

# Breeding of Grain legumes at NPZ with a focus on winter faba beans



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# ***Norddeutsche Pflanzenzucht Hans-Georg Lembke KG***

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- Family owned breeding company with 2 stations in Hohenlieth and Malchow
- 210 coworkers
- Plant breeding since 1897
- Crops: Winter Rapeseed, Spring Rapeseed, *Fababeans*, *Combining peas*, Fodder Grasses, *Red Clover*
- Red clover breeding since seit 1955
- Faba bean breeding since 1980
- Pea breeding since 2005
- Partnership with RAGT/ FR in breeding of grain legumes since 2009



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## *Some milestones in grain legume breeding at NPZ*

- Start of spring faba bean breeding in 1980
- Start of winter faba bean breeding in 1980, stopping of these activities in 1984 due to complete loss of the nursery
- Restart of winter bean activities in 1999 on a low level because of new germplasm availability and research at University of Göttingen (Prof. W. Link)
- Representation of Grain pea varieties in Germany of various partners, mainly Serasem/FR since the 1980ies
- Begin of pea breeding on the base of the program of SWS GbR in 2005
- Enlargement of pea activities by continuing the pea program of Toft A/S, Denmark in 2006
- Start of closer interaction with RAGT/ FR in breeding of grain legumes since 2009

