phase successfully. *Ae. aegypti* (Group 5, Table 1) is the only mosquito tested so far that will maintain *R. nielseni* through to parasitic phase with the emergence of post-parasites that will molt and mate successfully and produce viable eggs. Although susceptibility is low, use of this host does permit culture of the nematode and it will be utilized until a more efficient laboratory host can be found.

The determination of a susceptibility index (Petersen and Chapman 1979) has not been possible to date due to the erratic availability of both nematodes and mosquito larvae.

While the low preparasite challenges may be directly responsible for the predominance of emergent female post-parasites in the case of Group 3 mosquitoes, actual evidence for this has yet to be obtained.

However, the fact that infections occur and cause mortality in Group 2, 3 and 4 mosquitoes, irrespective of the suitability of these mosquitoes as hosts for maintenance of the nematode, indicated the future feasibility of inundative use of the nematode against them.

The parameters suggested by Petersen and Chapman (1979) as critical for successful field trials have still to be evaluated for both host and parasite. The further determination of such compatibility or control index is dependent on further success in the *in vivo* culture of *R. nielseni*.

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GRANULAR APPLICATOR

DAVID COCHRAN

Collier Mosquito Control District, P. O. Box 7069, Naples, Florida 33941

Many chemicals for use in pest control are currently being marketed and labeled for granular applications. There is a problem in that the application equipment currently available is a modification of a sand blaster which is not really suited to field use due to the need for compressed air to operate the sand blaster. Furthermore it will not withstand the corrosive properties of some chemical formulations. Therefore, the need arose to develop an alternative to the traditional sand blaster. A granular applicator can be constructed from any piece of equipment that has a high volume blower, such as an old thermal fog unit. The basic modifications can be made simply and inexpensively and materials can be bought locally.

If an old thermal fogger is available, the first thing to do is to remove the protective cage and all of the thermal apparatus. This leaves the motor to drive the blower and the blower itself mounted on the base.

The exhaust of the blower is to be made vertical if it is not already a vertical exhaust blower. This can be done easily by installing a close nipple and an elbow (90°) of the same size as the exhaust port. The next step is to install the "Barco Swivel." This is acccomplished by installing a close nipple either into the vertical exhaust blower or into the elbow and screwing the swivel onto it. Roll stop brackets are installed at 180° to each other on the ball portion of the swivel to prevent sideways movement but still allow front-to-back movement and turning. Into the ball of the swivel a 4″ close nipple is fitted with a galvanized "T" (Figure 1). In one end of the "T" a plug is fitted, and into the other a reducer. On the inside of the

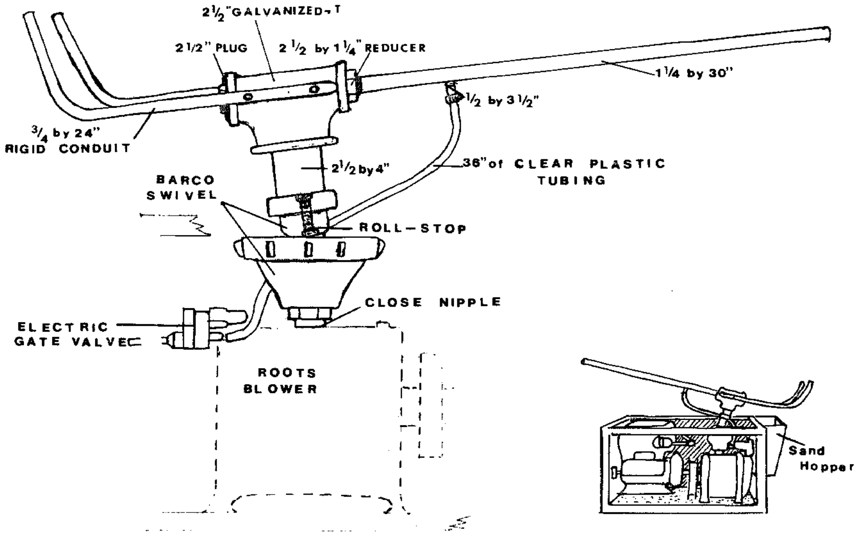

Fig. 1. Sand blower.

