Agronomy 526 Homework

Due: 4/12/22

1. The following data are from an experiment designed to evaluate three forage legumes grown in mixtures with smooth bromegrass. The four treatments were: 1) no legume control 2) birdsfoot trefoil, 3) alfalfa, and 4) kura clover. The experimental design was a RCBD with four replications. Forage yields (kg DM / ha) were determined for each plot four times during the growing season. All factors other than blocks were fixed.

Block	Treatment	Harvest 1	2	3	4
1	Alfalfa	6052	1850	2424	1272
	Control	2930	316	626	89
	Kura	5366	897	1877	338
	Trefoil	6459	1883	1565	282
2	Alfalfa	6473	2313	2803	1172
	Control	3042	350	686	114
	Kura	5396	925	1938	297
	Trefoil	7085	2127	1777	254
3	Alfalfa	7379	1910	2349	736
	Control	3108	246	330	95
	Kura	5510	877	2185	599
	Trefoil	5749	1535	2631	219
4	Alfalfa	7066	2000	3098	1568
	Control	3181	266	490	142
	Kura	5546	882	2109	444
	Trefoil	7997	1343	1663	241

Using the REPEATED statement in PROC MIXED:

a. Perform an analysis of variance using the UN (unstructured) covariance structure.

b. Perform the analysis using the compound symmetry (CS) structure.

c. Evaluate the output of the analyses from 1 and 2 and determine if the data conform to the assumptions required for analyzing the experiment as a split plot in time.

d. Perform the analysis with any other covariance structures that seem reasonable.

e. Use model fitting criteria from the MIXED output to select the most appropriate covariance structure of those evaluated in 4.

f. Using the best model for the analysis of variance, interpret the results making sure to explain any interactions.

*   turn in your SAS program as well as output