OPERATIONAL AND SCIENTIFIC NOTES

DESCRIPTION OF A PROTOTYPE MACHINE USED FOR MARSH MANAGEMENT IN MARYLAND[1]

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The mosquito control program operated by the Maryland Department of Agriculture, Pest Management Section, follows integrated pest management principles. An important part of our work is an Open Marsh Water Management (O.M.W.M.) program aimed at the control of salt marsh mosquitoes, primarily *Aedes sollicitans*. Most of the O.M.W.M. work occurs on the vast salt marshes of the Eastern Shore region of Maryland. Approximately 162,150 acres of marsh are located in this region. Of the total, ca. 20,000 acres of primary *Ae. sollicitans* breeding marsh exist in pristine condition. An additional 16,000 acres have been ditched in the parallel grid system, mostly during the 1930's by manual labor, and periodic renovation is necessary on approximately 6,000 acres.

Due to the extensive scope of the Eastern Shore marshes, a fast, efficient technique of ditch excavation is necessary. For this reason we rely on rotary ditching equipment to construct most of our O.M.W.M. systems. Rotary ditchers are also required, when conditions permit their use, under guidelines adopted by the Maryland Mosquito Control Advisory Committee to reduce the impact of spoil deposition. We currently operate 3 amphibious rotary ditchers which construct 30 in. by 30 in. ditches. The escalating costs of these large amphibious ditchers, combined with a need for a smaller, more versatile machine, prompted us to look for alternative equipment. We envisioned a crawler tractor with a ground pressure of less than 2.5 lb. per in^2 equipped with a small rotary ditcher and a device, such as a blade, to level and spread spoil. The ability to spread spoil was desirable because we are required under United States Army Corps of Engineers' permits to level any existing spoil piles encountered while renovating old parallel ditch systems. This existing spoil is often used to fill small, nearby breeding depressions. A unit to fill these needs was designed and built to our specifications by a local dealer in heavy equipment and was put into service in March of 1980. This unit is described herein.

The tractor used is a Case Model 350 crawler with a diesel engine of 44 gross HP and a torque converter transmission. The track gauge is 72 in. and each track consists of 36 links, each with a 36 in. wide steel pad. This gives a ground pressure of less than 2.4 lb per square inch. The tractor is also equipped with a steel all weather cab and a 3-point hitch and live power takeoff. The entire unit is balanced for uniform ground pressure over the entire track bearing surface.

Mounted on the tractor is a Case front end loader with a 4-in-one bucket of ¾ yd^3 capacity. The bucket has been modified by the addition of wings which extend the full width of the tracks. These were deemed necessary to clear a level path for the tracks in an effort to avoid undo wear on lower track rollers. The tractor-loader combination gave us a machine which can be used for grab type work, standard loading, dozing and spoil spreading. With the exception of the wings, all components are standard production items of the supplier's company.

On the rear of the tractor we mounted a Dondi Model DMR-25B rotary ditcher which weighs about 700 lb. It mounts on the 3-point hitch and derives its power from the PTO at the standard PTO speed of 540 RPM. This ditcher has a Mono-wheel cutter head which cuts a ditch of 30 in. top width, 9 in. bottom width and 20 in. depth. The side angle of the ditch is 30 degrees, The working depth of the ditcher is controlled by the hydraulics of the 3-point hitch. All controls, for both bucket and ditcher, are hydraulic and are located in the cab of the tractor.

During 84 days of use during 1980, the unit logged 424.8 hr of operation. The only major problem we had occurred shortly after it was placed in service. The PTO shaft on the Dondi ditcher is of the telescoping type and was the sealed type, i.e. lubricated for life. After 130 hr of use, this shaft no longer telescoped and broke the PTO. Lubrication fittings were added to the PTO shaft to allow for daily lubrication, and this problem has not recurred.

One thing that would improve the operation of this unit would be a transmission that would

[1] Maryland Department of Agriculture Contribution No. 23.

Fig. 1. Modified tractor—side view showing bucket wings and Dondi Ditcher.

Fig. 2. Dondi Ditcher in operation.

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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