

Technologies for fertilizers and management strategies of N-fertilization in coffee cropping systems to reduce ammonia losses by volatilization

Supplementary Material

Figure S1. Daily N-NH₃ losses by volatilization in the first, second, and third split application (a, b, and c) of conventional and stabilized N fertilizers. Rainfall, average temperature, and relative air humidity after splitting the N fertilization in the 2015/2016 crop season (d).

Figure S2. Daily (a) and accumulated (b) N-NH₃ losses by volatilization in slow- and controlled-release N fertilizers. Rainfall, average temperature, and relative air humidity after splitting the N fertilization in the 2015/2016 crop season (c).

Figure S3. Daily N-NH₃ losses by volatilization in the first, second, and third split application (a, b, and c) of conventional and stabilized N fertilizers. Rainfall, average temperature, and relative air humidity after splitting the N fertilization in the 2016/2017 crop season (d).

Figure S4. Daily (a) and accumulated (b) N-NH₃ losses by volatilization in slow- and controlled-release N fertilizers. Rainfall, average temperature, and relative air humidity after splitting the N fertilization in the 2016/2017 crop season (c).

Figure S5. Accumulated N-NH₃ losses by volatilization in the first, second, and third split application (a, b, and c) of conventional and stabilized N fertilizers in the 2015/2016 crop season.

Figure S6. Accumulated N-NH₃ losses by volatilization in the first, second, and third split application (a, b, and c) of conventional and stabilized N fertilizers in the 2016/2017 crop season.

Figure S7. Thickness of surface coatings by MEV images (a) and elemental composition of surface coatings (b) of the controlled release source: urea coated with elemental sulfur (S⁰) + polymer (Blend N – fertilizer).

Figure S8. Thickness of surface coatings by MEV images (a) and elemental composition of surface coatings (b) of the controlled release source: urea coated with plastic resin.

Figure S9. Thickness of surface coatings by MEV images (a) and elemental composition of surface coatings (b) of the controlled release source: urea coated with polyurethane.

Figure S10. Images of the conventional N fertilizers: urea (a), ammonium nitrate (b), and ammonium sulfate (c).

Figure S11. Images of the stabilized N fertilizers: urea treated with NBPT (a) and urea treated with Cu and B.

Figure S12. Images of the fertilizers: Slow-release: Urea-formaldehyde (a) and Physical barrier: Urea + adhesive + CaCO₃ (b).

Figure S13. Dry leaves in the canopy projection of the coffee plant hindering fertilizer incorporation.

