

**IMPACT OF WHORL FEEDING BY FALL ARMYWORM IN CORN****Z. Taillon****G. M. Lorenz****University of Arkansas Cooperative Extension Service****Lonoke, AR****G. Studebaker****University of Arkansas NEREC****Keiser, AR****N. Seiter****University of Arkansas SEREC****Monticello, AR****N.M. Taillon****W. A. Plummer****University of Arkansas Cooperative Extension Service****Lonoke, AR****B. Stewart****University of Arkansas SEREC****Monticello, AR****H.M. Chaney****J. L. Black****A. J. Cato****University of Arkansas Cooperative Extension Service****Lonoke, AR****Abstract**

Fall armyworm larvae were placed in corn whorls at various levels of infestation to determine the amount of damage and subsequent yield loss. As infestation levels increased damage levels increased as suspected. However, yield loss was only observed on V3 stage corn at the highest infestation level. No other yield loss was observed.

**Introduction**

Infestations of whorl feeding caterpillars, particularly fall armyworm (*Spodoptera frugiperda*) and to a lesser extent corn earworm (*Heliothis zea*), have increased in corn and occurred earlier in the year during the last two growing seasons. The current recommendation in Arkansas is to treat for whorl feeders when levels reach 3-6 worms per whorl, regardless of the size or growth stage of the plant. New insecticide chemistries are much more effective against caterpillar pests and give a much longer residual than those previously available. Growers can now realize 90%+ control of whorl feeders whereas they could expect less than 50% control in the past. Preliminary data from neighboring states indicates that the economic threshold for early whorl stage corn using these new insecticides may be much lower than 3-6 worms per whorl. It is also probable that early stage corn (emergence to V6 growth stage) is more sensitive to yield loss from whorl feeding caterpillars such as the fall armyworm. It is likely that the economic threshold may be lower on early growth stage corn. Research is needed to determine the true economic threshold for whorl feeding caterpillars on early and later growth stage non-Bt field corn in Arkansas. The objective of this study was to determine the infestation level of whorl feeding caterpillars that result in economic yield loss, and to determine if plant growth stage at the time of infestation has an association with yield loss from whorl feeding caterpillars.

**Materials and Methods**

Trials were conducted in Arkansas at the Southeast Research and Extension Center, Monticello; Northeast Research and Extension Center, Keiser; and Lon Mann Cotton Research Center, Marianna in 2015 and 2016. Plot size was 12.5 ft. (4rows) by 10 ft., in a randomized complete block with 4 replications. Conventional varieties used were DKC 6694 in 2015 and P1637R in 2016. The center two rows of each plot were infested with 3<sup>rd</sup> instar larvae both years. In 2015, plots were infested at V5 at levels of 1 per 10 plants, 1 per 5 plants, 1 per plant, 3 per plant and 6 per plant, as well as a treatment that was not infested as a control. In 2016, plots were infested at V3 and another set of plots at V12. Infestation levels were 1 per 10 plants, 1 per 5 plants, 1 per plant, and 1 per 3 plants whorls at V3; and,

1 per 2 plants, 1 per plant, 3 per plant, and 10 per plant at V12. Both growth stages had a treatment that was not infested as a control. Damage was assessed 3-5 days after infestation to ensure that caterpillars were present using a 1(low)-5(high) damage scale. All trials were taken to yield. Data was processed using Agriculture Research Manager V.9 (Gylling Data Management, Inc., Brookings, S.D.) and Duncan's New Multiple Range Test ( $P=0.10$ ) to separate means.

### **Results and Discussion**

In 2015, ratings at Rohwer and Marianna indicated that as the number of caterpillars infested increased damage levels increased, however, damage levels did not correlate with yield (Figures 1 and 2). Yield data from all 3 locations did not appear to be impacted at any level of infestation at V5.

In 2016, damage ratings at all locations and at both growth stages were similar to the previous year (Figures 3 and 4). However, yield at the V3 growth stage was reduced at highest infestation level (Figure 5). In the V12 growth stage, yield was not impacted at any level of infestation (Figure 6).

