

MITIGATING DROUGHT STRESS IN ARABICA COFFEE SEEDLINGS THROUGH SOIL STABILIZATION WITH BIOCHAR DERIVED FROM HIGHLAND AGRICULTURAL WASTE

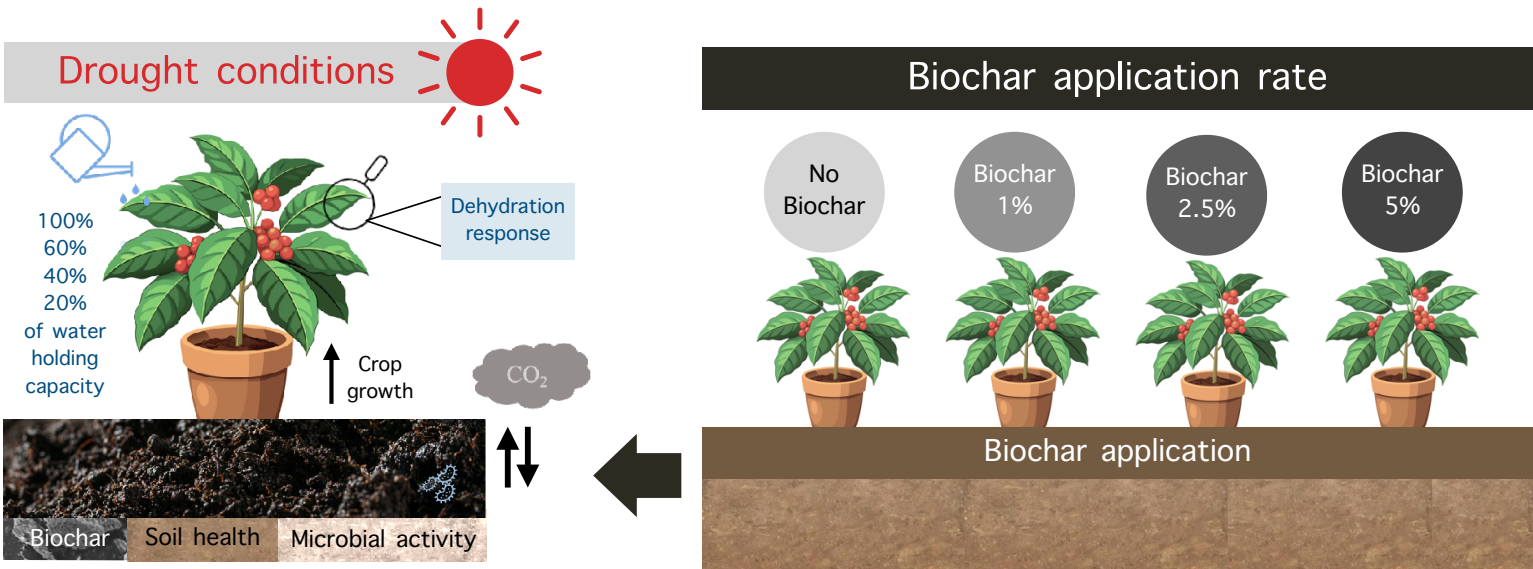
Sasiprapa Kullachonphuri¹, Phonlawat Soilueang¹, Piyaphad Ninlaphong¹, Yupa Chromkaew¹, Nipon Mawan², Wanwisa Pansak³, and Nuttapon Khongdee^{2*}

¹ Department Of Plant And Soil Science, Faculty Of Agriculture, Chiang Mai University, Chiang Mai, Thailand, 50200
² Department Of Highland Agriculture And Natural Resources, Faculty Of Agriculture, Chiang Mai University, Chiang Mai, Thailand, 50200
³ Faculty of Environment and Resource Studies, Mahidol University, Nakhon Pathom, Thailand

*Corresponding author: nuttapon.k@cmu.ac.th

INTRODUCTION

Biochar can improve soil properties and mitigate drought stress in plants by enhancing soil water retention. This study examines the effects of different doses of corncob biochar on Arabica coffee under varying water conditions to understand its role in alleviating drought stress.