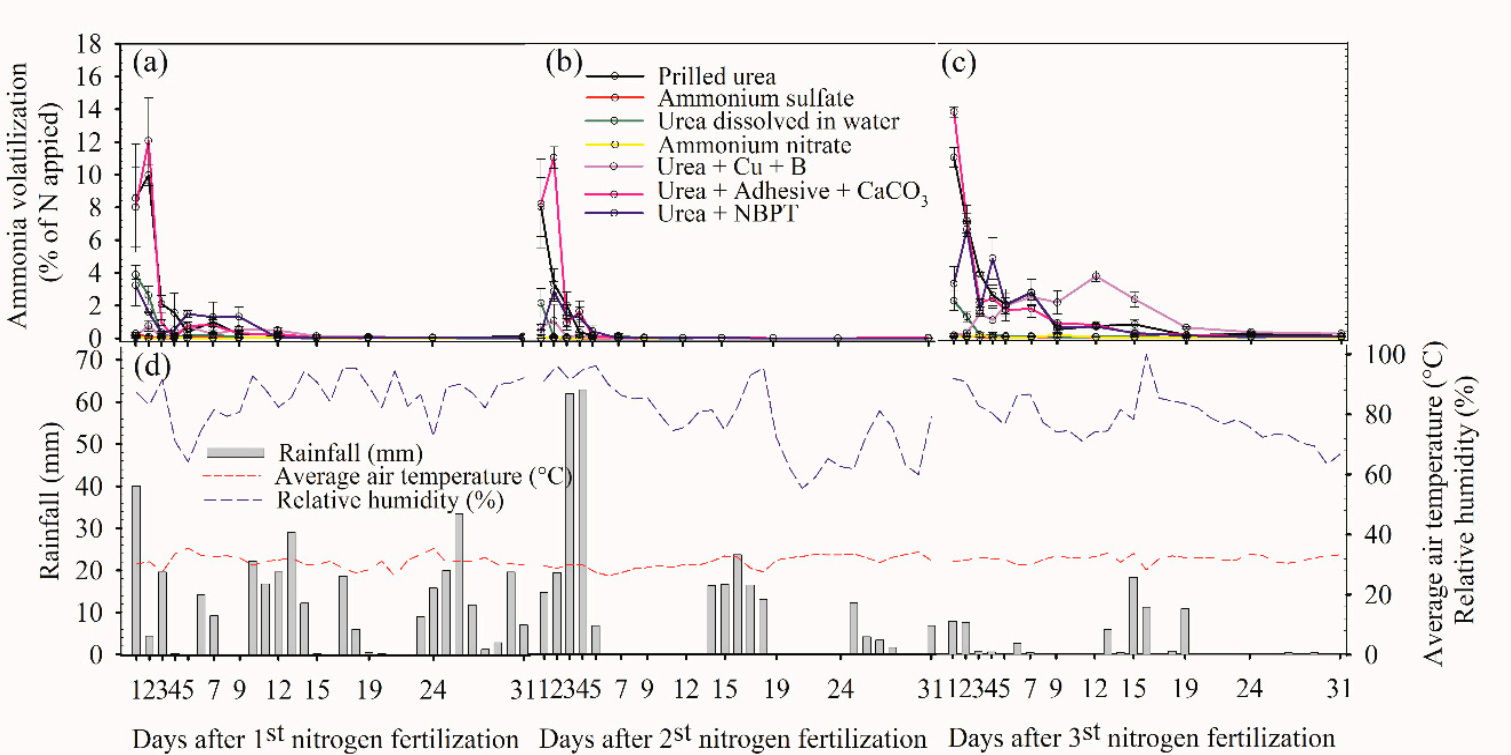


Figure S1

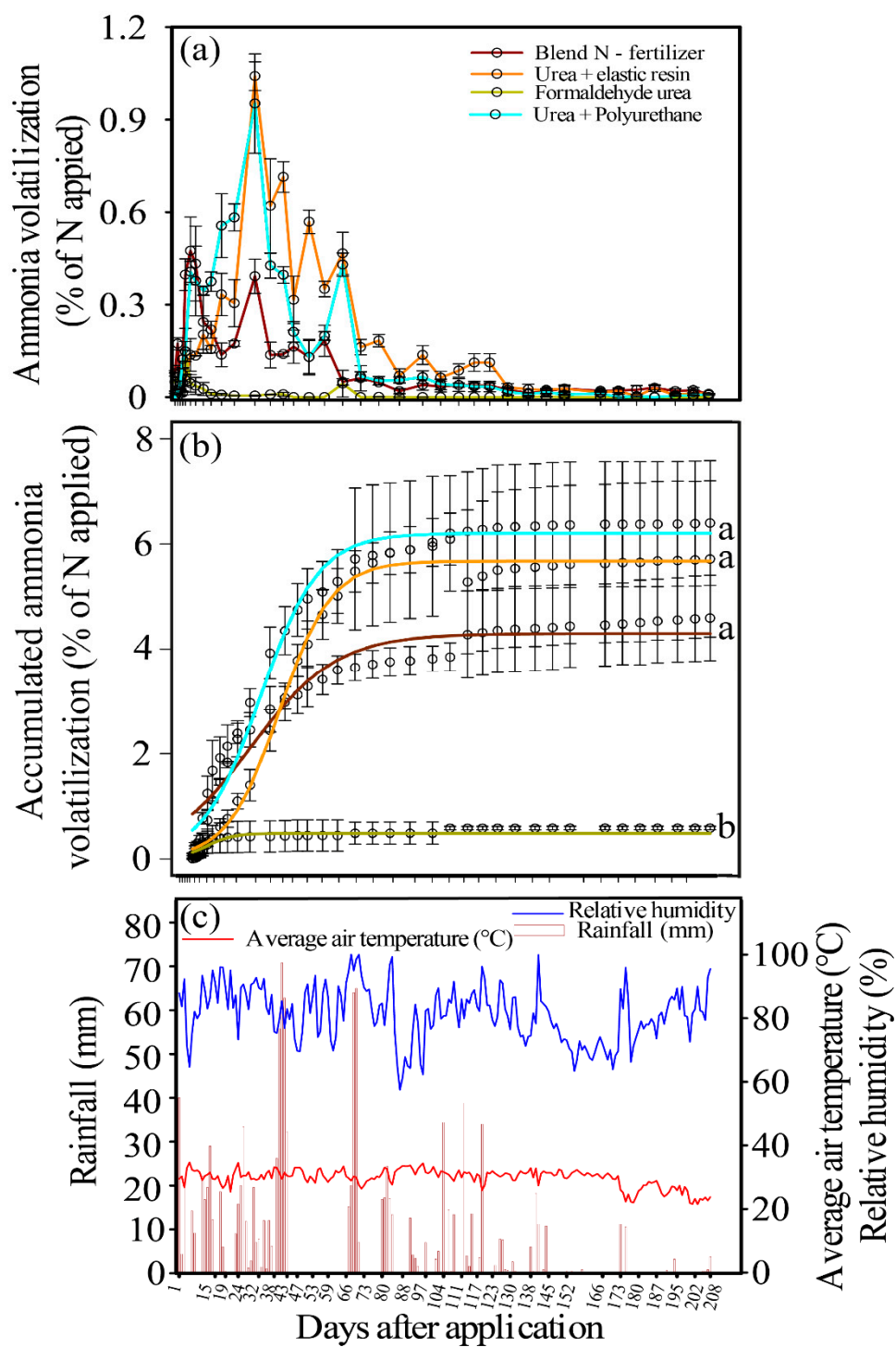


