

Syngenta - Nya betningsmedel mot jordburna svampsjukdomar i sockerbeter

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

2004

SBU Projektkod 2004-1-2-487

**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:

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Använd gärna denna information, men glöm inte att ange källan vid publicering!

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2004-1-2-487

Antal försök 3

Appendix 1a

Fältkort

Försöksvärd		Odlarnummer
Hushållningssällskapet, Dan Molin	4871/04	23 215
Gård	Adress	Telefon
Borgeby gård	237 91 Bjärred	0708-161080

Syfte: Att prova nya betningsmedel mot jordburna svampsjukdomar i sockerbetor.**Uppdragsgivare:** Syngenta, SBU, DuPont, AgroBest

Försöksled	Uppdr.g	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll obehandlad	Syng/Dup	-	-
2 Kontroll m insekticid	Syng/Dup	-	Cruiser 600fs 30 g
3 Euparen+Tachigaren	Syng/Dup	10+14	Cruiser 600fs 30 g
4 Maxim Tech + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
5 Dynasty + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
6 Maxim Tech + Dynasty + Tach	Syngenta	6+6+14	Cruiser 600fs 30 g
7 Dynasty + Tachigaren	Syngenta	16+14	Cruiser 600fs 30 g
8 Maxim Tech+Tachigaren	Syngenta	12+14	Cruiser 600fs 30 g
9 Euparen+Tachigaren	DuPont	10+18	Cruiser 600fs 30 g
10 Euparen+Tachigaren	DuPont	10+30	Cruiser 600fs 30 g
11 Näringslösning MicroBest	Agro Best	10+14	Cruiser 600fs 30 g 4,0 l/ha*

Bricknr i försöket:

2201-2244

Försökets totala yta, m²:

2154

Skördeyta/parcell, m²:

2 r x 10 m

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: Högt svampinfektionstryck.

*I led 11 sprutas näringslösning i såfäran, 5 cm bredd, 100 l vatten/ha, i samband med sådd.

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

Försöksuppgifter:

		Försöksåtg.:	PM	Datum/Sign.
Såmaskin, märke	Monozentra SP	Generalprov 6	2.6.1 HS	1/12-03 LJ
Sådd, datum	15/4	Utstakning i fält	2.4.1 HS	12/3 LJ,AE
Radavstånd, cm	48	Parcellvis sådd	2.4.2 HS	15/4 TB,AH
Antal frö per m	5,1	Svampprov	2.6.1 HS	1/12-03 LJ
Sort	Jakarta	Planträkning 20	2.5.4 HS	26/4 AE,HH
Betning, produkt	Enligt plan ovan	Planträkning 50	2.5.4 HS	27/4 TB, AH
Uppkomst, datum	26-apr	Planträkning max	2.5.4 HS	19/5 LJ,RHF
Förfrukt 2003	Höstvete	Planträkning slutl	2.5.4 HS	30/6 LJ,ORM
År med betor 1992-02:	1995,1998,2001	Rotbrandsbed. 1	2.5.8 HS	10/5 HH,RHF,ÅO
		Rotbrandsbed. 2	2.5.8 HS	24/5 HH,RHF,ÅO
Gödning	Se "Behandlingsdata"	Skörd	2.4.7 HS	4/10 LJ,TB
Ogräsbekämpning	Se "Behandlingsdata"	Lev. provtvätt	2.4.7 HS	4/10 TB
Svampbekämpningar	Se "Behandlingsdata"	Analys	- DS	
Insektsbekämpningar	Se "Behandlingsdata"			

20040312/ÅO

Försöksdata kontrollerat (datum+sign.): 20041124 LJ

Betningsmedel mot jordbruna svampsjukdomar

SBU projektkod 2004-1-2-487

Antal försök 3

Appendix 1b

Fältkort

Försöksvärd		Odlarnummer
Sten Olsson	4873/04	52 279
Gård	Adress	Telefon
Skiberöd	Skiberöds gård, 240 33 Löberöd	0709-367698

Syfte: Att prova nya betningsmedel mot jordbruna svampsjukdomar i sockerbeter.**Uppdragsgivare:** Syngenta, SBU, DuPont, AgroBest

Försöksled	Uppdr.g	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll obehandlad	Syng/Dup	-	-
2 Kontroll m insekticid	Syng/Dup	-	Cruiser 600fs 30 g
3 Euparen+Tachigaren	Syng/Dup	10+14	Cruiser 600fs 30 g
4 Maxim Tech + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
5 Dynasty + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
6 Maxim Tech + Dynasty + Tach	Syngenta	6+6+14	Cruiser 600fs 30 g
7 Dynasty + Tachigaren	Syngenta	16+14	Cruiser 600fs 30 g
8 Maxim Tech+Tachigaren	Syngenta	12+14	Cruiser 600fs 30 g
9 Euparen+Tachigaren	DuPont	10+18	Cruiser 600fs 30 g
10 Euparen+Tachigaren	DuPont	10+30	Cruiser 600fs 30 g
11 Näringslösning MicroBest	Agro Best	10+14	Cruiser 600fs 30 g 4,0 l/ha*

Bricknr i försöket:

2289-2332

Försökets totala yta, m²:

2154

Skördeyta/parcell, m²:

2 r x 10 m

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: Högt svampinfektionstryck.

*I led 11 sprutas näringslösning i såfäran, 5 cm bredd, 100 l vatten/ha, i samband med sådd.

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

Försöksuppgifter:

		Försöksåtg.: PM	Datum/Sign.
Såmaskin, märke	Monozentra SP	Generalprov 6 2.6.1 HS	1/12-03 LJ
Sådd, datum	13/4	Utstakning i fält 2.4.1 HS	7/4 LJ
Radavstånd, cm	48	Parcellvis sådd 2.4.2 HS	13/4 TB,AH
Antal frö per m	5,1	Svampprov 2.6.1 HS	1/12-03 LJ
Sort	Jakarta	Planträkning 20 2.5.4 HS	26/4 LJ
Betning, produkt	Enligt plan ovan	Planträkning 50 2.5.4 HS	29/4 AE,HH
Uppkomst, datum	26-apr	Planträkning max 2.5.4 HS	19/5 TB,HH
Förfrukt 2003	Höstvete	Planträkning slutl 2.5.4 HS	28/6 TB
År med betor 1992-02:	1993,1997,2000	Rotbrandsbed. 1 2.5.8 HS	12/5 HH,RHF,ÅO
		Rotbrandsbed. 2 2.5.8 HS	26/5 HH,RHF
Gödsling	Se "Behandlingsdata"	Skörd 2.4.7 HS	7/10 LJ,TB
Ogräsbekämpning	Se "Behandlingsdata"	Lev. provtvätt 2.4.7 HS	8/10 TB
Svampbekämpningar	Se "Behandlingsdata"	Analys - DS	
Insektsbekämpningar	Se "Behandlingsdata"		

