

ecobreed WP2 report

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Horizon 2020
Grant agreement No 771367

Task 2.1 Screening of genetic resources and breeding material (M13-48)

Twenty genotypes per partner of winter common wheat are multiplied by the respective project partner.



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Task 2.1 Screening of genetic resources and breeding material (M13-48)

BOKU multiplies in 2019 winter wheat material ($n=20$) from LIVESEED partners which will be included in the forthcoming observation & evaluation trials

Dottenfelder Hof

Aristaro
Butaro
Curier
Graziaro
Jularo
Philaro
Saludo
Thomaro

Brandex-POP
Liocharls-POP

GZ Peter Kunz

Ataro
Pizza
Poesie
Prim
Royal
Scaro
Tengri
Wital
Wiwa

GZF Darzau

Tilliko



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Task 2.1 Screening of genetic resources and breeding material (M13-48)

30 (MTA-ATK) + 33 (UNITUS) genotypes of winter durum wheat were sown already in observation plots as enough material was available. The trials are sown at MTA-ATK, UNITUS (+3 Syngenta „bio“ checks; +6 „engineered“ lines) and BOKU (+3 Austrian check varieties).



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Task 2.2 AMF-compatibility evaluation (M13-36)

Task 2.3 Allelopathic activity screening (M13-36)

Not started yet – seed exchange with UVIGO in May 2019 (GA Prague)



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Task 2.4 Marker assisted selection (M13-48)

Common bunt resistance

First crosses at BOKU in 2017 to resistant lines → „backcrosses“ in 2018;
Marker check in November 2018 → identification of „heterozygous“ plants
and planting → second „backcrosses“ in winter 2019 → identification of
„heterozygous“ plants and planting in February 2019 (first round)

Resistance source	Number of QTL	QTL located on chromosomes	Resistance originating from
S5.58	4	1A, 1B, 7A, 7D	Blizzard
P101.81	2	1A, 1B	Bonneville
P101.30	2	1A, 1B, 7A	Blizzard
P106.30	3	4B, 7D	PI119333
P106.24	2	4B, 7D	PI119333



Elite parental line	Crossed to resistance source	Resistance QTL present in F ₁	Elite cultivar developed by
1351.5.10_P2	S5.58, P106.30	1A, 1B, 4B, 7A, 7D	?
1325.10.1_P1	S5.58	1A, 1B, 7A, 7D	?
Midas	S5.58	1A, 1B, 7A, 7D	Probstdorfer Saatzucht
Tommi	S5.58	1A, 1B, 7A, 7D	Nordsaat Saatzuchtgesellschaft
Spontan	S5.58	1A, 1B, 7A, 7D	Secobra; (Limagrain GmbH)
Genius	S5.58	1A, 1B, 7A, 7D	Saatbau Linz eGen
Kolompos	S5.58	1A, 1B, 7A, 7D	Agricultural Research Institute, Martonvásár
Arnold	P101.81	1A, 1B	Probstdorfer Saatzucht
Tilliko	P101.30	1A, 1B, 7A	Cultivari gGmbH, Darzau
Amicus	P106.30	4B, 7D	Saatbau Linz eGen
Capo	P106.24	4B, 7D	Probstdorfer Saatzucht



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Cross-name	Pedigree	BC parent	Res. donor	Resistance QTL
CC13	S5.58/1351.5.10_P2	Tillstop	Blizzard	1A 1B 7D
CC1	S5.58/1351.5.10_P2	Christoph	Blizzard	1A 1B 7A 7D
CC19	S5.58/Midas	20812-2-2	Blizzard	1A 1B 7A
CC3	S5.58/Midas	Arminius	Blizzard	1A 1B 7D
CC21	S5.58/Tommi	Nemchinovskaja17	Blizzard	1A 1B 7D
HG1	S5.58/Spontan	Tillstop	Blizzard	1A 1B 7A 7D
HG4	S5.58/Spontan	Tobias	Blizzard	1A 1B 7D
HG6	S5.58/Genius	Ehogold	Blizzard	1A 1B 7D
HG3	S5.58/Midas	Kolompos	Blizzard	1A 1B 7A
CC17	P101.81/Arnold	1325.1.10.P1	Bonneville	1A 1B
CC18	P101.81/Arnold	1314.3.11.P1	Bonneville	1A 1B
CC5	P101.81/Arnold	Arminius	Bonneville	1A 1B
CC7	P101.81/Arnold	Aurelius	Bonneville	1A 1B
CC16	P106.30/Amicus	Tillexus	PI119333	4B 7D
CC6	P106.30/1351.5.10_P2	Arminius	PI119333	7D
CC9	P106.30/1351.5.10_P2	Aurelius	PI119333	7D
HG7	Capo/P106.24	Bernstein	PI119333	7D

