Phase II: An Analysis of the Effects of Drought on Nancy's Calico Flour Corn

Woudstra, Hannah (School: Sioux Center High School)

Malnutrition, a severe worldwide problem, falls into two categories: kwashiorkor, the lack of protein, and marasmus, the lack of all nutrients and calories. Nearly all cultures consume maize, or corn, in some form but maize typically lacks nutrients. In Phase I of this project, I tested an experimental variety of flour corn, Nancy's Calico Flour Corn, against other varieties of human-grade corn in regards to protein to determine if it would help reduce kwashiorkor. Testing showed that Nancy's Calico Flour Corn is statistically higher in protein than the other corn varieties tested. Drought and thus crop failure is a leading cause of malnutrition along with a lack of calories. Thus, Phase II focused on two factors: first drought-resistance and second caloric content. Growth and emergence rates of Nancy's Calico Flour Corn were both tested in drought conditions. Bomb calorimetry was used to test the calorie levels in Nancy's Calico Flour Corn. The calorie testing found that Nancy's Calico Flour Corn averages 376 calories per 100 grams. This means that Nancy's Calico Flour Corn is around the same calorie level as commercially available corn flour. The emergence rate found that while Nancy's Calico Flour tends to emerge after the 6-10 day average for emergence, there is no noticeable difference in emergence rates between moisture levels or age of seed as the emergence rate overall is 93.75% in 21 days. Additionally, observational data and testing done on Nancy's Calico Flour Corn indicates its drought resistance.

Awards Won: