

Results of a german-estonian sea buckthorn cultivar trial

by

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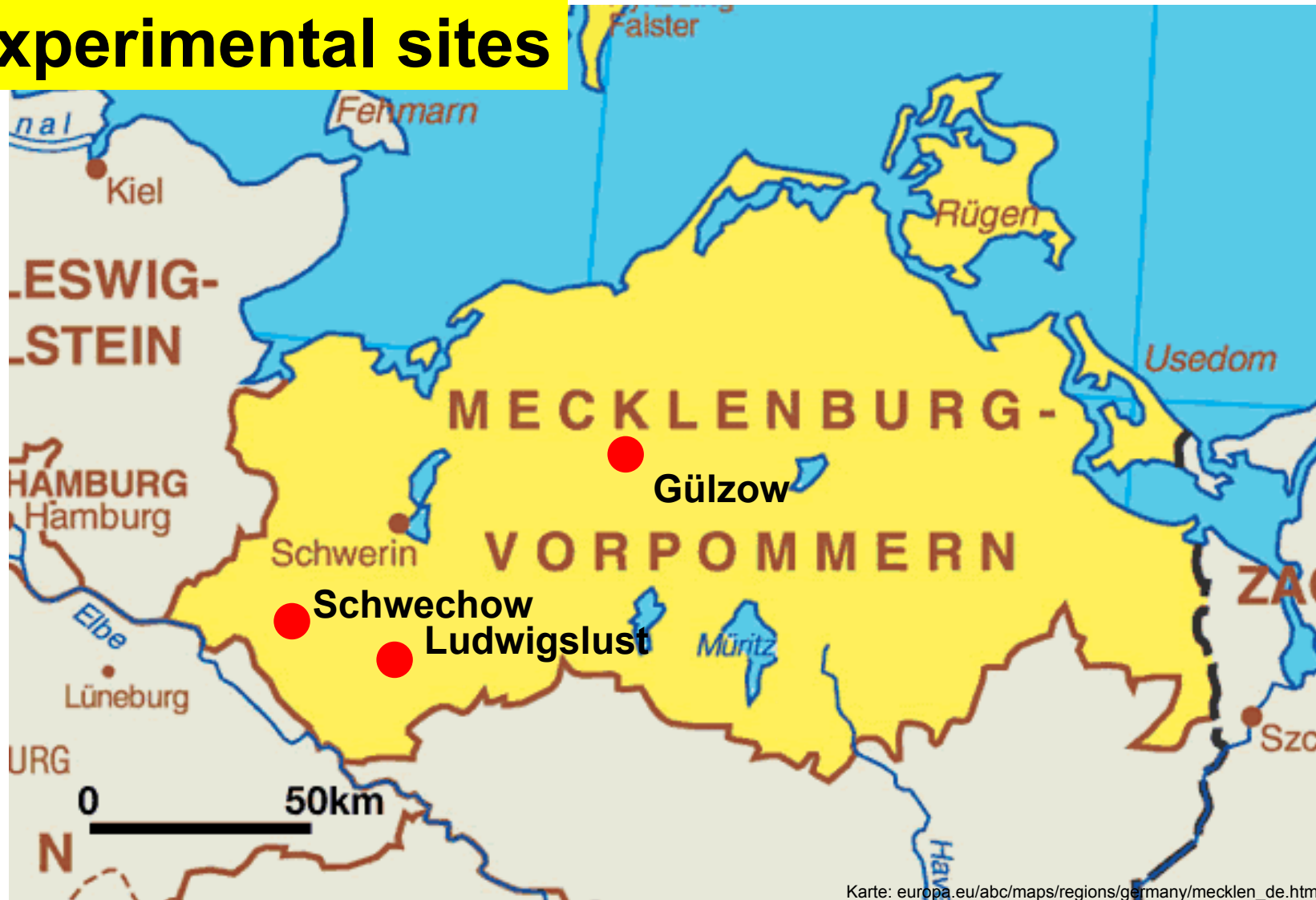
Aim of our work

**Comparing of well-known and new
sea buckthorn varieties
(origins from Germany and Russia)
on their agronomic value in
Mecklenburg-Western Pomerania and Estonia**

Expectation for (new) sea buckthorn varieties

- **Cultivation technical parameters**
 - Consistent growth
 - Strong health
 - High yield
 - Good ability to regenerate after the harvest cut
 - Poor berries retention force
 - Good ability for propagation
 - Resistance to frost
 - Expansion of the harvest period (early to late ripening)
- **Chemical and phytochemical composition**
 - High concentration of nutrients and bioactive substances

Experimental sites



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Experimental sites



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Experimental site



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Short characteristic of the experimental sites

Site:	Schwechow	Gülzow	Rõhu
Soil type:	very loamy sand	loamy sand	sandy clay
pH-value:	6.0	6.2	5.5
Content of humus:	2.5 %	1.2 %	4.8 %
Preculture:	apple	ecological agriculture	fruit trials
Irrigation:	none	sometimes	sometimes

Experimental set-up

(Female) varieties	12
Repetitions	3
Plants per repetition	5
Plants per variety	15
Each between 2 parcel	1 Pollinator (5 : 1)
Habit	free growing shrub

Date of plantation	November 2004 or rather March 2005
Interspaces	4.50 x 1.00 m (within the parcel) 4.50 x 1.50 m (between parcels)

