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INFLUENCE OF DIFFERENTIATED CULTURE PROCEDURES ON THE YIELD OF SEA BUCKTHORN - RESULTS OF A FIELD EXPERIMENT IN BERLIN-DAHLEM

EuroWorkS
2nd European Workshop on Seabuckthorn
Vilnius, Lithuania, 18. - 19. October 2012

Outline

- Background
- Experimental Station Berlin-Dahlem
- Experimental Setup
- Results: Growth behavior
  Yield potential
  Plant health
- Summary

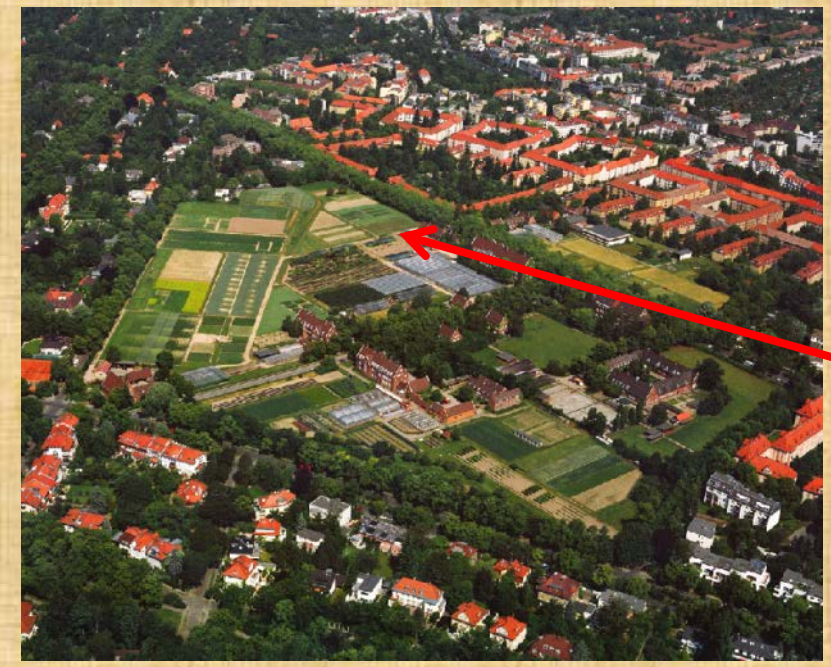
Background

Interest in high-quality sea buckthorn products in Germany,
but some difficulties for producer:

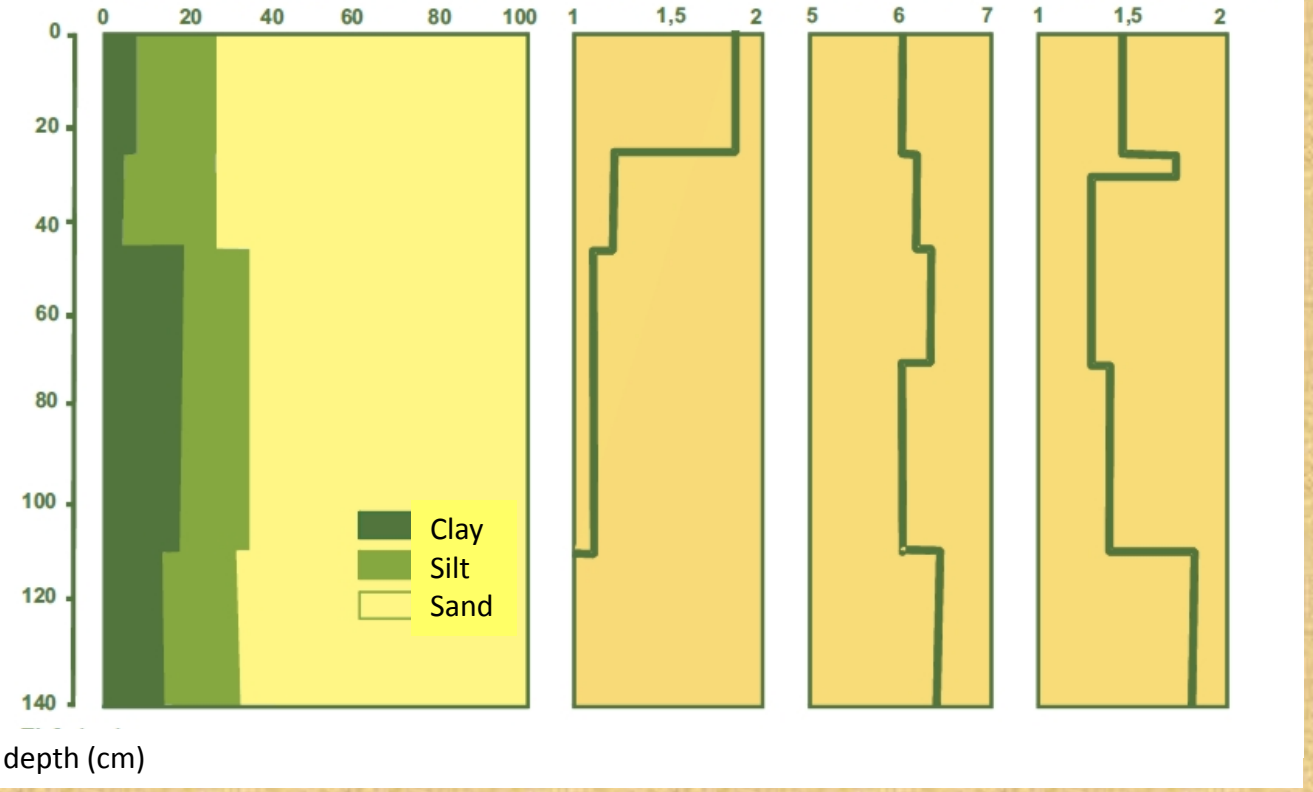
1. Specified harvest technology and separation technology urgently
2. Unsafe channels of distribution
3. Missing cultivation experience
4. Low profit potential
5. Short harvest time space
6. Reinforced appearance of illnesses like *Verticillium* ssp. with some varieties

Experimental Station Berlin-Dahlem

Average annual temperature	9.9 °C
Total annual precipitation	561.9 mm
Sum of climatic water balance	-135.6 mm
Days of frost (< 0°C)	69
Ice days (<0°C/24 h)	21
Summer days (>25°C)	42
Hot days (>30°C)	9



