Wisconsin Fast Plant® and Wheat Growth with Competition and Limited Nutrient Availability

Cameron Gilbreath and Shannon Wilson

Introduction:

Our objective was to examine and evaluate the effect intensity of competition between the Wisconsin Fast Plant® and Wheat and to determine whether an addition of nutrients would be able to account for any decrease in growth due to competition. We hypothesize that the growth of each species will decrease when both are present in the same pot due to the introduction of competition for the same amount of resources.

Materials:

- Ruler, Scale, Plant Pots and Trays, and one seed per plant per treatment.

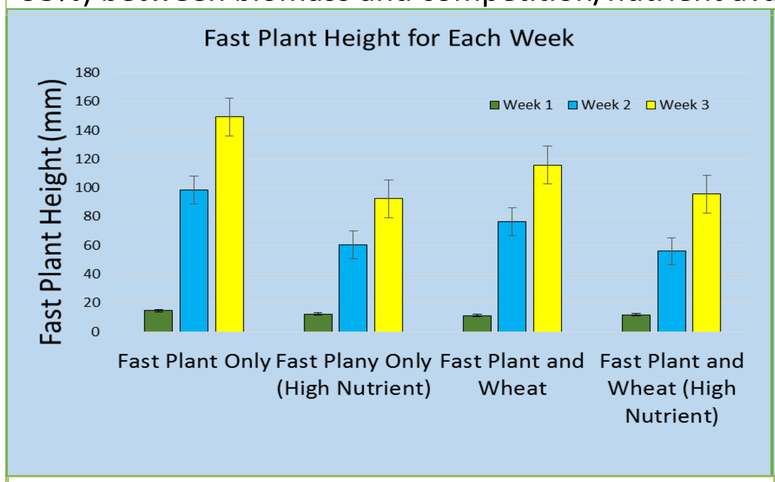
Methods:

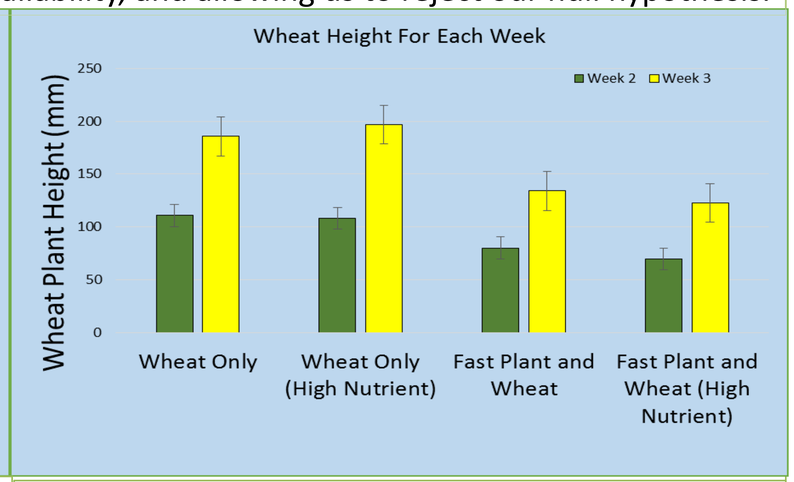
- Plant one seed of Wisconsin Fast Plant® or Wheat depending on the treatment (Barley was originally planted during week 1 but did not germinate and we had to replant with wheat during the second week)
- Each week we would measure and record the dependent variables (each plant's height, number of leaves, whether flowering had occurred, and whether splitting had occurred)
- During week 3, after recording the above listed variables, the plants were harvested and the aboveground biomass was measured and recorded

Results:

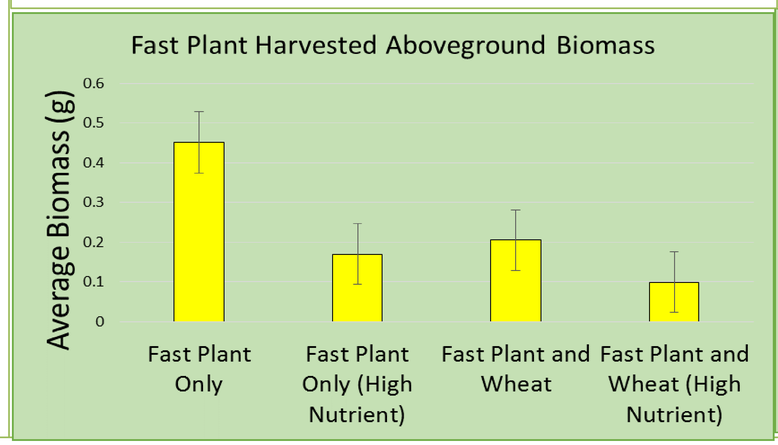
Significance:

Statistics were calculated using the PAST program. There were predicted significances between variables such as Number of Leaves and Plant Height. An ANOVA test was run for each plant to test for significance between biomass and competition and biomass and fertilizer. The p-values are 3.728×10^{-10} and 1.879×10^{-12} for Fast Plant and 3.114×10^{-17} and 0.04998 for Wheat. These values show a high significance (greater than 95%) between biomass and competition/nutrient availability, and allowing us to reject our null hypothesis.

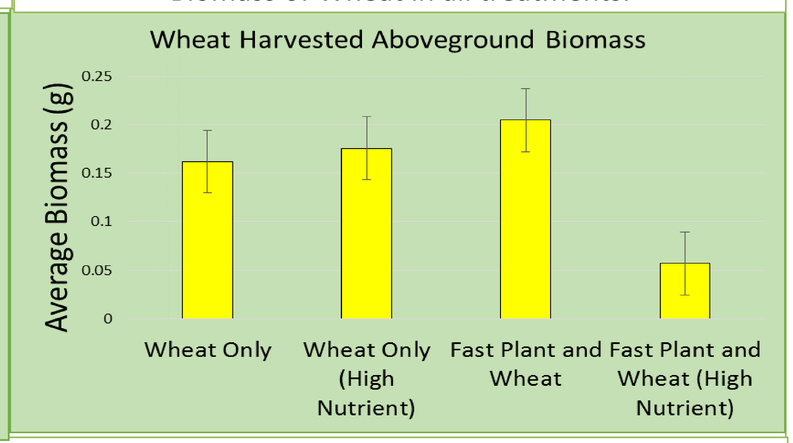




These graphs are of the Plant Height and Aboveground Biomass of Wisconsin Fast Plant in all treatments.



These graphs are of the Plant Height and Aboveground Biomass of Wheat in all treatments.



Conclusion:

Our interpretation of the data did support our initial hypothesis that the overall growth of each species would decrease when both were present in the same restrictive environment. However, our data did show that the average overall growth of Wisconsin Fast Plants with the added nutrients of the fertilizer was significantly smaller than the trials with less fertilizer. There are multiple possible causes for this. These could include: Environmental conditions, amount of Fertilizer (1 pellet was used on Low Nutrient, 4 on High Nutrient), or Type of Fertilizer. But, because we don't know the reasoning behind this unexpected result, there is room for further study into the effects of nutrient availability on Wisconsin Fast Plants.

References:

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