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Supplementary Material

Investigating the foliar uptake of zinc from conventional and nano-formulations: a methodological study.

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Supplementary table:

Table S1: Mean diameter and relative abundance (in brackets) of the different ZnO products for all experiments where PSD is the particle size distribution.

Supplementary figures:

Figure S1: Autoradiography was performed on the treated leaf and a new leaf of live plants.
Figure S2: SEM micrograph of unirradiated ZnO-MPs. These particles were then applied to the YFEL of wheat plants.
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Figure S5: High resolution image of irradiated ZnO-MP showing lattice fringes (indicative of ordered layering of atoms) across the entirety of the grains imaged (indicative of completely crystalline grains).

Table S1: Mean diameter and relative abundance (in brackets) of the different ZnO products for all experiments where PSD is the particle size distribution.

Sample I.D.		**Intensity PSD**		**Zeta potential, mV**	
	Expt	Original Spiking solution	Irradiated Spiking solution	Original Spiking solution	Irradiated Spiking solution
ZnO-MP*	1, 2	Peak 1: 143 (90%) Peak 2: 505 (10%)			
ZnO-NP*	1, 2	Peak 1: 56 (98%) Peak 2: 161 (2%)			
ZnO-NP	3	1029 ± 93 nm	Peak 1: 697 ± 44 (63%) Peak 2: 193 ± 26 (37%)	+ 16.6 ± 1.3	+ 25.0 ± 0.7
ZnO-MP	3	2769 ± 430 nm	2545 ± 273 nm	+23.8 ± 1.9	+ 8.9 ± 0.1

*data are from Li et al. 2018

Li C, Wang P, Lombi E, Cheng M, Tang C, Howard DL, Menzies NW, Kopittke PM (2018). Absorption of foliar-applied Zn fertilizers by trichomes in soybean and tomato. Journal of Experimental Botany **69**, 2717–2729. doi:10.1093/JXB/ERY085