Soil Parameter



Soil type

brown earth – antigo soil

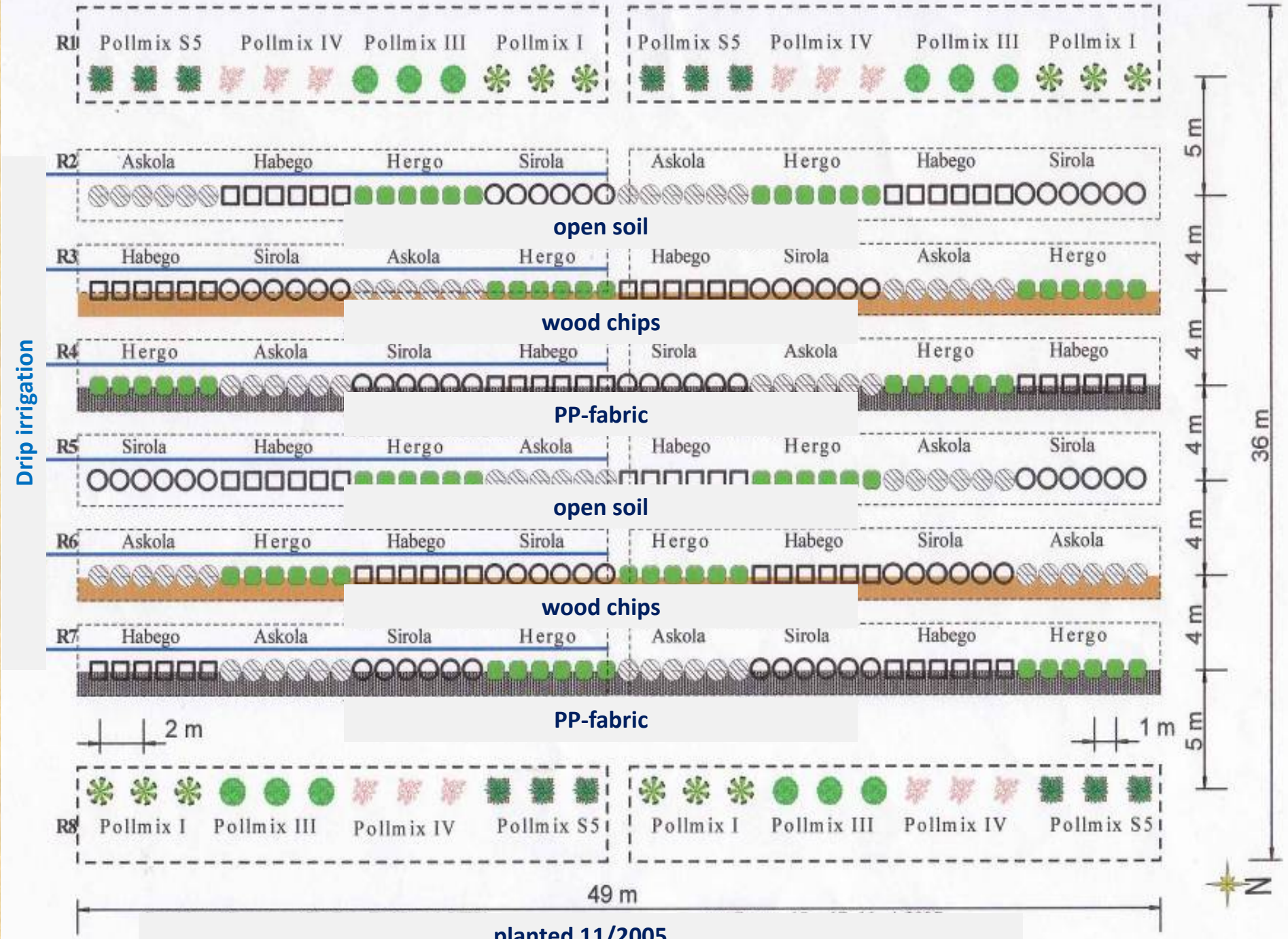
World Reference Base for Soil Resources(WBR): Albeluvisol

Experimental Setup

1. Comparison of Varieties
1.1. ´Hergo´
1.2. ´Askola´
1.3. ´Habego´
1.4. ´Sirola´

2. Cultivation System
2.1. Open Soil (Mechanical Weed Control)
2.2. Shrubs in Polypropylen Fabric (Mypex)
2.3. Shrub Rows Covered with Wood Chips

3. Irrigation
3.1. Without irrigation
3.2. With drop irrigation


R1 Pollmix S5 Pollmix IV Pollmix III Pollmix I
Pollmix S5 Pollmix IV Pollmix III Pollmix I
R2 Askola Habego Hergo Sirola
Askola Hergo Habego Sirola
open soil
R3 Habego Sirola Askola Hergo
Habego Sirola Askola Hergo
wood chips
R4 Hergo Askola Sirola Habego
Sirola Askola Hergo Habego
PP-fabric
R5 Sirola Habego Hergo Askola
Habego Hergo Askola Sirola
open soil
R6 Askola Hergo Habego Sirola
Hergo Habego Sirola Askola
wood chips
R7 Habego Askola Sirola Hergo
Askola Sirola Habego Hergo
PP-fabric
Drip irrigation
2 m
1 m
5 m
4 m
4 m
4 m
4 m
4 m
5 m
36 m
R8 Pollmix I Pollmix III Pollmix IV Pollmix S5
Pollmix I Pollmix III Pollmix IV Pollmix S5
49 m
planted 11/2005
N

´Hergo´

variety approval : 1983

habitus:	broad, upright and strong growth
	branches bow with a lot of fruit
	up to 4 m high
	few to medium amount of thorns
fruit:	medium-large, cylindric
	100-fruit-weight 37 g
specifics:	high yield (30% more than ´Leikora´)
	suitable for mechanical harvesting
	less ascorbic acid than ´Leikora´ (appr. 150 mg/100g FM)

´Askola´

variety approval : 1991

habitus: fast growth rate , upright growth
up 5 m high
few to medium amount of thorns

fruit: small to medium, oval to cylindric
100-fruit-weight 29 g
deep orange in colour

specifics: high yield
high ascorbic acid (appr. 260 mg/100g FM)

´Sirola´

variety approval : 2003

habitus:	medium growth rate, strong upright growth
	few to medium amount of thorns
fruit:	big, oval in shape
	100-fruit-weight 47 g
	deep-red in colour
specifics:	very early ripening from end of July to August
	high carotene and oil content
	susceptible to *Verticillium spp.*

