allow a slower forward speed. With the PTO at correct operating RPM, the lowest forward gear gives a ground speed that is still too high to allow cutting a full depth ditch on one pass. At present, we have to make at least 2 passes on each ditch to get maximum depth.

The major advantage of this unit is that it allows us to use 1 machine that can dig a ditch without leaving spoil piles and also level any existing spoil piles, essentially giving us a 2-in-1 machine. Theoretically, it should be capable of digging shallow ponds but this has not been tried. It is also considerably cheaper, both to purchase and operate, than the amphibious ditchers. This unit was purchased at the same time as an amphibious rotary ditcher and costs less than half as much.

This unit has suited the needs of our program by giving us more flexibility of operation and increasing the efficiency of ditch construction. Mosquito control districts with a need for similar equipment may benefit from our experience. Districts which require larger ditches than can be cut by the Dondi ditcher described herein are advised that larger ditchers of this type are available. However, they require higher horsepower ratings than provided by our tractor.

NUMBER OF EGGS PER MALE GIANT WATER BUG, *BELOSTOMA MICANTULUM* IN PARAGUAY[1]

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The giant water bug, *Belostoma micantulum*, is a very common aquatic predator in the environs of Asunción, Paraguay. It is found in shallow water at the edges of lakes and ponds, at the borders of streams, and in temporary pools. Many of these sites are also occupied by larvae of mosquitoes, especially *Aedes*, *Psorophora*, and *Culex*. Since another species of belostomatid in the region, *B. elegans*, is known to eat culicid larvae (DeCarlo 1939), it seems likely that *B. micantulum* has an impact on populations of mosquitoes.

From 23 July 1979, to 13 April 1980, I collected 12 males of *B. micantulum* which had eggs attached to their hemelytra. All collections were made ca. 30 km from Asunción in Areguá, Departmento Central, Paraguay. Most of the specimens were collected by dipping near the shore or adjacent to aquatic vegetation. A mean of 52.3 eggs (S.D. = 18.43, range, 30 to 95) were found on each male. This is an indication of the number of eggs deposited by females at each oviposition.

References Cited

DeCarlo, J. A. 1939. 1) Metamorfosis de *Belostoma elegans* Mayr—2) *Belostoma ellipticum* Latreille = *Belostoma impavidum* Torre Bueno. (Hemiptera-Belostomatidae). Revista de la Sociedad Entomológica Argentina, 10:231–234.

[1] Hemiptera: Belostomatidae. Thanks are given to Prof. Dr. Axel O. Bachmann, Universidad de Buenos Aires, Argentina, for identifying the specimens, and to Peace Corps and the Instituto de Ciencias Básicas, Universidad Nacional de Asunción, Paraguay, for support.

SUSCEPTIBILITY OF *AEDES AEGYPTI* TO VARIOUS LEVELS OF HYDROGEN PEROXIDE

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As the result of favorable responses from testing with hydrogen peroxide in efficacy tests against the aquatic weed, coontail (*Ceratophyllum demersum*), testing was initiated to determine its effect on non-target organisms.

Reviews of the literature for ascertainment of prior testing with hydrogen peroxide against mosquitoes was fruitless. Quimby (1981) and Kay and Quimby (1981) demonstrated herbicidal efficacy with hydrogen peroxide in the suppression of coontail used alone and in combination with a chelated copper complex.

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Representatives of all larval instars of *Aedes aegypti* reared from eggs held at constant temperatures were used to determine the efficacy of hydrogen peroxide as a larvicide. Eggs of this species were obtained from a rearing colony located at the Gulf Coast Mosquito Laboratory (USDA, SEA-AR) at Lake Charles, Louisiana. Tests were conducted at the Southern Weed Science Laboratory (Stoneville Research Quarantine Facility), Stoneville, MS 38776.

Bioassays were conducted under controlled conditions with larvae confined to 250 ml glass beakers which served as exposure containers. Each replicate was filled to 200 ml with the various concentrations of hydrogen peroxide-aerated tap water solutions. Ten larvae were introduced into each of 7 replicates per concentration and held for continous exposure. Mortalities were taken at 24 hr intervals, and dead larvae were removed daily. Control replicates were of the same containers and number with aerated tap water as the exposure medium. All replicates received grated animal food at 48 hr intervals throughout the test period(s).

Mortality data for these tests showed ranges of acceptability at dosages beginning at 3.2 mM and increased as the concentrations increased. Values at the end of the 168 hr test period for all stages and in all concentrations of 3.2 mM or higher were 60% or higher (Table 1).

While such a technique is not deemed economically feasible for wide range mosquito control, it could have potential for use in industrial impoundments or similar situations.

Table 1. Larvicidal properties of hydrogen peroxide on larvae of *Aedes aegypti* under controlled laboratory conditions.

Concentration mM	Percent mortality/time period (hrs.) 24	48	72	96	120	144	168
	First and Second Instars						
Control	0.0	4.3	4.3	5.7	5.7	5.7	5.7
3.2	34.3	45.7	54.3	64.3	64.3	67.1	67.1
4.8	60.0	65.7	68.6	80.0	80.0	81.4	81.4
6.4	62.8	68.6	81.4	91.4	92.8	97.1	97.1
	Third and Fourth Instars						
Control	0.0	0.0	0.0	1.4	1.4	1.4	1.4
3.2	8.5	21.4	28.5	42.8	48.5	54.2	60.0
4.8	17.1	38.5	40.0	60.0	70.0	77.1	78.5
6.4	28.5	58.5	68.5	75.7	81.4	88.5	90.0

These data are offered as a supplement to the use of hydrogen peroxide in an integrated management program for aquatic weeds and its effect(s) on non-target organisms.

References Cited

Quimby, P. C., Jr. 1981. Preliminary evaluation of hydrogen peroxide as a potential herbicide for aquatic weeds. J. Aquatic Plant Mgmt. (In Press).

Kay, Stratford and P. C. Quimby, Jr. 1981. Responses of coontail to H_2O_2 ± CU. J. MS Acad. Sci. XXVI (Suppl.):18.

NATIVE AND EXPERIMENTAL REPELLENTS AGAINST BLACK FLIES (DIPTERA: SIMULIIDAE) IN THE AMAZON BASIN OF BRAZIL

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A plethora of medical problems is attributable to black flies in the Amazon Basin. Certain flies have been incriminated as vectors of *Onchocerca volvulus* (Rassi et al. 1975, Shelley et al. 1979) and *Mansonella ozzardi* (Cerqueira 1959, Shelley and Shelley 1976) and are believed to be responsible for mortality in humans as a direct consequence of allergic reactions to their bites (Noble et al. 1974, Pinheiro et al. 1974). In addition, their pestiferousness may seriously deter residents of the interior from productivity and leisure (Lacey in press, Lacey and Charlwood 1980).

Due to the enormous volume of water passing through the major larval breeding sites, larvicidal control, except under certain conditions, would not be practical in most of the basin. One method of reducing biting activity is

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