



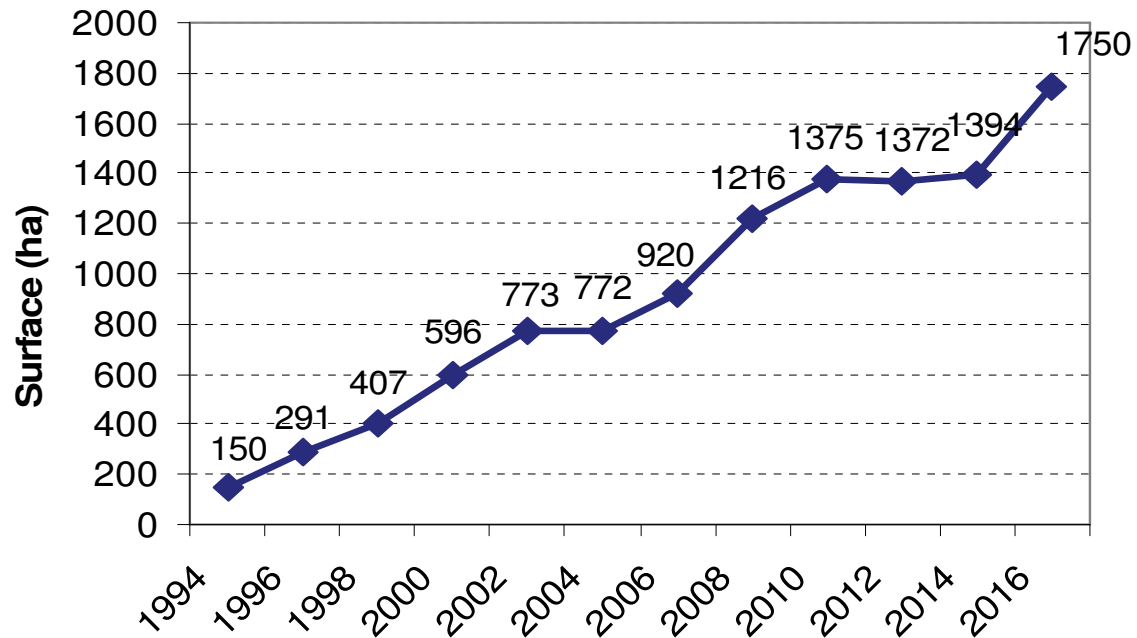
Research Activity 2016

Markus Kelderer & Staff

May 30, 2017



Increase of the surface of organic cultivation in South Tyrol



Source: Autonome Provinz Bozen, Abt. 31 Landwirtschaft

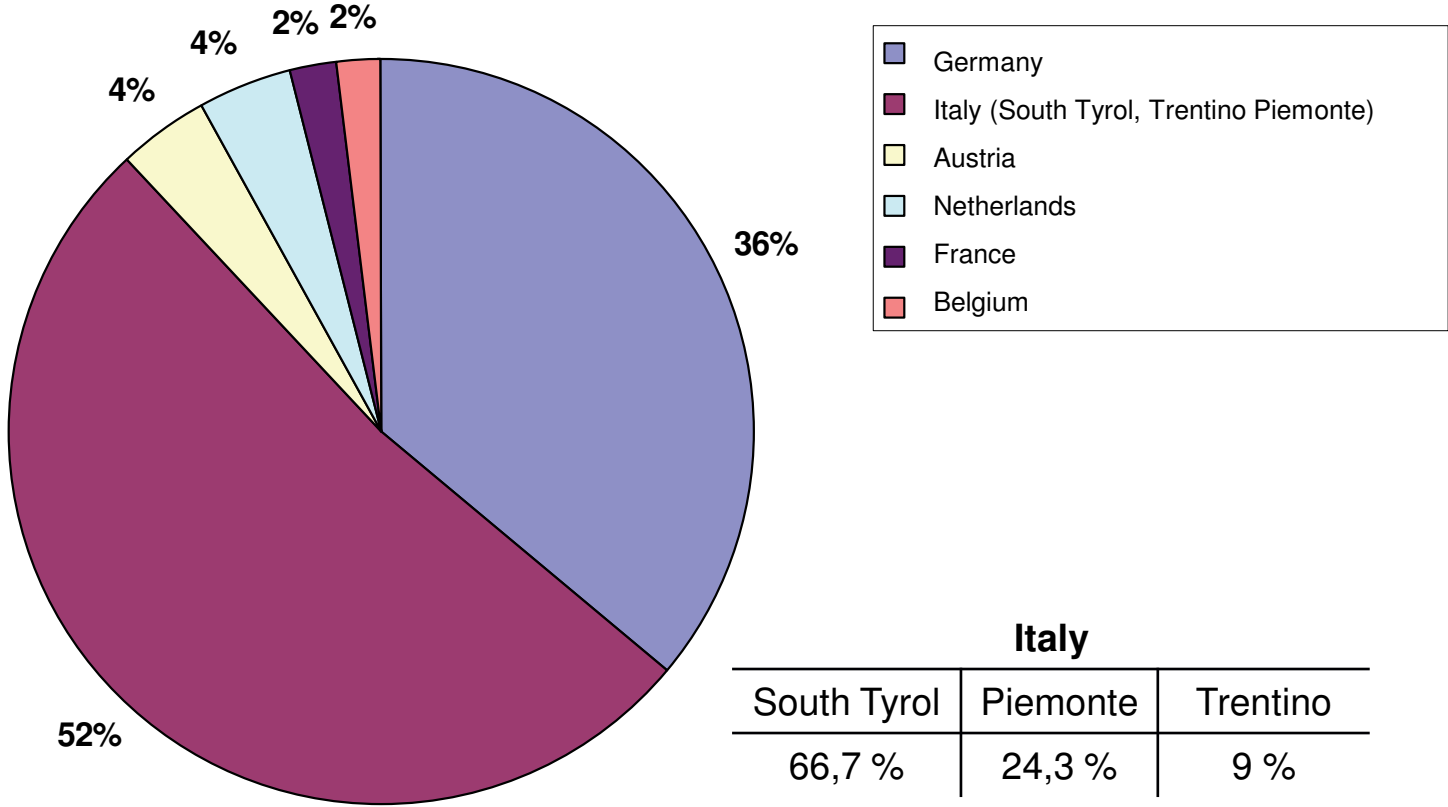
2016 Farms with organic cultivation: 471

Varieties 2015/16

Variety	Harvest 2015 (t)	Harvest 2016 (t)
Gala	14.319	14.245
Golden Del	9.602	7.667
Braeburn	6.246	6.295
Pinova	3.887	3.385
Red Del	2.675	2.181
Fuji	1.805	1.405
Cripps Pink	1.602	1.750
Topaz	1.323	1.341
Jonagold	1.223	767
Kanzi	771	62
Granny Smith	756	716
Idared	534	453
Gold Rush®	176	193
Other varieties	1.801	2.230
Dessert apples	46.858	43.500
Industrial Apples	9.000	8.000

Source: Europäisches Bioforum, AMI

Countries producing organic apples in the EU (2016)



Source: Obstbau Weinbau, South Tyrolean Extension service, July/August 2016, Nr. 7/8

Presentation of the Working Group for Organic Farming

Active at Laimburg Research Centre as of 1993

Head of the working group:

- Markus Kelderer

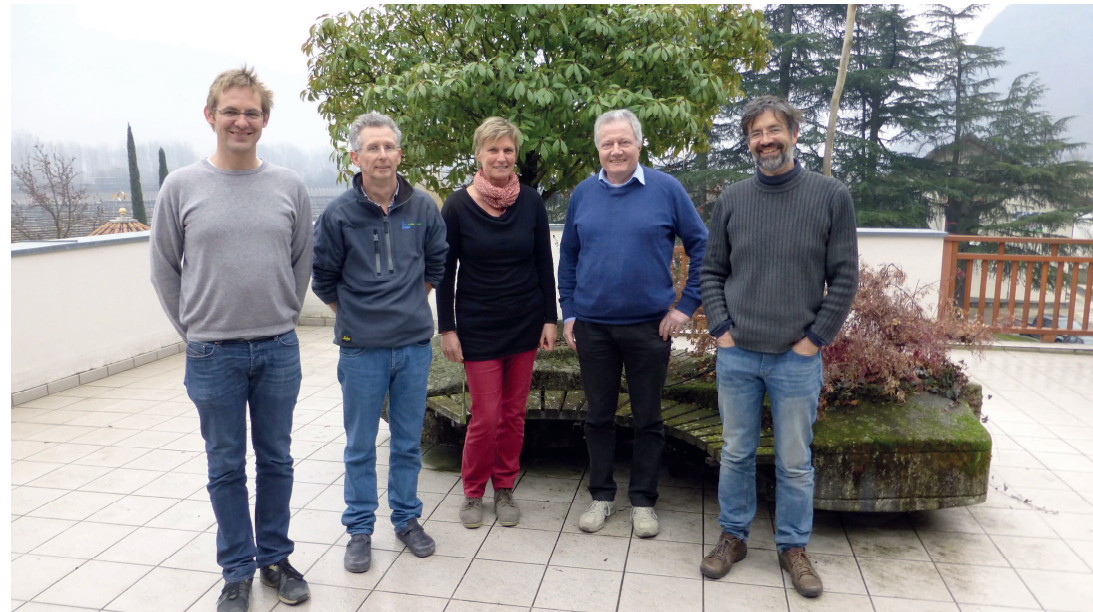
Permanent employees:

- Claudio Casera
- Ewald Lardschneider

Interns

Projekt staff:

- Anne Topp (part-time)
- Josef Telfser



A c t i v i t i e s 2 0 1 6

Topic	Number Trial Variants	Number Sites	Lb/private	Execution
Functional Biodiversity (botany)	2	3	Lb/Private	Josef Telfser
Functional Biodiversity (Entomology)	2	2	Lb	Josef Telfser
Functional Biodiversity (Network)	-	-	Private	Josef Telfser
Residues KP Apples + Vine	16	2	Lb	Claudio Casera
Rosy apple aphid	4	1	Lb	Claudio Casera
Codling moth - Net	8	3	Lb	Claudio Casera
Primary Scab	15	2	Lb	Claudio Casera
Secondary Scab	13	1	Lb	Claudio Casera
Scab regulation with irrigation	7	2	Lb	Claudio Casera
Sooty blotch	3	3	Private	Claudio Casera
Gloeosporium	12	2	Lb	Claudio Casera
Drift reduction	6	2	Lb	Claudio Casera
Peronospora	5	1	Lb	Claudio Casera
Soy lecithin	4	2	Lb	Claudio Casera
Regulation of rabbits	5	1	Private	Claudio Casera
Varieties - Sites	6, 10, 18	3	Private/LB	Ewald Lardschneider
Varieties org-conv	22, 34	2	Lb	Ewald Lardschneider
Woolly apple aphid, rootstocks, plant protection products, varieties	2, 5, 10	3	Lb	Ewald Lardschneider
Woolly apple aphid pruning	5	1	Lb	Ewald Lardschneider
Injector Nozzles	2	3	Lb	Ewald Lardschneider
ADV Lime Sulphur	2	5	Lb	Ewald Lardschneider
ADV Oils	4	3	Lb	Ewald Lardschneider
Melolontha - soil management	5	1	Lb	Ewald Lardschneider
Melolontha - Neem and Buckwheat	2	2	Private	Ewald Lardschneider
Cicada	6	1	Private	Ewald Lardschneider
Viticulture Brush	4, 4, 3, 3, 2, 2, 12	7	Private/LB	Ewald Lardschneider
Viticulture Varieties	25	1	Lb	Ewald Lardschneider
Apple proliferation disease - Net	5	1	Lb	Ewald Lardschneider
Apple proliferation disease- treatments	4	2	Private	Ewald Lardschneider
Replant disease - steaming	8	1	Lb	Ewald Lardschneider
Natyra Rootstocks	2	2	Lb	Ewald Lardschneider
Seedings Farm Meraner	4	1	Private	Ewald Lardschneider
Fertilization trial	15	2	Lb/Latsch	Anne Topp
Replant disease	12 / 4 / 2	3	Lb/Latsch/Private	Anne Topp
Mineralisation of organic fertilizers	6	-	Laboratory	Anne Topp



