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Grain legumes in Austria

Results from variety trials

28.10.2013 Copenhagen

Grain legumes in Austria

Growing of grain legumes in Austria (in ha) ecologically

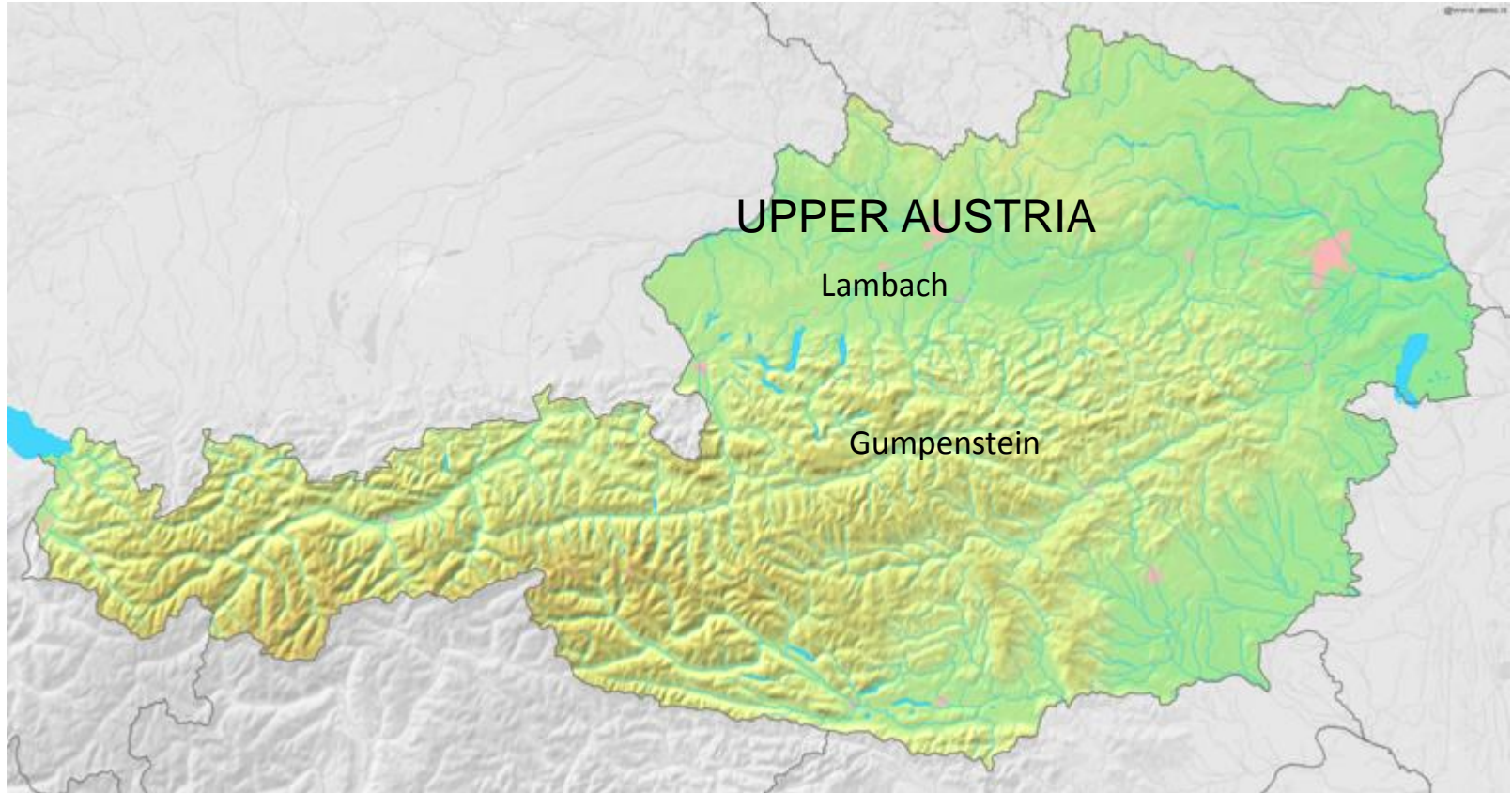
Grain legumes	2000	2003	2006	2009	2012
Field peas	3.454	9.237	8.709	3.999	3.686
Faba beans	459	1.127	1.900	1.884	5.299
Sweet lupins	300	100	178	101	48
Lentils, chick-peas and vetches		531	885	1.401	1.094
Other grain legumes		348	935	946	2.331
% of grain legumes from arable land	24	26	30	25	28

Corn yield of grain legumes

Field peas	17,9	13,4	7,2
Faba beans	23,6	19,2	16

Source: Green Report, Ministry of Agriculture, Forestry, Environment and Water Management, 2013

Austrian topography



Source: http://www.worldmapfinder.com/Map_Detail.php?MAP=73725&FN=Austria_topographic_map.

