

AGRICULTURAL EXPERIMENT STATION
Oregon State Agricultural College
W. A. Schoenfeld, Director
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ONION MILDEW

By

Frank P. McWhorter, Plant Pathologist, Oregon State College

1081
In sections of western Oregon, especially where onions are grown for seed purposes, downy mildew is recognized as an increasingly serious disease. The handling of the crop for optimum seed production is favorable to the development of the mildew disease. All above-ground parts of the plant are attacked. An important circumstance is the recently demonstrated fact that the fungus can pass through the flower parts into the seed. The fungus can be seed-borne because (1) it may enter the seed as mentioned above and (2) it may be present as a contaminant in the chaff which accompanies the seed. It is necessary, therefore, for the grower of onion seeds to take especial precautions to prevent the development of the disease. He should do this not only to protect himself against disastrous losses in yield, but also to prevent dissemination of the disease in the seed.

Unfortunately no entirely adequate control is known. The downy mildew fungus is difficult to kill with fungicides because the body of the fungus proper lies within the leaf tissues. The function of ordinary sprays is, therefore, one of protection. This circular suggests the trial of a new method or principle in spray control.

General Considerations Which May Effect Control

1. The fungus over-winters in debris in the soil. Crop rotation is, therefore, essential. Burning of onion tops is helpful against both insects and fungi.

2. All possible precautions should be taken to prevent scattering of the tiny fungus (mildew) spores. These spores form mostly in wet weather and during the early morning hours in the presence of heavy dew. One should not walk through fields or perform cultural practices at a time when the leaves are wet. When spores are scattered under such conditions they may land in water droplets on leaves which would furnish them the necessary moisture for germination and infection. Any cultural practice which tends to increase the rapidity of drying-off of dew, rain or fog, is considered advisable. This consideration makes clean culture, removal of weeds, etc. especially desirable.

3. It is obviously desirable to start with mildew-free seed. Since one cannot be certain that the seed is mildew free, some seed growers (and general growers) may wish to consider disinfection of the seed by heat treatment. Studies in Ireland, where this same mildew does great damage to onions, have shown that it is possible to kill the fungus in the seed by treating the seeds in hot air at 104° Fahrenheit for eight hours. Trial of this treatment could be made with the help of the Oregon Agricultural Experiment Station. Chemical disinfection on onion seed for mildew control is not recommended.

Special Spray Trials

The development during the past three years of a new type of spreader known as "detergents" offers a new method of applying Bordeaux mixture to onion foliage. Our suggestion that trial of these spreaders be made on onions is based on the success we have experienced in spraying the foliage of bulbous ornamentals whose onion-like foliage is equally difficult to cover. There are two groups of these spreaders: (1) Dusts or pastes sold under such trade names as Pomo, Vatsol, Arkesak, etc.; (2) oil-like compounds of which the one known as Penetrol is now available on the Portland market. (Penetrol is not chemically a true detergent.)

Trial formulae would be -

1. To every 50 gallons of 4-4-50 Bordeaux add 1/2 to 1 pound of Pomo or Vatsol.
2. To every 50 gallons of 4-4-50 Bordeaux add 1 pint of Penetrol.

Trial of similar formulae on foliage of other bulbs has produced a cover which stayed on for weeks during the season of continuous rains.

The Penetrol suggestion is especially hopeful since it enables the Bordeaux to actually penetrate the leaf. On the other hand, this property of Penetrol may lead to burning of the foliage - a point which can only be determined by actual experience. For this reason we recommend only small area trials of the Penetrol at first. The true detergents (Group 1) have no tendency to induce burning but do enormously improve the sticking and spreading qualities of the Bordeaux on the foliage.

When using detergents the Bordeaux can be applied without recourse to very high pressures. Medium pressures, proper adjustment of the nozzles, and, above all else, the right amount of the detergent so that the spray spreads evenly over the leaf, are essential points.

Since the preparation of detergents in the spray mixtures requires some experience, our office, with the cooperation of your county agent, would be pleased to be present during some of the first trials.