EcoOrchard

[http:// coreorganicplus.org/research-projects/ecoorchard](http://coreorganicplus.org/research-projects/ecoorchard)

Goal: Promotion of the **functional Biodiversity** in ecological Apple Orchards through the seeding of flowering plants in the middle of the tramline

Trials:

Botanic trial in Block 1 and 12 Laimburg:

Comparison of the Performance of two **different seed mixtures** (simple and cheaper, partially cultivated vs complex compositions, wild exemplars).

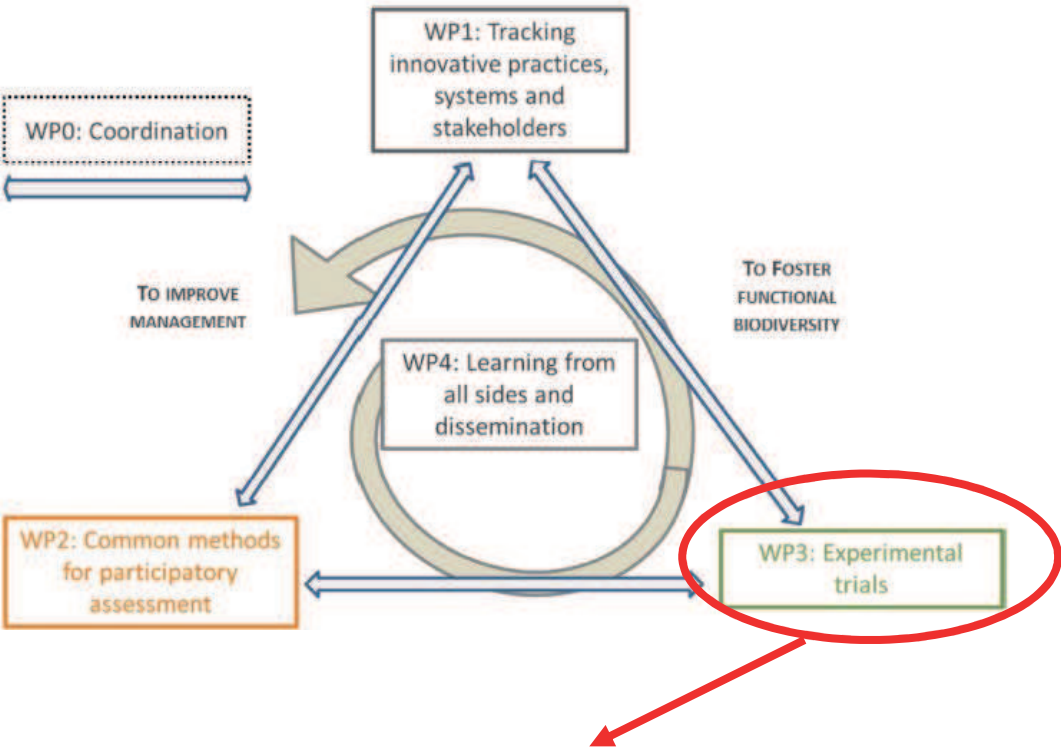
Entomologic trial in Block 25 and 27 Laimburg:

What impact does the sowed flower strip in the centre of the tramline (ca. 50 cm) have regarding the infestation of the **rosy apple aphid** and **codling moth**?

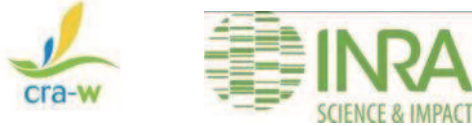
Trial orchards: Block 1, Block 12, Block 25, Block 27 at the Laimburg Research Centre

Plant protection: normal organic strategy against fungi (application of copper and sulphur products), complete **abdication** of treatments against **pests**

EcoOrchard – Organization of the Project



WP 3 (Field Trials) Evaluation
Botanic Evaluation (3 dates)
Visual Examination (3 dates)
Monitoring Flight of the codling moth (Pheromone traps)
Sentinel Pray Evaluation
Beating
Cardboard band-traps - codling moth (3 dates)
Damage Assessment
Yield Evaluation

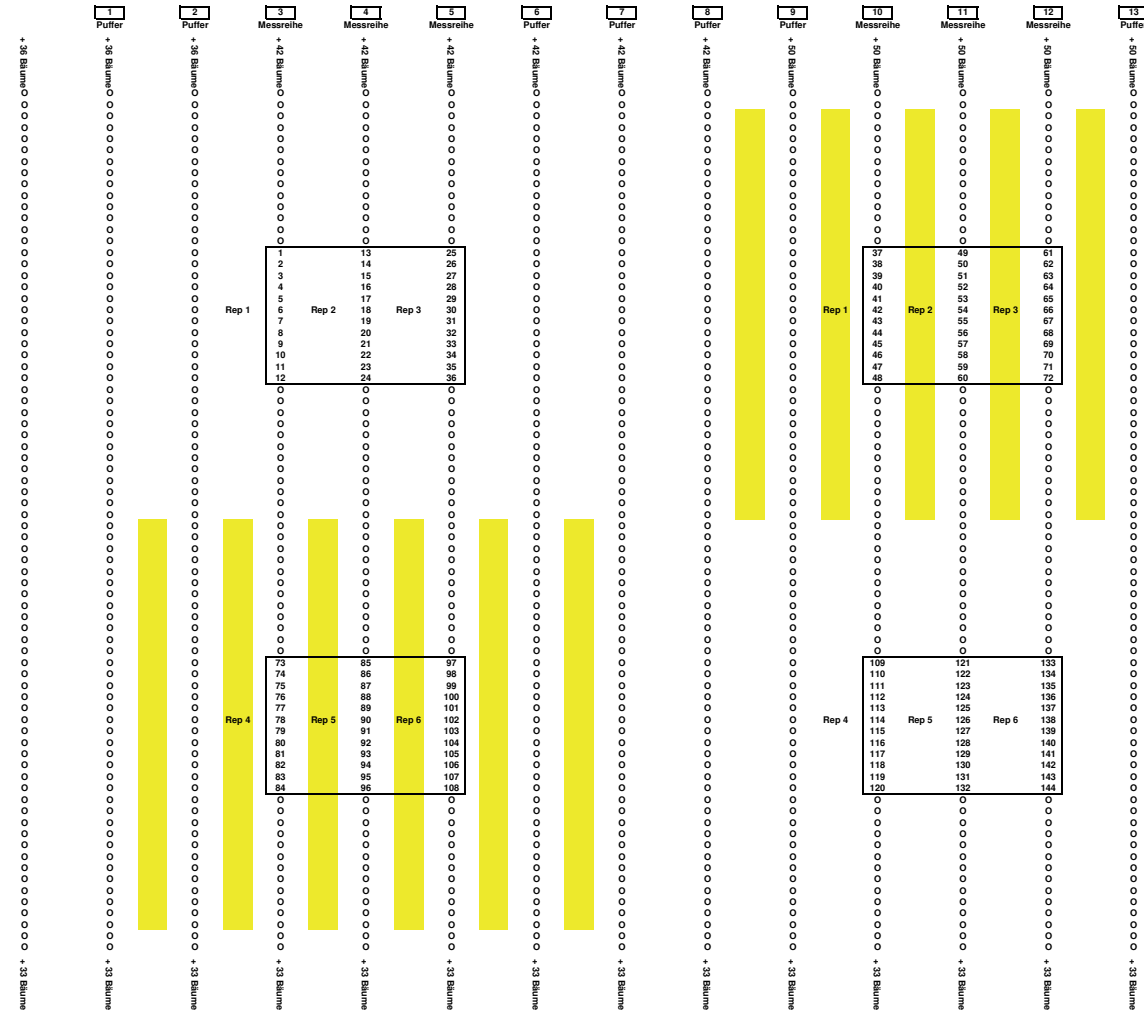


EcoOrchard 2016: Plan of the trial => Example

Plan of the trial:
Block 25
Variety/Rootstock:
 Braeburn/M9
Year of planting:
 2008
Plant spacing:
 3,15m x 0,75m

West: Braeburnlage konv.

Nord: Braeburn Junganlage konv.



Fahrtwege

Süd: Gala Anlage bio.



