

Development of an IPM Program for Arthropod Pests of Cool-Season Grass Hay Crops

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Studies were initiated in the fall of 2005 with the goal of designing improved management programs for insect and mite pests of cool-season forage grass crops. Timothy, the primary species grown, is an important hay crop that is marketed for horses as well as timothy hay that is also exported to Asia. Field sites were utilized in California, Nevada, and Washington for these studies although the crop is grown in several western states. Two species of thrips and four to five species of mites, depending on the area, were the targets of this research. Populations of these pests were quantified every 10 to 14 days in untreated timothy fields so as to better understand population build-up and to develop some ability to predict outbreaks. Populations of the key natural enemies were simultaneously monitored. Data are still being collected and summarized.

The effects of these pests on timothy yield and on hay quality were evaluated. In Washington, so far in 2006 mite populations have not reached numbers high enough to cause economic damage. A cool, wet spring, and significant rain events as late as mid-June have helped to keep mite populations down. In Nevada, at two locations, significant thrips populations developed but did not significantly impact hay yields. Conversely, hay quality and visual appearance, which is of utmost importance in this market, was reduced by high thrips levels. In California, similar results were found. Methods to sample thrips populations are being evaluated in this project such as counting thrips by direct observation, collecting tillers for counting thrips in the lab, rapping timothy tillers into a cup, sticky cards, and sweep netting. Finally, control measures for thrips and mite pests are being explored. A late winter/early spring oil treatment trial was conducted in a Washington timothy field with a history of spider mite infestation to determine the efficacy of dormant oil treatments on spider mites. Treatments were winter oil, summer oil, four different insecticides/miticides, burning, and mowing. Spider mites were greatly reduced in the post-treatment grass and duff/soil samples in all treated plots while mites increased in the untreated plots in the soil samples. Burning and mowing were just as effective in reducing spider mites as oils and pesticides. In California and Nevada, the efficacy of registered and experimental insecticides, including some organic options was compared against thrips. Samples were collected at weekly intervals following application but data are still being tabulated from preserved samples. Overall, this study will serve to strengthen the knowledge of the biology and abundance of key pests and beneficials in timothy which will contribute to the development of treatment decision schemes (economic thresholds) for major pests of timothy. Treatment trials with insecticides, oils, and non-chemical controls will document alternative control methods for mites and thrips which are less toxic to the beneficial organisms.

PICTURES



Figure 1. Spider mite damage in timothy field, Washington, 2005.



Figure 2. Collecting yield data from timothy plots, Nevada, 2006.



Figure 3. Yellow sticky trap for sampling thrips moving over timothy field, California, 2006.