

Supporting methods

The pH of sediment/biochar was determined by pH 400 meter (Spectrum Technologies, Inc., Aurora, Illinois, USA) at a soil/deionized water ratio of 1:2.5(w/v); the electric conductivity of sediment and biochar was measured using a WET Sensor (WET-2, Delta-T Devices Ltd., Cambridge); the C, N and H contents of sediment/corn stalks/biochar were measured with a C/H/N elemental analyser (EuroVector S.P.A EA3000, Milan, Italy) and the O content of corn biochar was calculated by the law of conservation of mass; the NO_3^- and NH_4^+ of sediment were extracted using CaCl_2 solution before determined with AA3 Continuous Flow Analytical System (AA3, Bran+Luebbe, German).

For biochar, the ash content was measured according to the stand method outlined by the American Society for Testing and Materials (ASTM) (ASTM, 2007); the surface physical properties were measured using an ASAP-2020 surface area analyzer (Micromeritics Instrument Corporation, US), then the surface area was calculated using the Brunauere Emmett eTeller (BET) equation, the total porous volume was calculated by the density functional theory approach, and the micropore volume was calculated using the t-plot method (Puziy et al., 2003).

Reference:

ASTM, 2007. Standard Test Method for Chemical Analysis of Wood Charcoal. ASTM International, West Conshohocken, PA

Puziy, A .M., Poddubnaya, O.I., Martinez-Alonso, A ., Suarez-Garcia, F., Tascon, J., 2003. Synthetic carbons activated with phosphoric acid III. Carbons prepared in air. Carbon 41, 1181-1191.

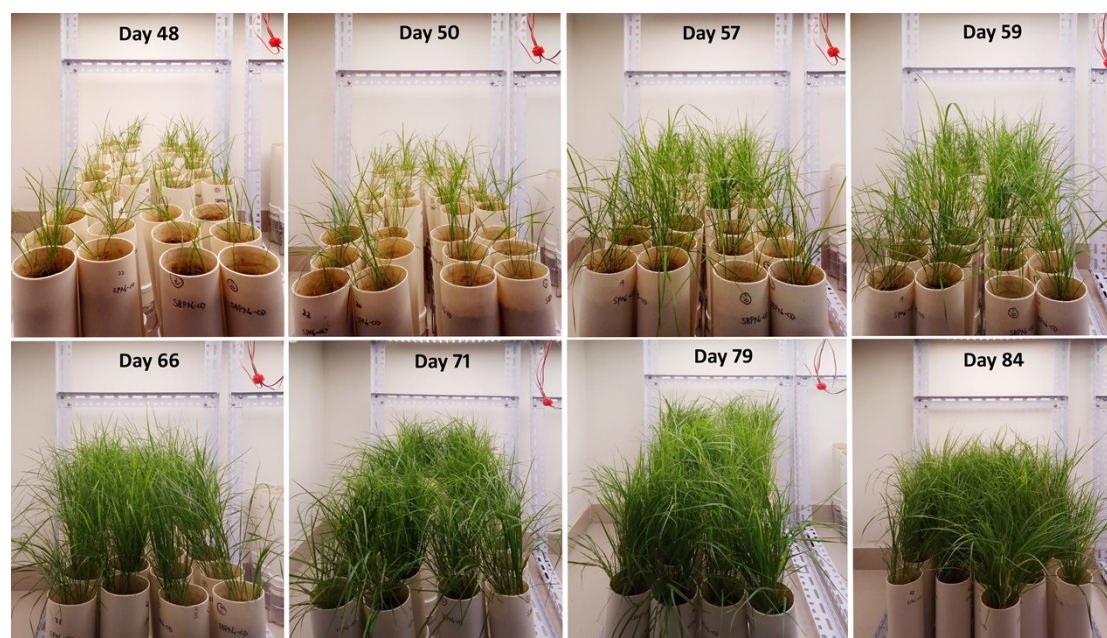


Fig. S1. The growth status of *Calamagrostis angustifolia* during the incubation period.