Botanic trial in Block 1 and Block 12

Simple Mixture	Complex Mixture
Achillea millefolium	Achillea millefolium
Ajuga reptans	Ajuga reptans
Bellis perennis	Bellis perennis
Cardamine pratensis	Campanula rotundifolia
Carum carvi	Cardamine pratensis
Centaurea jacea	Carum carvi
Daucus carota	Centaurea jacea
Galium mollugo	Daucus carota
Hypochaeris radicata	Galium mollugo
Leontodon autumnalis	Geranium pyrenaicum
Leontodon hispidus	Hieracium pilosella
Leucanthemum vulgare	Hypochaeris radicata
Lotus corniculatus	Lathyrus pratensis
Medicago lupulina	Leontodon autumnalis
Prunella vulgaris	Leontodon hispidus
Trifolium pratense	Leucanthemum vulgare
Veronica chamaedrys	Lotus corniculatus
Vicia sepium	Myosotis scorpioides
Anthoxanthum odoratum	Prunella vulgaris
Cynosurus cristatus	Silene dioica
Festuca guestfalica	Silene flos-cuculi
Poa nemoralis	Trifolium pratense
Blue => FAB Plants	Veronica chamaedrys
	Vicia sepium
	Anthoxanthum odoratum
	Cynosurus cristatus
	Festuca guestfalica
	Lolium perenne
	Poa nemoralis
	Poa pratensis
	Blue => FAB Plants

Comparison of the performance of two different seed mixtures (simple and cheaper, partially cultivated vs complex compositions, wild types). => Examinations on 3 dates

FAB - Pflanzen



Vicia sepium



Carum carvi



Trifolium pratense



Centaurea pratensis



Lotus corniculatus



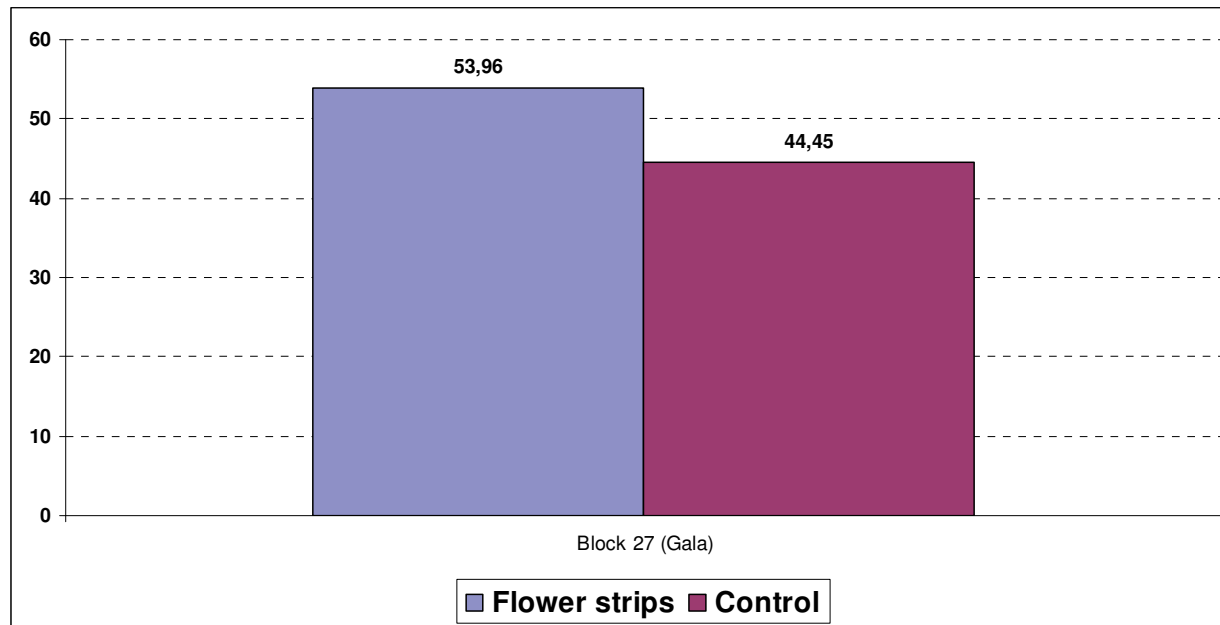
Daucus carota



Cardamine pratensis

Entomologic trial: First results

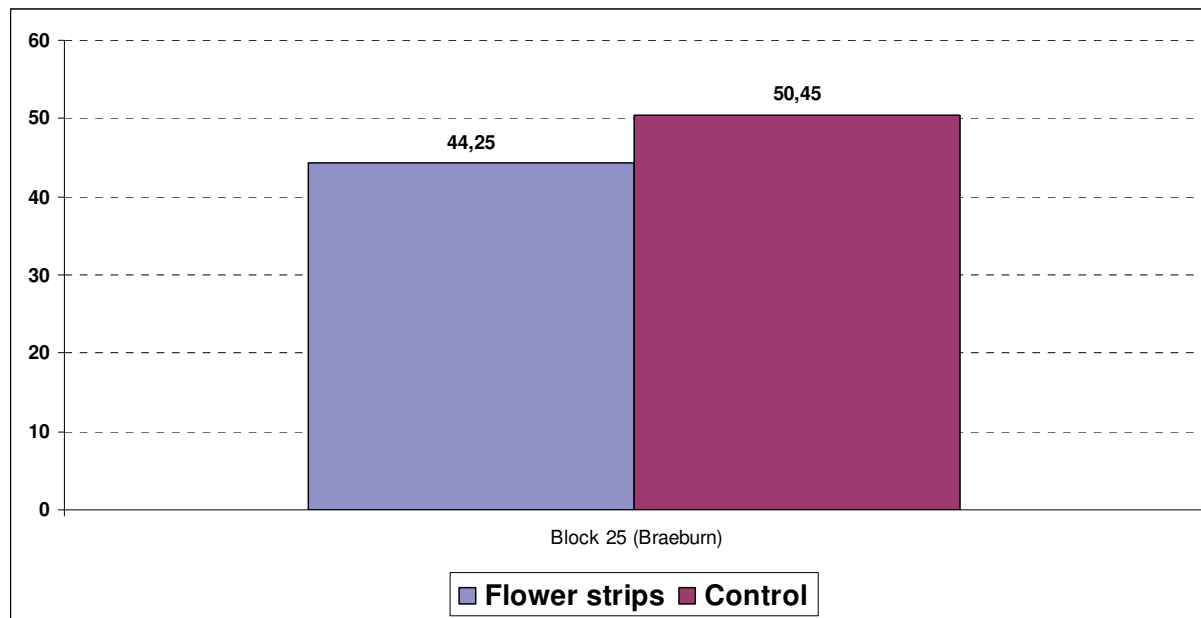
% marketable fruits Block 27 (Gala)



04.05.2016

Entomological trial: First results

% marketable fruits Block 25 (Braeburn)



29.09.2016

KP-Residues on Golden D. and Ruländer

Our findings thus far:

- Conventional fungicides: 0,01 ppm
- Currently, only a few laboratories reach this result
- Lb = 0,5 ppm; residues-monitoring Biosüdtirol = 0,1 ppm
- Apple: 4 treatments in the late spring – Summer 15 ppm
- Reduction of the residues of the apple 10 fold in year
- Reduction of the residues of the grapes 3-4 fold per year
- Reduction is effected by the roots

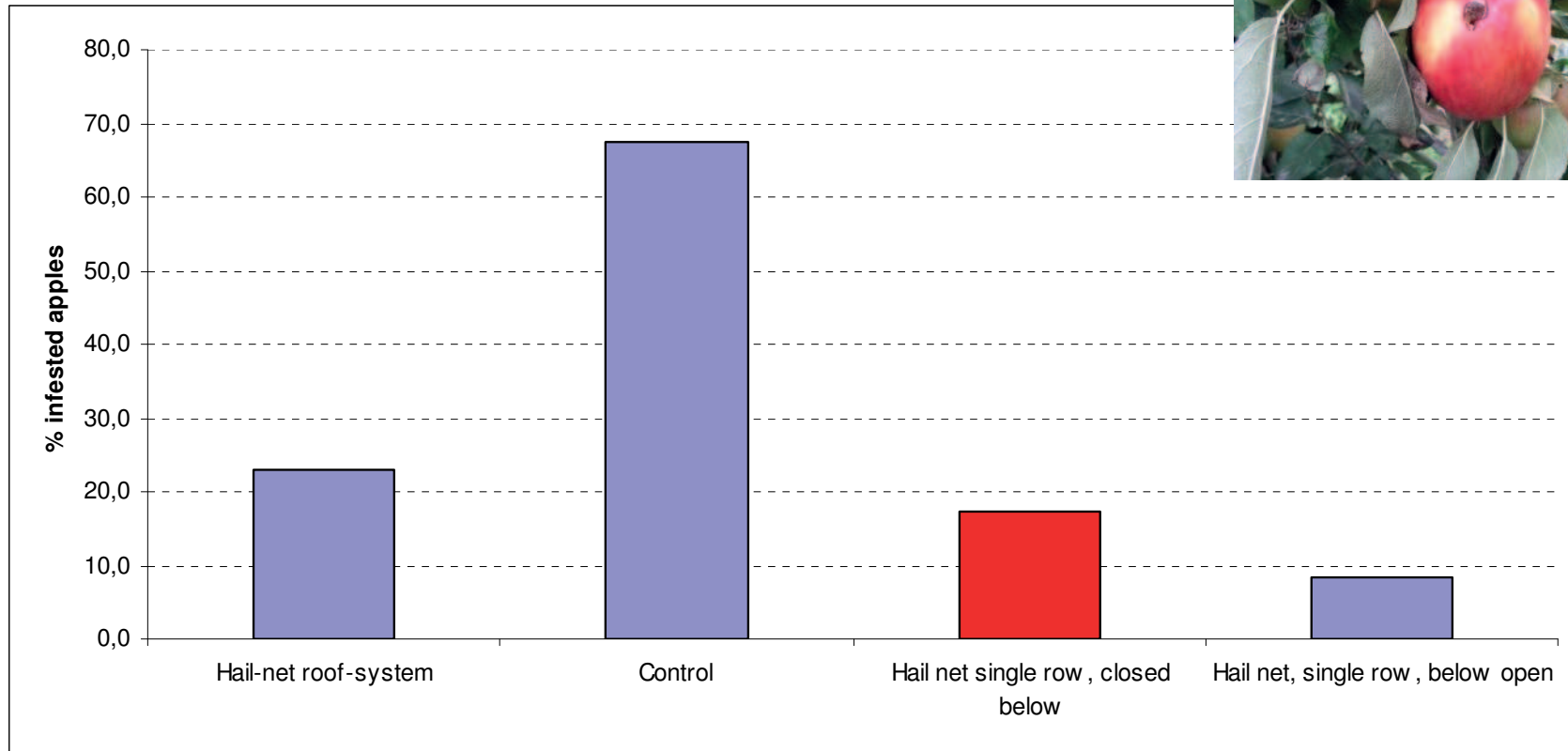
Collaboration with W.Rizzolli (Lb) und J.Gehl (Hipp)

Codling moth-trial with Nets: Braeburn Bl. 53:

Variant	Mesh Width (mm)
Hail net roof system	3,0 x 8,0
Control	-
Hail net single row, closed below	3,0 x 8,0
Hail net single row, open below	3,0 x 8,0



