



TRansition paths to sUstainable
legume-based systems in EEurope

Grain legume research at NARIC Szeged

11th September 2018, Budapest



National Agricultural Research and Innovation Centre

– Institutional background

NAIK institutes and research departments:

- NAIK AKK – Agro-Environmental Res. Inst.
- NAIK ÁTK – Res. Inst. for Animal Breeding, Nutrition and Meat Sci.
- NAIK ERTI – Forest Res. Inst.
- NAIK ÉKI – Food Science Res. Inst.
- NAIK GYKI – Fruitculture Res. Inst.
- NAIK HAKI – Res. Inst. for Fisheries and Aquaculture
- NAIK MBK – Agricultural Biotechnology Inst.
- NAIK MGI – Inst. of Agricultural Engineering
- NAIK NÖKO – Dep. of Field Crop Research, SZEGED
- NAIK ÖVKI – Res. Dep. of Irrigation and Water Management
- NAIK SZBKI – Res. Inst. for Viticulture and Oenology
- NAIK ZÖKO – Vegetable Crop Res. Dep.

NAIK companies:

- Cereal Research Non-profit Ltd.
- Hungarian Dairy Research Institute Ltd.
- Hungarian Horticultural Propagation Material Non-profit Ltd.
- Vegetable Production Research Institute Ltd.



Department of Field Crop Research, Szeged



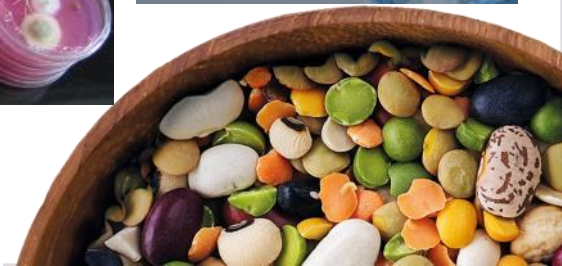
3 laboratories (Szeged)

- Molecular
- Analytical
- Phytopathological

Melinda TAR, head of department, NARIC Szeged



Main research projects

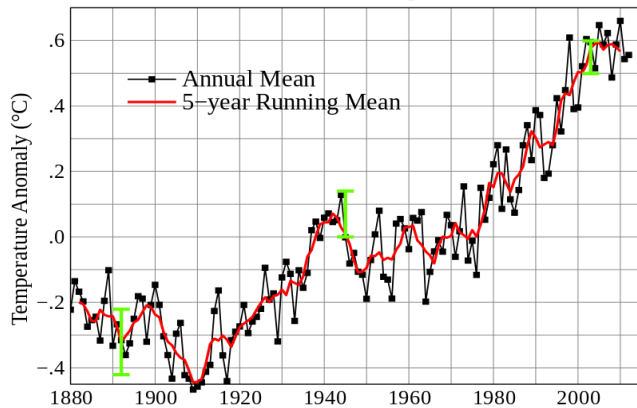


Agricultural Challenges 1. – Population and climate change



Warmer temperature

Global Land–Ocean Temperature Index

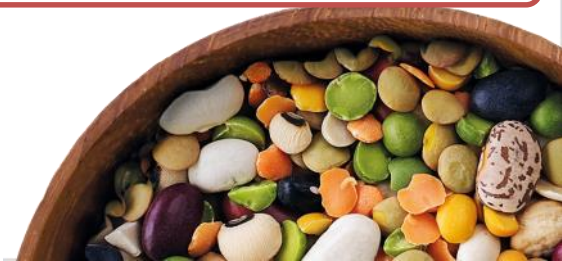


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Increased frequency of extreme climatic events



