



Genetic engineering in hops

Gene transfer - advantages

- fast and directed transfer of single genes
- ⇒ improvement of resistance without changing quality traits
- transfer of genes beyond typical genetic resources as wild hops
- ⇒ no cross-breeding limitations

Methods

(a) indirect transfer by soilborne bacteria (Agrobacterium tumefaciens)



(b) direct transfer by gene gun(= particle bombardment)







State of the art

transgenic Saazer in the greenhouse

with expression of GUS reporter gene



Objectives - resistance to fungal pathogens

obtained by a transfer of genes coding for chitinolytic enzymes

Detection of transgenic tissue and transgenic plants

- GUS staining
- PCR (Polymerase Chain Reaction)
- Southern Blot (not shown)





Powdery mildew

Acknowledgements

The funding by the Bavarian State Ministry for Agronomy and Forestry is gratefully acknowledged.

Special thanks are due to Ms B. Haugg and Ms P. Hartberger for their excellent technical assistance.