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By D. Lonsdale[1], G. A. MacAskill [2], D. R. Rose[1], C. Tilbury[1] & K. V. Thorpe[1]

Summary

Reports of pests, diseases and disorders of trees received during 1999 and 2000 are reviewed. The sources included advisory enquiries and records received through the 'Condition Survey of Non-woodland Trees'. The survey, known until 1999 as the Amenity Tree Health Monitoring Scheme, was re-designed in 2000 with a view to providing a quantitative basis for monitoring year-to-year changes in tree condition. Notable occurrences, which exceeded the usual fluctuations in disease and pest incidence in both years, were severe outbreaks of willow scab and an increased prevalence of waterlogging damage and associated Phytophthora diseases.

Background

In 1993 a project to establish a "Non-Woodland Amenity Tree Health Monitoring Scheme" was undertaken by Forest Research on behalf of the Department of the Environment (now the Office of the Deputy Prime Minister). In a series of observation plots set up throughout England, volunteer observers reported twice yearly (June and September) on the health of the trees. There were initially 106 plots in the scheme, 54 rural and 52 urban (Strouts, 1994).

The project was re-designed in 2000, and the name changed to the "Condition Survey of Non-Woodland Trees." This was to reflect a trend towards a more holistic approach to the overall condition of the trees. Individual trees are now selected and monitored annually at each plot for overall indicators of health (e.g. crown density), and for various specific kinds of damage. Some types of damage, which usually require specialist diagnosis, were not included on the new assessment forms, but were included in advisory casebook data. The new-style survey also provided scope to record any kind of damage that was unusual in its nature or severity, if necessary with the involvement of the authors of this report.

In the interests of replication, the trees in the revised survey were chosen from a range of genera (see Appendix) that were relatively well represented at the original 106 plots. At each plot, a minimum of 30 trees, representing at least six of the genera, was to be selected. Some of the original 106 plots proved not to include enough trees of the appropriate genera and were, where possible, replaced by new plots nearby. In addition, plots for the detailed monitoring of crown density in oak (*Quercus robur* and *Q. petraea*) and beech (*Fagus sylvatica*) were set up, to provide a comparison with the Forest Condition Survey conducted by Forest Research (http://www.forestry.gov.uk/forest_research).

A range of tree pests and diseases, and general indications of tree condition are assessed by

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volunteers, in most cases using a simple scoring system running from 0, indicating no symptoms, to 3, the presence of severe symptoms.

The scoring system used to assess crown density is a simplified version of that used in the Forest Condition Survey. Crown transparency of chosen trees is estimated in 5% classes by reference to a standard set of photographs of 'ideal' trees (Innes & Boswell, 1991, see also Hendry *et al*., 2001), and can be used to provide an index of tree condition.

This note is a summary of the reports received in 1999 and 2000, from seventy-four and sixty-one plots respectively, augmented by information from sources including the Disease Diagnostic and Advisory Services of Forest Research3 The latter information drew upon advisory casebook data from woodland as well as non-woodland trees. Some of the tree problems covered in these reports have been described in Tree Damage Alerts and these are listed at the end of this Note.

Damage affecting several genera

Weather-related damage

1. Like the previous year, 1999 overall was warmer and wetter than average (see http:/www.meto.govt.uk/climate/uk). Every month apart from June was warmer than the long-term average. In many parts of England, very warm and dry July weather continued into early August with even higher temperatures. Following the 1998/99 winter, very wet soil conditions in many areas led to numerous reports of damage in the advisory casebook. Most cases involved the death of recently planted trees, including yew (*Taxus baccata*), beech (*Fagus sylvatica*), Scots pine (*Pinus sylvestris*), Douglas fir (*Pseudotsuga menziesii*) and cherry (*Prunus* spp.). The wet conditions also increased the incidence of at least some of the Phytophthora diseases mentioned below. The remainder of the 1999 growing season brought considerable regional variation in rainfall; some areas had episodes of heavy rain, while others were so dry at times that some tree species suffered premature defoliation and marginal browning as a result of drought stress.

2. The year 2000 resembled 1999 for its relative warmth and wetness (see www.meto.govt.uk/climate/uk), but did not include prolonged spells of hot, dry weather with local occurrences of drought stress. The months of April and May were exceptionally wet, with three times the average rainfall occurring in April in many areas. April was not only wet but cold, while May was fairly warm at first before turning much cooler. This combination of conditions favoured various fungal diseases of leaves and shoots (see below). In most areas, extremely wet weather in the autumn continued into the 2000/2001 winter. The effects of the resulting wet soil conditions will be mentioned in the 2001 report. The advisory records show that strong winds which accompanied the heavy autumn rains uprooted many trees on roadsides and banks, in some cases causing human fatalities.

