Buffalo yellowing - Is it a disease complex?

By Nga Tran and Andrew Geering, The University of Queensland

The turf pathology team at The University of Queensland undertook a 6-month scoping study to search answers for the question “what causes the yellowing in buffalo grass?” under the levy-funded project ‘Identification and management of mosaic viruses and secondary pathogens in buffalo turf (Hort Innovation project TU19000)’. The project finished in June 2020 with the final report submitted to Hort Innovation and diagnostic reports sent to growers whose farms were surveyed. The project team surveyed 27 farms in the Hawkesbury and Hunter Valleys NSW, the Gold and Sunshine Coasts in Southeast Queensland and periurban Perth, Western Australia. Yellowing was found to be widespread but subtly different types of symptoms were observed and at least three separate factors associated with the problem.

Two viruses, sugarcane mosaic virus (SCMV) and panicum mosaic virus (PMV), were common in NSW. Plants infected by these viruses were stunted and had yellow-green mosaic patterns on the leaves. SCMV was the most damaging and widespread of the two viruses and was found on all but one of the farms in NSW but was comparatively rare in Queensland and Western Australia. Instances of SCMV infection were found in all commercially available buffalo grass varieties but PMV was only found in Palmetto in NSW. A third virus has been discovered that is completely new to science and characterization of this virus in ongoing. A diagnostic test has been developed for this virus and it has now been found in three States that were surveyed.

Another major cause of yellowing was poor root health. A range of fungal species were isolated from the rotting roots but a new species of *Curvularia* was most consistently associated with the disease symptoms. This novel *Curvularia* species was detected in samples collected from NSW and Queensland. It is hypothesized that excessive use of nitrogen fertilizers and poultry manure could encourage this pathogen.

Abiotic stressors including iron and manganese deficiencies, alkaline bore water, and thatch buildup were the major causes of yellowing in Western Australia. The turf farmers in this State did not consider yellowing to be a major problem as the problem could be effectively managed by applications of soluble fertilizers.

In NSW and Queensland, nematode populations in the soil of the turf farms were assessed. A number of species were detected such as reniform (*Rotylenchulus* sp.), stunt (*Tylenchorhynchus* sp.), stubby (*Paratrichodorus* sp.) and ring nematodes (*Criconemella* sp.) but all were at densities well below the threshold to cause damage.

Findings of the project TU19000 indicate that yellowing is a disease complex that may be caused by viruses, fungi or abiotic stressors. Work is continuing to develop integrated disease management strategies for buffalo grass yellowing but farm quarantine and good hygiene practices can be applied to prevent further spread of the viruses.

Figure 1. (a) Paddock of buffalo grass with yellowing and (b) a sugarcane mosaic virus-infected plant that has yellower, narrower leaves and more stunted growth compared with the healthy grass in the background, and (c) a plant with poor root health, which was associated with infection by the fungus *Curvularia*.

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