Predicting Success? A Tale of Two Midges

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Abstract

Two closely related midges, Dasineura dielsi Rübsaamen and Dasineura rubiformis Kolesik, are successfully established biological control agents in South Africa against Acacia cyclops A. Cunn. Ex. G. Don and Acacia mearnsii de Wild respectively. Initial establishment for both species occurred at the same locality and at the same time but their subsequent performance varied considerably. Both species oviposit within the flower heads of their hosts and the developing larvae induce clusters of galls that preclude pod development. However, the two species differ in several respects enabling comparison of the biological characteristics underlying their performance. D. dielsi develops entirely within the gall structure, is multivoltine and disperses rapidly, whilst D. rubiformis spends part of its life cycle in the gall and the remainder in the soil, is univoltine and disperses less readily. Mortality factors for each of the midge species are quite different, and impact different life stages, but overall mortality for both species can be extremely high. Despite this, both species are proving to be successful in their own right which highlights the difficulties of predicting a biological control "winner".