

## Effects of red clover (*Trifolium pratense*) green manure and compost soil amendments on wild mustard (*Brassica kaber*) growth and incidence of disease

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### Abstract

Using a soil bioassay technique, seedling growth and incidence of disease of wild mustard (*Brassica kaber*) and sweet corn (*Zea mays*) were assessed in soil from field plots that received either of two treatments: incorporated red clover (*Trifolium pratense*) residue plus application of compost ('amended soil'), or application of ammonium nitrate fertilizer ('unamended soil'). Soils were analyzed for percent moisture, dissolved organic carbon, conductivity, phenolics, and nutrient content. A trend toward greater incidence of *Pythium* spp. infection of wild mustard seedlings grown in amended soil was observed during the first 40 days after incorporation (DAI) of red clover and compost, with significant differences ( $\alpha = 0.05$ ) at two out of four sampling dates in 1997, and four out of four sampling dates in 1998. Incidence of *Pythium* infection was 10–70% greater in the amended soil treatment during that period. Asymptomatic wild mustard seedlings grown in amended soil were also on average 2.5 cm shorter ( $\alpha = 0.05$ ) at 5 DAI than those grown in unamended soil in one year out of two. Concentration of phenolic compounds in soil solution was weakly correlated with decreased shoot and root growth ( $r = 0.50, 0.28$ , respectively) and increased incidence of disease ( $r = 0.48$ ) in wild mustard seedlings in one year out of two. Dissolved organic carbon concentration was weakly correlated with increased disease in wild mustard seedlings in both years ( $r = 0.51, 0.33$ , respectively). Growth of corn seedlings did not differ between the two soil treatments, suggesting that red clover green manure and compost may selectively reduce density and competitive ability of wild mustard in the field. Bioassay results corresponded well with emergence and shoot weight results from a related field study, indicating that this technique may be useful for screening potential soil treatments prior to field studies.