

the author was at the Vector Biology Laboratory, University of Notre Dame, Notre Dame, Indiana. The adults were identified by Dr. George B. Craig, Jr. to be *Aedes hendersoni*.

At the present time, it is not known if *Aedes triseriatus* occurs in Manitoba or not. From the distribution of this species shown by Zavortink (1972), Manitoba could be within the species range.

**ACKNOWLEDGMENTS.** I give credit to Dr. George B. Craig, Jr. and Dr. D. M. Wood for the discovery of *Aedes hendersoni* in Manitoba.

#### References Cited

- Brust, R. A. and K. S. Kalpage. 1967. New records for *Aedes species* in Manitoba. Mosquito News 27 (1):117-118.
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## A COMPARISON OF INSECTICIDE GRANULE SPREADERS

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In the Metropolitan Mosquito Control District (Minnesota) many mosquito breeding sites, especially intermittently wet upland depressions and densely vegetated marsh areas, are not accessible by truck-mounted treatment equipment but are too small to be economically treated by air. Such sites must be treated by field personnel using hand-operated or back-pack insecticide granule spreaders. During the summer of 1977, field tests were conducted to compare the time efficiencies of 4 insecticide granule spreaders in common use.

The machines tested included 3 hand-operated spreaders: the Cyclone® Heavy Duty Hand Broadcast Seed Sower Model 2, the Horn® Seed Sower, and the Seymour Universal® No. 75. The Echo (Kioritz)® DM-9, the 4th machine tested, is a motorized back pack model. A total of 272 observations were made for sites of sizes 0.5, 1.0, 1.5 and 2.0 acres. All tests used the same standard sand insecticide granule formulation. A summary of the data is given in Table 1.

Table 1. Mean time in minutes required to treat one site with granules.

	Site Size (Acres)			
	0.5	1.0	1.5	2.0
Spreader	0.5	1.0	1.5	2.0
Horn	6.89	9.77	14.17	17.56
Echo (Kioritz)	8.50	9.00	15.00	16.20
Cyclone	8.97	13.05	21.00	21.71
Seymour	9.46	14.39	26.33	27.63

An analysis of variance of the mean time to treat a site showed, as expected, that treatment time depended on site size ( $p=.0002$ ) as well as spreader type ( $p<.005$ ). Further analysis indicated that the Echo and Horn spreaders were not significantly different ( $p>.5$ ). This is interesting since the Echo is motorized while the Horn is not. Both, however, were significantly faster than the Seymour and Cyclone spreaders ( $p<.0005$ ). An interaction graph (Figure 1)

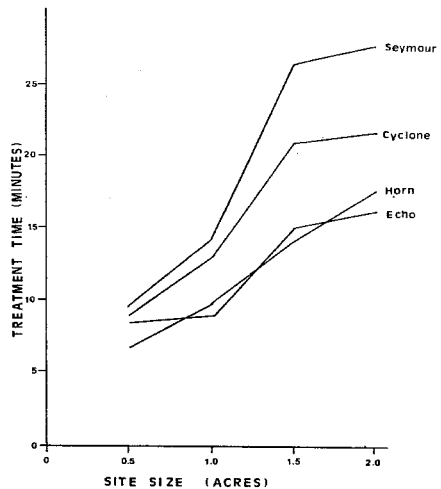


Figure 1. Relative efficiency of four insecticide spreaders.

shows these differences to be more exaggerated for larger sites. In addition, there is some indication that the Horn may be slightly better than the Echo for very small sites.

The authors wish to thank all MMCD employees who took part in these tests.