The first step will pertain strictly to preliminary trial information gathering. I will use this time to flush out problems with equipment and protocols. I will look for alternative ways to complete experiments and find and use all of that to inform the experimental aspects of my project.

* The European corn borer is another a dull brown colored moth but with big consequences. This species of lepidopteran is responsible for a large amount of damage to a number of agricultural crops and to no small amount corn plants. Once mated, the females of this species will lay their eggs and fix them to the substrate (in this case a host plant), and after the eggs mature, they will hatch and neonate larvae will eclose from the egg and begin feeding on the host plant. They bore a hole into the stem of their host plant and over the course of its life these larvae will consume almost their body weight in food. During this time these larvae are sensing the environment around them and integrating that information as they develop to make important developmental decisions. Light timing plays an important role in how these creatures progress through their life cycle. More specifically, the number of hours of light these insects are exposed to every 24 hours can mean the difference between continuous development from larva to pupa to adult or discontinuous development, where the time between larva and pupa are separated by months. Making these decisions as a larvae are critical life events. Imagine making the wrong decision and diapausing in the middle of winter.
* The decision to diapause modulates different processes that we can use as indirect indicators of diapause. Two of these processes include the upregulation of lipid and protein production by the fat body. These metabolites do some amazing things when given the chance to shine.

The next step I will be taking is to create an experimental design that will assist me in characterizing the

Seasons

Diapause

Diapause induction

Biology of

**Introduction**

Climate and organisms

* What is climate genrally and how does its regularity or irregularity effect ecosystems and the organisms in those ecosystems
  + Talk about seasons and insect dependency on the regularity of those seasons as important parts of their life history.
  + Basically set the stage to discuss diapause

Diapause

* General stages of diapause
* What does diapause look like in my model
  + Cue that induce diapause
  + Life stage that diapause is signaled
  + Physiology of my system at diapause induction
* Finally end on a discussion about the proliferation of fat and proteins

Fat Body

* What is the biology of the fat body
* Explain the labile nature of fat and how that in the insect senses its environment
* The role of the fat body leading up to diapause
  + Signal of environment and reaction of the fat body

The European corn borer lends its self to characterizing the role of the fat body in inducing diapause.

* The overall goal of my project
* “Studies detailing diapause-associated changes in intermediary metabolism and feeding physiology are needed across taxa with different diapause strategies to expand our understanding of the metabolic processes underlying prediapause reserve accumulation. The ultimate goal in this area is to under- stand the underlying neurological and endocrine signaling mechanisms that regulate diapause-associated shifts in feeding patterns and intermediary metabolism. ”

**Objective**

The objective of this study is to characterize the extent to which the production of TGs and SPs differ across the 4 phenotypes. I hypothesize that there is a direct relationship between the production of triglycerides and storage proteins such that in the strain that spends a longer period of time diapausing will produce more TG and proteins. To chase this hypothesis I intend to characterize the production of TGs and SPs at the point in the ECB life history where TG and protein production is ultimate. produces that directly coorelates with the each strains differning length of diapause. Thus, the univoltine strain UZ spends a longer amount of time diapausing and thus needs a larger supply of fat.

The evidence produced in this study will have two effects. First it will to the body science relating to the physiological requirements leading up to diapause in related taxa. Second, characterizing TG and protein production and how that production differes between the different phenotypes is something that has yet to be capitulated in *Ostrinia nubilalis*. Further, having a clearer understanding of the physiological requirements of this fragile