3. Frost was not widespread during the 1999 growing season but there were reports of spring frost damage to susceptible genera (*Aesculus, Castanea* and *Juglans)* at three plots. The nature of such damage depends largely on the stage of growth at the time of the event. While buds may be killed on *Castanea sativa* (sweet chestnut), it is the partly developed

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leaves that are affected on *Aesculus hippocastanum* (horse chestnut), which flushes earlier. The damaged leaves remain generally green but areas of interveinal tissue are killed and fail to expand with the surrounding leaf tissue, thus becoming torn and perforated. This type of damage is not serious and may be overlooked or mistaken for the effects of insect feeding. The year 2000 did not bring any notable reports of spring frost damage

Mammals

4. In 1999 there were continued reports of damage by established populations of grey squirrels (*Sciurus carolinensis*) at plots in central and south-west England. The new scoring system that applied in 2000 did not make specific provision for recording this commonly observed type of damage, but there was still provision for observers to record any unusually severe occurrences. No such records were received. (for further information see Tree Damage Alert 34,61,68)

Horse chestnut scale (*Pulvinaria regalis*)

5. Females of this insect deposit white waxy wool on the trunks and main branches of thin barked trees in the spring. This can be very conspicuous, attracting considerable public concern in urban areas. However, in addition to the visual impact, there is also evidence that severe infestation can result in reduced overall tree health. There is, therefore, some demand for local authorities to clean the scales and eggs from the bark. One council (Bedford) has used mycorrhizal treatments on young trees whose establishment seemed in doubt owing to the effects of severe infestation. However, there is no evidence to suggest it has had a significant impact on tree health or insect infestation in treated trees.

6. *Pulvinaria* was recorded from 25 plots in 1999, including four from which it had not previously been reported. Similarly, in 2000, the insect was recorded at 25 of the 61 re-defined plots from which survey forms were received in 2000. Of the 25 plots, five were rural, which is consistent with other observations that the insect, although still mainly found in urban areas, is increasingly moving into the countryside. However, there are reports that the insect is becoming more widespread within areas where it has previously been localised. Leeds was the most northerly plot from which records were received, but *P. regalis* is known to have spread much further north; perhaps into Scotland. The genera affected in the plots were *Aesculus*, *Acer* and *Tilia*. There was one report on pedunculate oak (*Quercus robur*), but this would be a new host record and remains to be checked.

Aphids

7. Under the system used in 1999, there was no routine recording of aphids. At some plots there were, however, reports of honeydew and sooty moulds on broadleaved trees, which may have been attributable either to aphids or to related sucking insects such as the horse chestnut scale. In 2000, aphids were recorded on 15 of the 17 tree genera included in the new-style survey. The two species recorded as aphid-free were holly (*Ilex aquifoilum*) and Lawson cypress (*Chamaecyparis lawsoniana*). Yew would also have been recorded as aphid-free, but for one record tree. Among the 61 plots from which data were received, the highest average aphid score was for sycamore (*Acer pseudoplatanus*) - 0.9 on the scale of 0 (no symptoms) to 3 (severe symptoms).

8. Although the two conifers included in the new-style survey were aphid-free or almost so, 1999 brought numerous advisory enquiries about aphids on spruces (*Picea* spp.) in private gardens. The species concerned was the large, spruce bark aphid (*Cinara piceae*). During May and June these aphids were seen crowded on the trunk and branches, producing copious amounts of honeydew. The aphids themselves, despite being present often in very large numbers, have very little obvious effect on the health of the tree (TDA 74). It is their excretion of sugar-rich honeydew, which drips on to anything beneath, that causes concern. Apart from being extremely sticky, it attracts other insects such as ants and wasps, which feed on it, and may also become colonised by black sooty moulds which can mar the appearance of trees long after the departure of the aphids. Other than washing down the trunk with a jet of water, there is very little that can be done by way of control. However, the colonies often disappear quite suddenly, rarely persisting until September.

Damage by other insects

9. In 1999, a form of skeletonising damage was quite prominent in some localities on lime (*Tilia* spp.). This was caused by heavy infestations of the oak slug sawfly (*Caliroa annulipes*). The affected patches, which appeared brown by reflected light and translucent by transmitted light, were seen on the leaves in May and June and again, more extensively, in August. Closer examination of the damage revealed that the lower epidermis of the leaf had been grazed away by the small, slug-like larvae of this insect. In 2000, the new-style survey scores for leaf feeding damage ranged from 0.4 to 1.0 in most of the recorded tree genera.

