MONOCHAETIA KARSTENII — A LEAF DISEASE OF CAMELLIA

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INTRODUCTION

Camellias form a specialist line of work in the experimental programme at Efford, particularly in relation to developing an accelerated production schedule for well branched, budded plants in 2 to 2½ years. However, all camellia trials came to an abrupt halt in 1977 due to the loss of a large proportion of the young plants which developed a progressively worsening leaf drop and subsequently died. The problem was not initially associated with disease as the early symptoms of leaf scorch on the young foliage was similar to that observed when levels of nutrition were excessive, or sun scorch from water splashes, and no fungal bodies could be found on the damaged tissue. The problem persisted and intensive work by pathologists eventually identified the cause as fungal. The organism was originally thought to be *Pestalotiopsis guepini*, but more recently has been identified as a closely related species, *Monochaetia karstenii*, which was considered only weakly pathogenic, capable of colonising wounded or damaged tissue, but not a serious problem. In any event, experience has shown that if allowed to build up unchecked it causes major problems in young plants, particularly where they are under stress in propagation or in the increasingly intensive production schedules used today.

THE DISEASE

In a severe outbreak on young plants symptoms are first seen as a leaf "scorch", followed by premature leaf drop, stem die-back, and often plant death. In less severe cases plants can recover after initial leaf drop. The "scorched" area is not the typical brittle scorch, the leaf remaining soft and pliable as the die-back continues, and mention has already been made that no fungal spores can be detected on these areas, even under a lens. The source of infection is found on the lower, older leaves, especially if they have been damaged or trimmed during propagation. Here the more typical necrotic areas which develop adjacent to damaged tissue are covered with black pinhead-sized fruiting bodies of the fungus (acervuli). Each acervuli contains thousands of spores which can be spread in air currents and water splashes.

Once identified it was realised that the disease was widespread and many of the leaf drop problems on *Camellia* were possibly associated with the disease. On most nurseries it could be found on the lower foliage of older plants and was not causing any untoward problems on these larger plants, except as a source of inoculum for infecting younger plants when conditions were right. Where levels of inoculum were allowed to build up, conditions adverse to plant growth favoured progress of the disease, at which stage it was capable of infecting healthy tissue of young plants causing serious trouble. The epidemic at Efford in 1977 was related to the very hot season of 1976 which produced severe plant stress, together with a range of experimental treatments, several adverse to growth.

Since the disease is endemic it has to be lived with, but improving cultural techniques and use of fungicides can help reduce the disease to manageable proportions.

IMPROVED CULTURAL TECHNIQUES

All possible steps should be taken to improve hygiene and minimise factors causing stress to young plants to enable them to resist infection.

Factors to consider include:

1. **Stock Plants.** Stock plants can be a major source of infection as sporing bodies can overwinter on dead flowers or in stem lesions as well as on the foliage. The presence of the disease is not usually a problem as far as stock plant growth is concerned, but provides a source of inoculum which can be a problem during propagation. Routine hygiene measures for stock include:

a. Removal of dead flowers (from plant or off the ground).

b. Removal of diseased foliage.

c. Routine fungicide programme, but especially just prior to taking cuttings.

2. **Propagation.** Since stress is severe during propagation this stage is at greatest risk for fungal infection and needs close attention to detail.

a. As with stock plants, routine hygiene measures are fundamental, with regular inspection to remove dropped leaves as they provide a prime site of initial fungal infection.

b. Leaves of cuttings should not be trimmed as this provides an entry point for wound pathogens. Trial results have clearly identified trimming of leaves during propagation as one of the major sources of infection of *Monochaetia karstenii* on young plants.

c. Routine fungicide spray programme, particularly for winter material under polythene covers as this environment is ideal for fungal growth.

3. **Young Plants.** Promotion of active growth in the liner stage and during the first season of growth in larger pots is important and can be achieved by:

a. Prevention of salt accumulation from too high a rate of fertilizer.

b. Do not overdose phosphate. Too high a rate of base phosphate will cause severe stress in young plants.

c. Prevent waterlogging and root death by improving compost structure. Granulated pine bark looks promising as a means of improving compost drainage and aeration.

d. Do not water with overhead spray lines. The higher humidities and water splash increase the risk of disease spread.

Plants at Efford have been successfully grown on either low level irrigated sand beds or benches, or by using pot drip irrigation on a weldmesh bench. The drier atmosphere of the latter method is particularly suitable where disease risk is high.

e. In periods of high light intensity (and temperature) shade the crop to reduce stress.

f. Use chemical pinching agents with caution as their mode of actions can increase plant stress.

g. Routine fungicide programme used for plant protection.

FUNGICIDE PROGRAMMES

A range of chemicals have been screened for both phytotoxicity and effectiveness in controlling the disease, in cooperation with the Glasshouse Crops Research Institute and the Agriculture Development and Advisory Service plant pathologists. Only three of those screened in these trials were effective without proving phytotoxic on the limited range of camellias used.

1. Benomyl (Benlate) appeared to give some protection against infection, but did not eradicate the disease.

2. Prochloraz (Sportak) and carbendazim/maneb (Delsene M) appeared to have potential both in protection and eradication or reduction of inoculum levels, but neither have Approved Label Recommendations for such use.

However, because of the high level of endemic *Monochaetia* inoculum at Efford, both chemicals are used as protectant

sprays in routine fungicide prgrammes at the rate of 1 g product/litre applied to run off.

a. Stock Plants: Rotation of prochloraz and carbendazim/maneb at monthly intervals during growing season, ensuring an application just prior to taking cutting.

b. During Propagation: Rotation of prochloraz, captan, benomyl, carbendazim/maneb and iprodione (Rovral) at fortnightly intervals.

c. During liner and first season of growth: Rotation of prochloraz and carbendazim/maneb at monthly intervals during the growing season, reducing to 2 to 3 month intervals during the autumn and winter.

CONCLUSION

Once a crop is infected with *Monochaetia karstenii* it is difficult to eradicate and use of fungicides alone will not give control under adverse growing conditions. Prevention is the most effective control, and much can be achieved by improved culture such as routine hygiene measures together with attention to detail in the production schedule, promoting active growth, and reducing as far as possible the factors causing stress. Once these measures are adopted fungicides become an important aid as a further means of protecting the plant against infection.

CONCERNS WHEN PROPAGATING PLANTS FOR THE URBAN ENVIRONMENT

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The world population continues to grow and with it the demand for resources. The United States, the land of "never-ending" resources, is now also concerned about resource depletion, population growth and control and, most recently, people living in close proximity to their neighbors. These concerns, first discussed in greater degree in the 1960's, have lead to the simultaneous interest in and development of scientific programs called urban horticulture. They are concerned with the study of the interaction of people and plants in urban environments.