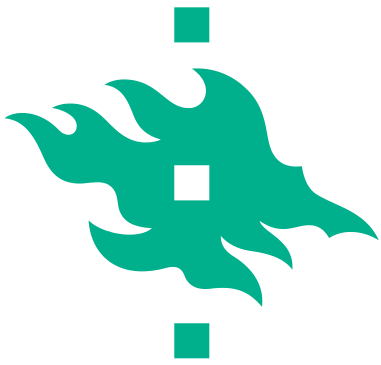


LENTIL:

A new crop in Finland

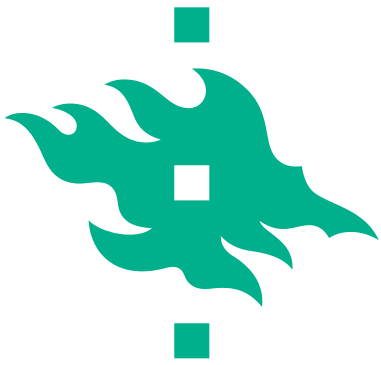
Clara Lizarazo and Fred Stoddard

15 June 2011



Overview

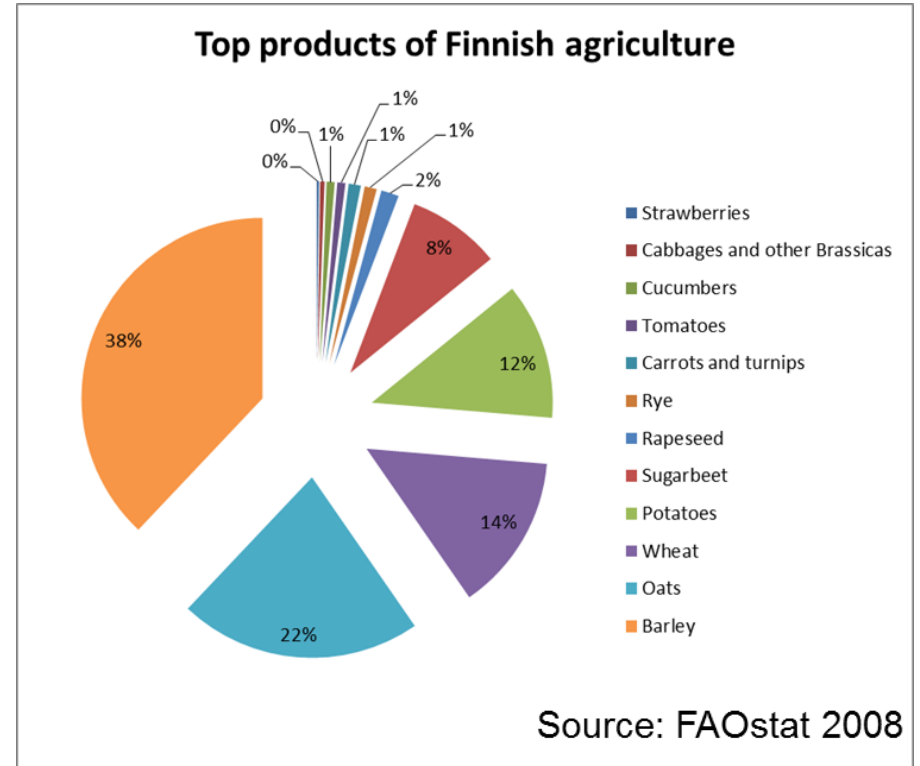
- Background - Finnish Agriculture
- Global production
- Growth requirements
- Lentil adaptation to Finnish conditions
- Quality of Finnish grown lentils
- Pests and diseases of lentil in Finland
- Future prospects

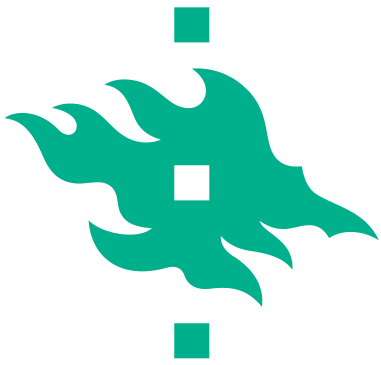


Legumes in Finnish agriculture

- Only 2.3 million ha of arable land
- Short growing season limits potential range of species and cultivars
- Pea 0.2 - 0.3%
 - 10 000 ha in 2010
- Faba bean 0.1 - 0.4%
 - 10 000 ha in 2010

“Maintaining the sustainability of agricultural ecosystems is dependent on the conservation of farmland biodiversity” (Tscharntke et al 2005).



