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Is wheat individual grain characteristics variance a source of genetic variability for water stress tolerance?

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Introduction:

- ✓ Grain yield is usually analyzed through its different average numeric components
- ✓ However each component shows a large intragenotypic variance (eg grain size will vary depending on the tiller and the position on the spike)
- ✓ Variance of these components has not be so far fully explored particularly in relation to stress tolerance

There is environmental and genetic variance for individual grain characteristics:

Grain surface is used as proxy for grain weight.
In 228 genotypes, we extracted 2 genotypes with:

- Similar mean grain surface
- Different grain surface variances

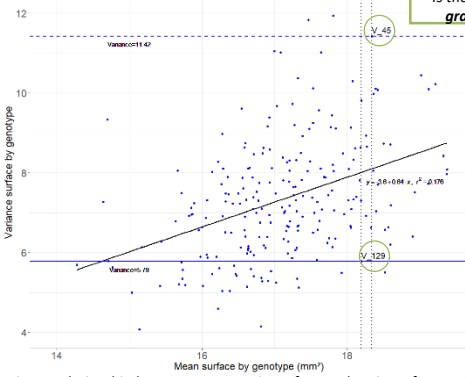


Fig. 1: Relationship between mean grain surface and grain surface variance for 228 genotypes

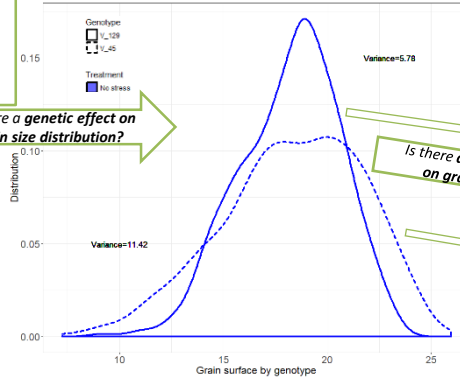


Fig. 2: Grain surface distribution for 2 genotypes

Variability of distribution between genotypes showing different grain characteristics variance:

➤ Genetic variance for grain size

Variability of distribution between treatments:
➤ Environmental variance for grain size

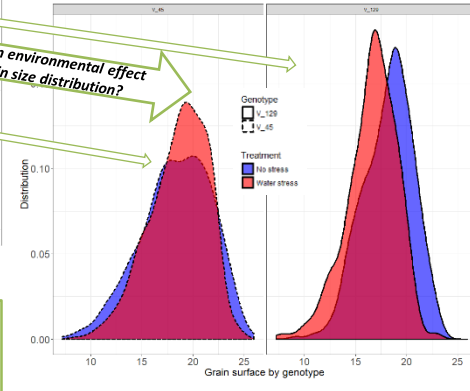


Fig. 3: Grain surface distribution for 2 genotypes for 2 treatments

Issues:

- Understand precisely the structure of the variance associated to individual grain characteristics
- Stratify variance into inter- and intra-spike variances

How to study these issues?

