

# Efficacy of Selected Insecticide Seed Treatments on Bird Cherry-Oat Aphids in Wheat

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## Abstract

Bird Cherry-Oat Aphids, *Rhopalosiphum padi* (Linnaeus) (BCOA) are common in Kansas wheat fields and may vector Barley Yellow Dwarf Virus, causing a wide variety of problems including stunted and non-reproductive wheat (Whitworth and Ahmad, 2008). This experiment consisted of an experimental seed treatment and compared it to a control and a seed treatment already commercially available. Results showed that although the experimental treatment didn't provide control; seeds with CruiserMaxx<sup>®</sup> seed treatment were protected until 22 days after planting. The results indicate that the aphids these common seed treatments are fighting against were not as effective as previously determined.

## Purpose

The purpose of this research is to test the efficiency of selected insecticides on BCOA; including a new experimental seed treatment and its effectiveness compared to a current seed treatment, CruiserMaxx<sup>®</sup>.

## Questions, Hypotheses, and Predictions

**Question:** Will the insecticide seed treatments provide control of BCOA aphids, and for how long?

**Hypothesis:** The insecticide CruiserMaxx<sup>®</sup> and the combined properties of CruiserMaxx<sup>®</sup> and the experimental pesticide will have low aphid counts for the duration of the experiment.

**Prediction:** Plants with insecticide seed treatments will have reduced aphid populations.

## Study System

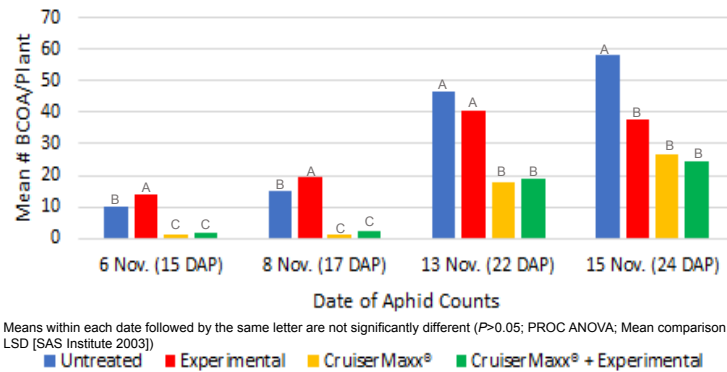
Bird Cherry-Oat Aphids, *Rhopalosiphum padi* (Linnaeus), are soft bodied and are one of the largest aphids found on wheat (Salsbury and White, 2007). They are common in Kansas wheat and are a concern because they may vector Barley Yellow Dwarf Virus. These aphids primarily reproduce asexually and will mature in 10-14 days, but only live up to about 21 days (Whitworth and Ahmad, 2008). They are common in the fall and are the first aphid to become active in the spring. When the weather starts to get cold, aphids will begin to produce winged aphids to allow for migration over long distances (Whitworth and Ahmad, 2008).



## Methods and Experimental Design

The study consisted of 4 treatments; CruiserMaxx<sup>®</sup>, Experimental, CruiserMaxx<sup>®</sup> + Experimental, and an untreated control. Treated wheat seeds were planted on October 22nd by placing 5 seeds/treatment into 12cm diameter pots filled with growing medium. Plants were placed in a growth chamber at 20 degrees C, and 12:12 L:D, and watered as needed. On November 6th, 15 Days After Planting (DAP) plants were infested by placing 5 adult BCOA on each plant. Aphid counts were made at 15, 17, 22, and 14 DAP by counting the # of aphids on each plant. The data was entered into Excel and analyzed using (ANOVA) SAS 9.1.

## Efficacy of Wheat Seed Treatments Relative to BCOAs



## Results

This study showed that seeds with only CruiserMaxx<sup>®</sup> and the combined CruiserMaxx<sup>®</sup> and experimental effectively killed BCOA infesting plants. However, after two weeks they lost their protective qualities and began to accumulate an exponential amount of aphids. Aphid numbers on the control and experimental seed treatments doubled for every count taken. Treatments containing CruiserMaxx<sup>®</sup> had consistently low aphid populations until 22 DAP when populations began to grow rapidly. The experimental treatment alone did not control aphids better than the control. By 24 DAP none of the seed treatments were providing control of BCOA.



## Conclusions

Seed treatments containing CruiserMaxx<sup>®</sup> provided good control of BCOA, but only for the first 17 days after planting. The experimental seed treatment is not a good option for the control of aphids. Thus, CruiserMaxx<sup>®</sup> is a good option for BCOA control in the fall, for the first 2 weeks after planting.

## Future Directions

This experiment needs to be repeated to determine that the results are consistent. Also, this should be done on a large-scale field setting with naturally occurring aphid populations to see if the elements have any significant effects on the results.

## References

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