

The use of Arsenate of Lime with Sulphide Sprays.

Arsenate of lime is the only poison on the market that can be used with sulphide sprays, such as lime sulphur, barium tetra-sulphide and sodium sulphides, such as "Soluble Sulphur" and "Sulfocide," without such chemical change taking place between the sulphide and the poison as would result in injury to foliage. When acid (hydrogen) or standard lead arsenite is added to lime-sulphur a certain amount of double decomposition occurs resulting in the formation of lead sulphide and crude arsenite of lime, five per cent of which is soluble arsenic. This reaction may precipitate as much as 35 per cent of the sulphur from the solution as lead sulphide, the black "sludge" with which the orchardist is familiar. Arsenate of lime, on the other hand, does not cause any perceptible decomposition or change in the sulphide composition and the standard brands contain much less than one per cent of soluble arsenic. The presence of lime sulphur in the spray prevents the formation of soluble arsenic compounds from arsenate of lime.

With sodium sulphide solutions, such as "Soluble Sulphur" and "Sulfocide," arsenate of lime is the only commercial poison that can be used without damage to foliage resulting from the formation of soluble arsenical compounds.

On account of the apparent increase in the toxic value of arsenicals that results from the presence of sodium salts, it has been found desirable to decrease the amount of arsenite of lime used with sulphide sprays to the proportion of one-half pound of arsenate of lime to forty gallons. It has been found that the sodium sulphide solutions do not adequately protect the arsenate of lime against air and that in order to eliminate yellowing where the sodium sulphide with arsenate of lime combination is used for the four sprays, 10 pounds of hydrated or water-slaked lime must be added to each 40 gallons, although it may be pointed out that injury has been practically eliminated by using five pounds of lime to each 40 gallons in an orchard that was not well-cared for.

The use of Arsenate of Lime with Bordeaux Mixture.

Arsenate of lime has given the best of satisfaction and no leaf injury when used as a spray for the apple in conjunction with Bordeaux mixture made according to the various formulæ. It would appear that on account of its adhesive qualities arsenate of lead assists the fungicidal action of Bordeaux mixture more than arsenate of lime. On the other hand, the difference in cost and greater convenience are both in favour of arsenate of lime.

Formulæ for use of Arsenate of Lime.

As a potato spray:—

Arsenate of lime: $1\frac{1}{2}$ pounds.

Bordeaux mixture: 40 gallons.

As an apple spray: The following proportions are practically equivalent on account of the effect of the fungicides on the action of the poisons:—

With Bordeaux mixture: 1 pound of arsenate of lime to 40 gallons.

With lime sulphur: $\frac{3}{4}$ pound of arsenate of lime to 40 gallons, adding 5 pounds of hydrated or water-slaked lime to the two sprays applied after the blossoms.

With "Soluble Sulphur" and "Sulfocide": $\frac{1}{2}$ pound of arsenate of lime to 40 gallons, adding 10 pounds of hydrated or water-slaked lime to each spray.

Cost of Arsenate of Lime Compared with other Poisons.

When the cost of arsenic is taken into consideration arsenate of soda is the only arsenical insecticide that approaches in any degree arsenate of lime in cost as a potato poison. Paris green and arsenate of lead are at the present time costing about two-thirds more than arsenate of lime while arsenite of zinc is costing about one-third more.