Figure S2

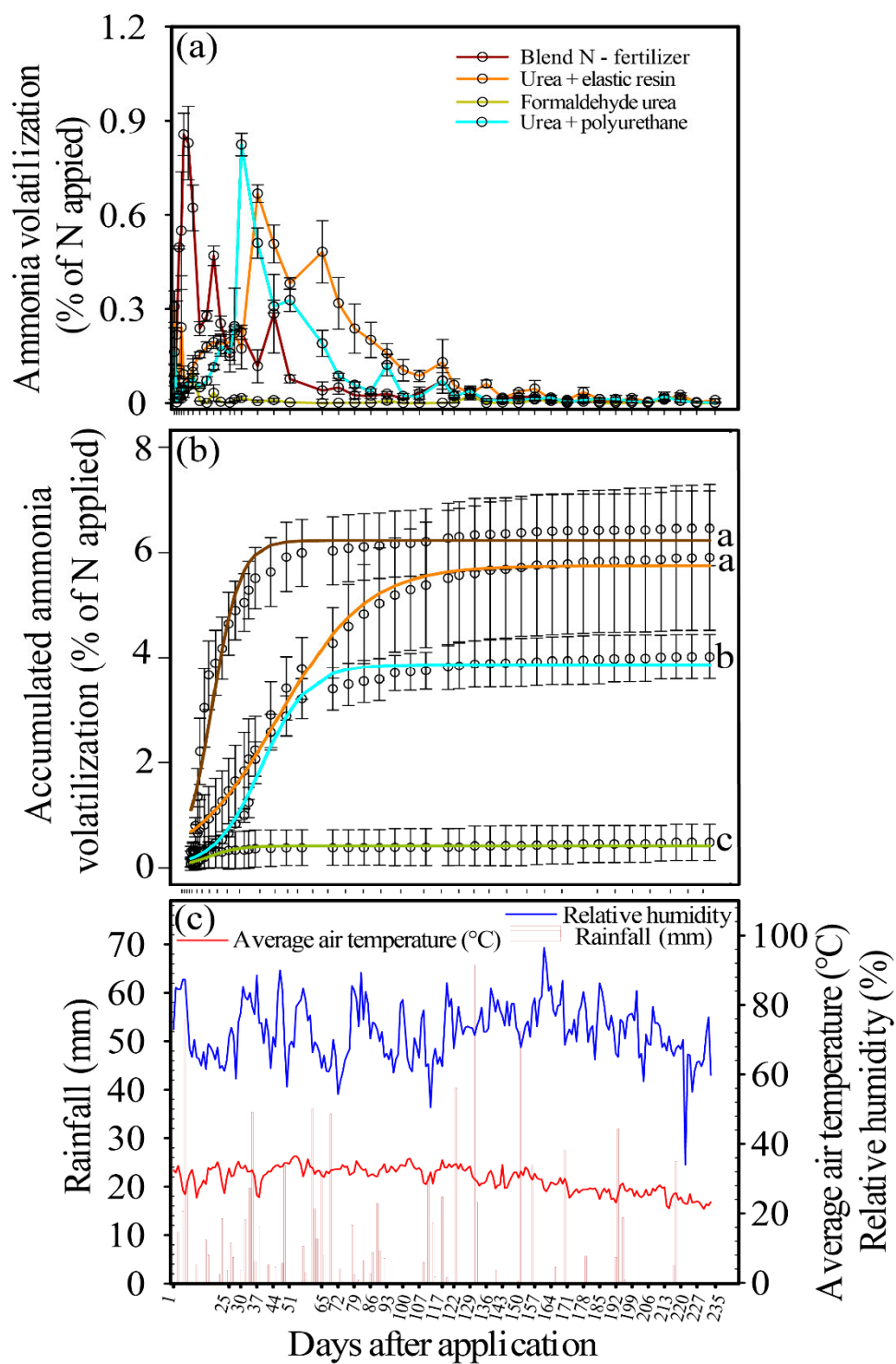


Figure S4

