

IDENTIFICATION OF ADDITIONAL RESTORER GENES IN THE MAPPING POPULATION [544C x MOt]BC1

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Winter Rye

- Is a highly versatile crop.
- As a green plant, it is used as livestock pasture and as green manure in crop rotations.
- As grain, it is used for livestock feed and as feedstock in alcohol distilling and as flour, it is used in production of bread and many other baked products.



goo.gl/QaKZZX



goo.gl/CjmNC2

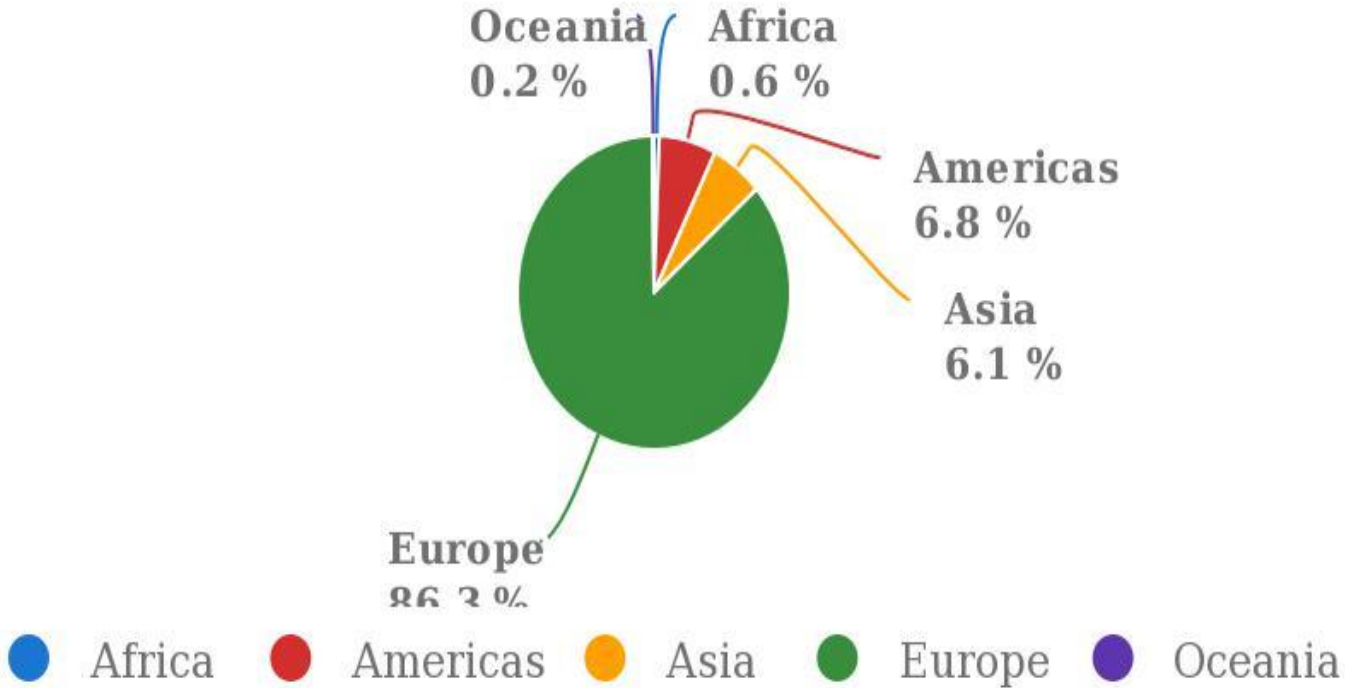


goo.gl/Wf6FY5



Production share of Rye by region

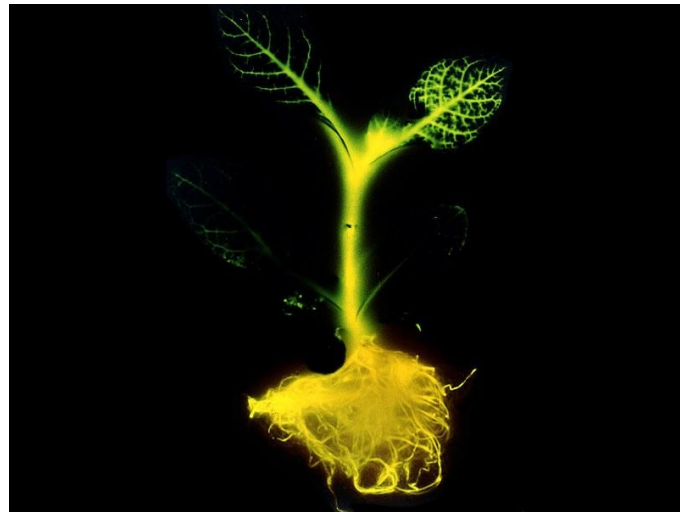
2020



Source: FAOSTAT (Apr 22, 2022)

Cytoplasmic male sterility (CMS) system

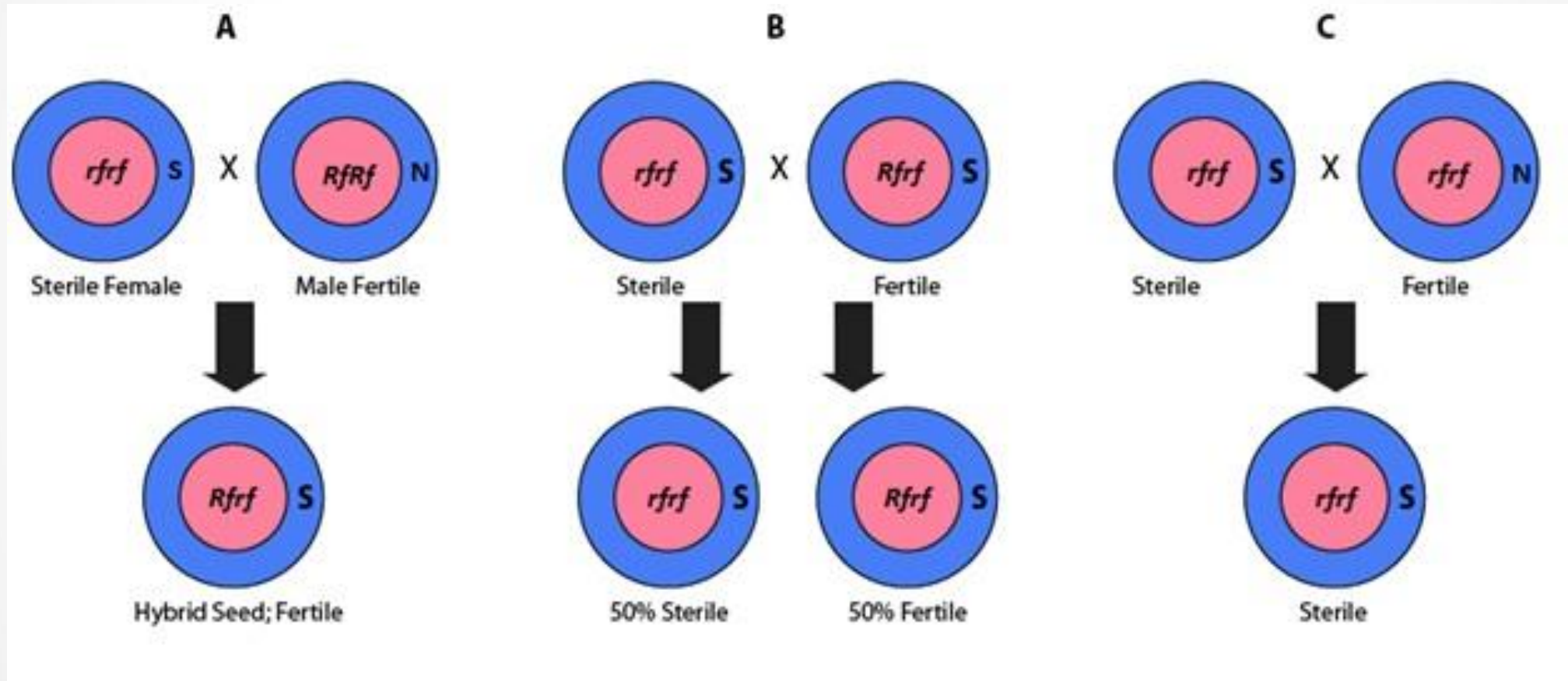
- CMS-Pampa (CMS-P)



