kontroll obehandlad / Untreated	0,55	10,9
2	Tachigaren	0,51	11,2
3	Tachigaren	0,54	12,1
4	Tachigaren	0,48	11,1
RSQ %		76,2	86,2
CV		22,9	28,2
LSD 5%		0,1	1,8
Prob.		0,1432	0,5362

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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Disease severity index in green house experiment 2007

Behandling / Treatment	Rotbrand / Damping-off	
	g a.i./unit	DSI 0-100
1 Kontroll	-	65,0
2 Maxim tech+Tachigaren	6+14	63,5
3 Maxim tech+Tachigaren	6 + 18	67,3
4 Maxim tech+Tachigaren	6 + 30	63,5
5 Euparen+Tachigaren	10 + 14	66,3
RSQ %		14,1
CV		9,7
LSD 5%		9,7
Prob.		0,887

Summary of disease severity index in green house experiments 2005-2007

	g a.i./unit	Rotbrand / Damping-off, DSI 0-100					
		1	2	3	4	3 exp. exp. 1 - 3	4 exp. exp. 1 - 4
1 Kontroll/untreated	-	68,1	65,8	47,8	65,0	59,9	62,4
2 Hymexazol	14	64,4	55,7	29,0	63,5	49,5	53,0
3 Hymexazol	18	54,2	54,4	36,9	67,3	48,2	52,3
4 Hymexazol	30	51,0	52,9	30,6	63,5	46,0	49,8
RSQ %		82,2	36,1	81,2	35,5	65,1	64,5
CV		8,2	12	13,3	7,5	12,2	12
LSD 5%		7,8	3,9	9,7	7,8	3,7	3,4
Prob.		0,0022	<0,0001	0,0015	0,6748	<0,0001	<0,0001

Betningsmedel mot jordburna svampsjukdomar

 Appendix 11
 SBU projektkod 2007-1-4-487

Skörd / Harvest

2007

Behandling / Treatments	Ant. plantor No. Plants 1000-tal/ha 1000-nds/ha	Renvikt Clean weight ton/ha	Sockershalt Sugar content %	Sockers Sugar		Blåtal Amino-N mg/100g beta	K + Na mM/ 100 g beta	Renhet Cleanness %	
				ton/ha	rel 1				
Kvistofta	Drilling: 070405, Harvest: 070911								
1 Kontroll	-	81,3	41,43	15,76	6,54	100	13	5,08	82,93
2 Maxim tech+Tachigaren	6 + 14	86,5	47,72	16,08	7,68	117	12	4,90	85,66
3 Maxim tech+Tachigaren	6 + 18	83,3	45,08	15,80	7,13	109	11	4,99	87,49
4 Maxim tech+Tachigaren	6 + 30	87,2	46,12	15,77	7,28	111	11	4,95	84,34
5 Euparen+Tachigaren	10 + 14	84,4	39,9	15,74	6,28	96	12	4,96	84,21
RSQ %		39,0	47,8	44,7	50,8	-	51,7	47,11	51,5
CV		6,9	14,1	1,8	14,6	-	8,3	4,3	3,1
LSD 5%		9,0	10,1	0,4	1,7	-	1,6	0,3	4,2
Prob.		0,6163	0,4097	0,4315	0,3610	-	0,1773	0,8113	0,2767
Skiberöd	Drilling: 070331, Harvest: 071010								
1 Kontroll	-	71,1	54,40	18,44	10,05	100	8	3,96	89,97
2 Maxim tech+Tachigaren	6+14	81,8	61,35	18,59	11,43	114	8	3,78	88,82
3 Maxim tech+Tachigaren	6 + 18	84,1	57,06	18,23	10,44	104	8	3,87	91,31
4 Maxim tech+Tachigaren	6 + 30	87,5	57,89	18,48	10,74	107	8	3,81	90,60
5 Euparen+Tachigaren	10 + 14	82,3	57,3	18,54	10,63	106	7	3,83	90,5
RSQ %		49,6	78,3	86,87	79,99	-	64,7	45,3	29,3
CV		9,6	11,8	0,82	12,01	-	11,3	2,4	3,5
LSD 5%		12,0	10,4	0,23	1,97	-	1,3	0,1	4,8
Prob.		0,0992	0,7096	0,0495	0,6545	-	0,7988	0,1139	0,8369
Svenstorp	Drilling: 070402, Harvest: 071025								
1 Kontroll	-	78,4	72,84	18,23	13,27	100	12	4,53	91,34
2 Maxim tech+Tachigaren	6+14	79,4	71,10	18,24	12,98	98	13	4,42	90,92
3 Maxim tech+Tachigaren	6 + 18	82,0	72,97	18,41	13,43	101	12	4,44	91,57
4 Maxim tech+Tachigaren	6 + 30	82,6	70,80	18,52	13,12	99	13	4,32	90,83
5 Euparen+Tachigaren	10 + 14	84,4	69,21	18,40	12,73	96	12	4,25	91,17
RSQ %		30,5	26,2	52,3	23,3	-	69,5	43,4	45,2
CV		6,9	8,3	0,9	8,3	-	6,5	5,5	1,4
LSD 5%		8,6	11,5	0,3	2,1	-	1,6	0,5	2,4
Prob.		0,5737	0,9180	0,2779	0,9398	-	0,5280	0,6272	0,9467
3 försök									
1 Kontroll	-	76,9	56,22	17,48	9,96	100	11	4,52	88,08
2 Maxim tech+Tachigaren	6+14	82,6	60,06	17,63	10,69	107	11	4,37	88,47
3 Maxim tech+Tachigaren	6 + 18	83,2	58,37	17,48	10,33	104	10	4,43	90,12
4 Maxim tech+Tachigaren	6 + 30	85,8	58,27	17,59	10,38	104	11	4,36	88,59
5 Euparen+Tachigaren	10 + 14	83,7	55,49	17,56	9,88	99	10	4,34	88,64
RSQ %		71,0	98,1	99,3	98,7	-	97,3	99,4	93,5
CV		3,5	3,7	0,8	3,9	-	4,8	1,1	1,2
LSD 5%		5,5	4,0	0,3	0,7	-	1,0	0,1	1,9
Prob.		0,0485	0,1615	0,6021	0,1698	-	0,4513	0,0104	0,2343

