Supporting Online Information for:

Recycling slaughterhouse waste into fertilizer: how do pyrolysis temperature and biomass additions affect phosphorus availability and chemistry?

Marie J. Zwetsloot, Johannes Lehmann[*]*, Dawit Solomon*

Supporting Information includes 7 pages, Table S1 and Figure S1-S6

[*]Correspondence to: Department of Crop and Soil Sciences, Bradfield Hall 909, Cornell University, Ithaca NY 14853. E-mail: CL273@cornell.edu

Table S1. Specific surface area (SSA) analysis using CO_2.

Sample	SSA (m^2 g^{-1})
Rendered bone 220°C	16.4 ± 12.2
Rendered bone 350°C	4.9 ± 0.4

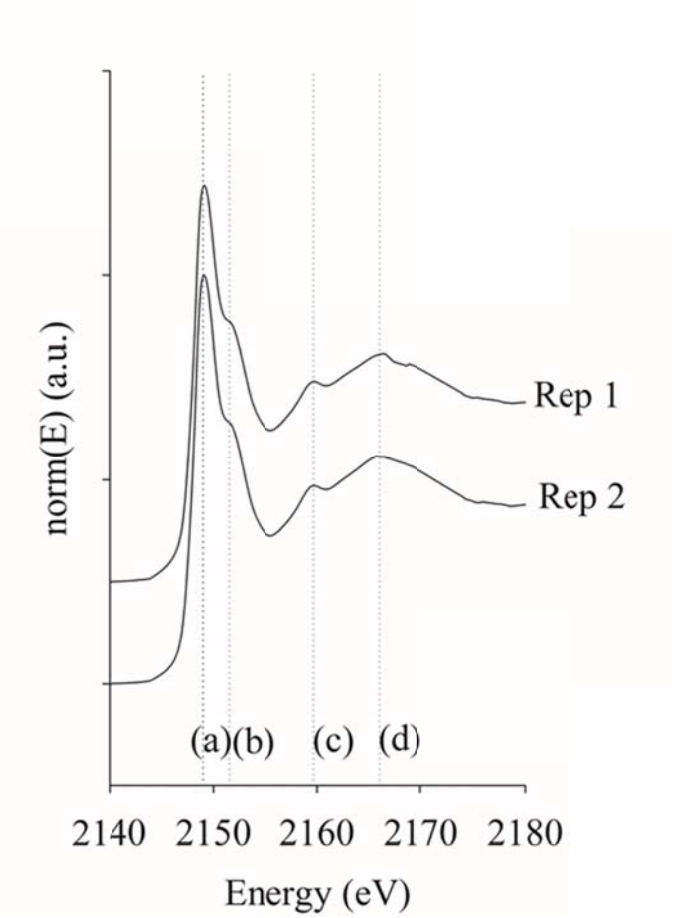

Figure S1. Phosphorus K-edge X-ray Absorption Near Edge Structure spectroscopy of duplicate bone with meat residue and wood char at 550°C scans (Rep 1and Rep 2). The dotted lines indicate energy levels that characterize unique spectral features for different P species: (a) absorption edge, (b) CaP shoulder, (c) secondary peak of OCP and HA, (d) oxygen oscillation.