- CMS-Vavilovii (CMS-V)

- CMS-R
- CMS-C
- CMS-S
- CMS-G

Cytoplasmic-genetic system



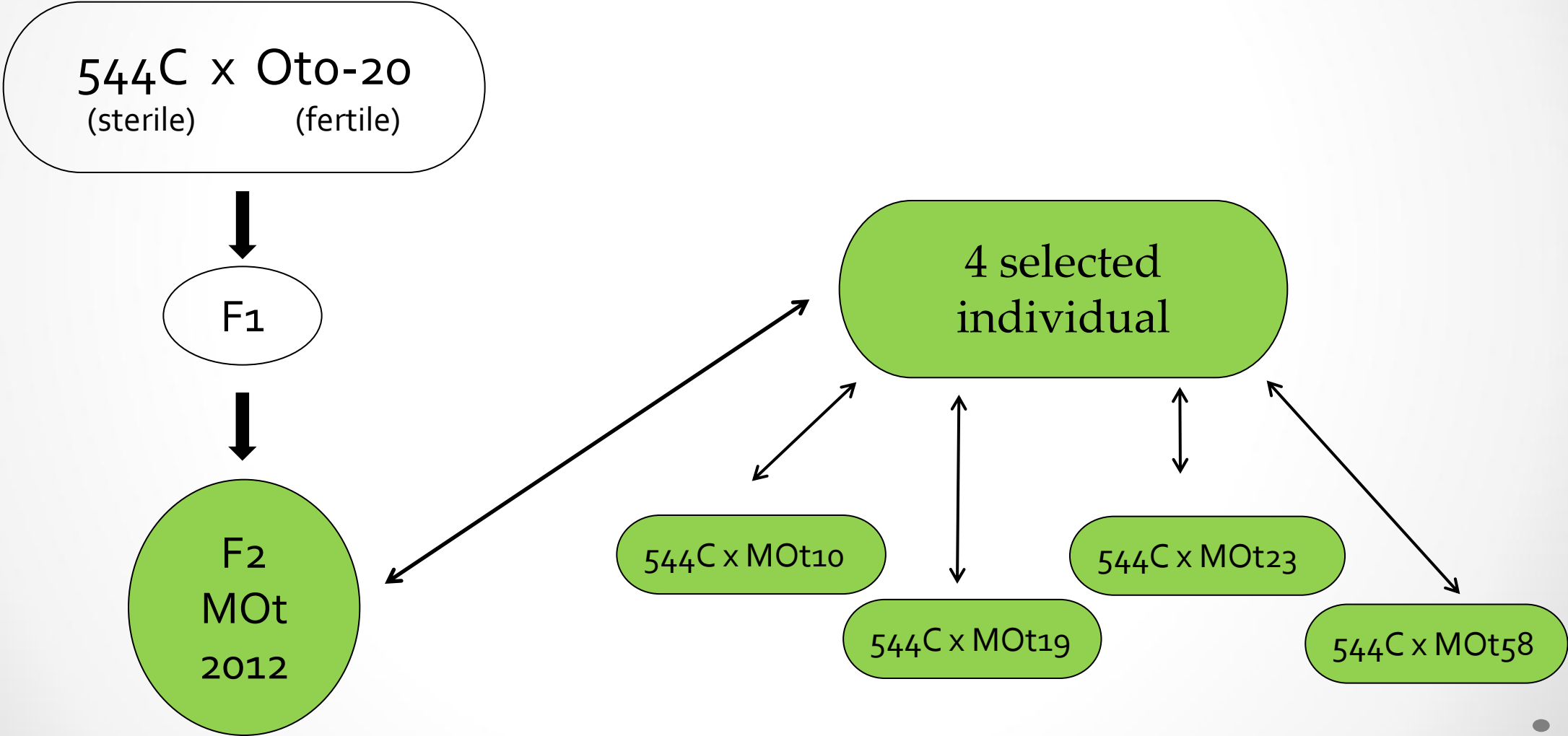
Purpose

- This study was aimed to determine the chromosomal location of secondary nuclear genes controlling male fertility restoration in the cytoplasm C and