

Abstract

Development of disease management approaches based on environmental stewardship through reducing total reliance on chemical fungicides is a growing trend in turfgrass industry. Integrated pest management strategy that involves combination of biofungicides, plant defense response elicitors and compatible chemical fungicides, is one of the most sustainable solutions towards reaching that goal. Bacterial metabolites, namely cyclic lipopeptides, surfactin and fengycin, from various *Bacillus* species, can function as biofungicides and elicitors of plant defense against fungal pathogens. These bacterial metabolites have been found to protect several different plant species including, tomato, beans, tobacco, and potato, from different fungal pathogens including, *Botrytis*, *Colletotrichum*, and *Fusarium* species. In our preliminary study, *Bacillus amyloliquefaciens* FZB42 producing both surfactin and fengycin was found to be able to induce defense response in perennial ryegrass that suppressed infection by *Magnaporthe oryzae*. Partially purified surfactin and fengycin from the same strain were also found to be able to inhibit the growth of *M. oryzae* mycelium. Currently, purified metabolites are required to be evaluated in order to understand their roles in the mechanisms of plant defense response activation. Rapid and effective activation of systemic resistance in plants, induced by surfactin and fengycin, could provide protection against a wide range of pathogens. This study will generate important information on formulation of bacterial products and their timing of applications to protect perennial ryegrass against infection from various pathogens.