### **Summary**

The impact of whorl feeding caterpillars in corn appears to be in large part cosmetic only in later vegetative growth stages even at high infestation levels but may impact yields on early vegetative growth stages.

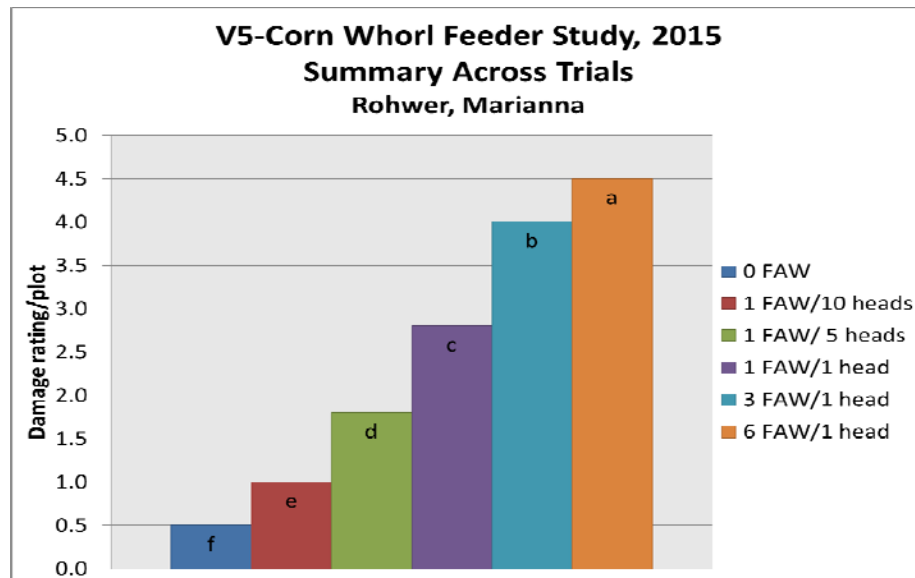


Figure 1. Damage rating per plot, 1(low damage) to 5(high damage), at 2 locations, 2015.

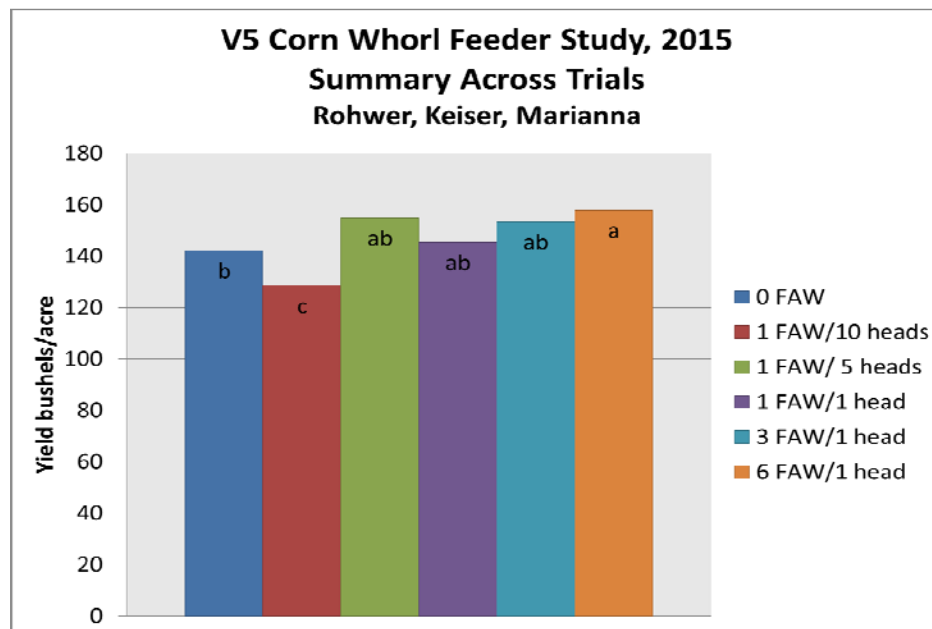


Figure 2. 2015 yield data (bushels/acre) at 3 locations.

