PLANT-GROWTH EXPERIMENT

7.   Describing the Data

Now we compare the height of the plants obtained by various combinations of seed type and watering plan by providing some summary statistics. The two tables displayed below show the factor-level means and standard deviations for the three seed types and four water levels.

HEIGHT * SEED			
HEIGHT			
SEED	Mean	N	Std. Deviation
1.00	39.5000	8	3.2950
2.00	39.5000	8	5.7071
3.00	39.0000	8	4.0356
Total	39.3333	24	4.2699

As you can see, the mean height is 39.5 for seed type 1 and 2, and 39 for seed type 3. The marginal means differ very little from the overall mean of 39.3333. In other words, there is very little variability in the mean height for the three seed levels. Seed main effects do not seem to be significant. Moreover, the variability in the plant height is relatively small across the three seed levels.

HEIGHT * WATER			
HEIGHT			
WATER	Mean	N	Std. Deviation
1.00	35.3333	6	2.8752
2.00	37.0000	6	1.7889
3.00	40.0000	6	2.3664
4.00	45.0000	6	1.4142
Total	39.3333	24	4.2699

The plant height is the largest for water level 4 and smallest for water level 1. There is a great deal of variability in the mean height across the four water levels. The marginal means differ significant from the overall mean of 39.3333, the average of all 24 heights.

Notice that each of the two tables describes one factor only, and therefore is not able to display the interaction (if any) between the two factors. The following SPSS output provides some numerical summaries of the plant height for each combination of levels of the factors.

SEED * WATER

Dependent Variable: HEIGHT

SEED	WATER	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1.00	1.00	36.000	1.041	33.732	38.268
	2.00	38.000	1.041	35.732	40.268
	3.00	40.000	1.041	37.732	42.268
	4.00	44.000	1.041	41.732	46.268
2.00	1.00	32.000	1.041	29.732	34.268
	2.00	38.000	1.041	35.732	40.268
	3.00	42.000	1.041	39.732	44.268
	4.00	46.000	1.041	43.732	48.268
3.00	1.00	38.000	1.041	35.732	40.268
	2.00	35.000	1.041	32.732	37.268
	3.00	38.000	1.041	35.732	40.268
	4.00	45.000	1.041	42.732	47.268

The combination of seed 2 and water level 4 produces the highest plants. The combination of seed 2 and water level 1 produces the lowest plants.