

NEW PLANT DISEASE PROBLEMS ON ORNAMENTAL PLANTS IN CALIFORNIA

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A title such as the one above might be misleading in that it could suggest that disease organisms frequently are being brought into the state. This probably is true due to the huge amount of plant materials imported to supply the ornamental plant industry. However, many of the organisms are not new and have been found and reported as occurring in the state. Control measures frequently have been worked out for such organisms. Occasionally, organisms new to California are brought in or, sometimes, organisms already here are found to be infecting new hosts. Perhaps some of the hosts have had the problem for some time before it is detected.

Although none of the new diseases reported here are as potentially threatening overall as a problem such as the ash white fly, to individual growers they can be a serious problem.

Anigozanthos spp. are interesting Australian plants grown for cut-flowers and recently as a potted plant. Following its introduction into California for cut-flower production, a leaf spot was found on plants from the San Diego and Watsonville areas. The causal fungus is a species of *Alternaria* (4) and is in a group of fungi that tend to be host specific. Infection results in round or elliptical black spots on the leaves. The size of the spots varies and in a susceptible species such as *A. manglesii* D. Don, can be an inch or longer and may develop in streaks. Control measures have not been developed yet nor has the host range in the genus been completed.

Recently *Anigozanthos* hybrids have been developed for use as potted plants. These are being produced in large numbers using tissue culture. Recently some of these plants in a nursery in the San Francisco Bay area developed blackened areas in the leaves. These started as small spots and rapidly enlarged, sometimes covering the width of the leaf and also extending up and down the leaves so that sometimes nearly the whole leaf became black. Culturing failed to reveal the cause of the problem but free-hand sections of infected materials revealed the presence of a foliar nematode. This was identified as *Aphelenchoides fragariae* (Ritz.-Bos.) Christie (9) and presently, studies are in progress to determine if this is a common or specialized form of that nematode. Studies also are in progress to determine the susceptibility of other *Anigozanthos* spp. "Vidate" as a foliage spray may give control.

Several years ago a leaf spot was found during the winter months on calendula in central coastal California. The fungus killed the

leaf tissues resulting in somewhat angular spots up to ½ in. across. Small black spots were found on the stems (6). The fungus, also an *Alternaria* was found to infect *Calendula* spp., and of 20 species inoculated, all were found to be susceptible, although 2 species were only moderately affected. When inoculated, *Dimorphotheca pluvialis* Moench and *Osteospermum calendulaceum* Harv., which are in the same tribe as calendula, were found to be susceptible. An *Alternaria* sp. infecting *Calendula* was reported from Denmark (3) but that fungus has a different host range than the fungus in California. Iprodione was found to give good control in experiments here.

Another *Alternaria* has been found on annual and perennial candytufts. Though reported in Europe (3) and in Florida (10) only recently has it been reported in California (6). The fungus has been identified as *Alternaria brassicae* (Berk.) Sacc. and has been reported on many members of the Cruciferae (2). Following inoculations with the fungus, candytuft, broccoli, Brussels sprouts, cabbage, cauliflower, radish, and 16 species of *Iberis* were found to be susceptible. In candytuft, infection results in small black spots on the leaves, stems, flowers, and fruits. Infected leaves yellow and drop. Severely infected plants have only a few leaves at the top and do not produce saleable flowers. Most *Alternaria* species do not infect flowers. In candytuft, the fruits also were infected and as a result, might be seed-borne.

Several years ago, leaves of pansies in several central California nurseries turned pale green to yellow. This was found to result from infection by a downy mildew (8). Although two downy mildews have been reported in the U.S. (2, 11), one of which also has been reported in Europe (1), the fungus in California is a different genus than the others. Why is this new form in California and where did it come from? The fungus has not been observed since although excellent control has been found using several metalaxyl sprays.

A new disease on marguerite daisies appeared two years ago in central coastal California. The disease results from infection by a species of *Ramularia*; symptoms appear as angular brown areas on the leaves which can become 1½ in. across. Small circular spots appear on the stems. In shipping, infected leaves become invaded by secondary fungi resulting in a destruction of the foliage. Although new, the fungus has spread through much of the marguerite growing area. Experiments are in progress to find a control.

In the production of miniature roses in greenhouses, a crown and root rot problem has developed. The fungus *Cylindrocladium scoparium* Morg. has been isolated repeatedly and has been reported on roses before, but not in California, and not on miniature

roses. The fungus causes a cutting rot but also produces crown and root rot on young plants. Some cultivars are more susceptible than others. Experiments are in progress to find an effective fungicidal control.

Eustoma grandiflora (Raf.) Shinn., or lisianthus is a new crop being grown as a bedding plant or for growing in pots. The plant has been found to have several problems associated with the roots and crown. *Pythium*, *Phytophthora*, and *Rhizoctonia* have been isolated from infected roots. A crown rot resulting from *Fusarium solani* (Mart.) Sacc. has been found. Recently a vascular wilt resulting from infection by *Fusarium oxysporum* has been reported (5). The plant seems to have lost some of its popularity, possible because of disease problems.

Time limits this to only a few of the problems which are new on ornamental plants in California. Others, such as twig and branch die back in oaks, new leaf spots on dichondra, ivy, *Lychnis*, and baby's breath, powdery mildews on a number of plants, and many root rot problems could be included.

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