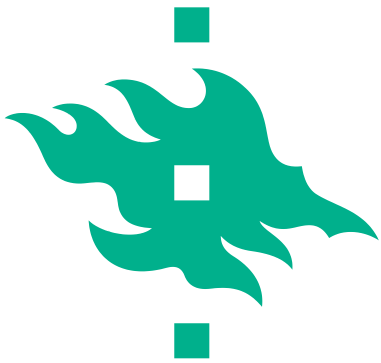


Including legumes in Finnish Agriculture

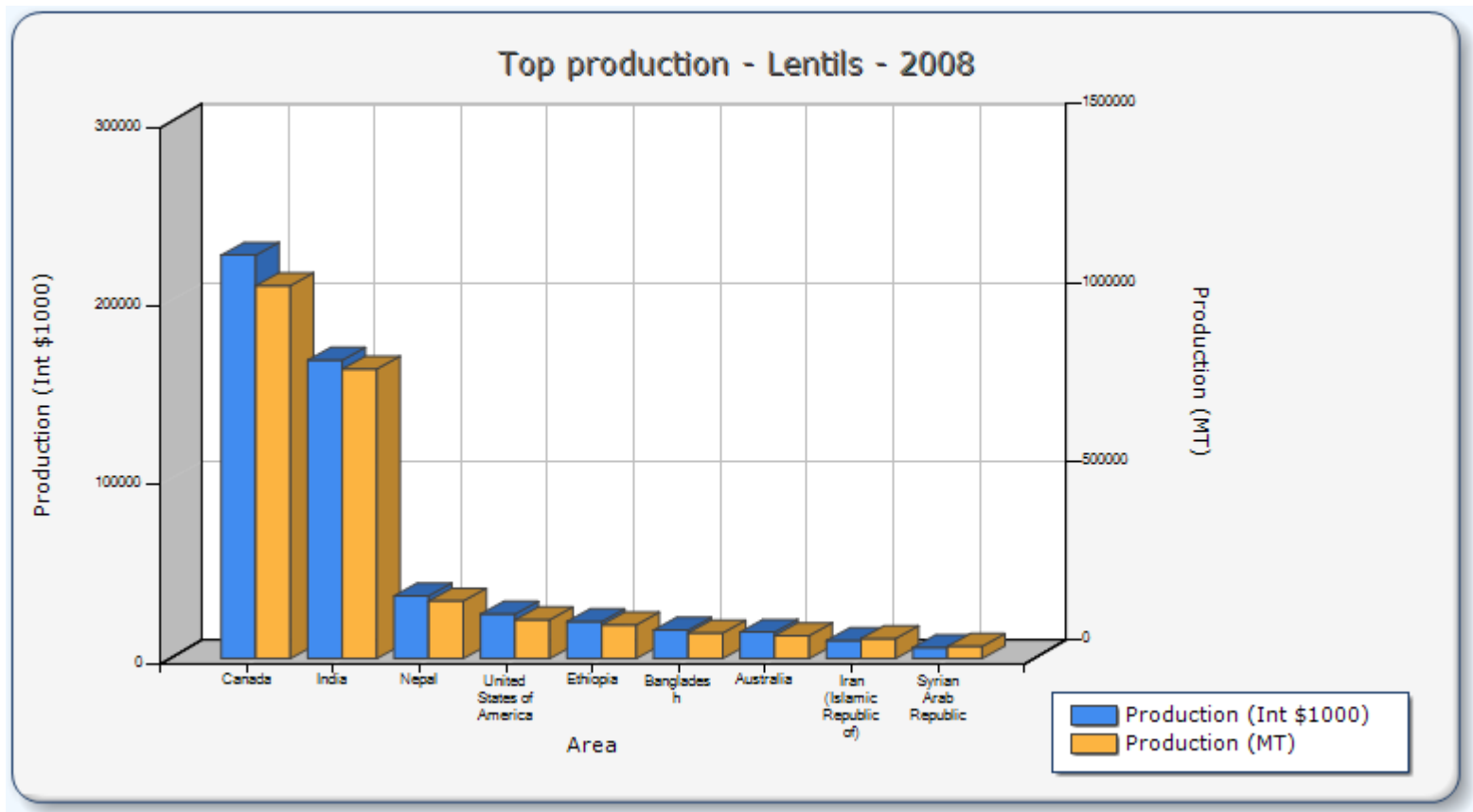
1. Screening of grain legumes to identify potential new crops with appropriate earliness and disease resistance for Finnish conditions.
2. Evaluation of the nutritive quality of Finnish-grown legumes.