20040312/ÅO

Försöksdata kontrollerat (datum+sign.): 20041125 LJ

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod 2004-1-2-487

Antal försök 3

Appendix 1c

Fältkort

Försöksvärd		Odlarnummer
Karl-Ragnar Orsmark	4872/04	3 013
Gård	Adress	Telefon
Höganäs	Åsbacka gård, 263 92 Jonstorp	0709-548161

Syfte: Att prova nya betningsmedel mot jordburna svampsjukdomar i sockerbetor.**Uppdragsgivare:** Syngenta, SBU, DuPont, AgroBest

Försöksled	Uppdr.g	Dos fung. g a. i./unit	Dos ins. g a. i./unit
1 Kontroll obehandlad	Syng/Dup	-	-
2 Kontroll m insekticid	Syng/Dup	-	Cruiser 600fs 30 g
3 Euparen+Tachigaren	Syng/Dup	10+14	Cruiser 600fs 30 g
4 Maxim Tech + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
5 Dynasty + Tachigaren	Syngenta	6+14	Cruiser 600fs 30 g
6 Maxim Tech + Dynasty + Tach	Syngenta	6+6+14	Cruiser 600fs 30 g
7 Dynasty + Tachigaren	Syngenta	16+14	Cruiser 600fs 30 g
8 Maxim Tech+Tachigaren	Syngenta	12+14	Cruiser 600fs 30 g
9 Euparen+Tachigaren	DuPont	10+18	Cruiser 600fs 30 g
10 Euparen+Tachigaren	DuPont	10+30	Cruiser 600fs 30 g
11 Näringslösning MicroBest	Agro Best	10+14	Cruiser 600fs 30 g 4,0 l/ha*

Bricknr i försöket:

2245-2288

Försökets totala yta, m²:

2154

Skördeyta/parcell, m²:

2 r x 10 m

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: Högt svampinfektionstryck.

*I led 11 sprutas näringslösning i såfåran, 5 cm bredd, 100 l vatten/ha, i samband med sådd.

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

Försöksuppgifter:

		Försöksåtg.:	PM	Datum/Sign.
Såmaskin, märke	Monozentra SP	Generalprov 6	2.6.1 HS	1/12-03 LJ
Sådd, datum	16/4	Utstakning i fält	2.4.1 HS	15/3 LJ
Radavstånd, cm	48	Parcellvis sådd	2.4.2 HS	16/4 TB,AH
Antal frö per m	5,1	Svampprov	2.6.1 HS	1/12-03 LJ
Sort	Jakarta	Planträkning 20	2.5.4 HS	27/4 LJ
Betning, produkt	Enligt plan ovan	Planträkning 50	2.5.4 HS	29/4 LJ
Uppkomst, datum	27-apr	Planträkning max	2.5.4 HS	21/5 LJ
Förfrukt 2003	Höstvete	Planträkning slutl	2.5.4 HS	2/7 LJ
År med betor 1992-02:	1998,2001	Rotbrandsbed. 1	2.5.8 HS	11/5 HH,RHF,ÅO
		Rotbrandsbed. 2	2.5.8 HS	25/5 HH,RHF,ÅO
Gödsling	Se "Behandlingsdata"	Skörd	2.4.7 HS	30/9 LJ,TB
Ogräsbekämpning	Se "Behandlingsdata"	Lev. provtvätt	2.4.7 HS	4/10 TB
Svampbekämpningar	Se "Behandlingsdata"	Analys	- DS	
Insektsbekämpningar	Se "Behandlingsdata"			

20040312/ÅO

Försöksdata kontrollerat (datum+sign.): 20041124 LJ

Fältplan/Fieldplan**Borgeby**

IV	9	11	4	8	3	7	1	5	6	10	2
III	2	4	8	1	7	11	5	9	10	3	6
II	4	6	10	3	9	2	7	11	1	5	8
I	11	2	6	10	5	9	3	7	8	1	4

Höganäs

IV	5	1	8	10	7	9	11	3	4	2	6
III	9	5	1	3	11	2	4	7	8	6	10
II	11	7	3	5	2	4	6	9	10	8	1
I	7	3	10	1	9	11	2	5	6	4	8

Skiberöd

IV	3	8	4	9	1	11	6	10	7	2	5
III	7	1	8	2	5	4	10	3	11	6	9
II	9	3	10	4	7	6	1	5	2	8	11
I	5	10	6	11	3	2	8	1	9	4	7

Jordanalys/Soil analyses 2004

For definition of soil fractions and soil type see below.

		Borgeby	Höganäs		Skiberöd		
			Klass		Klass		Klass
pH-värde	pH	7,4		7,3		6,6	
P-AL (mg/100 g jord)		6,9	III	12	IV	9,6	IV
K-AL (mg/100 g jord)		6,5	II	9,3	III	5,6	III
Mg-AL (mg/10 g jord)		5,6		8,4		3,9	
K/Mg-kvot		1,2		1,1		1,4	
Ca-AL (mg/kg jord)		280		250		130	
K-HCl (mg/100 g jord)		80	2	87	2	57	2
Cu-HCl (mg/kg jord)		10		9,3		9,2	
P-HCL mg/100 g		49	3	83	5	78	5
Bor (mg/kg jord)	Boron	1,2		0,58		0,55	
Mullhalt (%)	Organic matter	2,9		3,7		3,2	
Lerhalt (%)	Clay content	10		15		6	
Finler (%)	Fine Clay	10		13		6	
Sand + grovmo (%)	Sand + fine sand	65		51		62	
Jordart	Soil type	nmh1Sa		mmhmoLL		mmh1Sa	
Basmättnadsgrad		>80		>80		70	
S-värde (mekv/100g jord)		12,1		13,4		7	
T-värde (mekv/100g jord)		12,1		14,7		10	

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

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Analys av marksmitta och vanligaste förekommande svampar på försöksplatserna 2004**Risk of infection and most frequently occurring fungi on the trial locations 2004**

Jordprov tagna december 2003. Analys av svampinfektionstryck är utförd av Maria Nihlgård, Syngenta, enligt Ewaldz metod (1993).

