**Abstract**

**The effect of diapause on digestive efficiency across different strains of European corn borer**

Since the early 20th century, European corn borer (ECB) has remained a primary pest of agricultural corn. ECB is responsible for approximately $1 billion dollars in costs related to yield loss and managing this pest. Understanding the digestive efficiency of these larvae could provide comprehensive information to better manage the impact of ECB.

To understand the relationship between digestive efficiency and diapause we used two sympatric strains of ECB with different diapause lengths. The effect of diapause on digestive efficiency was tested by comparing the consumption rate of each strain during the fifth instar when feeding on corn plant leaves. We found that the shorter diapausing strain had a higher rate of digestive efficiency compared to the strain with a longer diapause. For the shorter diapausing strain of ECB, a higher digestive efficiency could be beneficial because competition for resources is higher when this strain begins feeding, so these larvae must utilize the resources more efficiently for survival in comparison to the longer diapausing strain which begins feeding when competition is lower. These results can be used to create better, more efficient pest management systems for farmers who are economically impacted by these larvae. One approach is planting more crops to compensate for any loss of yield due to ECB.