

SHOTHOLE STUDY MAKES NEW DISCOVERIES

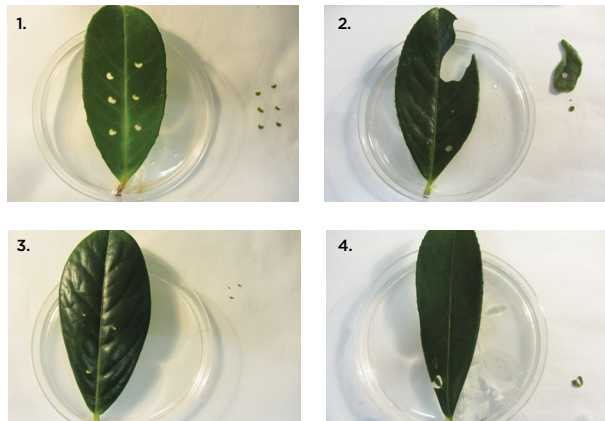
Helen Grogan shares Teagasc/UCD research findings into one of the most visible Cherry Laurel diseases

Cherry Laurel (*Prunus laurocerasus*) is an important plant species for nurseries and cut-foliage growers. The cultivar 'Rotundifolia', used widely for hedging, is the main one propagated in nurseries and is an important plant for export trade. The cut-foliage sector, on the other hand, mainly grows the cultivar 'Etna' along with smaller amounts of 'Caucasica' and 'Novita'.

One of the most noticeable diseases to affect Cherry Laurel is shothole, which is predominantly caused by the bacterial pathogen *Pseudomonas syringae* pv *syringae* (*Pss*). Researchers at Teagasc and UCD have been working on this disease for the past three years and have made some interesting discoveries. Leighton Smith, a Masters student at UCD, studied the epidemiology of *Pss* on Cherry Laurel and found that the cultivars 'Rotundifolia' and 'Novita' displayed the most severe symptoms while 'Caucasica' was the least susceptible to shothole disease and 'Etna' was somewhere in between (photo 4). Abiotic factors such as wounding (e.g. pruning, wind/insect damage), exposed sites and mild temperatures were all found to promote shothole disease and may account for why the disease can be prolific in nurseries and cut-foliage plantations. To sustainably reduce the occurrence of shothole, growers may need to consider providing more shade for Cherry Laurel (e.g. interplanting with taller species) or to counteract 'wounding' effects by reducing pruning events and protecting from insects.

DISEASE-CAUSING ORGANISMS

Brian McGuinness and Danielle Boland at Teagasc surveyed 11 commercial Cherry Laurel plantations and seven nurseries in a systematic manner to obtain diseased material, and to identify the pathogens associated with shothole symptoms and



SHOTHOLE SYMPTOMS ON DIFFERENT CULTIVARS OF *P. LAUROCERASUS* 28 DAYS AFTER INFECTION WITH *PSS*. PHOTO 1: 'ROTUNDIFOLIA'; PHOTO 2: 'NOVITA'; PHOTO 3: 'ETNA' AND PHOTO 4: 'CAUCASICA'.

other blemishes. In 2017, the predominant organism associated with disease symptoms was the *Pss* bacterium, with 28% of samples testing positive for the diagnostic syringomycin B gene (n=320). Shothole symptoms can vary from distinct 'shotholes' to leaf-edge necrosis, making the recognition of symptoms more challenging. Six per cent of samples were associated with a fungus identified as a *Neofabraea* sp., the first time this has been recorded on *P. laurocerasus* (photo 2), while the known *P. laurocerasus* fungal pathogen, *Eupropolella britannica*, was isolated from just two samples. Many samples yielded no pathogen, most likely because once shotholes have formed, the pathogen has been excised from the plant and is no longer present. Interestingly, another bacterial species, *Micrococcus aloverae*, was isolated from shothole symptoms on an infected

'Rotundifolia' hedgerow, so not all shothole symptoms are caused by the same organism. They may be a generalised response to infection, although this hypothesis needs further research.

Worryingly, *Xanthomonas arboricola* pv. *pruni*, a destructive pathogen of stone-fruit *Prunus* species worldwide, such as peaches, apricots and plums, is also known to infect Cherry Laurel and produce a shothole like symptom.

Currently, it is absent from the UK, which has 'Protected Zone' status, meaning it restricts

imports of *Prunus* plants to countries that also have Protected Zone status. In Ireland, the Department of Agriculture, Food and the Marine is seeking 'Protected Zone' status for Ireland, which would be a distinct advantage for the sector, facilitating the growth of exports of *P. laurocerasus* cultivars for hedging.

In conclusion, from a plant health perspective, most shothole symptoms on Cherry Laurel in cut foliage plantations and nurseries are caused by *Pseudomonas syringae* pv *syringae* but other bacteria can cause similar damage so vigilance is needed to ensure that *Xanthomonas arboricola* pv. *pruni* is not imported on plants coming from outside non-protected zones. Ireland is well-placed to embrace sustainable *Xanthomonas*-free *P. laurocerasus* production for both cut foliage and hedging. ✨



This work was led by HELEN GROGAN, Teagasc and ANGELA FEECHAN, UCD and was funded by the Department of Agriculture, Food and the Marine's competitive research programmes. Helen is a Senior Research Scientist in Teagasc's Horticulture Development Department. Her main research focus is mushroom science but she also contributes to research for the Cut Foliage and Hardy Nursery Stock sectors. Helen co-ordinates a DAFM funded research project called 'New Leaves' which is looking at pest and disease issues of *Prunus laurocerasus* as well as propagation techniques for hard to propagate species. Helen.grogan@teagasc.ie