identification of molecular markers linked with this gene.



POPULATION

(544C x MOt)BC₁



Phenotypic evaluation

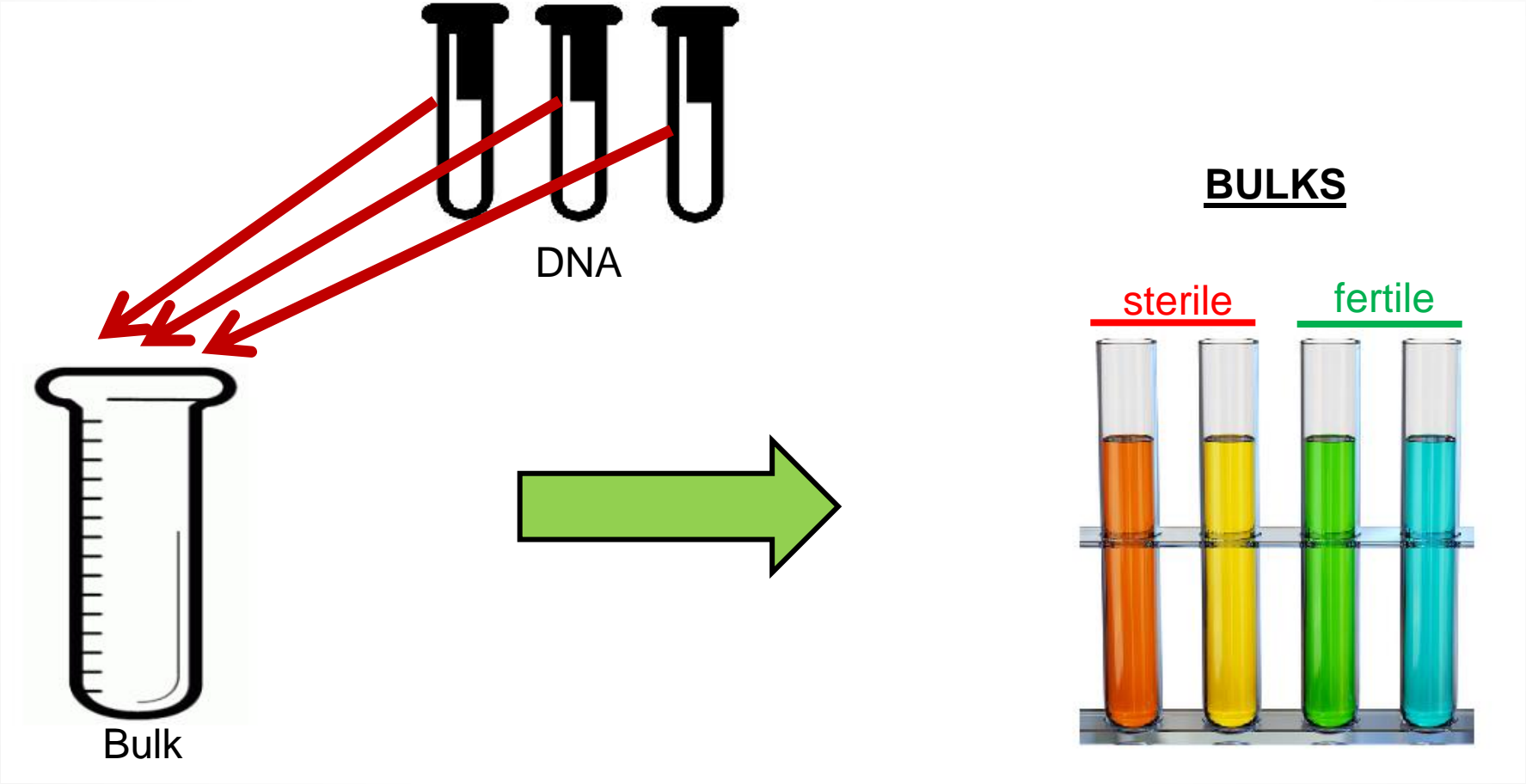
Mapping population were phenotyped in the experimental station of the West Pomeranian University of Technology Szczecin using two methods:

