

Agronomy 526 Homework

Due: 2/24/22

1. An agronomist suspects that newer corn hybrids respond differently to plant population than those released just a few years ago and plans an experiment to test this hypothesis. The null hypothesis is that hybrids will respond the same when planted to different populations. If the null hypothesis is true then there will be no interaction between hybrid and population and the response to either treatment factor can be described by its main effect. However, if what the researcher believes is true, then the interaction will be significant and an evaluation of simple effects of the treatment combinations will be necessary.

The proposed experiment uses a completely random design (CRD) with four replications. Treatments include ten hybrids (H) planted to five populations (P). All treatments are to be in factorial combination.

- a. Diagram a layout for the experiment that shows the relationships among the treatment factors.
- b. Write the linear additive model for the experiment and describe each term in the model.
- c. Using the algorithm described in your lecture notes from last week, write the expected mean squares for the experiment.
- d. Write the formulas for calculating the mean square for each term in the model.
- e. Construct an ANOVA table with “Source”, “df”, and Expected Mean Square” as column headings.
- f. Based on the expected mean squares, indicate the correct error term to use for testing each fixed main effect and interaction.