

**The impact of different biochars on *Stemphylium* leaf blight SLB suppression
and productivity of onion *Allium cepa* L.**

ABSTRACT

Objectives: Onion is a highly consumed vegetable crop in many countries, being a vital component of every dish. Recent studies indicated that different plant residues' and animal manure-based biochars have strong impacts on the growth and development of plants. However, the impact of these biochars on disease suppression remains elusive. Therefore, this two-year study assessed the impact of animal and plant residues-based biochars on the suppression of *Stemphylium* leaf blight (SLB) of onion and productivity of the crop. Methods: Three pyrolyzed biochars (cotton sticks, wheat straw and poultry litter) were used in the study. Biochars were prepared in the laboratory and applied to soil prior to crop sowing in same concentration during both years of study. Results: Poultry litter biochar had the highest impact on allometric traits and productivity of onion, and successfully reduced SLB severity. The control treatment had the lowest productivity and the highest disease severity during both years of the study. The remaining biochars (cotton sticks and wheat straw) had moderate influence on growth and development of onion plants. The disease severity was higher compared to poultry litter; however, it was lower in both biochars than control treatment. It is concluded that different animal and plant residues-based biochars could be used to improve plant health. Nonetheless, the response of these biochars will be crop-specific. Conclusion: Poultry litter biochar can be successfully used to suppress SLB in onion and productivity of the crop. Nevertheless, the actual mechanisms involved in disease suppression warrant further investigation.

Keyword: *Allium cepa*; Biochar; Poultry litter; *Stemphylium* leaf blight; Disease severity