Evaluation of Fungicides and Biofungicides for Managing Botryosphaeria dothidea Canker in Redbud

Abstract

Redbud (*Cercis* sp.) is a popular ornamental flowering tree valued for its vibrant flowers and heart-shaped foliage. Tennessee leads redbud production in the United States. However, canker disease caused by *Botryosphaeria dothidea* poses significant challenges to redbud production. Characterized by dark, sunken lesions, vascular discoloration, and dieback of shoots and branches, this disease significantly reduces the marketability of redbuds. Currently, there is no effective management strategy for Botryosphaeria canker. This study evaluated the efficacy of fungicides and biofungicides (Avelyo, KleenGrow, BAS 673 05FH, BAS 673 05FL, BW165, BW240N, MBI-121, Postiva, SP2478, SP2700WP, and Tril-21) for managing Botryosphaeria canker both *in vitro* and under greenhouse conditions. *In vitro* assays were conducted twice using mycelial plugs from 6-day-old fungal cultures inoculated onto potato dextrose agar (PDA) plates amended with fungicide, with six replicates per treatment arranged in a completely randomized design. Colony diameters were measured after incubating for four days at 25°C, and all the treatments significantly reduced fungal growth compared to the control. Greenhouse trials were conducted from June-November in 2023 and 2024 in a completely randomized design with 14 treatments, including non-treated - inoculated, non-inoculated, and wound controls, with six replications for each treatment. Redbuds were wounded and artificially inoculated with fungal mycelial plugs and fungicides were applied weekly or biweekly. Plant height, width, lesion length, chlorophyll content, and pathogen recovery were assessed over a six-month period. In greenhouse conditions, all tested fungicides and biofungicides lowered canker lesion length and pathogen recovery compared to the non-treated, inoculated control. BW165, BAS 673 05 F, BW240N, and MBI-121 were the most effective products in reducing Botryosphaeria canker lesion length and pathogen recovery. However, no significant difference was observed in plant height and width among different treatments. These findings provide growers with effective management options for reducing canker caused by *B. dothidea* in redbud production.