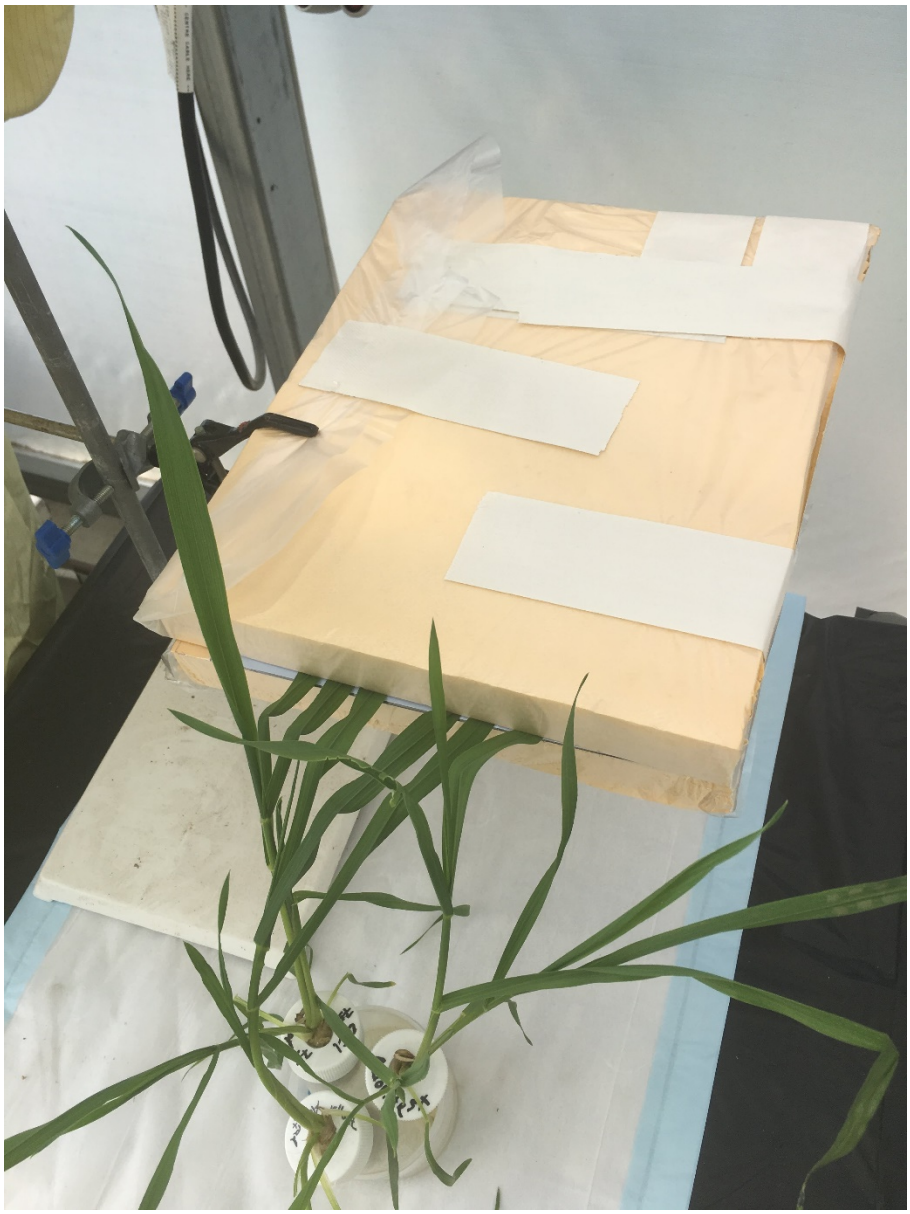

Figure S1: Autoradiography was performed on the treated leaf and a new leaf of live plants.