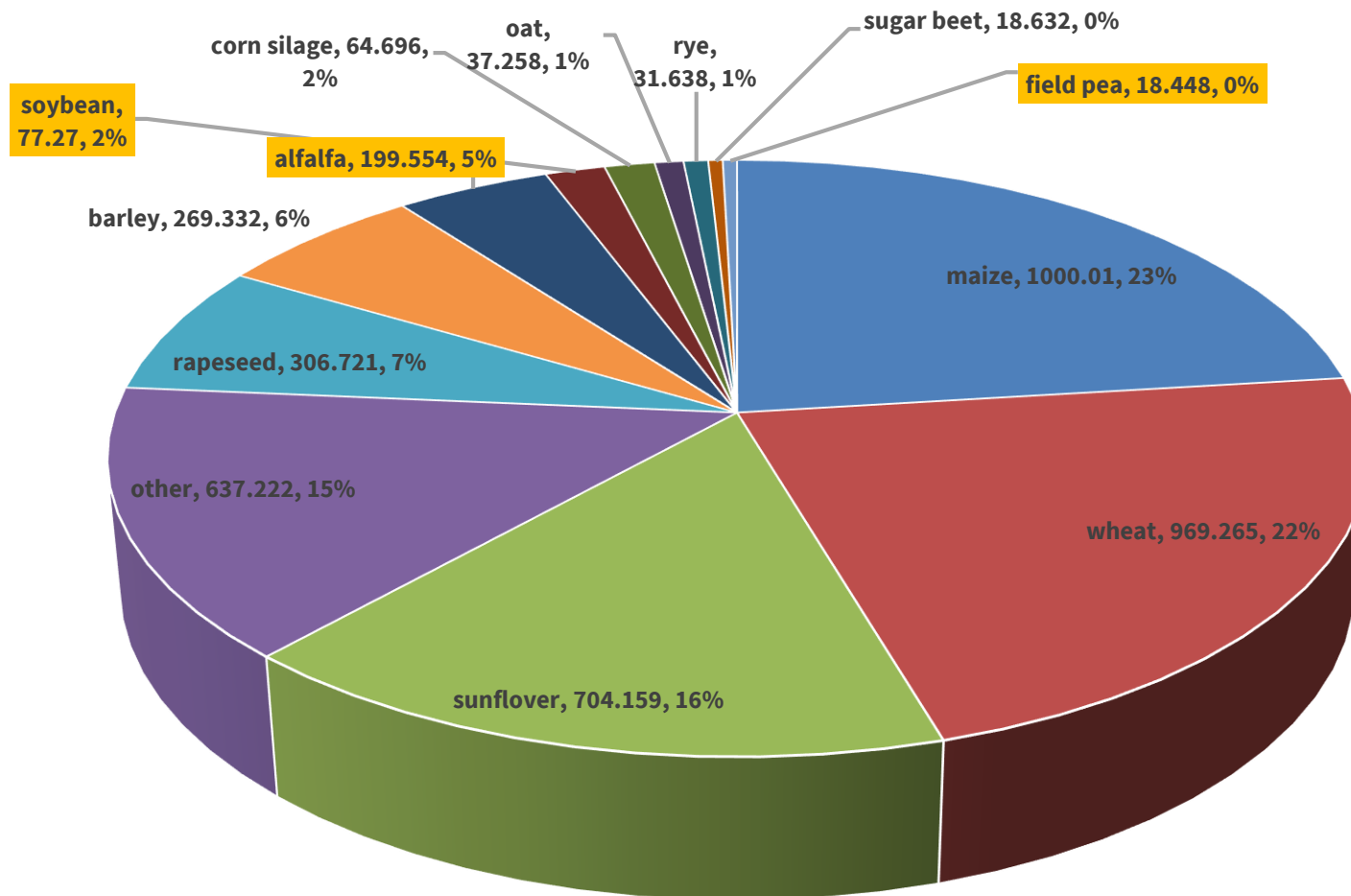
Diseases, weeds, insects



Research challenges 2. – Crop rotation system



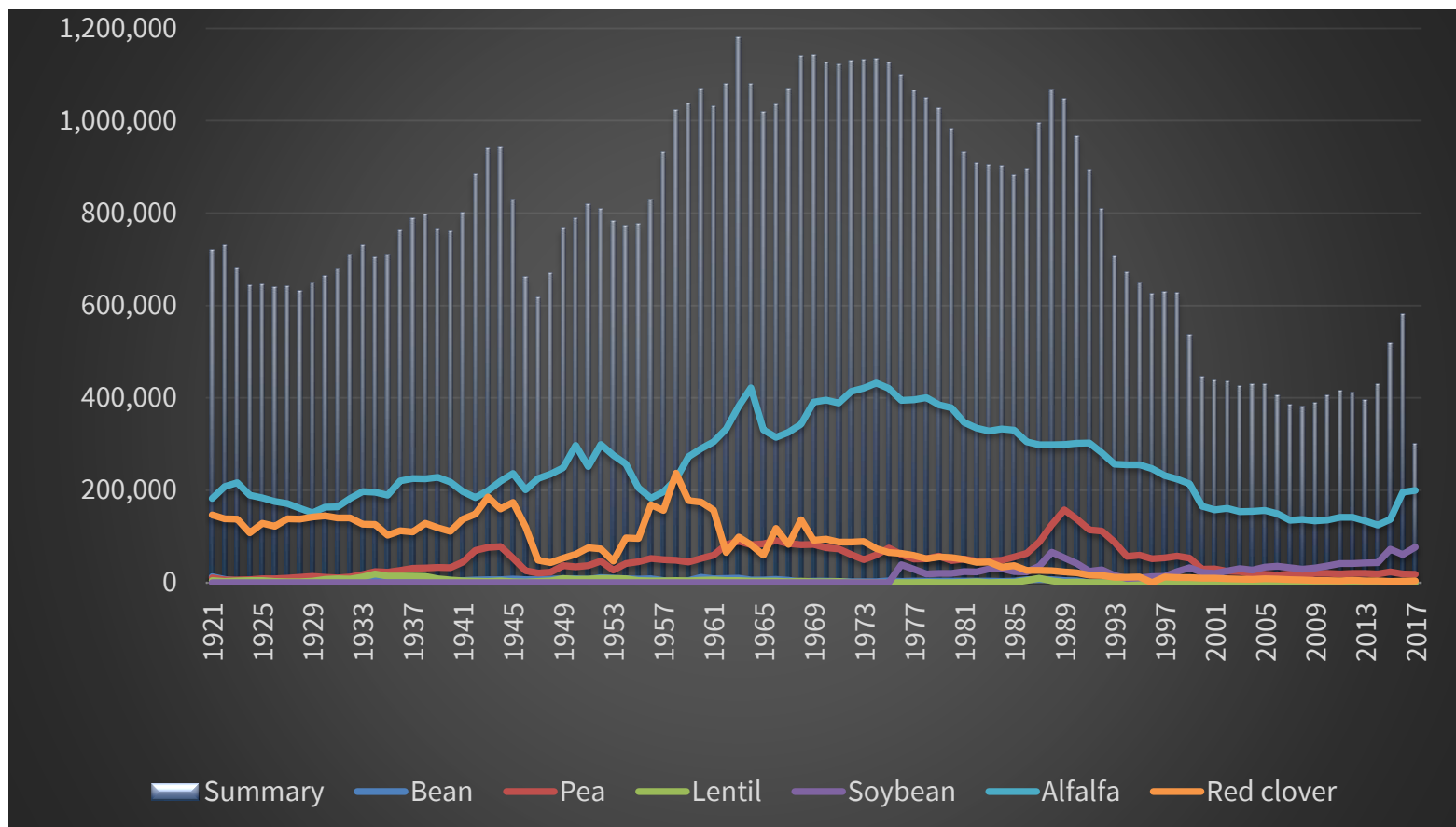
Sowing area of main cultivars in 2018



Research challenges 2. – Crop rotation system



Sowing area of legumes in last 100 years



MAIN GOALS



Crop rotation system again



Healthy food, alternative protein feed



New cultivars



- Chickpea
- Field pea
- Faba bean
- (Soybean)



STEP 1

Collect genetic resources from genebanks and partner institutes



- Center for Plant Diversity, Tápíószele (field pea)
- USDA (chickpea, field pea, faba bean)
- KALRO, Kenya
- Hassan IV Morocco
- INRA

Number of collected genotypes:

Chickpea: 450

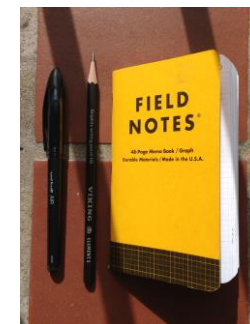
Field pea: 98

Faba bean: 128



STEP 2 – on the field

Check the adaptability and yield potential of them



	A	B	C	D	E	F	G	H	I	J
80	18102	DEA18101		6	34	31				
81	18103	DEA18102	Uttar vil párszori Vízben	2	4				4	
82	18104	DEA18103		7	31					
