

Assignment 2

Your Name

2026-06-16

About this assignment

- **Goal:** to review the concepts learned about treatment structure and design structure of an experiment.
- **Due:** Tuesday, June 23.

1.

A group of agricultural scientists have received funding to study the effects of water availability and nitrogen fertilizer on corn yield. They know that the effect of nitrogen may depend on the water availability and they have enough resources to study 3 irrigation regimes that mimic dry years, average years, and wet years. At the same time, they wish to study three levels of Nitrogen fertilizer: the farmer's most common rate, farmer's + 200 lb N/ac, and farmer's - 200 lb N/ac. The scientists can run this experiment in a field that historically has always showed very low spatial variability.

1a.

What treatment structure would you use? How many levels for each factor?

1b.

What design structure would you use?

1c.

Fill out the following table with the values you consider:

| Source | df |
|----------|----------|
| Factor A | fill out |
| Factor B | fill out |
| A x B | fill out |
| Error | fill out |
| Total | fill out |

1d.

Mention two strategies to increase the degrees of freedom of the error (see table above), show how they would increase said degrees of freedom, and discuss the implications in the conclusions of the study.

2.

Find a publication from your domain (e.g., animal science, agronomy, etc.) and paste a snippet of the Materials and Methods section where they describe the designed experiment. Answer the following questions:

2a.

What is the treatment structure? How many levels for each factor?

2b.

What is the design structure?

2c.

Would you change anything in the wording/writing to make it more understandable?