´Habego´
(Syn. ´Orange Energy ®´)

variety approval : 2003

habitus: very strong growth, broad upright growth
branches with many fruits overhanging
medium amount of thorns

fruit: big, oval in shape
100-fruit-weight 51 g
orange in colour

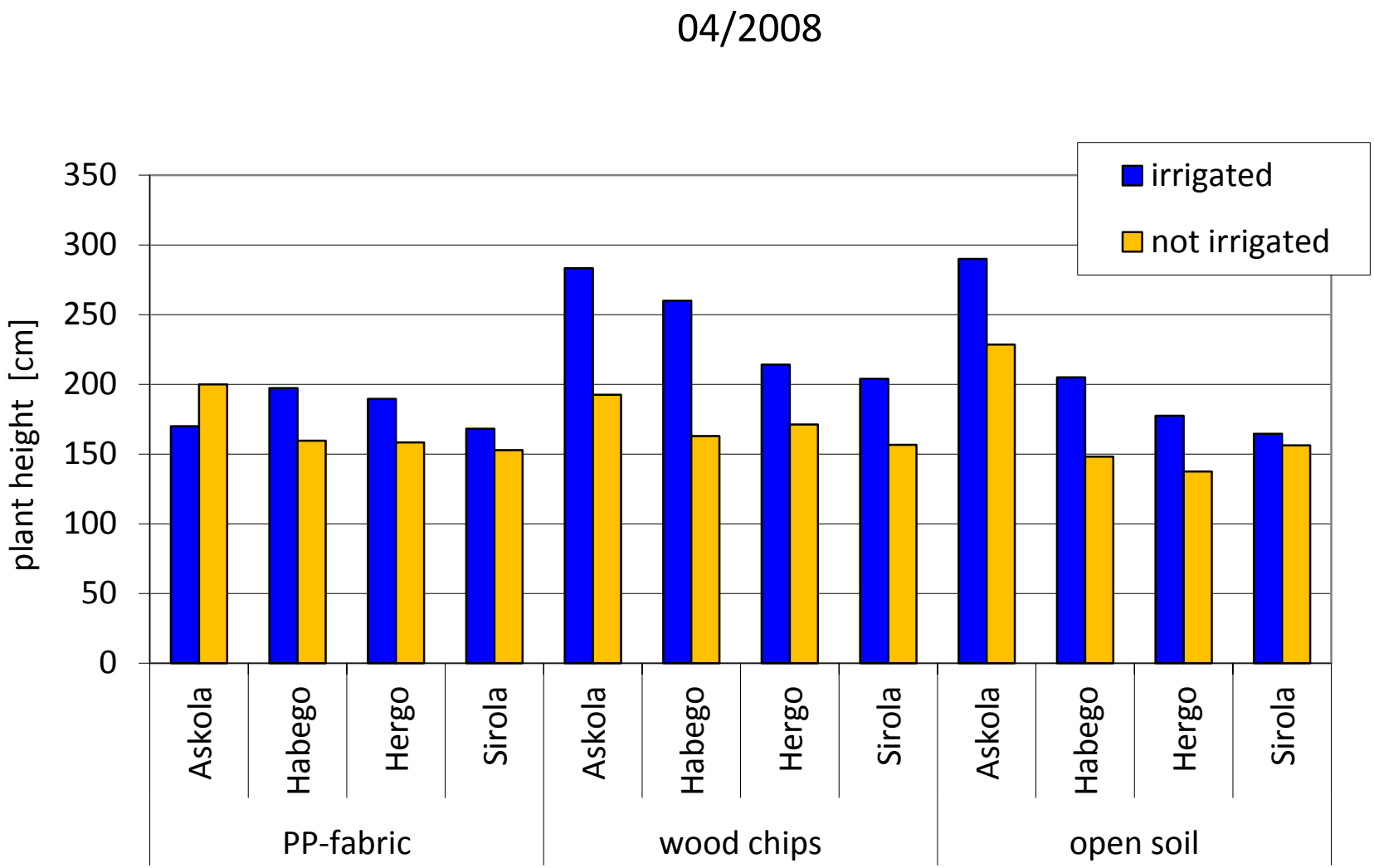
specifics: very high yield
high carotene and oil content

.