83	18105	DEA18104	Utara 07/27	14	66	16			50	
84	18106	DEA18105		46	200	48			101	
85	18107	DEA18106		65	285	24			213	
86	18108	DEA18107	Mini/Novi - Széles-Méretűek (B)	28	111	12			34	
87	18109	DEA18108		28	111	12			34	
88	18110	DEA18109	Genet	18	80	14			66	
89	18111	DEA18110		14	145	20			116	
90	18112	DEA18111	DS1 1-2	4	27	13			36	
91	18113	DEA18112		41	226	32			104	
92	18114	DEA18113	DS1 1-10	7	20	10			30	
93	18115	DEA18114	DS10-1-14	23	100	4			94	Hogyan lehet felvenni
94	18116	DEA18115		20	88	46			62	
95	18117	DEA18116	DS1 1-1-17	23	94	47			67	
96	18118	DEA18117	MELBONE	32	138	25			104	
97	18119	DEA18118		12	44	15			29	
98	18120	DEA18119		16	61	13			48	
99	18121	DEA18120	CONDOR AUSTRALIAN WINTER	37	151	39			112	
100	18122	DEA18121		20	97	49			68	
99	18123	DEA18122	MINI PLANT SELECTION FROM DEKORAT	43	235	83			152	
98	18124	DEA18123		25	120	25			85	
97	18125	DEA18124		12	50	16			34	
96	18126	DEA18125	MELBONE WINTER	12	45	14			31	
95	18127	DEA18126		14	67	36			52	