Female varieties

German origin ¹		(Estonian)/Russian origin ²
Askola	Leikora	Botanitcheskaja Ljubitelskaja
Dorana	Sirola	Gibrid Pertsika
Frugana		Otradnaja
Habego		Podaruk Sadu
Hergo		Trofimovskaja

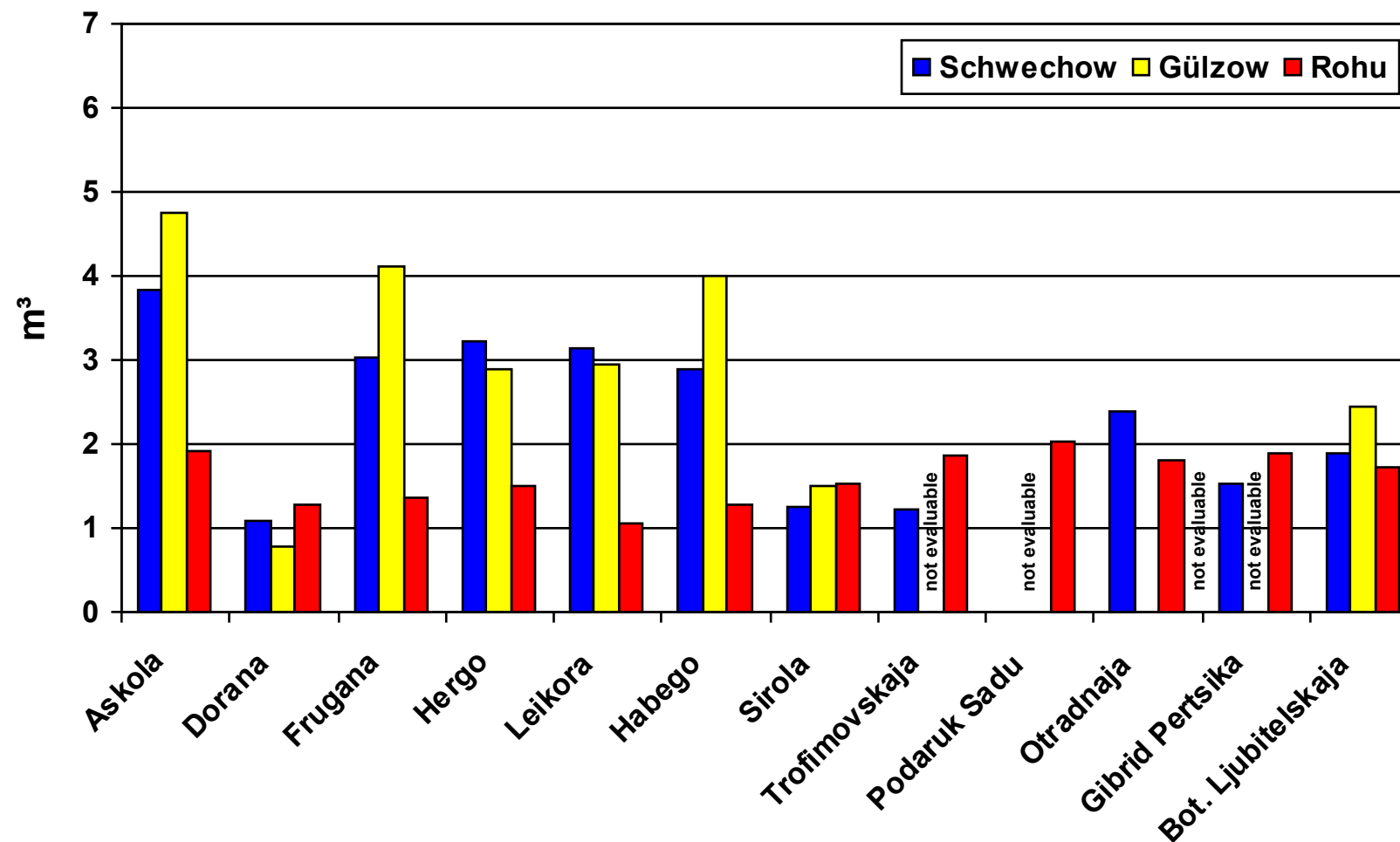
¹ = by ALBRECHT in Berlin-Baum-
schulenweg selected varieties

² = Selection/culture from the Botanic Garden of
Moscow's national Lomonossov University

