

Science Into Practice - Understanding daffodil rust

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BOF 076a: Understanding physiological disorders in narcissus - extension to studying the three-year down crop

Daffodil rust, a sporadic physiological disorder, can render daffodil stems unmarketable. The cause is unknown but environmental factors have been suggested as a possible trigger.

Plots of the rust-prone cultivar Golden Ducat were planted in 2012 in 10 locations in Cornwall where crops appear most at risk from the disorder. Environmental parameters were recorded, along with concentrations of major nutrients and trace elements in leaves and soil. Potential links with virus infection were investigated using a molecular technique.

Rust incidence varied widely during the three years of observation, appearing in most plots and with levels increasing through the flowering period, but severity was low. In 2014 there was mild rust at all sites by the post-picking stage, with occasional but more severe symptoms of stem cracking at one site. Trace levels of rust were common, particularly after flowering, suggesting that rust may persist at a low and insidious level.

Despite the presence of various viruses there was no evidence to suggest an association with rust. The fungal disease *Stemphylium* was isolated from several samples, but there is no proof that it is pathogenic on daffodils, and nothing to contradict the theory that this rust is physiological in nature.

High soil water content late in the year was found to be closely related to high levels of rust. The apparent relationship between soil water and rust incidence was stronger in the winter months than around flowering, suggesting that incidence is related to conditions over a longer period. It is now looking as though the onset of rust lesions in daffodils after prolonged periods of high soil water content is a type of oedema.

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