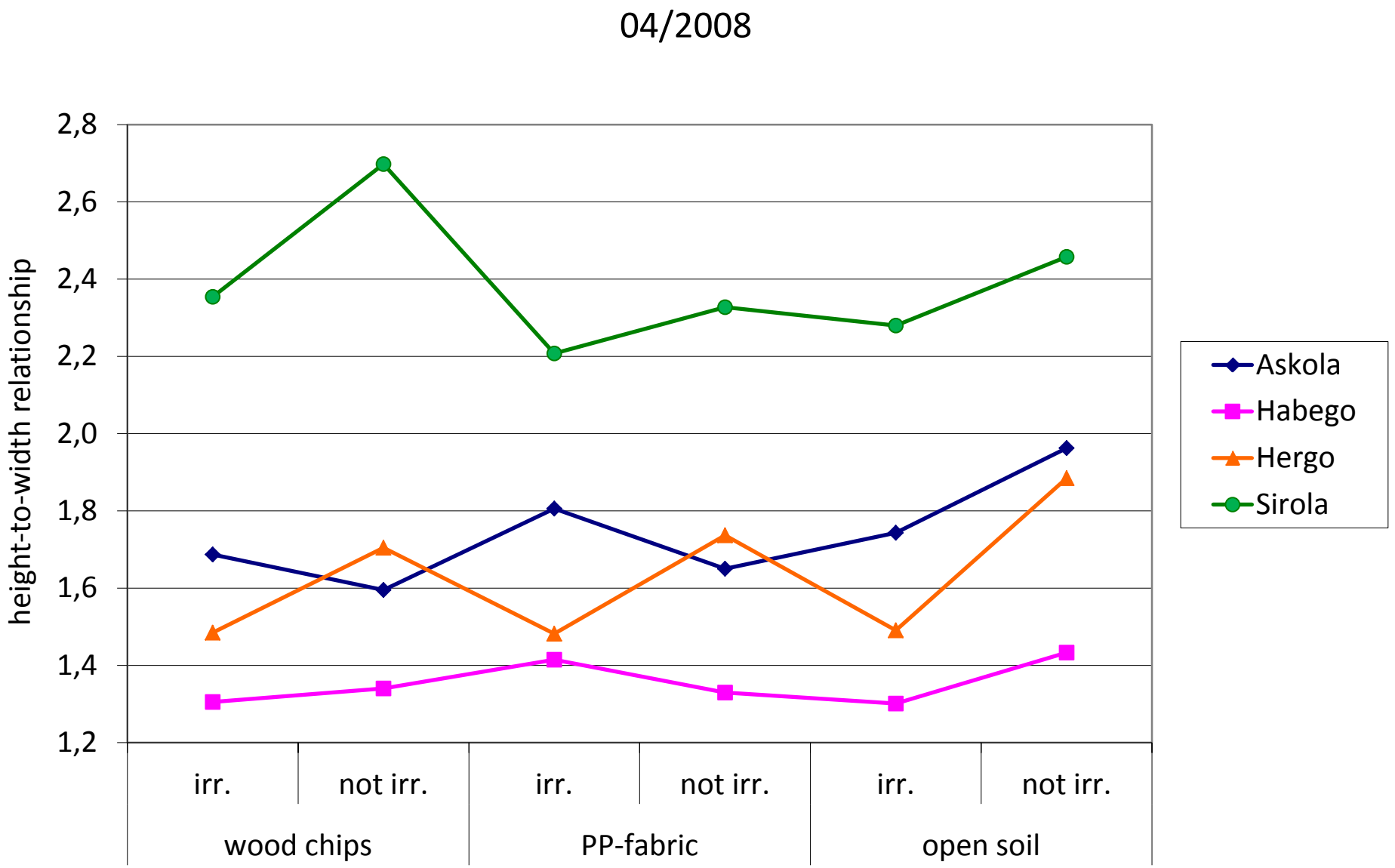
Results

Sea Buckthorn after 2nd Cut in 2010

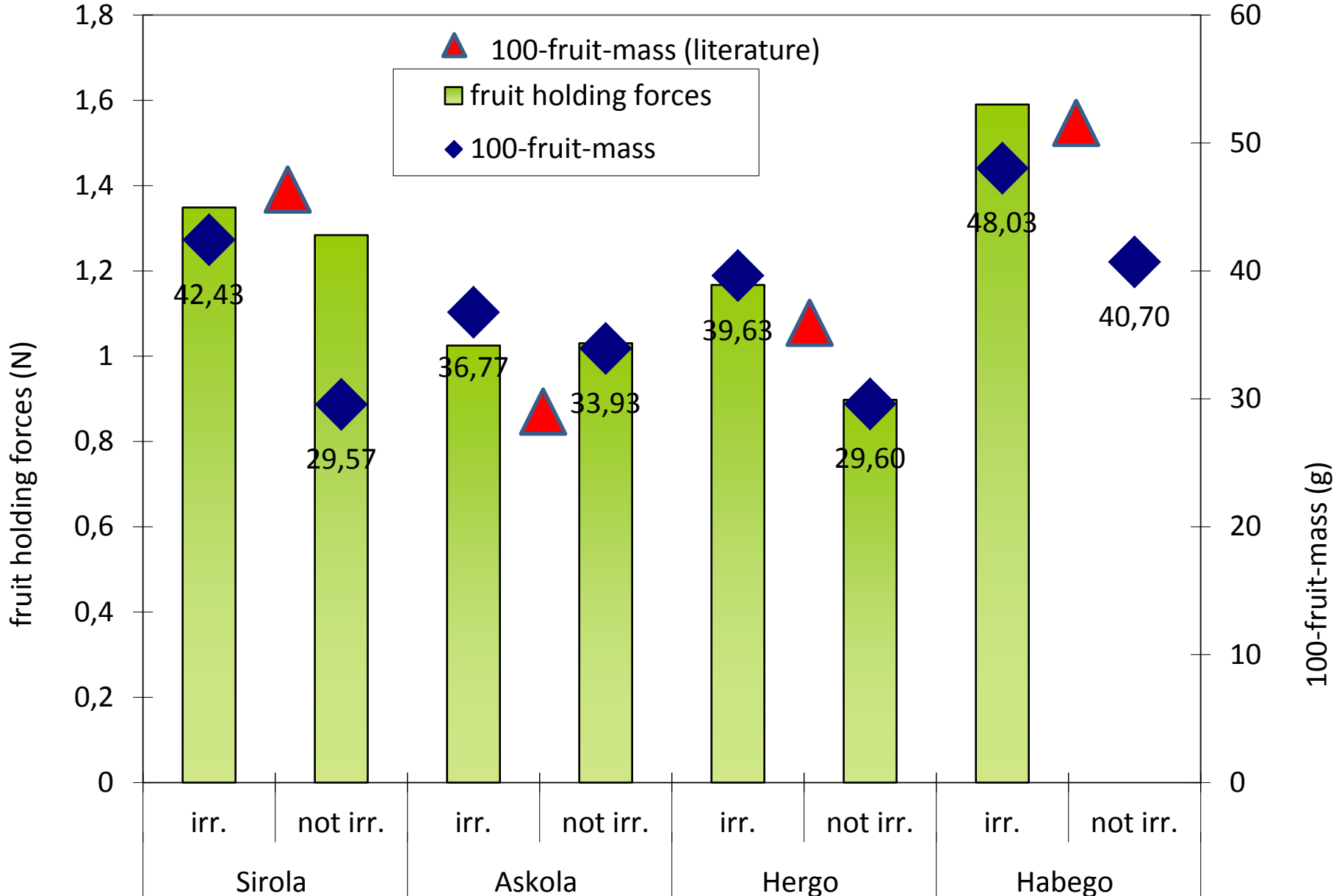
Results – Growth Behavior



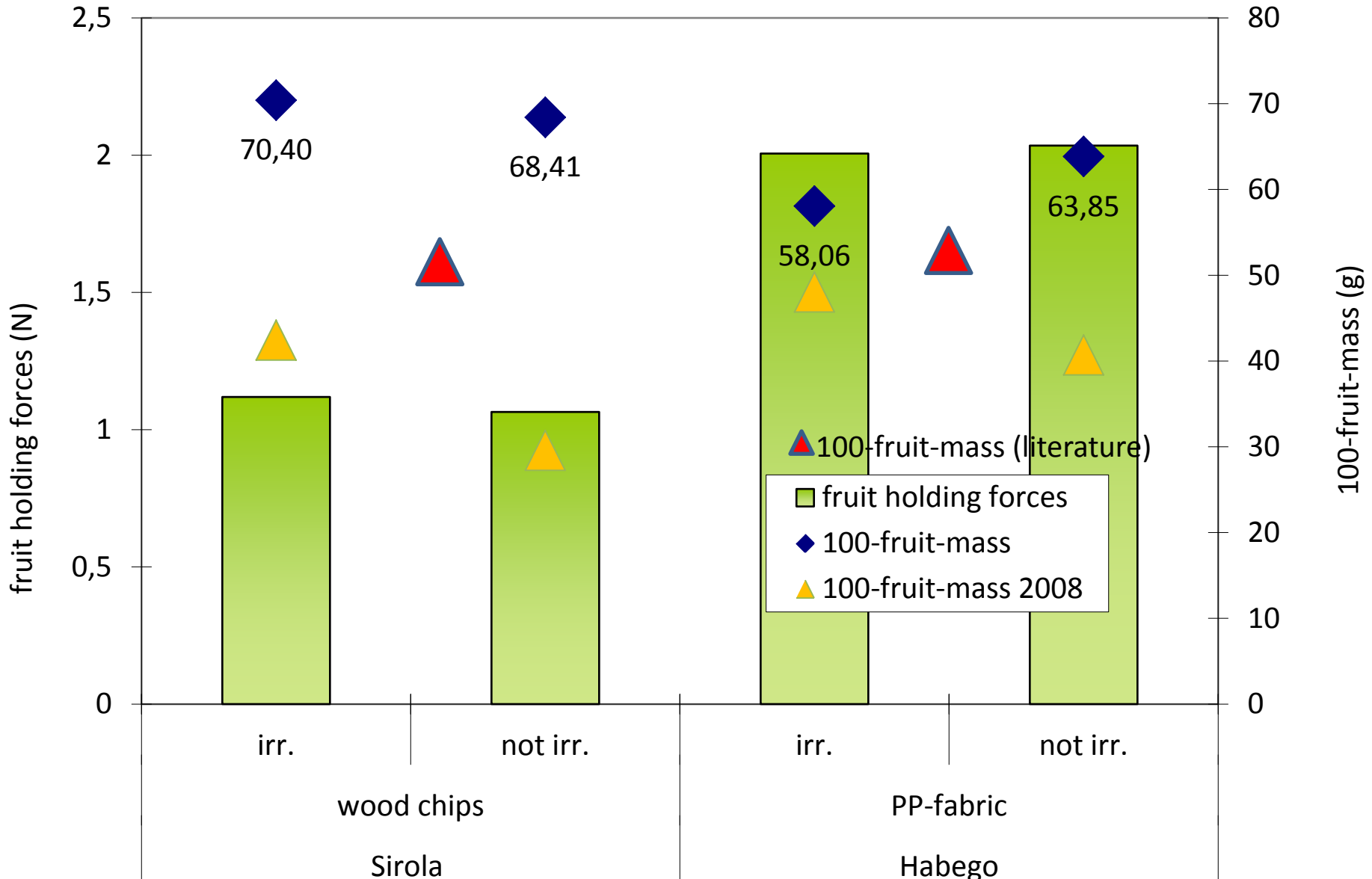
