ENGINEERING Agriculture, https://journal.hep.com.cn/fase
https://doi.org/10.15302/J-FASE-2026707
Achini DIAS et al., ENGINEERING Agriculture, 2026, 13(6): 26707
RESEARCH ARTICLE

Physicochemical responses to standard and biodegradable plastic film mulches in a tropical dry-zone Alfisol

Achini DIAS[1], Martine GRAF[1], Meththa GIMHANI[1], Mojith ARIYARATNE[2], Anurudda KARUNARATHNA[3], Chamila PERERA[4], Davey L. JONES[1], David R. CHADWICK[1], Surani CHATHURIKA (✉)[5]

1 School of Environmental and Natural Sciences, Bangor University, Bangor, Gwynedd, LL57 2UW, UK.

2 Department of Crop Science, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400, Sri Lanka.

3 Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400, Sri Lanka.

4 Field Crop Research and Development Institute, Mahailluppallama 50270, Sri Lanka.

5 Department of Urban Bioresources, Faculty of Urban and Aquatic Bioresources, University of Sri Jayewardenepura, Gangodawila, Nugegoda 10250, Sri Lanka.

Received April 28, 2026;
Accepted July 20, 2026.
Correspondence: surani@sjp.ac.lk
© The Author(s) 2026. Published by Higher Education Press. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0)

SUPPLEMENTARY MATERIALS

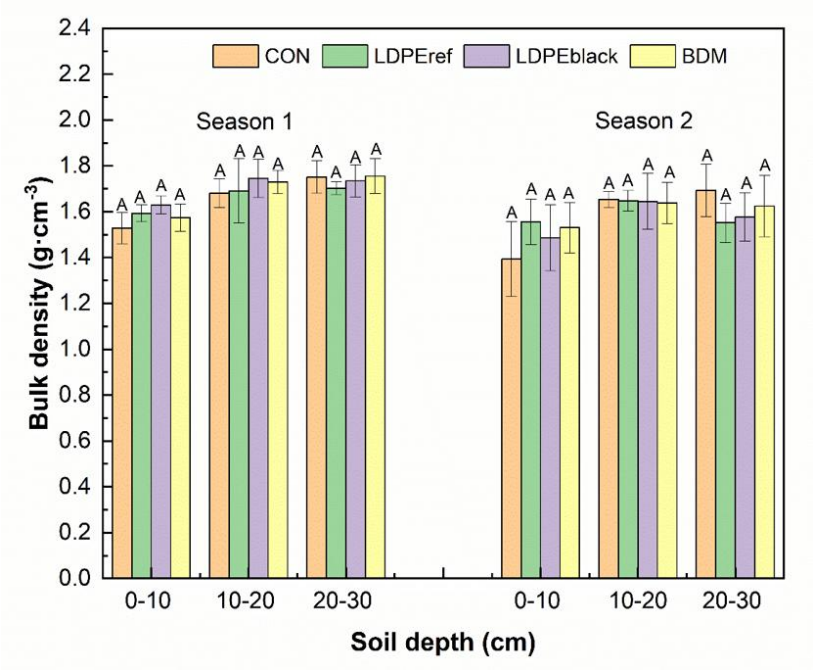


Fig. S1 Soil bulk density (g·cm^{-3}) at 0–10, 10–20, and 20–30 cm depth measured at the end of each growing season to assess the effect of plastic film mulch application on soil compaction across treatments: control (CON), reflective low-density polyethylene ($LDPE_{ref}$), black low-density polyethylene ($LDPE_{black}$), and black biodegradable PLA-PBAT (BDM). Within each season and soil depth, different letters indicate significant differences between treatments (Tukey's HSD, $p < 0.05$). Values represent mean ± SD ($n = 4$).

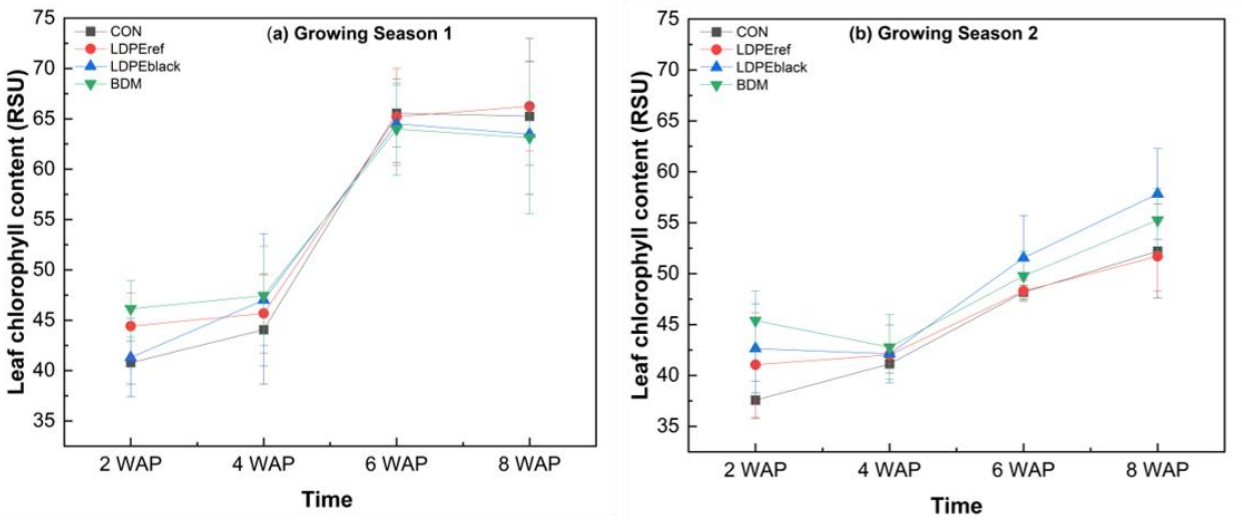


Fig. S2 Leaf chlorophyll content, expressed as relative SPAD units (RSU) measured bi-weekly from 2 to 8 weeks after transplanting (WAP) to assess the effect of plastic film mulch application on plant physiological status across growing seasons: (a) Season 1 and (b) Season 2, under control (CON), reflective low-density polyethylene ($LDPE_{ref}$), black low-density polyethylene ($LDPE_{black}$), and black biodegradable PLA-PBAT (BDM) treatments. Values expressed as mean ± SD ($n = 4$).