Braeburn Bl. 53: Codling moth trial with Nets



Primary Scab trial 2016: Fuji Bl. 45 + 41

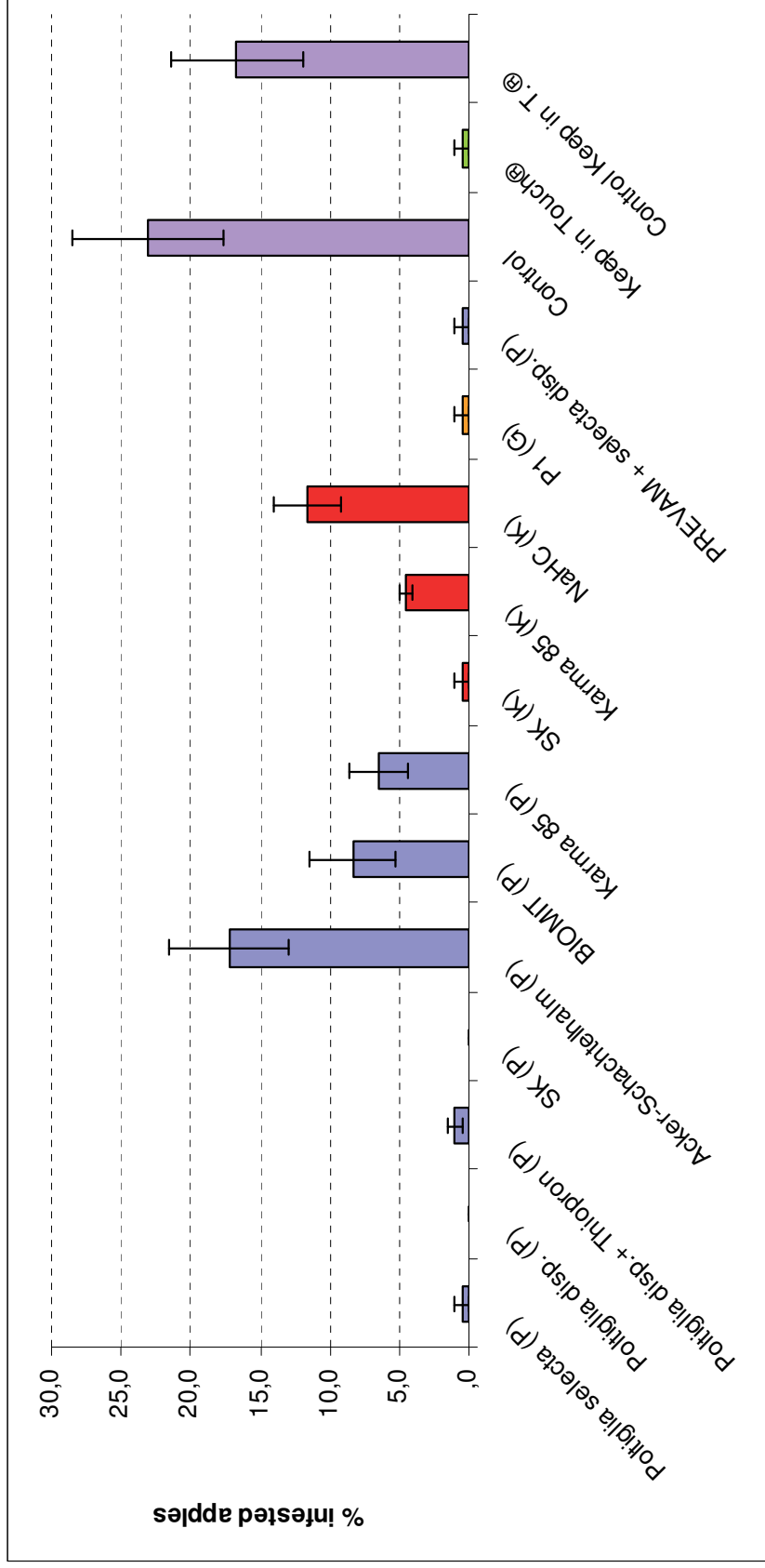
Product	Producer	Dose/ha WS	Dose/ha Product		Timing	Note
			before blossom	after blossom		
Poltiglia selecta	UPL	10 g Cu	50 g		preventative	rainfastness 20 mm
Poltiglia disp.	UPL	10 g Cu	50 g			
Poltiglia disp.+ Thiopron	UPL	10 g Cu + 200 g	50 g + 200 g			
Limesulphur	Polisenio	1,2 kg	1,6 kg	1,2 kg		
Horsetail extract	Cerrus	400 g	400 g			
BIOMIT	Peragros	400 g	400 g			
Karma 85	Certis	333 g	333 g			
Limesulphur	Polisenio	1,2 kg	1,6 kg	1,2 kg	500-600 dh whether dry or wet (curative)	-
Karma 85	Certis	333 g	333 g			
NaHC	Geofin	500 g	500 g			
P1	Trifolio	-	0,05	0,13	150 dh + 300 dh + 450 dh (systemic)	preventative with Cu till 22.4; from 27.04 till 14.05 with P1
PREVAM + selecta disp.	Geofin + UPL	250 ml + 10 Cu	250 ml + 50 g		preventative	rainfastness 20 mm
Control	-	-	-	-	-	-
Keep in Touch®	Keep in Touch System	-	-	-	before blossom - beginning of april	-
Control Keep in Touch®	-	-	-	-	-	-

Primary scab trial 2016: Keep in Touch®

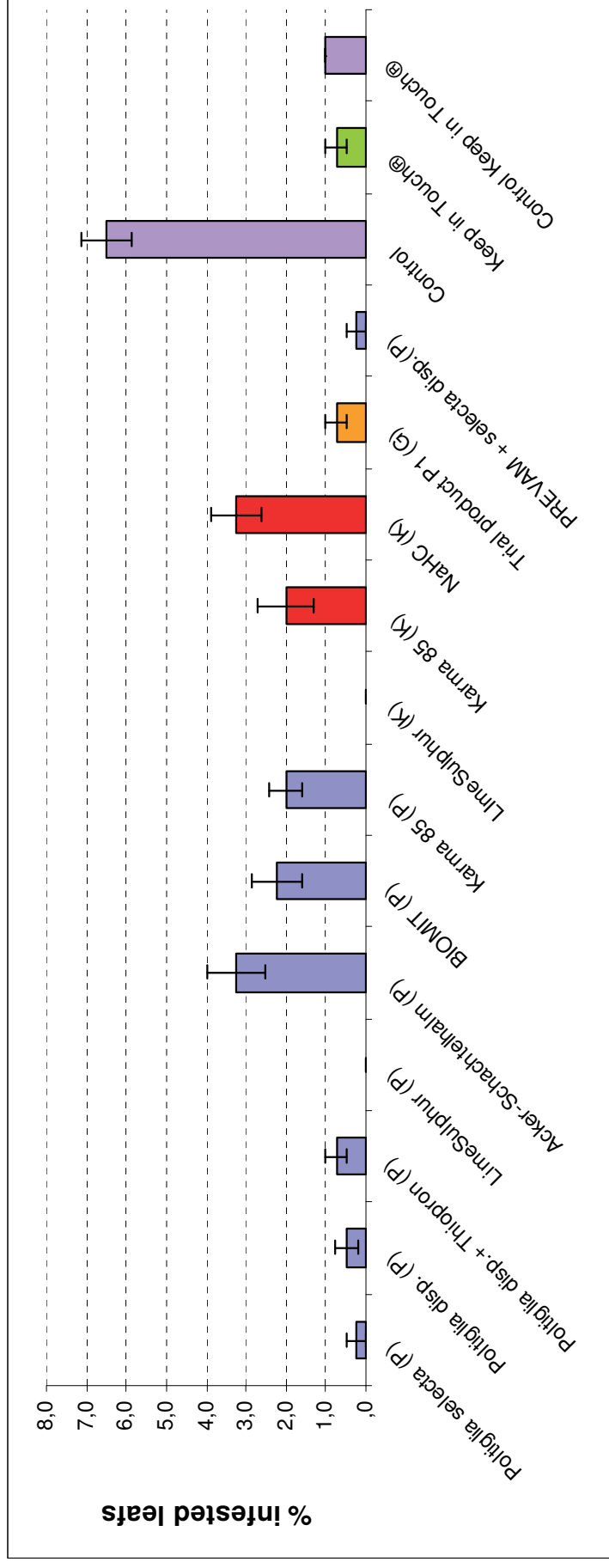


Primary scab 2016: Fuji Bl. 45 + 41

% of apples infested with scab on May 30th, 2016

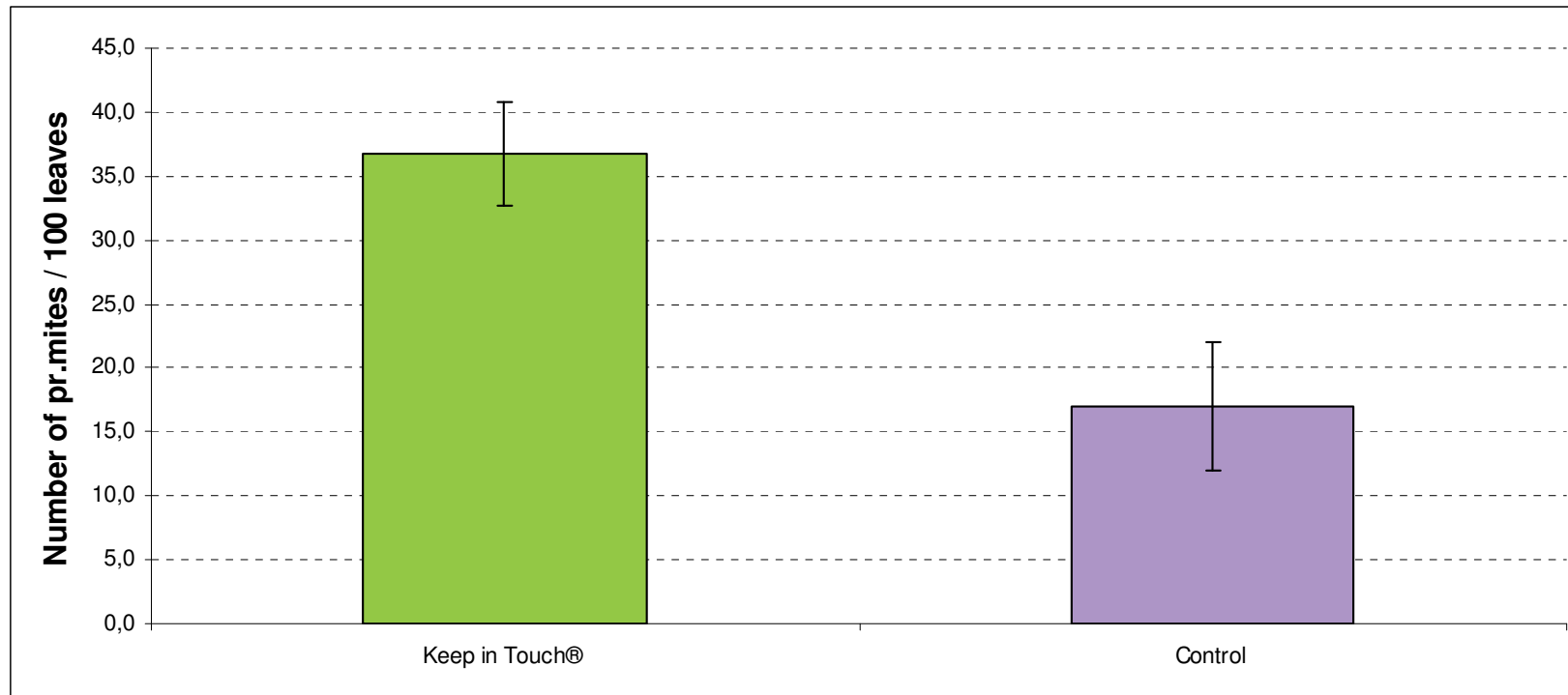


Primary scab 2016 Fuji Bl. 45 + 41: % Infestation of Marssonina on 30.06.16 - Estimate



