



Figure S1. The seedling raised in 100% biochar.

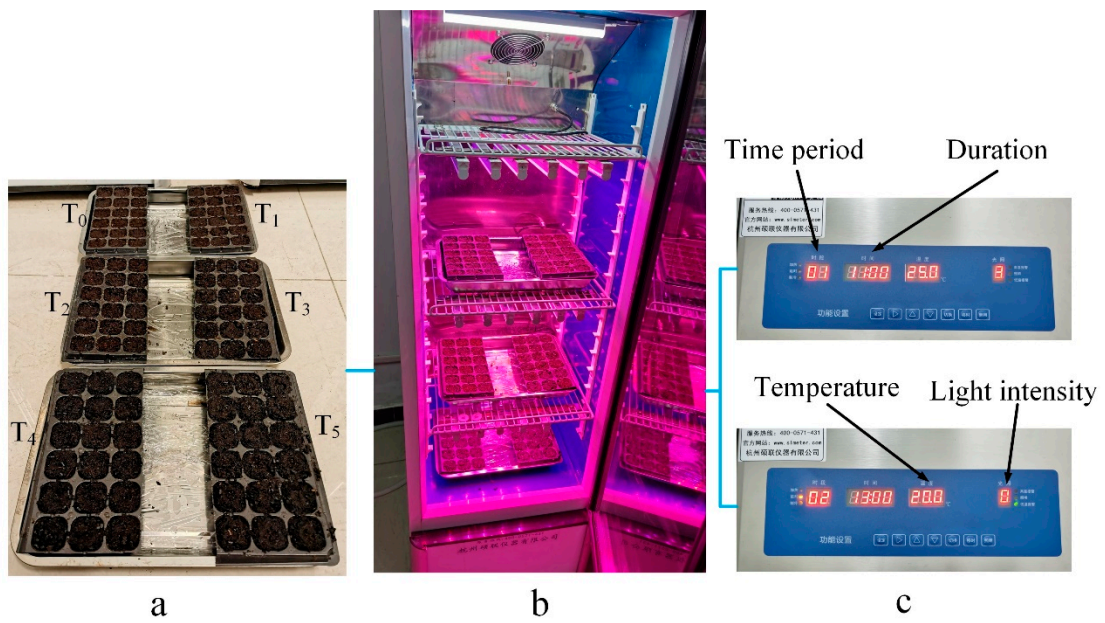


Figure S2. The cultivation of the substrates. (a) The substrate absorbed enough water; **(b)** the incubator; **(c)** parameter setting of the incubator.

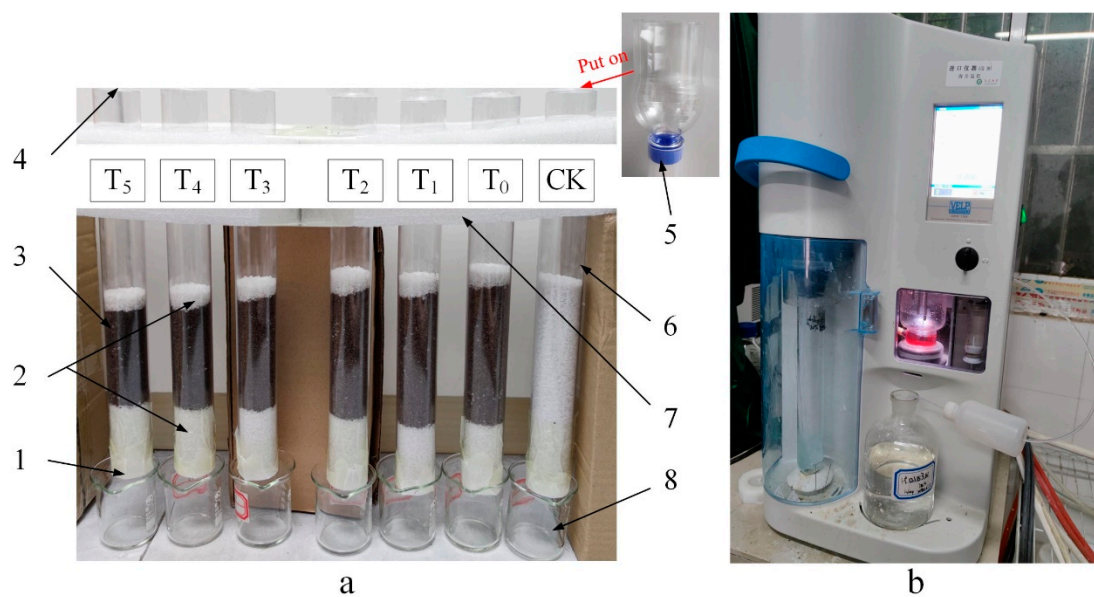


Figure S3. Determination of nitrogen by soil column leaching method. (a) The soil column leaching method; **(b)** Kjeldahl azotometer; 1) Nylon net; 2) Quartz sand; 3) Substrate; 4) Polyethylene film; 5) Simple drip irrigation device; 6) PVC pipe; 7) Frame; 8) Breaker.