Results – Growth Behavior



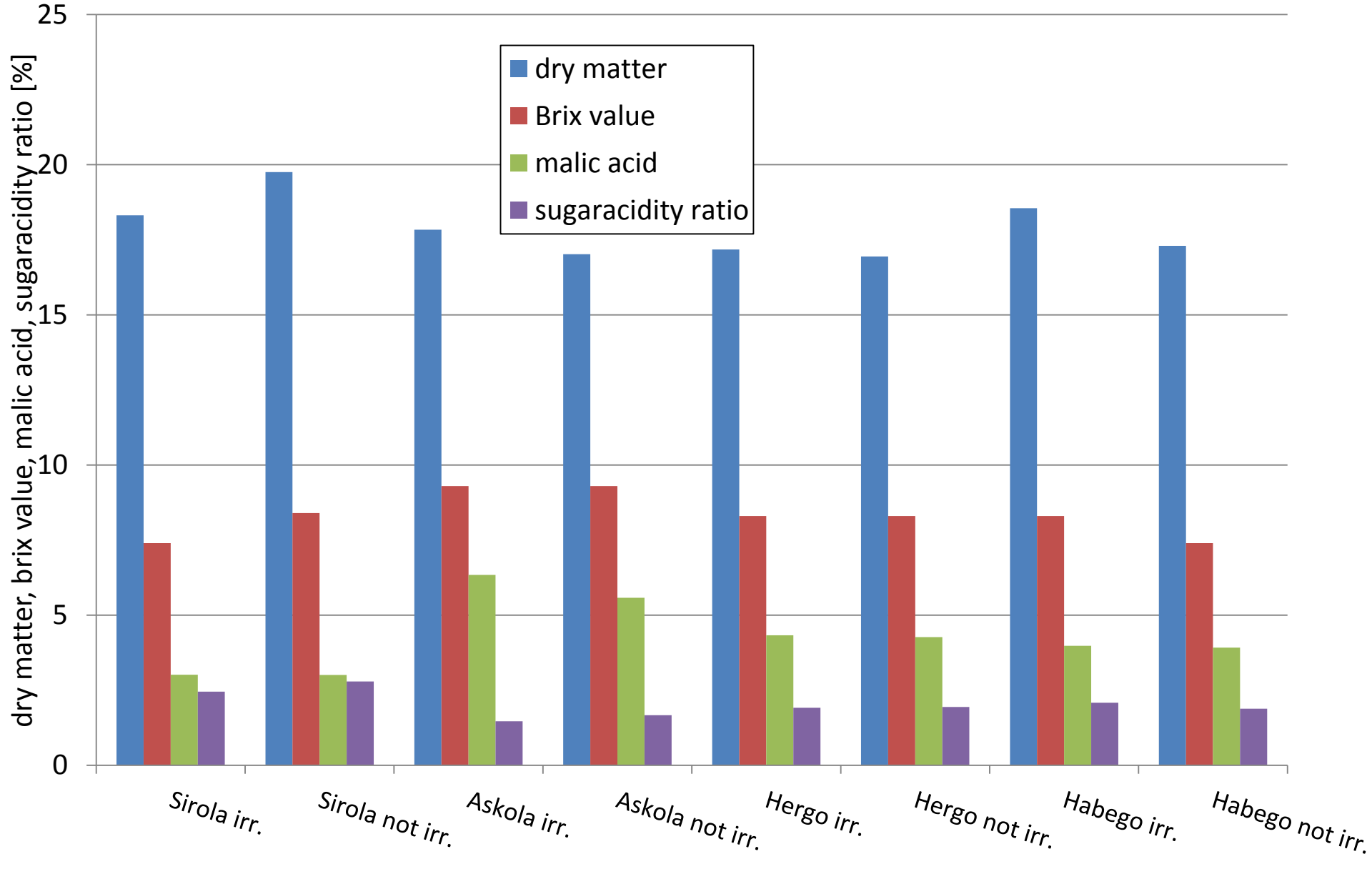
Fruit Holding Forces and 100-Fruit-Mass 1st Harvest 2008, Shrubs Planted in PP-Fabric



