

***Natural selection in perennial  
ryegrass (*Lolium perenne* L.)  
populations: developing selection  
methods for the complex feature  
"persistence"***

Lydia Gerson

***“Grass is the forgiveness of nature - her  
constant benediction.  
Forests decay, harvests perish, flowers  
vanish,  
but grass is immortal.”***

Brian Ingalls, Associate Professor, Department of Applied Mathematics, University of Waterloo (works in systems biology and molecular biology)



# *The importance of Lolium perenne L.*



<http://media.viennablog.at/26322/20080525-fussballrasen.jpg>



[http://www.bio-austria.at/var/plain/storage/images/media/images/schafe\\_auf\\_der\\_weide/50108-1-ger-DE/schafe\\_auf\\_der\\_weide\\_imagelarge.jpg](http://www.bio-austria.at/var/plain/storage/images/media/images/schafe_auf_der_weide/50108-1-ger-DE/schafe_auf_der_weide_imagelarge.jpg)

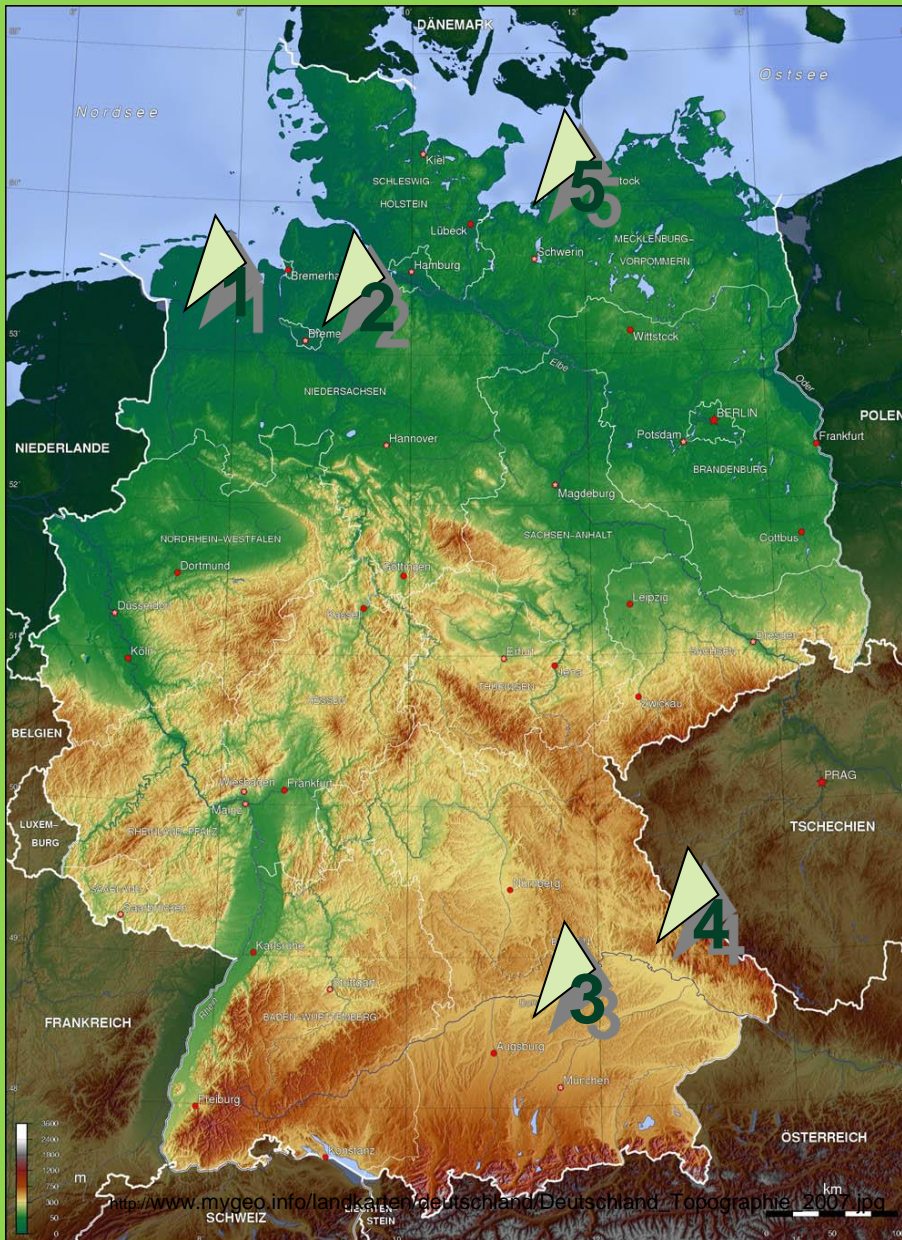


<http://www.duenger.tv/rasen/images/categories/4.gif>



<http://www.doliwa-naturfoto.de/Bilder-Galerie/Tiere/Saeugetiere/Kuh/Kuh3/kuh3.html>