Male varieties

German origin	(Estonian)/Russian origin
Pollmix, Klone 1- 4	Pollmix

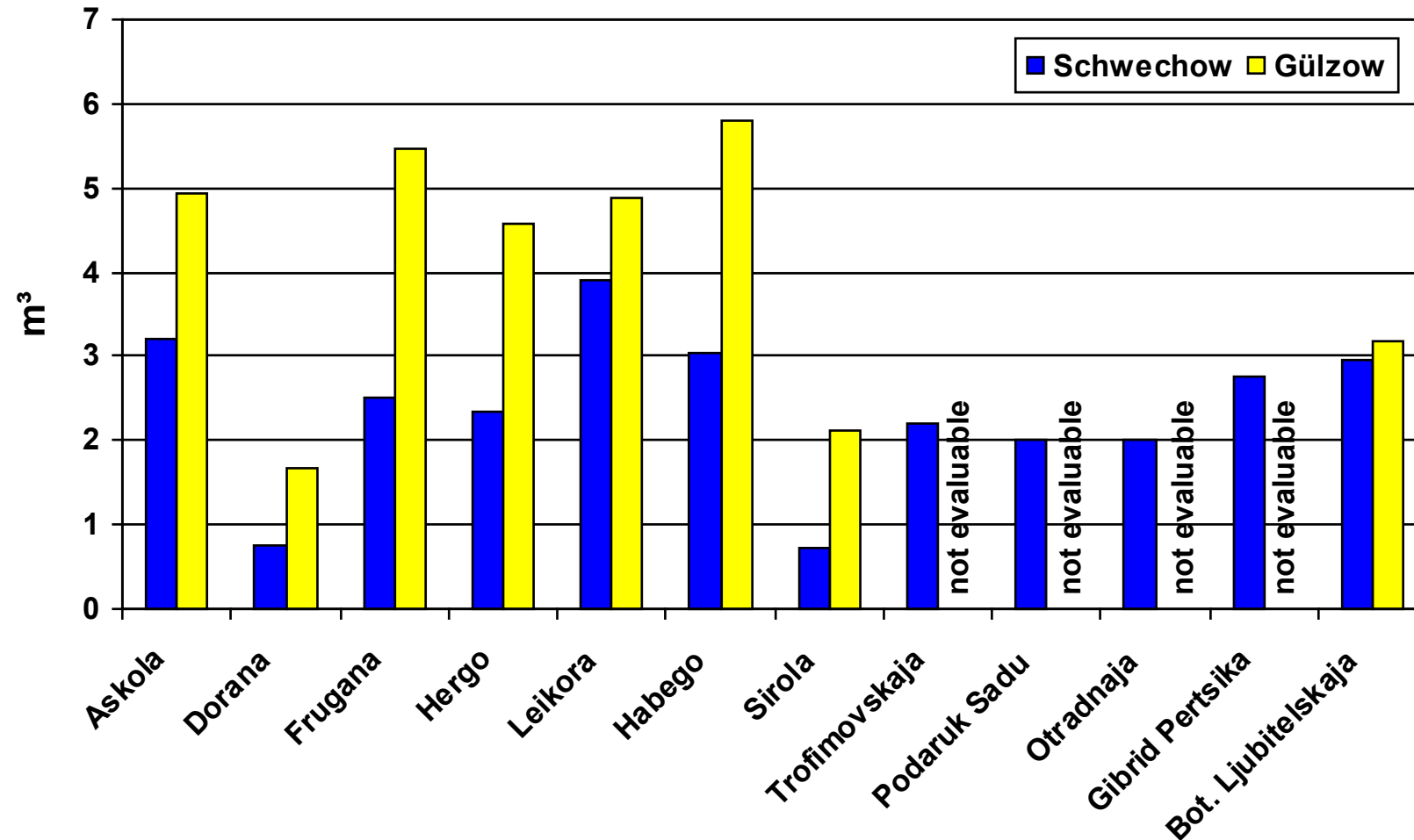
Shrub volume before harvest, 2007



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Shrub volume, autumn 2008



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Regeneration after harvest cutting

Askola, harvest 2007, 2009





Plant health

(pests and diseases according to the data of the literature)

- **Pests (animals)**
 - Common wintermoth (*Operophtera brumata*)
 - Sea buckthorn fly (*Rhagoletis batava*)
 - Sea buckthorn moth (*Jebechia hippophaealla*)
 - Sea buckthorn acarid (*Eriophyes hippophaenus*)
 - Sea buckthorn leaves sucker (*Psylla hippophaes*)
 - Sea buckthorn aphids (*Capitorphorus hippophaes*)
- **Diseases (fungi)**
 - Wilt diseases due to *Fusarium*- and *Rhizoctonia*-species, *Verticillium dahliae*



Plant health

- **Pests (animals)**
- **Common wintermoth (*Operophtera brumata*)**
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- **Wilt disease** due to *Fusarium*- and *Rhizoctonia*-species, ***Verticillium dahliae*** !