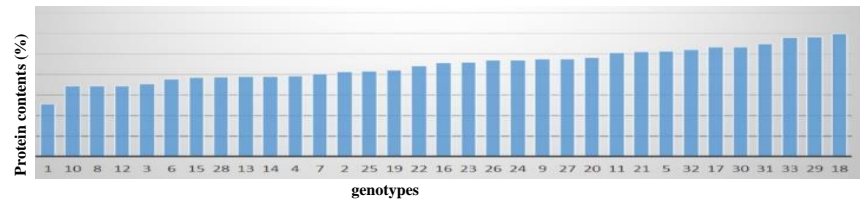
STEP 3 – in the laboratory



QUALITY TRAITS (protein content, amino acid profile and tripsin inhibitor analysis)



Fast analysis

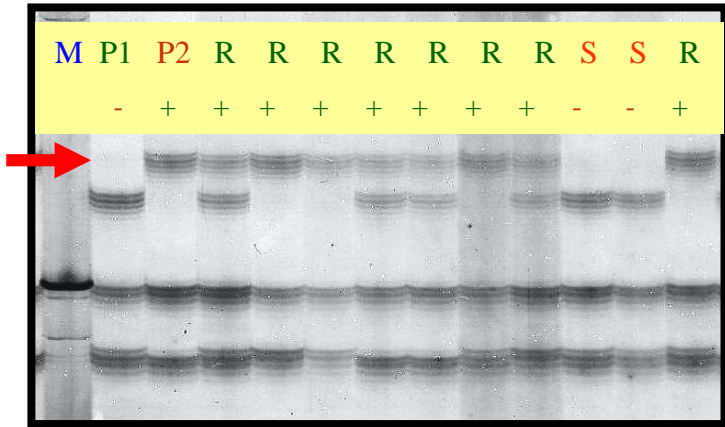
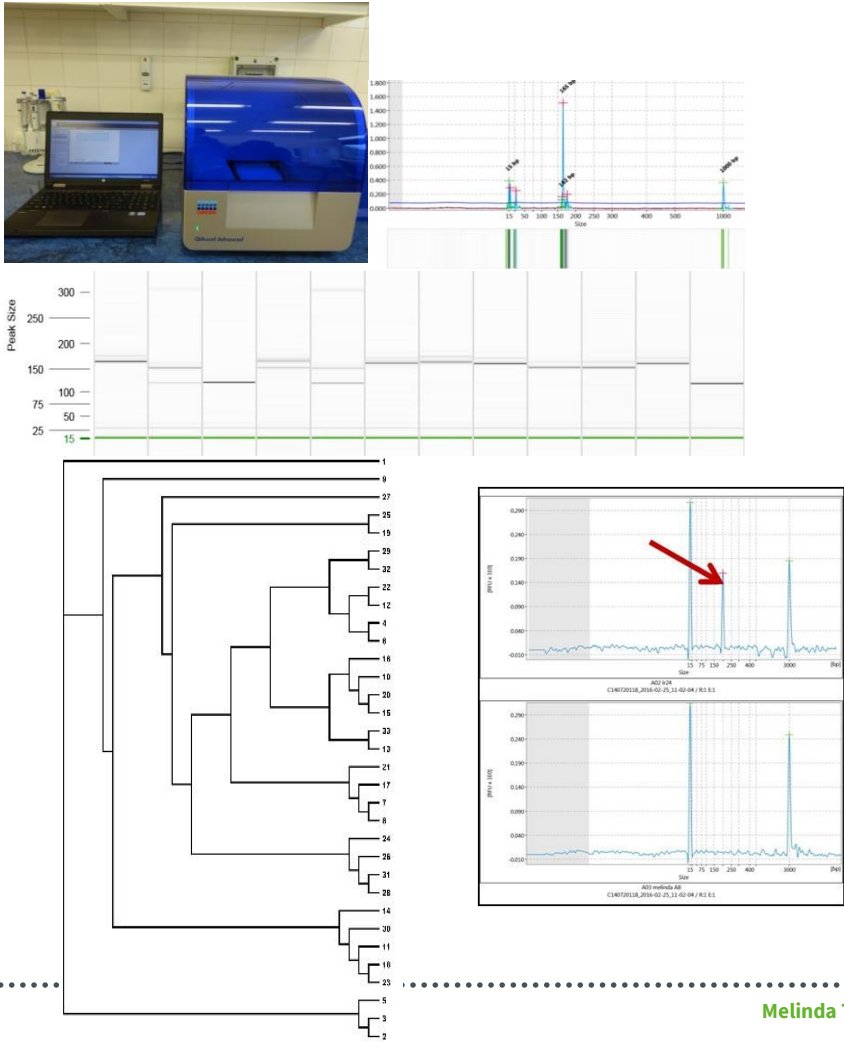


STEP 4 – in the laboratory



Genetic diversity analysis and QTL analysis

Marker assisted selection



STEP 5 – agronomy



THANK YOU FOR YOUR KIND ATTENTION!



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