Samples were collected during December 2003. Analysis of infestation risk was performed by Maria Nihlgård 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)
Borgeby	63	Medium	<i>Aphanomyces, Pythium, Rhizoctonia</i>
Skiberöd	36	Low	<i>Aphanomyces, Pythium, Fusarium</i>
Höganäs	63	Medium	<i>Aphanomyces, Pythium, Rhizoctonia</i>

Plats Location	Isolerade svampar från plantor i fält Fungi isolated from plants collected in the field
Borgeby	Not isolated
Skiberöd	<i>Pythium</i> spp.
Höganäs	<i>Aphanomyces, Fusarium oxysporum, Pythium</i> spp.

Betningsmedel mot jordburna svampsjukdomar

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Appendix 5

Behandlingsdata Weed control and fertilization

Skiberöd

Ogräsbekämpning/Weed control

Datum	Produkt och dos
12/5	2 G + 2 B + 1,5 superolja
25/5	1 G + 0,5 P + 1,5 B + 0,2 T + 1 superolja

Gödsling/Fertilization

Datum	Produkt och giva	N	P	K
11-apr	Probeta NPK 620 kg/ha	93	24	43

Höganäs

Ogräsbekämpning/Weed control

Datum	Produkt och dos
27/4	1,2 G + 1,2 B + 0,3 superolja
6/5	0,6 G + 1,25 B + 0,15 P + 0,05 T + 0,3 superolja

Gödsling/Fertilization

Datum	Produkt och giva	N	P	K
12-apr	Probeta N 600 kg/ha	120		
våren 2003	Till höstveten 30 ton flytgödsel/ha		26	58
06-maj	Microplan 0,5 liter/ha			

Borgeby

Ogräsbekämpning/Weed control

Datum	Produkt och dos
28/4	0,75 G + 1,5 B + 0,05 T + 0,5 superolja
10/5	1 G + 1,5 B + 0,3 P + 0,1 T + 0,5 superolja
27/5	2 G + 1,5 B + 0,5 P + 0,18 T + 0,5 superolja

Gödsling/Fertilization

Datum	Produkt och giva	N	P	K
01-apr	Probeta NPK 800 kg/ha	120	30	54

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod
Appendix

Planräkningar/Plant number

Skiberöd

Behandling/Treatments		Planräkning 1000-tal/ha Plant number 1000nds/ha			Planräkning Plant number
Sådd/drilling:	13/4				Plh slutlig
Skörd/harvest:	7/10	20%	50%	Max	after inter-row cult.
	Datum/Date	040426	040429	040519	040628
1	Kontroll obehandlad	11,7	30,7	52,1	53,1
2	Kontroll m insekticid	12,2	38,3	70,8	70,8
3	Euparen+Tachigaren	10+14	17,7	54,2	85,9
4	Maxim Tech + Tachigaren	6+14	15,4	48,7	88,5
5	Dynasty + Tachigaren	6+14	17,2	49,5	88,8
6	Maxim Tech + Dynasty + Tach	6+6+14	16,2	52,1	89,1
7	Dynasty + Tachigaren	16+14	19,8	53,7	89,3
8	Maxim Tech+Tachigaren	12+14	17,5	46,6	93,2
9	Euparen+Tachigaren	10+18	17,2	50,5	91,2
10	Euparen+Tachigaren	10+30	14,6	50,3	89,3
11	Näringslösning MicroBest	10+14	19,8	51,3	84,9
RSQ %		33,5	57,4	87,5	87,3
CV		32,6	16,4	6,3	6,2
LSD 5%		7,7	11,3	7,7	7,5
Prob.		0,4665	0,0056	<0,0001	<0,0001
		ns			

Planräkningar/Plant number

Höganäs

Behandling/Treatments		Planräkning 1000-tal/ha Plant number 1000nds/ha			Planräkning Plant number
Sådd/drilling:	16/4				Plh slutlig
Skörd/harvest:	4/10	20%	50%	Max	after inter-row cult.
	Datum/Date	040426	040429	040521	040702
1	Kontroll obehandlad	23,18	68,49	96,88	96,09
2	Kontroll m insekticid	16,41	52,60	95,05	92,97
3	Euparen+Tachigaren	10+14	20,31	61,46	99,22
4	Maxim Tech + Tachigaren	6+14	20,05	61,72	95,31
5	Dynasty + Tachigaren	6+14	19,01	58,33	96,61
6	Maxim Tech + Dynasty + Tach	6+6+14	21,09	63,28	97,14
7	Dynasty + Tachigaren	16+14	19,27	58,33	97,14
8	Maxim Tech+Tachigaren	12+14	18,49	57,55	96,61
9	Euparen+Tachigaren	10+18	19,79	61,20	97,40
10	Euparen+Tachigaren	10+30	15,36	48,18	97,66
11	Näringslösning MicroBest	10+14	18,23	58,07	95,05
RSQ %		48,6	47,4	14,5	30,9
CV		17,19	14,19	4,54	3,46
LSD 5%		4,77	12,09	6,35	4,81
Prob.		0,1325	0,1411	0,9690	0,6650
		ns	ns	ns	ns

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

Appendix

Planräkningar/Plant number

Borgeby

Behandling/Treatments		Planräkning 1000-tal/ha Plant number 1000nds/ha			Planräkning Plant number Plh slutlig after inter-row cult.
		20%	50%	Max	
Sådd/drilling:	15/4				
Skörd/harvest:	4/10				
	Datum/Date	040426	040427	040519	040630
1	Kontroll obehandlad	38,3	64,6	99,0	98,4
2	Kontroll m insekticid	39,8	71,1	100,8	100,0
3	Euparen+Tachigaren	10+14	34,1	69,0	105,2
4	Maxim Tech + Tachigaren	6+14	33,9	58,6	103,4
5	Dynasty + Tachigaren	6+14	28,1	62,0	105,0
6	Maxim Tech + Dynasty + Tach	6+6+14	31,3	61,7	98,7
7	Dynasty + Tachigaren	16+14	28,1	59,6	101,6
8	Maxim Tech+Tachigaren	12+14	39,1	66,2	102,9
9	Euparen+Tachigaren	10+18	28,9	58,3	101,6
10	Euparen+Tachigaren	10+30	31,0	63,8	101,6
11	Näringslösning MicroBest	10+14	27,3	62,5	102,6
RSQ %		46,2	35,1	38,4	41,0
CV		29,5	15,7	3,6	3,8
LSD 5%		13,9	14,4	5,3	5,6
Prob.		0,5208	0,7368	0,2639	0,1237
		ns	ns	ns	ns