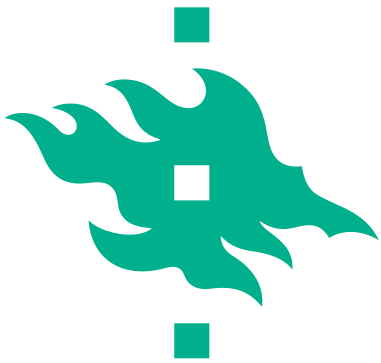
LENTIL
Lens culinaris



Global lentil production



Source: FAOstat 2008

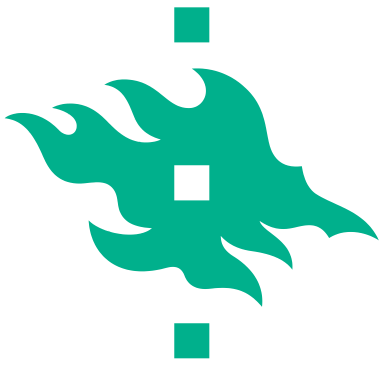


Growth requirements

- Mineral soil, pH 6.0 – 8.0
- Free draining soils with a loamy sand structure or heavier (e.g., clay)
- Weed control
- Short and cool season crop
- Needs *Rhizobium leguminosarum* (pea group)
- Avoid growing lentils in the same place more than once in three years



LIZARAZO 2010

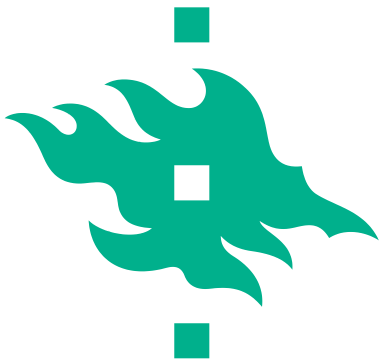


Adaptation to Finnish environmental conditions

- 4 cultivars were screened in 2009
- 13 cultivars in 2010
- Management was better in 2010 than 2009, season was warmer
- 5 selected cultivars will be screened again in 2011

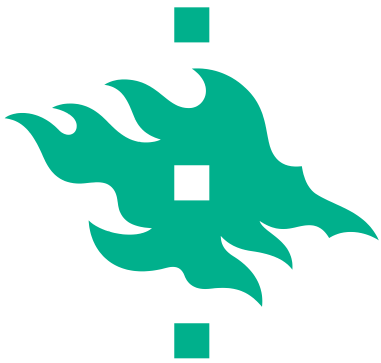


LIZARAZO 2010



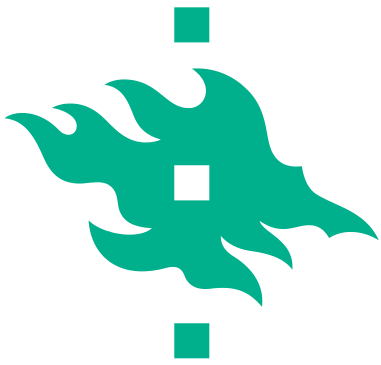
Adaptation: Growing degree-days to flowering & maturity

Cultivar	Growing degree days (2010)	
	flowering 90%	maturity 90%
Rosetown	474,7	901,9
Milestone	474,4	924,6
Redbow	487,7	924,6
Rosebud	481,0	929,2
Black	504,5	943,4
Blaze	481,0	961,2
Meteor	478,0	969,0
Redcoat	474,4	976,5
Robin	468,0	980,2
Redberry	474,4	990,8
Viceroy	491,0	994,0
Sovereign	484,3	1137,0
Sedley	487,7	1214,7
SE	2,0	13,3