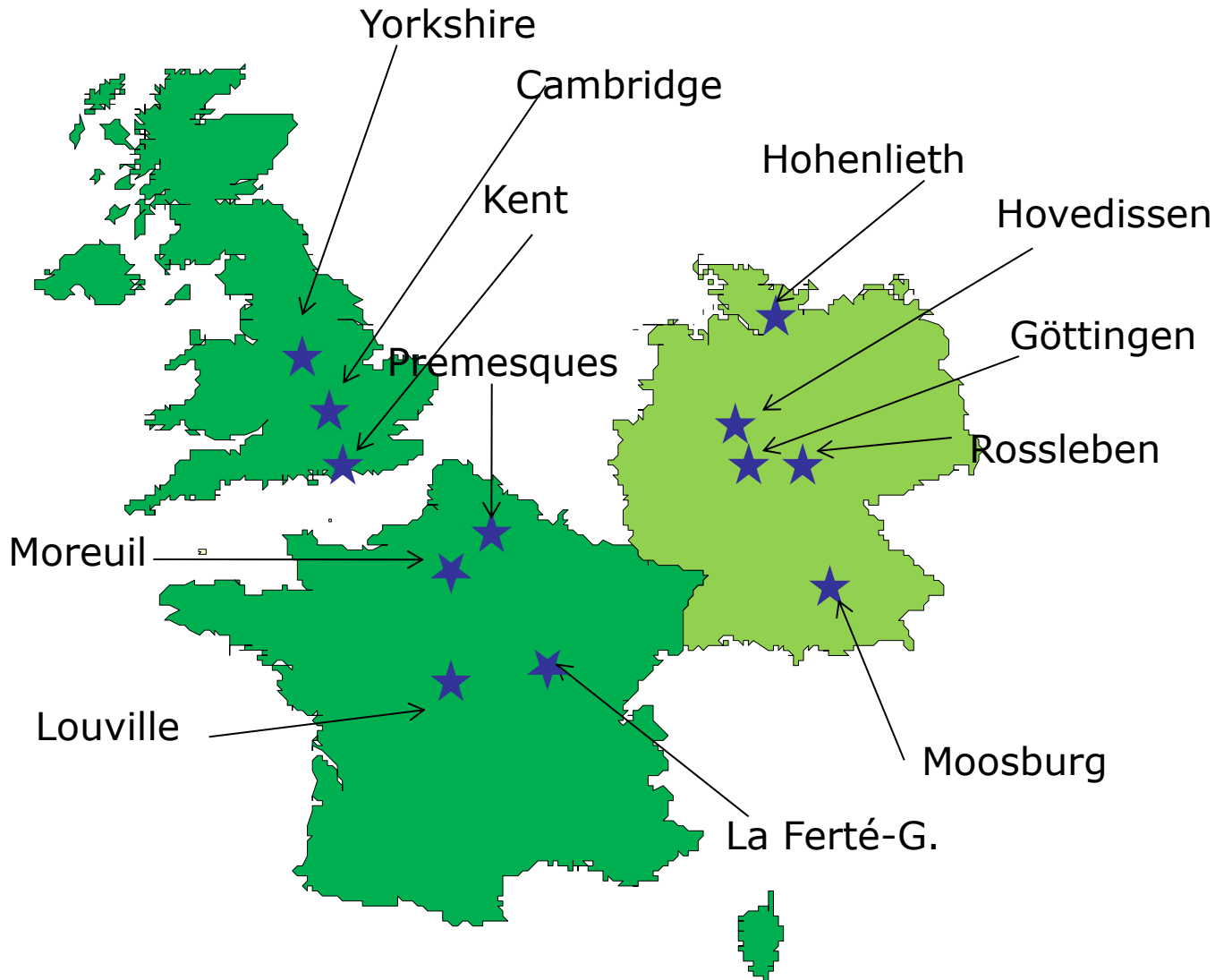


# Portfolio of NPZ and RAGT in breeding of grain legumes

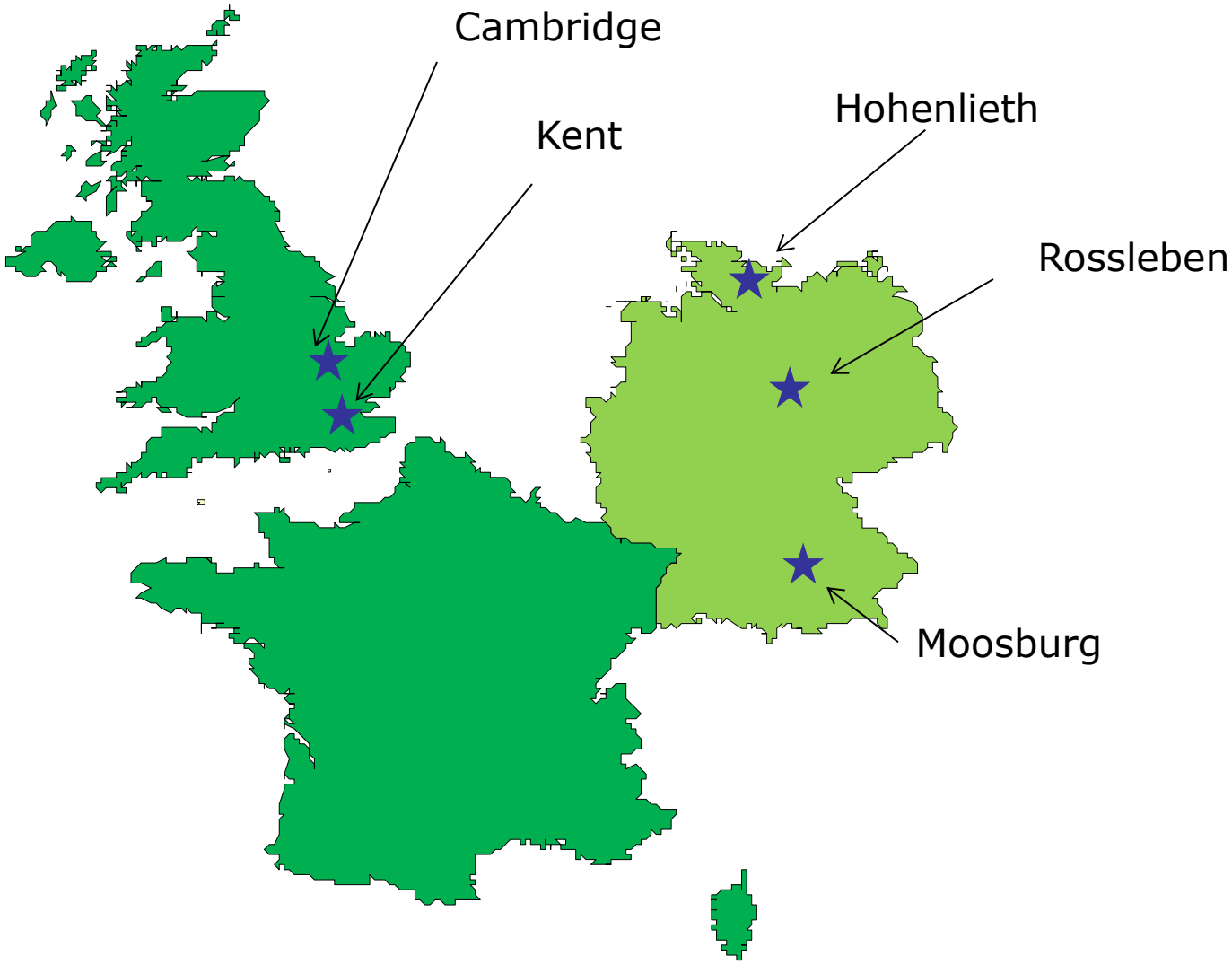
	Combining peas		faba beans	
	spring type	winter type	spring type	winter type
RAGT	++	+	+	-
NPZ	++	-	++	+



# Spring Faba bean network locations 2013



# Winter Faba bean network : locations 2012-13



# Selection criteria for winter faba beans (from the perspective of the UK market)

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- 1. Grain Yield***
- 2. Short plant type***
- 3. Good standing power***
- 4. white hilum***
- 5. Winter hardiness***



