COMPARISON OF GENOTYPES FROM TEN NATIVE POPULATIONS OF PERENNIAL RYEGRASS WHEN ASSESSED IN FOUR CONTRASTING EUROPEAN ENVIRONMENTS

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Ten populations of perennial ryegrass (*Lolium perenne* L.) from germplasm collections from the UK, Czech Republic, Norway, Portugal and Denmark were cloned and planted in regeneration plots, each comprising 49 genotypes, at sites in the UK, Denmark, Czech Republic and Portugal. Seed yield of each genotype within the plot was recorded to give a 3-way data matrix. GxE effects were quantified using ANOVA including AMMI to partition the GxE interaction. Using REML, meta-analysis was used to study all three dimensions of the data allowing for any differences in variances. Genotype sensitivities to different environments were calculated using Joint Regression method. Biplot and cluster analyses were used to visualize association and grouping structure. Concordance correlation was used to study seed yield reproducibility. Pair-wise comparisons of similarity matrices were done using the Mantel test. Extent of common information in the similarity matrices was investigated according to CPC Analysis. Generally, the populations responded differently to environments, indicating that the response of populations to regeneration in other countries may not be easy to predict.