Comparison of Germination Rates of Crops and Wild Agricultural Species

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Introduction
For thousands of years, wild species of plants were used by humans for food and medicine. Wild carrots were used by the Europeans for approximately 5,000 years before being domesticated in the Afghan region 1,100 years ago. It is suspected that lettuce was domesticated by the Egyptians around 2500 B.C.E. Corn was domesticated 10,000 years ago in Mexico by farmers who planted specific seeds to isolate desirable traits. Native Americans domesticated the sunflower 4,000 years ago in Eastern North America.

Due to their genetic uniformity, crops are at risk for wide-spread failures from disease and other threats. In the 1990s, farmers began crossing crops with their crop-wide relatives in order to increase genetic diversity and improve their survival rate. In the case of failure, the impact can be deadly. The Philippines and Indonesia suffered rice losses, which impacted their country significantly as rice is a staple food in those countries. Thus, efficiency is important when growing crops. My hypothesis is that the crops will have more uniform germination rates than their wild relatives and germinate more rapidly.

Materials and Methods
Crop seeds of carrot, corn, lettuce, and sunflower were obtained from Seeds of Change and wild seeds of those same plants were obtained from the USDA. There was 1 variety of crop seeds and 3 varieties of wild seeds for each plant. These seeds were planted in an 8 x 16 flat with soil and placed on the mist bench. Over the next week, the plants were monitored daily for signs of germination. As the days progressed, the germination rates were tracked on an Excel sheet.

Results

Figure 1: Germination Rates

Figure 2: Germination Time
Figure 3: Germination Time
Figure 4: Germination Time
Figure 5: Germination Time

Future Implications
This research is important primarily for educational purposes. Since crops originated from their crop-wide relatives, it is vital to conserve the crop-wide relatives. Crop-wild relatives have the potential to strengthen crops and contribute to taste, nutritional content, etc. Factors such as climate change, habitat destruction, and pollution threaten the crop-wide relatives. Without the crop-wide relatives, it would be a difficult endeavor to preserve the crops due to their genetic uniformity.

As the world population increases, the demand for similar foods will also increase. A wide-spread failure of crops would produce massive devastation. This signifies the importance of learning about the crop-wide relatives and their environment in order to ensure the health and welfare of this generation and the ones to come.

References

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