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## **BOTRYTIS BLIGHT OF BOUVARDIA FLOWERS**

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## **BOTRYTIS STEM ROT OF TUBEROUS-ROOTED BEGONIA**

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## PAPERS IN THIS ISSUE

### **Botrytis Blight of Bouvardia Flowers, by C. M. Tompkins**

A serious blight is prevalent on bouvardia cut flowers when they are stored in waxed containers in commercial refrigerators at 48° F in San Francisco. Symptoms consist of small to large light-brown lesions on buds and open flowers. Often lesions coalesce to form larger lesions. In advanced stages, the flowers become shriveled and deformed.

The causal organism has been identified as *Botrytis cinerea* Pers. Its pathogenicity has been established. The disease may be controlled by spraying the flowers with an aqueous solution of copper oleate (1:800) immediately after packing.

### **Botrytis Stem Rot of Tuberous-rooted Begonia, by C. M. Tompkins**

A stem rot of *Begonia tuberhybrida* Voss is prevalent in greenhouses at Capitola and on the San Francisco peninsula.

Principal environmental factors favoring the disease are relatively cool, foggy weather, overwatering, and crowding of the plants. Disease symptoms consist of dark-brown, water-soaked, occasionally sunken and shriveled, irregular-shaped lesions which usually occur at or near the base of the main stem of the plant. Lesions may also develop at some distance above the soil line, at nodes or internodes, and may coalesce to form larger lesions. In advanced stages, the internal tissues are completely invaded, the stem breaks at the lesion site, and the top of the plant falls. Infection may also occur on the axils of leaves and through leaf scars and growth cracks caused by heavy nitrogenous fertilization.

The causal organism has been identified as *Botrytis cinerea* Pers. Its pathogenicity has been established.

The disease may be controlled by removing all debris, excising all infected areas, and painting them, as well as leaf scars, wounds, and growth cracks, with Ziram (Zerlate) paste. This process is repeated daily from midseason until the seed is harvested. Hairy-stemmed varieties are generally more resistant to infection than varieties with smooth stems and few hairs.

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## **BOTRYTIS BLIGHT OF BOUWARDIA FLOWERS<sup>1</sup>**

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### **INTRODUCTION**

In the San Francisco Bay region of California, hybrid bouvardia plants (*B. humboldtii* Hort. var. *grandiflora*) are grown on a limited scale in greenhouses for the production of cut flowers, used chiefly in wedding bouquets and corsages. A serious flower blight, affecting both pink and white varieties, was first observed in April, 1949, in the flowers packed for marketing in small, waxed cardboard boxes. These boxes had previously been stored for several days in a commercial refrigerator at a temperature of 48° F. Upon examination, the flower clusters in each box, in a lot of approximately 50 boxes, proved to be completely infected and a total loss. Similar losses were sustained on an average of thrice weekly over a period of two months during the current season.

The results of studies on this disease and a method of control are presented herewith.

### **SYMPTOMS OF THE DISEASE**

The symptoms of the disease consist of small to large, irregular-shaped, light-brown lesions which appear on buds and open flowers (plate 1, *A, B, C*). In advanced stages of the disease, these lesions frequently coalesce to form larger, dark-brown areas on somewhat deformed, shriveled flowers (plate 1, *D, E*) in marked contrast to healthy specimens (plate 1, *F*). Most of the flower clusters become infected after several days' storage (plate 2).

### **FACTORS FAVORING INFECTION**

Only the flowers become infected, and not until the boxes in which they are packed have been stored under commercial refrigeration at 48° F. It is customary, in packing the flowers, to line each box with a sheet of waxed paper on which numerous flower clusters are closely arranged, side by side. Before the box is closed, the flowers are atomized freely with water and then covered with a sheet of waxed paper. Storage of the boxes under refrigeration lasts from one to five days, depending upon market demands. Humidity in boxes is high and, together with a low temperature, provides optimum conditions for infection.

<sup>1</sup> Received for publication September 20, 1949.

<sup>2</sup> Associate Plant Pathologist in the Experiment Station.

## THE CAUSAL FUNGUS

Isolations made from diseased buds and open flowers on potato-dextrose agar have consistently yielded a fungus which has been identified as *Botrytis cinerea* Pers.

## PATHOGENICITY

Four isolates of the fungus from infected bouvardia (two from white flowers and two from pink flowers) proved pathogenic to healthy bouvardia flowers in standard containers. Inoculum was prepared by growing the fungus on potato-dextrose agar slants in large test tubes and was ready to use as soon as the fungus sporulated. A spore suspension was prepared in a sterile atomizer. Two boxes containing both pink and white healthy bouvardia flower clusters were atomized freely with a spore suspension of one of the isolates. Each of the remaining three isolates was used in the same manner. Controls consisted of four boxes of mixed, healthy flowers which were atomized with sterile distilled water. The boxes were then closed and placed in the refrigerator. Examination 24 hours later revealed severe infection of flower clusters in the inoculated boxes, while the controls remained healthy. In the inoculated series, all noninfected flowers finally became infected two to three days after inoculation. The fungus was reisolated from representative flower samples selected from each inoculated box and proved to be identical with the original isolates. When tested again in parallel series, the reisolates again proved pathogenic. Symptoms on artificially infected flowers were identical with those on naturally infected flowers. Both pink and white bouvardia flowers appear to be equally susceptible to infection by *Botrytis cinerea*.

## CONTROL OF THE DISEASE

Since bouvardia flowers must be kept moist in waxed containers to maintain freshness, tests were conducted which involved the use of a copper oleate spray, sold under the trade name of Greenol. An aqueous solution of this fungicide (concentration 1 to 800) was atomized on healthy pink and white flowers in each of three boxes immediately after packing. Controls, consisting of three boxes, were atomized as usual with tap water. The boxes were then placed in the refrigerator. Examination of both lots over a period of five days showed that the flowers atomized with water were a complete loss in three days, while those treated with Greenol remained healthy for five days or more. The test was run again with similar results. No noticeable residue or discoloration of the flowers was observed after applying the fungicide. The control of this disease is, therefore, effective and inexpensive.

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