

Weed Management Strategies for Organic Flax, 2005–2006

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Introduction

Demand for certified organic flax has increased due to a rise in human consumption of food products rich in omega-3 oil and due to the recent construction of a certified organic oilseed expelling facility in Cherokee, IA. Challenges exist to raising organic flax in the upper Midwest due to competition from weeds and limited information about weed management strategies for organic farmers. Weeds can reduce flax yield and re-populate the soil seed bank, increasing weed pressure in the future. In 2005 and 2006, research was conducted to assess: 1) which weed management strategies can best control weeds in flax, and 2) how do weeds affect flax grain yield.

Material and Methods

Seven weed management treatments, categorized as biological, mechanical, or chemical, included:

- drilled flax, no underseeding (control)
- drilled flax + broadcasted red clover (*Trifolium pretense*) (14 lb/acre)
- drilled flax + broadcasted alfalfa (*Medicago sativa*) (16 lb/acre)
- drilled flax + broadcasted grass/legume mix [orchardgrass (*Dactylis glomerata*) 2 lb/acre, timothy (*Phleum pretense*) 3 lb/acre red clover 4 lb/acre and alfalfa 4 lb/acre]
- drilled flax + sethoxidym (Poast) and MCPA (Rhomene) herbicides
- broadcast flax
- flax cross drilled at half seeding rates at 30° angles in two directions.

Flax was planted with a Massey Ferguson 8-ft end-wheel drill with single-disk openers, with

7-in. row spacings on April 8, 2005 and April 11, 2006 at 50 lb/acre. Flax was harvested when plots contained 95% dark brown bolls. All plants were cut at ground level in four, 1-ft² quadrats per plot. Harvest dates were July 28, 2005 and July 20, 2006. Flax plants, legume and grass underseedings, and weeds were hand separated. Underseeding species and weeds were dried at 140°F in a forced air drier and dry matter weights recorded. Flax plants were air-dried, grain was hand threshed, weighed, and grain moisture was measured. All data were analyzed with the GLM model of SAS. Tests of differences between means were made at the 0.05 probability level and different treatment means were compared using a Duncan's Multiple Range Test.

Results and Discussion

Grain yield: In 2005, there were no differences in grain yield among all treatments. Weed suppression by these treatments, indicated by weed biomass yield at the time of flax harvest, was somewhat less consistent than grain yield (Figure 1), although biomass yield was less for the broadcast treatment. In 2006, the red clover underseeding treatment resulted in the lowest grain yield and the control and herbicide treatments produced the highest yields. Only the herbicide treatment, however, resulted in less weed biomass at the time of flax harvest (Figure 2). The alfalfa, grass/legume, 2-way, and broadcast treatments resulted in grain yields intermediate to the treatments noted above and were not statistically different.

Acknowledgments

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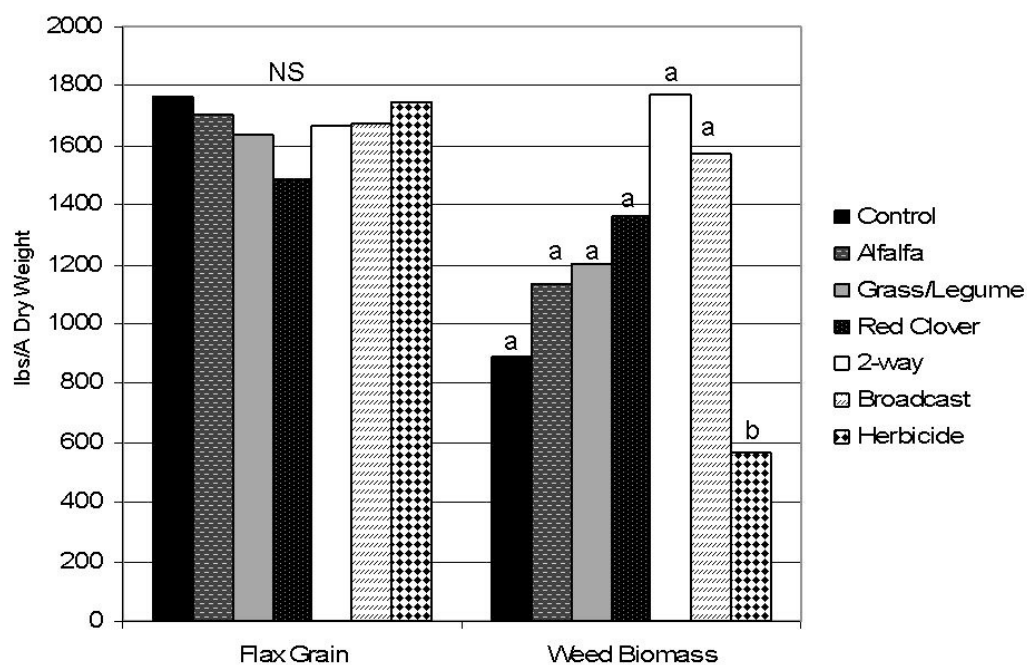


Figure 1. Weed management strategy effects on flax grain and weed biomass yields, 2005.

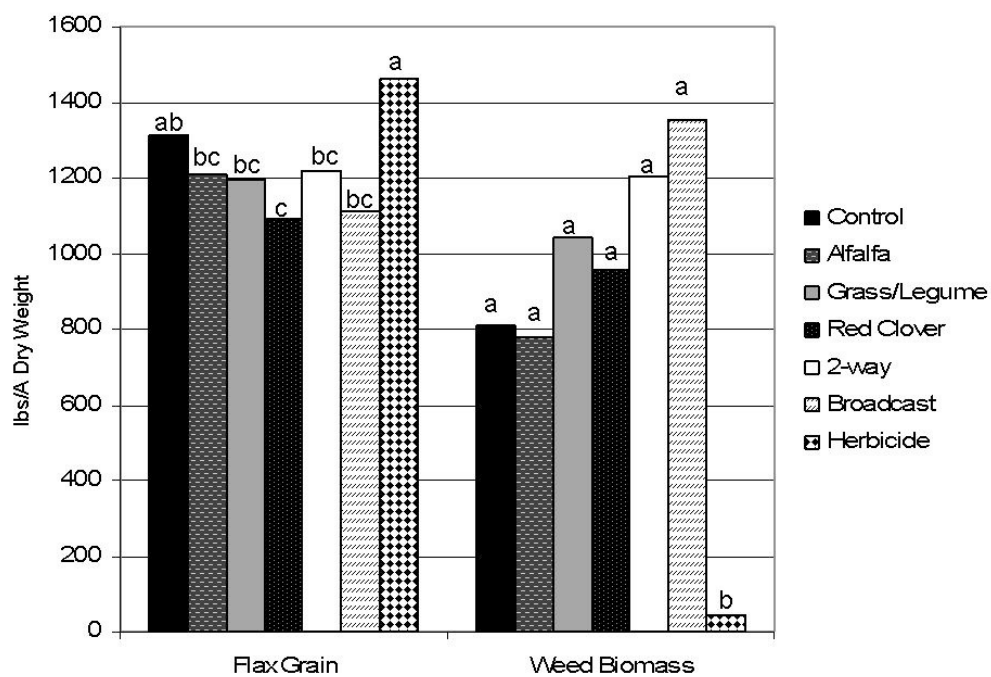


Figure 2. Weed management strategy effects on flax grain and weed biomass yields, 2006.