

Increasing Preventative and Curative Options for Clover Root Curculio Management in Western Alfalfa

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Clover root curculio (*Sitona hispidulus* Fab.) (CRC) is an economically important pest of leguminous forage crops. The rhizophagous larvae can cause severe root damage and root exposure to secondary plant pathogens, leading to reduced forage quality and yield. Currently, there are no registered insecticides for larval management and sustainable management options are limited, likely a result of our poor understanding of CRC phenology in the Intermountain West. Resistant alfalfa varieties provide one option for management, however, varieties resistant to chewing insects are not commercially available. Plant resistance to herbivores in different feeding guilds is documented in various cropping systems, therefore we evaluated commercial alfalfa varieties targeting root pests, including the Northern root-knot nematode (*Meloidogyne hapla*: RKN), for cross-resistance to CRC. Our objectives were (1) to determine the phenology of susceptible CRC life stages, and (2) under no-choice laboratory settings, investigate the impacts of RKN-resistant alfalfa varieties on CRC larval feeding and development. Alfalfa fields were surveyed for two consecutive field seasons from April – September for egg and larval CRC via soil-core samples, while adults were sampled using a vacuum sampler. CRC eggs were present September through April, suggesting they overwinter as eggs and adults. Larval populations peaked in June with adults most prevalent from August to September. For variety trials, we developed a soilless method to evaluate CRC larval feeding which consisted of growing alfalfa plants between two germination papers and placing rolled papers with plants in hydroponic nutrient solution. When plants had grown an appropriate number of nodules (4-6), one CRC immature was introduced to each plant in a no-choice experimental arena. Consumption of root material (nodules and lateral roots) was similar among varieties. Surprisingly, RKN-resistant varieties trended towards supporting greater larval development (larger head capsule widths) than the control RKN-susceptible variety. To confirm alfalfa variety preference in CRC, future research will focus on evaluating additional nematode-resistant varieties and conducting choice-tests between RKN-resistant and non-resistant varieties. With a better understanding of CRC phenology growers can begin to better predict populations and time management as strategies become available.