'Asian Longhorn Beetle' (*Anoplophora glabripennis*)

10. First, it should be noted that this exotic pest has not, to date, been shown to have established itself in the UK, despite having been found at various localities, particularly sea ports where infested wood has been imported from China as packing material around goods. Tree wardens, arboriculturists and others with an interest in trees may have received information on the potential threat that this beetle poses to the well being of a wide variety of our broadleaved tree species. It is known to have become established in street trees at several locations in the USA, and more recently in Austria, and could do likewise in the UK.

11. *Anoplophora glabripennis* is a large beetle, up to 35 mm in length, excluding its long black and white antennae. The body of the adult is black and shining, with distinctive white markings. The legs are long, often with a distinct blue colour. The larvae feed at first under the bark of otherwise healthy trees and later penetrate deep into the heartwood, making round tunnels up to 10 mm in diameter. The larval activity produces quite large amounts of coarse sawdust, which can accumulate at the bases of trees or in branch crotches.

12. Anyone who thinks that he or she may have seen one of these beetles or would like more information or a copy of our poster should please contact the Forestry Commission Plant Health Service, Tel: 0131 314 6414 or Forest Research Tel: 01420 22255

Bleeding canker

13. This disease, usually associated with the fungus *Phytophthora cactorum*, is found in Britain on various tree species, particularly horse chestnut (*Aesculus* spp.) and lime (*Tilia* spp). This species of *Phytophthora* can spread not only via the soil, but also by rain-splash and can therefore infect stems and branches of trees above ground. Other species, such as *P. cambivora* and *P. cinnamomi* usually enter the tree at or below ground level. Bleeding canker is not specifically assigned a numerical score in the survey, but severe occurrences can be recorded on the survey form. The advisory casebook showed a marked increase in the occurrence of this disease in 1999 and one of the survey plots (Peckover) provided a report of a suspected occurrence.

Rust

14. Several of the tree genera selected for the new-style survey can be affected by rust fungi. The most commonly affected are poplars and willows, on which the causal fungi are various species of *Melampsora*. Advisory records show that rust caused widespread and severe defoliation of poplars in 1999 and again in 2000. Some poplar varieties were worse affected in 1999 than in 2000, but others showed the reverse tendency. Year-to-year relative differences in the severity of attack on different poplar varieties are related to fluctuations in the frequency of genetically different forms of the fungus. Each of these forms can attack some varieties or species but not others. In the absence of any contrary reports, it seems likely that the severe attack in 1998 on *Populus* x *candicans* 'Aurora' was not conspicuously repeated in 1999 or 2000. In 1999, blackening and premature fall of leaves was reported on *P. alba* and *P. nigra*, which are affected by different species of rust fungus.

15. The data for 2000 show low scores for poplars (0.3) and for willows (0.1). Birch (*Betula*), another genus which is also commonly affected by rust, showed rather a low score of 0.6. In view of the generally high frequency of poplar and willow rust, as shown by advisory records, the low scores in the survey may reflect a widespread failure to recognise rust. This interpretation of the data is reinforced by the fact that other tree genera, which are not known to be affected by rust in the UK, had higher scores than poplar. For example, London and oriental planes (*Platanus* x *hispanica* and *P. orientalis*) collectively purported to have an average 'rust' score of 1.0.

Mildews

16. Mildews are characterised by a thin white coating of fungal growth on leaves, which remain living and green beneath the coating. In 2000, when recording of mildew was first included in the survey, the two highest scoring genera were oak, with an average score of 0.3 and plane, with a score of 0.2. These scores were low but consistent with advisory casebook data in showing a relatively frequent occurrence of mildew on these two genera. Less consistent with advisory data was a survey score of less than 0.1 for *Acer* - a surprisingly low value.