Damage symptoms 'Podaruk Sadu', Schwechow, 2009

Damage symptoms 'Sirola', Gülzow, 2007





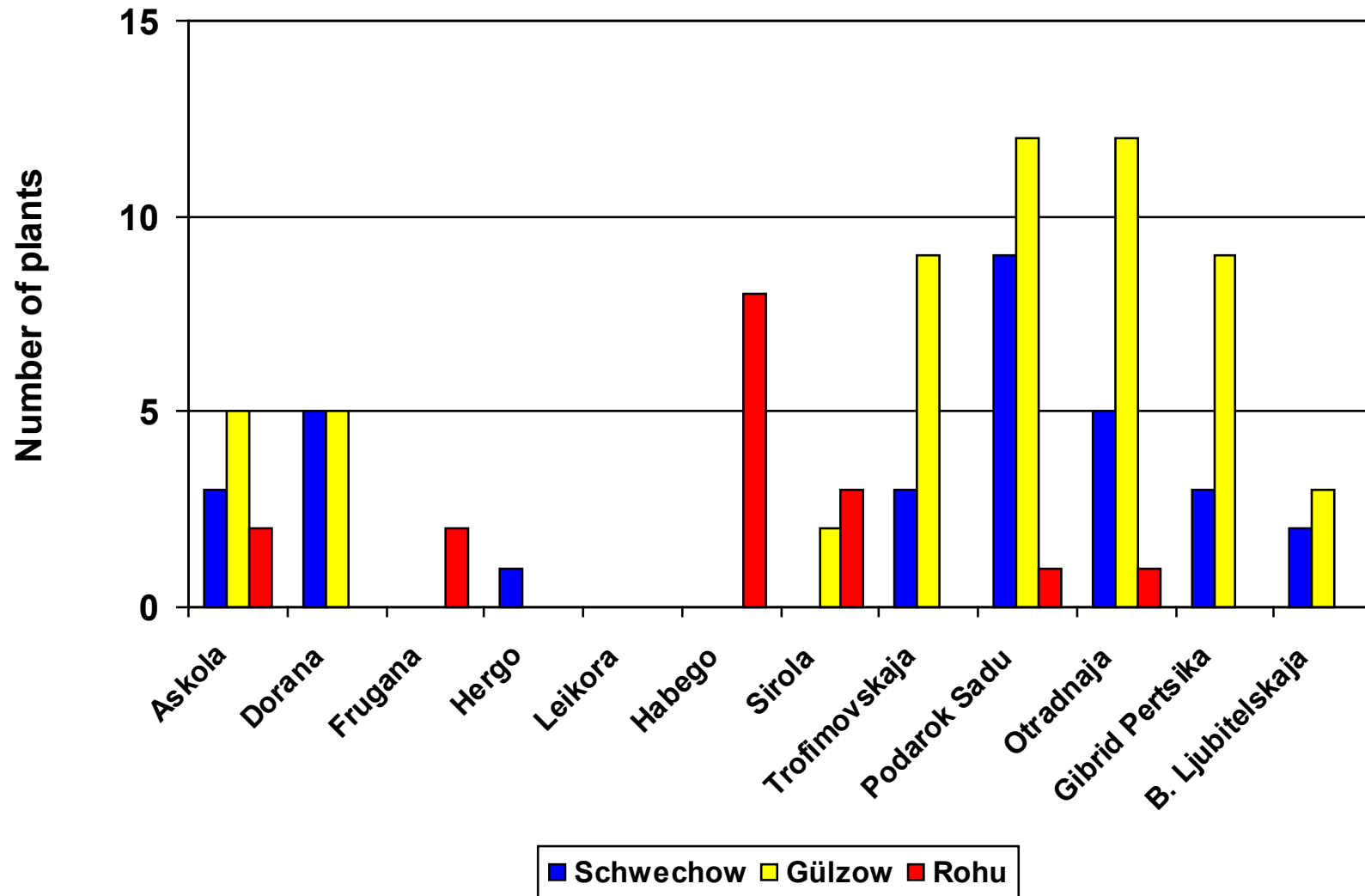


Damage symptoms 'Gibrid Pertsika', Gülzow, 2007



Damage symptoms 'Podaruk Sadu', Gülzow, 2007

Perished plants, 2009 (n = 15)



