A Bibliography of the Sugarbeet Root Maggot, Tetanops myopaeformis (Röder) (Diptera:Otitidae)

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INTRODUCTION

The sugarbeet root maggot, *Tetanops myopaeformis* (Röder), is regarded as a major insect pest of sugarbeets in the western United States (Colorado, Idaho, Oregon, Washington, Montana, Wyoming, New Mexico, North Dakota and Minnesota) and the provinces of Manitoba and Alberta in Canada. Approximately 38% of the sugarbeet acreage is subject to damage in the U.S. (Theurer et al. 1982) and 75% in Canada (Whitfield, unpublished data). Feeding damage by the sugarbeet root maggot can cause loss in yield by reducing plant stand early in the season; feeding throughout the season leads to reduced root weight at harvest. Overall yield loss has been estimated at 2% with losses ranging up to 100% in heavily infested areas (Blickenstaff et al. 1981).

The sugarbeet root maggot is one of only two species in the family Otitidae known to be phytophagous (Allen and Foote 1967). Although the sugarbeet root maggot is believed to be native to western North America, no native plants have been found to be suitable hosts (Mahrt and Blickenstaff 1979). Its life history differs from other economically important root maggot species such as the onion maggot, *Delia antiqua* (Meigen), or the cabbage maggot, *Delia brassicae* (Wiedemann), in that it overwinters as a mature third instar larvae and has only one complete generation a year. Pupation occurs in the spring and adult females lay eggs in the soil next to

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sugarbeet seedlings. The larvae feed on the developing sugarbeet root by tunneling along the exterior root surface which causes the root to lose vital plant fluids. Bacterial symbionts in the larvae have been identified and it has been suggested that they are important in nutritional requirements (Iverson et al. 1984). During late summer, mature larvae cease feeding and enter diapause.

A review of the literature indicates that there have been considerable fluctuations in sugarbeet root maggot populations from year to year with high infestations for most areas reported in the 1950's, early 1970's and after 1980 (Anderson 1984, Gojmerac 1956, Keller and Stallings 1976, Turnock 1977). Soil fumigation, insecticide-impregnated fertilizer and granular formulations of insecticides applied at planting have been recommended for root maggot control in sugarbeets in the past. The most recent infestations in the sugarbeet production areas of N. America have generated new interest in the development of a better means of root maggot control. Application of postemergent soil insecticides for larval control has been shown to be effective in small plot tests (Blickenstaff et al. 1981, Lundquist et al. 1970). By delaying an insecticide treatment until the adults have emerged, sugarbeet fields can be monitored to determine if control measures are necessary. Development of a monitoring and forecasting system for sugarbeet root maggot emergence is being investigated in several states and provinces (Anderson 1984, Whitfield 1984).

Much of the literature on the biology and control of the sugarbeet root maggot has been published in industry journals, federal or state government publications and in some cases relatively obscure or non-indexed publications. This paper is the first bibliography prepared on the sugarbeet root maggot and is intended to assist researchers who are interested in its bionomics or control. The literature cited includes proceedings, research reports, technical and popular articles. Area-specific extension circulars and general pest alert or detection re-

ports were omitted. References were obtained by computer search (Biosis Previews, CAB Abstracts, *Dissertation Abstracts*), manual searching of *Bibliography of Agriculture, Biological Abstracts, Review of Applied Entomology, Entomology Abstracts, Field Crop Abstracts, Biological and Agriculture Index,* and literature citations of accumulated papers.

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