Planräkningar/Plant number

3 försök

Behandling/Treatments		Planräkning 1000-tal/ha Plant number 1000nds/ha			Planräkning Plant number Plh slutlig after inter-row cult.
		20%	50%	Max	
		3 försök	3 försök	3 försök	3 försök
1	Kontroll obehandlad	24,4	54,6	82,6	83,0
2	Kontroll m insekticid	22,8	54,0	88,9	88,5
3	Euparen+Tachigaren	10+14	24,0	61,5	96,8
4	Maxim Tech + Tachigaren	6+14	23,1	56,3	95,6
5	Dynasty + Tachigaren	6+14	21,4	56,6	96,8
6	Maxim Tech + Dynasty + Tach	6+6+14	22,8	59,0	95,0
7	Dynasty + Tachigaren	16+14	22,4	57,2	96,0
8	Maxim Tech+Tachigaren	12+14	25,0	56,8	97,6
9	Euparen+Tachigaren	10+18	22,0	56,7	96,7
10	Euparen+Tachigaren	10+30	20,3	54,1	96,2
11	Näringslösning MicroBest	10+14	21,8	57,3	94,2
RSQ %		50,4	33,7	64,1	64,9
CV		33,4	18,0	7,3	8,8
LSD 5%		6,1	8,2	5,6	14,3
Prob.		0,9478	0,8457	<0,0001	0,3834
		ns	ns		ns

Disease index and root rot index

Skiberöd

Behandling/Treatment		Rotbrand Damping-off		Kronisk rottröta Root rot	
Sådd/drilling:	13/4	DSI 1	DSI 2	RI	
Skörd/harvest:	7/10	0-100	0-100	0-3	
	Datum/date	040514	040527	041020	
1	Kontroll obehandlad	-	50,4	36,8	0,53
2	Kontroll m insekticid	-	48,0	36,6	0,47
3	Euparen+Tachigaren	10+14	44,1	37,7	0,39
4	Maxim Tech + Tachigaren	6+14	45,7	34,8	0,40
5	Dynasty + Tachigaren	6+14	36,4	36,1	0,43
6	Maxim Tech + Dynasty + Tacl	6+6+14	40,8	37,4	0,55
7	Dynasty + Tachigaren	16+14	45,6	40,0	0,50
8	Maxim Tech+Tachigaren	12+14	47,1	35,3	0,41
9	Euparen+Tachigaren	10+18	45,5	38,0	0,42
10	Euparen+Tachigaren	10+30	47,2	34,7	0,48
11	Näringslösning MicroBest	10+14	47,5	36,6	0,43
RSQ %		74,5	24,5	28,9	
CV		9,0	13,5	38,02	
LSD 5%		7,4	7,1	0,25	
Prob.		0,0308	0,9427 ns	0,94 ns	

Disease index and root rot index

Borgeby

Behandling/Treatment		Rotbrand Damping-off		Kronisk rottröta Root rot	
Sådd/drilling:	15/4	DSI 1	DSI 2	RI	
Skörd/harvest:	4/10	0-100	0-100	0-3	
	Datum/date	040510	040524	041008	
1	Kontroll obehandlad	-	31,2	30,6	0,07
2	Kontroll m insekticid	-	37,8	30,1	0,23
3	Euparen+Tachigaren	10+14	28,2	24,6	0,24
4	Maxim Tech + Tachigaren	6+14	27,2	31,2	0,20
5	Dynasty + Tachigaren	6+14	30,5	33,2	0,43
6	Maxim Tech + Dynasty + Tacl	6+6+14	35,5	29,0	0,28
7	Dynasty + Tachigaren	16+14	28,0	38,9	0,17
8	Maxim Tech+Tachigaren	12+14	30,5	29,6	0,14
9	Euparen+Tachigaren	10+18	30,9	29,2	0,49
10	Euparen+Tachigaren	10+30	33,2	34,0	0,23
11	Näringslösning MicroBest	10+14	29,4	33,7	0,16
RSQ %		92,0	68,8	53,4	
CV		14,3	20,3	65,35	
LSD 5%		6,4	9,2	0,23	
Prob.		0,0540	0,2656 ns	0,0293 ns	

Disease index and root rot index

Höganäs

Behandling/Treatment		Rotbrand		Kronisk rotträta	
		Damping-off		Root rot	
Sådd/drilling:	16/4	DSI 1	DSI 2	RI	
Skörd/harvest:	4/10	0-100	0-100	0-3	
	Datum/date	040512	040525	041008	
1	Kontroll obehandlad	66,7	36,0	0,34	
2	Kontroll m insekticid	66,7	40,1	0,42	
3	Euparen+Tachigaren	10+14	63,2	33,4	0,30
4	Maxim Tech + Tachigaren	6+14	63,0	37,5	0,58
5	Dynasty + Tachigaren	6+14	66,3	36,0	0,41
6	Maxim Tech + Dynasty + Tacl	6+6+14	61,9	41,9	0,58
7	Dynasty + Tachigaren	16+14	65,5	49,6	0,34
8	Maxim Tech+Tachigaren	12+14	67,0	39,2	0,61
9	Euparen+Tachigaren	10+18	65,8	38,6	0,34
10	Euparen+Tachigaren	10+30	61,2	44,8	0,45
11	Näringslösning MicroBest	10+14	61,0	36,8	0,47
RSQ %		70,7	74,3	42,5	
CV		5,8	14,3	39,37	
LSD 5%		6,8	8,2	0,25	
Prob.		0,3401	0,0192	0,1648	
		ns		ns	

Disease index and root rot index

3 försök

Behandling/Treatment		Rotbrand		Kronisk rotträta	
		Damping-off		Root rot	
		DSI 1	DSI 2	RI	
		0-100	0-100	0-3	
		3 försök	3 försök	3 försök	
1	Kontroll obehandlad	-	49,1	34,5	0,31
2	Kontroll m insekticid	-	50,6	35,6	0,38
3	Euparen+Tachigaren	10+14	45,1	31,9	0,31
4	Maxim Tech + Tachigaren	6+14	44,4	34,5	0,39
5	Dynasty + Tachigaren	6+14	45,0	35,1	0,42
6	Maxim Tech + Dynasty + Tacl	6+6+14	46,6	36,1	0,47
7	Dynasty + Tachigaren	16+14	45,9	42,8	0,34
8	Maxim Tech+Tachigaren	12+14	47,3	34,7	0,39
9	Euparen+Tachigaren	10+18	47,0	35,3	0,42
10	Euparen+Tachigaren	10+30	47,5	37,8	0,39
11	Näringslösning MicroBest	10+14	45,4	35,6	0,35
RSQ %		71,8	24,0	26,8	
CV		19,3	22,4	49,36	
LSD 5%		7,3	6,5	0,15	
Prob.		0,8720	0,1975	0,6609	
		ns	ns	ns	