## Map of Germany showing the five experimental sites



- 1 – Detern,
- 2 – Schmalenbeck,
- 3 – Spitalhof,
- 4 – Hötzelndorf,
- 5 – Malchow/Poel

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***“There’s one good thing about snow, it  
makes your lawn  
look as nice as your neighbor’s.”***

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Clyde Moore, director of First Service Networks (a national provider of facility and maintenance repair systems)

## ***objectives***

***Is it possible to detect changes in the genetic constitution of varieties which expose different degrees of winter hardiness after four years of cultivation?***



- **Genotype mixtures and winter survival of variety 'Guru' from sites Hötzelndorf (mountainous) and Schmalenbeck (moor) after four years of cultivation, with drastic changes being visible at Schmalenbeck.**



## ***objectives***

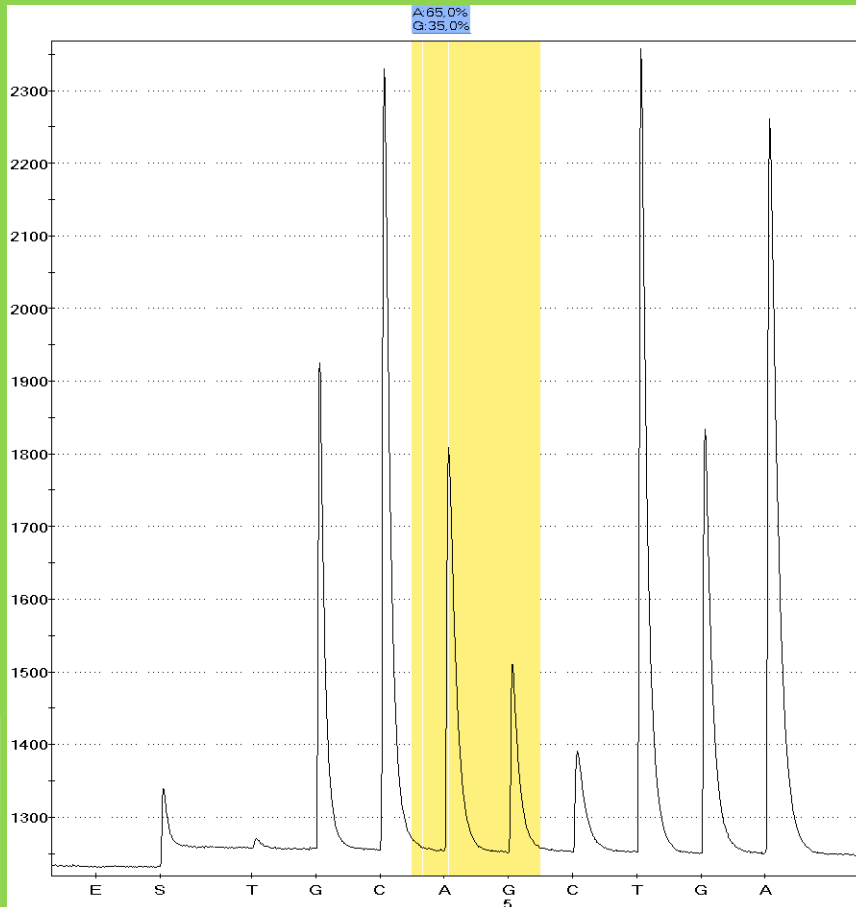
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***concerning the effects of selection: Which alleles become more dominant in the winter hard varieties and which alleles are reduced?***

