

Scale insects

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Identification, Biology & Management

There are more than 200 species of scale insect recorded in the UK, many of which do not pose a serious issue. They are stationery and often limpet-like. Examples of troublesome scales in the UK and Ireland are mussel scale (*Lepidosaphes ulmi*), Euonymus scale (*Unaspis euonymi*), minute cypress and juniper scales (*Carulaspis* species), horse-chestnut scale (*Pulvinaria regalis*) and beech scale (*Cryptococcus fagisuga*). The holm oak bark scale (*Nidularia pulvinata*) is an example of a recent introduction, being found for the first time in the UK in London in 2024.

There are two main groups of scale insects – soft scales and armoured scales. High populations of either group can deplete host plant carbohydrates, i.e. energy, and nutrients. Historically a greenhouse issue in the UK, scale issues are increasing as the climate warms and new invasive species are introduced. Infestations may reflect drought and other host stresses e.g. root damage, compaction, or heavy pruning.

Symptoms

The adult females are the most noticeable, being rounded, oval, or elongated, often with a humped appearance. Size ranges from under 1mm to over 1cm. They may be found on the foliage or stems. Soft scales (fig 1 & 3) and their white egg masses are often larger and more noticeable, whereas armoured scales (fig 2) are often much smaller and sometimes highly camouflaged.

Figure 1: Female soft scales with egg masses



Figure 2: Armoured scales on cypress (*Carulaspis*)



Initial host symptoms are yellowing foliage, weakened, stunted or distorted growth, and sunken spots on the upper leaf surface that correspond to the position of scales below. Some bark scales cause swelling around themselves. Damage from feeding may be most noticeable on young tissue.

Soft scales expel sugary sticky honeydew which encourages growth of unsightly dark sooty mould fungus. The fungus itself does not feed on the

plant but can block light from reaching foliage and spoil surfaces below.

Biology

The main morphological difference between the two groups is if the scale cover is attached to the insect or not: soft and armoured respectively. On host plants, soft scale insects feed within the phloem which contains sugary sap, therefore producing honeydew, whereas armoured scales feed in parenchyma tissue which contains stored carbohydrates in the form of starch.

Figure 3: Young soft scales



Scale insects generally remain static on plants and feed by inserting their stylets into plant tissue. Females lay hundreds, sometimes thousands, of eggs either under their wax scales, coverings of woolly wax, or their bodies. Such large numbers of eggs increase the risk of populations expanding rapidly.

The tiny, barely visible, crawlers (fig 4) hatch some weeks or months later and disperse over plants before settling to feed. Crawlers spread by wind or animal and human activity.

Soft scale insects typically have one generation per year, while armoured scales can have multiple generations per year.

Male scales may be smaller and differently shaped to the females. They ultimately become a small, winged insect that emerges from its scale to mate, though some species reproduce asexually.

Management

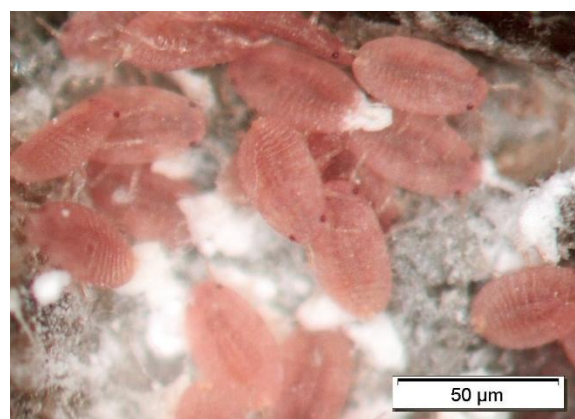
The key treatment is a combination of horticultural oil and an appropriate plant protection product, timed to coincide with crawlers emerging. This targets crawlers before they have settled and begun to form their waxy protective scales.

On most UK outdoor tree species, scale eggs hatch in late June to July.

Oil can also be applied during winter dormancy to reduce overwintering populations, which are more exposed on deciduous plants. Physical intervention, i.e. careful scrubbing, can also be highly effective.

Nitrogen fertilisation of scale infested plants should preferably be delayed until a good level of control has been achieved.

Figure 4: Scale crawlers, 50µm = 5% of 1mm



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