In this practical, we will use the same SoyNAM dataset we used in the previous exercises. However, to make the modeling manageable, we will subset the dataset based on environment. Environment in SoyNAM dataset is defined as a combination of location and year and there are 18 environments in the SoyNAM dataset with 9 locations and up to 3 years. We will subset the data to include only three environments and remove all or some of the lines from a particular environment and use the model to predict those lines.

We will model GxE interactions using the SOMMER package. The SOMMER package has built-in options to specify several variance-co-variance structures. We will fit models with GxE effects using a few of those var-covariance structures in the first exercise. In the second exercise, we will predict GEBVs of untested genotypes in tested and untested environments and compare the prediction accuracy of these models.

Tasks:

1. Compare models fit with any four of the var-covar structures introduced in this practical
2. Predict GEBVs of untested genotypes in tested and untested environments and test accuracy of models
3. Discuss other approaches to fit GxE models (using environmental covariances)