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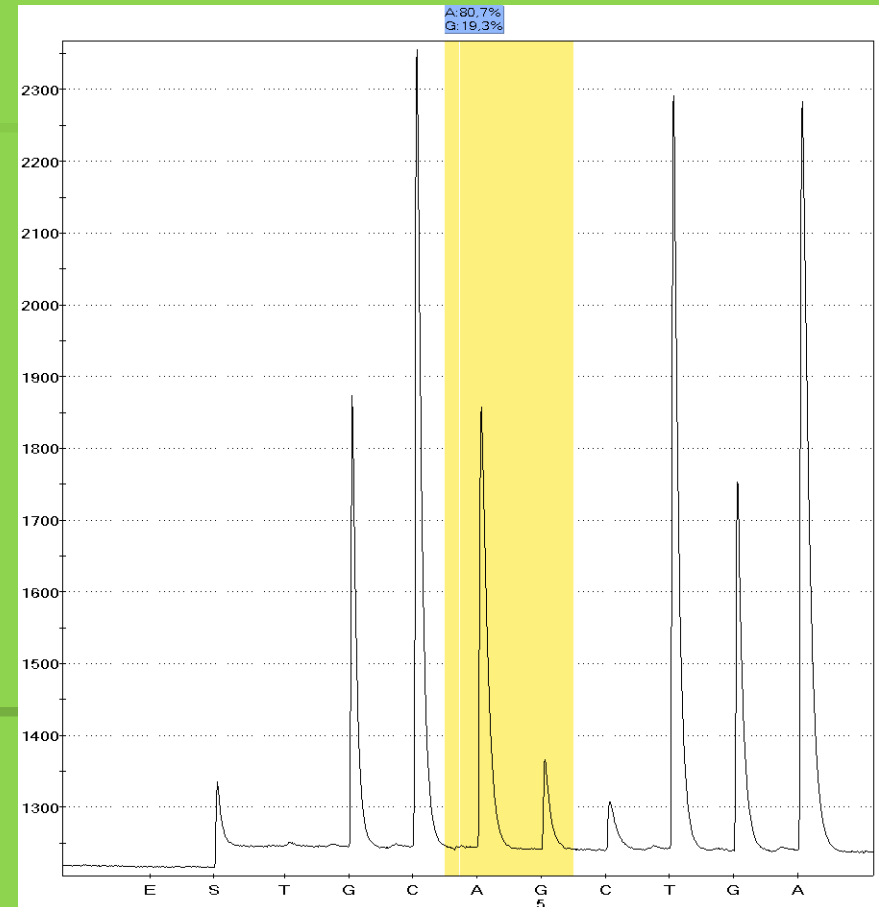


# pyrosequencing method is adopted



**A: 65,0%**

**G: 35,0%**



**A: 80,7%**

**G: 19,3%**

***the aim***

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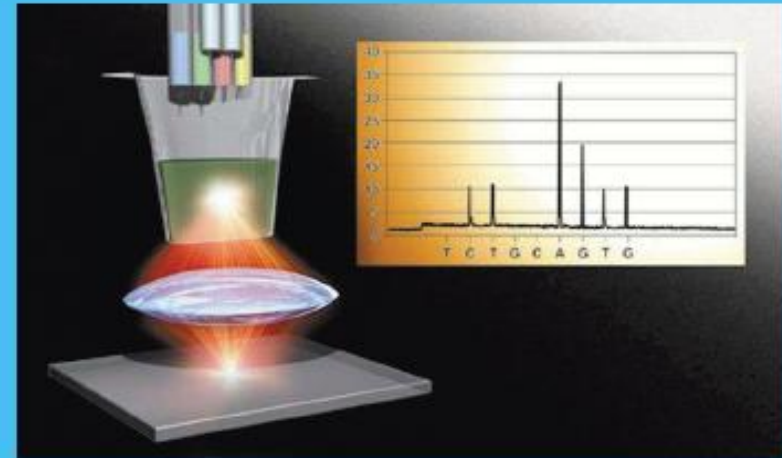
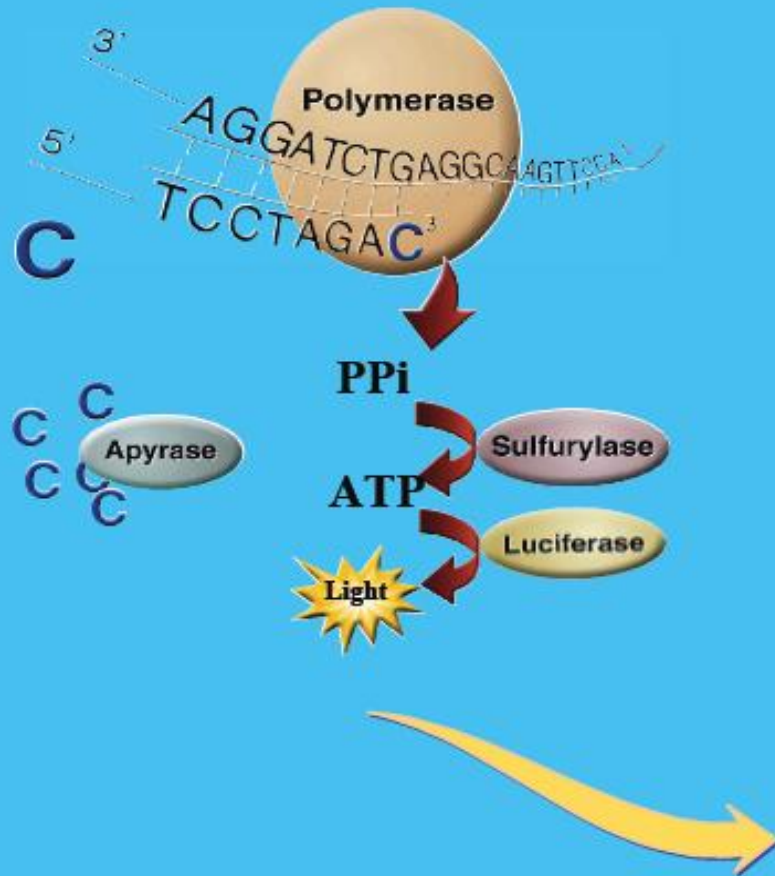
***selection of persistent  
genotypes***

