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Supplement of

Agricultural harvesting emissions of ice-nucleating particles

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Figure S1. Photographs from pre (top left), during (top right), and post- (middle row) sorghum harvest and during a corn harvest (bottom row). The images show the landscape before and after harvesting and the amount of material that is kicked up during harvesting. The image in the middle row demonstrates that even after active harvesting has stopped debris is still being lofted from the harvested field.



Figure S2. Photographs showing during the soybean (top left) and wheat (top right) harvests and after the wheat harvest (bottom row). The change in the landscape and the amount of material ejected during the harvests are visible as well as the impact on air quality shown in the bottom right figure. The haze seen in the bottom right photo is from particles emitted during the wheat harvest.

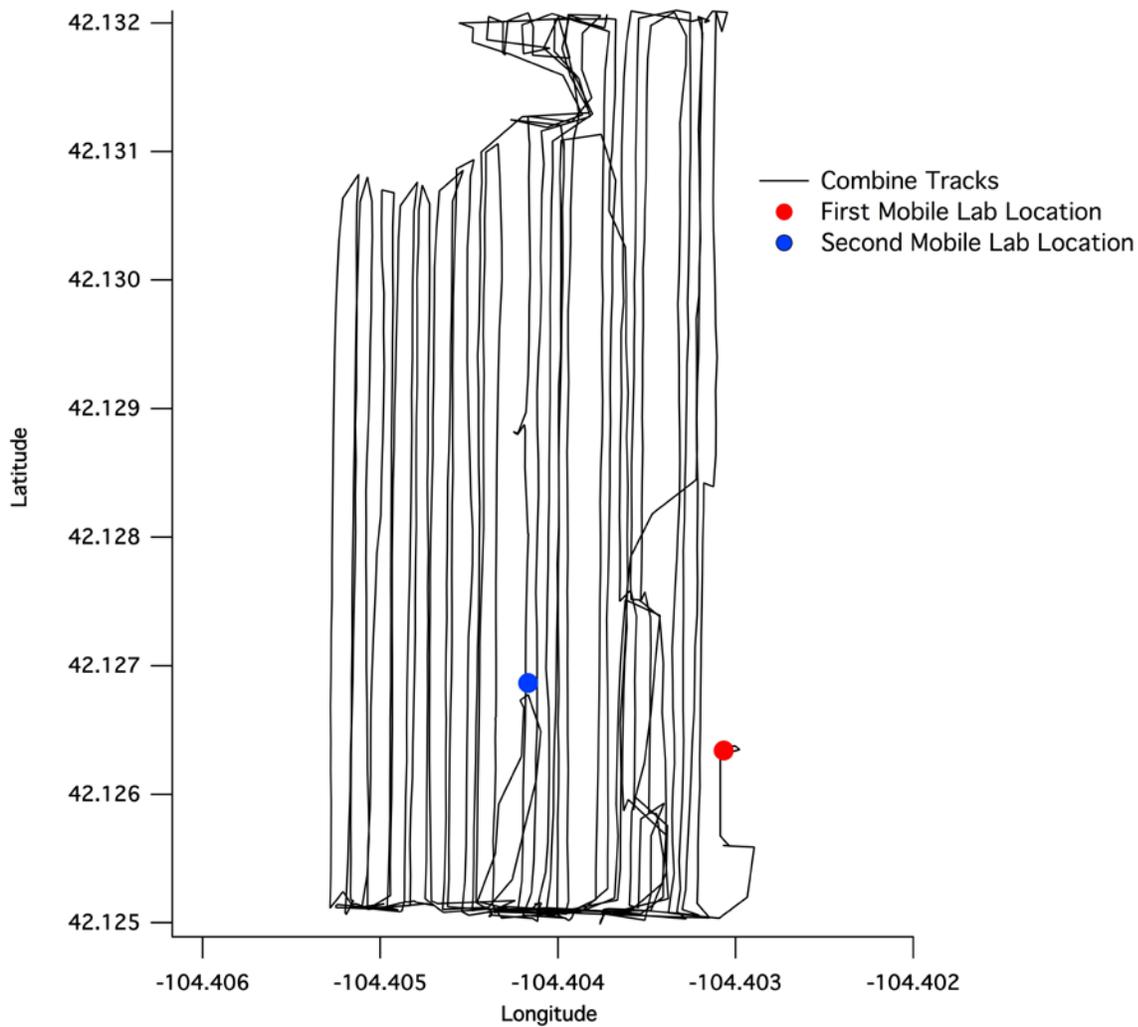


Figure S3. GPS track from a combine harvester during a corn harvest in Wyoming (black). The mobile laboratory was located at the red marker, downwind of the field being harvested. Once the harvester moved further into the field and the direct plume was too dilute by the time it reached the mobile laboratory, the mobile laboratory was moved further into the field (blue marker) to finish the harvest.

