MISSISSIPPI

Agricultural and Mechanical College

EXPERIMENT STATION.

BULLETIN NO. 32.

A NEW KEROSENE ATTACHMENT FOR KNAPSACK SPRAYERS.

HOWARD EVARTS WEED.

AGRICULTURAL COLLEGE, MISS.,

DECEMBER, 1894.

A NEW KEROSENE ATTACHMENT FOR KNAPSACK SPRAYERS.

In Bulletin 30 of this Station is described an attachment to the knapsack pump, by means of which kerosene can be mechanically mixed with water for use as an insecticide. As originally designed, (See Report of Wisconsin Station, 1891) an attachment was placed on an orchard pump, but realizing that kerosene is wanted more largely in garden work we designed an attachment for a knapsack pump, that pump being the one best adapted for garden work. Experiments made last season showed that the attachment did good work in the hands of a careful person, but experience in the field showed that slight modifications would make the proportions of the mixture more exact, the adjustment more simple, and the pump better for general use. The attachment, as now made, is described in the following pages.

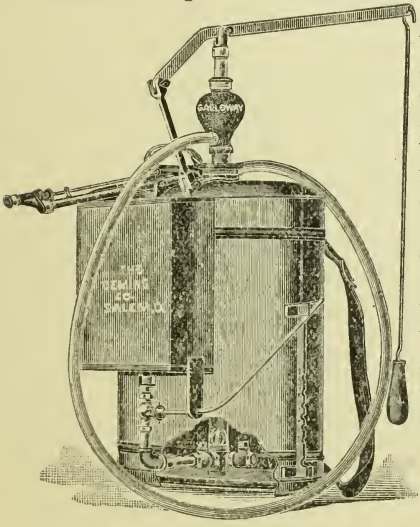
The accompanying illustration shows the attachment as now made by the Deming Co., of Salem, Ohio, in connection with their "Perfected Galloway" Knapsack Sprayer. The kerosene is placed in a separate tank holding one gallon, and which is attached to the main tank by means of clips. A brass pipe connects the kerosene tank with the bottom of the pump in the center of the main tank, and a check valve is placed in the kerosene pipe just inside the main tank, with a second valve through which the water passes, at right angles to this. These check valves permit the passage of the kerosene and the water into the pump, but prevent any mixture of the liquids except while pumping.

A stopcock is placed in the connection between the kerosene tank and the pump, and attached to it is a rod bent around to the side of the main tank where it fits into notches on a gauge, as shown in the illustration. When the rod is placed in the bottom notch the stopcock is closed, and when in the top notch it is fully open, and when in the latter position equal parts of kerosene and water are used.

The notches on the gauge plate are marked to indicate the proportion of kerosene which is being used, as follows:

5-10
4-10
3-10
2-10
1-10
1-15
1-20
1-30
0

Thus, when one part of kerosene to twenty-nine of water is wanted, the rod is placed to the notch marked "1-30," and when one part of kerosene to nineteen of water is wanted, the rod is placed in the notch marked "1-20," and so on. The rod may be changed from one notch to another at any time, even while pumping, and is held firmly in place until changed by the operator.



When the stopcock is changed from one proportion to another, the last proportion indicated will not be secured until a few strokes of the pump have cleared the mixture already in the cylinder and pipes. The working of this attachment is very simple; the main tank is filled with water, and the smaller tank with kerosene, the gauge rod is placed in the notch corresponding to the amount of kerosene wanted in the spray, and the pump worked in the usual manner. The kerosene attachment can be readily detached from the main tank when the pump is wanted for ordinary purposes.

USES.

Insects that eat leaves can be killed by spraying or dusting the leaves with Paris green and similar poisons, but all insects which suck the juices of plants or the blood of animals can be killed only by the application of some

substance like kerosene directly to the insects themselves. Although poisons like Paris green are not applicable to insects which take their food by sucking, yet an external irritant, like kerosene, is applicable to all, and it matters not how they take their food. Kerosene can be used against all insects except those living in confined places where they cannot be reached, such as tomato worms, those living in stored grain, etc. The amount of kerosene which should be used will vary with the kind of insect to be treated, some requiring a much larger proportion than others. Nearly all plants will bear one part of kerosene to ten of water, but when a stronger application is to be made, it should first be tested on a few plants to see if the foliage is affected. For the treatment of ordinary insects the following proportions are recommended:

Plant-lice, of all kind, 1-20.
Caterpillars or other larvæ exposed on leaves, 1-15.
Scale insects on leaves, 1-10.
Scale insects on bark, summer treatment, 2-10.
Scale insects on bark, winter treatment, 3-10.
Lice on domestic animals, except hogs, 3-10.
Lice on hogs and ticks on cattle, 5-10.

The mixing of the two liquids takes place partially in the pump, but more largely in the nozzle, where they are divided into very fine particles. Of course a mixture made in this way is not a permanent one, nor is it necessary that it should be so. What is needed is simply a dilution of the kerosene so that it will not cause injury when applied, and the attachment accomplishes this object fully.

Heretofore, when kerosene has been used as an insecticide, it has been necessary to make it into an emulsion by mixing it with soap suds, which is a complicated operation requiring considerable care, but with this attachment no care is needed except to see that both tanks are kept filled, and the gauge rod in its proper place. The attachment adds about two dollars to the cost of the pump, but more than doubles its value.

[The writer wishes to thank the Deming Co. for favors shown while recently at their factory in perfecting the attachment, and also to state that the use of the check valves and the notches on the gauge plate were originally suggested by Mr. Wm. L. Deming.]