

Section VI
Biological and Cultural Controls

EFFECTS OF TILLAGE ON MINT ROOT BORER, COMMON GROUNSEL,
AND SOIL CHEMICAL FACTORS IN PEPPERMINT

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Test plots were located in the Willamette Valley of western Oregon in 1981 and 1982. Plowed (7.5-15 cm deep), disked (5-10 cm deep), and untilled treatments were compared to determine the effects of tillage in peppermint on (1) emergence of adult mint root borer (MRB), (2) stands of common groundsel, and (3) soil acidity and nutrient elements.

Plowing significantly reduced emergence of adult MRB by an average of ca. 80%. The greatest reductions in plowed plots (ca. 93%) occurred when diskling following plowing was performed to a depth of 10 cm. Double diskling reduced emergence of adult MRB by an average of ca. 56%, and the greatest reduction (ca. 97%) occurred when a roller-harrow was used after diskling. In all treatments adult emergence peaked from early July to early August.

In one test plot plowing significantly reduced stands of common groundsel by ca. 95% in April and by ca. 80% in July, and significantly reduced false dandelion by ca. 65%. Even though plowing reduced the density of common groundsel in other test plots, neither the dry weight biomass nor plant vigor were reduced. Diskling reduced stands of common groundsel to a limited extent.

Peppermint fields which have not been plowed or limed for several years, generally have higher levels of soil acidity, phosphorus and potassium in the surface 0-5 cm than soil in 5-15 cm. Plowing resulted in a more uniform distribution of pH and nutrients throughout the 0-15 cm soil layer. Plowed plots had higher levels of pH and Ca in the surface 0-5 cm of soil and higher levels of P and K in 5-15 cm of soil. In disked plots, levels of pH, P and K in 0-5 cm and 5-15 cm soil samples were intermediate between plowed and untilled plots.

Peppermint plant vigor was higher in tilled than untilled treatments in one test plot, resulting in higher peppermint hay and oil yields. Peppermint hay and oil yields in other test plots were generally not affected by tillage treatments.