Sudden oak death

17. Sudden oak death (SOD) has recently been publicised via warning leaflets and magazine articles (e.g. Forestry Commission Exotic Pest Alert: Sudden Oak Death). In California and Oregon, where this disease is causing serious damage to the native oak species of western North America, for example coast live oak (*Quercus agrifolia*) and black oak (*Q. kelloggiii*), the causal agent has been identified as *Phytophthora ramorum*. It also affects a wide range of other trees and shrubs. During the time period covered by this report (1999-2000) SOD had not been found on oaks in the UK. However, it had been isolated from *Rhodedendron* and *Viburnum* in nurseries in the Netherlands (Werres *et al*., 2001). Research is currently under way to assess the risk to Britain's trees in the event of the SOD pathogen being imported4. Information on 'SOD' can be obtained from the sources of information shown above for the Asian longhorn beetle. An update on the profile of SOD in the UK will be presented in a future ARIN, 'The Health of Non-Woodland Trees in England 2001.'

18. Like *P. cactorum*, the SOD pathogen can infect the stems of trees above the ground, causing bleeding cankers on its oak hosts in N. America. If the disease were to occur in the UK, the bleeding symptom might help to distinguish it from the so-called oak dieback or oak decline that has been occurring here for about the last ten years. However, there are some cases in which dark exudations occur due to the larval burrowing of one of the organisms sometimes implicated in the dieback of oaks already stressed by other factors; i.e. the oak jewel beetle (*Agrilus pannonicus*). In oak decline, as distinct from SOD, a different species of *Phytophthora* (*P. quercina*) is one of several factors involved.

Decay in street trees

19. Local authority tree officers are increasingly reporting occurrences of basal decay and in some cases root killing among street trees, especially the rosaceous species that have often been planted in recent decades. The fungi involved are often species of *Ganoderma*. There is some evidence that the onset and development of such decay is accelerated by injury to root systems, as often occurs when trenches are dug.

Unspecified causes of foliar yellowing or browning

20. Yellowing or browning in various genera were commonly reported in the survey up to 1999, but could not generally be attributed to particular causes. These symptoms are included in the new-style survey, as they serve as general indicators of poor health or damage. The occurrence of the symptoms in yew (*Taxus*) was a particular feature of the survey data up to 1999 and this is consistent with advisory casebook data. On the other hand, there is some reason to believe that some of these survey records may have been due to the observation of normal senescence of older yew needles, which occurs in June. In 2000, however, the mean scores for yellowing and browning in yew were only 0.2 and 0.3 respectively. Higher values were, for example, recorded in beech, with a yellowing score of 0.3, and in horse chestnut, with a browning score of 0.5. The latter score can be attributed mainly to leaf blotch, caused by the fungus *Guignardia aesculi* (see below).

[4] Further information from Dr. Webber, Pathology Branch, Alice Holt Lodge, Farnham, Surrey

Other kinds of damage

21. Urban trees are vulnerable to damage from several non-living agents. There were no reports of road salt damage in 1999, but slight damage from salt or other chemicals was reported in 2000 from three plots (Southampton and two in London). A few individual trees of two species, horse chestnut and London plane were involved. Other kinds of damage reported in a few instances in 1999 were caused by vandalism or by trenching activities. In 2000, when disturbance of the rooting zone (i.e. compaction, trenching etc.) was included in the survey scores, it showed an average value of 0.4 for all trees.

22. Pruning, which is both an arboricultural practice and a form of damage, is now recorded in the survey when it has been done recently. Several years' data may eventually show whether pruning is being practised either more or less frequently within the survey plots. In 2000, the frequency of recent pruning was generally low. It was, however, interesting to note that the various genera showed different frequencies. The highest average scores were for *Ilex* (0.2) and for *Aesculus* (0.1).

Problems affecting individual genera or species.

23. Summaries of the scores relating to different kinds of recorded damage, or incidence of specific diseases on the chosen tree species can be found in Tables 1 and 2.

***Acer* - Maples and sycamore**

24. Sycamore (*A. pseudoplatanus*) is one of the most commonly represented species in the plots. In general, most trees are in good condition. Some individual trees continue to show symptoms of drought damage. Tar-spot, caused by *Rhytisma acerinum*, was again common in 1999 and was occasionally accompanied by marginal browning. In 2000, sycamore had an average tar-spot score of 1.1, whereas Norway maple (*A. platanoides*) was not affected. There were also several reports of leaf-blotching on sycamore in 1999, which may have been due to giant leaf blotch disease caused by the fungus *Pleuroceras pseudoplatani*. This fungus infects leaves in the spring and causes large lesions which often originate at the base of the leaf. The lesions can be quite extensive by September and affected leaves fall prematurely.