Variety trials with grain legumes

Exact plot trials with faba beans, field peas, sweet lupins, seed vetches and soya-beans at Lambach since 2006

Field trials with sweet lupins and soya beans in all parts of Upper Austria at farms since 2006

Comparison of faba beans, field peas, sweet lupins and soya-beans in spite of corn yield, row protein content and row protein yield

Mixtures of grain legumes and cereals (winter peas with triticale, winter fabe beans with winter wheat)

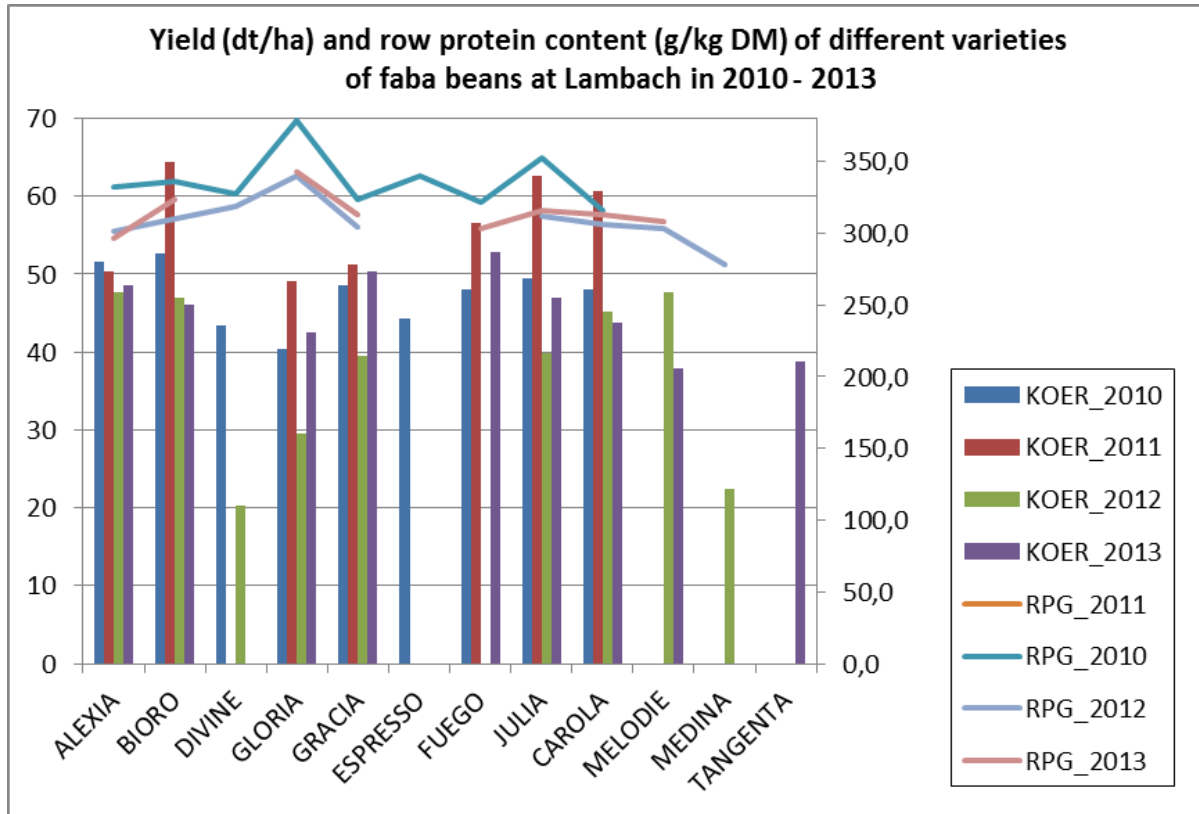
Growing of winter peas in pure seed

Variety trials with faba beans

Faba beans: Results of variety-trials from Lambach (Austria) 2010 - 2013

	Corn yield				Row protein content				Row protein yield			
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
ALEXIA	106,5	89,4	114,9	104,9	97,8	98,1	96,5	93,4	106,2	88	111,6	95,9
BIORO	108,7	114,2	113,4	99,2	98,9	97,8	99,2	101,9	109,6	112	113,1	112,9
DIVINE	89,6		49,2		96,5		102,0		88,2		50,4	
GLORIA	83,3	87,0	71,1	91,8	111,4	111,0	109,0	107,9	94,6	97	77,9	96,9
GRACIA	100,3	90,8	95,5	108,5	95,2	94,6	97,3	98,5	97,4	86	93,5	104,6
ESPRESSO	91,4				100,0				93,3			
FUEGO	99,1	100,2		114	94,6	94,3		95,5	95,6	94,7		106,6