Fruit Holding Forces and 100-Fruit-Mass 2009



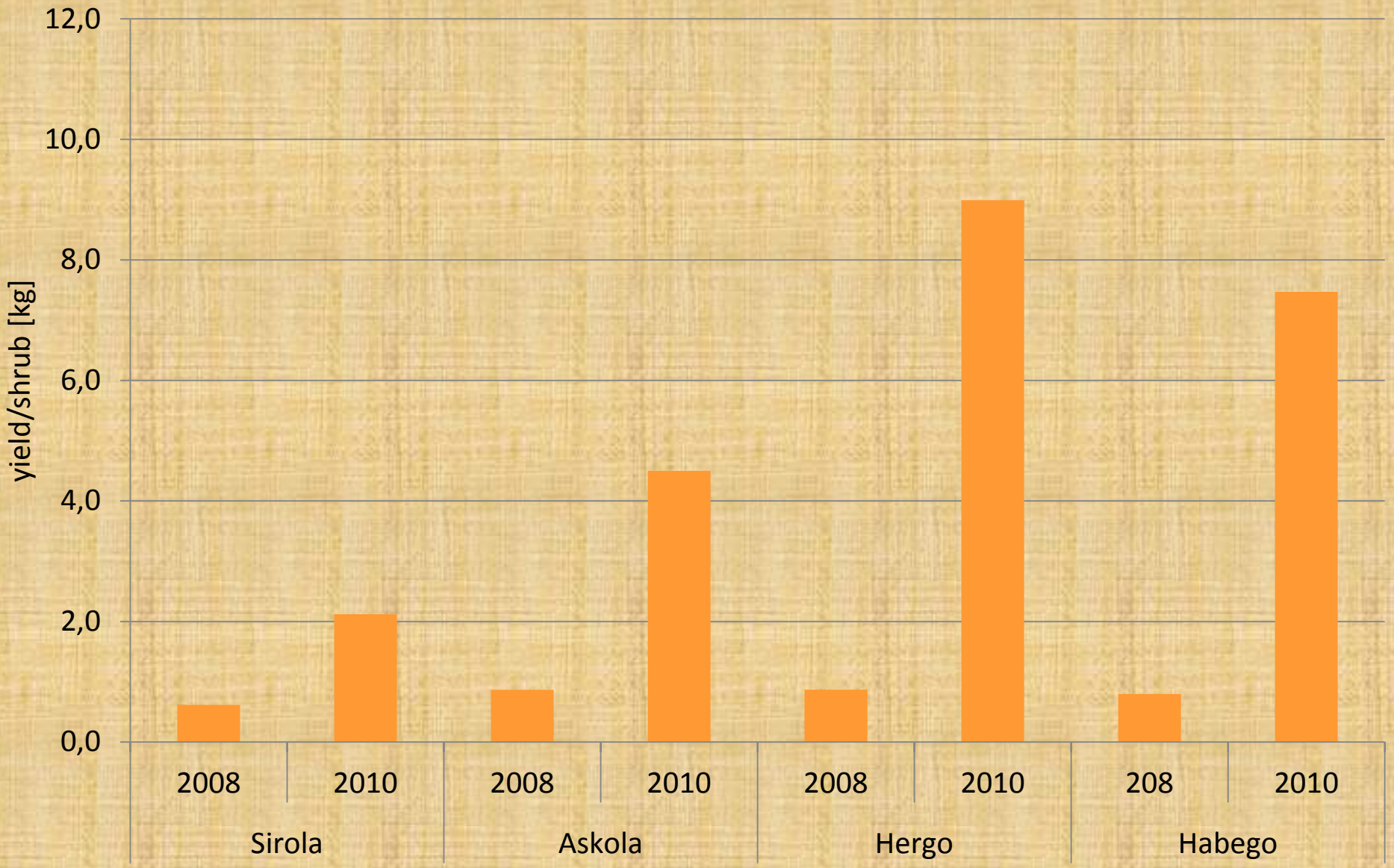
Fruit Content



Results - Yield

´Habego´ 2012/10/01

Results - Yield



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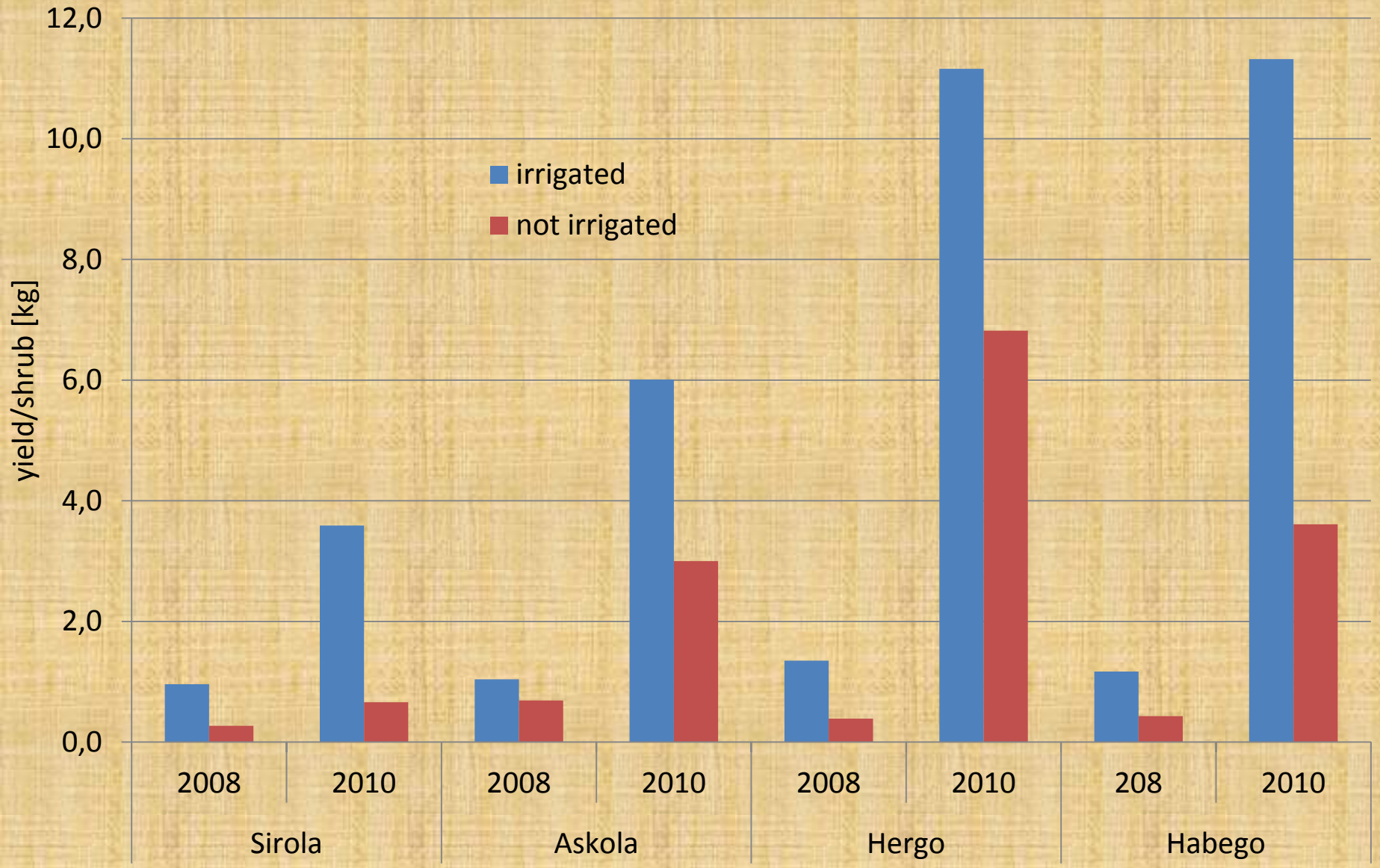