SEM for ICP and XFM experiments

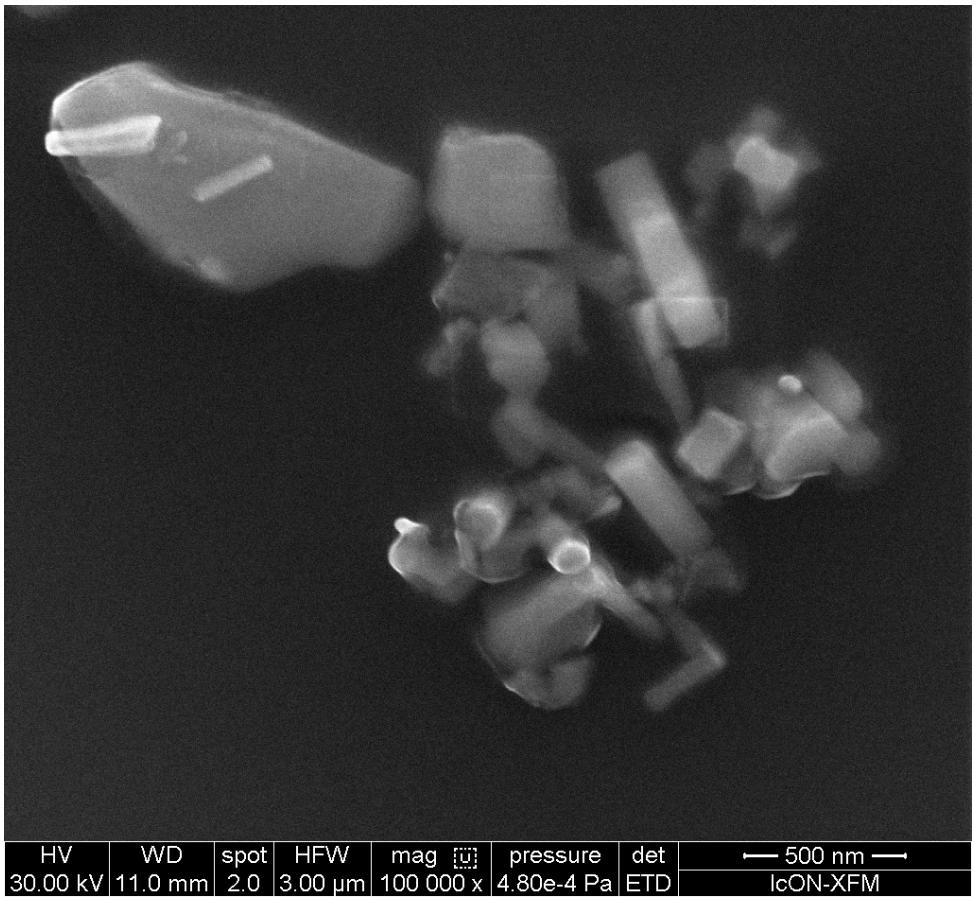

Figure S2: SEM micrograph of unirradiated ZnO-MPs. These particles were then applied to the YFEL of wheat plants.

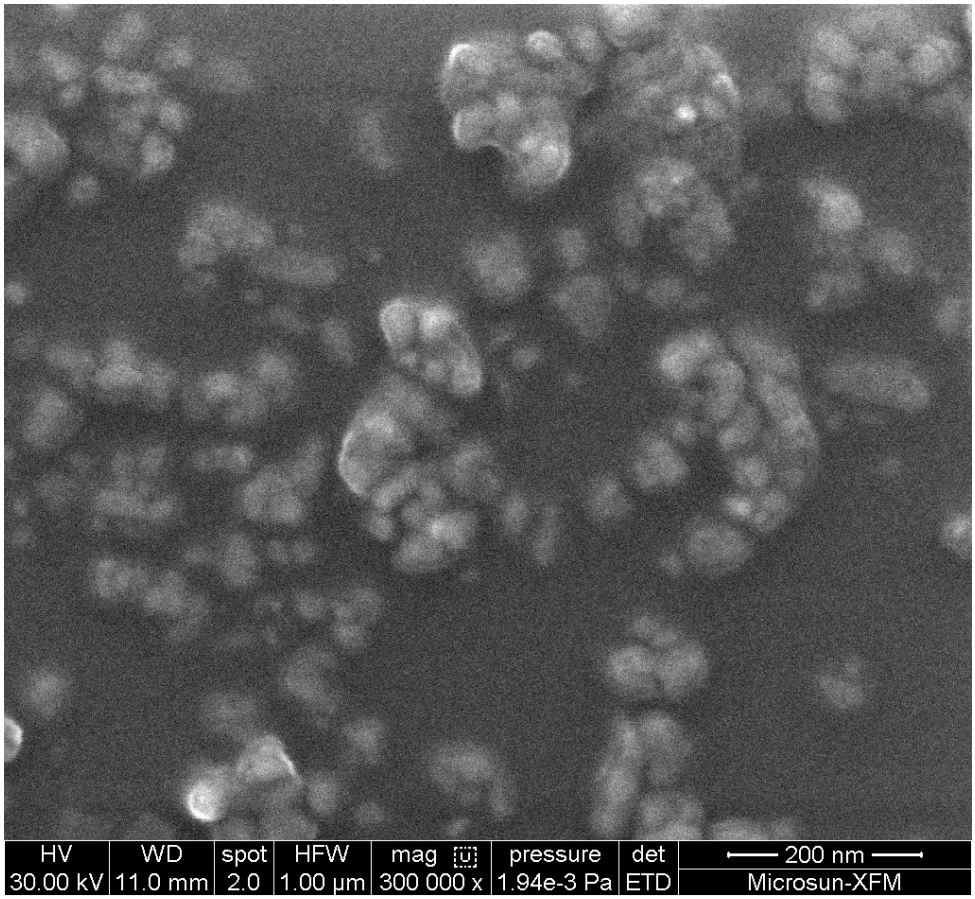

Figure S3: SEM micrograph of unirradiated ZnO-NPs. These particles were then applied to the YFEL of wheat plants.