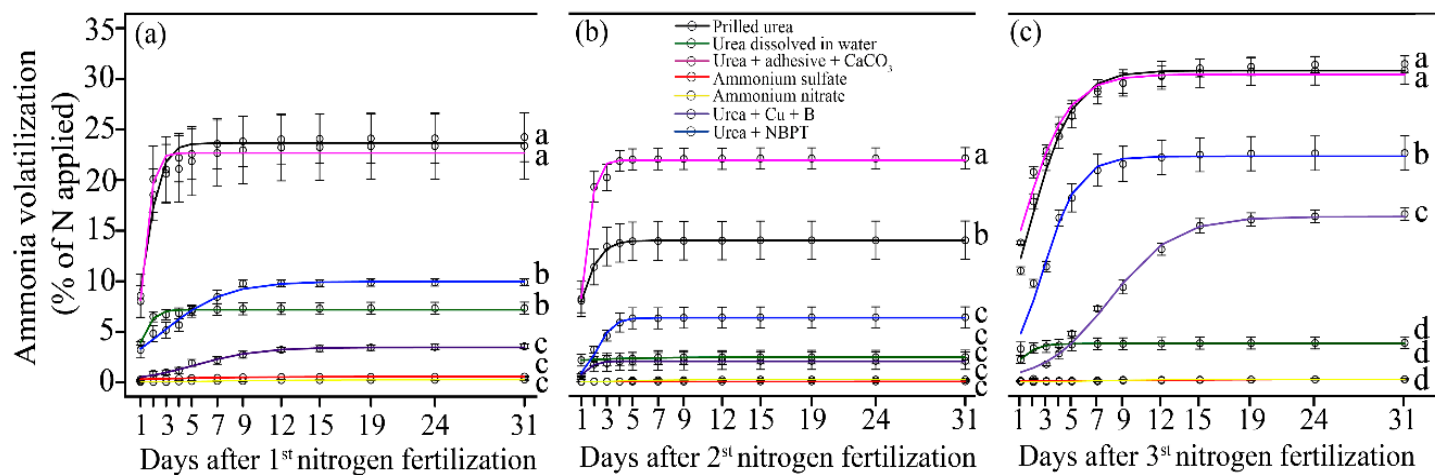


Figure S5

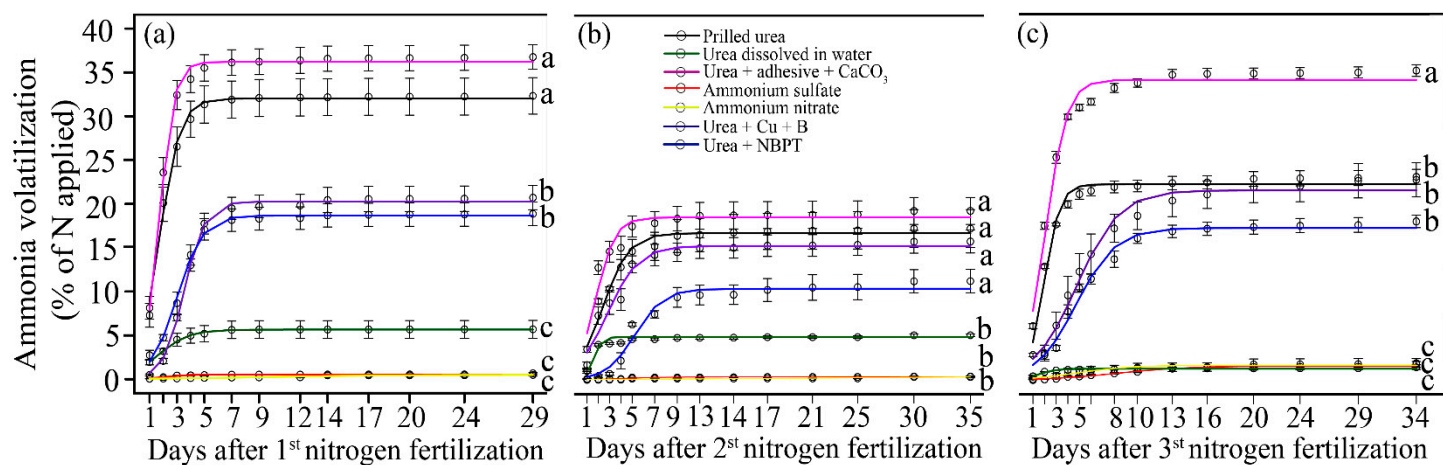