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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Appendix

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Skörd/Harvest

Borgeby

Behandling/Treatments		No. plants Ant. plantor	Clean weight Renvikt	Sugar content Sockershalt	Sugar Socker		Amino-N Blåtal	K + Na		Extr. sugar Utv. socker		Cleanness Renhet
Sådd/drilling:	15/4	1000-nds/ha	ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%	ton/ha	rel 1	%
Skörd/harvest:	4/10	1000-tal/ha	ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%	ton/ha	rel 1	%
1	Kontroll obehandlad	98,4	62,6	17,44	10,89	100	12	3,4	91,15	9,93	100	91,57
2	Kontroll m insekticid	100,0	63,5	17,71	11,24	103	13	3,6	91,09	10,24	103	91,43
3	Euparen+Tachigaren	10+14	104,4	63,1	11,20	103	11	3,6	91,24	10,22	103	91,89
4	Maxim Tech + Tachigaren	6+14	103,4	62,4	11,00	101	13	3,5	91,16	10,03	101	92,13
5	Dynasty + Tachigaren	6+14	105,5	60,1	10,68	98	12	3,5	91,29	9,75	98	92,37
6	Maxim Tech + Dynasty + Tach	6+6+14	97,1	64,6	11,47	105	13	3,6	91,02	10,44	105	91,43
7	Dynasty + Tachigaren	16+14	102,6	62,4	11,12	102	12	3,5	91,34	10,16	102	90,10
8	Maxim Tech+Tachigaren	12+14	103,4	63,6	11,16	102	12	3,5	91,17	10,17	103	91,66
9	Euparen+Tachigaren	10+18	103,1	62,7	11,12	102	11	3,6	91,13	10,13	102	91,60
10	Euparen+Tachigaren	10+30	102,6	60,8	10,78	99	12	3,6	91,12	9,82	99	92,42
11	Näringslösning MicroBest	10+14	102,9	62,7	11,13	102	12	3,5	91,34	10,17	102	91,42
RSQ %		41	15,5	13	17,7	-	32,1	28,2	16	18,2	-	43,1
CV		3,8	6,1	2,09	5,62	-	12	4,5	0,34	5,54	-	1,09
LSD 5%		5,6	5,5	0,54	0,91	-	2	0,2	0,46	0,82	-	1,44
Prob.		0,1237	0,9197	0,9545	0,8923	-	0,5991	0,6471	0,9273	0,8911	-	0,1583
		ns	ns	ns	ns	-	ns	ns	ns	ns	-	ns

Skörd/Harvest

Höganäs

Behandling/Treatments		No. plants Ant. plantor	Clean weight Renvikt	Sugar content Sockershalt	Sugar Socker		Amino-N Blåtal	K + Na		Extr. sugar Utv. socker		Cleanness Renhet
Sädd/drilling:	16/4	1000-nds/ha	ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%	ton/ha	rel 1	%
Skörd/harvest:	4/10	1000-tal/ha	ton/ha	%	ton/ha	rel 1	mg/100g beta	mM/ 100 g beta	%	ton/ha	rel 1	%
1	Kontroll obehandlad	96,1	65,8	16,71	10,99	100	22	4,4	88,88	9,76	100	90,73
2	Kontroll m insekticid	93,0	63,7	16,71	10,64	97	20	4,1	89,30	9,50	97	91,03
3	Euparen+Tachigaren	10+14	98,2	66,6	16,72	101	21	4,3	89,02	9,91	101	92,19
4	Maxim Tech + Tachigaren	6+14	96,6	61,8	16,43	92	19	4,2	88,97	9,04	93	90,76
5	Dynasty + Tachigaren	6+14	96,1	62,8	16,87	96	21	4,3	89,14	9,44	97	90,16
6	Maxim Tech + Dynasty + Tach	6+6+14	98,2	59,1	16,77	90	17	3,9	89,80	8,90	91	90,82
7	Dynasty + Tachigaren	16+14	97,1	65,0	16,74	96	22	4,6	89,21	9,45	97	89,21
8	Maxim Tech+Tachigaren	12+14	95,3	59,7	16,63	90	18	4,1	89,38	8,86	91	90,60
9	Euparen+Tachigaren	10+18	95,6	65,3	16,55	98	22	4,4	88,66	9,58	98	91,14
10	Euparen+Tachigaren	10+30	95,6	60,2	16,77	92	20	4,1	89,40	9,02	92	89,70
11	Näringslösning MicroBest	10+14	96,6	67,1	16,69	102	21	4,4	88,79	9,93	102	91,69
RSQ %		30,9	49	24,4	50,2	-	32	39,7	30,8	49,1	-	61,4
CV		3,5	6,9	1,58	6,88	-	16	9,5	0,75	6,64	-	1,53
LSD 5%		4,8	6,3	0,39	1,06	-	5	0,6	0,98	0,92	-	2,01
Prob.		0,665	0,1337	0,6122	0,1393	-	0,3471	0,4296	0,5036	0,1625	-	0,2024
		ns	ns	ns	ns	-	ns	ns	ns	ns	-	ns

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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Appendix