- visual observations of pollen shedding of each individual (Geiger and Morgenstern 9-point scale)
- assessment of seed setting within spikes isolated on each plant before flowering

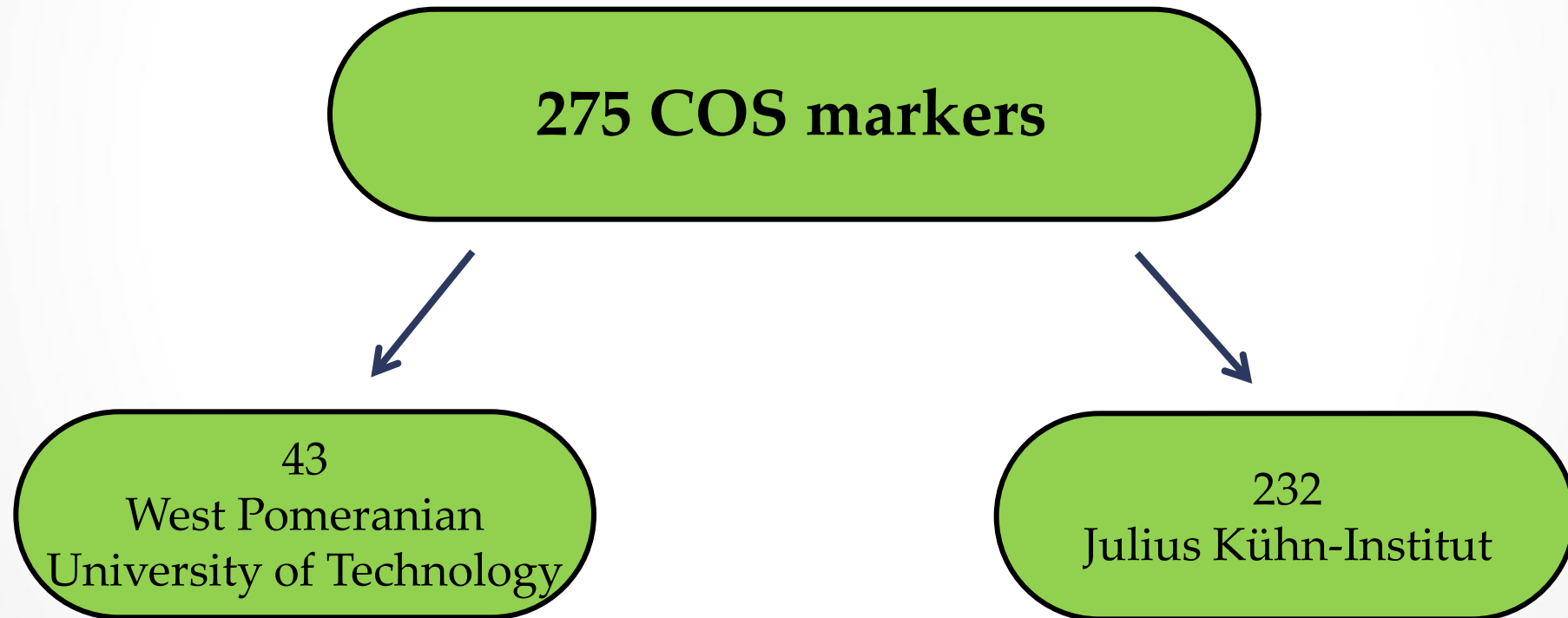


Fig.1. by M. Orłowska

Bulk Sample Analysis (BSA)

