Name(s)
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Project Number
J1922

Project Title
How Does Companion Planting with Nitrogen Fixing Crops Affect Plant Development?

Abstract

Objectives/Goals
The objective of this study is to measure the effects (defined as a difference in mass) between a solitary Swiss chard plant and a Swiss chard plant that is planted in close proximity to a nitrogen fixing legume (in the case of my experiment; either a bean or pea).

Methods/Materials
Three 0.46m by 0.3m by 1.07m planters, vegetable soil, potting soil, 24 Swiss chard seeds, eight bean seeds, eight pea seeds, available water. In my experiment, I filled all three planters with an equal amount and ratio of potting and vegetable soil. I then planted eight isolated Swiss chard in the first planter, paired up eight Swiss chard with eight beans in the second planter, and paired eight Swiss chard with eight peas in the second planter. After a 77-day growth period, I then carefully dug up each plant, isolated their roots from the surrounding soil, and measured their individual masses.

Results
From the data I collected in my experiment, I have found that on average, the solitary Swiss chard plants weighed 16.125 grams, while on average, a Swiss chard planted with a bean weighed 3.875 grams, and on average a Swiss chard planted with a pea weighed 6.375 grams. This displays that planting a Swiss chard in close to a legume (bean or pea) has a negative effect on plant growth. This data fulfills my objective by showing an effect in growth between the average solitary Swiss chard specimen, and the average Swiss chard specimen planted with a legume.

Conclusions/Discussion
The results of my study could be implemented in many ways, but must notably in agriculture. A common issue in today's agricultural systems is the lack of fertilizer in developing countries. A common solution to this problem is the use of nitrogen fixing legumes to replenish nutrients in the soil. My study could be used to advise farmers not to plant a feeder (such as Swiss chard) and a legume (such as a bean or pea) during the same time period. If agriculturalists implemented the results of my project, they could better farm with low amounts of fertilizer.

Summary Statement
As measured by the mass of several Swiss chard plants, I've concluded that planting a Swiss chard plant in close priximity to a legume impairs overall grwoth.

Help Received
The only help I was given over the course of my project was advice from my mother regarding the contruction of my tri-fold board.