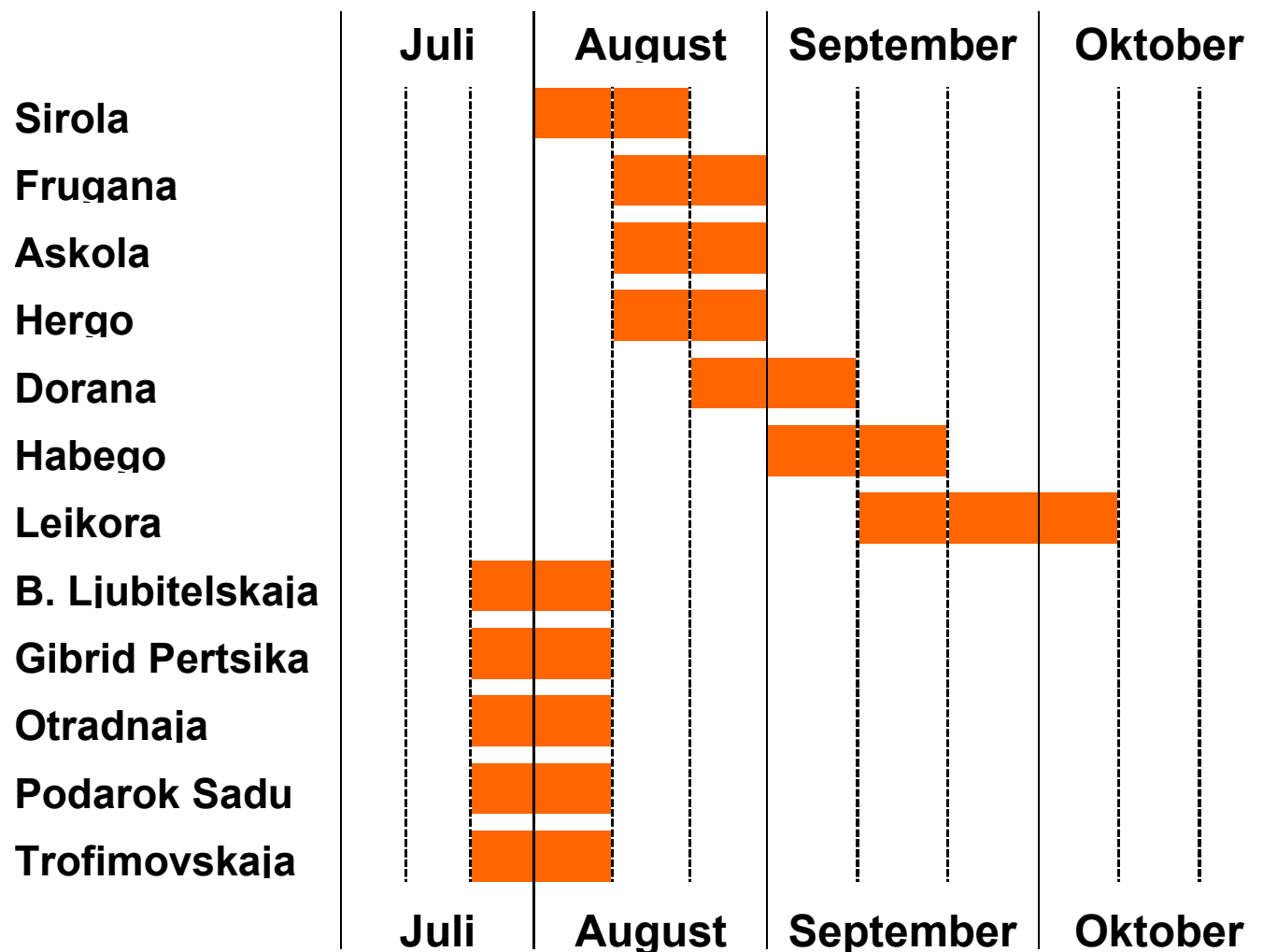


Winter damage (2009/2010), 'Habego', Rohu



Winter damage (2009/2010), 'Frugana', Rohu

Harvest time for each variety



Harvesting with “Berry Shaker HK 2“, Gülzow







Podarok Sadu





Shrubs after harvest cutting, 'Hergo', Schwechow 2009







German varieties, harvest 2007 and 2009, Schwechow

Variety	Yield (kg/shrub)		Total yield 2007 - 2009 (kg/shrub)
	2007	2009	
Askola	9.1	5.4	14.5
Dorana	3.5	1.6	5.1
Frugana	2.0	2.8	4.8
Hergo	6.2	6.3	12.5
Leikora	-	7.8	7.8
Habego	8.4	9.0	17.4
Sirola	4.7	4.9	9.6



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Russian varieties, harvest 2007 and 2009, Schwechow

Variety	Yield (kg/shrub)		Total yield 2007 - 2009 (kg/shrub)
	2007	2009	
Trofimovskaja	-	6.0	6.0
Podarok Sadu	-	4.6	4.6
Otradnaja	5.1	11.6	16.7
Gibrid Pertsika	-	5.5	5.5
B. Ljubitelskaja	-	10.6	10.6

German varieties, harvest 2007 and 2009, Gülzow

Variety	Yield (kg/shrub)		Total yield 2007 - 2009 (kg/shrub)
	2007	2009	
Askola	3.6	5.5	9.1
Dorana	1.1	-	1.1
Frugana	3.4	3.1	6.5
Hergo	5.1	8.4	13.5
Leikora	-	14.0	14.0
Habego	9.8	12.2	22.0
Sirola	6.9	5.8	12.7



Russian varieties, harvest 2007 and 2009, Gülzow

Variety	Yield (kg/shrub)		Total yield 2007 - 2009 (kg/shrub)
	2007	2009	
Trofimovskaja	-	-	-
Podarok Sadu	-	-	-
Otradnaja	-	-	-
Gibrid Pertsika	-	-	-
B. Ljubitelskaja	2.4	9.9	12.3