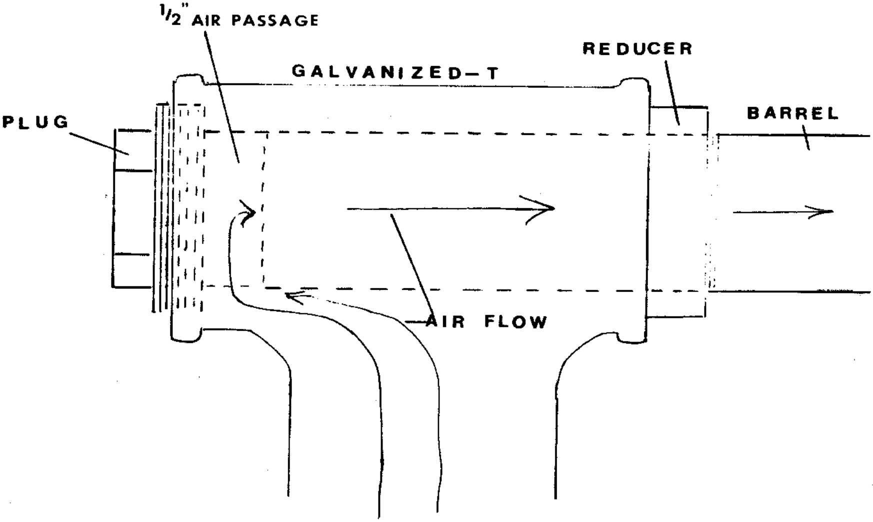

Fig. 2. Enlargement of Galvanized-T

reducer a short piece of barrel stock (1¼″ pipe) is fitted so that when screwed into the galvanized T, it extends past the vertical opening of the T and to within ½″ of the plug (Figure 2). This allows some protection of the blower from any sand that may fall back into the T if there is an engine failure when the barrel is raised.

To the outside of the reducer is fitted the barrel (1¼″ by 30″ galvanized pipe). At 6″ from the reducer, a ½″ piece of threaded pipe is fitted into a threaded hole in the ventral side of the barrel. This is to become the insertion tube (Figure 3) into which the granular material is inserted into the air stream. The end that is fitted into the barrel is first threaded 1″ and then cut approximately at a 30° angle to the vertical and is then screwed into the barrel with the angle facing the front.

side of the protective cage around the apparatus. Inside the hopper and attached to the granular pickup tube located in the bottom of the hopper is a breather tube which allows the suction through the clear tubing at all times when the motor is running.

All switches are mounted within easy and quick reach of the operator. The controls include a switch for the electric gate valve and a cut off switch for the motor on the blower.

Materials thus far applied through the applicator have been a 20/30 grit sand formulation and a vermiculite formulation; no clay or colloidal formulations have as of yet been tested. The most effective range and penetration in heavy foliage areas has been with the 20/30 grit sand formulation. This is due to the weight of the particles in relation to their small size which allows for a maximum velocity with

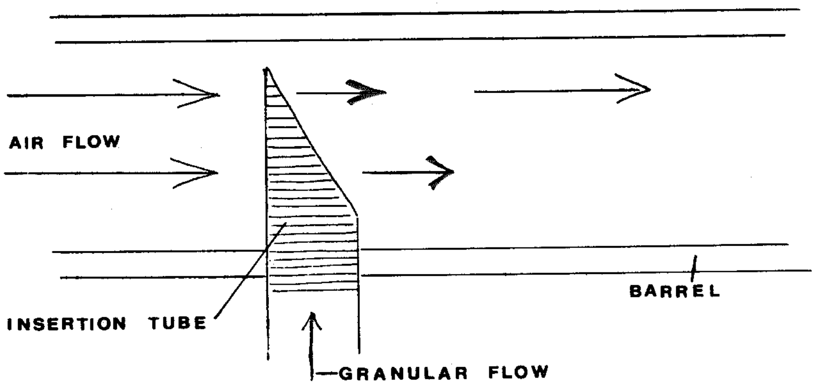

Fig 3 ENLARGEMENT OF INSERTION TUBE ASSEMBLY

To this tube a 2 ft piece of clear tubing is attached. The other end of the tubing is attached to an electric gate valve. This valve regulates the flow of the sand as well as allows for the rapid cut off of the sand flow in case of an emergency.

The gate valve is attached to the hopper by means of a galvanized pipe into which 3/16″ holes (Granular Pickup Tube) are drilled to allow the granular material to enter the suction created by the venturi action of the insertion tube.

The hopper is constructed of sheet metal in the shape of a thick V and is mounted on the

a relatively small amount of wind resistance in and outside of the barrel. The vermiculite formulation proved to be too light for any effective range; although the velocity obtained within the barrel was good, the wind resistance once outside the barrel was too great due to the large surface area and the relative lightness of the particle, therefore, the particle's velocity dropped off sharply. At present, we are using an "Altosand" formulation and have the applicator calibrated for 5 lb of sand formulation per acre with an effective range of 15 to 100 ft at the extreme barrel position. To increase or decrease the application rate, the forward motion of the vehicle is decreased or increased respectively.

