



39	90	PATH
39	Supersedes 88	PATH
	39	2010

Arboriculture Research Note 39

Issued by the Arboricultural Advisory & Information Service

CORYNEUM CANKER OF MONTEREY CYPRESS AND RELATED TREES, by R G Strouts

Summary

The history, cause and symptoms of this fungal bark disease, which is responsible for most of the disease in Monterey cypress in Britain, are described. Slightly infected trees should benefit from surgery but severely damaged trees are best replaced. In the next 20 or 30 years the disease may become a problem on Leyland cypress.

Introduction

1. The Monterey cypress (*Cupressus macrocarpa*) was introduced into Great Britain in 1838 and, until its displacement by the hardier Leyland cypress (*x Cupressocyparis leylandii*), was widely planted as a hedge, screen and specimen tree. It was particularly favoured for seaside planting because of its resistance to wind and salt spray.
2. Apart from periodic severe winter-cold damage, no major disorder was reported on Monterey cypress until 1969 when *Coryneum* canker was found to be causing widespread and severe damage in southern England. The disease has been troublesome in the USA since the 1920s, and known in France since 1940. It is causing serious damage to the Italian cypress (*Cupressus sempervirens*) in Italy, and is now by far the commonest cause of death and disfigurement of Monterey cypresses in England and Wales. It also occurs in Ireland. In Scotland the fungus has been found once (on dead needles of Western red cedar (*Thuja plicata*) but not the disease. It has not yet been seen on nursery stock in the United Kingdom.

Symptoms

3. The fungus, which causes the disease, *Seiridium* (formerly *Coryneum*) *cardinale*, invades the tree through fine bark cracks, which develop naturally in branch and twig crotches, and through other wounds to the bark. It then grows slowly through the bark, killing the cambium. When branches are girdled their distal parts die, the foliage fading through dull green to yellow and finally browning before falling. The disease is therefore characterised by the death of an ever-increasing number of scattered branches and, often, the early death of the top metre or so of the tree.
4. Year by year more of the crown is killed by a combination of new infections and the continuing spread of old ones. The whole tree may be killed gradually in this way or more quickly if the fungus girdles the main stem.
5. Resin often exudes from or encrusts the fungus-permeated bark and the continuing growth of tissue around the lesion may produce long, sunken cankers. Often, however, it is necessary to cut into the bark to distinguish live from dead tissue.

6. The *Seiridium* fruit bodies, resembling minute, dark, intact or burst pinhead-sized blisters, often develop on killed bark. As they are obscure and resemble those of a certain saprophytic fungi, they are identifiable with certainty only under the microscope.
7. In Britain this is only evidently progressive branch disease of Monterey cypress and other susceptible species though some insects and other fungi can kill scattered branchlets and certain root diseases may kill whole trees.

The fungus and its spread

8. The sexually produced fruit bodies have been reported only from California. Based on these, the fungus has been placed provisionally in the ascomycete genus *Leptosphaeria*.
9. The asexually produced fruit bodies (the *Seiridium cardinale* state) are very commonly produced wherever the disease occurs, and it is the spores (conidia) from these, which initiate the vast majority of new infections. The conidia are spread in water droplets and wind-blown rain but probably over only relatively short distances.
10. How the fungus spreads over greater distances is not always clear. The dry *Leptosphaeria* ascospores are undoubtedly wind blown and therefore carried far and wide, but whether these are produced in this country is unknown. Conidia are certainly carried away on the bodies of insects and birds and new infections could sometimes result. In all probability the disease was introduced from the USA to Europe and other distant parts by man on infected plant material, and he probably continues to aid its spread in this way today.

Species susceptibility

11. In nature, the disease has been found only on members of the cypress family or sub-family (*Cupressaceae/Cupressineae*). The following table lists the relative field susceptibility of the members of this group, which are grown commonly in Great Britain.

Very Susceptible	Intermediate Severe damage unusual	Highly resistant ²
<i>Cupressus macrocarpa</i> ¹ <i>Cupressus sempervirens</i> ¹	<i>Calocedrus decurrens</i> <i>x Cupressocyparis</i> <i>Leylandii</i> ^{1,3} <i>Juniperus chinensis</i> <i>Thuja plicata</i> ¹	<i>Chamaecyparis lawsoniana</i> <i>Chamaecyparis nootkatensis</i> <i>Cupressus arizonica</i> <i>Cupressus glabra</i> <i>Juniperus virginiana</i> <i>Thuja occidentalis</i>

1. Infected trees of these species have been found in Great Britain.
2. Several of these species are susceptible to artificially induced infections but natural infections have been rarely or never reported.
3. But see paragraph 12 below.

We have insufficient information on the following species to be able to comment on their susceptibility: *Chamaecyparis obtusa*, *Ch. pisifera*, *Thujopsis dolobrata* and *Juniperus communis*.

12. For some years it had been known that artificially infected Leyland cypress were susceptible to the disease but not until 1982 was a naturally infected tree found in this country. At about this time, natural infections were also reported on numbers of young Leyland cypress abroad. Several cases of damage to various clones and on trees from 8-60 years old have now been discovered in the south of England. Given the enormous numbers of Leyland cypress that there are, these cases are in themselves of no significance, but they do give rise to some concern that the disease could in time become a considerable nuisance on this species. It seems unlikely to turn out to be as serious as on Monterey cypress, however: trees inoculated with the fungus at Alice Holt in 1971 have

continued to grow vigorously in spite of the annual extension of the original cankers, the death of some branches, and a few spontaneous new infections.

Control

13. There is no chemical cure for the disease and its prevention with fungicidal sprays, though possible, is impracticable on any but nursery trees.
14. Because of its slow-spreading nature, the destruction of all infected parts may well prolong the life of trees to a useful degree. Pruning cuts should be made well below infected bark, following good pruning practice, and wounds treated with a fungicidal paint¹ recommended for Nectria canker or Silver leaf control on ornamentals. This treatment is likely to be most effective in the less susceptible species or where the disease has only recently appeared and is still confined to a few branches or trees. Where, however, infections are numerous and of long-standing, and especially in Monterey cypress, such measures would be inappropriate and probably ineffective; it would be better to replace the infected trees.

Choice of species

15. Disease resistance is only one of many factors to be taken into account in selecting tree species. At present, Coryneum canker is of overriding importance only in the case of Monterey cypress, and then only in the southern half of England and Wales. Here, the risk of the tree being severely damaged and killed by the disease long before reaching maturity is high.
16. The position regarding Leyland cypress remains uncertain but present evidence suggests that over the next 20 or 30 years the disease may become quite a common, disfiguring, though not necessarily fatal condition of this species. As it is a commonly planted tree much further north than Monterey cypress, the disease will probably also occur further north in time.

Suggested further reading:

Strouts, R.G (1973). Canker of cypresses caused by *Coryneum cardinale* Wag. in Britain. *European Journal of Forest Pathology* 3,1 pp13-24

Published by:

December 1990

Arboricultural Advisory and Information Officer
Alice Holt Lodge
Wrecclesham
Farnham
Surrey
GU10 4LH

Revised with minor alterations April 2010

NOT TO BE REPRODUCED WITHOUT THE PUBLISHER'S PERMISSION

© Crown Copyright 1990

The Arboricultural Advisory and Information Service provides advice and information about trees based on research results and experience, both national and international, to arboriculturists, landscape architects, the construction industry and other professionals, also to private individuals. The Arboricultural Research Note series is supported by the Forestry Commission.

¹ The current status under the *Control of Pesticide Regulations 1986* of any fungicidal paint must be checked before it is used.