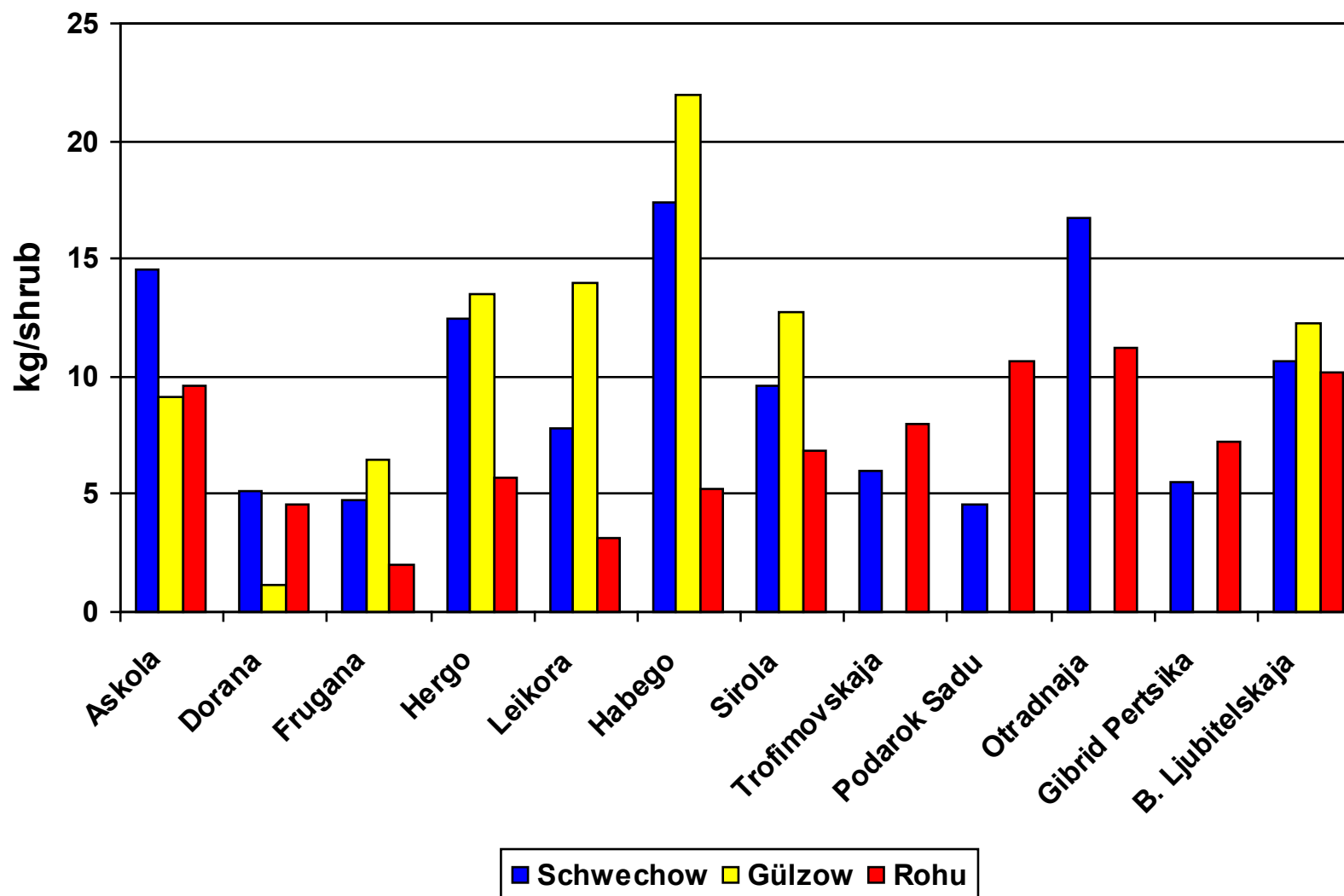
German varieties, harvest 2007 - 2009, Rõhu

Variety	Yield (kg/shrub)			Total yield 2007 - 2009 (kg/shrub)
	2007	2008	2009	
Askola	0.1	2.3	7.2	9.6
Dorana	0.0	0.4	4.2	4.6
Frugana	0.0	0.0	2.0	2.0
Hergo	0.2	1.2	4.3	5.7
Leikora	0.0	0.0	3.1	3.1
Habego	0.0	0.3	4.9	5.2
Sirola	0.8	4.1	1.9	6.8

Russian varieties, harvest 2007 - 2009, Rõhu

Variety	Yield (kg/shrub)			Total yield 2007 - 2009 (kg/shrub)
	2007	2008	2009	
Trofimovskaja	1.2	6.2	0.6	8.0
Podarok Sadu	1.4	8.7	0.5	10.6
Otradnaja	3.0	7.7	0.5	11.2
Gibrid Pertsika	1.1	5.6	0.5	7.2
B. Ljubitelskaja	1.1	4.9	4.2	10.2

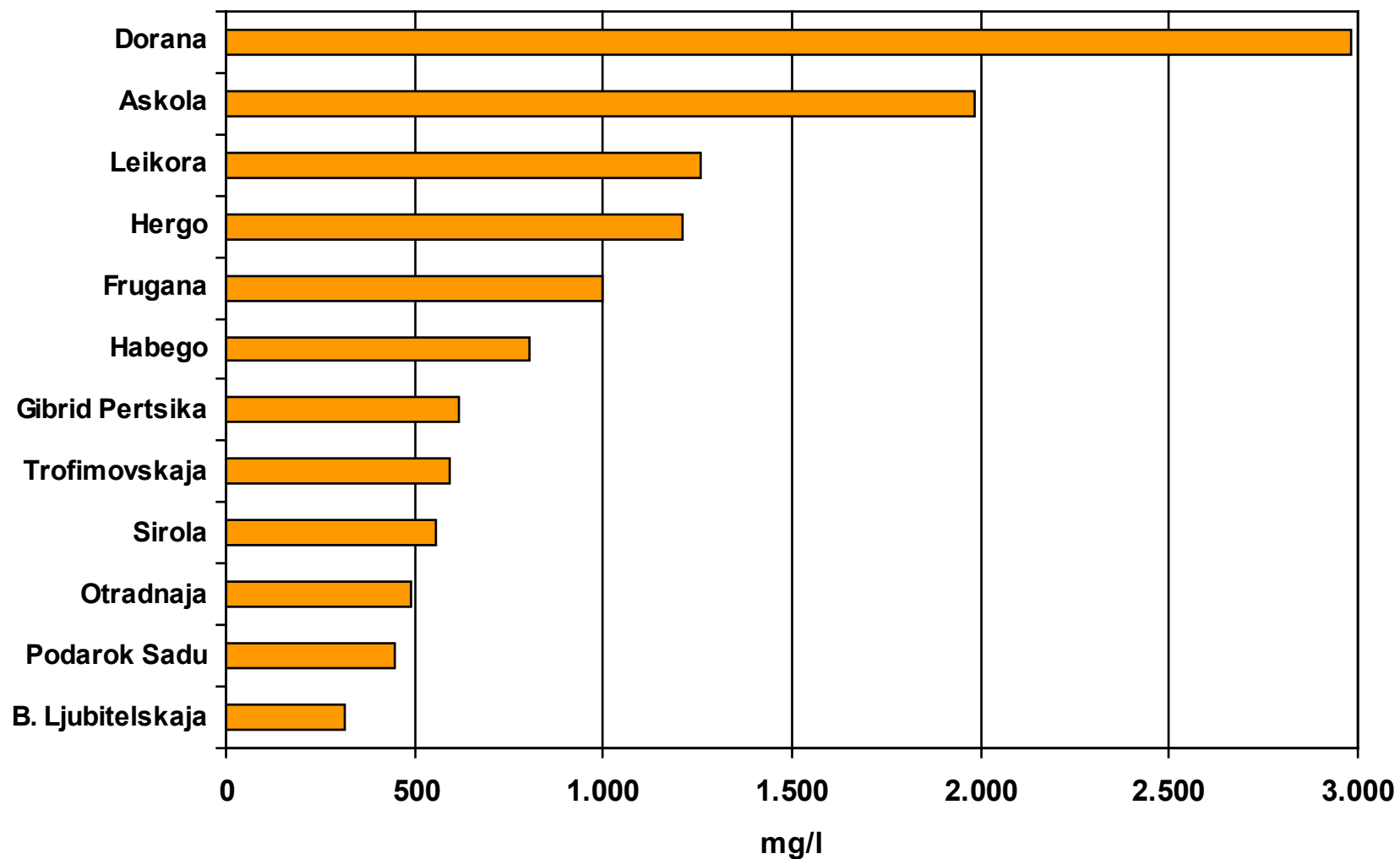
Summing-up: Total yield per shrub (kg), 2007 - 2009



