

GROUND SPRAYING EQUIPMENT

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Let us start our discussion of ground spraying equipment with a short review of equipment used in the past. The evolution of this equipment has led to what we are using today. Since the improvement in spraying equipment is dependent upon the chemicals used, the subject will have to be discussed under two separate groups; first, the mechanical means of ground spraying; second, the different kinds of chemicals to be applied.

In 1912 we used sprinkling pots, and believe it or not, an ordinary house broom to brush on the oil, which method is still used in India, Africa, and other parts of the world. The means of transportation were bicycle and horse and wagon.

A little later we modernized our methods by using knapsack sprayers and stirrup pumps, and traveled around in auto trucks made from converted passenger cars. These trucks caused many hours of grief, but were the beginning of real progress in the development of ground spraying. The trucks were structurally weak and poorly designed for the use to which they were put and something better was desired.

By 1920 it was possible to buy commercial vehicles which, for the time being, met transportation requirements. It was at that time that cylindrical tanks were mounted on the trucks and partly filled with fuel oil. Charged with compressed air and a short hose attached, they constituted the first mechanical catch basin spraying units. This proved such an improvement over the sprinkling pot method, that it led, in 1926, to the installation of a rotary pump mounted on the running board of a truck carrying a larvicide tank. Up to this time the greatest pressure we could generate with the stirrup pumps was about 60 pounds, but this equipment gave us working pressures up to 150 pounds. This made finer sprays,

more even distribution and greater coverage of larvicides.

This success led to the desire to have a vehicle which could travel in the soft ground in marshy areas. A small truck equipped with track laying tread enabled us to approach nearer some hitherto inaccessible spots. This conversion was far from the ideal answer but it was progress.

The next step was the installation of a plunger type pump driven by a power takeoff, capable of generating from 300 to 400 pounds working pressure. This permitted longer hoses and 300 feet became the standard although more was used on occasions. Improved nozzles added to the value of this equipment. This was a great stride in the field of ground spraying equipment, and is still the standard. What we did was adapt orchard spraying equipment to mosquito control. This was developed for larval control, using oil and different emulsions. The same plunger type pump, with its high pressure, made possible the first experiments in mist or fog spraying of pyrethrum emulsions for the control of adult mosquitoes.

Then with the development of the two axle drive truck the nightmare of having the spray rigs bogged down at frequent intervals in soft ground was solved. It is now possible to use mechanical sprays in nearly any place we wish.

So much for the past history of ground spraying. The thought for today includes control of the adult mosquito by means of aerosols in addition to control of the larvae. DDT and other new chemicals necessitate the adaptation of old machines and the invention of new types for the procedures involved in using them as larvicides and insecticides.

As the new formulas are brought out, new equipment is being developed for

the most effective and economical means of dispersal. Different types of machinery are required for the control of larvae from that needed for control of the adult mosquito. What will be the equipment of tomorrow? I think the high pressure plunger type pump, modified with mist nozzles, will still be used for many of the formulas, but with some changes in the technique of the spray man. Several machines are already on the market for the application of aerosols. One type generates an oil vapor or aerosol fog. Still another machine is so designed that it can blow either a liquid mist, a dust

application or a combination of the two. Since aerosols and mists or fine sprays depend upon the wind for their transportation, all of this equipment must be used on the windward side and the vapors allowed to drift across the area being controlled.

So long as we have new chemicals requiring new techniques of application, we will need new equipment or adaptations of the old to achieve their advantages in mosquito control work. The paper that follows will discuss the different larvicides and insecticides that have been and are to be used in these mechanical units.