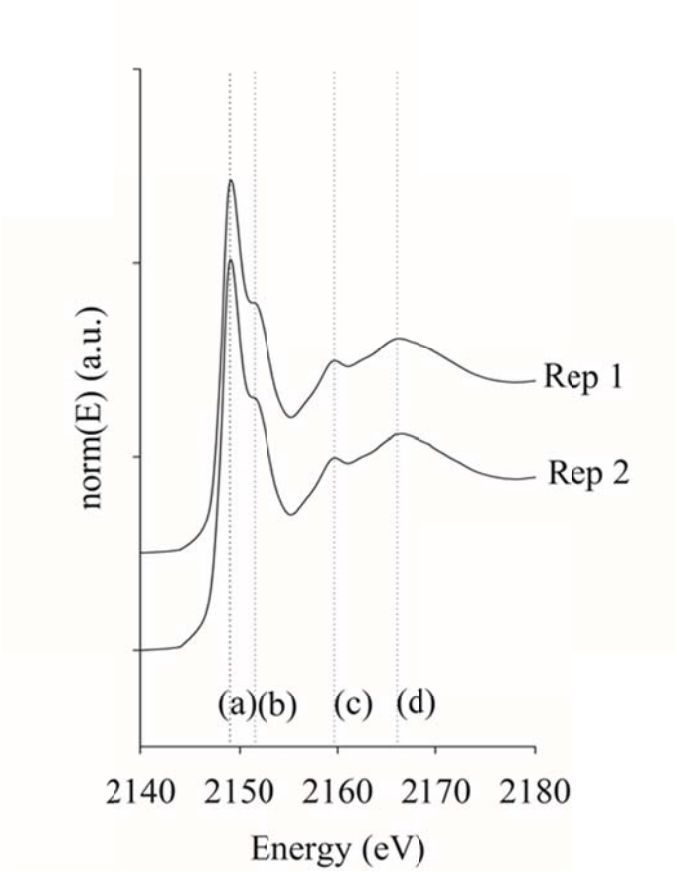

Figure S2. Phosphorus K-edge X-ray Absorption Near Edge Structure spectroscopy of duplicate rendered bone with wood at 220°C scans (Rep 1 and Rep 2). The dotted lines indicate energy levels that characterize unique spectral features for different P species: (a) absorption edge, (b) CaP shoulder, (c) secondary peak of OCP and HA, (d) oxygen oscillation.

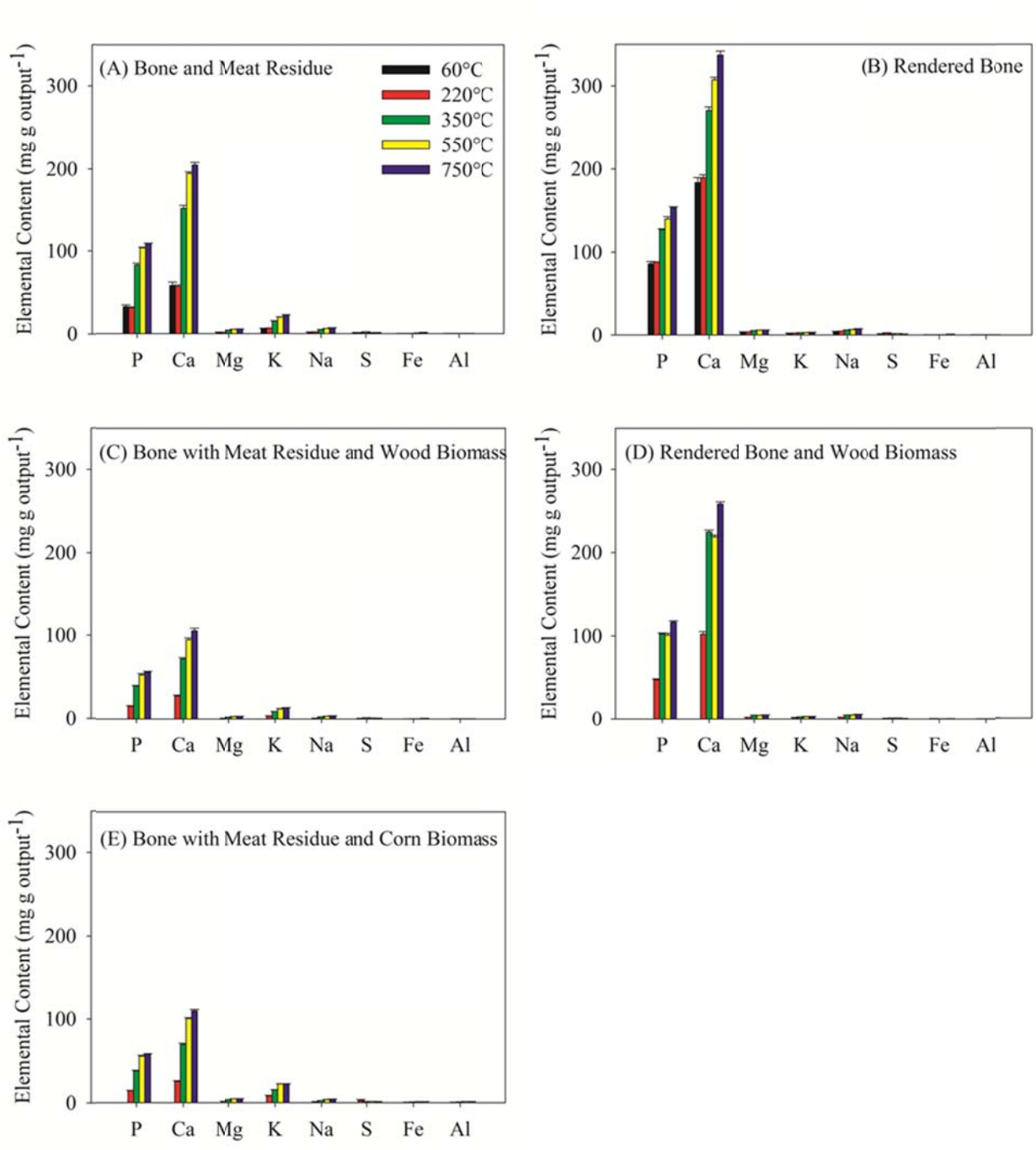

Figure S3. Total elemental analysis of bone-based fertilizers at 60, 220, 350, 550 and 750°C. Elements include phosphorus (P), calcium (Ca), Magnesium (Mg), potassium (K) and sodium (Na).