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Skörd/Harvest

Skiberöd

Behandling/Treatments		No. plants Ant. plantor	Clean weight Renvikt	Sugar content Sockershalt	Sugar Socker		Amino-N Blåtal	K + Na		Extr. sugar Utv. socker		Cleanness Renhet
Sådd/drilling:	13/4	1000-nds/ha					mg/100g	mM/				
Skörd/harvest:	7/10	1000-tal/ha	ton/ha	%	ton/ha	rel 1	beta	100 g beta	%	ton/ha	rel 1	%
1	Kontroll obehandlad	53,1	47,6	16,77	7,99	100	11	4,0	89,94	7,19	100	86,60
2	Kontroll m insekticid	70,8	52,4	16,71	8,76	110	11	3,8	90,07	7,89	110	90,18
3	Euparen+Tachigaren	10+14	85,9	53,8	17,06	115	11	3,8	90,48	8,30	116	88,14
4	Maxim Tech + Tachigaren	6+14	88,5	55,9	16,78	117	11	3,6	90,47	8,48	118	90,19
5	Dynasty + Tachigaren	6+14	89,1	54,3	17,09	116	10	3,7	90,63	8,41	117	90,90
6	Maxim Tech + Dynasty + Tach	6+6+14	88,5	56,5	16,99	120	11	3,8	90,40	8,68	121	90,28
7	Dynasty + Tachigaren	16+14	89,6	56,0	17,11	120	11	3,7	90,63	8,68	121	89,58
8	Maxim Tech+Tachigaren	12+14	92,4	56,6	16,93	120	11	3,8	90,35	8,65	120	92,24
9	Euparen+Tachigaren	10+18	90,9	58,2	17,17	125	10	3,7	90,65	9,05	126	90,91
10	Euparen+Tachigaren	10+30	89,8	55,9	16,98	119	10	3,8	90,43	8,58	119	90,81
11	Näringslösning MicroBest	10+14	86,5	56,5	17,02	120	11	3,7	90,58	8,71	121	90,76
RSQ %		87,3	53,0	57,89	56,51	-	32	38,5	40,95	58,43	-	46,93
CV		6,2	5,7	1,25	5,91	-	7	4,9	0,36	5,87	-	2,32
LSD 5%		7,52	4,51	0,31	0,79	-	1,08	0,27	0,47	0,71	-	3,01
Prob.		<0,0001	0,0048	0,0598	0,0023	-	0,3882	0,3222	0,0723	0,001285	-	0,0531
				ns		-	ns	ns	ns		-	ns

Betningsmedel mot jordburna svampsjukdomar

SBU projektkod

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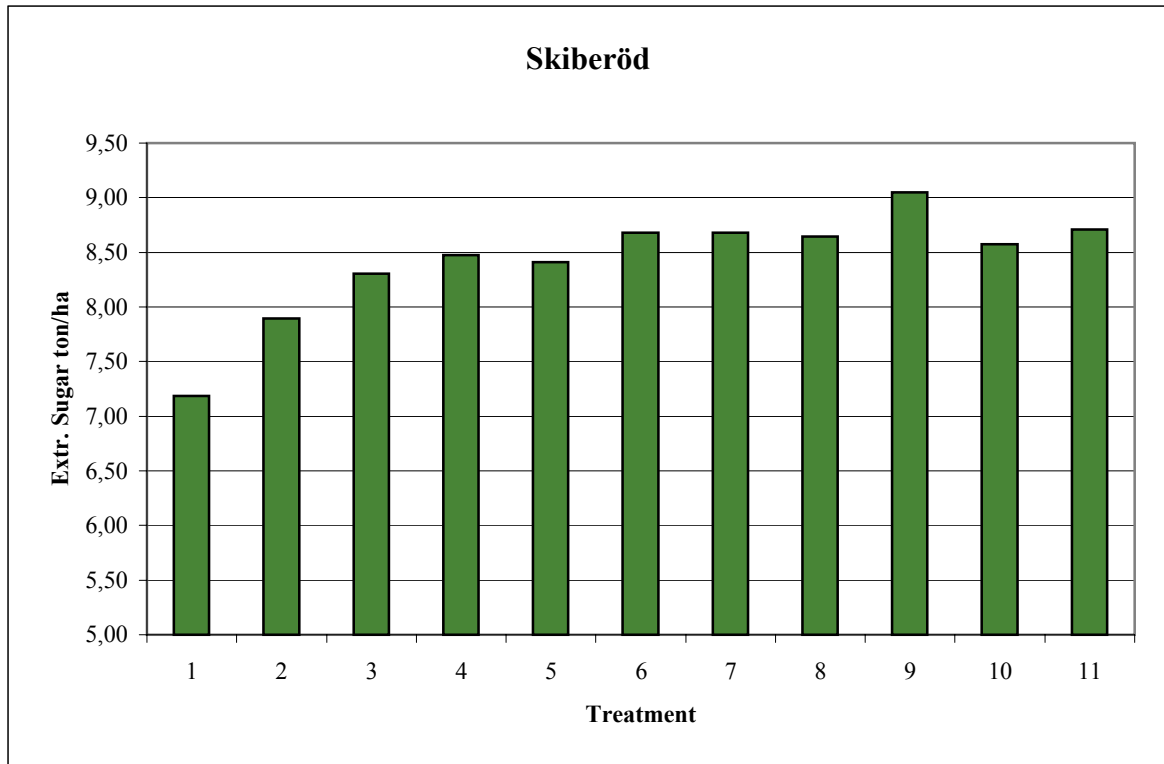
Appendix

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Skörd/Harvest

3 försök

Behandling/Treatments	No. plants Ant. plantor 1000-nds/ha 1000-tal/ha	Clean weight Renvikt ton/ha	Sugar content Sockerhalt %	Sugar Socker		Amino-N Blåtal mg/100g beta	K + Na		Extr. sugar Utv. socker		Cleanness Renhet %
				ton/ha	rel 1		mM/ 100 g beta	%	ton/ha	rel 1	
1 Kontroll obehandlad	82,6	58,7	16,97	9,96	100	15	3,9	89,99	8,96	100	89,63
2 Kontroll m insekticid	87,9	59,9	17,04	10,21	103	14	3,9	90,15	9,21	103	90,88
3 Euparen+Tachigaren	10+14	96,2	61,1	17,18	105	14	3,9	90,25	9,48	106	90,74
4 Maxim Tech + Tachigaren	6+14	96,2	60,0	16,94	102	14	3,8	90,20	9,18	102	91,03
5 Dynasty + Tachigaren	6+14	96,9	59,1	17,25	102	14	3,8	90,35	9,20	103	91,14
6 Maxim Tech + Dynasty + Tach	6+6+14	94,6	60,0	17,15	103,33	14	3,8	90,41	9,34	104	90,85
7 Dynasty + Tachigaren	16+14	96,4	61,1	17,23	104,3	15	3,9	90,39	9,43	105	89,63
8 Maxim Tech+Tachigaren	12+14	97,0	59,9	17,04	102,2	13	3,8	90,30	9,23	103	91,50
9 Euparen+Tachigaren	10+18	96,5	62,0	17,15	106,3	14	3,9	90,15	9,59	107	91,22
10 Euparen+Tachigaren	10+30	96,0	59,0	17,17	101,2	14	3,8	90,32	9,14	102	90,98
11 Näringslösning MicroBest	10+14	95,3	62,1	17,15	106,4	15	3,8	90,23	9,60	107	91,29
RSQ %	74,95	79,43	96,98	82,59	-	95,57	86,92	95,10	83,85	-	52,88
CV	6,9	4,3	0,58	4,39	-	8,2	4,0	0,28	4,33	-	1,17
LSD 5%	11,00	4,44	0,17	0,77	-	1,98	0,26	0,42	0,69	-	1,81
Prob.	0,1990	0,7786	0,0146	0,7096	-	0,8334	0,8695	0,6795	0,6780	-	0,4619
	ns	ns		ns		ns	ns	ns	ns		ns



