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**Marker Assisted Selection (MAS) is an efficient strategy to increase breeding progress, especially for traits such as resistance to fusarium head blight (FHB) that are difficult to select for under field conditions and that are controlled by multiple genes. The purpose of the presented work is to incorporate resistance gene *Fhb1* located on chromosome 3B into two Polish advanced breeding lines F<sub>2</sub>BC<sub>2</sub> of winter wheat (recurrent parent, RP) SMH8527 (Smolice Plant Breeding Company, IHAR Group, Poland) and DL414/10 (DANKO Plant Breeding Company, Poland). The donor of the resistance gene is wheat line AIII62 (F<sub>5</sub>BC<sub>2</sub>) derived from the cross between Sumai 3 and Polish cultivar Muszelka. This line was confirmed with molecular markers to contain *Fhb1* gene (Fig.1).**

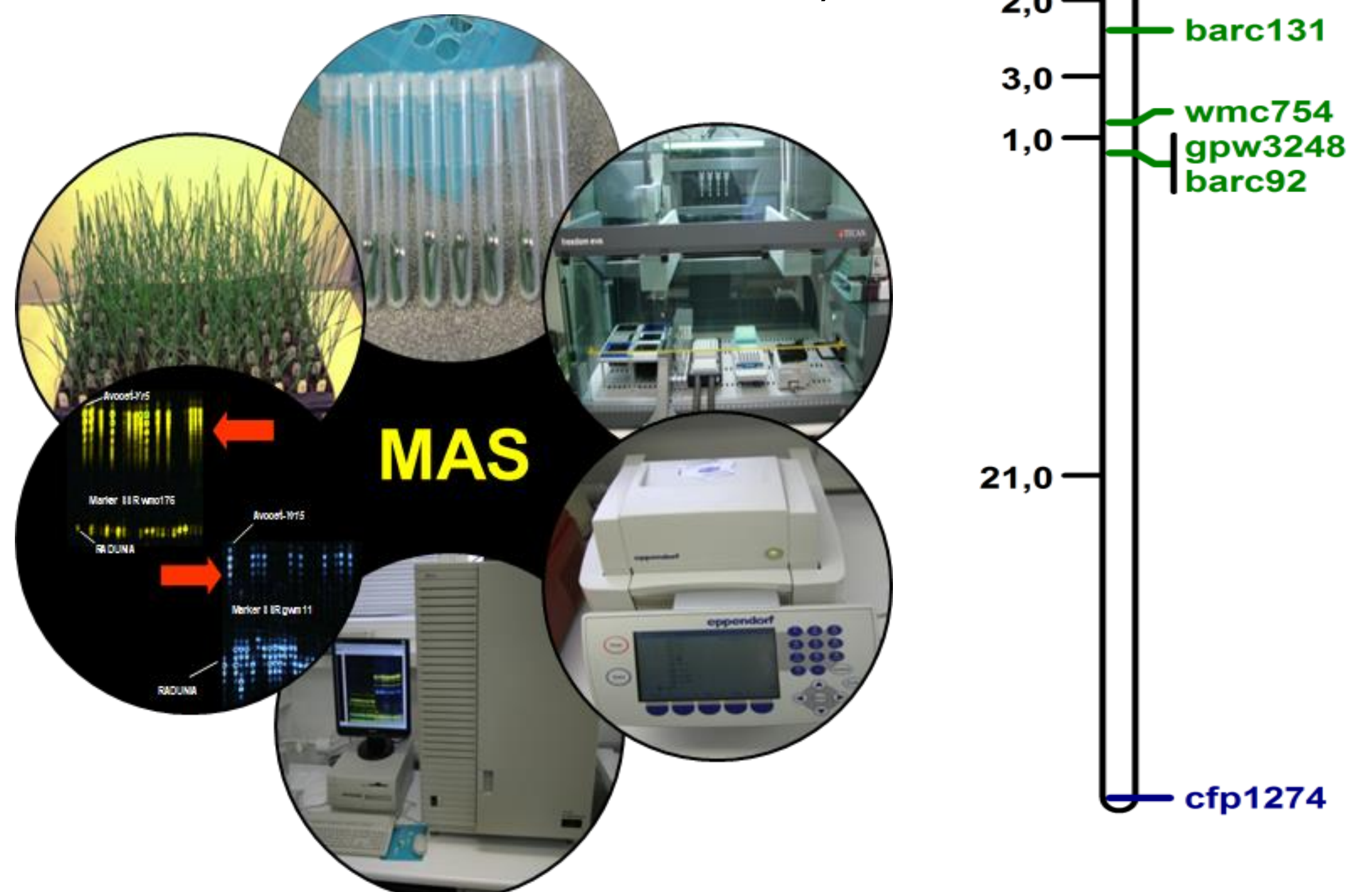
## Materials and methods

In order to reduce the size of the donor chromosome segment containing the target locus, plant selection in the offspring populations ( $F_2BC_2$ ) was focused on selecting individuals with the target gene (*Fhb1*) and recombination events between the target locus and linked flanking markers (recombinant selection). DNA polymorphism between RP and *Fhb1* gene donor at ten SSR flanking markers (gwm389, barc238, barc12, gpw7080, gwm493, barc131, wmc754, gpw3248, barc92 and cfp1274) spanning ca 40cM (Fig.2), allowed us to choose at least two polymorphic flanking markers and central markers (confirming the presence of *Fhb1* gene).



## Results

In each population 120 plants were evaluated for best combination of alleles at selected marker loci. After molecular selection five and ten F<sub>2</sub>BC<sub>2</sub> individuals in the first (RP SMH8527) and second (RP DL414/10) population were chosen, respectively. In parallel, during the selection process we also left some plants in each combination without *Fhb1* gene. These plants will serve as control genotypes in estimation a real effect of resistance gene in future experiments.



**Figure 3.** Diagram presents the workflow of DNA isolation, PCR and gel electrophoresis under Marker Assisted Selection.

## Acknowledgements

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