Task 2.4 Marker assisted selection (M13-48)

Common bunt resistance

→ KASP markers (LGC Biosearch Technologies)

QTL	Number of markers tested	Chromosomal region spanned by markers (mbp)
1A	12	28,83
1B	14	33,65
4B	12	566,51
7A	7	15,3
7D	10	7,13



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Task 2.4 Marker assisted selection (M13-48)

Common bunt resistance

→ BC3 in summer 2019 with new parents: Adamus, Alicantus, Annie, Dropia, Mirastar, Mv Lucilla, Tillexus, Tillstop, Viki



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BC2-Kreuzung	Adamus	Alicantus	Annie	Dropia	Mirastar	MY Lucilla	SZD-7661	SZD-8896	Tillexus	Tillstop	Yiki	W10.115.4.2.1	W10.193.1.1.5	W12.207.2.3	W6.175.2.5.9
DD-1	n	m	m	m	n	n	n	n	y	y	n	n	n	n	n
DD-2	n	m	m	m	n	n	n	n	y	y	n	n	n	n	n
DD-3	n	m	m	m	n	n	n	n	y	y	n	n	n	n	n
DD-4	n	m	m	m	n	n	n	n	y	y	n	n	n	n	n
DD-6	n	m	m	m	n	n	n	n	y	y	n	n	n	n	n
DD-9	n	n	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-10	n	n	n	y	n	y	y	y	y	y	y	n	y	y	y
DD-11	n	n	n	n	n	n	y	y	y	y	y	n	y	y	n
DD-16	n	n	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-17	n	n	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-18	n	n	n	m	n	m	m	n	y	y	n	n	n	n	n
DD-19	n	m	m	n	n	n	n	n	y	y	n	n	n	n	n
DD-20	n	n	n	n	n	n	n	n	y	y	n	n	n	n	y
DD-22	n	n	n	m	n	n	m	n	y	y	n	n	n	y	y
DD-23	n	n	n	n	n	n	y	n	y	y	n	n	n	y	y
DD-24	n	n	n	n	n	n	n	n	n	y	n	n	n	n	y
DD-25	n	n	n	n	n	n	n	n	y	y	n	n	n	n	y
DD-27	n	n	n	n	n	n	m	n	y	y	n	n	n	m	y
DD-32	n	m	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-33	n	m	m	n	n	n	n	n	y	y	n	n	n	n	n
DD-34	n	n	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-35	n	n	n	y	n	n	n	n	m	m	n	n	n	n	n
DD-40	n	n	n	y	n	y	n	n	y	y	n	n	n	y	n
DD-41	n	y	y	n	y	n	n	y	n	n	y	n	y	y	n
DD-45	m	n	n	n	n	n	m	n	y	y	n	n	n	y	y
DD-46	m	n	n	n	n	n	m	n	y	y	n	n	n	y	y
DD-49	n	n	n	n	n	n	n	n	y	y	n	n	n	y	n
DD-50	n	n	n	m	n	m	m	n	y	y	n	n	n	y	m
DD-51	n	n	n	n	n	n	n	n	y	y	n	n	n	y	n
DD-52	n	n	n	m	n	m	m	n	y	y	n	n	n	y	m
DD-54	n	n	n	m	n	m	m	n	y	y	n	n	n	y	m
DD-62	n	n	n	n	n	n	n	n	y	y	n	n	n	n	y
DD-63	n	n	n	n	n	n	n	n	y	y	n	y	y	n	y
DD-64	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-65	y	y	n	n	y	n	y	n	n	n	n	n	n	n	n
DD-66	n	n	n	n	n	n	n	n	y	y	n	n	n	n	n
DD-67	n	n	n	n	n	n	n	n	y	y	n	y	y	n	y
DD-68	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-69	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-70 (11)	m	m	m	n	m	m	m	m	m	m	m	m	m	m	m
DD-71	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-72	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-73	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-74	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y
DD-75	y	y	y	n	y	n	n	n	m	m	n	y	y	n	y



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Task 2.4 Marker assisted selection (M13-48)

