

# Monarch Oviposition and Larval Survival on Nine Native Milkweed Species

## RFR-A1508

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### Introduction

The Iowa Monarch Conservation Consortium was established in March 2015. Adding milkweeds to agricultural landscapes is one of many Consortium goals. In order to further monarch butterfly conservation efforts, scientists need more information about milkweed phenology and persistence on the landscape, and how monarchs are using these plants because milkweeds are now absent from most agricultural fields. This study is being conducted over multiple years to examine both oviposition preference and larval survival on nine milkweed species endemic to Iowa. These data will be used as a baseline for informing monarch habitat conservation and restoration efforts across the midwest.

### Materials and Methods

Milkweeds grown in the ISU greenhouse, without the use of pesticides, were planted across Iowa at 11 Iowa State University Research and Demonstration Farms. Each of nine milkweed species was randomly assigned to a 1m<sup>2</sup> plot within one row. Each block was separated by 1m. Five milkweeds of the same species were placed within each 1m<sup>2</sup> plot. The milkweed species included common milkweed, *Asclepias syriaca*; swamp milkweed, *A. incarnata*; butterfly milkweed, *A. tuberosa*; whorled milkweed, *A. verticillata*; showy milkweed, *A. speciosa*;

poke milkweed, *A. exaltata*; Sullivant's milkweed, *A. sullivanti*; tall green milkweed, *A. hirtella*; and bluevine milkweed, *Cynanchum laeve*. Once a week, each plant was examined for the presence of monarch eggs and larvae by carefully inspecting each leaf. When a larva or egg was found, the milkweed species and plant position within the plot were recorded. This protocol was modified from the Monarch Larva Monitoring Project.

### Results and Discussion

Monarch eggs and larvae were observed throughout the summer, but most findings were recorded in July and August during the second breeding generation. Monarch eggs and larvae were found on all nine milkweed species, indicating that all the milkweeds were suitable monarch hosts. The highest number of average eggs/plant was recorded from August 3–10, 2015 (Figure 1). *A. incarnata* had the highest average number of larvae (4/plant) when all monitoring data were pooled (Figure 2). This represents 33 percent of all findings (data not shown). Swamp milkweed grew well at all locations.

All nine milkweed species included in the demonstration plots are suitable host plants for monarch butterflies. Peak egg laying in 2015 occurred during the first week of August. *A. incarnata* was the species with the highest number of larvae on average at all sites, although all species were used for egg laying and as larval host plants.

### Acknowledgements

This research was supported through grants from the Iowa Native Plant Society, The Center for Global and Regional Environmental Research, and Prairie Biotic

Research, Inc., as well as the Iowa Monarch Conservation Consortium. The authors would like to thank Nick Howell and Jacob Graber for greenhouse assistance; Chris Beedle, Bernie Havlovic, Nick Howell, Steve Jonas, Nick Piekema, Warren Pierson, Ken

Pecinovsky, Matt Schnabel, Josh Sievers, Myron Rees, Lyle Rossiter, Wayne Roush, and Vince Lawson for milkweed plot planting and maintenance assistance; Logan Crees, Ali Ford, Teresa Blader, and Royce Bitzer for plot monitoring assistance.

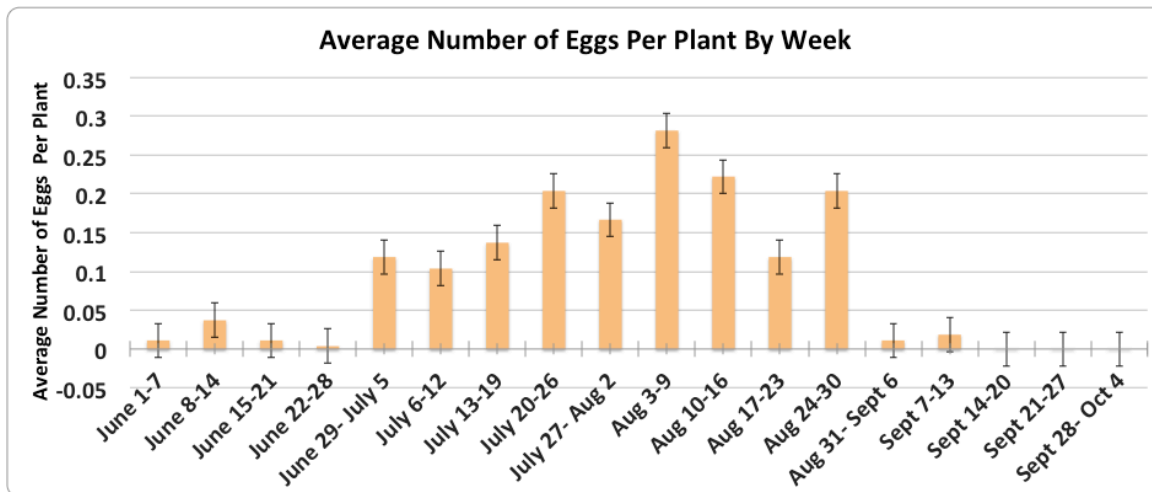


Figure 1. Average number of eggs laid per plant by week. All ISU Farm sites and species were pooled. Error bars represent standard errors.

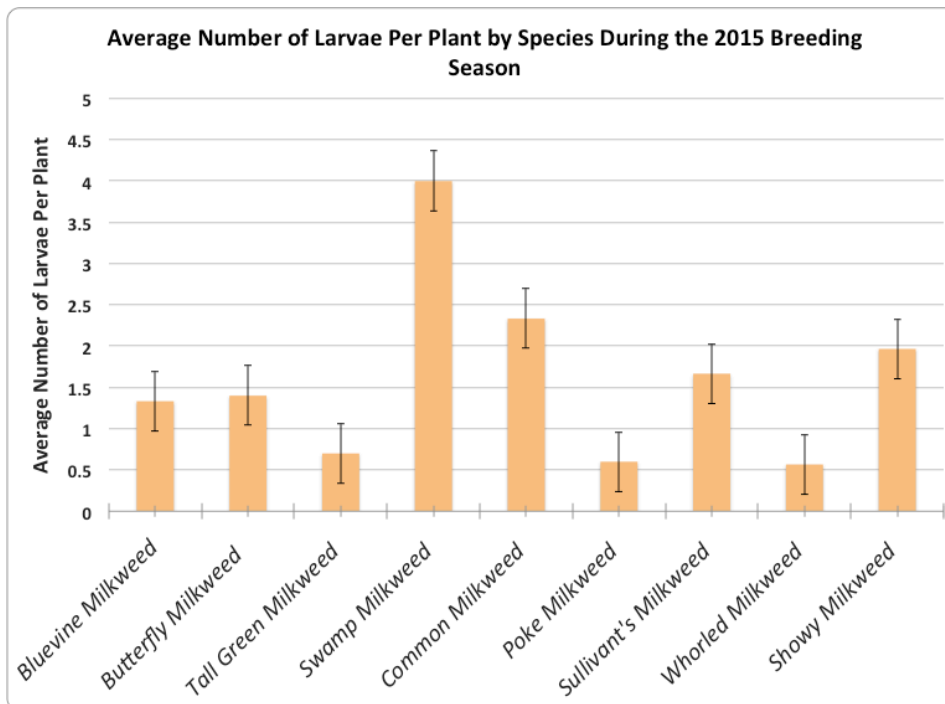


Figure 2. Average number of larvae per plant by species during the 2015 breeding season. All ISU farm sites were pooled. Error bars represent standard errors.