Economically speaking, the granular applicator when used in conjunction with the sand formulation has reduced the time spent treating an area, caused less physical damage to the area by the vehicle carrying the treatment apparatus and allowed a more effective coverage of the area as compared with a liquid which is often caught up in the vegetation away from the target site.

RECORDS OF *AEDES MERCURATOR* FROM EASTERN JAMES BAY, QUEBEC

ALAIN MAIRE, YVES MAILHOT, CLAUDE TESSIER AND ROGER SAVIGNAC

Groupe de Recherche sur les Insectes Piqueurs, Université du Québec à Trois-Rivières, C.P. 500, Trois-Rivières, Qué.

Aedes mercurator was described by Dyar (1920) from specimens collected at Dawson, Yukon Territory, 16 July. The localities of specimens of the C.N.C. (recognized by Wood (1977) as *Ae. mercurator* instead of *Ae. stimulans* (non Walker)) and records from Alberta (Enfield 1977) indicate a western distribution for this species in North America. This holarctic species also is distributed throughout the USSR (Danilov 1974, 1978; Proskouriatova and Markovich 1977).

We wish to report the 1st *Ae. mercurator* found as far east as eastern James Bay and the 1st reported for Quebec. The 1st specimen was a larva collected, 5 June 1977, from a tidal pot-hole at Eastmain (52°13′N; 78°34′W) along the eastern shore of James Bay. This specimen was identified by D. M. Wood, Biosystematics Research Institute, Ottawa, and is presently in the C.N.C. Another larva was found, 1 June 1979, in the same type of habitat at Fort George (53°50′N, 79°00′W). In both cases, the vegetal community was a *Potentilla egedii* and *Pucinellia lucida* unit (Maire et al. 1979). A 3rd larva of *Ae. mercurator* was found, 5 June 1979, in LG-1, where a dam is under construction on La Grande Rivière, 30 km east of Fort George. The larval breeding site was a man made ditch with a muddy bottom which was filled with brown-colored standing water. Rearing of the 4th stage larva yielded a female.

In the Eastmain larval breeding site *Ae. mercurator* was associated with *Ae. implicatus* Vockeroth (75%) and *Ae. cantator* (Coquillett) (21%) as dominant species along with a few *Ae. punctor* (Kirby) larvae. In 15 pot-holes located within the same vegetal unit we also found *Ae. flavescens* (Müller), *Ae. campestris* Dyar and Knab and *Ae. dorsalis* (Meigen), all typical species of western Canada. In the springtime *Ae. implicatus* and *Ae. cantator* dominate (Maire and Mailhot 1978) while during summer *Ae. dorsalis* is largely dominant (> 90%) and frequently accompanied by *Ae. campestris* which is relatively constant (about 30%).

In the Fort George larval breeding site, *Ae. mercurator* was again associated with *Ae. implicatus*, the dominant species (33%) along with *Ae. punctor* (14%), *Ae. cantator* (7%) and 1 larva of *Ae. excrucians* (Walker). There were 44% 1st stage larvae not identified.

In LG-1 *pionips* Dyar dominated (80%) and was associated with *Ae. punctor* (10%), a few larvae of *Ae. excrucians* and 1 larva of *Ae. dorsalis*.

This last locality, although continental, cannot be compared with those reported in southern Alberta by Enfield and Pritchard (1977 a, b) who found *Ae. mercurator* associated with *Ae. euedes* Howard, Dyar and Knab in a temporary pond of the aspen parkland zone, 25 April to 20 May 1975.

The occurrence of *Ae. mercurator* in these 3 James Bay localities is not unexpected as they lie within the potential distributional area previously suggested by Wood (1977): "the species now appears to occur from Alaska and southern Alberta east at least to James Bay."

Moreover *Ae. flavescens, Ae. campestris* and *Ae. dorsalis*, which are essentially eastern species, were also found in the same tidal type of habitat along eastern James Bay.

In spite of low larval densities *Ae. mercurator* is probably present all along the eastern part of James Bay, from the littoral up to the lowlands. The boreal character of the species is also confirmed by our records.

We thank D. M. Wood who verified our identifications and Société d'Energie de la Baie James (SEBJ) which supported our expeditions across the "Territoire de la Baie James" during 1977 and 1979.

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