

Assessment of early planting and early-maturing hybrids as tools in management of the red sunflower seed weevil

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The red sunflower seed weevil has long been considered a key pest of sunflowers in North Dakota. The weevil has one generation per year, with adults emerging from the soil during early summer (Figure 1). Because females need to feed on pollen to complete development of their eggs (Korman & Oseto 1989), adult weevils move among plants within an area, leaving plants on which pollen shed is complete and landing on plants still in bloom. Female weevils lay eggs through the sunflower hull onto developing seeds, where larvae remain until they are mature. At maturity, larvae chew through the hull and drop, burrowing into the soil to overwinter. Though feeding of each weevil larva damages only a single seed, it reduces seed weight and oil (Oseto & Branness 1980). National Sunflower Association sunflower production survey data from 2017–2021 suggest red seed weevil is currently the most serious insect pest of sunflowers. Specifically, damage from the red seed weevil was detected in 46% of the 164 samples submitted in 2021, with damage as high as 76% of seeds in a sample. In some counties, damage has been bad enough that reportedly no confection contracts were offered in 2023.

Chemical management alone has not been shown to be effective in some regions so it is important to use all of the tools in the pest management toolbox. By utilizing cultivar maturity and earlier planting dates we can add a layer of avoidance to our pest management strategy. Previous research in both South Dakota (Gednalske and Walgenbach 1983) and North Dakota (Oseto et al. 1987, Prasifka et al. 2016) show that early planting can prevent much of the damage by red sunflower seed weevils. This was repeated in Dickinson in 2022 even with weather conditions delaying the earliest planting dates. Across planting dates a clear trend emerged of increasing damage with later plantings and evidence that the use of early-maturity hybrids can have an additional benefit for avoiding seed weevil damage (Figure 2). This research is under consideration to be repeated in 2023 at multiple locations with an emphasis on impact of planting date and cultivar maturity on weevil damage and yield.

Referenced Cited

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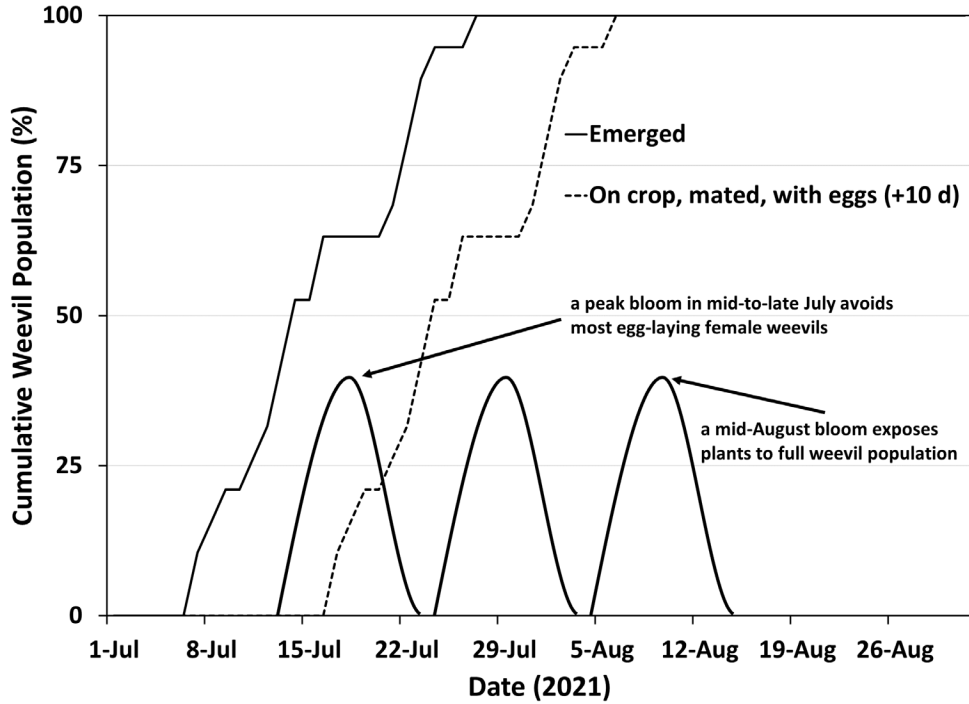


Figure 1. Emergence of red sunflower seed weevil adults in Fargo, ND during summer 2021 from plots planted to spring wheat in April 2021. Emerged weevils (or those mated and ready to lay eggs) can be compared to three potential crop bloom periods shown in ‘bell-shaped’ curves.

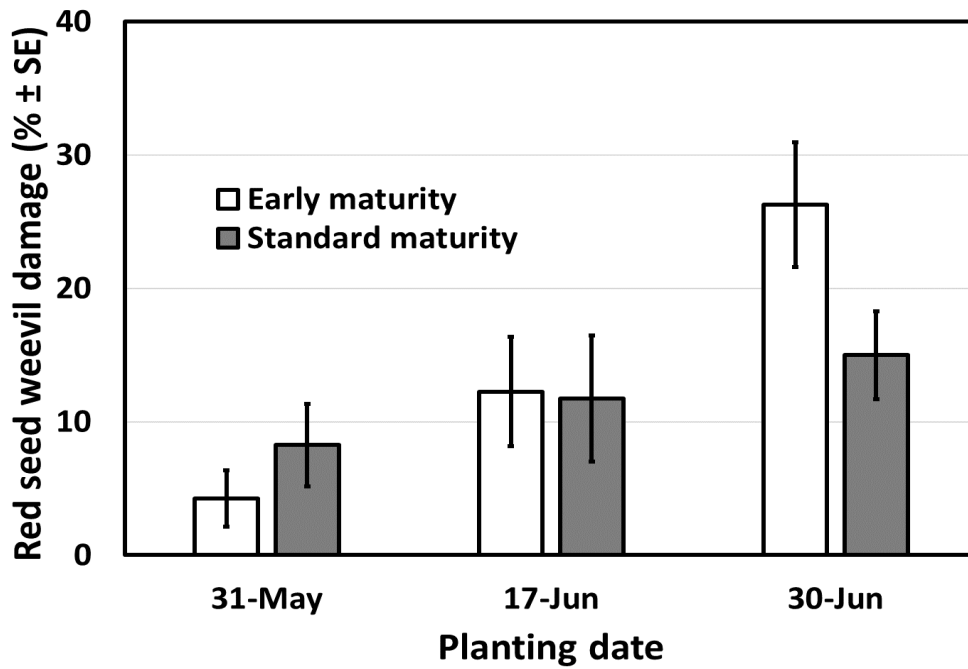


Figure 2. Red sunflower seed weevil damage in 2022 trial near Dickinson, ND. Plots varied for planting dates and hybrid maturities. No insecticides or other insect management used.