

Genomic Selection for Agronomic Important Traits in Two-Rowed Winter Barley

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Winter Barley and Genomic Prediction

- Total area of production of winter barley has declined since 2009 in Denmark.
- Need for advanced tools for improving genetic gains at the current situation of restricted land.
- GP has proven to be a formidable tool in view of this through numerous studies.



Objectives

- Develop GS models for seed quality related traits from two barley breeding companies in Denmark.
- Identifying the genes controlling these traits through GWAS
Searching for QTLs affecting these traits
- Investigating the impact of G*E interactions in the models

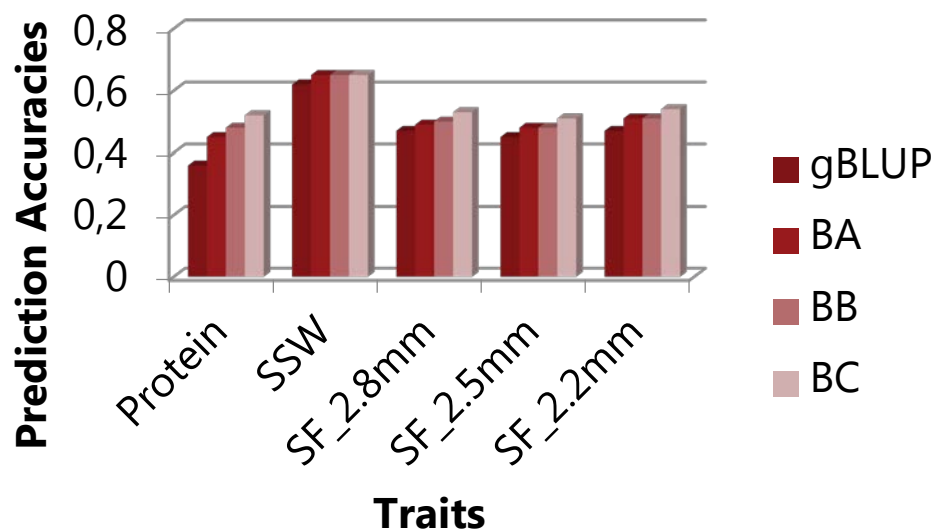


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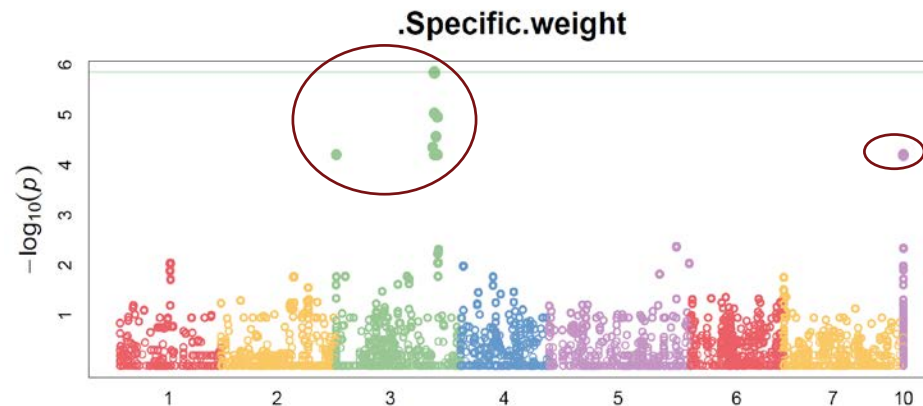
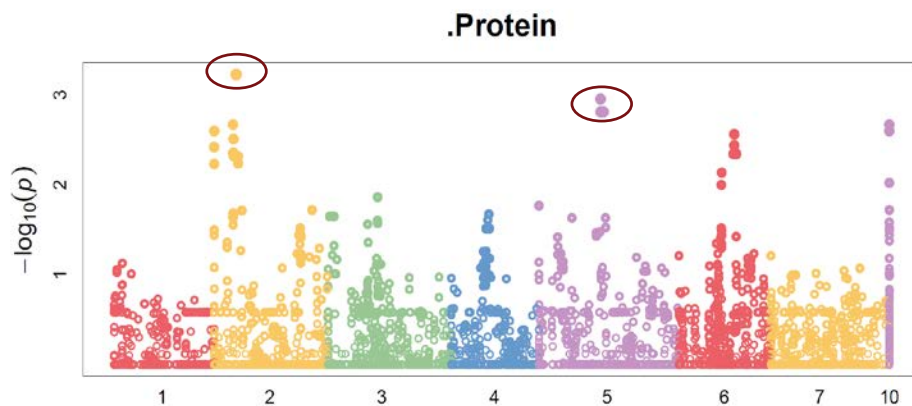
- Two year data sets (2015, 2016) received from breeding companies.
 - Company 1: Protein content, seed specific weight, seed fraction (2.2, 2.5 and 2.8mm) weights
 - Company 2: Protein content , seed specific weight
 - Genotyped with the barley 9K iSelect SNP chip
- Genomic selection analysis for company 1 almost ready for publication
- Seeds from company 2 has been sorted in fractions and data ready for analysis



Overview of Results



| Trait | No of SNPs | Chr | R ² |
|----------|------------|---------|----------------|
| Protein | 5 | 2, 5 | 0.04-0.05 |
| SSW | 16 | 3, 10 | 0.06-0.09 |
| SF_2.8mm | 4 | 6, 4 | 0.03-0.04 |
| SF_2.8mm | 4 | 6, 4 | 0.03-0.04 |
| SF_2.2mm | 8 | 6, 4, 3 | 0.03-0.04 |



Upcoming Tasks

- Combining both year data sets for thorough
 - GWAS analysis
 - Investigate the impact of G*E in the GS models
- Extraction of PA and Pi and identifying the genes controlling them
- Thesis submission: Feb 2019

