



**Estonian
Crop Research
Institute**

Current situation of *Triticum* classification in National Collections and related ongoing projects

Estonian Crop Research Institute, Jõgeva

Reine Koppel – WW breeder
Anne Ingver – SW breeder
Küllü Annamaa - genebank

17-19.09.2019, Piestany



**Eesti
Taimakasvatuse
Instituut**

Variety breeding

Breeding programs:

Cereals

Oil crops

Grasses

Potatoes

Vegetables



More than 300 varieties have breed at the Institute

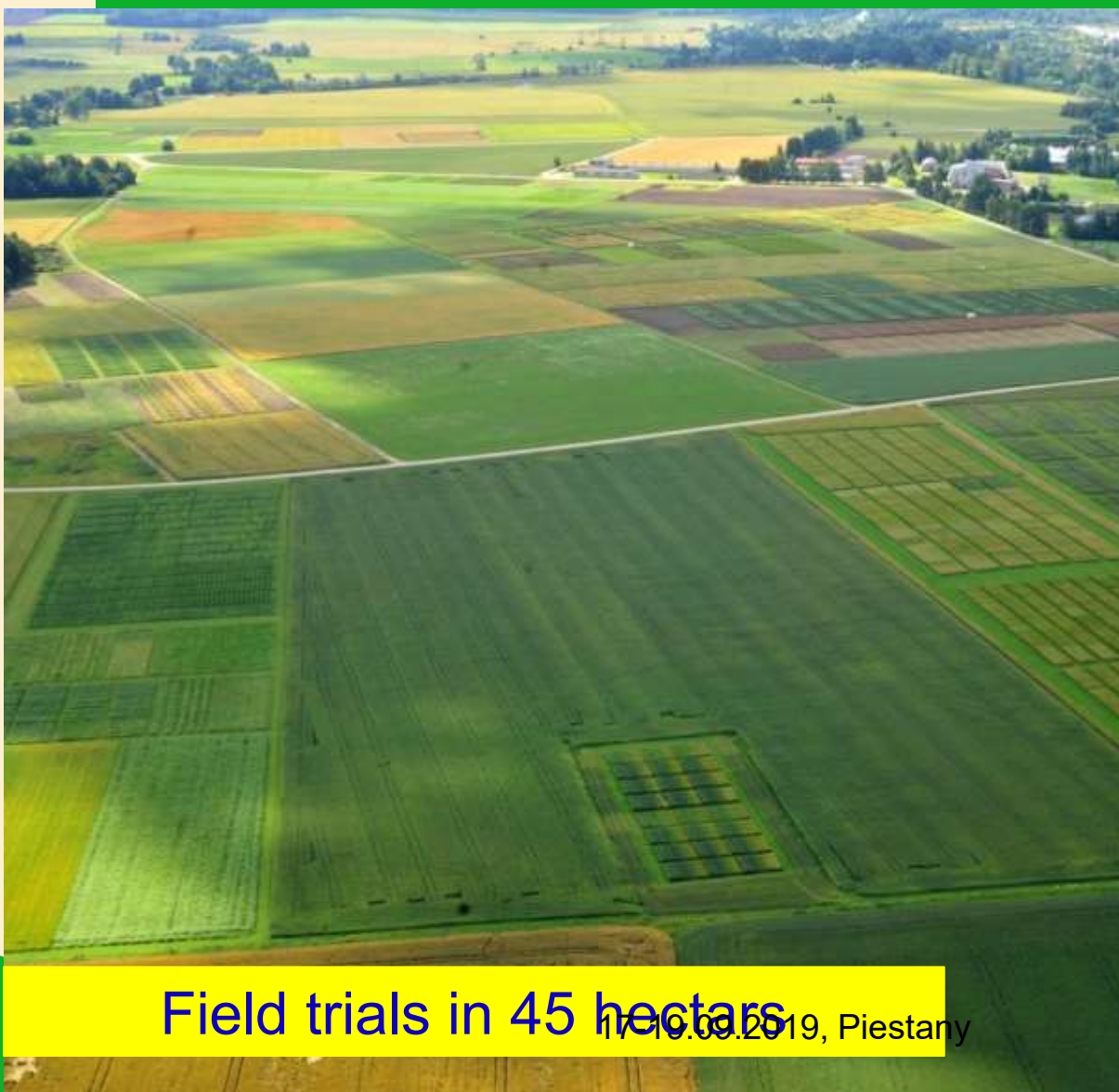
82 varieties in the EU common catalogue

42 UPOV protected varieties

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Trial fields

5400 accessions in the gene bank and breeders collections



Field trials in 45 hectares

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Wheat breeding objectives

Good winterhardiness

Suitable length of growing period

High and stable yield

Good kernel quality

Good milling and baking quality

Disease resistance

Lodging resistance

Good winterhardiness



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Different wheat species used in ECRI

In plant breeding plots:

Triticum aestivum (mostly var. *lutescens* , some
milturum, *erythrospermum*)

Triticum aestivum subsp *spelta*

In “adaption plots” – only for testing adaption in our
climate

Triticum durum - SW

Triticum monococcum WW

Triticum turgidum subsp. *dicoccum* WW

SW

Spelt 2014



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Spelt 2016



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Spelt 2017



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Emmer 2018



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Einkorn 2014



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2019



Eincorn

KAHU TERANISU
Emmer

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**Eincorn:
Terzino
Tifi
Svenskaja**



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In ECRI Genebank

***T. aestivum* (452 accessions, WW, SW)
From Scandinavia, Baltics, W-Europe, Russia,
Canada, Central Europe)**

***T. durum* (5 accessions)**

***T. monococcum* (1)**

***T. timopheevii* (1)**

Estonian University of Life Science

Institute of Agricultural and Environmental Sciences

