Purposes:

1. Gain experience in partitioning variability due to GxE interactions

2. Utilize knowledge from partitioning to make advancement decisions

Keywords: Multi-Environment Trial (MET), Variance due to GxE interactions, interactions due to heterogeneous variance, interactions due to changes in rank

Useful R commands

- getwd()
- setwd()
- read.csv()
- rm()
- attach()
- factor()
- lm()
- aov()
- summary()

References:

Captivate: Multi Environment Trials – Types of GxE

Chapter 8, Bernardo

Muir et al, 1992

For the second phase of field trials a selected set of 49 experimental lines and a check cultivar were entered into a replicated multi-environment trial (MET) consisting of two 50 plot blocks at each of ten environments. The experimental lines are designated 1 – 49 and the check is designated as line 50. Harvestable yield from two row plots were obtained from 10 locations in a single year. The lines were assigned to the field plots using a randomized complete block design, where each block is represented as one of two replicates per location. The data exist in a file designated as Multi Environment Trials-Types of GxE ds5.csv . Your team needs to

1. Partition the variance due to GxE interaction effects into variability due to heterogeneity of genotypic responses among environments and variability due to inconsistent ranking (lack of correlation) among the genotypes.
2. If the objective of the cultivar development program is to identify lines that will perform best across any environments within your region, which lines should you advance? Use the information from the partitioning of GxE interaction variance to justify your decision.
3. If the objective of the cultivar development program is to assure high yields across all types of environments in the sales region that might be encountered in any given year, which lines should you advance? Use the information from the partitioning of GxE interaction variance to justify your decision.