

Table 8.11 *Data from Oxide Growth Experiment*

Run	FP	St 1	St 2	St 3	St 4	St 5	St 6	St 7	St 8	St 9
1	1	90.1	90.1	92.8	87.8	88.2	88.2	90.4	92.1	91.8
1	2	91.9	93.3	94.1	89.1	91.4	92.2	87.5	91.2	91.1
1	3	88.1	90.8	91.5	88.2	90.5	92.3	87.4	92.6	92.4
1	4	90.0	93.1	92.7	91.6	89.2	92.6	87.0	93.2	95.2
2	1	90.7	90.8	90.3	92.7	88.4	89.0	89.1	92.6	92.8
2	2	88.6	89.1	91.5	89.5	86.6	93.4	89.9	91.8	92.3
2	3	90.2	90.4	90.9	94.7	91.3	91.3	90.0	91.6	92.0
2	4	90.8	92.6	92.6	88.4	92.4	89.9	89.9	91.9	94.1
3	1	89.4	90.0	93.0	90.4	90.4	89.9	91.6	92.6	93.0
3	2	89.7	90.1	92.1	88.6	90.0	92.6	89.2	92.5	93.0
3	3	86.6	94.9	91.0	89.0	90.9	92.3	90.5	93.6	93.6
3	4	93.2	93.9	91.7	90.3	90.5	93.0	89.7	92.5	94.6
4	1	87.8	93.2	91.7	85.6	90.3	87.9	89.1	93.2	90.9
4	2	86.6	92.4	90.9	90.9	91.4	90.4	89.7	92.6	92.7
4	3	91.9	93.5	97.9	90.1	87.7	92.1	89.0	92.0	93.4
4	4	89.1	92.1	94.6	92.0	89.6	92.4	92.9	96.2	96.1
5	1	91.8	90.4	91.7	91.8	89.0	90.0	88.9	93.8	92.3
5	2	89.3	94.5	94.6	95.8	93.0	91.7	89.2	93.3	95.2
5	3	90.0	92.0	95.0	92.7	88.5	91.3	90.0	92.1	93.9
5	4	90.2	90.4	93.4	92.4	88.8	91.7	89.4	96.7	92.5
6	1	90.3	91.1	93.3	93.5	87.2	88.1	90.1	91.9	94.5
6	2	91.1	89.8	91.5	91.5	90.6	93.1	88.9	92.5	92.4
6	3	92.4	91.7	91.6	91.1	88.0	92.4	88.7	92.9	92.6
6	4	94.1	91.5	95.3	92.8	93.4	92.2	89.4	94.5	95.4
7	1	90.3	91.2	93.0	89.7	88.1	91.0	89.7	95.0	95.4
7	2	92.7	89.3	90.9	90.2	88.8	92.5	89.9	94.2	93.6
7	3	87.0	94.0	95.8	91.7	89.7	88.7	90.7	94.9	91.4
7	4	91.8	91.8	91.6	94.7	92.7	92.5	90.1	94.9	92.8
8	1	89.0	89.8	89.0	90.5	90.1	88.6	90.5	91.3	93.3
8	2	89.9	90.6	90.4	91.8	88.3	93.1	88.4	92.1	93.1

- What is the model for the data?
- Input the data (there is code to do this in the R Examples for Chapter 8 on the web page for the book).
- Analyze the data using `lmer()` function in the `lme4` package and the `aov()` function.
- Describe any significant differences you find and interpret what these differences mean by referring to tables or graphs of means or multiple comparison tests.
- Check the assumptions of equal variance and normality of the whole-plot and split-plot error terms as described in Section 5.9.