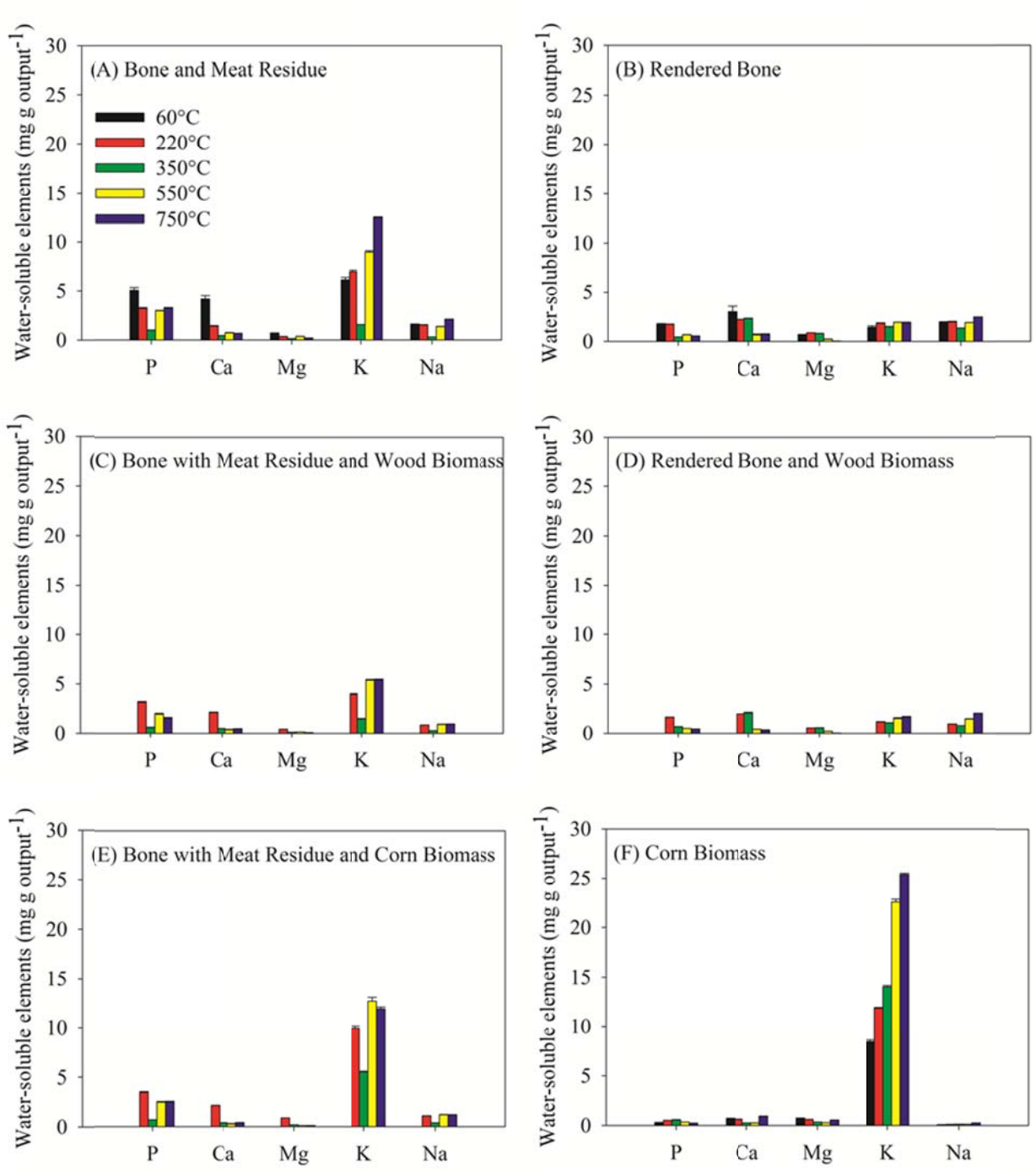

Figure S4. Water-soluble elements of original feedstock and char at 60, 220, 350, 550 and 750°C: Elements include phosphorus (P), calcium (Ca), Magnesium (Mg), potassium (K) and sodium (Na).

