

Nitrogen source influences wild mustard growth and competitive effect on sweet corn

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Manipulations of the soil environment can affect the growth and competitive ability of annual weeds because of the large influence that soil conditions exert on seedlings early in the growing season. Our objective was to identify soil nitrogen (N) management systems with weed suppression potential. We hypothesized that competition from wild mustard against sweet corn would be weaker when N was supplied by organic sources (organic) or a split application of NH_4NO_3 fertilizer applied at planting and 4 wk thereafter (split) than when NH_4NO_3 fertilizer was applied in a single dose at planting (early). This hypothesis was tested in a 2-yr field experiment conducted in central Maine. Wild mustard's maximal relative growth rate (RGR) was 12% lower ($P < 0.05$) in 1997 and 1998, and the amount of time needed to achieve maximal RGR was delayed by 0.8 d ($P < 0.05$) in 1997 in the organic compared to the early treatment. The competitive effect of wild mustard on sweet corn yield was lower in the organic treatment than in the early and split treatments in 1 of 2 yr. In 1997, competition from wild mustard reduced marketable ear yields of sweet corn by 30%, but the magnitude of yield reduction did not differ between the three N addition treatments. In contrast, in 1998, sweet corn yield in the organic treatment was not reduced by weed competition, whereas yield loss in the early and split treatments was 20 and 35%, respectively. The mechanisms underlying selective suppression of weeds, but not crops, by organic N sources require further attention.