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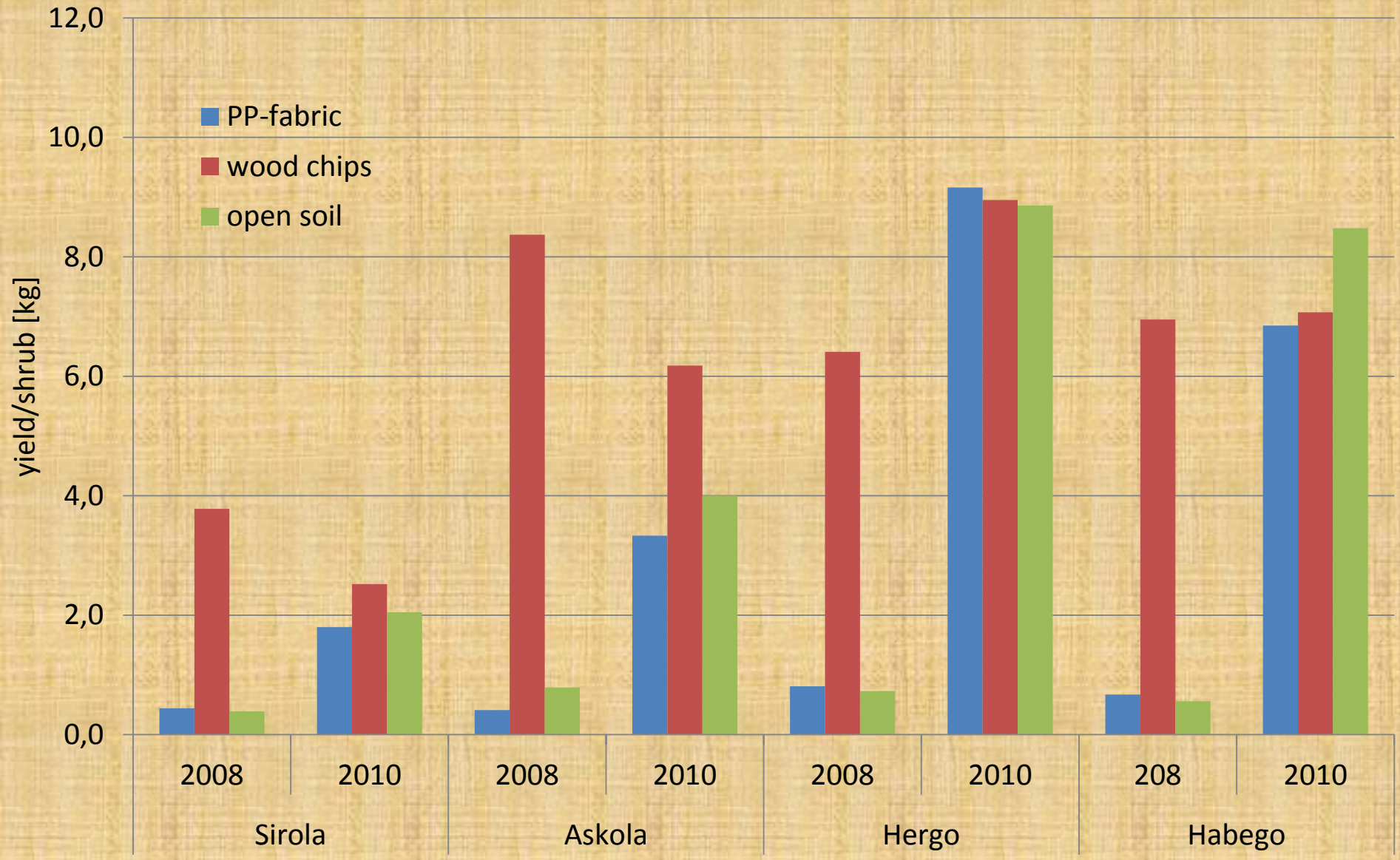
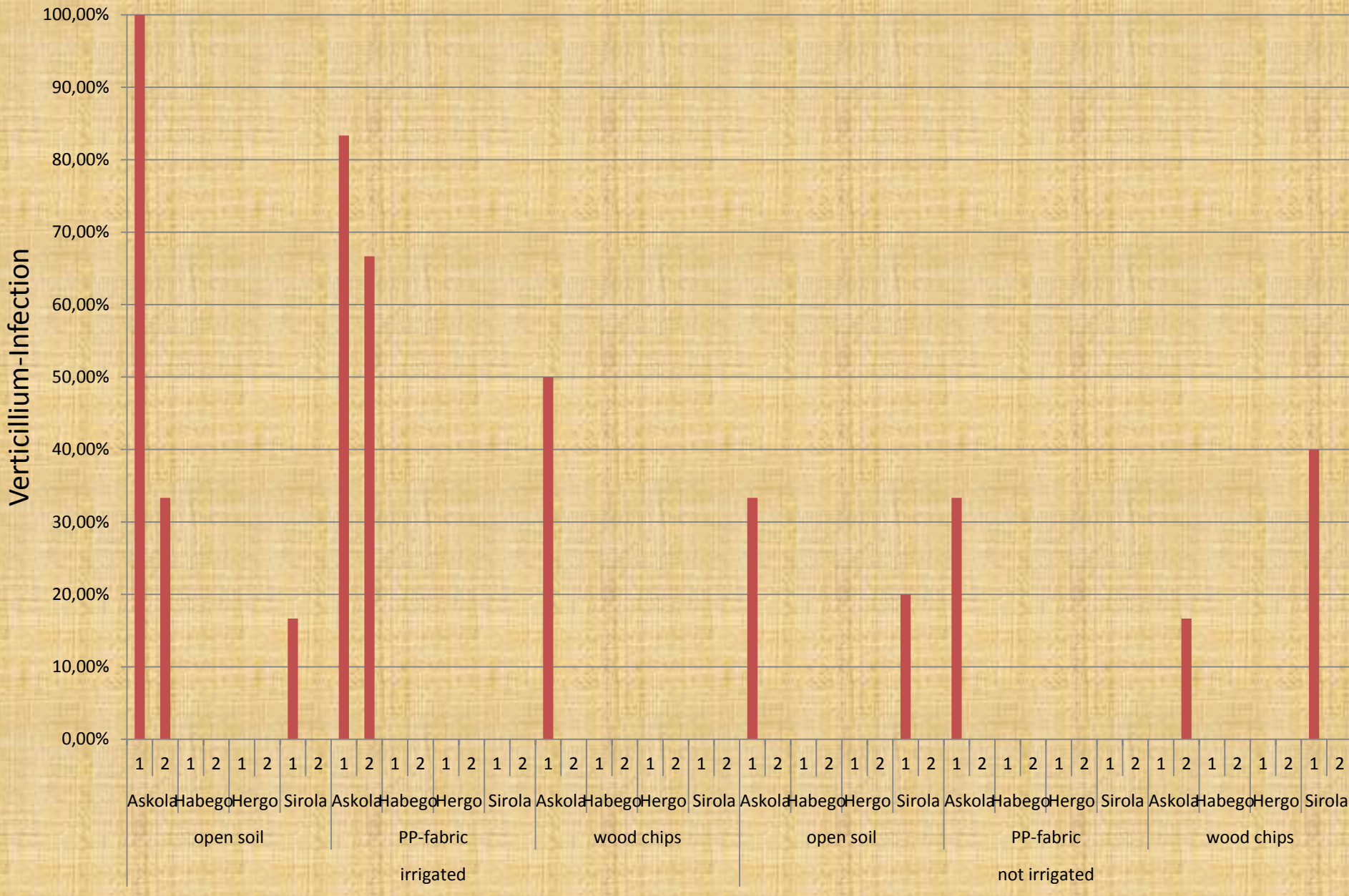