Eget

Nya betningsmedel mot jordburna svampsjukdomar i sockerbetor

Sammanfattning

Syftet med denna försöksserie var att prova effekten av två nya betningsmedel, Maxim Tech och Dynasty, på jordburna svampar i sockerbetor. I serien har också två olika doser 18 och 30 g av Tachigaren provats och resultaten jämförts med standardbetningen 14 g i Sverige. I försöksserien har också ett led provats där en näringslösning har sprutats direkt i såfåran vid sådd.

- Dynasty i dosen 6 g kan reducera angreppen av rotbrand. I dosen 16 g är Dynasty lätt fytotoxisk.
- Maxim Tech visade inte på någon fytotoxitet för någon av doserna. Rotbrand reducerades i ungefär lika stor utsträckning som för Tachigaren.
- Dosen med 18 g Tachigaren gav signifikant ökad sockerskörd på en av försöksplatserna jämfört med standardbetningen. Den högre dosen av Tachigaren, 30 g, försenade uppkomsten räknad vid 20% genomsnittlig uppkomst. Vid full uppkomst var plantantalet på samma nivå som i övriga behandlingar.
- Näringslösningen har inte gett något utökat skydd eller tillväxtstimulering jämfört med standardbetningen.

Summary

The purpose of the present investigation was to test two new seed treatments Maxim Tech and Dynasty against soilborne fungi in sugar beets. Two different doses of Tachigaren 18 and 30 g were also tested. The trial series included one treatment where a nutrient solution was added to the furrow at drilling.

- The results of this trial series show that the treatment with Dynasty 6 g may reduce damping-off. However, the treatment with 16 g dose of Dynasty may be slightly phytotoxic.
- The treatments with Maxim Tech showed no phytotoxicity in either dose and has an effect on damping-off similar to the one in the standard treatment with Tachigaren (treatment three).
- Of the three tested doses of Tachigaren, the 18 g dose shows a significant increase in sugar yield at one of the trial locations compared to the standard dose 14 g. The 30 g dose of Tachigaren delayed plant emergence at 20% average emergence over the trial.
- The nutrient solution in treatment 11 provided no extra protection or growth promotion than the standard Swedish fungicide treatment.

Introduction

A number of soil borne fungi may cause substantial damage in sugar beet fields by reducing plant number and growth. One of the most important of these pests and diseases in Sweden is the water mold fungus *Aphanomyces cochlioides*. Under favourable conditions (warm and wet soil), *A. cochlioides* typically attack young seedlings 2 – 3 weeks after emergence. The roots become brown and in severe attacks, the entire hypocotyl (region between root and cotyledons) and cotyledons may rot and the seedling dies. Early seedling attacks of *A. cochlioides* may result in low plant numbers on the field.

Other fungi may also cause root rot e.g. *Pythium* spp. (preemergence damping-off) and *Rhizoctonia solani*. *Pythium* spp. attacks young seedlings within the first week after emergence. Recent inventories in Sweden have indicated that *Pythium* spp. and *Rhizoctonia solani* seem to be less common than *A. cochlioides* (L. Persson, SBU, pers. comm.)

This trial series included a total of eleven different seed treatments: one untreated control, one treatment with insecticide (Cruiser 600 FS) but without fungicide and, eight treatments with combinations of insecticides and fungicides (see field plan). Treatment eleven consisted of a nutriate solution that was added directly onto the furrow at drilling.

The trials were laid out on three locations, with low to medium risk of damping-off, in the southern part of Sweden. The trials were sown 13/4 (Höganäs), 15/4 (Borgeby) and 16/4 (Skiberöd). 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.

The purpose of the present investigation was to test two new seed treatments Maxim Tech and Dynasty, three doses of Tachigaren and one nutriate solution against soilborne fungi in sugar beet and to compare their effect with the standard seed treatments that are used in Sweden today.

Material and methods

In late autumn 2003, soil samples were taken from a number of different locations in the south of Sweden. The soil samples were analyzed for their potential to infect young sugar beet seedlings. 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. Skiberöd is situated in the central part of Skåne 25 km east of Lund, Höganäs is situated in the northwestern part of Skåne and Borgeby 5 km west of Lund. The result of the soil test from the three locations is shown in appendix 4.

The results of the analyses of soil type on each locality are shown in appendix 3.

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.

Damping-off

Evaluation of damping-off 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:

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

where n = number of beets in each class.

The results are shown in appendix 7.

Harvest

After harvest, the number of beets that showed symptoms of chronic root rot was counted in each plot and classified into one of three groups: 1. very weak, 2. weakly and 3. strongly infected beets, respectively. Beets classified as strongly infected are characterized by a severely deformed taproot whereas weakly infected beets show only moderate signs of deformation. A root rot index (RI: 0 – 3) was calculated:

$$RI = (0 * n_0 + 1 * n_1 + 2 * n_2 + 3 * n_3) / \text{total no. plants in the plot}$$

where n = the number of plants in each class.

A root rot index below one indicates minor deformations on the beets whereas a root rot index close to three indicates severely deformed beets (appendix 7).

The evaluation was carried out at the central tare house in Örtofta (Agri Provtvätt, Örtofta Sockerbruk, Danisco Sugar).

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 show that *A. cochlioides* was the most frequently occurring fungus at the three trial locations (appendix 4). The highest soil index was found on Borgeby and Höganäs (63). Although the risk of root rot infection at Skiberöd was considered low, the most severe attacks of damping-off occurred at Skiberöd. Fungi was also isolated from plants collected in the field. At Skiberöd *Pythium* spp. was isolated. At Höganäs three fungi were isolated: *Aphanomyces*, *Fusarium oxysporum* and *Pythium* spp.

