

Centennial Honors College
Western Illinois University
Undergraduate Research Day 2013

Poster Presentation

Impact of Heat Stress on Field Pennycress Seed Yield and Pollen Viability

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Field pennycress (*Thlapsi arvense* L.) is a new crop being investigated for its potential as a possible off season source for biodiesel. Related to the Brassica species of mustard and canola, winter annual field pennycress is also susceptible to heat stress during the reproductive stage of development. The objective of this study was to determine at what temperature seed development was inhibited in pennycress. The hypothesis of our experiment is that pollen viability becomes diminished as temperatures rise above 30°C as seen in the 2012 growing season.

A growth chamber experiment was conducted on spring pennycress 'Spring 32' over an 8 week period. Thirty plants in individual pots were grown to anthesis at 24°C day /18°C night. Five plants were transferred to 30, 32, 33, 34, and 35°C for 7 days and returned to normal conditions (24°C). Plant height, pod number, seed number, seed mass, dry biomass, seeds per pod, and harvest index were calculated for each plant. Pollen was collected from each plant after treatment, fixed in Carnoy's fixative, and examined for viability under a dissecting microscope. Pollen was also placed on growing media to evaluate percentage of pollen germination.

Plant height was not significantly impacted by increased temperatures when compared to plants which remained under 24°C conditions. However, temperatures above 30°C had a significant impact on pod and seed numbers. Pollen viability decreased by 84% at 30°C and 100% at 32°C. Pollen germination could not be determined due to the small size and poor visibility.