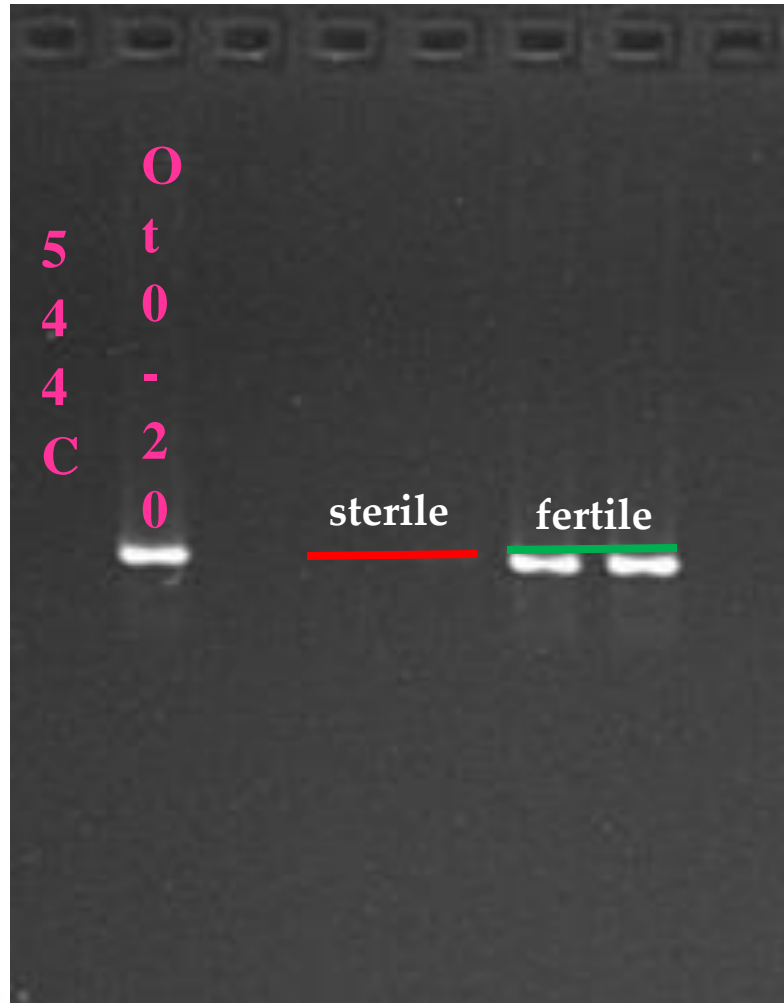


Screening on 7 chromosomes in population (544C x MOt)BC1

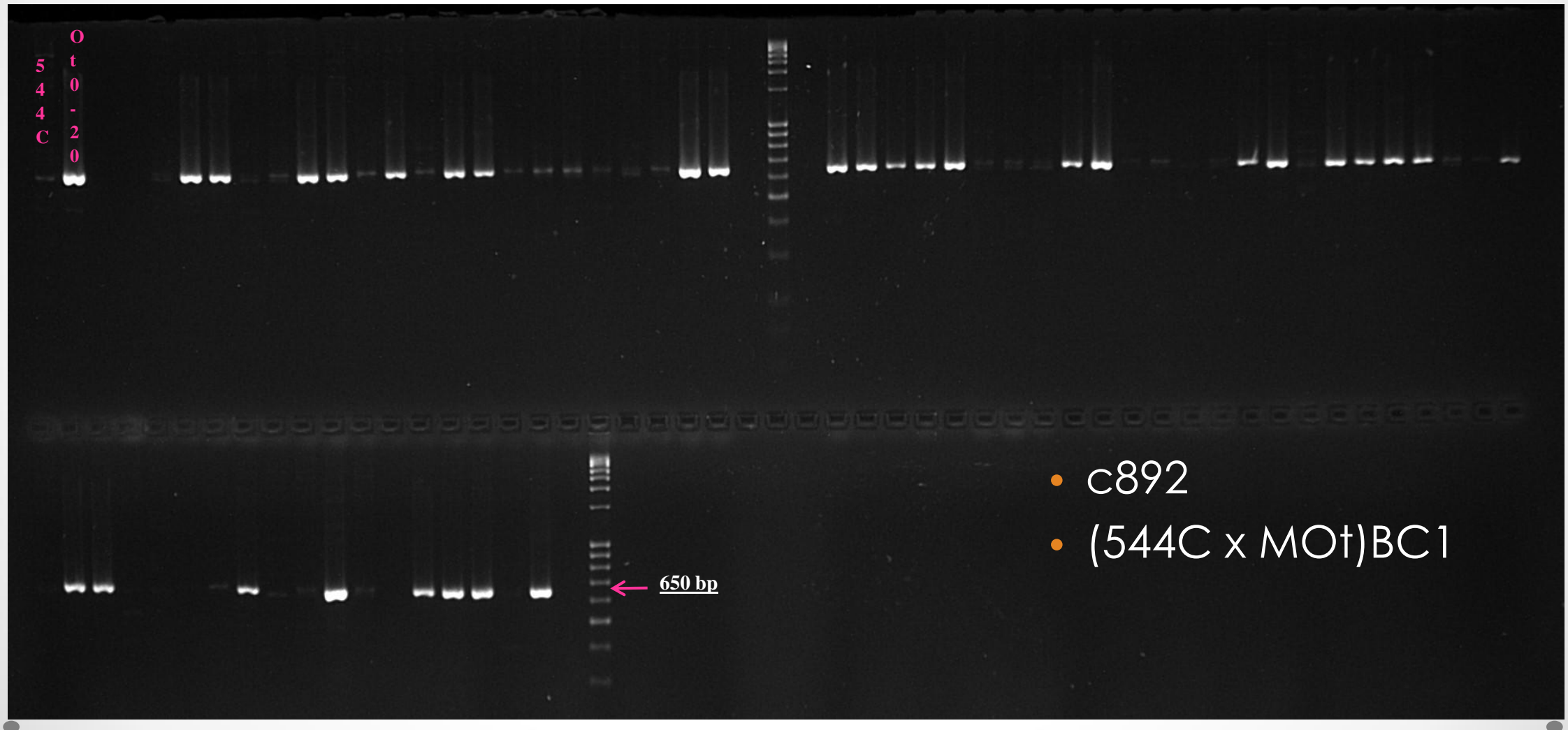


Markers	CHROMOSOME							sum
	1	2	3	4	5	6	7	
Monomorphic	19	9	16	7	14	4	5	74
Polimorphic	19	6	16	67	10	9	2	129
Kodominant	15	1	9	43	9	9	1	87
Dominant	4	5	7	24	1	0	1	42
No amplification	19	15	11	6	11	5	5	72
sum	57	30	43	80	35	18	12	

