

Scientific Study of Plant Spacing vs. Plant Shape

Introduction

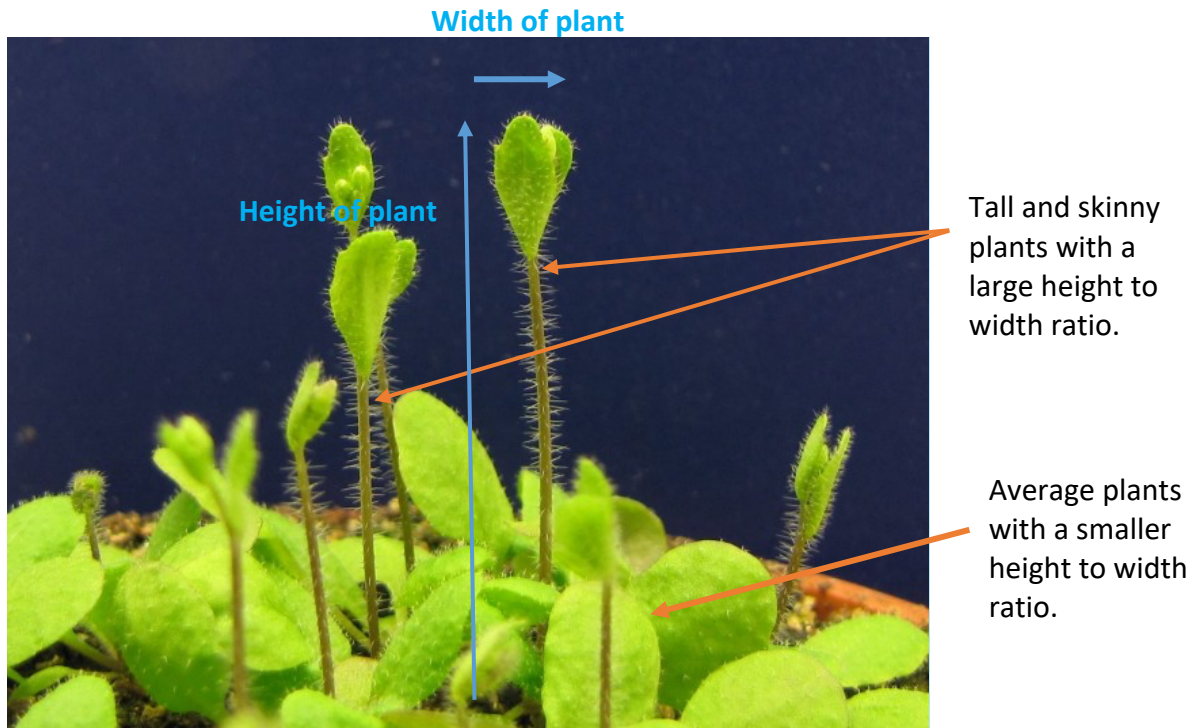
An ecosystem contains many different organisms, and these organisms interact with each other. One of the ways that organisms interact is through competition. Competition occurs when organisms need to share the same resource and the resource is in limited supply. The result is that some organisms outcompete the others and get more of the resource, and the other organisms do not fare as well. A common example of competition would include plants that are crowded for space. In this case, some of the plants may die, which effectively gives more space to the surviving plants. This is the basis of our scientific study. We want to answer the question: Does changing the distance between plants affect the shape of the plant? It seems likely that placing the plants closer together will cause competition, which could lead to plants dying, or possibly to plants altering their usual growth (height, fullness, and number of leaves, for example).

Study Design

The independent variable in our study is the spacing between plants. We will plant coleus seeds at different spacings, ranging from 1"-14" between seeds. The dependent variable is the shape the plant grows. We will measure the ratio of the height of the plants to the width of the plants, the symmetry of the plants, and whether they live or die. Figure 1 below shows how the height and the width of the plants are measured. The height to width ratio would be height divided by width.

Anticipated Outcome

Our prediction is that plants will have a smaller height to width ratio and will be more symmetric when they have more space (at the 14" spacing) than when they are crowded (at 1"). The height to width ratio is often larger when plants are competing for sun; they grow tall and skinny. However, it is also possible that there will be no measurable difference in how the plants grow at different spacings, because the plants will only have to compete for space and possibly sunlight, and at the closest spacing, some of the plants might die. Another possibility is that the plants will be generally smaller due to competition, but not actually have a different shape.



Plants growing tall and skinny in an effort to outcompete their neighbors. These plants will have a large height to width ratio.