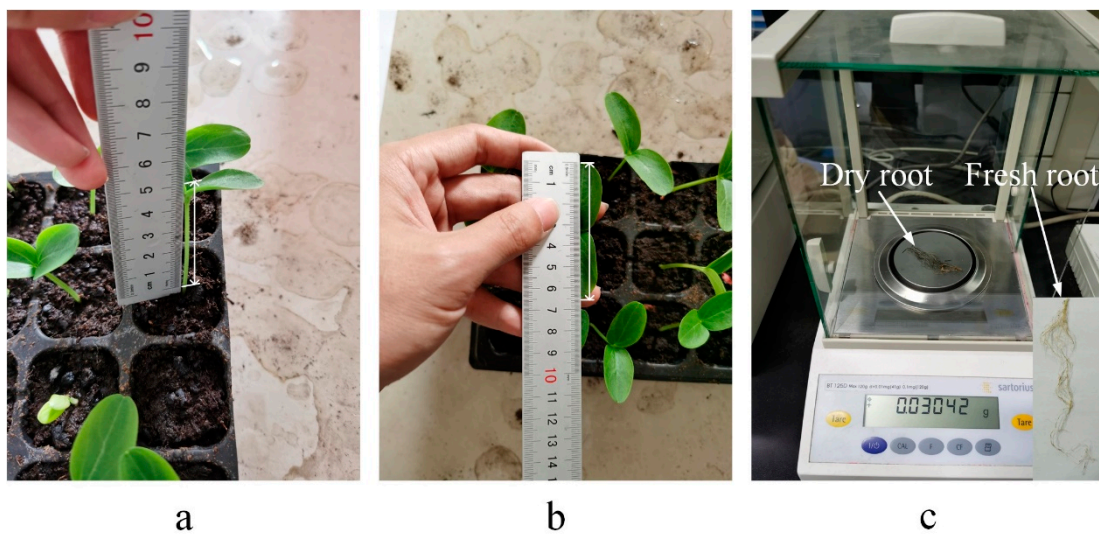


Figure S4. Determination of the seedling growth parameters. (a) Measurement of plant height; **(b)** Measurement of leaf exhibition; **(c)** Weight of the root dry matter.

Electronic universal

testing machine

Seedling

Clamping apparatus

Root scanning photo



a



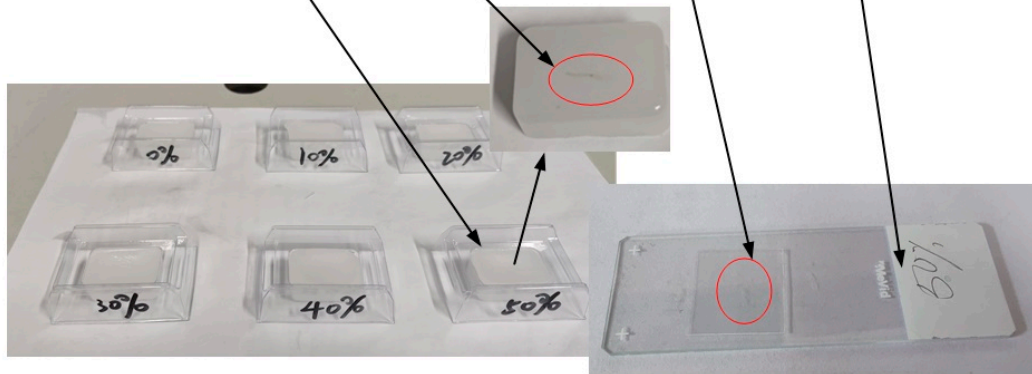
b

Paraffin block

Root-tip

Root-tip slice

Glass slide



c

Figure S5. Analysis of the root system. (a) Measurement of seedling's compressive strength; (b) Scanning and analysis of root system; (c) Measurement of the length of root-tip cells.

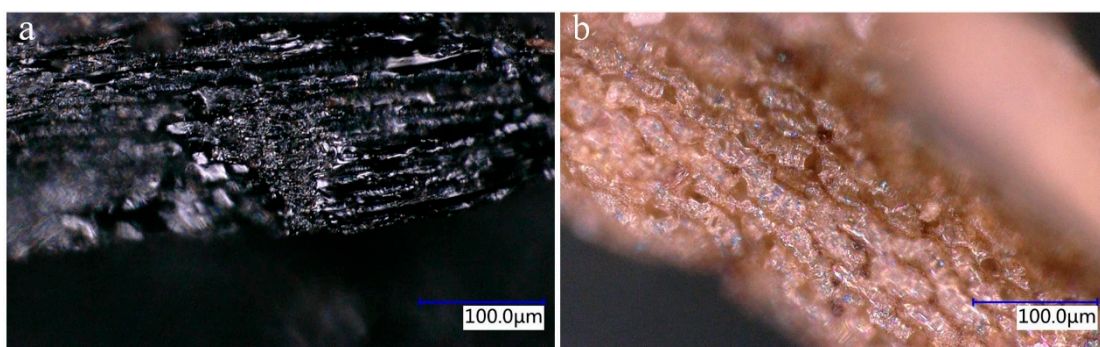


Figure S6. Surface characteristics of substrate under the microscope. (a)Surface characteristic of biochar; **(b)** Surface characteristic of peat.