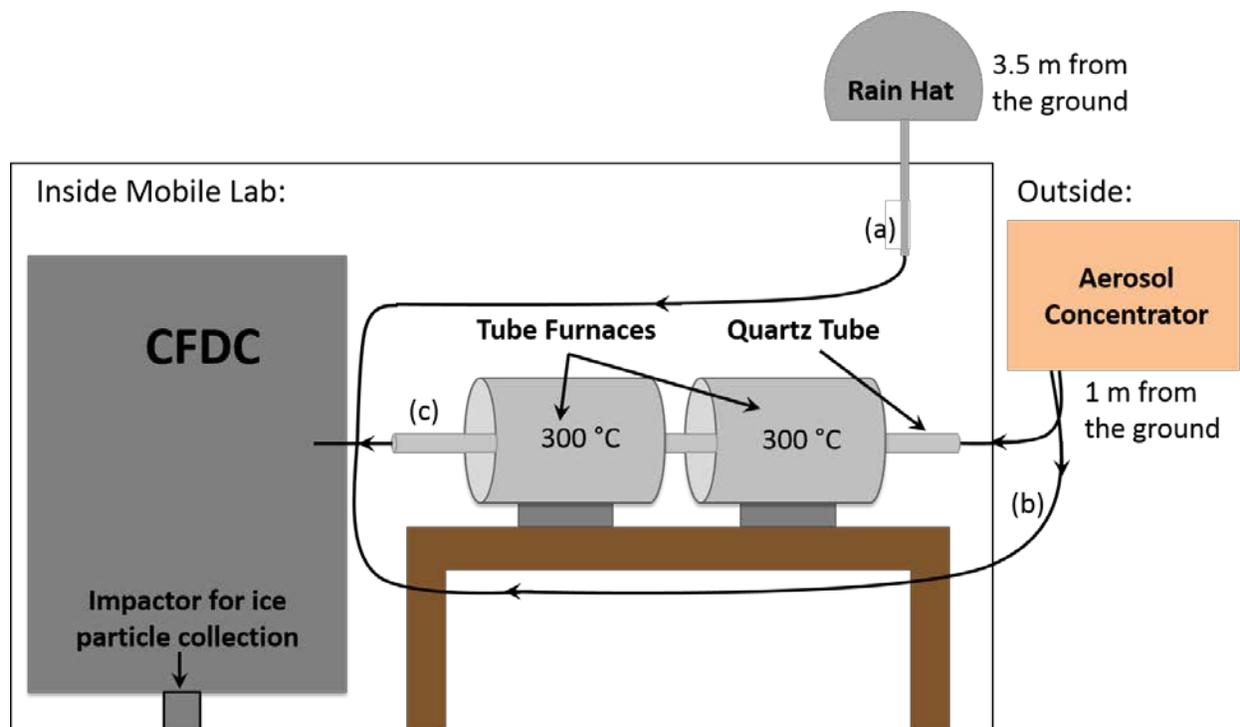


Figure S4. Schematic showing the various sampling configurations used during the study. Ambient sampling through a rain hat (a), concentrated aerosol sampling through an aerosol concentrator (b), and concentrated and heated sampling through an aerosol concentrator and heating tubes at 300 °C (c) are shown. Flow direction is indicated by arrows.

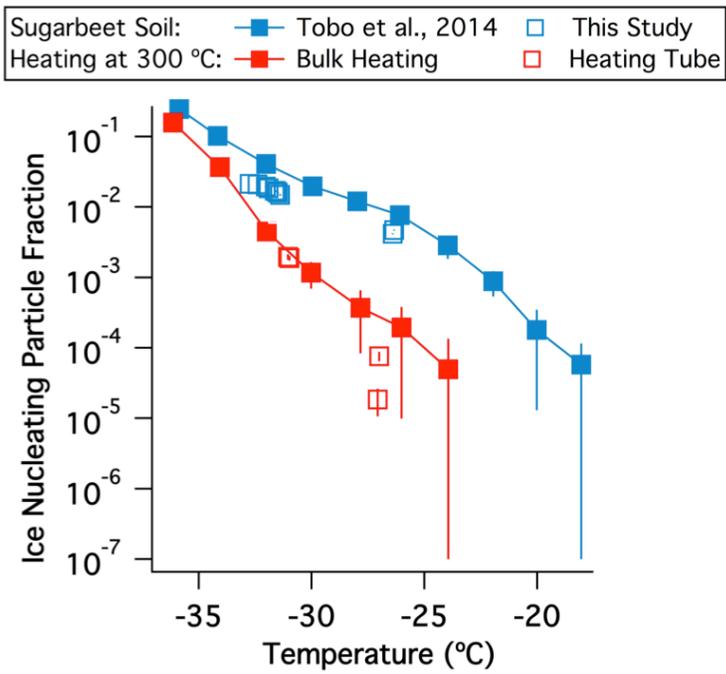


Figure S5. Ice nucleating particle fraction plotted against CFDC operating temperature for a laboratory generated sugar beet soil sample. Results from Tobo *et al.* (2014) are shown with solid square markers and results from this study are shown with open square markers.