25. Sooty bark disease of *Acer* is caused by the fungus *Cryptostroma corticale*, which occurs asymptomatically in the sapwood of healthy trees until triggered into activity by moisture stress. It was recorded in the survey both on Norway maple, which averaged 0.2) and on sycamore (with a score of less than 0.1). These scores must, however, be regarded as suspect, since only seven plots provided sooty bark disease data for Norway maple. Also, the disease has previously been reported only very rarely on Norway maple, and this suggests a need to verify its identification at the plots concerned.

Aesculus hippocastanum **- Horse chestnut**

26. In both 1999 and 2000 the advisory casebook included many enquiries in southern England about leaf blotch of horse chestnut caused by the fungus *Guignardia aesculi*. The characteristic areas of brown, dead tissue, usually with yellow margins, are very obvious by September, by which time severely damaged leaves may fall prematurely. There are no obvious effects on the health of mature trees, but there is no information on more subtle effects, such as a possible reduction in vigour. The disease has also been found on *A. indica* and *A. carnea*. Although *Guignardia* infection can extend around the leaf margins, causing 'scorching', it is probably not to blame for cases of leaf scorch affecting only the margins. Such symptoms occur year after year on horse chestnuts in certain locations but the cause has not been ascertained. Marginal scorch on various other tree species has been ascribed to disease induced by highly specialised xylem-inhabiting bacteria.

27. Horse chestnut leaf blotch was not specifically recorded in the survey until 2000, when the average score was 1.1. Of the 22 plots from which data on *Aesculus* spp. were provided, there were five at which the disease was scored as absent; these were Attingham (Shropshire), Hull, Leeds and Skipton (Yorkshire) and Speech House (Gloucestershire).

28. The horse chestnut leaf-mining moth (*Cameraria ohridella*) has not been recorded in Britain, but it has spread to the near continent following its introduction into central Europe. In the hot summers of central Europe, the moth can cause serious defoliation due to the rapid build-up of its populations through a number of generations. The usually cooler summer of the UK would probably be less favourable to the moth, but vigilance is needed in case it reaches our shores.

Alnus spp. **- Alder**

29. The 1999 survey produced no new reports of Phytophthora disease of alder, but trees continued to decline in plots where the disease was already present. Under the new system introduced in 2000, *Alnus* was not included for specific scoring as it was present at too few plots to allow adequate replication of data. There were no special observations of this disease in 2000. It should, however, be noted that alders at some sites in Scotland have been dying back severely in recent years. It remains unclear whether there is a distinct cause, but the fungus *Apiognomonia oxystoma* usually seem to play a part in the dieback process. There have been no other notable occurrences of damage on alder in England, but the 1999 survey produced some reports of slight damage to leaves by leaf-skeletonising insects; probably chrysomelid beetles. Another kind of damage is the failure of shoots to flush, caused by the bud mining activities of the larvae of the small bud-mining moths *Argyresthia brockeella* and *A. goedartella*.

Betula spp **- Birch**

30. In 1999 there were a few reports of early leaf fall by September; this may have been associated with one of the minor leaf spot fungi but drought stress may also have been involved. In 2000 there were advisory enquiries about severe defoliation and even dieback of birch twigs in some areas, but none of these cases led to a definitive diagnosis.

The survey data for 2000 showed an average score for premature defoliation of 0.3, which was not consistent with any widespread or severe problem. Birch is one of the genera that commonly develops leaf rust, but the overall score for 2000 was only 0.1. Other tree genera not known to be affected by rust in Britain had higher scores than birch, almost certainly in error.

***Castanea sativa* - Sweet chestnut**

31. In 1999, there was little reporting of damage on sweet chestnut, apart from the spring frost damage recorded in the advisory casebook. In the survey, there was one report from Hastings of possible killing by *Armillaria*. In 2000, there were no notable records either in the advisory casebook, or in the survey plots. Routine numerical scoring of the condition of sweet chestnut is not included in current survey as this species occurs in too few plots to allow adequate replication.

***Crataegus* - Thorn**

32. In 1999, as in previous years, there were scattered reports of crown and twig dieback of *Crataegus*, mainly involving individual old trees (e.g. in churchyards). The unique D-shaped exit holes of jewel beetles (*Agrilus* sp.*)* were found on dead trees at Andover in 1999, as previously reported, but this host genus was not one of those included in the Andover plot when the new-style survey began in 2000. There were not any notable occurrences recorded for *Crataegus* at any plots in 2000, but it is interesting that the genus scored higher for bacterial canker than any of the other genera. As no such canker is known to occur commonly on *Crataegus* in the UK, it seems possible that this score reflects the observation of some other condition with similar symptoms. The main disease of concern on thorns (as with *Sorbus* spp. and various other Rosaceae) is fireblight; the average score for this in 2000 was 0.4.

