**A study on the digestive efficiency of the European corn borer (Ostrinia nubialis) over two strains through Uric Acid quantification**

**Abstract**

Digestive efficiency is an important topic in the realm of insect physiology because it guides the allocation of nutrients to the insect in stages of growth, development, and reproduction. Insect pests are detrimental to farmers all over the US; to combat this, digestive efficiency is being merged into integrated pest management practices to create an innovative procedure to reduce losses. We know that European corn borers prep for diapause by increasing the nutrient storage to survive their dormant period. We do not know if digestive efficiency is altered as a result of upcoming diapause. Here we show as a result of upcoming diapause the European corn borer increases its digestive efficiency over two strains in varying amounts, extracting more nutrients from their diet and as a result producing less frass. With these findings, direct application into integrated pest management techniques can be done by genetically engineering the strain that requires a higher digestive efficiency (DE) by inserting the lower DE gene into it. As a result, the strain will breed and spread this antievolutionary gene extinguishing this variety. For the low DE strain, advanced monitoring techniques can be used to accurately and efficiently guide the farmer’s use of insecticide to protect their crop with a fraction of the cost based on the DE research.

**Hypothesis**

The ECB that experience longer summer-like photoperiods are expected to have a higher digestive efficiency than the ECB reared in winter-like photoperiods. The reasoning behind this is because the digestive track slows down while asleep, so it is believed that the more daylight the larvae experience the more diet they fully digest. Testing the digestive efficiency over the two photoperiods will allow insight if this theory proves accurate.

**Material and Methods**

∑ Frass\_\_\_\_

= Digestive Efficiency

∑ Consumed diet

**Discussion**

This project will benefit the insect control industry by providing information that has not been studied before. With the potential of different consumption and digestion patterns farmers will be able to efficiently deal with the European corn borer who would otherwise be destroying crops or be killed by overuse of pesticide. This data will help farmers decide how much pesticide they need when, with very little waste. This in turn saves the farmer money and prevents unnecessary pesticide runoff.