JULIA	102,1	111,0	96,0	101,4	103,8	100,2	99,9	99,6	98,5	111,4	96,4	98,7
CAROLA	99,1	107,5	109,1	94,3	92,9	98,2	98,1	98,6	93,8	105,8	107,5	91
MELODIE			114,9	81,8			97,0	97,1			112,1	77,7
MEDINA			54,0				88,9				48,3	
TANGENTA				83,8				102,9				84,4
standard mean	48,4	56,38	41,42	46,36	339,8	334,9	312,2	317,3	1613	1884	1286	1503

Variety trials with faba beans

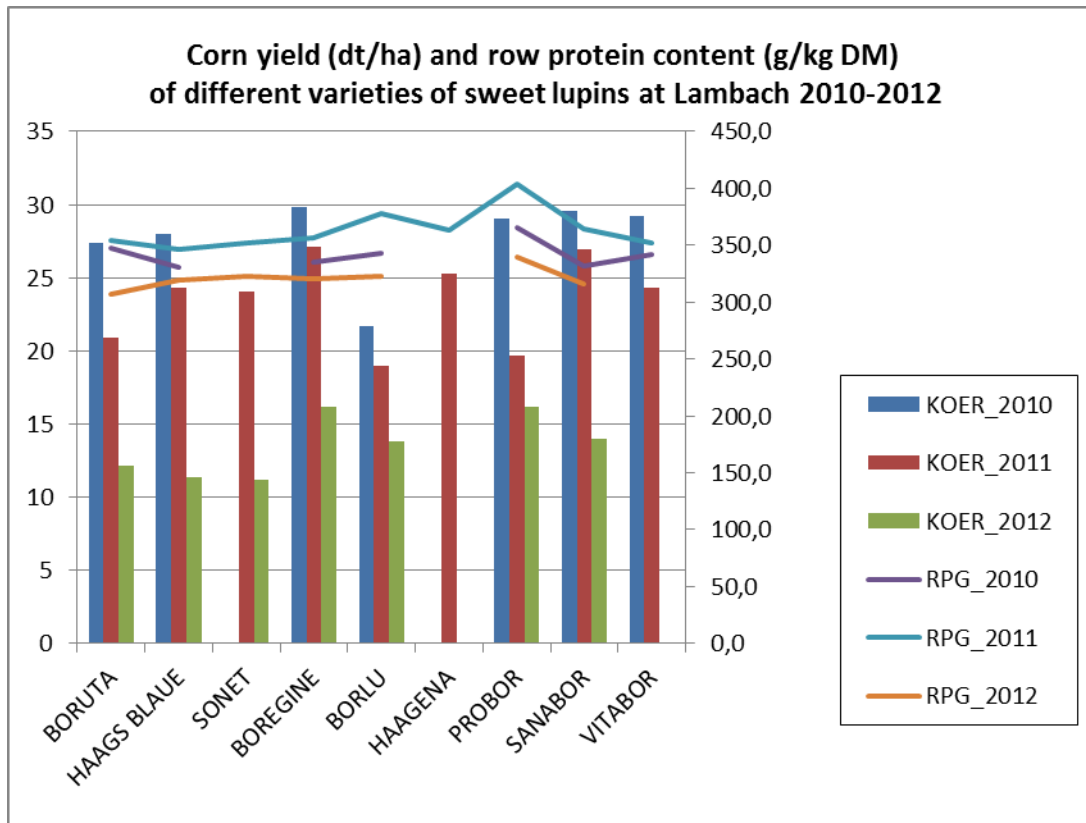


Variety trials with sweet lupins

Sweet lupins: Results of variety trials from Lambach (Austria) 2010 - 2012

	Corn yield			Row protein content			Row protein yield		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
BORUTA	99,2	90,8	87	101,4	96,6	95,8	100,6	88,1	83,3
HAAGS BLAUE	101,60	105,80	81,4	96,7	94,3	99,3	98,3	100,1	80,8
SONET		104,8	80,1		95,8	100,6		100,8	80,6
BOREGINE	108,2	117,8	116,2	98,0	97,0	99,8	106	114,7	115,8
BORLU	78,60	82,40	99,1	100,1	103,0	100,6	78,7	85,3	99,8
HAAGENA		110,0			99,0			109,4	
PROBOR	105,3	85,7	115,7	106,8	109,8	105,9	112,5	94,5	122,5
SANABOR	107,1	117,4	100,5	97,0	99,2	98,5	103,9	116,9	98,9
VITABOR	105,80	105,90		99,8	96,0		105,7	102,1	
standard mean	27,59	22,99	13,95	342,3	367,3	321,1	944	841	448

Variety trials with sweet lupins



Picture above: beginning of may

Picture below: beginning of june



Variety trials with sweet lupins

Sweet lupines: Results of different varieties from 4 sites in Upper Austria 2010

	Corn yield	Row protein content	Row protein yield	Plants/ha	Husks/plant
HAAGS BLAUE	12,92	333,2	430,5	885.000	9
BORUTA	17,47	364,1	636,1	965.000	9
BORLU	12,63	364,3	460,1	885.000	12
SANABOR	17,22	350,0	602,7	735.000	15
VITABOR	14,24	356,9	508,2	915.000	16
BOREGINE	16,82	359,9	605,4	825.000	16
PROBOR	14,53	391,5	568,9	905.000	15
standard mean	15,12	360,0	544,5	866.667	13

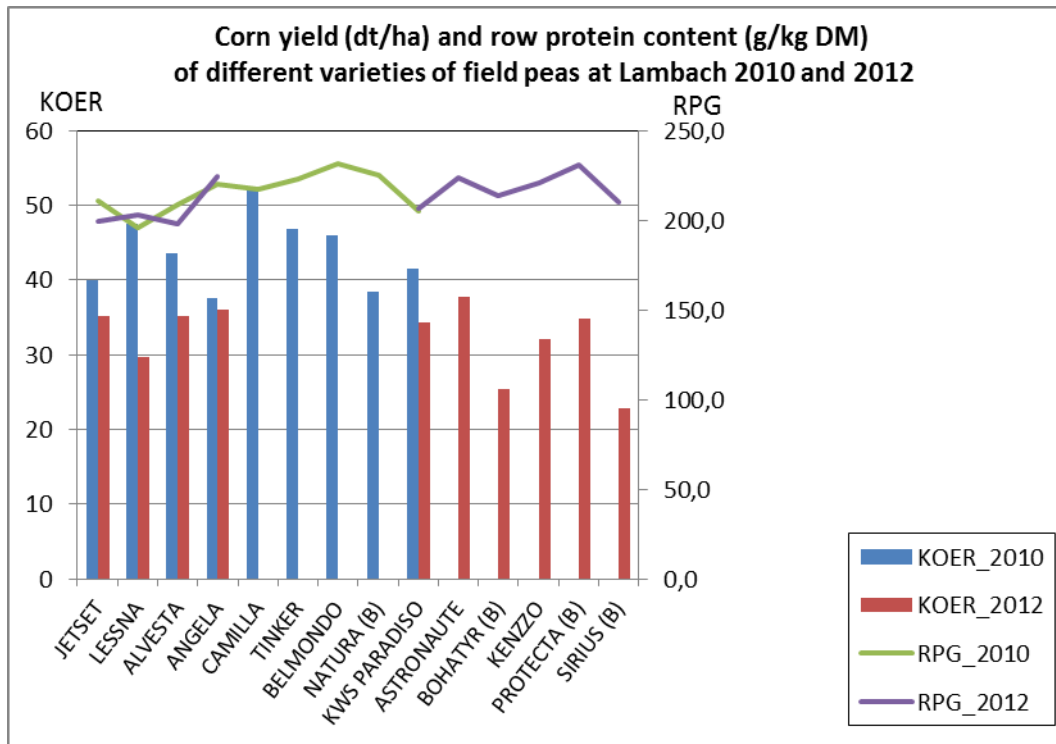


Variety trials with field peas

Field peas: Results of variety trials from Lambach (Austria) 2010 + 2012

	Corn yield		Row protein content		Row protein yield	
	2010	2012	2010	2012	2010	2012
JETSET	95,1	103,4	101,2	96,7	96,5	97,4
LESSNA	113,0	87,0	94,1	98,3	106,6	83,3
ALVESTA	103,5	103,2	100,3	96,1	104,1	96,6
ANGELA	89,6	105,8	105,9	108,8	95,2	124,6
CAMILLA	124,7		104,3		130,5	
TINKER	111,4		107,2		119,8	
BELMONDO	109,5		111,3		122,3	
NATURA (B)	91,3		108,3		96,0	
KWS PARADISO	98,8	100,6	98,5	100,1	97,6	98,1
ASTRONAUTE		110,7		108,5		116,9
BOHATYR (B)		74,8		103,5		75,4
KENZZO		94,1		106,9		97,9
PROTECTA (B)		102,4		111,8		111,5
SIRIUS (B)		67,0		101,7		66,3
standard mean	41,99	34,02	207,9	206,2	870,8	720,4

