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Grade 7-Red Saint Joseph Catholic School

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Botany

When Plants Attack: Even Plants Need Space to Live!

The purpose of this experiment was to observe the growth of companion and combatant plants to understand how they grow in different spacing patterns, close together and spread out. Sunflowers were planted in between bush beans and basil. Sunflowers are combatants with bush beans but companions with basil. The hypothesis of this experiment was that if the spacing between the plants is too small then the plant growth will be stunted; if the spacing is just right then the growth is maximized. By discovering the correct spacing and understanding the interaction between the plants, a better garden can be built to provide healthy flowers, vegetables, and herbs for everyone to enjoy.

To conduct this experiment, sunflower, bush bean, and basil seeds were sown and germinated in a custom-made cedar planter box (0.61 x 1.22 meters). A custom mix of garden soil and moisture control potting mix was combined in the planter box (5 total bags). A 30 watt grow light for plants was mounted over the box to provide 16 hours of artificial light each day, and the box received sunlight from a south-facing window. A soil moisture meter was used to maintain the right soil moisture level and a flexible metric ruler was used to measure the plant heights. The procedure for the experiment was to sow the seeds in three different spacing patterns (10.2, 15.2, 20.3 cm) and water the plants so that the soil moisture was just right each day for proper growth. The average plant heights were measured and recorded in Google Sheets at the end of each day for 36 days. Pictures were taken each day to visualize plant growth. The dependent variables were the growth height, the height difference for the three plant types, and three spacing patterns. The independent variables were the distance between each plant and the three plant types. The number of seeds per plant type (seed density) and amount of sun and artificial light on the plants was kept constant for the three plant spacing distances to better understand the effect of spacing on growth; this was the control for this experiment.

The conclusion was that the hypothesis was mostly correct. Basil and sunflowers were clearly impacted by all three plant spacings. The three spacings had a minimal impact on the overall height of the bush beans. Basil growth was stunted considerably, more than likely impacted by the bush beans, a combatant to basil. Surprisingly, bush beans grew 38% higher than the sunflowers and stunted sunflower growth for the 10.2 cm spacing pattern. The optimum planting pattern appears to be the 15.2 cm spacing for bush beans and sunflowers. It is recommended that basil be planted much further away than 20.3 cm from bush beans and sunflowers for optimum growth. So even plants need space to live properly!