Figure S6

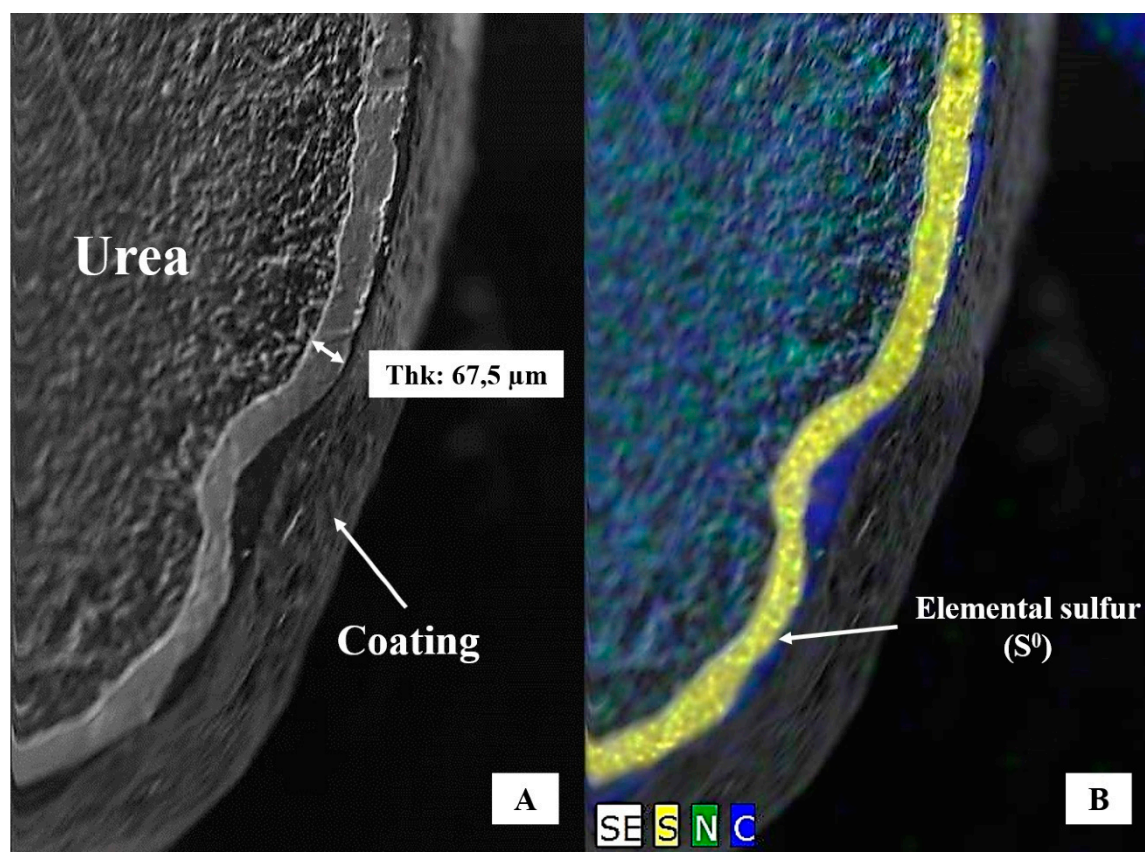


Figure S7

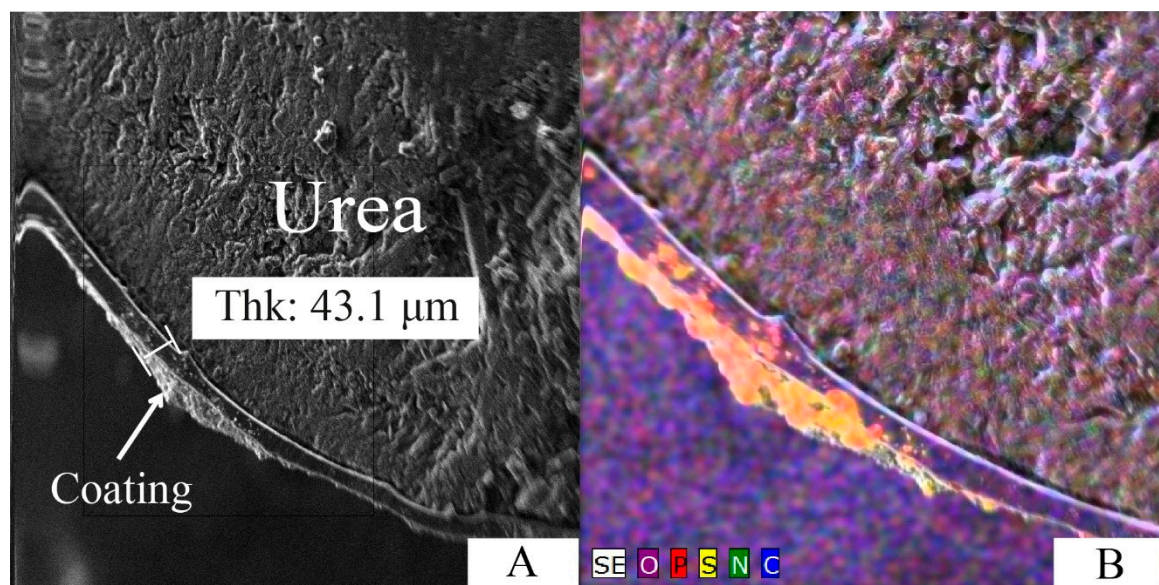