***Fagus sylvatica* - beech**

33. It was apparent both from general observations and from the advisory casebook that mature beech trees in some areas continued to show crown dieback and thin crowns during 1999 and 2000, perhaps due to the long-term effects of drought (see Cannell & Sparks, 1999; http://www.nbu.ac.uk/iccuk/). In the survey plots, however, the average score in 2000 for crown thinness in beech was only 0.4. The crown condition of beech may also be affected by heavy mast production (Redfern *et al*., 1999) although 1999 was not a heavy mast year. There were no major insect problems reported in either year although beech leaf miner (*Rhynchaenus fagi*) was noted at three plots in 1999.

***Fraxinus excelsior* - Ash**

34. Most of the problems reported on ash in 1999 involved individual trees. A few reports of leaf distortion were probably caused by the aphid *Psyllopsis fraxinicola* which rolls leaf margins. In 2000 *Fraxinus* scored more severely for crown thinness (0.9) than any of the 15 other tree genera recorded, although this is not entirely consistent with other sources of information. Some of the crown dieback reported from hedgerow and parkland trees dates back to previous years and its description fits ‘ash dieback’ syndrome, which can

often be attributed to agricultural disturbance (Hull & Gibbs, 1991).

Ilex aquifolium - Holly

35. In 1999, the rather wet weather provoked an outbreak of Phytophthora blight of holly, caused by *P. ilicis*. This disease, which affects leaves, twigs and berries, develops mainly in cold weather and is normally halted by the relative warmth of the spring. However, according to advisory records, cool wet weather in the spring of 1999 allowed the leaf disease and shoot killing to continue until the end of April. As a result, some trees were badly defoliated. This disease is not specifically recorded under the survey system introduced in 2000, but it should lead to significant scores for 'leaf spotting' (one of the general categories of symptoms). The score for *Ilex* in 2000 was, however, only 0.1. This is consistent with the relative rarity of Phytophthora blight of holly in the UK.

36. Another very common condition in holly is the presence of the holly leaf miner (*Phytomyza ilicis*), which is now specifically included in the survey. The 2000 data showed an average score of 0.7. Of the fifteen plots from which data on holly were provided, two showed a zero score for this insect and a further four omitted a score.

Malus - Crab and other apples

37. Owing to a lack of replication, *Malus* could not be included in the new-style survey that began in 2000. In 1999, as in earlier years, apple scab (causal agent *Venturia inaequalis*) was again widespread on apples and ornamental crabs, leading to severe defoliation by September in some cases.

Platanus x *hispanica* - London plane

38. There were scattered reports in 1999 of anthracnose disease of London plane, caused by the fungus *Apiognomonia veneta*. Most of the damage involved death of leaves in the spring but there were also reports of twig dieback in the autumn. The disease has several phases which develop at different times of year: in the spring, buds may fail to flush as a result of infections from the previous year. Infection can also develop during the spring, causing twig blight. The leaf blight stage occurs in summer and starts with killing of the veins and surrounding leaf tissue. If the fungus spreads down the petiole into the twig, the affected leaves fall. The severity of the disease is aggravated by cool weather in the spring (Strouts, 1991). In 2000, the advisory casebook showed relatively few cases of anthracnose, but the average score for premature leaf fall was 0.6; higher than for any of the other 15 recorded genera.

Populus spp - Poplar

39. Apart from rust which is mentioned above with other diseases that affect a range of tree genera, one of the most conspicuous diseases of poplar is bacterial canker, caused by *Xanthomonas populi*. This was not recorded specifically in the survey until 2000, but in 1999 there was a report at one plot (Newcastle-on Tyne) of twig dieback in *P.* x *candicans* 'Aurora', that may have been due to this disease. In 2000, the average score for bacterial canker in poplar was only 0.1; less than that for *Fraxinus*, which is affected by a similar kind of canker.

Prunus - Cherry

40. For reasons of replication, selected cherry species and hybrids are the only members of this large and varied genus that are now routinely included in the survey. Notable occurrences of damage on other members of the genus can, however, be recorded. In 1999, a range of flowering cherries showed symptoms (death of flowers and shoot dieback) in the spring caused by the fungus *Monilinia.* This fungus was even more prevalent in 2000, but the average score for foliar browning by the time of the assessment (July to August or early September) was only 0.2. Thin crowns on some trees had been attributed to the effect of severe infestation by cherry blackfly (*Myzus cerasi*) in 1998, but this aphid seemed to be no more prevalent than usual in 1999 and 2000. The aphid score for cherry in 2000 was only 0.1.

