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STEM ROT OF LEGUMES (Sclerotinia trifoliorum)

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The leguminous crops including alfalfa, clover, vetc, etc. are of such tremendous importance that any disease like the stem-rot or wilt which causes serious damage to them is a matter of large concern. Although stem-rot is exceedingly difficult to control, a knowledge of its nature may be a help to some of our readers in dealing with it.

This disease is serious only in the sections of Oregon which have a moist and mild winter and spring climate. It is confined almost entirely to the areas west of the Cascades. Here the damage varies with the season. As a rule, it is during long-continued periods of mild and wet weather that the greatest damage is done and fields with a heavy and dense stand suffer more than those where the stand is not so thick and tall.

The first symptoms indicating the presence of the disease are found in the wilting of individual plants or individual stems here and there in the field. Such wilted and drooping stems are usually paler than healthy ones. The affected stems are softened and decayed near the surface of the ground and in wet weather a white, cobwebby growth of the fungus appears on the diseased stalks and on the ground around them. If conditions stay moist, every stalk on the plant is likely to rot away at the base. The whole plant wilts and dies but the fungus continues to grow on the dead remains as long as moisture is present.

From each infected plant the white, mold-like growth will spread out along the moist ground sometimes for several inches. If it reaches another clover or alfalfa or vetch plant this will be attacked. Having reached a new base of supplies, the fungus can crawl still farther on. In this way, if it stays moist continuously in the field, the stem rot is often able to spread out from a diseased plant in all directions and cause the death of a number of plants around it.

These dead patches may be so numerous in a field or so large that as high as a third or half of the plants or more may be destroyed in a single season. Then undesirable weeds and grasses come to occupy the vacant spots reducing the quality of the hay as well as preventing the clover, for example, from filling in again.

Where does the disease come from and how does it increase from year to year? Let us first look closely at a diseased plant. The rotted stem base as mentioned before is covered with a white cottony fungous growth. When sufficiently nourished, the fungus begins to form small roundish or irregular shaped solid bodies at first whitish but soon showing a coal black color on the outside while remaining white within. These are the resting bodies or Sclerotia of the fungus. They vary from the size of a pin head to the size perhaps of a vetch seed or small pea. They are found both on the outside and in the pith of the stems.

It doesn't matter how they get onto the soil, whether mixed with seed as sometimes happens, or in straw or manure thrown on the land or whether they lie on the ground where they fell from the diseased plants, eventually these black resting bodies will sprout when the wet weather of fall and winter arrives and produce tiny brown mushroom-like stalked cups that are the only spore-producing bodies the fungus has.

Each of these spore-cups produces thousands of microscopic spores shooting them forcibly into the air where they are wafted like dust over the field. Most of the spores perish but some of them will be able to start the disease going again.

Dry weather stops the work of the fungus at once and unless the ground surface is constantly moist the mold will not spread over the ground either. The disease dies down in the field with every dry spell and summer dryness stops all further progress. In fact, it is probable that the disease must get a new start from spores each winter. As a general rule a field slightly attacked the first year is likely, if weather is favorable, to be much more heavily attacked the next year because of the many scattered resting bodies or Sclerotia formed the year before.

## CONTROL

Our knowledge of the disease and its habits gives us our clues to control. The Oregon Agricultural College makes the following suggestions: First of all, a field that has had diseased plants in it should not be replanted to any leguminous crop for two years at least but should be rotated to crops that are not susceptible. Second, it is risky to plant legumes near a field in which the disease is known to be present. Third, the seed used should be free from the resting bodies or Sclerotia of the fungus. Fourth, the field should not be allowed to go into the winter with too heavy a top-growth but, if possible, should be so cut or pastured down that the soil surface has a chance to dry off as much as possible whenever the rain lets up and the sun comes out so as to hinder the mold from running along the ground.

Fifth, those types of legumes and those varieties which are most susceptible should be avoided if possible in favor of those which are more resistant.

The experience of the Farm Crops department of the Oregon Experiment Station, through its variety trials and field observations, indicates that alsike clover is more susceptible than red clover; than in general, red clover from foreign seed is likely to be more susceptible than that from home-grown seed; that sweet clover is especially susceptible, the white kind being much worse than the yellow-flowered; that purple vetch is the worst of the vetches while woolly-podded vetch and Monantha vetch are next in line; that Hungarian vetch, common vetch, and hairy vetch are more resistant; that Grimm alfalfa and Kansas common are probably the most resistant of available types of alfalfa.