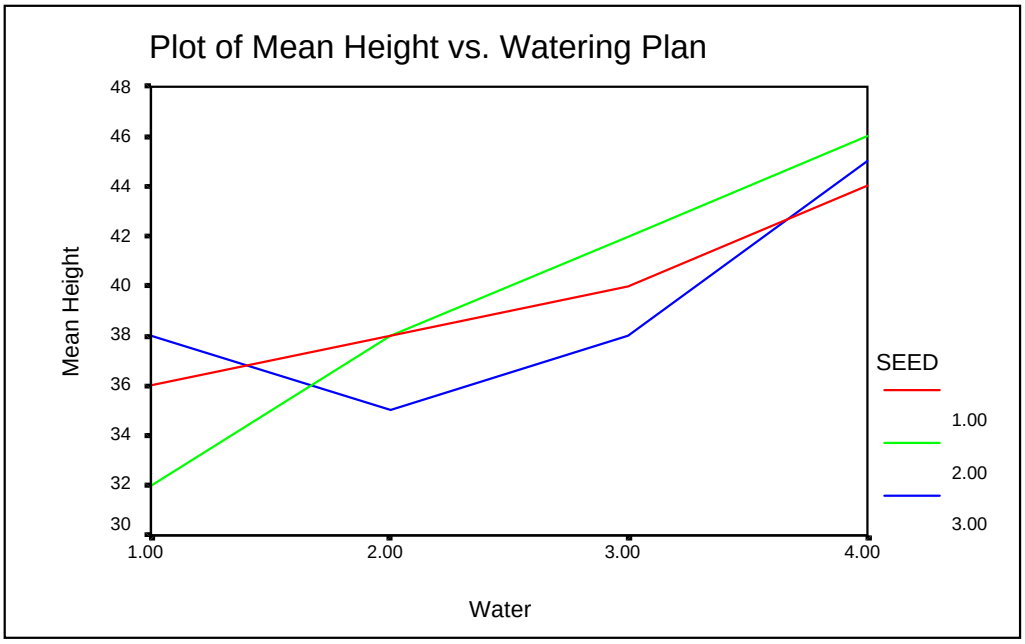
PLANT-GROWTH EXPERIMENT

6. Displaying the Data

Graphical displays of the data can be very helpful for understanding the information contained in the data. We will visualize the effects of seed type and watering plan on the plant growth by obtaining the plot of mean heights versus seed type by watering plan and the plot of mean heights versus watering plan by seed type.

6.1 Mean Heights versus Watering Plan by Seed Type
6.2 Mean Heights versus Seed Type by Watering Plan
6.3 Scatterplot of Height versus Watering Plan with Seed as the Grouping Variable

6.1 SPSS produces the following line chart of mean height versus watering plan by seed type:



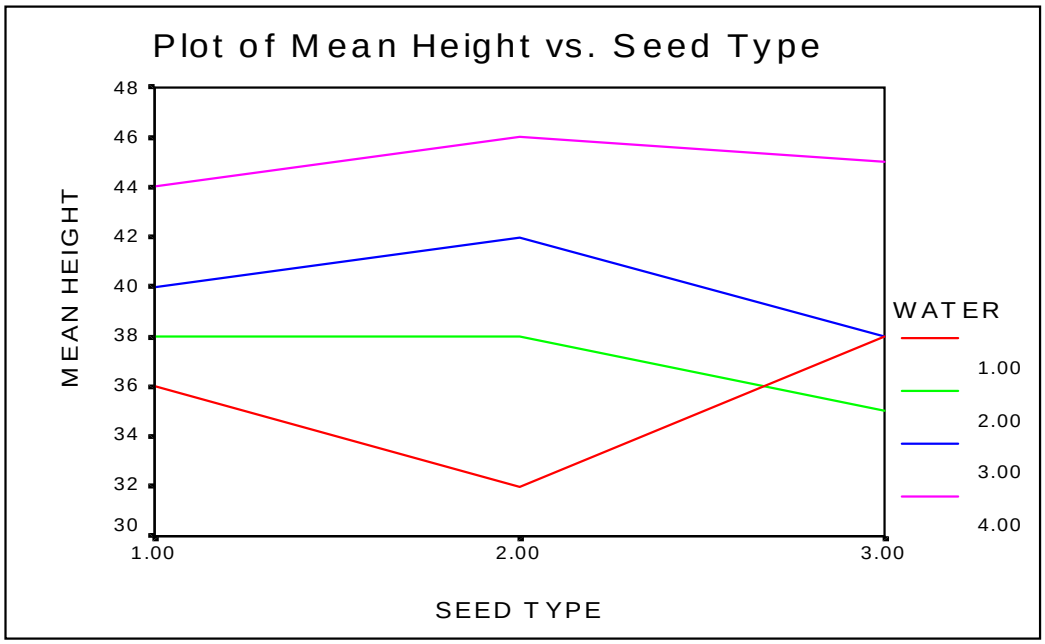
The lines in the graph are obtained by connecting the factor-level means for the four water levels. The plot indicates that the mean height increases with the water level for the seed type 1 and 2. On the other hand, the mean height decreased slightly from water level 1 to level 2 and increased sharply at water levels 2 and 3. The growth rate is uneven for different combinations of seed type and amount of water. The graph indicates a lack of additivity (interaction) between the means for the different seeds when taken across the water levels.