41. Late-season death of leaves, as reported from some plots in 1999, may have been due to cherry leaf scorch, caused by *Apiognomonia erythrostoma*. *Apiognomonia* fungus was identified on samples collected from trees in Derbyshire. The symptoms may not have been obvious in early September, but become more so in the winter as affected trees retain the brown, shrivelled leaves. This disease, cherry leaf scorch, and also cherry leaf-spot (caused by the fungus *Blumeriella jaapii*) are specifically included in the new recording system (see Table 2 and Tree Damage Alerts 10 and 43).

42. There were no confirmed reports in 1999 of bacterial canker of cherry and few reports of Kanzan disease. In 2000 bacterial canker was reported at five of the 61 plots from which survey forms were sent. The cherry species involved were *Prunus avium* and *P. cerasus.*

Quercus spp - Oak

43. An episodic or gradual development of stag-headedness in large oaks is typical of old or stressed trees, but a progressive and severe decline over a few years has been recognised as a pathological condition, known as oak decline. This is, however, a loose definition, as a number of damaging agents are involved (Gibbs, 1999). For a few years, until 1999, there were reports of crown dieback from several of the survey plots, mostly involving pedunculate oak, *Q. robur*. These reports did not provide a basis for assessing whether the deterioration in crown condition had been sustained and severe enough to suggest a diagnosis of oak decline. The annual monitoring of the new survey system may allow such an assessment. However, for the present, only the 2000 data are available; these

show an average score for crown thinness of 0.4. Oak mildew, which may be a factor in oak decline was reported in 1999 from several plots but it mostly affected young trees. In 2000, the average score for oak mildew was 0.3. The average score for oak knopper gall in 2000 was 0.7.

***Sorbus* - Whitebeams and rowan**

44. Premature leaf fall had been reported in previous years on *S. aria* , and the problem was widespread in 1999. In 2000, *Sorbus* showed a numerical score for premature leaf fall of 0.5; not a very high value, but it was equalled only by *Platanus*. Drought seems likely to have induced leaf fall in some cases during 1999, but the symptom is also associated with graft union failure in the cultivar 'Lutescens'. In 2000 there were no confirmed cases of fireblight within the plots, but the re-defined plots gave an average score of 0.1. As fireblight data were provided only from nine plots, there was poor replication; indeed all the reportedly affected trees were at one plot in Boston (Strouts, 2000).

***Salix* spp - Willow**

45. In 1999 most of the damage reported on willows was early in the season and involved dieback of leaves and twigs. It seems likely from advisory records that such damage was mainly attributable to willow scab, caused by *Pollacccia saliciperda.* The affected leaves develop dark spots in the spring and later become generally blackened, while usually remaining attached. Black lesions also develop on the shoots, the tips of which may die back and curl over (Rose 1989a). Scab in 1999 was favoured by the wet and sometimes cold spring weather. The advisory casebook for 2000 again showed severe occurrences of scab, and the survey data showed willows as having a higher score for darkening of leaves than any other genus. This score was, however, only 0.6, perhaps reflecting the compensatory growth of fresh foliage by the assessment period later in the growing season.

46. Another disease of willow that produces dark marks on leaves is anthracnose, caused by the fungus *Marssonina salicicola.* It can be particularly damaging to weeping willows, *S. alba tristis* and *S. alba* Chrysocoma (Rose, 1989b). Black spots develop on the young leaves which may become curled and distorted. Black lesions may also develop on the shoots, which may become girdled so that their tips die back. The fungus can overwinter in the shoot cankers. Damage can be severe in wet growing seasons. There were unusually few cases of anthracnose in 1999. There were no reported sightings of the giant willow aphid (*Tuberolachnus salignus*).

Ulmus spp - **Elm**

47. Owing to a lack of replication, *Ulmus* could not be included in the new-style survey. In 1999, Dutch elm disease continued to cause damage in several plots and again affected hedgerow suckers. It is also worth noting that *Ulmus* is one of several genera that suffer from horse chestnut scale infestations.

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TREE DAMAGE ALERTS

The following Tree Damage Alerts (TDAs) were published by the Arboricultural Advisory and Information Service for the ODPM during the period covered by this report.

54. Global warming: a threat to trees?
Changes in global weather may affect tree health directly, or more insidiously through the impact of new pests and diseases.

