

Spraying of Fruit Trees.

SPRAYING of fruit-trees and other plants has come to be a necessity in order to secure a profitable yield so as to sufficiently remunerate the grower for the time, care and labor spent in cultivation. But that the doing of anything so necessary to the success of the fruit-grower should be performed in a way, and at a time, which should prove detrimental to the interests of the fruit-growers' best friends—the bee-keepers—would be much regretted, were it not for the fact that such spraying, if properly done, will in no wise result in loss to the apiarists.

Bulletin No. 7, as issued by the United States Department of Agriculture, and to which we referred on page 505, gives full directions for making and applying the various poisonous compounds used in spraying for the destruction of the harmful pests, and states very decidedly that "no spraying as described by the Department has ever resulted in the slightest deleterious effects upon the fruit subjected to it." This will be welcome information to all who feared that the spraying had caused poisoning among those who had partaken of fruit which had been sprayed. It thus behooves all who employ this means of protecting their fruit, to follow carefully the *modus operandi* as given by the Department of Agriculture.

On the subject of preparing the arsenites (London purple, Paris green and white arsenic) for spraying purposes, the Bulletin says:

The poisons should be thoroughly mixed with water at the rate of from 1 pound to 100 to 150 gallons of water, and applied with a force pump and spray nozzle. In preparing the wash, it will be best to first mix the poison with a small quantity of water, making a thick batter, and then dilute the latter and add to the reservoir or spray tank, mixing the whole thoroughly.

When freshly mixed, either London purple or Paris green may be applied to apple, plum, and other fruit-trees, except the peach, at the rate of 1 pound to 150 to 200 gallons, the latter amount being recommended for the plum, which is somewhat more susceptible to scalding than the apple. White arsenic does little, if any, injury at the rate of 1 pound to 50 gallons of water when freshly mixed.

As shown by Mr. Gillette, however, when allowed to remain for some time (two weeks or more) in water, the white arsenic acts with wonderful energy, scalding when used at the rate of 1 pound to 100 gallons from 10 to 90 per cent of the foliage; the action of the other arsenites remains practically the same, with perhaps a slight increase in the case of London purple.

With the peach these poisons, when applied alone, even at the rate of 1 pound to 300 or more gallons of water, are injurious in their action, causing the loss of much of the foliage.

By the addition of a little lime to the mixture, London purple and Paris green may be safely applied, at the rate of 1 pound to 125 to 150 gallons of water, to the peach or the tenderest foliage or in much greater strength to strong foliage, such as that of the apple or most shade trees.

Whenever, therefore, the application is made to tender foliage, or when the treating with a strong mixture is desirable, lime water, milky, but not heavy enough to close the nozzle, should be added at the rate of about 2 gallons to 100 gallons of the poison.

In spraying apple-bloom, which perhaps as much as any other (if not more) affects the bees most seriously when not applied at the proper time, the Bulletin continues thus:

With the apple, in spraying for the codling-moth, at least two applications should be made, *the first, after the falling of the blossoms, or when the apples are about the size of peas, and the second a week or ten days later.* The first brood of the codling-moth lays its eggs in the flower end of the young apple, and the worms upon hatching gnaw their way into the interior of the apple, and on sprayed trees get poisoned in so doing, an infinitesimal amount being sufficient to destroy so minute a worm. The second spraying is for the purpose of destroying larvæ hatching from eggs which may be laid after the first spraying, as the arsenic is gradually washed off by rains.

For the plum curculio on the plum, cherry, peach, etc., two or three applications should be made during the latter part of May, and the first half of June. The poison in this case is applied for the purpose of destroying the adult curculios which hibernate and gnaw into the young growth of the trees, and even into the hard young fruit before laying their eggs. The eggs are pushed under the skin so that the larvæ are not ordinarily affected by the poisoning.

In the case of most leaf-feeding insects one should spray on the first indication of their presence.

Treating the subject of spraying from a purely hygienic stand-point, several instances are cited where careful experiments have been made to ascertain what possible deleterious effects could arise from the consumption of fruit to which had been applied the arsenites so deadly to the codling-moth and other parasites. Regarding the eating of apples that were so treated, the following reference is made.

In case of spraying apple orchards for the