

FUNGIOUS DISEASES OF TREES, PLANTS, AND FRUITS.

The following excerpt, *re* these, is taken from Bulletin No. 23 of the Central Experimental Farm:

"A brief consideration of the principles underlying the practice of spraying may enable the grower to understand the nature of fungous diseases, and this will be of service in directing an intelligent application of the remedies which are recommended. A glance at the character and habits of parasitic fungi will throw light upon the system of treatment.

The word *fungi* is used to designate an exceedingly numerous class of plants of simple organization; we must never lose sight of the fact that they belong to the vegetable world, and are therefore subject to the ordinary conditions of plant life. Some of them derive their nourishment from living plants and animals, others from dead plants or animals. Those which draw their food from other plants more highly organized than themselves are termed parasites, and it is with this class that the fruit-grower is chiefly concerned. These plants (parasitic fungi) have not the power of assimilating food from the soil or atmosphere, and therefore must obtain it in a prepared condition through the agency of the higher plants upon which they feed. The vegetative part of a fungus—that part corresponding to the root, stem and leaves of the higher plants—is made up of delicate thread-like tubes, usually more or less matted together; these collectively are termed *mycelium*. The term *hypha* is applied to a single thread-like tube. Parasitic fungi bear no seeds or flowers, but are reproduced by spores, which are borne upon specialized branches of the hyphae. These spores are produced in great numbers and are the principal, though not the only, means of spreading disease. The hyphae-threads of the parasitic fungi penetrate the tissues of the host plant—a name applied to the plant upon which they feed.

The spores are exceedingly light and easily carried by currents of air. When one falls upon a leaf and is supplied with moisture it germinates by sending out a slender tube, which effects an entrance into the tissues of the leaf through the breathing pores (stomata) or intercellular spaces. After the parasitic fungus has thus entered the interior of a leaf, it develops rapidly at the expense of the tissues of the latter. Pushing forward from one cell to another, the contents are appropriated and fresh vigor is thus gained by the parasite. This goes on till the vigor of the host plant is much impaired, or its life destroyed. Some of the principal parasitic diseases attack both foliage and the fruit of the host plant, as in the case of the "mildew" of the grape, "scab" of the apple and pear, and "rot" of the plum and peach. They are thus doubly destructive. If this destruction were confined to a few cells, leaves, or even to a few plants, the loss would be trifling; but the extraordinary rapidity with which fungi multiply, and the ease with which their reproductive bodies (spores) are carried from plant to plant, renders their extirpation a very difficult matter.

This explanation of the methods of reproduction and growth of these diseases emphasizes the truth of the maxim that "prevention is better than cure." When the mycelium of the fungus has become established within the tissues of the host plant, any remedy applied to the exterior of the plant, it is readily seen, can at the best be only partially effective.

Fungous diseases, in accordance with natural laws, will in all probability increase in number, in proportion as the food plants upon which they prey are multiplied, and as climatic conditions are favourable to their development."

There are many ways in which the injuries of fungous diseases may be prevented. Among these are the following:—

- (1.) As a general rule, not however without important exceptions, plants weakened in vitality are more subject to the attack of parasitic fungi than those in vigorous growth. Consequently, methods of cultivation and fertilisation, which tend to produce sound development and early maturity, should be adopted as far as practicable.

Fertilisation and
Cultivation.