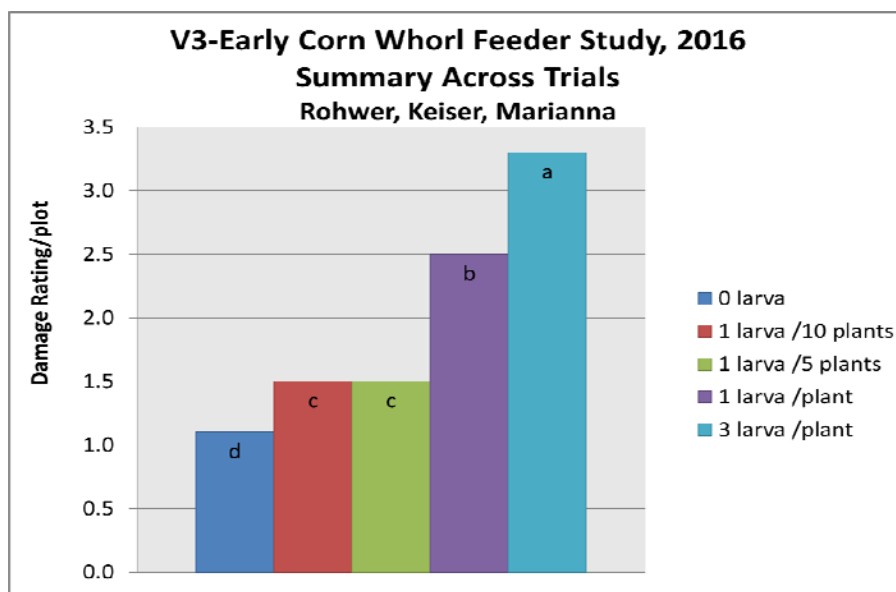


Figure 3. Damage rating per plot, 1(low damage) to 5(high damage), of trial infested at V3 growth stage at 3 locations, 2016.

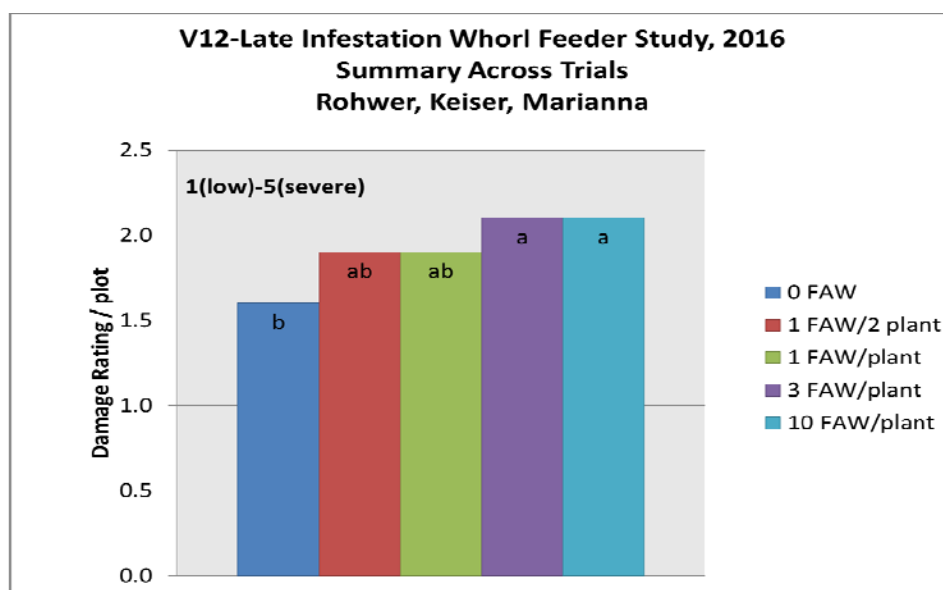


Figure 4. Damage rating per plot, 1(low damage) to 5(high damage), of trial infested at V12 growth stage at 3 locations, 2016.

