Discussion #5

February 28, 2010
1. In a split plot design, what are the error terms for both the MP and SP in a:
   A. RCBD
   B. CRD

2. In a strip plot design: what would be the error terms for both the MP and SP in a
   A. RCBD
Repeated Measures Decision Tree

1. Run standard split-plot analysis
   - NS
     - STOP
   - **
     - 2. Test conservative df
       - NS
         - STOP
       - **
         - 3. Use SAS REPEATED G-G G adjusted p
           - STOP
In Triads

1. Run standard split-plot analysis
   1. Why are RMs considered split plots?
   2. What are the two main differences between a traditional subplot and ‘Time’ as a subplot?

2. Test conservative df
   1. Why use conservative df?
   2. How would you going about doing this?

3. Use SAS REPEATED (G-G adjusted p)
   1. How would this be done in SAS?
   2. Why is this done?

Together

Review Overall procedure (Steps 1-3) and then discuss what would be your next steps
**Question #1**

<table>
<thead>
<tr>
<th>Class Variable</th>
<th>Block or Treatment</th>
<th>Number of Levels</th>
<th>Fixed or Random</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Block</td>
<td>4</td>
<td>Random</td>
<td>Blocks in the field</td>
</tr>
<tr>
<td>2</td>
<td>Treatment</td>
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<td>Fixed</td>
<td>Level of applied nitrogen (0 or 100 lbs/ac)</td>
</tr>
<tr>
<td>3</td>
<td>Treatment</td>
<td>4</td>
<td>Fixed</td>
<td>Four green manure treatments (3 green manures and a control)</td>
</tr>
</tbody>
</table>

- **Design:** RCBD with a split-plot factorial treatment structure; 1 rep per block*factorial combination
- **Response Variable:** Sugar beet yield (tons/ac)
- **Experimental Unit:**
  - a) For N Level, the experimental units are main plots (2 per block);
  - b) For Green Manure Type, the experimental units are subplots (4 per main plot).
- **Subsamples:** No
Question 1.7

Is there a yield difference between BV (Barley + Vetch) at N = 0 and B (Barley) at N = 100? [Use LSD; you need to do the calculations by hand.] If you wished to do a Tukey comparison instead of an LSD, what would you change in the procedure you just went through? [Don't actually do it, just state what would be different in the procedure. Tip: What about your first analysis made it LSD?]

• Where to look: Topic 12, split plot designs and its relatives, page 11

• LSD vs Tukey = A difference in the MSD calculation
### Question #2

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<td></td>
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</tr>
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</table>

**Design:** RCBD with a strip-plot (or split-block) treatment structure; 1 rep per block*factorial combination

**Response Variable:** Sorghum yield

**Experimental Unit:**
- a) For irrigation method, the experimental units are halves of the blocks;
- b) For N rates, the experimental units are thirds of the blocks (strips orthogonal to the halves allocated to irrigation methods).

**Subsamples?** No
Question 3.2

Analyze the data from this experiment in the following three ways:

a. Generate an ANOVA table assuming no correlation among the different sampling points in time (i.e. an ANOVA with full degrees of freedom).

b. Generate an ANOVA table assuming perfect correlation (i.e. an ANOVA with conservative degrees of freedom).

c. Present ANOVA tables for mainplot (Intervention) and subplot (Village) effects using the "Repeated" option under Proc GLM. Present the Sphericity test result and comment on its meaning.