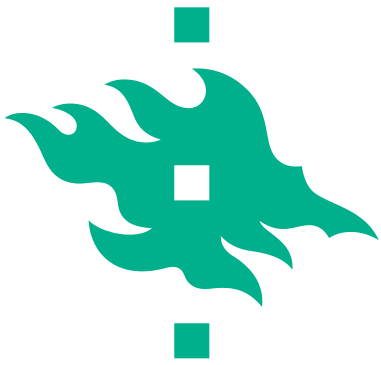
Adaptation: Seed and dry matter yield

Cultivar	Seed yield (t/ha)	TDM (t/ha)
Meteor	1.87	3.27
Redbow	1.68	2.77
Redcoat	1.65	3.04
Rosetown	1.58	2.78
Milestone	1.54	2.66
Redberry	1.54	2.90
Robin	1.51	2.89
Sovereign	1.41	3.12
Viceroy	1.40	2.62
Rosebud	1.39	2.37
Blaze	1.38	2.47
Black	1.05	2.02
SE	0.05	0.08



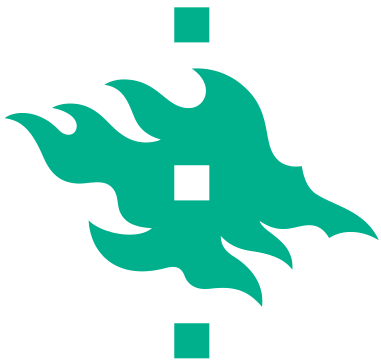
Quality (1): Protein and ash content

Cultivar	<u>Protein (%)</u>	<u>Ash (%)</u>
Black	32,61	3,876
Robin	31,65	3,520
Redberry*	30,31	3,228
Blaze	30,15	3,184
Viceroy	29,59	3,222
Redcoat*	29,02	3,269
Sovereign	29,01	3,051
Rosebud	28,79	3,393
Rosetown*	28,73	3,556
Redbow*	27,50	3,354
Milestone*	26,69	2,753
Meteor**	26,37	2,991
SE	0,27	0,048



Quality (2): starch, oil and sugar content

Cultivar	Starch (%)	Oil (%)	Soluble sugar (%)
Redberry	42.6	0.78	2.64
Rosetown	43.7	0.89	2.32
Milestone	45.2	0.82	2.83
Redbow	44.1	0.92	2.58
Rosebud	42.8	0.87	2.75
SE	0.4	0.02	0.07



Pests and diseases

Sclerotinia rot



SASKATCHEWAN PULSE GROWERS 2000

Pea moth



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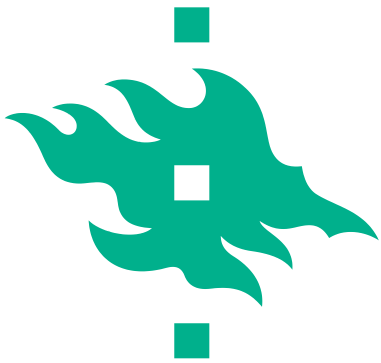
Etiella moth



LIZARAZO 2010

Other diseases that may affect lentils:

- Botrytis stem and pod blight (*Botrytis cinerea*)
- Ascochyta blight (*Ascochyta lentis*)
- Anthracnose (*Colletotrichum truncatum*)



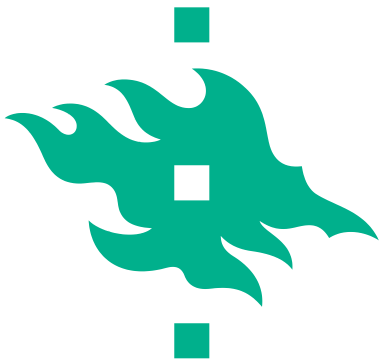
Future prospects

- Early cultivars of lentil can help to increase the arable land dedicated to legumes in Finland, and provide a high-value protein crop
- Lentil can help to diversify Finnish cropping systems and improve soil quality thanks to BNF
- Locally grown lentil can help to reduce greenhouse gas emissions
- Finnish grown lentil could be consumed locally and could also be exported



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