55. Christmas trees under siege
Many people have reported seeing large black sticky insects on their *Picea abies*. This note identifies the causal agent and examines its impact.

56. Brown leaves due to slugworm damage
This year large numbers of trees were affected by leaf browning. This note details the life cycle of a possible causal agent - the oak slug sawfly.

57. Are you getting rust(y) on your poplars ?
The rust species *Melampsora* is becoming more of a problem on poplars grown for both amenity and bioenergy.

58. The gentle pitter-patter of spores on willow
Herein are described a number of pest and disease problems which may be affecting our willow trees.

59. A circular tale
Find out what kind of insect pest you may find lurking in the packaging surrounding your new furniture, and what to do if you do find something unexpected.

60. Will there be kisses at Christmas?
Most of our mistletoe is imported from France. This note outlines a few possible methods of propagating mistletoe in the UK.

61. Grey squirrels again
Both amenity and forest trees can be severely damaged by bark stripping especially when squirrel numbers are high. Read this note to find out why and when they do it and how to control the problem.

62. Mr McGregor's gate
Rabbits can be a serious pest during the winter months. How can we protect our trees against them?

Appendix: Genera of trees included in the survey from 2000 onwards

Acer
Aesculus
Betula
Crataegus
Chamaecyparis
Fagus
Fraxinus
Ilex
Platanus
Populus
Prunus
Quercus
Salix
Sorbus
Taxus
Tilia

TABLE 1 Mean scores of tree damage at all 61 plots active in 2000 (0 to 3 scale)

TREE SPECIES	Disturbance	Exposed wood	Bacterial canker	Other perennial cankers	Fungal fruiting or rhizomorphs	*Agrilus* spp.	*Pulvinaria*	New pruning	Crown thinness	Crown yellowing	Crown browning	Dark spots or blotches on leaves	Rust	Mildew	Aphids	Leaf-eating damage	Chemical or salt damage	Premature leaf fall
Acer platanoides	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Acer pseudoplatanus	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Aesculus hippocastanum	0.4	0.4	0.2	0.1	0.0	0.0	0.6	0.1	0.3	0.4	0.5	0.9	0.1	0.0	0.3	0.6	0.0	0.3
Betula pendula	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Crataegus spp	0.4	0.7	0.2	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.1	0.3	0.2	0.1	0.2	0.4	0.0	0.0
Chamaecyparis lawsoniana	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fagus sylvatica	0.3	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.4	0.3	0.3	0.3	0.1	0.0	0.3	0.5	0.0	0.1
Fraxinus spp.	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.1	0.0	0.1	0.0	0.0	0.3	0.5	0.0	0.1
Ilex spp.	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.3	0.0	0.0	0.1	0.5	0.0	0.1
Platanus spp.	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.2	0.2	0.8	0.0	0.0
Populus spp.	0.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.7	0.3	0.1	0.3	1.0	0.0	0.3
Prunus spp	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.2	0.3	0.1	0.0	0.1	0.6	0.0	0.1
Quercus spp.	0.3	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.2	0.2	0.5	0.1	0.3	0.5	0.6	0.0	0.1
Salix spp.	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.6	0.1	0.4	0.6	0.1	0.0	0.1	0.4	0.0	0.5
Sorbus spp.	0.2	0.4	0.0	0.1	0.0	0.0	0.0	0.1	0.6	0.2	0.2	0.7	0.2	0.0	0.2	0.5	0.0	0.6
Taxus baccata	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1
TIlia sp.	0.3	0.1	0.0	0.0	0.0	0.0	0.5	0.1	0.2	0.4	0.3	0.5	0.1	0.1	0.8	0.9	0.0	0.2

Table 2: Mean scores (0-3) for specific tree problems on 'targeted genera,' in 2000

Tree Species	**Disease/ Insect pest**	**Mean Score**
Acer platanoides	Tar spot	0
Acer platanoides	Sooty bark disease	0.2
Acer pseudoplatanus	Tar spot	1.1
Acer pseudoplatanus	Sooty bark disease	0
Aesculus hippocastanum	Leaf blotch	1.1
Crataegus spp.	Fireblight	0.4
Fagus sylvatica	Beech scale	0.3
Ilex spp.	Leaf miner	0.7
Prunus spp.	Cherry leaf scorch	0.3
Prunus spp.	Cherry leaf spot	0.2
Quercus spp.	Knopper gall	0.7
Salix spp.	Giant willow aphid	0
Sorbus spp.	Fireblight	0.1