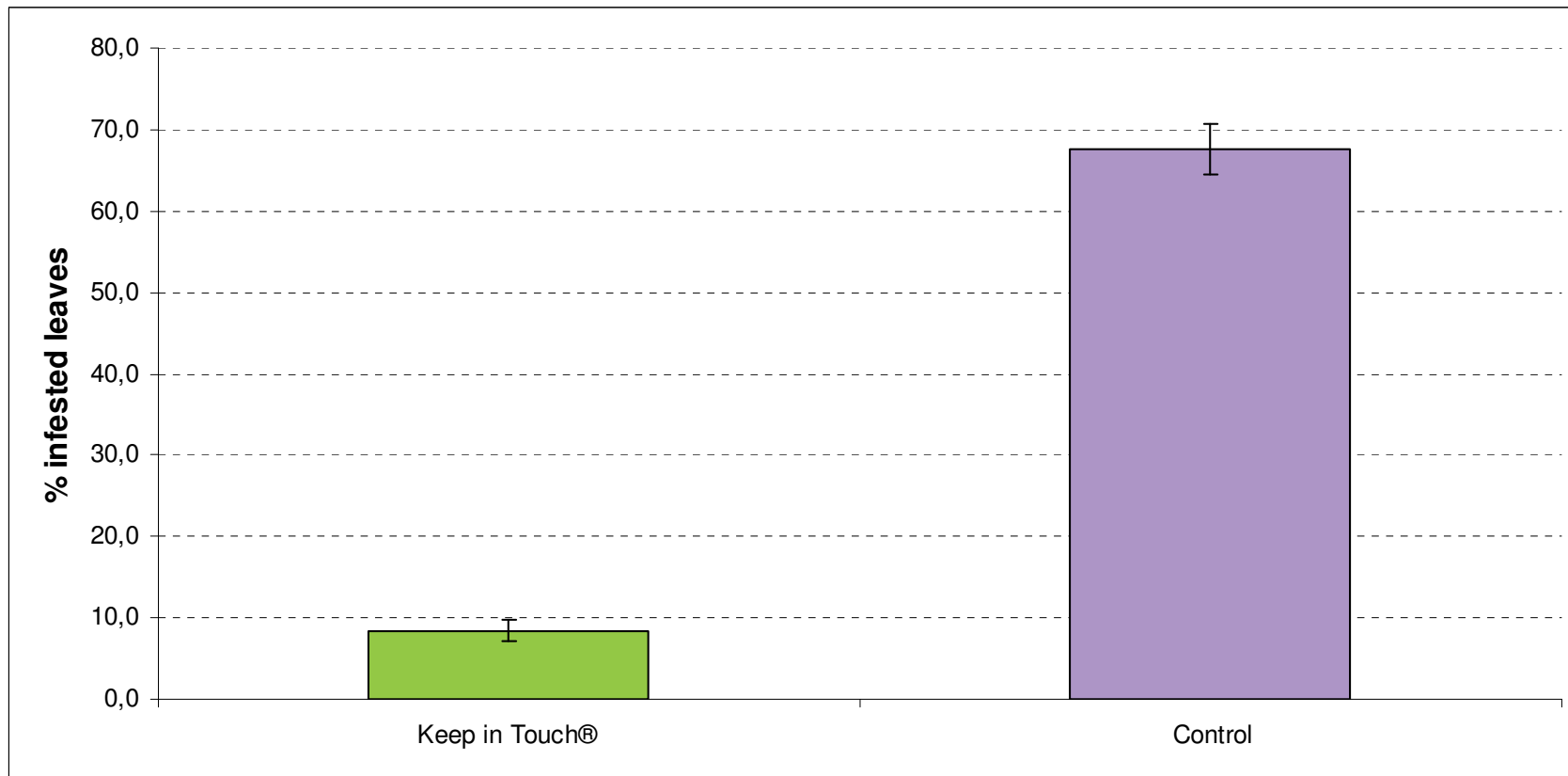
Keep in Touch® Fuji Bl. 41

Evaluation of predatory mites on 17.08.2016

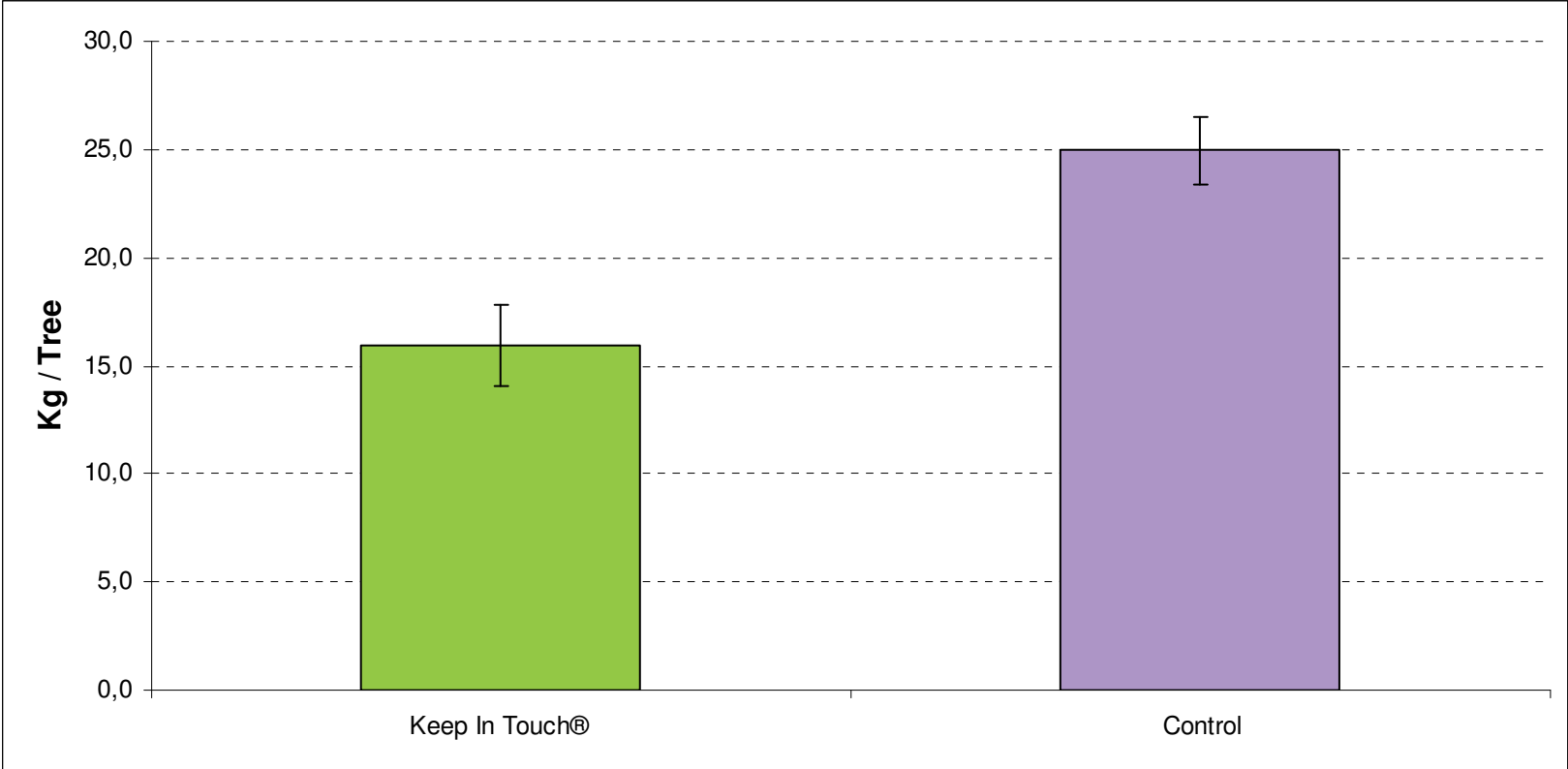


Keep in Touch® Fuji Bl. 41

Infestation of Secondary scab on the 13.10.2016



Keep in Touch® Fuji Bl. 41 Yield / Tree on 13.10.2016



Keep in touch®



Testing of plant protection products against the woolly apple aphid

Nr.	Active matter	Trade name	Distributor	Dosis/hl at 1500l/ha	Dosis/hl at 2000l/ha	Comment
2	Potash Soap	Flipper	Dow	1 l	750 ml	with sprayer, and trunk additionally with pistol
3	Potash Soap	Flipper	Dow	4 l	3 l	
4	Sulphur+Mineral oil	Polithiol	UPL	6 l	4,5 l	
5	Sulphur+Mineral oil	Tiovit + Ekooil	Syngenta + Adama	510 g + 3 l	390 g + 2,25 l	
6	Control					Control