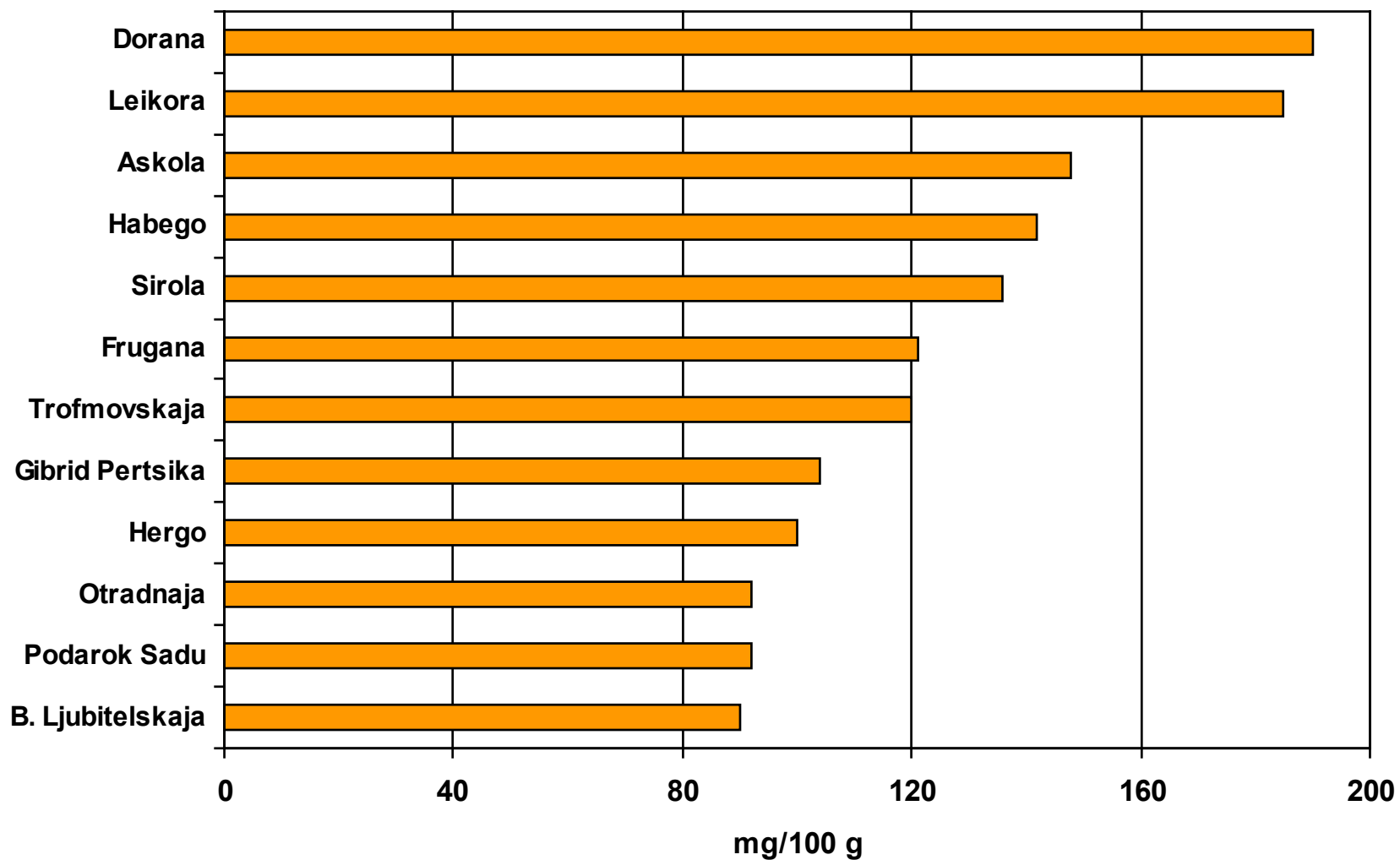
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Content of ascorbic acid, Schwechow, 2009



