

once, by which much loss will be prevented, because those insects which are most injurious to crops are naturally common species, and the life histories of nearly all of these have been worked out, and already practical remedies have been discovered.

There is at the present time in North America a large and earnest body of students working at problems connected with the discovery of new remedies or the improvement of old ones, by means of which insects which injure crops may be controlled. Something new is being learnt every day as to the means of either making or applying remedies, and day by day new facts are being learned concerning the life histories and habits of the insects which are the causes of loss. In the present bulletin an effort has been made to supply Canadian farmers with the best remedies and the latest developments in methods of applying them. So much is written nowadays in magazines, newspapers, etc., concerning insect injuries and the best ways of preventing them, that a great many experiments have been necessary to find out how reliable some of the proposed remedies were, and the present bulletin gives only the best results of such experiments as have been actually tried by officers of the Division of Entomology.

APPARATUS.

Nearly all insecticides may be used both as dry powders or in liquid. In the case of the useful arsenical poisons, it is necessary to mix them with some other substance as a diluent, on account of their caustic action upon tender vegetation, and also for convenience of distribution and to economise the material. For dry applications, suitable diluents will be found in flour, land-plaster, air-slaked lime, finely sifted ashes, or even road dust. The important point is that the powder shall be perfectly dry and in a very fine state of division, so as to mix thoroughly with the insecticide and thus insure even distribution. There are several implements for distributing dry insecticides such as bellows, insect guns, dusting boxes, etc., many of which will be found mentioned in the catalogues of our leading seedsmen. A convenient method for distributing dry poisons is to place the powder in a small bag of very fine muslin, then tie this to the end of a short stick so that it swings freely. If the bag is tapped lightly with another stick held in the other hand, the operator can walk erect and do much better work than by stooping along over his crop with an aching back. Dry mixtures should be applied in still weather and, if possible, when the plants are wet with dew. It is found by experience, however, that during the spring months when insecticides are most needed, there are often periods of several days when these conditions do not occur. It therefore becomes necessary to apply the poison in some other way, so that the material may be evenly distributed over the plant to be protected, and not blown away by the wind. For this purpose, mixing with water and then applying with a spraying pump is the most convenient plan.

I have no doubt that it will repay any one who has to apply insecticides, even in a small garden, to go to the expense of procuring a pair of proper bellows for dry mixtures, and a force pump with a spraying nozzle for liquid applications. Makeshift contrivances, such as watering cans, whisks, and even bunches of leaves, which are frequently used, actually cost far more in wasted