Figure S8

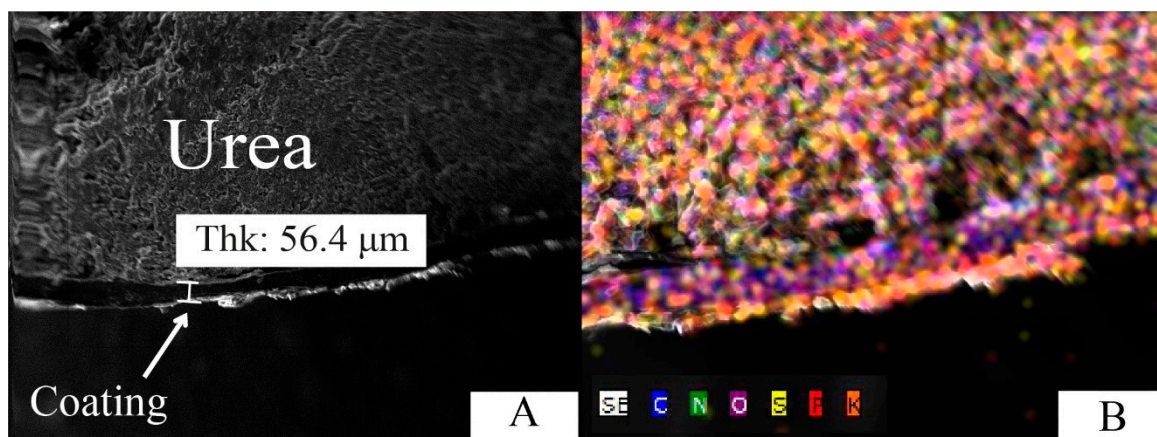


Figure S9