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

Appendix 12 a

2007-1-4-487

Skörd / Harvest

12 försök 2004-2007

Behandling / Treatments	Ant. plantor No. plants 1000-tal/ha 1000-nds/ha	Renvikt Clean weight ton/ha	Sockershalt Sugar content %	Socker Sugar ton/ha	rel 1	Blåtal Amino-N mg/100g beta	K + Na mM/ 100 g beta	Renhet Cleanness %
1 Kontroll obehandlad / Untreated	83,9	59,05	17,07	10,11	100	13	4,26	89,02
2 Tachigaren ¹ 10+14	93,4	61,06	17,20	10,53	104	12	4,15	89,46
3 Tachigaren ¹ 10+18	92,9	60,90	17,14	10,47	104	12	4,18	89,83
4 Tachigaren ¹ 10+30	94,0	60,41	17,17	10,40	103	12	4,16	89,93
RSQ %	80,0	94,5	99,4	96,3	-	97,3	98,4	82,8
CV	5,8	3,4	0,6	3,5	-	5,0	1,9	1,2
LSD 5%	4,4	1,7	0,1	0,3	-	0,5	0,1	0,9
Prob.	0,0001	0,0886	0,0144	0,0387	-	0,1307	0,0092	0,1882

1. Additional seed treatment was Euparen (tolylfluamid) during 2004-2006. In 2007 the additional seed treatment was Maxim tech (fludioxonil).

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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Skörd / Harvest

Heavily infested trials

8 försök 2004-2007

Behandling / Treatments	Ant. plantor	Renvikt	Sockethalt	Socket		Blåtal	K + Na	Renhet
	No. plants	Clean	Sugar content	Sugar		Amino-N		Cleanness
	1000-tal/ha 1000-nds/ha	weight ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%
1 Kontroll obehandlad / Untreated	81,4	57,07	16,91	9,70	100	13	4,40	89,18
2 Tachigaren ¹ 10+14	91,6	59,62	17,09	10,24	106	12	4,28	89,74
3 Tachigaren ¹ 10+18	90,8	59,18	17,00	10,12	104	12	4,33	90,44
4 Tachigaren ¹ 10+30	92,2	58,68	17,05	10,06	104	12	4,28	90,09
RSQ %	77,4	93,4	99,1	95,9	-	98,0	98,0	82,6
CV	6,8	4,2	0,7	4,3	-	5,3	2,1	1,3
LSD 5%	6,3	2,6	0,1	0,5	-	0,7	0,1	1,2
Prob.	0,0053	0,2143	0,0258	0,1147	-	0,2256	0,0568	0,2119

1. Additional seed treatment was Euparen (tolylfluamid) during 2004-2006. In 2007 the additional seed treatment was Maxim tech (fludioxonil).

Skörd / Harvest

Weakly infested trials

4 försök 2004-2007

Behandling / Treatments	Ant. plantor	Renvikt	Sockethalt	Socket		Blåtal	K + Na	Renhet
	No. plants	Clean	Sugar content	Sugar		Amino-N		Cleanness
	1000-tal/ha 1000-nds/ha	weight ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%
1 Kontroll obehandlad / Untreated	88,9	63,02	17,38	10,92	100	13	3,97	88,70
2 Tachigaren ¹ 10+14	97,1	63,94	17,43	11,11	102	12	3,89	88,89
3 Tachigaren ¹ 10+18	97,1	64,34	17,41	11,16	102	12	3,90	88,61
4 Tachigaren ¹ 10+30	97,7	63,88	17,41	11,10	102	12	3,91	89,62
RSQ %	81,5	97,6	99,9	97,8	-	86,0	99,0	86,5
CV	4,4	1,4	0,4	1,5	-	4,8	1,4	1,0
LSD 5%	6,7	1,5	0,1	0,3	-	0,9	0,1	1,4
Prob.	0,0431	0,2785	0,7605	0,2414	-	0,6424	0,2042	0,4231

1. Additional seed treatment was Euparen (tolylfluamid) during 2004-2006. In 2007 the additional seed treatment was Maxim tech (fludioxonil).