

Agronomy 526 Homework

Due: 4/7/22

1. The following data are from an experiment designed to evaluate the crude protein (CP) concentration of six legumes at three different harvest dates. The six legumes were: 1) crimson clover, 2) red clover, 3) white clover, 4) berseem clover, 5) crownvetch, and 6) sweetclover. The legume treatments were replicated four times in a randomized complete block design (RCBD). Three hay harvests were made sequentially on the same legume plots within each block.

| Legume | Harvest | Block | | | |
|--------|---------|-------|-------|-------|-------|
| | | 1 | 2 | 3 | 4 |
| 1 | 1 | 19.11 | 18.87 | 18.10 | 20.11 |
| 1 | 2 | 20.72 | 20.14 | 18.00 | 19.52 |
| 1 | 3 | 21.92 | 19.97 | 17.87 | 20.57 |
| 2 | 1 | 15.70 | 15.63 | 16.98 | 15.49 |
| 2 | 2 | 17.21 | 16.22 | 15.45 | 14.51 |
| 2 | 3 | 15.40 | 15.31 | 16.38 | 14.05 |
| 3 | 1 | 14.51 | 15.66 | 15.00 | 14.72 |
| 3 | 2 | 16.76 | 16.89 | 15.04 | 14.79 |
| 3 | 3 | 18.14 | 15.05 | 18.17 | 15.16 |
| 4 | 1 | 21.24 | 20.74 | 20.53 | 19.32 |
| 4 | 2 | 17.41 | 15.35 | 16.15 | 13.52 |
| 4 | 3 | 15.68 | 16.21 | 12.81 | 12.16 |
| 5 | 1 | 23.55 | 23.34 | 21.25 | 22.51 |
| 5 | 2 | 20.72 | 20.19 | 19.85 | 21.69 |
| 5 | 3 | 21.69 | 20.42 | 21.06 | 20.03 |
| 6 | 1 | 17.25 | 17.96 | 17.43 | 15.73 |
| 6 | 2 | 14.13 | 15.26 | 13.13 | 14.43 |
| 6 | 3 | 14.06 | 13.19 | 13.02 | 11.75 |

- a. Write the linear additive model and expected mean squares for the experiment.
 - b. Perform the analysis of variance and interpret the results.
 - c. Slice the Legume x Harvest interaction means and interpret the results.
 - d. Make a bar chart of the Legume x Harvest interaction means.
 - e. Use PDIFFS to answer the following questions:
 - 1) which legume species had the highest CP concentrations across the three harvests?
 - 2) which legume species had the most and least stable CP concentrations across the three harvests.
- * turn in your SAS program as well as output