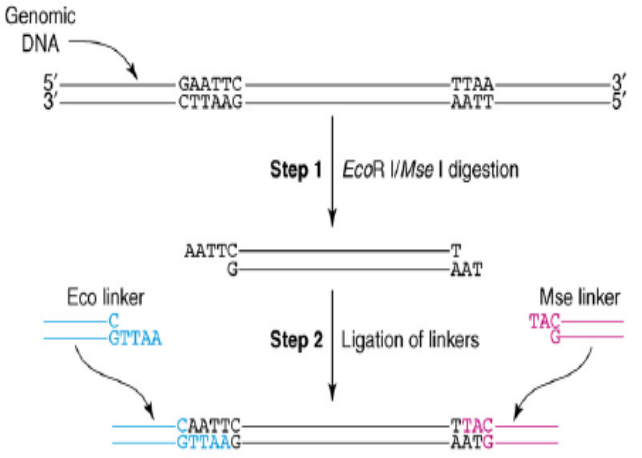
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## ***Lolium markers***

- **7 *Lolium* marker sets, distributed on the whole genome (1 set per chromosome)**
- **established in IPK for SNP-based genotyping system of out crossing species *Lolium perenne* L. (determination of frequencies of alleles in defined bulks for differentiation of accessions)**

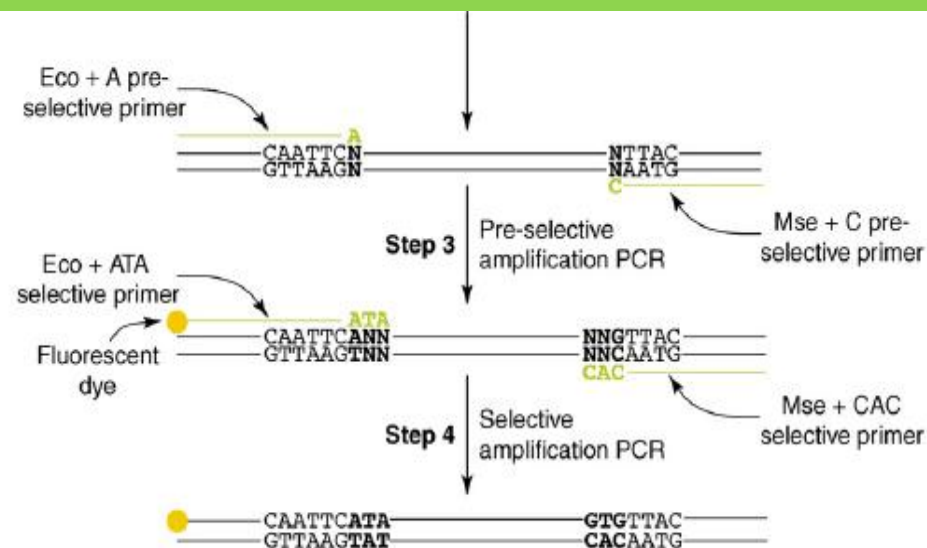
# the pyrosequencing method





# AFLP analysis

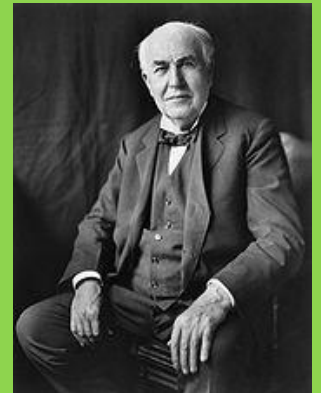
- for more detailed analyses the AFLP-analysis is considered to be used, LfL offers primer combinations




## ***outlook***

**“Until man duplicates a blade of grass,  
nature can laugh at his so  
called scientific knowledge.”**

**Thomas Edison, American inventor, scientist and businessman**



## ***acknowledgements***

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- 
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  - **Dr. Klaus Dehmer (IPK, AG TEN, Groß Lüsewitz)**
  - **Dr. Stephan Hartmann (LfL, Bavaria)**

***thank you for your attention!***