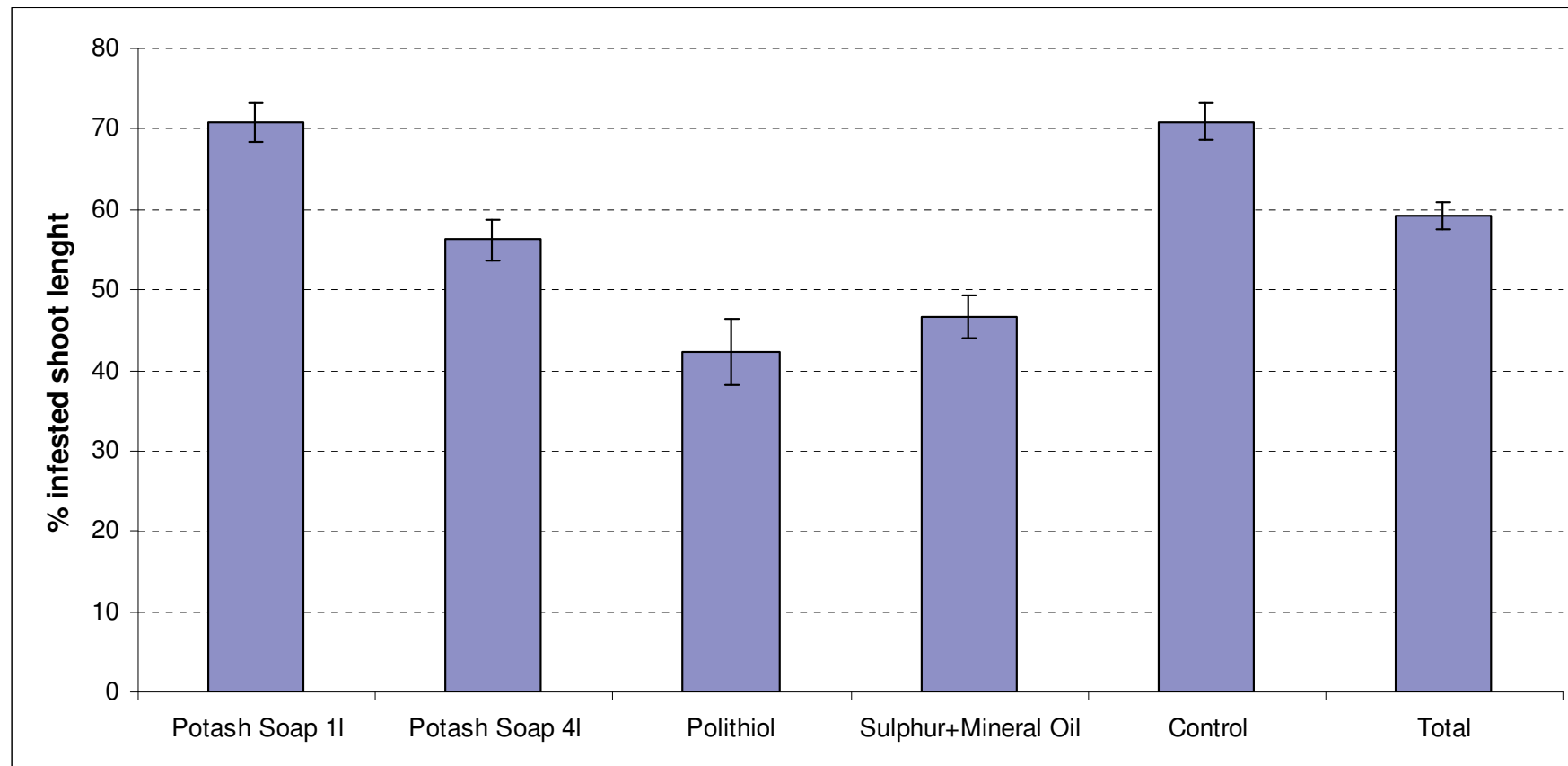
Treatment: 2000l/ha + Sprayer

Spray adjustment: 2000 l/ha, 3,5 km/h, 11 bar, green nozzle



Testing of plant protection products against the woolly apple aphid

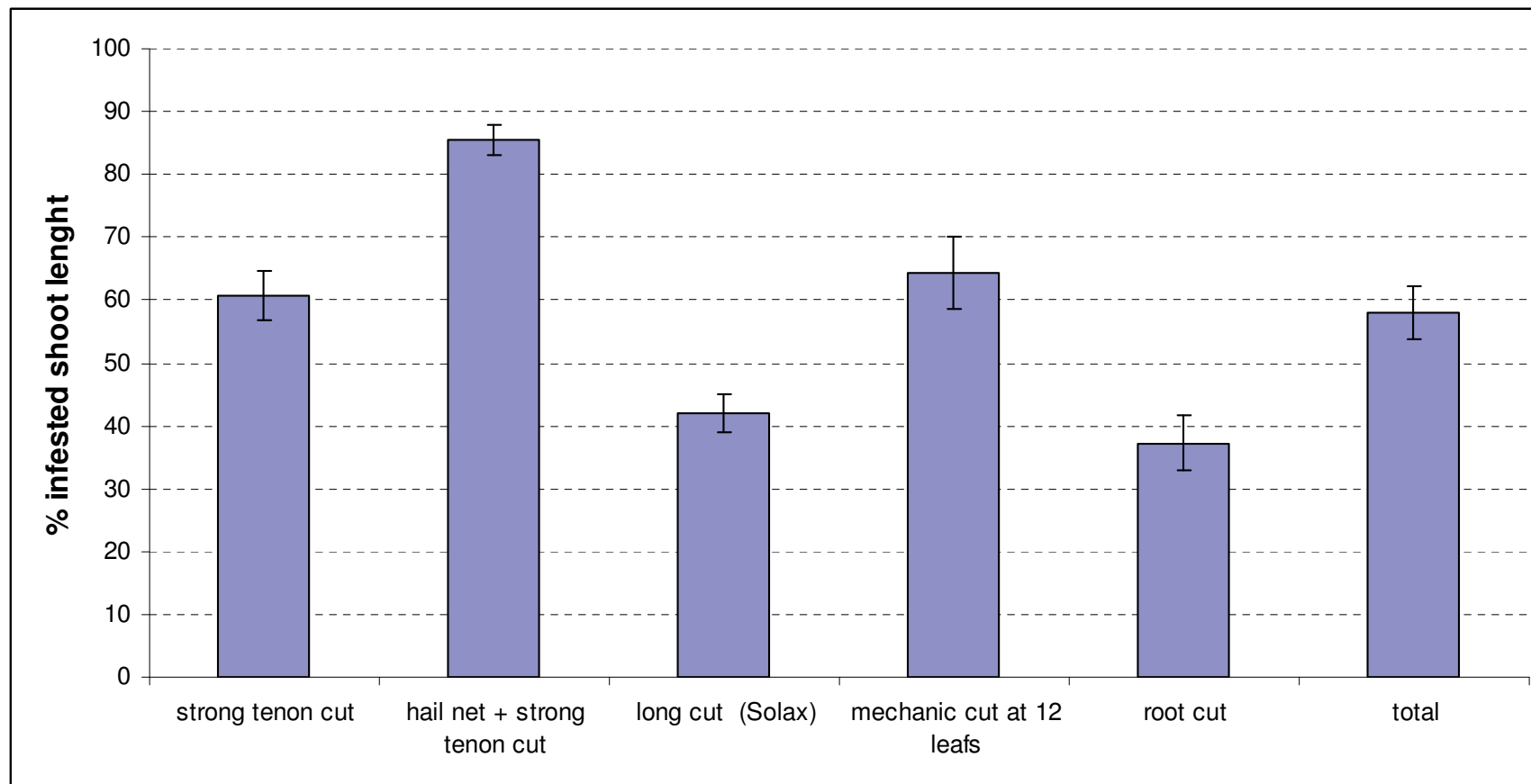
Fuji Block 1, Year 2016



Woolly apple aphid – pruning trial

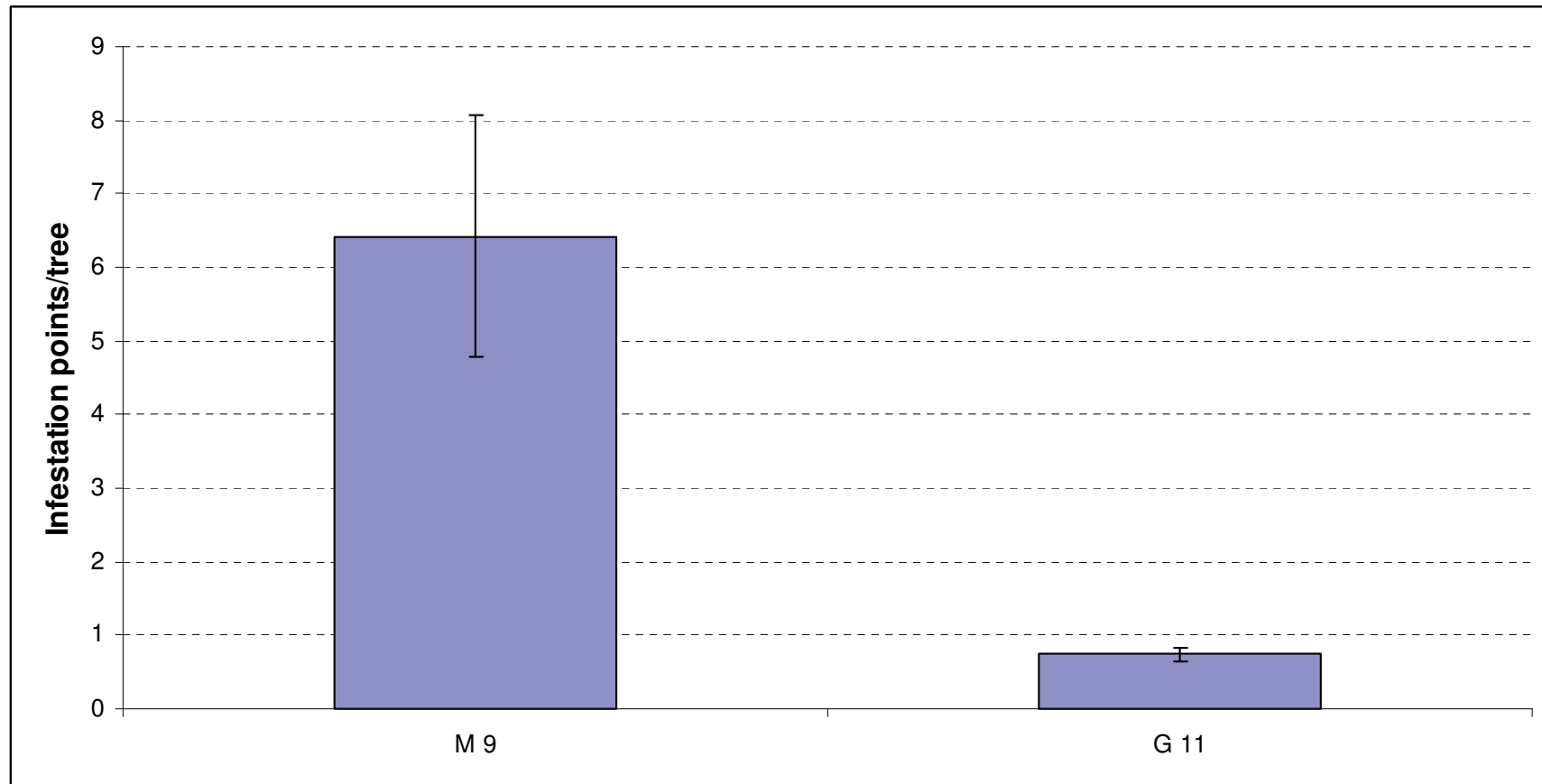
Nr V	Variants	Notes
1	Strong tenon cut	Loong shoots and long fruit shoots have been cut, strong stimulation of vigor
2	Hail net + strong tenon pruning	
3	Long Cut (Solax)	Possibly little amounts of cutting wounds, little stimulation of vigor
5	Mechanic cut at 12 leafs	Manual correction
7	Root cut	Normal pruning until 2015, as of 2015 root cut

