Thus, it is clear that a single application of non-selective toxic agent to rice fields can sufficiently disrupt the predator complex so that resurgence of mosquito larvae populations can continue for a long period. The much higher capacity of mosquito populations to increase allows them to reach economically significant numbers long before predators can recover and provide control. This phenomenon must be carefully considered when evaluating the potential impact of a given treatment on pest management strategies, e.g. Schaefer et al. (1981).

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A MERMITHID PARASITIZING *AEDES DECTICUS* IN LABRADOR

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In June 1980, a larval mosquito collection was made at a grassy lake overflow site 2.5 km from Jean Rapids, Wabush, Labrador during a survey of mosquitoes in the Labrador City—Wabush area. A total of 23 mermithid nematodes emerged from the collection of 128 larvae which consisted of *Aedes decticus* Howard, Dyar and Knab, *Ae. canadensis* (Theobald), *Ae. diantaeus* Howard, Dyar and Knab, *Ae. abserratus* (Felt and Young), *Ae. pionips* Dyar and *Ae. punctor* (Kirby). This was the first record of a mermithid naturally parasitizing mosquitoes in the Province of Newfoundland and Labrador, Canada (Ellis and Chapman 1980). As the mosquito larvae were held en masse in 1980, the host species of the nematode could not be determined.

However, in June 1981, further collections were made at the same site. This time the 265 mosquito larvae were reared individually so that the host species of the nematode could be established. Nematodes were collected as they emerged and kept in water in a petri dish at 17°C. Dead larval hosts were identified (Wood et al. 1979). Other specimens that died as larvae or pupae were identified, then dissected and presence or absence of nematodes noted. The rest of the collection was allowed to mature to adults which were identified and then kept over water until they died in case they should deposit nematodes. On the day that they died, they were dissected as a double check on nematode presence or absence. The species composition of the collection in 1981 is shown in Table 1. Of the 7 species represented, a total of 66 (23♂; 43♀) nematodes emerged only from larval *Ae. decticus*. The infection rate in this species was 33.3%. This is the first report of *Ae. decticus* serving as a host for a mermithid parasite (Petersen 1980). In the other larval mosquitoes examined encapsulated mermithids were found in 2.5% and 1.4% of *Ae. canadensis* and *Ae. punctor*, respectively. Observations on the emerged nematodes at 17°C in 1980 showed that they started to molt 10 days after emergence. The molt itself lasted from 8–11 days. However, mating started before the completion of the molt and the first eggs were laid 13 days after the onset of this process. Eighty percent of the eggs developed

Table 1. Mosquito species composition of collection near Jean Rapids, Labrador 1981.

Mosquito species	% of total collection
Aedes abserratus	1.5
Ae. canadensis	14.7
Ae. cinereus	1.1
Ae. decticus	20.4
Ae. excrucians	4.9
Ae. hexodontus	5.7
Ae. punctor	51.7

to stage 6, the pre-hatch stage (Poinar and Gyrisco 1962), after 24 days. Approximately, 855 eggs were laid. A positive identification of the nematode has not yet been made but will be published elsewhere together with further observations on the nematodes' biology by the senior author and Dr. B. Ebsary, Biosystematics Unit, Canada Agriculture, Ottawa.

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A NOMOGRAPH FOR RAPID DETERMINATION OF GROUND ULV ADULTICIDING COSTS

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Among the 50 mosquito control districts receiving state matching funds in Florida, 272 vehicle-mounted ULV machines were operated in fiscal year 1979–80 (October 1, 1979–September 30, 1980) to apply adulticides to 20,058,782 acres at an average cost of 0.12 cents per acre. [This figure includes chemicals, labor, vehicle maintenance and operational costs.] On an acreage basis, the ground application of adulticides made up 79.0% of temporary mosquito control measures employed by state supported districts and counties. Other temporary measures included aerial adulticiding 19.2%, ground larviciding 0.4%, and aerial larviciding 1.4%. On a cost basis, ground adulticiding accounted for 33.9% of expenditures for all temporary control ($2,344,001 of $6,915,140).

Directors of mosquito control districts must make frequent judgments on the most cost-effective ground adulticiding system from those available in terms of budget, effectiveness, public acceptance and environmental considerations. Often, unscheduled operations necessitated by explosive mosquito populations or vector-borne disease activity require immediate, on-the-spot decisions. Also, rapid and unpredictable changes in insecticide availability, prices, and observed effectiveness may precipitate modification of even routine insecticide application procedures.

In any case, in making judgments, decisions or recommendations, directors usually deal in cost-per-mile when projecting ground application costs for a given insecticide. When flow rate, vehicle speed, and ground application rate are used together with the cost of the chemical, all factors necessary to determine operational costs are known.

In administering state matching funds and providing technical assistance to mosquito control districts, the Mosquito Control Section of the Office of Entomology must also make very close estimates of comparative costs of ground adulticiding with competitive products on a cost-per-mile basis. To meet this need, the senior author has developed a nomograph (Fig. 1) incorporating the linear relationships of the variables. With only a straight edge, the user may make an immediate approximation of the cost-per-mile of an insecticide at a given flow rate, vehicle speed, ground application rate and price per gallon. All calculations are made on the basis of a 300 ft. swath width.

This note presents the nomograph and describes its use with our expectation that it will find wide application among mosquito control workers who employ vehicle-mounted ground ULV units in mosquito adulticiding operations.

A full page copy of the nomograph will be mailed to those requesting reprints of this article.