

ADJUSTED TREATMENT THRESHOLDS FOR POTATO LEAFHOPPER IN GLANDULAR-HAIRED ALFALFA

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Introduction

Potato leafhopper (PLH) resistant alfalfa varieties with the glandular haired trait have been commercially available for four years. Potato leafhopper is considered the most significant insect pest of alfalfa in Wisconsin and the upper Midwest. PLH injury to alfalfa can result in leaf yellowing (“hopperburn”), plant stunting, loss of yield and forage quality, and reduced alfalfa stand persistence. During the 2000 growing season we established field trials at the Arlington and Marshfield Agricultural Research Stations in a continuing effort to evaluate the efficacy of glandular haired varieties under Wisconsin conditions and agronomic practices, as new “generations” of varieties with improved resistance are released. In particular, the Arlington study was designed to evaluate the extent to which current treatment thresholds recommended in Wisconsin for PLH management in alfalfa need to be adjusted for glandular haired alfalfa cultivars advertised to be resistant to PLH. Our experience thus far indicates that commercial glandular haired varieties currently available exhibit various levels of partial resistance, but not complete resistance, to PLH. Consequently, effective management of this pest in the near term will likely require a combination of plant resistance and insecticide application as needed.

Arlington Trial

The Arlington trial included three factors: two treatment thresholds (the conventional threshold recommended by UW Extension (which increases with crop height) and twice the conventional threshold); three insecticide treatments (Warrior (synthetic pyrethroid insecticide) at the recommended rate, Warrior at a reduced (approximately half) rate, and no insecticide); and three alfalfa varieties (Pioneer 5454 (no PLH resistance), DK131HG (53% resistant plants), and Evergreen (79% resistant plants)). Plots were direct seeded on April 26, 2000. The conventional threshold plots were sprayed on June 23, with an average of 2.75 PLH per sweep on 9 inch alfalfa. The conventional threshold times two plots were sprayed on June 27, with an average of 8.9 PLH per sweep on 13 inch alfalfa. The plots were cut on July 19. Data recorded included weekly PLH counts and crop heights, hopperburn ratings as warranted, and dry matter yields.

Results of this trial indicated 1) Insecticide treatment was statistically significant for all response variables measured up to first cut: PLH numbers, crop height, hopperburn and yield, but the reduced rate Warrior treatment was as effective in controlling PLH as the full rate Warrior treatment. 2) Within the unsprayed plots, alfalfa variety was statistically significant for all response variables measured up to first cut: PLH numbers, crop height, hopperburn and yield, and for all variables except yield the responses were best (fewest PLH, tallest plants and least hopperburn) for Evergreen, worst for Pioneer 5454, and intermediate for DK131HG. In the case of yield, Evergreen and DK131HG were not statistically different, but both were statistically greater than Pioneer 5454. 3) Within each variety, insecticide treatment was statistically significant for yield. In other words, all three varieties had a significant yield loss when not protected from PLH injury. 4) No statistical differences were detected between the two threshold levels (conventional vs. twice conventional) in any of the response variables.

Marshfield Trial

The Marshfield trial included four factors: five planting dates (April 10 & 25, May 10 & 25, and June 10), two establishment methods (with and without an oat nurse crop); two insecticide treatments (Warrior insecticide applied at full rate as needed and no insecticide); and two varieties (Pioneer 5454 and Pioneer 53H81 (glandular-haired)). Plots were cut at first flower, with the April 10 May 10 planting dates cut three times and the May 25 & June 10 planting dates cut twice, and all planting dates except May 10 received a season end cutting on September 5. Data recorded included PLH counts and dry matter yields.

Results reported here will include planting date, insecticide treatment and alfalfa variety; only the direct seeded treatment will be considered, with results from the oat establishment method to be reported elsewhere. Results of this trial indicated 1) Both insecticide treatment and alfalfa variety were statistically significant for PLH numbers (recorded on July 11) for the April 25 & May 10 planting dates; the other planting dates avoided PLH population buildup by either being so early (April 10) that plots were cut before PLH population buildup occurred in alfalfa or so late (May 25, June 10) that colonizing PLH bypassed these plots. 2) Both planting date and insecticide treatment were statistically significant for yield. 3) Alfalfa variety was not statistically significant for yield.

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