Variety trials with field peas



Picture above: Plot trial in June 2010

Picture below: Plot trial in June 2012



Variety trials from colleagues

In Upper Austria one colleague is carrying out field trials too, but he doesn't have the equipment for plot trials

- Trials with faba beans in 2012:

Variety	Corn yield relative	Protein cont. g/kg DM)	R. protein yield relative
ALEXIA	94	306	90
GLORIA	80	336	84
BIORO	108	322	110
JULIA	109	319	109
MELODIE	109	310	107
variety mean	28,3	319	775

The variety Melodie is poor in content of vicin/covicin

- Trials with sweet lupins in 2012:

Variety	Corn yield relative	Protein cont. g/kg DM)	R. protein yield relative
BORUTA	101	383	101
BOREGINE	84	389	87
SONATE	86	354	80
BORLU	151	381	152
variety mean	19,9	379,4	649

Boruta could be harvested first (it's a terminal variety), all others are branched and need more days for ripening

Variety trials with mixtures

Trials with winter forms in mixtures with winter-cereals (triticale, winter-wheat):

important is the same time of ripeness, almost the same height and the suitable percentage of each partner

Good partners are winter-triticale and winter-peas (EFB 33 or PICAR) – those winter-peas are relatively hardy

Other partners are winter-wheat and winter faba beans (HIVERNA and LILLY) – but they are not really hardy in strong winters

Pure seed of winter-peas were not successful , the winter-peas become very long, are lodging and cannot be harvested by combine-harvester

Variety trials with mixtures

Wintercereal - Grain legumes - Mixture Lambach 2010/11

Sowing: 18.10.2010
 Harvesting: 18.08.2011
 Preceding crop: Potatoes

Variants	Proportion of mixture	Corn Yield	Corn Yield	Row protein content	Row protein yield
		dt/ha	rel%	g/kg TM	kg/ha
TRIAMANT	Pure seed	57,31	108,5	113,1	648,18
PICAR/TRIAMANT	60:60	57,80	109,4	168,7	975,09
PICAR/TRIAMANT	80:40	67,95	128,6	149,7	1017,2
PICAR/TRIAMANT	100:20	38,76	73,4	226,0	875,98
EFB 33/TRIAMANT	60:60	58,16	110,1	184,9	1075,38
EFB 33/TRIAMANT	80:40	44,47	84,2	210,8	937,43
EFB 33/TRIAMANT	100:20	30,21	57,2	233,3	704,8
ANTONIUS	Pure seed	59,17	112,0	138,3	818,32
HIVERNA	Pure seed	35,79	67,7	305,5	1093,38
HIVERNA/ANTONIUS	60:60	63,14	119,5	158,4	1000,14
HIVERNA/ANTONIUS	80:40	60,66	114,8	189,1	1147,08
HIVERNA/ANTONIUS	100:20	54,60	103,3	215,3	1175,54
LILLY/ANTONIUS	60:60	53,17	100,6	161,1	856,57
LILLY/ANTONIUS	80:40	58,47	110,7	178,4	1043,1
LILLY/ANTONIUS	100:20	52,91	100,1	182,9	967,72

Variety trials with mixtures



Left picture:
Winter peas (EFB 33) in early spring



Right picture:
Winter peas with
winter triticale in
june



Left picture:
Winter faba beans
with winter wheat
in the end of april



Right picture:
Winter peas with
winter triticale in
the end of june

Experiences with grain legumes

- Faba beans are well adapted to the humid climate (Upper Austria)
- Faba beans normally cover the field with their leaves
- Field peas are better adapted to the dry regions (Eastern parts) and within the types (leafless, semi-leafless and leaf-types) the leafless types are not lodging when it rains a lot
- Sweet lupins are only suited for fields without weeds
- Within the sweet lupins there are different types (terminal and branched types): the terminal get ripe earlier but have less yield than the branched ones
- Mixtures of grain legumes and cereals are used in practice



Thank you for your attention!