Woolly apple aphid-pruning trial 2016, Fuji Block1



Woolly apple aphid – rootstocks trial 2016

Number of infestation points per crown



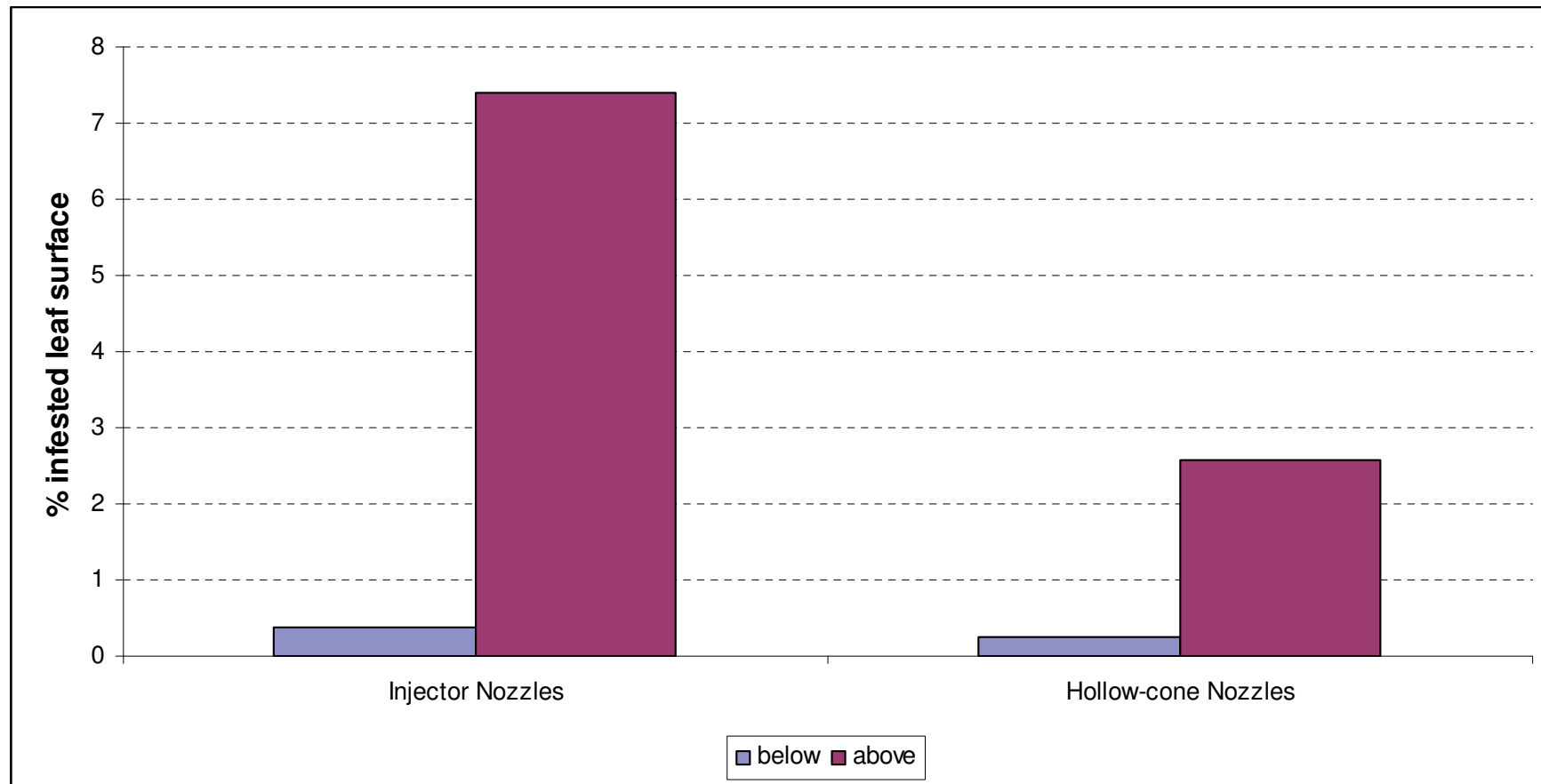
Injector Nozzles vs. Hollow-cone nozzles

3 Farms

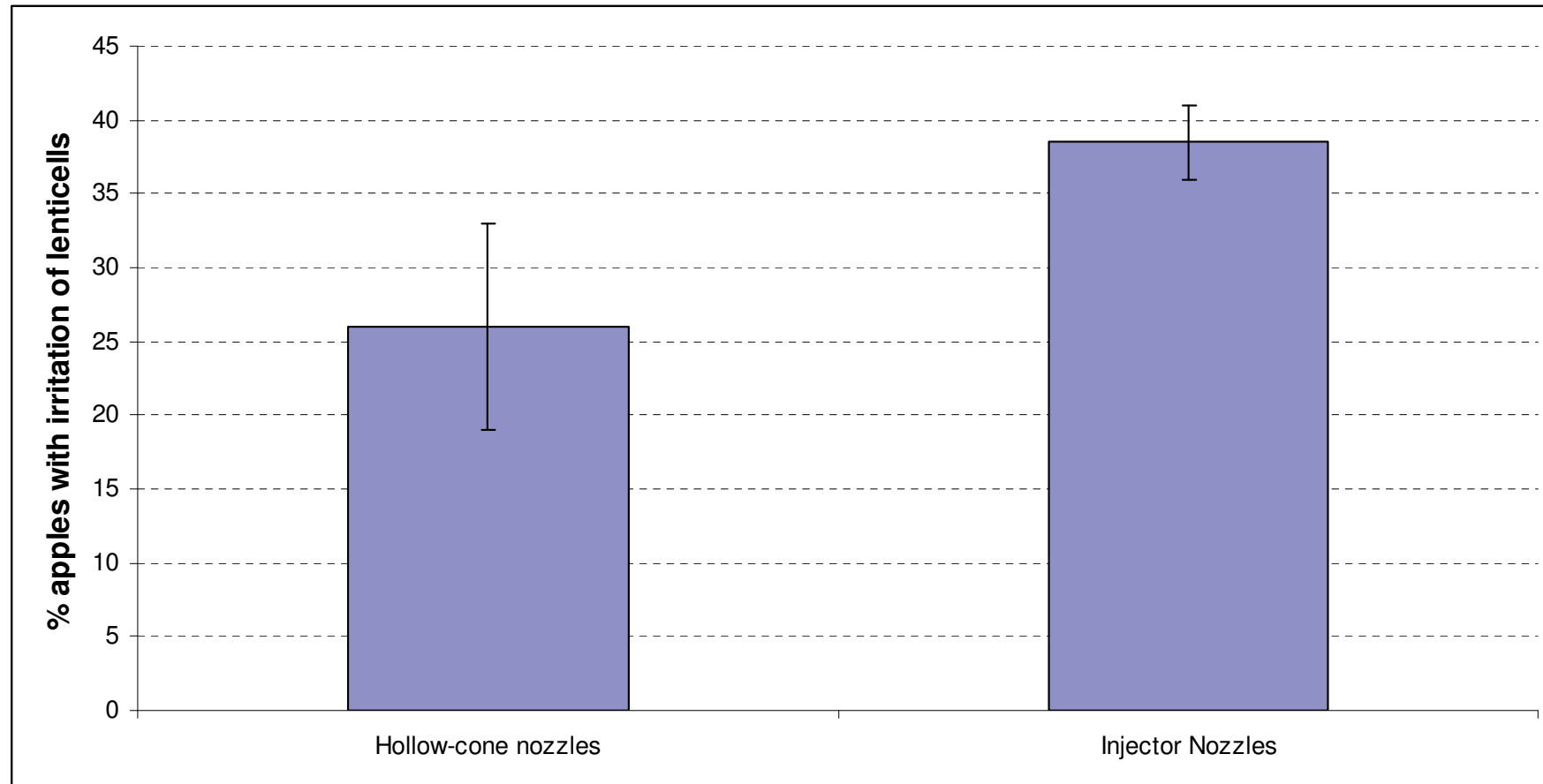
Nr.	Variant	Type		Water /ha	Speed
1	Injector Nozzles	Albuz green (CVI 80 015)*	whole nozzle ring	360 l	8,5 km/h
2	Hollow-cone Nozzles	Albuz yellow (ATR 80)	whole nozzle ring	360 l	8,5 km/h



Farm Riegler Toni: Evaluation of powdery mildew



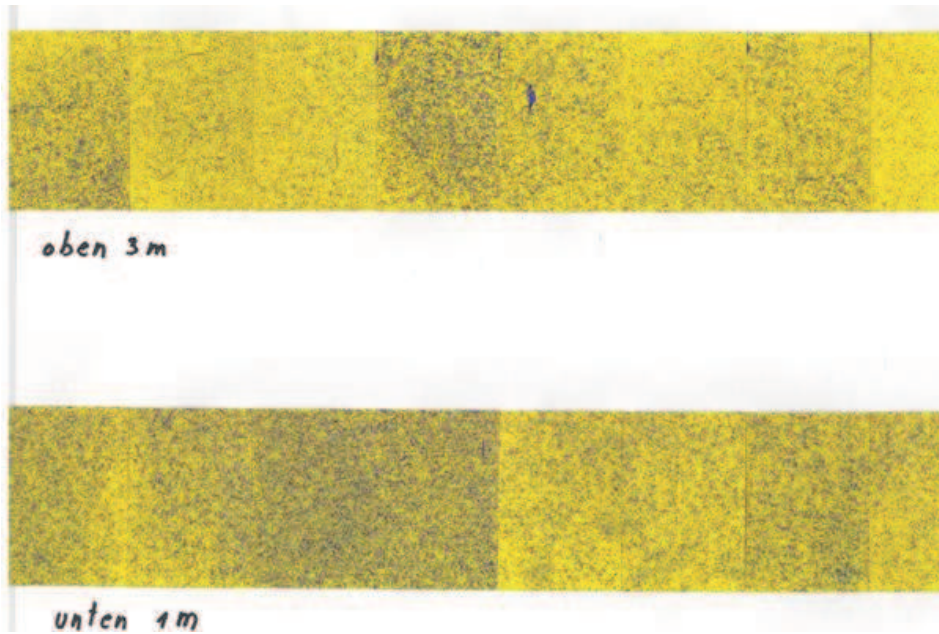
Irritation of Lenticells



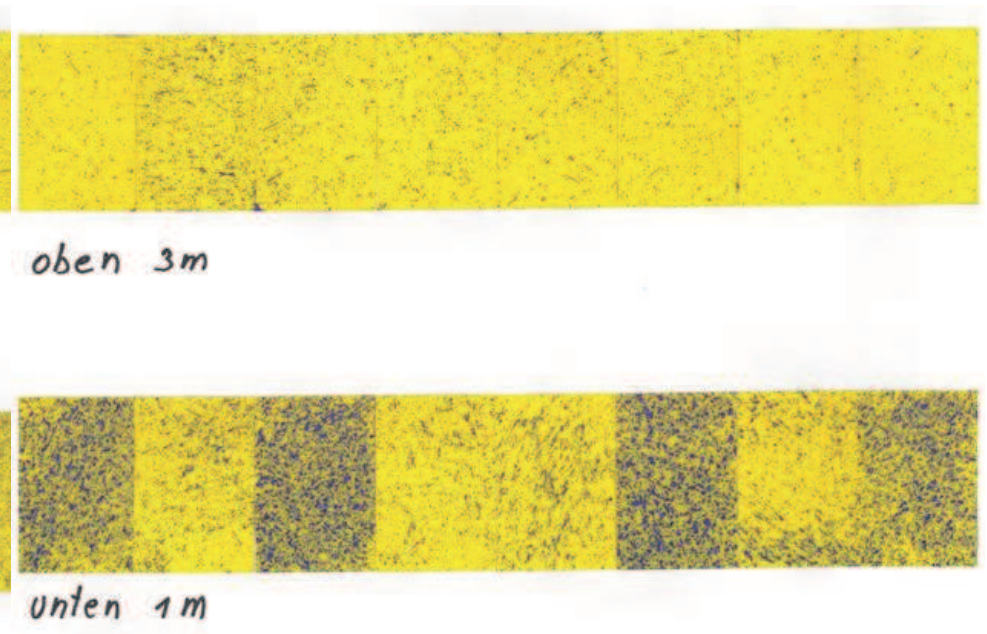
Injector Nozzles vs. Hollow-Cone Nozzles

Farm Riegler Toni

Hollow-Cone Nozzles



Injector Nozzles



Replant Disease

Innovative soil management and fertilization measures to improve the health of the soil in organic farming

Study of different soil management measures, which reduce the replant disease through the increase of the eco functionality of the system „soil“

Building on experiences of the **Project *Endobiofruit***:

- **Analysis of microbiological indicators** => early diagnosis of root pathogens or insufficient microbiological mass
- Elaboration of customized **strategies of soil management** especially in the phase of replanting or transition

Replant disease

- Studies of the soil condition were conducted and first effects of different compounds and composts were tested in pot trials.



