

# Molecular genetic analysis of durable adult plant leaf rust resistance in the Austrian winter wheat cultivar 'Capo'

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## Introduction

Leaf rust (*Puccinia recondita* f. sp. *tritici*) is a worldwide occurring disease of wheat. The ecological and economical best option for rust control is the use of resistant cultivars. Leaf rust resistance can be governed by major genes (*Lr-genes*) and/or quantitative (minor) resistance genes. The Austrian winter wheat cultivar Capo seems to possess durable adult plant leaf rust resistance (APR). As APR is often difficult to evaluate, there is little information about the genetic background. This project aims to genetically characterize durable adult plant leaf rust resistance in Capo and at developing tools for use in marker assisted selection.

## Materials and Methods

Recombinant inbred line populations from crosses between Capo and two susceptible cultivars - Isengrain and Furore - have been developed. These are tested at several locations during three

seasons in replicated field experiments. To provoke disease pressure over the whole experimental area, spreader rows (a mix of rust susceptible lines) are sown between double rows of the tested lines. Additionally susceptible plants that are artificially inoculated in the greenhouse will be planted into the spreader rows. In parallel 240 lines of the population Capo/Isengrain are characterized with molecular markers, mainly SSR- and AFLP-markers to construct a linkage map of this cross. A biometrical analysis of the resistance and the marker data will allow the detection of quantitative trait loci (QTLs) involved in leaf rust resistance. The second population (Capo/Furore) will be used for QTL validation.

## Preliminary Results and Future Work

In the first year of this project resistance data for leaf rust severity could be collected at two locations. Although disease pressure was very high, there were clear differences between the tested lines.

Half of the tested SSR-primers proved to be polymorphic between Capo and Isengrain. Analysis of the population has started.

A potential candidate gene for Capo's resistance could be *Lr34*. Therefore, the SSR markers *Xgwm130* and *Xgwm295* mapping near *Lr34* (SUENAGA, 2003) have been analyzed already. Analysis of variance revealed no significant association of leaf rust severity with either *Xgwm130* or *Xgwm295* alleles. Hence, *Lr34* does not seem to be involved in APR of Capo.

## References

SUENAGA, A. et al., 2003: *Phytopathology* 93 (7): 881-890.

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