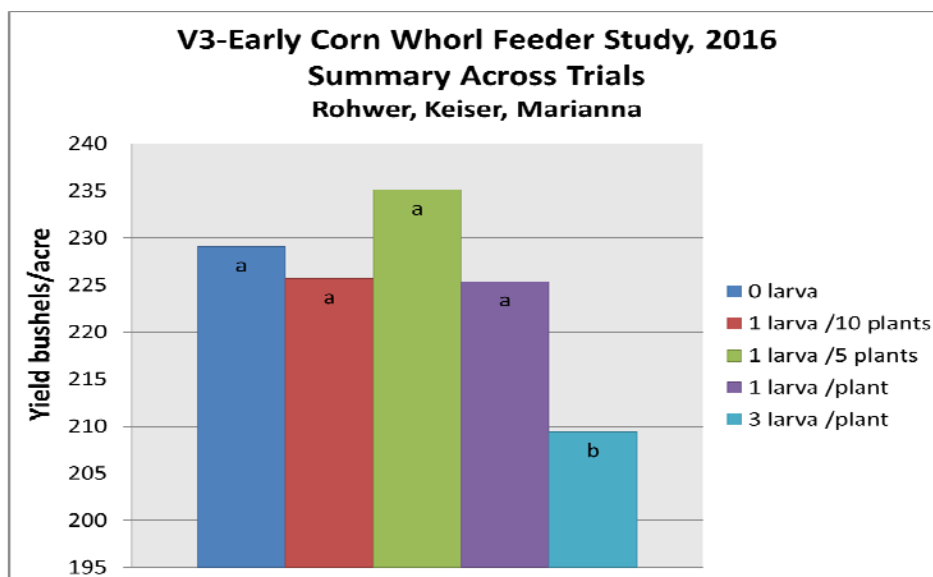


Figure 5. 2016 yield data (bushels/acre) at 3 locations for trial infested at V3 growth stage.

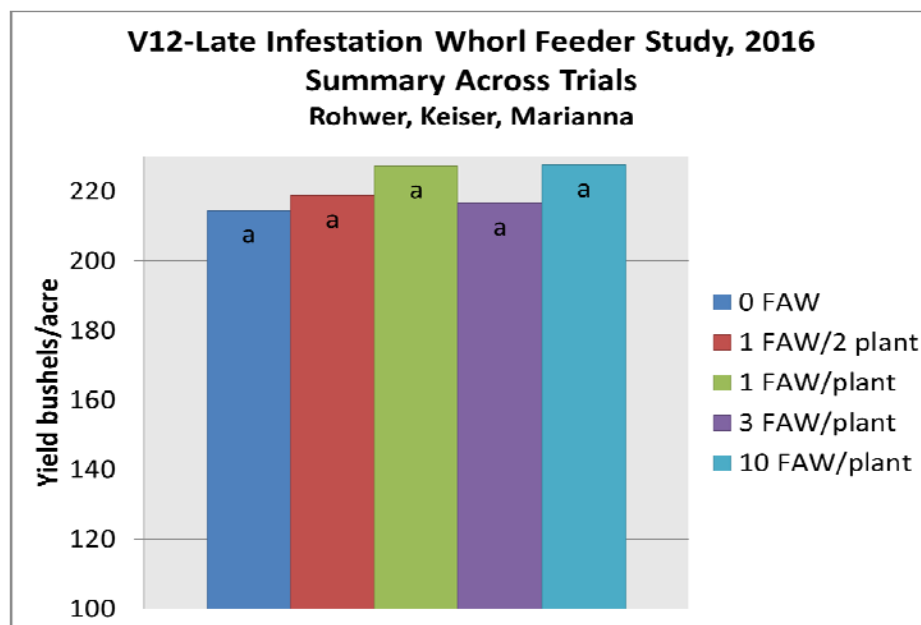


Figure 6. 2016 yield data (bushels/acre) at 3 locations for trial infested at V12 growth stage.

#### Acknowledgements

We would like to thank the Arkansas Corn and Grain Sorghum Board for funding this project, and Nancy Adams and her crew at the Monsanto Rearing Facility in Union City, TN for providing the fall armyworm larvae.