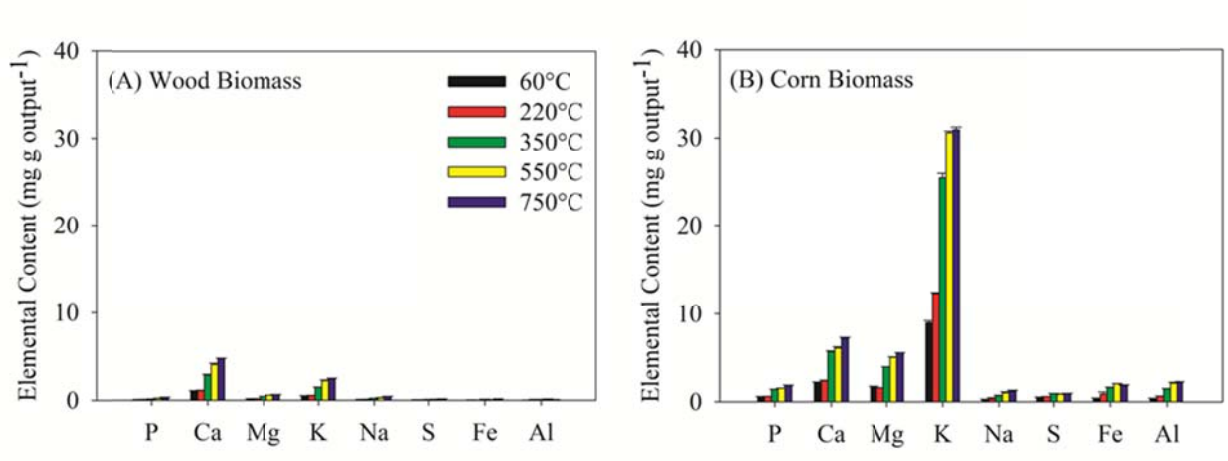

Figure S5. Total elemental analysis of (A) wood and (B) corn biomass at 60, 220, 350, 550 and 750°C. Elements include phosphorus (P), calcium (Ca), Magnesium (Mg), potassium (K) and sodium (Na).

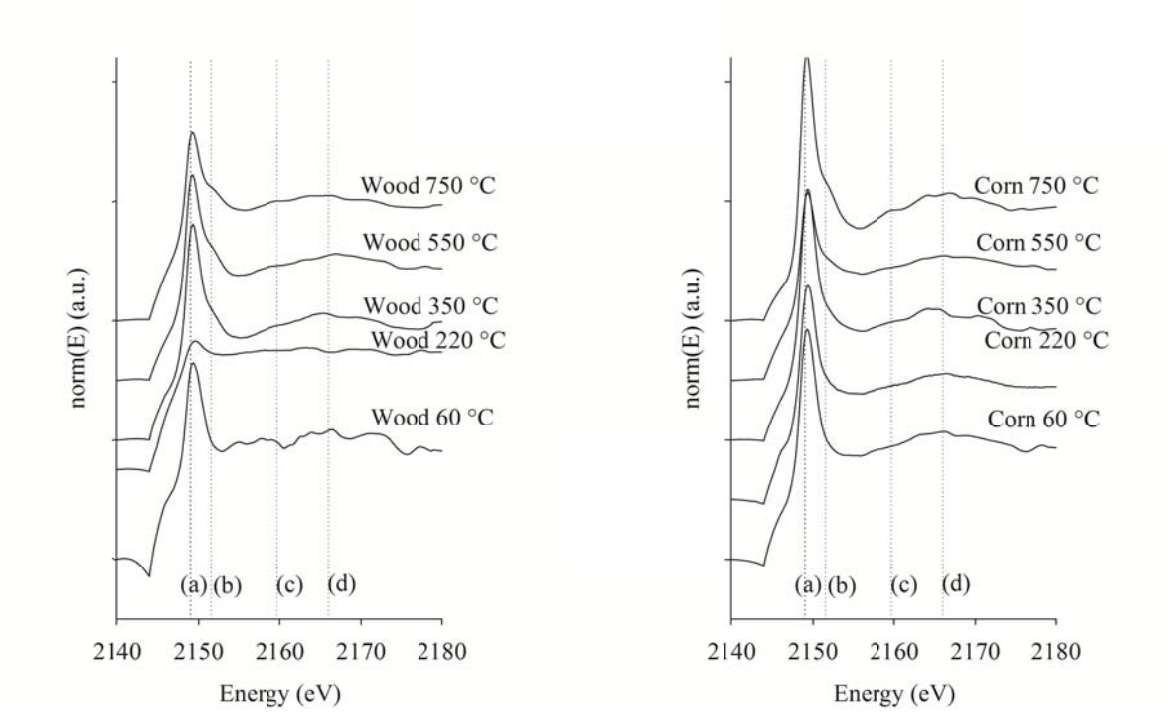

Figure S6. Phosphorus K-edge X-ray Absorption Near Edge Structure spectroscopy of wood and corn biomass at different pyrolysis temperatures. The dotted lines indicate energy levels that characterize unique spectral features for different P species: (a) absorption edge, (b) CaP shoulder, (c) secondary peak of OCP and HA, (d) oxygen oscillation.