Using Computers To Optimize Crop Yield

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Purpose - The purpose of this design project is to find a more efficient way of planting corn crops in order to increase a farm's output. This information can be used to help farmers, especially in countries where populations are higher and there is less access to money and technology. The program utilizes four crop planting patterns as well as three field shapes. In the project redesign the most efficient crop planting pattern and approximate field shapes were applied to a new set of crops: corn, soybeans, and rice, which helped further expand the real world applications of the project by showing that the hexagonal pattern is useful for a variety of crops. Additionally, the redesign incorporated ENSO as a weather phenomena that could affect crop growth. This addition helps show how new crop planting techniques can be used to combat weather damages. Procedure - In order to design this project, it was necessary to learn the Python programming language from a combination of professional programmers and online learning tools. The skills learned were then used to build and edit both the initial and subsequent redesigns of the project. Conclusions - The standard planting pattern for corn, soybeans, and rice is not the most efficient way to plant these crops, but rather it is the hexagonal pattern that the program modeled. The hexagonal pattern maximizes the space used to grow crops on the field, resulting in increased yields, even with pressures from weed infestations and ENSO. More crops are negatively affected by weed infestations and ENSO events when using the hexagonal pattern, however it is not enough to negate the increase in yields that the pattern provides. Square and circular shaped fields also lead to higher yields than triangular shaped fields.

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