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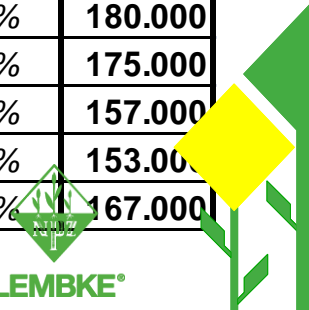
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# Faba beans: Evolution of acreages of spring and winter types in France and UK

year	France				
	winter		spring		TOTAL
2013	9.000	13%	58.000	87%	67.000
2012	10.000	13%	66.000	87%	76.000
2011	13.000	14%	77.200	86%	90.200
<b>2010</b>	<b>17.000</b>	<b>11%</b>	<b>134.000</b>	89%	<b>151.000</b>
<b>2009</b>	<b>8.000</b>	<b>9%</b>	<b>80.000</b>	91%	<b>88.000</b>
<b>2008</b>	<b>7.000</b>	<b>11%</b>	<b>54.000</b>	89%	<b>61.000</b>
2007	7.000	13%	45.700	87%	52.700
2006	11.000	14%	67.000	86%	78.000
2005	16.000	16%	86.000	84%	102.000
2004	16.000	20%	65.000	80%	81.000
2003	21.000	26%	59.500	74%	80.500
2002	26.500	31%	58.500	69%	85.000
2001	12.500	28%	31.500	72%	44.000

year	UK				
	winter		spring		TOTAL
2013	35.000	31%	80.000	69%	115.000
2012	47.000	49%	50.000	51%	97.000
2011	62.000	50%	63.000	50%	125.000
2010	76.000	45%	92.000	55%	168.000
2009	87.000	46%	102.000	54%	189.000
2008	68.000	58%	50.000	42%	118.000
2007	59.000	48%	65.000	52%	124.000
2006	75.000	44%	95.000	56%	170.000
2005	78.000	43%	102.000	57%	180.000
2004	81.000	46%	94.000	54%	175.000
2003	62.000	39%	95.000	61%	157.000
2002	75.000	49%	78.000	51%	153.000
2001	57.000	34%	110.000	66%	167.000





# *NPZ variety portfolio of faba beans*

- 1. Spring beans
  - Taifun D, DK
  - Espresso D, F
  - Fuego D, F, UK
  - Fabelle D, F
  - Fanfare D, UK, DK
  - Grafitty F
  - Vertigo D, UK, DK
- 2. Winter beans
  - Hiverna D (since 1986)
  - Husky UK
  - Nordica F



# Comparison of winter and spring faba beans

## at Hohenlieth

year	sowing date winter beans	harvest date winter beans	characterization of winter	range of survival (9 = high)	Yield of best spring bean variety (dt/ha)	Yield of best winter bean variety (dt/ha)	best winter bean variety
99/00	13th oct	8th aug	mild	7 - 8	52,2	81,1	Target
00/01	16 oct	14th sept	mild (cold march and april)	7 - 8	52,8	65,1	Hiverna
01/02	too wet	---	---	---	50,0	no yield trial sown	---
02/03	11th oct	14th aug	strong	1 - 6	43,0	12,9	Bulldog
03/04	16th oct	3rd sept	medium (cold march and april)	5 - 8	52,3	61,9	Clipper
04/05	12th oct	1stsept	medium (cold march and april)	1 - 7	57,1	43,4	Hiverna
05/06	29th sept	24th aug	medium-strong	1 - 7	42,0	46,8	Hiverna
06/07	12th oct	3rd aug	milde	4 - 9	39,0	no yield trial planned	---
07/08	24th sept	5th aug	milde	5 - 8	61,8	50,3	Hiverna
08/09	24th sept	25th aug	medium	1 - 9	57,4	54,7	Nordica
09/10	28th sept	27th aug	strong, much snow	1 - 9	40,4	64,3	Nordica
10/11	1st october	no harvest	strong, little snow	1-2	60,2	0,0	---
11/12	5th october	1st sept	strong, snow cover	1-8	54,1	55,1	Husky
12/13	19th october	25th aug	very long, snow cover	1-5	47,3	18,0	Hiverna



# Some conclusions on winter faba beans from the Hohenlieth site

- sowing time is mainly determined by soil and weather conditions, still unsure which is the optimal stadium for overwintering
- Winter damage occurs mostly at the end of winter/beginning of spring
- Snow cover is tolerated and appreciated
- There is a certain risk of loosing the crop: 3 failures within 12 years  
- this is higher than what is known from UK where there is hardly any winter loss
- Winter beans can yield significantly more than spring beans : especially in dry summers (not outlined here in detail)
- Hiverna is still the benchmark with respect to winter hardiness



# General conclusions on winter faba beans

- Proper testing on the „continent“ is still a challenge: as soon as you loose some genotypes during winter the yield data are very hard to interpret
- Winter hardy germplasm is on the way : research at University of Göttingen , at INRA/France
  - There is potential that this is higher than HIVERNA
- Open questions: can this be combined with high yield potential plus with enhanced agronomic features (stem stiffness)
- - this needs quite some breeding input
- How can this be achieved for „new“ and small crop like winter bean
  - The critical input: Breeding - is very low
- How will the markets for Grain legumes in Europe develop?
- - there is not much light at the end of the tunnel



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Thank you very much for your  
attention !



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# Trend yields of main crops in Germany

(Source: Statist. Bundesamt)