Collection of some triticum species for students, teaching

<i>Triticum monococcum</i>
<i>Triticum dicoccum</i>
<i>Triticum persicum</i>
<i>Triticum durum</i>
<i>Triticum turgidum</i>
<i>Triticum polonicum</i>
<i>Triticum timopheevi</i>
<i>Triticum spelta</i>
<i>Triticum aestivum</i>
<i>Triticum compactum</i>

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**Tallinn University of Technology
Department of Chemistry and
Biotechnology,
Division of Gene Technology**

Resistance to powdery mildew in

**a *Triticum aestivum* X *Triticum militinae* hybrid
line**

Cooperation with ECRI

Pre-breeding of spring wheat

Kadri Järve, Irena Jakobson



•Introgression of non-race specific powdery mildew resistance from *T. militinae* into bread wheat.

Using: DH lines, gene mapping, MAS
(Tsõmbalova et al., 2016; Ivanicova et al., 2016)

Generation of a spring wheat genotype with improved resistance to powdery mildew (1)

Source of resistance : *Triticum militinae*, a tetraploid species immune to powdery mildew

1. Cv Tähti was crossed with *T. militinae*, and resistant line 8.1 was selected in the F4BC1 population
1. QTL analysis of the cv Tähti*8.1 F2 population segregating for resistance was used to map the *T. militinae* introgressions responsible for resistance (TAG (2006) 112:760; TAG (2012) 125:609)

About 50 % of resistance cosegregated with a *T. militinae* introgression on chromosome 4A

Generation of a spring wheat genotype with improved resistance to powdery mildew (2)

3. 350 doubled haploid genotypes were derived from the cv Tähti*8.1 F3-F4 population
4. Resistant to powdery mildew DH line carrying the 4A introgression was selected (DH 303)
5. DH 303 was crossed with spring wheat cv. Mooni
Cv Mooni (FIN +EST) is popular in Estonia elite variety, however resistance to powdery mildew is low.
6. Controlling the presence of *T. militinae* introgression on chromosome 4A, DH303*Mooni progeny was 7-9 times backcrossed to cv. Mooni.

**Lines carrying the
Triticum militinae
introgression on
chromosome 4A. Field
tests in 2017, State
Testing in 2019**



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THANK YOU FOR YOU ATTENTION!

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