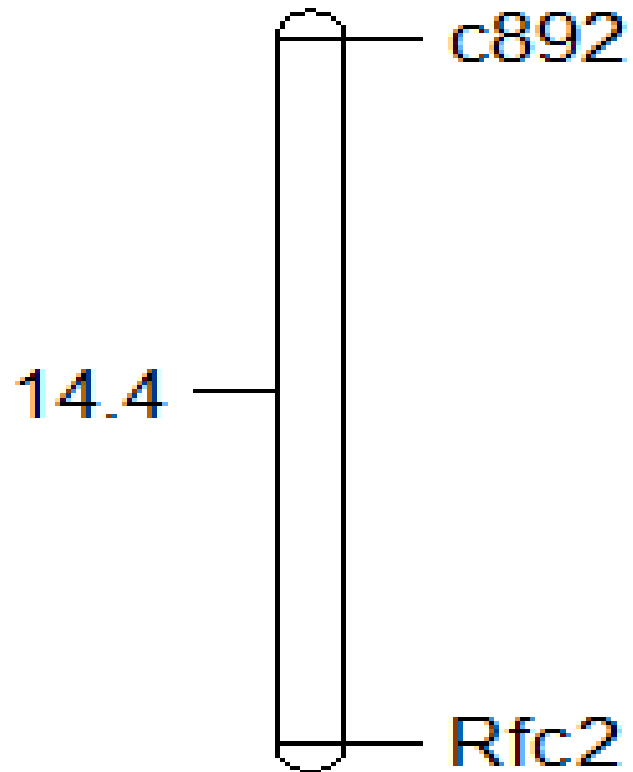
Result



Result



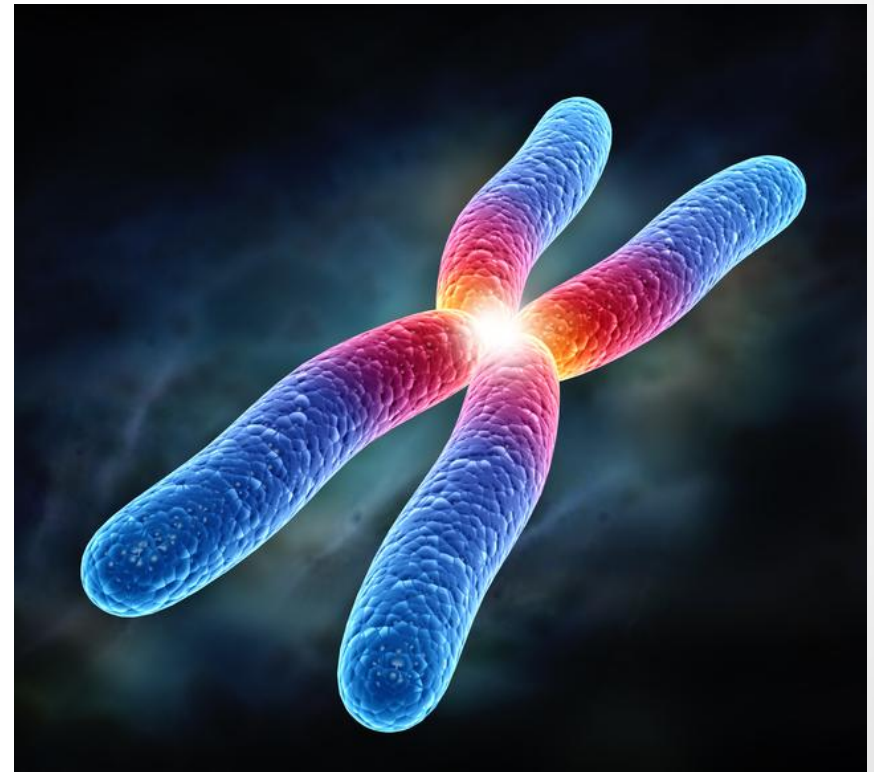
Result



- Distance between the c892 marker and the secondary restorer gene (Rfc2) located on chromosome 2 is 14,4 cM.

Future aims

- Continuation of these studies is necessary to confirm preliminary data.
- Precise chromosomal location of the additional restorer gene.



Thank You