EFFECTS OF SOIL ACTIVE HERBICIDES ON THE CRITICAL TIMING OF WEED REMOVAL IN ESTABLISHMENT ALFALFA

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Abstract

Annual weeds can compete with alfalfa during the establishment year, reducing yield in early cuttings and impeding optimum plant establishment. The critical timing of weed removal (CTWR) is the point in crop development when weed control must be initiated to preserve potential yield. A trial was initiated near Lingle WY, during the 2023 growing season, to quantify the effects of soil active herbicides on the CTWR in establishment alfalfa. Herbicide treatment consisted of no-PPI, or EPTC (2460 g ai ha^{-1}) + trifluralin (840 g ai ha^{-1}) applied PPI. Sub-plot treatment included season long weed-free, weed removal at: cotyledon, V1, V3, V5, and early bloom alfalfa growth stages, corresponding to 7, 14, 23, 35, and 48 days after alfalfa emergence, and a non-treated weedy control. A four-parameter logistic model was utilized to estimate the effects of weed removal timing on alfalfa yield, at first and second cutting, and on alfalfa stand. The CTWR based on 5% yield reduction of first alfalfa cutting began at 343 GDD (base 10C) after alfalfa emergence. There was no calculated CTWR for alfalfa treated with EPTC + trifluralin, as weed removal timing did not have a significant effect on first cutting yield. Alfalfa stand, assessed at first cutting, was affected by weed removal timing in the no-PPI treatment. Stand was reduced by 72% when weeds were allowed to compete with alfalfa from crop emergence to the first cutting. There was no effect of weed removal timing on second cutting alfalfa yield in the no-PPI or EPTC + trifluralin treatments.

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