VEHICLES FOR THE TRANSPORTATION OF INSECTICIDES

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It is relatively easy for the newer mosquito control districts to improve their control methods. This is especially true with the Toledo Area Sanitary District. During the past couple of years we have been investigating various improvements to vehicles which transport insecticides. The air boat and swamp buggy were the pieces of equipment under consideration.

AIR BOAT. Due to the fact that we have an extensive mosquito control problem on marginal shallows of the Maumee Bay and Maumee River areas, we purchased an air boat (Fig. 1) in the spring of 1956. This purchase was made after due study of other shallow draft hulls such as the water jet-propelled and various underwater propelled craft. Of course, the idea of the air boat is not new. I am sure that most of you have at least seen this type of craft in action. However, we found that one of our local boat builders, Ray Greene & Co., was entering into contract with the U. S. Navy for a rescue hull of similar design, made of fiberglass and plastic. The hull was 18 ft. 7 in. long and 8 ft. 4 in. wide, and had a depth of 22½ in. It was a sealed hull with

three inner-sealed compartments and reinforced decking. Steel plates had been securely anchored at various places in the hull and these were used for motor mounts, blocks and cleats. Upon delivery of our boat, our mechanics immediately began building a motor mount for a previously purchased Lycoming 190-HP engine. The engine was placed so that the propeller would not be a hazard and at the same time we would have traction propelled action or a pusher type motion. Numerous other pieces of supporting equipment, such as a trailer, ramp and boat house, were readied for a busy summer season.

By mid-May, just before the *Culex pipiens* started activity, our air boat was in use and ready for action. Of course, before we started any mosquito control activities in these marsh problem areas, the boat crews made paths through the cattails with the air boat and these were used as avenues for larviciding application. The boat crew became skilled in the use of this equipment and learned where and under what conditions it could best be used. Such problems as cattails hitting the propeller and damaging it were encountered but as the paths were worked wider and longer this difficulty was overcome. The hull was very satisfactory; it withstood all the bumping and scraping that it was subjected to this year with negligible damage.

No problem developed by condensation or leakage into the sealed hull. The hull does not require painting or caulking. However, a coat of anti-fouling paint may be useful. Mr. Ray Greene has stated that if a patch is necessary due to a break in the bottom of the hull, this patch may be applied easily and quickly by the operating crew. The average wooden or

FIG. 1.—Air boat in action.

aluminum hull could not have withstood the terrific beating that the fiberglass took with so little damage.

As far as turning radius and other boat maneuvering questions, this equipment showed quick response to the wheel at high speeds but, of course, this was not as pronounced at lower speeds unless the engine was speeded up. The only maneuver that the standard air boat cannot perform is backing.

The question of speed always comes up and we answer it this way: We have been clocked on a known water racing course at more than 25 MPH. However, our operators are instructed not to exceed the Toledo Harbor rate of 10 MPH. In spite of the fact that the hull and engine and supporting equipment weigh approximately one ton, the boat draws only about 6 inches of water at the transom when it is not in motion. When traveling at the average speed the boat draws about three or four inches.

The air boat will operate very well with one-half inch or so of water over the marshlands and, like other air boats, will cross sand bars and mud flats provided enough speed and momentum has been developed. Of course, draft at the fantail depends largely on the placement of the movable weight, such as spraying equipment. Therefore, generally speaking, the boat only draws four inches of water at the deepest point.

This equipment has solved a number of our larviciding problems and we will continue to operate it during the coming years.

MARSH BUGGY. It has long been the opinion of the writer that there is a need for a reasonably priced 4-wheel-drive swamp buggy. This is not a new idea because there have been many innovations of this type of vehicle over the past thirty or more years. At the Toledo Area Sanitary District we decided to use the Willys 1-ton 4-WD because it was one of the most common vehicles used in mosquito control, plus the fact that it is reasonable in price. The Willys Motors, Inc., loaned this District a standard 1955 Willys 1-ton truck for the purpose of experimenting along this line.

Our mechanics stripped the fenders and bed off this vehicle (Fig. 2) and then welded the spring saddles on top of the front and rear axles and also inserted a short extension on the front wheel drive shaft, this being necessary to take up the difference caused by raising the body.

Of course, there were a few other minor changes such as the longer hydraulic brake lines and the placing of the Pittman arm on top of the front wheel assembly rather than under as it is on the standard vehicle.

We were able to obtain some 12:50x16 aircraft tires and tubes which we mounted on Chevrolet truck rims that were cut and welded on the Willys wheel hub. By doing this, we extended the tire center from the standard 56″ to 74″.

We have used this vehicle for two full years and consider the experiment well worthwhile in spite of the fact that some of the Willys engineers scratched their heads and doubted that it would be a success. In the fall of 1956 we added the new Spicer free-floating-drive axle on the rear wheels, which gives drive on each of the wheels regardless of whether one wheel is stuck or not.

The tires cost $25.00 each because they were factory rejects and the rims and their extensions came to about $25.00 per wheel, which includes milling and welding, making a total cost of approximately $250.00 for turning the standard Willys 1-ton truck into a marsh buggy.

This unit seems to go where even angels fear to tread and it seldom becomes bogged or stuck, and even when it does get stuck it can be pushed out by hand. The usefulness of this vehicle is almost limitless because it is so mobile and its ground pressure is so low. It can travel at the rate of 30 to 40 miles an hour on hard surface road, yet it can go as slow as desired over marsh terrain. Generally speaking, the District has used this vehicle in its prehatch dusting program with a Root

duster applying 50-W DDT. However, a 50-gallon tank and pressure sprayer can easily be substituted for use around extensive marsh or field larviciding programs.

One of the main problems in mosquito control is tire rut mosquito breeding and this sometimes is caused by a mosquito control district's own vehicle making the ruts. The TASD swamp buggy will of course make ruts; however, where the conventional 1-ton 4-WD Willys truck will leave a 2-inch rut, the swamp buggy will leave only a slight indentation on the wet ground.

We no longer consider the Willys swamp buggy as an experiment; it has now joined our fleet of working vehicles and it is proving its value.

FIG. 2.—Swamp Buggy.

Have you indicated which tours you wish to take on February 25 in Washington? See page 319 for further information and instructions.