In central and northern Alberta, yield reductions from root maggot infestations can reach 52% in crops of Brassica rapa (Polish canola) and 20% in Brassica napus (Argentine canola). This two-year study assessed infestations of root maggots in Polish canola subjected to either drilled or top-dressed applications of ammonium sulfate, powdered elemental sulfur, prills of elemental sulfur and a spray formulation of powdered elemental sulfur. The results showed that less root damage occurred at the end of the season to plants treated with top-dressed sulfur applications than when the sulfur was drilled with the seed.

In central and northern Alberta, infestations by larvae of the cabbage maggot, Delia radicum, and the turnip maggot, Delia floralis, can be the single greatest limiting factor in the production of canola. Yield reductions from root maggot infestations can reach 52% in crops of Brassica rapa (Polish canola) and 20% in Brassica napus (Argentine canola). Research has shown that an integrated management strategy using cultural and chemical control practices for root maggots in canola can reduce infestations by these pests and limit economic losses.

A two-year study was conducted at two sites in central Alberta to evaluate for Polish canola, the role of elemental sulfur and sulfate in the integrated management of root maggots. The objectives of this were study were to determine the effect of different rates, methods of application and formulations of elemental sulfur and sulfate on root maggot infestations.

The study was conducted during the 1997 and 1998 field seasons near Fort Saskatchewan in a zero-till regime and near Wostok in 1997 and Andrew in 1998 in conventional-till regimes. The plots were treated with either drilled or top-dressed applications of ammonium sulfate at 0, 10, 25, 40 and 50 pounds per acre, and prills of elemental sulfur MF101® at 0, 10, 25, 50 and 100 pounds per acre. Powdered elemental sulfur was also tested in a spray formulation at 0, 10, 25, 50 and 100 pounds per acre. To assess the degree of root maggot infestation, egg-laying by females throughout the season and root damage were monitored.
damage at the end of the season were measured. Plots were also harvested to determine whether seed yield varied among plots subjected to the different treatment types.

Root maggot responses to the different sulfur treatments and application methods varied among years and sites, indicating that environmental factors have great importance in determining infestation levels by these pests, and the oxidation rate of elemental sulfur in soil. Sulfur formulation and application rate had significant effects on root maggot egg deposition and root damage for some sites and years, but even at high rates of application (112 kg ha⁻¹) reductions in infestation levels were not substantial relative to the controls. Sulfur additions alone will not greatly reduce root maggot infestation levels in canola, but canola growers should employ adequate sulfur nutrition for optimum crop health to enable plants to better compensate for damage by these pests.

Economic assessments to determine whether improved gross returns were achieved with the use of the sulfur/sulfate products indicated that these relationships were variable. At some sites, improved gross returns occurred with some products, but consistent relationships were not found. However, previous research has established that sulfur is an essential nutrient in the profitable production of canola and growers should ensure adequate levels are in agricultural soils. Overall the study showed that the application method of sulfur/sulfate is important for the integrated management of root maggot infestations in canola.

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