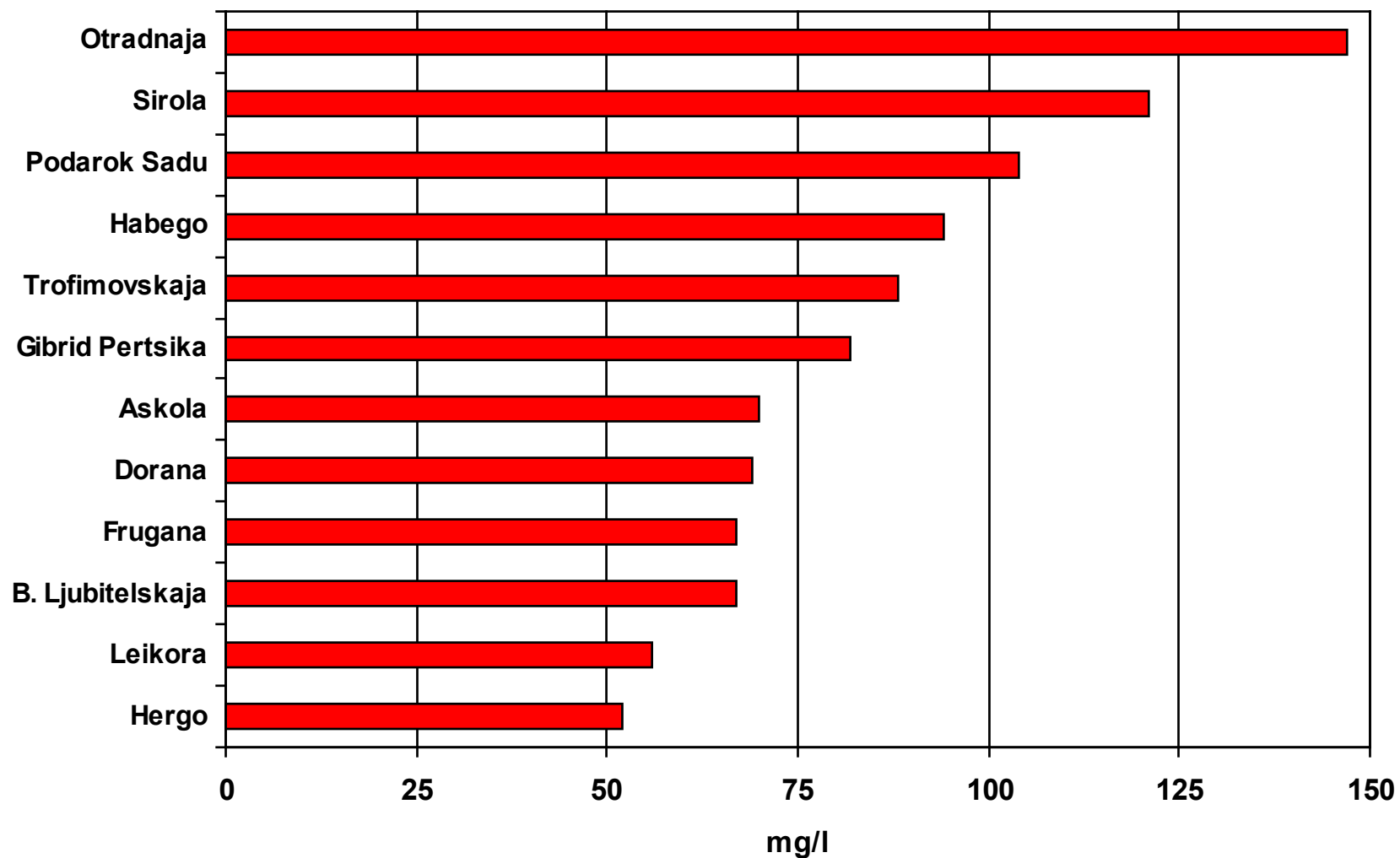
Content of ascorbic acid, Rõhu, 2008



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Content of carotene, Schwechow, 2009



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Conclusions

- A first harvest would be possible in the 3rd year, and a second in the 5th year.
- Currently in northern Germany's climate 'Hergo', 'Habego' and 'Leikora' are the best varieties, in regard to the following properties: plant health, growth, yield and ability for regeneration.
- Particularly, the variety 'Habego' is in many senses a innovation.
- In northern Germany the sensitivity of the varieties for the soil fungus *Verticillium dahliae* could be a first handicap to develop this culture widely. For all the Russian origin, and also for two German varieties, the sensitivity to this fungus is, up to now, middle to strong.



Conclusions

- In Estonia's climate the German varieties 'Askola', 'Dorana', 'Frugana', 'Habego', 'Hergo' and 'Leikora' have problems with winter respectively frost hardiness.
- Therefore the Russian varieties are more suited (for Estonia's climate).
- 'Dorana', 'Askola' and 'Leikora' have the highest content of ascorbic acid.
- 'Otradnaja', 'Sirola' and 'Podarok Sadu' have the highest content of carotene.

**Thank you very much for
your attention!**

**It's with pleasure that we would
reply to your further questions**

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