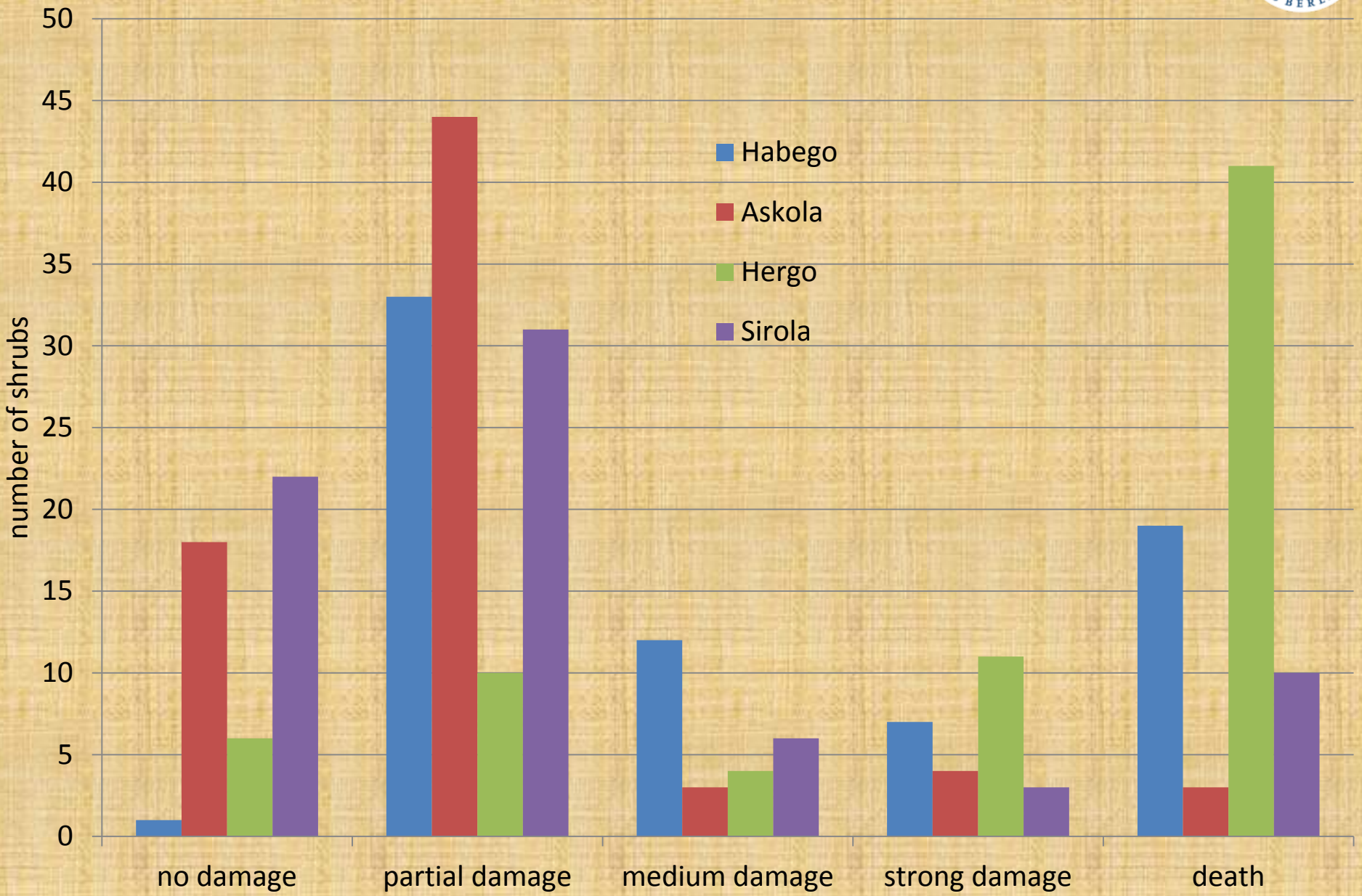
Results – Plant Health

´Askola´ with *Verticillium spp.* 2009/07/07

Results– Plant Health Screening 2007/07



Results – Plant Health Screening 2011/07



Summary

Woodchip soil covering in combination with irrigation showed the best shoot growth after the initial three year standing period.

An additional irrigation system clearly promotes the growth of sea buckthorn plants.

A soil cover with woodchips leads to the strongest new shoots.

The ´Hergo´ and the ´Habego´ varieties results in the highest yields, followed by the ´Askola´ variety. Yields from the ´Sirola´ variety fall significantly below.

´Askola´ and ´Sirola varieties show susceptibility to *Verticillium ssp*. However, the regeneration potential of both varieties is high.

A final assessment can only be made after the harvest evaluation in 2012 - this year many ´Hergo´ shrubs lack new shoots (frost damage?).


Thank you for your attention!