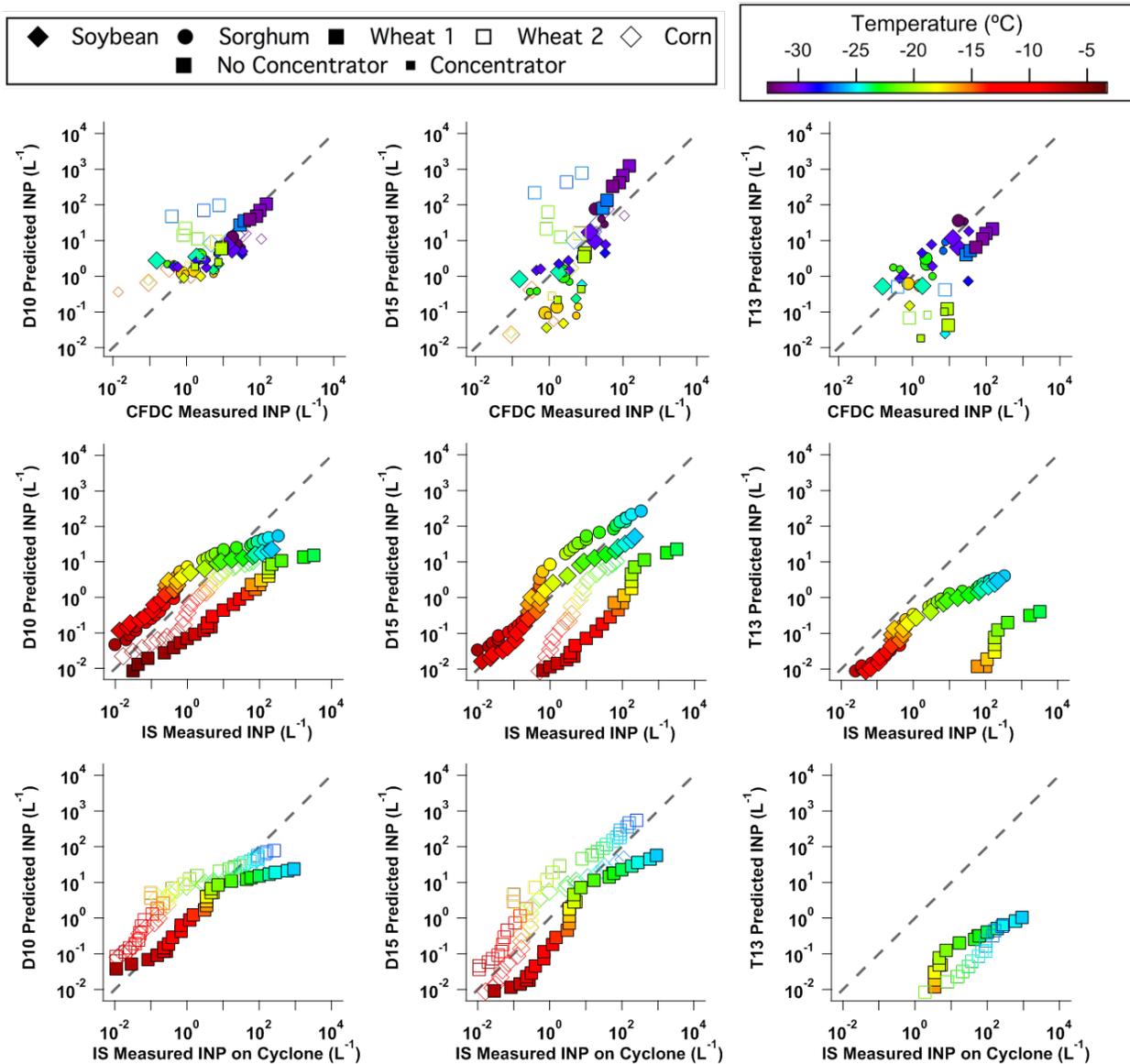


Figure S6. Same as Figure 8, but with color representing CFDC or IS operating temperature and the different symbols signify the different crops. INP number concentrations are predicted using three INP parameterizations, D10 (left), D15 (middle), and T13 (right), and are plotted against measured INP concentrations. The grey dashed line indicates a 1:1 line.