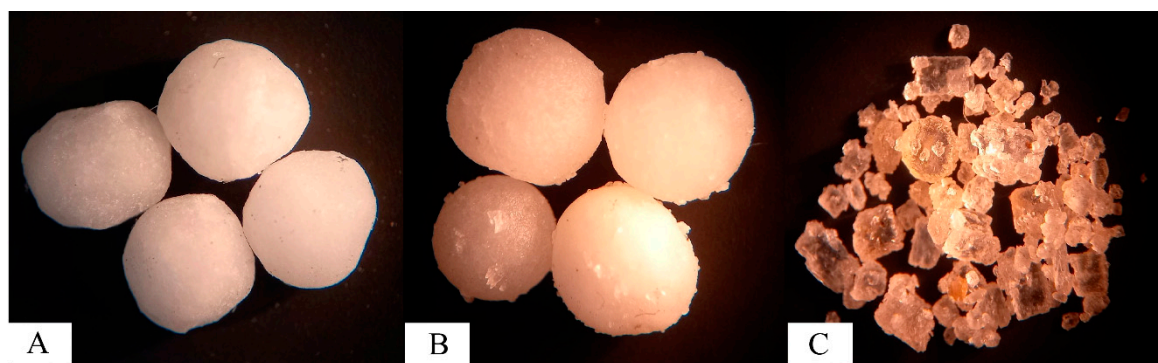


Figure S10

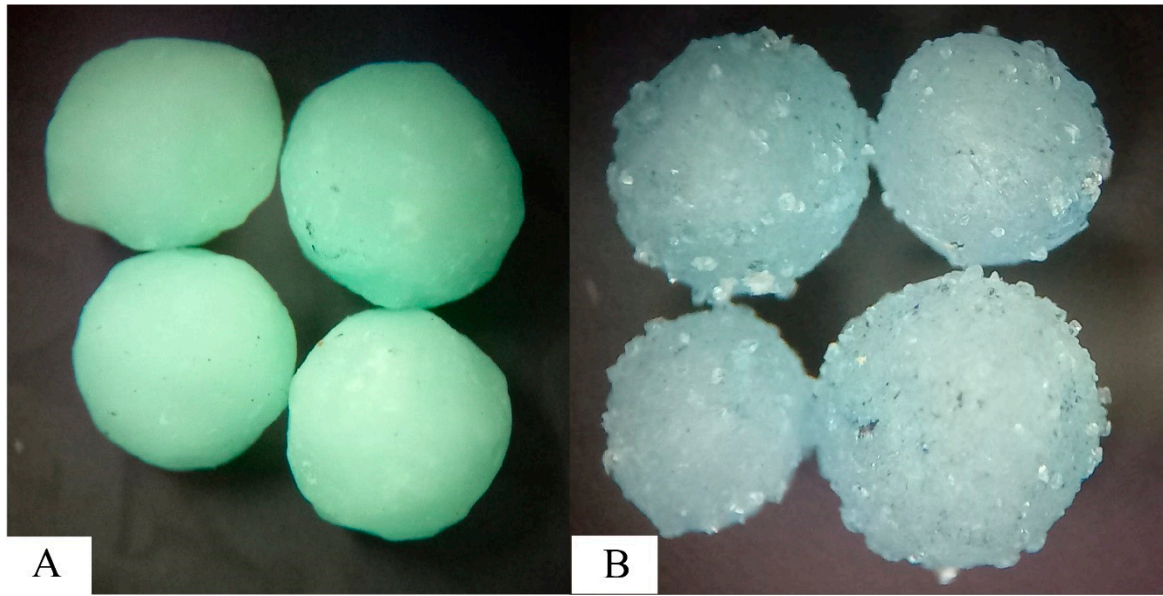