The seed 2 produces the shortest plants under the watering plan 1 but it surpasses the other seeds under the watering plans 2, 3, and 4. It looks that the plants obtained from the seed need more water than the other plants.

The seed 3 does not perform well under the watering plan 2 and 3, somehow increasing the frequency of watering and amount of water does not produce higher plants in this case.

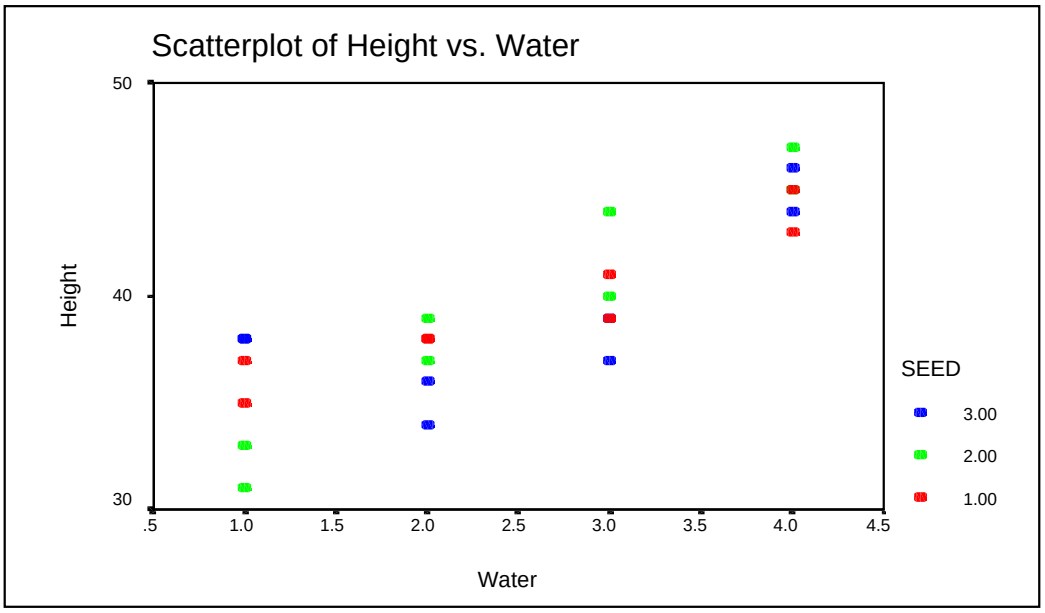
The strongest interaction effect is shown for the water level 1 with seeds 2 and 3. This corresponds to the point where the above graph displays the greatest degree of non-additivity.

6.2 SPSS produces the following line chart of mean height versus watering plan by seed type:



The three lines corresponding to the three water levels 1-3 show that the three seeds respond in similar manner across the three seed levels. There is no overlap and weak interaction between the watering plans 1-3 and seed type on the height. These lines indicate that the means for the water level 4 are higher than the means for water level 3, and those are higher than the means for water level 2. 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.

6.3 The effects of various water levels and seed type on height of the plants can also be visualized with a scatterplot of height versus watering plan with seed as the grouping variable:



The plot indicates that in general height increases with water level. The plot is consistent with the conclusions reached in sections 6.1 and 6.2