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Powdery Mildew

Disease of House and Garden Plants

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INTRODUCTION

Powdery mildew disease can be caused by several commonly occurring plant pathogenic fungi capable of infecting a wide range of plants. It may be found indoors on such plants as begonia and African violets, or outdoors on annuals, perennials, fruit trees, berry bushes, vegetables, and grasses. In mid to late summer almost any plant or plant part growing where sunlight and air movement are restricted may show signs of powdery mildew infection. The seriousness of the disease often varies with the variety of the host plant. For example, some mildew resistant varieties of rose never become infected with the fungus while less resistant varieties in the same garden may be so heavily infected that flower buds never open and leaves fall prematurely.

Symptoms

A white to grayish powdery or webby coating on the surface of leaves (Fig. 1 and 2), stems, buds, or fruit, is a sign that powdery mildew has become established. The coating consists of superficial, interwoven threads of fungus and chains of spores. If the powdery growth is removed, a brown to black lesion (Fig. 3) is usually found on the plant surface. This may be all that is evident if growth conditions for the fungus are unfavorable. The fungus enters and feeds only on the surface (epidermis) cells of the plant.

Injury proceeds slowly but steadily as the fungus drains away the plants' nutrients and reduced photosynthesis. Typical symptoms can include stunting and distortion of leaves, buds, growing tips, and fruit; death of invaded tissue; yellowing of leaves; premature leaf fall, and a general decline in plant growth and vigor.

Causal Agent and Life Cycle

Six closely related genera of fungi make up the family of powdery mildews. To the naked eye they appear identical; however, they differ in number of spores produced, the shape of microscopic structures, and host preference.

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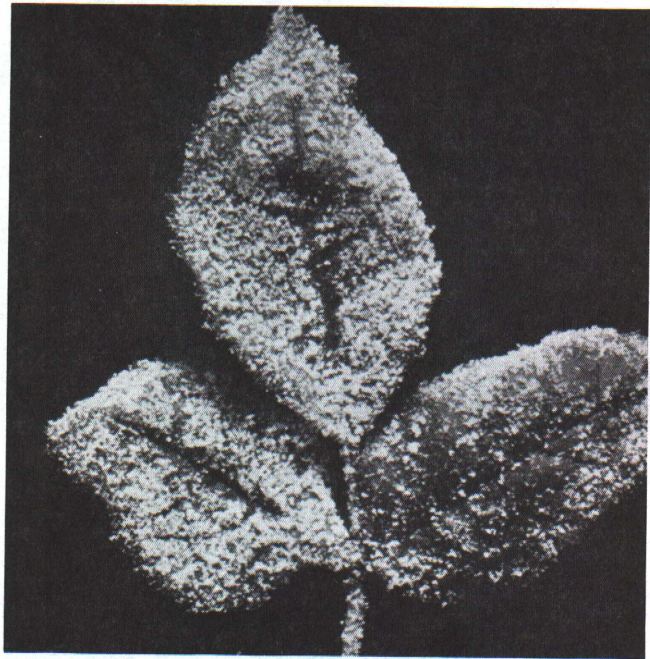


Fig. 1. Powdery mildew (conidial stage) on roses.

In the fall, tiny black spherical structures, appearing as specks and called cleistothecia, begin to appear in the powdery growth. These are the overwintering structures of the fungus. The cleistothecia contain overwintering ascospores that remain alive but dormant on plant debris throughout the winter. In certain hosts the mycelium alone may overwinter in dormant buds.

Ascospores rupture the cleistothecia in the spring and are carried about on air currents. When an ascospore lands on a susceptible host, spore germination takes place and mycelial threads penetrate the host. In a very short time, chains of another type of spore called conidia (summer spores) are formed all over the mycelium. Enormous numbers of conidia give the powdery appearance to the fungus. Conidia are readily dislodged and each individual spore is capable of making a new infection. There may be numerous conidial cycles during the summer outdoors, while in the greenhouse the conidial cycle is usually the only stage formed. As fall approaches, outdoor conidial production slows and cleistothecia begin to form.



Fig. 2. Powdery mildew on greenhouse chrysanthemums.



Fig. 3. Pansy leaf showing dark lesions due to powdery mildew infection.

Control Measures

The best control measure is to plant varieties resistant to powdery mildew. However, when dealing with susceptible varieties, sanitation and protective fungicidal sprays can give excellent protection. Sanitation means removing and destroying infected plant parts in the fall. This eliminates the major source of spore inoculum. Proper spacing and pruning to keep all parts of the plant open to air circulation, sunlight, and rain can help prevent infections from becoming established.

Fungicides used for powdery mildew control include sulfur* (wetable powder or dust), benomyl, copper compounds, actidione P.M.,* cycloheximide,* dinocap, parinol, and piperalin.¹ These compounds should be applied according to package label directions to insure maximum protection.

*These compounds may be phytotoxic to some plants. Check the package label for specific instructions and precautions. Use all fungicides properly—do not misuse fungicidal chemicals.

¹An additional spray for roses is the newly registered triforine.