

mature. In other respects its life history is similar to that of the Downy mildew.

Treatment—From the brief account of the life history of these fungi, which have been given above, it will be evident that the best means of preventing their growth is, first, by carefully destroying the foliage of the affected vineyard in the autumn; and, second, by an application in the spring to the young foliage of such mixtures as will prevent the germination of the spores, when they alight upon it. With reference to the best copper mixtures for spraying the vineyard, Mr. B. T. Galloway, Chief of the Division of Vegetable Pathology, Washington, D. C., writes us as follows:

"In reply to your recent inquiry as to the best method of combatting the powdery mildew of the grape, I have to say that the ammoniacal solution has been found fully as effective against this disease as any remedy now used. I would not advise the use of the Bordeaux mixture for this trouble, as it is certainly no better than the ammoniacal solution, while, on the other hand, it is considerably more expensive.

In case the ammoniacal solution is used, I would suggest that it be made by dissolving 5 ounces of copper carbonate in $1\frac{1}{2}$ pints of ammonia having the strength of 26°. When dissolved pour into a 50 gallon barrel, and fill the latter with water. The solution made in this way will cost about 50 cents per barrel."

We would advise our readers who intend experimenting during the coming spring with these mixtures, to make no delay in giving their order to the local druggist, who, as a rule, does not keep the copper carbonate in stock. He will, however, be able to procure it so as to sell it at about 60 cents a pound. Three or four applications will probably be sufficient for the vineyards of Ontario, because in these cooler latitudes, the fungus does not grow so luxuriantly as it does farther south. It is very important that the vines should be thoroughly sprayed so that every part liable to mildew shall be well covered with the mixture. An early spraying is very important, and the first application, according to Mr. Fairchild, of Washington, D. C., should be made at least one week or ten days before the young buds have fully burst their winter coats, just as the red tips of the young leaves are beginning to show. The second spraying may be postponed until the young leaves are from one to one and a half inches in diameter, but not later. The third spraying should be given when the flowers have fully opened, and this will not injure the blooms, for these have been fertilized before the caps have dropped off; and the fourth application may be made when the fruit is about the size of garden peas.

If this spraying is carefully attended to, we have the best authority for saying that our readers may count upon almost perfect immunity from the mildews, the rots, and also from several other fungi which affect the grape.

Of course, in order to do this work effectively, spraying machines of some kind will be necessary. Many growers, who have large orchards, have already