Plant number

The infection of root rot during emergence at Skiberöd was high which resulted in severe plant loss in the control treatments. The fungicide treatments added around 15 000 to 20 000 plants/ha compared with only insecticide treatment. The emergence in treatment 10 (30 g Tachigaren) was slower than for the treatments with 14 and 18 g Tachigaren.

There were no significant differences in plant number between the treatments at Höganäs or Borgeby. At Borgeby there was, with the exception of treatment 6 (Maxim Tech 6 g + Dynasty 6 g + Tachigaren 14 g), a slight increase in plant number for the fungicide treatments compared to the control with only insecticide treatment.

The average increase in plant number over three trials for fungicide treatments was around 7 000 to 10 000 plants/ha. There were no significant differences between the fungicide treatments.

Disease index

The results from the evaluation of disease index DSI 1 during emergence at Skiberöd showed that all the fungicide treatments had slightly lower DSI than the control treatments. There were no significant differences in DSI 1 between the three doses of Tachigaren. The DSI 1 value for the two doses of Dynasty 6 and 16 g was 36,4 and 45,6 respectively ($p < 0,05$). This result may suggest that the 6 g dose of Dynasty provide better protection to the plants than the 16 g dose. There were no significant differences between the two tested doses of Maxim Tech (6 g and 12 g, $p > 0,05$, NS).

The lowest DSI 1 at Skiberöd was found in the treatment with 6 g Dynasty (36,4) which was significantly different ($p < 0,05$, $LSD = 7,4$) from all the three doses of Tachigaren (14, 18 and 30 g), the two doses of Maxim Tech (6 and 12 g) and also from the high dose of Dynasty (16 g).

The disease index DSI 1 during emergence was relatively high at Höganäs. However, there were no significant differences between the fungicide treatments in DSI 1. Although the plants were less damaged when the second evaluation of DSI was performed, the standard dose of Tachigaren (14 g) had significantly lower DSI 2 (33,4) than the 30 g dose (44,8). The DSI 2 for the control treatment 1 without any fungicides or insecticides was 36,0. This may suggest that the 30 g dose of Tachigaren is slightly phytotoxic rather than that the 14 g dose has provided any protection to the plant at Höganäs.

The DSI 2 value for the two doses of Dynasty 6 and 16 g was 36,0 and 49,6, respectively at Höganäs ($p < 0,05$). This result may suggest that the 6 g dose of Dynasty is less phyto-

toxic to the plants than the 16 g dose. There were no significant differences between the two tested doses of Maxim Tech (6 g and 12 g, $p > 0,05$, NS).

The disease index during emergence was over all low at Borgeby. There were no significant differences in DSI 1 and DSI 2 between the treatments.

Investigation of beets after harvest

The investigation of beets with chronic symptoms of root rot carried out at the central tare house showed that there were no significant differences between the treatments when averaged over three trials (appendix 7).

Yield

All fungicide treatments at Skiberöd gave a 5 to 15% increase in sugar yield compared to only insecticide treatment. There were only minor differences between the sugar yield for the tested doses of Dynasty and Maxim Tech.

The 18 g dose of Tachigaren had significantly higher sugar yield than the standard dose 14 g. The 30 g dose of Tachigaren showed no increase in sugar yield compared to the standard dose 14 g.

At Borgeby and Höganäs there were no significant differences between the fungicide treatments and the controls.

Discussion

It is concluded that the conditions for development of damping-off was generally unfavourable 2004. The spring was very cold without much rain on all locations except Skiberöd. Here all fungicide treatments resulted in higher plant numbers compared to the controls. The plants that survived had disease index between 40 to 50 which indicates that the seedlings only show moderate symptoms of root rot. The roots on the young plants were brownish but the rot seldom reached up to the hypocotyl.

The results of this trial series show that the treatment with Dynasty 6 g together with Tachigaren may reduce damping-off. However, the treatment with 16 g dose of Dynasty (together with Tachigaren) may be slightly phytotoxic. The treatment with Maxim Tech together with Tachigaren showed no phytotoxicity in either dose and an effect on damping-off similar to that of the standard fungicide treatment with Tachigaren (treatment three).

Of the three tested doses of Tachigaren, the 18 g dose shows a significant increase in sugar yield at Skiberöd compared to the standard dose 14 g. The 30 g dose of Tachigaren delayed plant emergence at 20% average emergence over the trial but this difference in plant number to other treatments have disappeared at 50% and full emergence.

The treatment where the nutritional solution developed by Agrobrest was added at drilling directly in to the furrow performed similar to the fungicide treatments in plant number, disease index, root rot index and yield. The seed used in this treatment was treated with the standard fungicides Euparen and Tachigaren. The nutriate solution do not seem to add

any protective effect or stimulate growth on the plants during emergence or increase yield compared with the controls.

References

- Ewaldz, T. 1993. Determining the risk of damping-off in sugar beets. *Växtskyddsnotiser* 169 – 171.
- Larsson, M. and Gerhardson, B. 1990. Isolates of *Phytophthora cryptogea* pathogenic to wheat and some other crop plants. *Journal of Phytopathology* 129: 303-315.

Table 1. The table shows the evaluation of risk of damping-off (Ewaldz 1993)

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

GEP-information

Uppdragsgivare/Contractor:

Syngenta Crop Protection
Hans Rasmussen
Strandlodsvej 44, 1. sal
DK-2300 Köpenhamn S

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 Jakarta/ Variety Jakarta.

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

Höganäs	K-R Orsmark, Åsbacka gård, 263 92 Jonstorp
Borgeby	Hushållningssällskapet, att D. Molin, Borgeby Slott, 237 91 Bjärred
Skiberöd	S. 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, 12 g
Dynasty	<i>azoxystrobin</i>	6, 16 g

Avvikelser/Problems

Vid leverans av skördeproverna till provtvätten i Örtofta noterades en öppen säck för led 2 i block 1. Erhållna brutto- och nettovikter avviker inte från de som noterats för led 2 i block 2, 3 och 4 och värdena behövs i de statistiska beräkningarna.

Några bräcknummer var fel på bräckplanen som gjordes till skörd. Detta upptäcktes i god tid av försökspersonalen och inga resultat har påverkats.

One open sack with beets belonging to treatment 2 in block 1 was delivered to the tare house in Örtofta. The measured weights of the beets do not differ from the ones that were measured in treatment 2, block 2, 3 and 4 and the weights were retained in the statistical analysis.

Some of the plots numbers were wrong on the harvest schedule. The numbers were corrected before the plots were harvested and no results have been affected.

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Borgeby / 2004

Borgeby / 2004

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