A field test was conducted in a second step

Replant Disease



Field Trial, Pink Lady - Planting year 2014 - 2015

Nr.	Variant	Distributor	Foil	Planting
1	Untreated Testimony	-	-	2014
2	Untreated Testimony	-	-	2015
3	Compost	Ecorott - Aldein (I)	-	2014
4	Solarisation	Thatchtec BV - Wageningen (NL)	x	2015
5	Solarisation + Compost	Thatchtec BV - Wageningen (NL)	x	2015
6	Steaming	Celli SPA - Forli (I)	-	2014
7	Steaming + CaO + Foil	Celli SPA - Forli (I)	x	2014
8	Steaming + CaO	Celli SPA - Forli (I)		2014
9	Steaming + CaO + Foil + Compost	Celli SPA - Forli (I)	x	2014
10	Herbie + Foil	Thatchtec BV - Wageningen (NL)	x	2014
11	Biofence	Triumph Italia - Agrium Italia SPA - Livorno (I)	x	2014
12	Basamid	Certis - Europe - Saronno (I)	-	2014

Replant Disease

Steaming



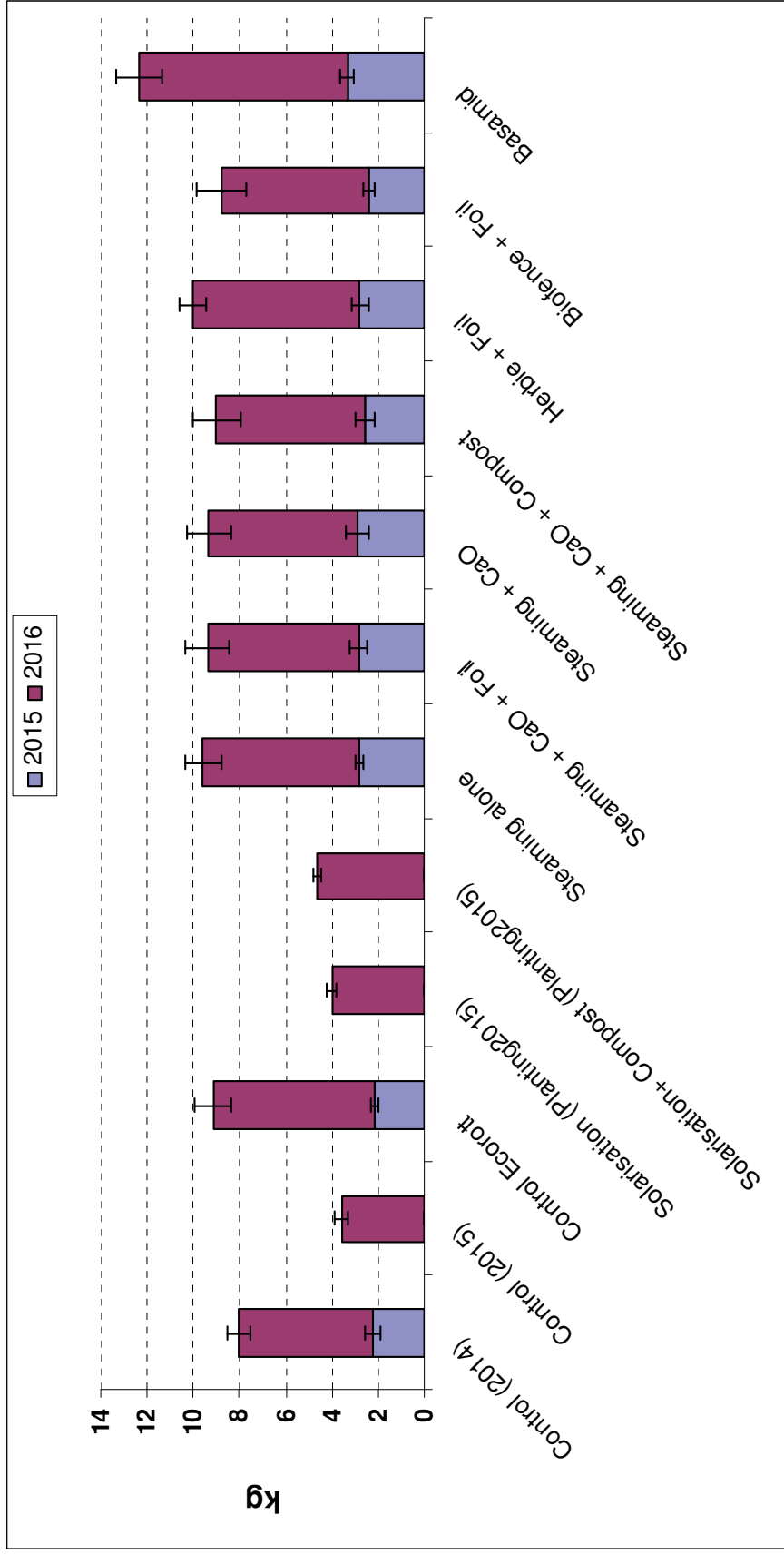
Solarisation



Replant Disease



Yield evaluation kg apples / tree



Replant Disease

Seedings

Farm: Josef Meraner, Eppan

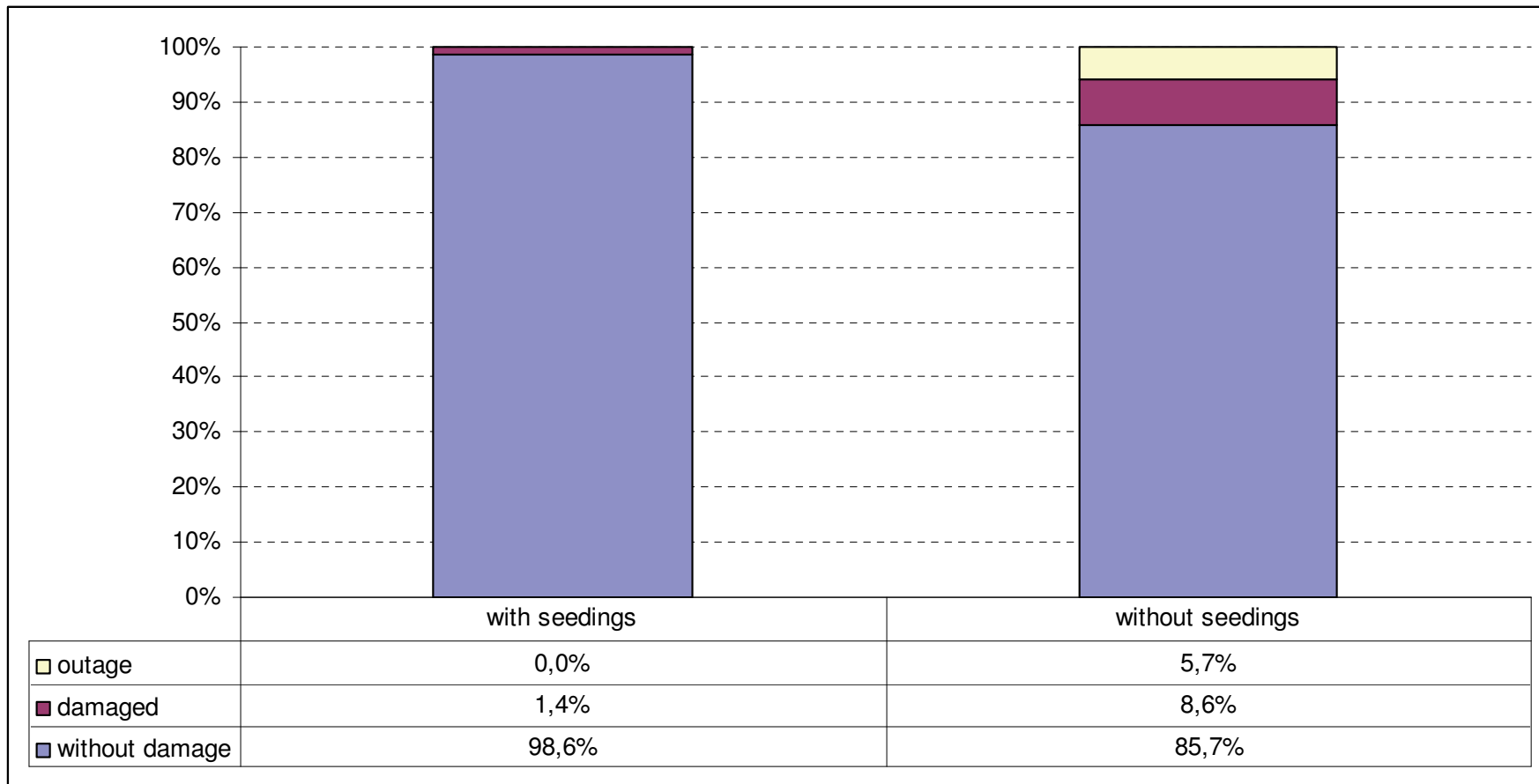
Nr.	Variant	Composition	Amount
1	Cruciferous plants	35% Yellow Mustard Litember, 35% Oil Radish Regresso, 20% Oil Radish Apoll, 10% Brown Mustard Vitasso	25 kg/ha
2	Wheat	100% Wheat	97 kg/ha
3	Barley	100% Naked Barley	139 kg/ha
4	Control	Natural Vegetal Cover	

Replant Disease

Seedings

Farm: Josef Meraner, Eppan

Comparison winter-damage with/without seedings



Thank you for your attention.



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