Figure S11

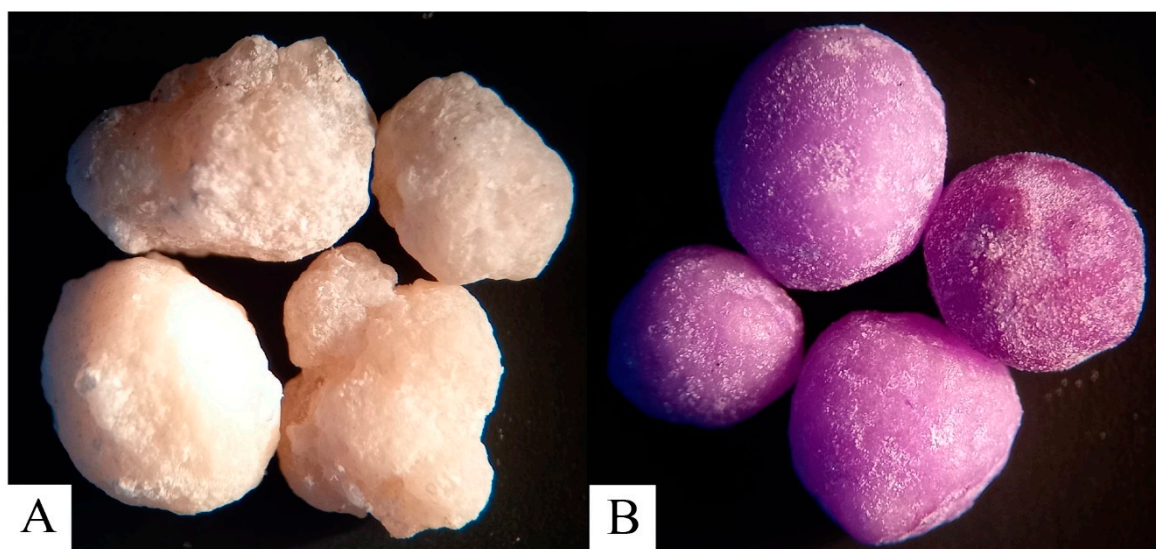


Figure S12



Figure S13