OBJECTIVE

- 1 To investigate the physical and chemical properties of biochar derived from agricultural wastes
- 2 To investigate the effects of different doses of corncob biochar on drought stress in Arabica coffee under varying soil water conditions

METHODOLOGY

- 1 The basic physical and chemical characteristics of the soil and biochar were assessed.
- 2 Growth and development of coffee seedling were monthly measured.
- 3 Plant responses were assessed through measurements of
 - Electrolyte leakage
 - Relative water content
 - Proline content
 - Total soluble sugar content.

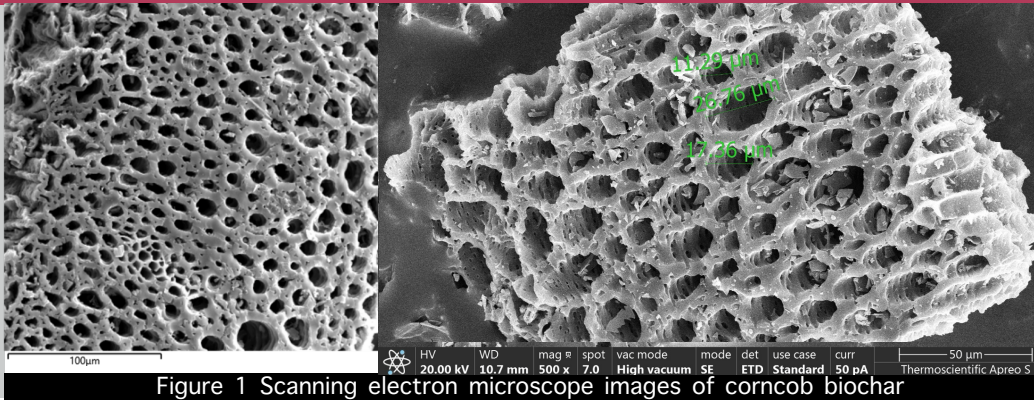


Figure 1 Scanning electron microscope images of corncob biochar

RESULTS

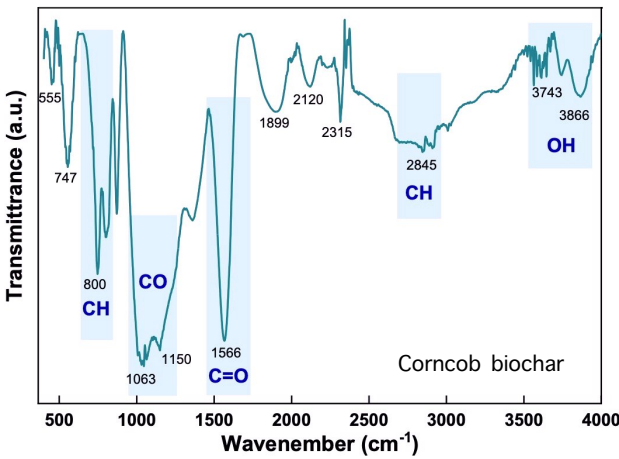
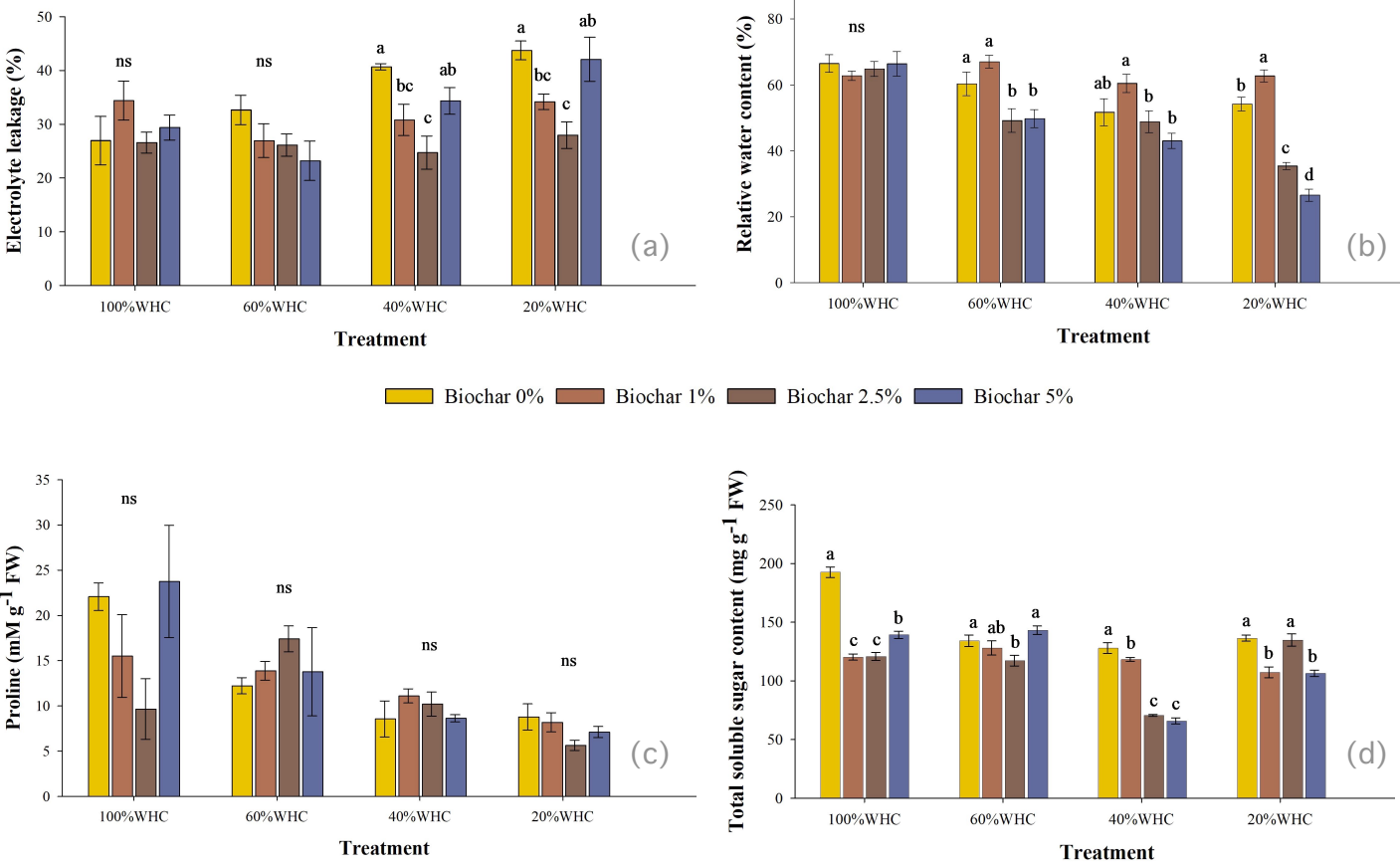


Figure 2 Fourier-transformed infra-red (FTIR) absorption spectra of corncob biochar after removal of biochar particles visible to the naked eye.

CONCLUSION

Based on these findings, it can be concluded that biochar derived from highland agricultural waste has the potential to mitigate the negative impacts of drought stress on Arabica coffee seedlings.

ACKNOWLEDGEMENT

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Note: The error bars indicate the standard error of the mean, with a sample size of n=3. The presence of distinct lowercase letters within each panel indicates statistically significant differences in the treatment means within each biochar dose and water condition, as determined by the least significant difference (LSD) test at a significance level of $\alpha \leq 0.05$.