

The figure now before you represents an unfortunate tree attacked on the one side by parasitic plants and upon the other by insects: the former can be much controlled by spraying with copper compounds, the latter with arsenical mixture and kerosene emulsions. These common enemies put a premium upon skill, patience and industry, and thus to some extent fulfil a good mission.

All plants may be spoken of as flowerless or flowering. Among the flowerless we find the fungi, all developed from spores, while the flowering develop from seeds. The slide now represented on the canvas illustrates the difference between a spore and a seed. Spores are minute, have no embryo, have no definite direction in germination, and give rise to a mass of threadlike structures upon which spores are borne in due time. Seeds, on the other hand, are quite visible, possess an embryo, germinate at a particular point and develop roots, stem, leaves and flowers and seeds.

Slide 3 indicates that the fungi grow upon organic substance, either dead, as in case of mushrooms, or upon living, as rust of wheat, etc. These last forms are called parasites, among which we find the mildews, blights, etc., that trouble the fruit grower. Flowering plants feed upon inorganic substances, such as nitrates, sulphates, etc., in the soil.

Slide 4 introduces to your notice the nine family names which require to be known by the student of parasitic plants. Two of these contain most of the enemies in horticulture, and two trouble the farmer with rust and smut. Two embrace the microbes you now see upon the canvas. Among these are invisible foes which lash even man by inflicting upon him many forms of disease. I shall now bring before you the forms of several of the mildews, followed by a series of slides illustrating a number of parasitic plants largely connected with grape rot, cherry rot, etc. In both these groups you will observe that a general structure is common, but they vary considerably when you study them with reference to specific characters.

Prof. Pantan pointed out the striking feature of each fungus as it appeared upon the canvas, and then gave the remedy. These were followed by illustrations representing 21 common insect enemies for which remedies were also given, all of which are grouped together for convenience under the head of Fungicides and Insecticides as follows:

I. FUNGICIDES.

Fungicides may be defined as chemical compounds or mixtures used for the purpose of destroying such injurious forms of plant life as live upon other plants by absorbing their juices to such an extent as to affect their vitality. Examples are seen in the *rusts*, *smuts*, *mildews* and *blights*.

It is but a comparatively short time since the life history of these obscure forms of plant life has been made out; but during late years wonderful strides have been made in this department of biology, and we are now in possession of knowledge that enables us to hold in check their destructive effects by the application of so-called fungicides; among which some of the most important are:

(1) *Bordeaux Mixture*. This consists of copper sulphate, lime and water in the following proportions: 6 lb. copper sulphate, 4 lb. lime, 22 gals. water. This may be prepared by dissolving the copper compound in 16 gals. water; slake the lime in 6 gals. water, and when the latter is cooled pour it slowly into the copper solution and mix thoroughly. Some use less water for dissolving the first.

Owing to a tendency of this to clog the nozzle of a sprayer some use a modified form (2) 6 lb copper sulphate, 4 lb. lime, 50 gals. water, or (3) 4 lb. copper sulphate, 4 lb. lime and 50 gals. water, and have had good results.

(1) *Ecu Celeste*. This consists of copper sulphate, ammonia (commercial) and water, 1 lb. copper sulphate, 1½ pints ammonia and 25 gals. water. Dissolve the copper sulphate in about 2 gals. hot water, as soon as cool add the 1½ pints ammonia and dilute to 25 gals.