Common bunt resistance

Co-operation with LIVESEED

- exchange of material with Agrologica (Mariager, DK); testing 2019 in Tulln and Prague
- Gumpenstein Conference: A. Borgen, V. Dumalasova, C. Vollenweider, V. Weyermann, F. Mascher, H. Grausgruber
- COST proposal (incl. BOKU, CRI, NARDI)



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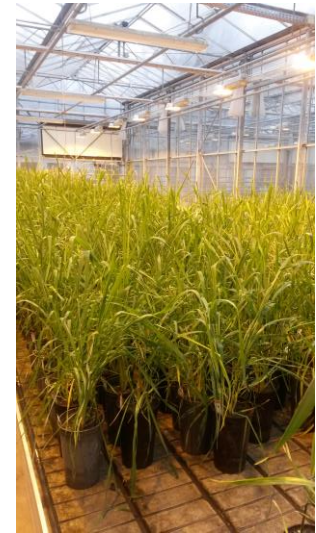
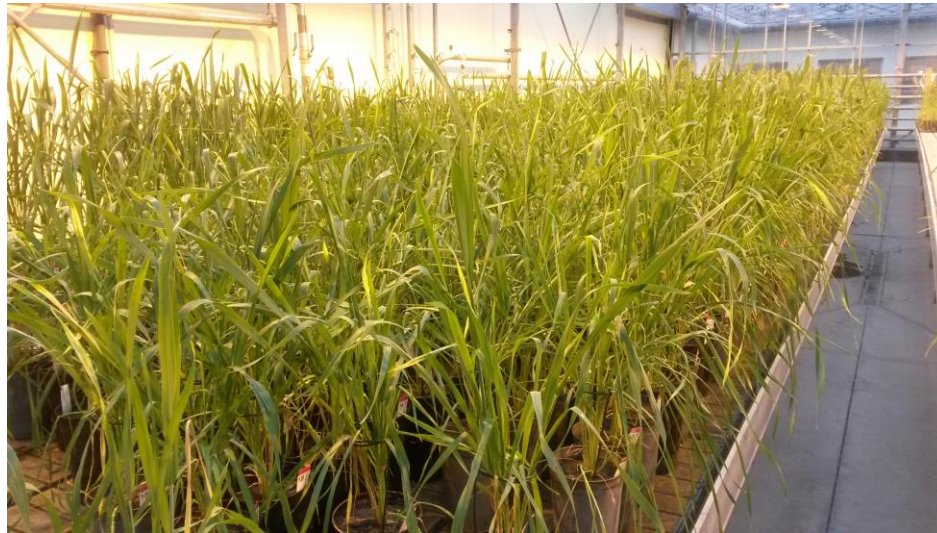


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Task 2.5 Development of new wheat germplasm for organic farming (M19-60)

MAGIC populations

- start of vernalization at MTA-ATK: 15 Aug 2018
- planting: 8 Oct 2018
- crossing in winter 2018/19; harvest February 2019



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Task 2.5 Development of new wheat germplasm for organic farming (M19-60)

MAGIC populations: number of pollinated spikes & hybrid seeds

Glosa / NS Ilina – 3 (33)

Ursita / NS 40S – 3 (32)

Mv Kolompos / IS Laudis – 4 (0)

Mv Toborzo / PS Dobromila – 5 (0)

Ehogold / PS Dobromila – 3 (2) / 3 (15)

Ehogold / XT9-23 - 3 (15)

Arminius / XT88-5R – 3 (16)

Aurelius / Colonia – 3 (16)

Tobias / Colonia – 3 (12)

Spontan / Annie – 3 (10)

Spontan / Tobias – 3 (7) / 3 (9)

Wendelin / Viki – 3 (2) / 3 (4)

IS Laudis / Viki – 3 (13)

IS Laudis / Colonia – 3 (2) / 3 (1)

→ new crosses in the field in May 2019

→ Mv Toborzo replaced by Mv Karej



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Task 2.5 Development of new wheat germplasm for organic farming (M19-60)

High protein crosses (incl. Gpc1 donor line)

- crosses scheduled for May 2019 at Martonvasar
- alternative crosses available at BOKU (& Fundulea ?)

Perennial wheat

- BOKU: multiplication of 5 bulks of perennial wheat obtained from Werner Vogt-Kaute (originally from Steve Jones, WSU)



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Perennial wheat

→ RGA: multiplication of *Thinopyrum intermedium* accessions; testcrosses with *Triticum* accessions; October: multiplication of 22 wheatgrass accessions in pots – spring 2019: field multiplication



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