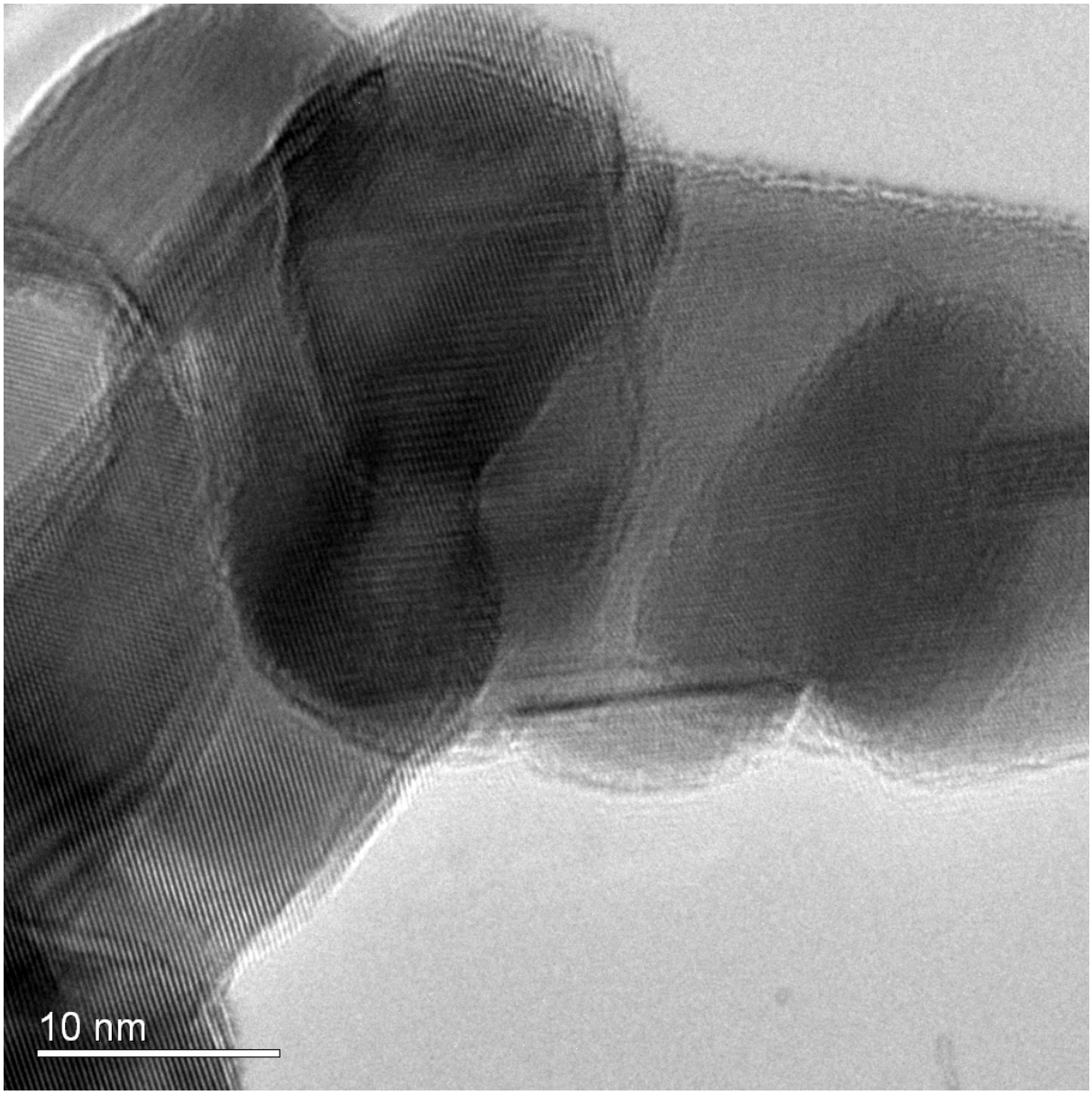

Figure S4: High resolution image of irradiated ZnO-NP showing lattice fringes (indicative of ordered layering of atoms) across the entirety of the grains imaged (indicative of completely crystalline grains).

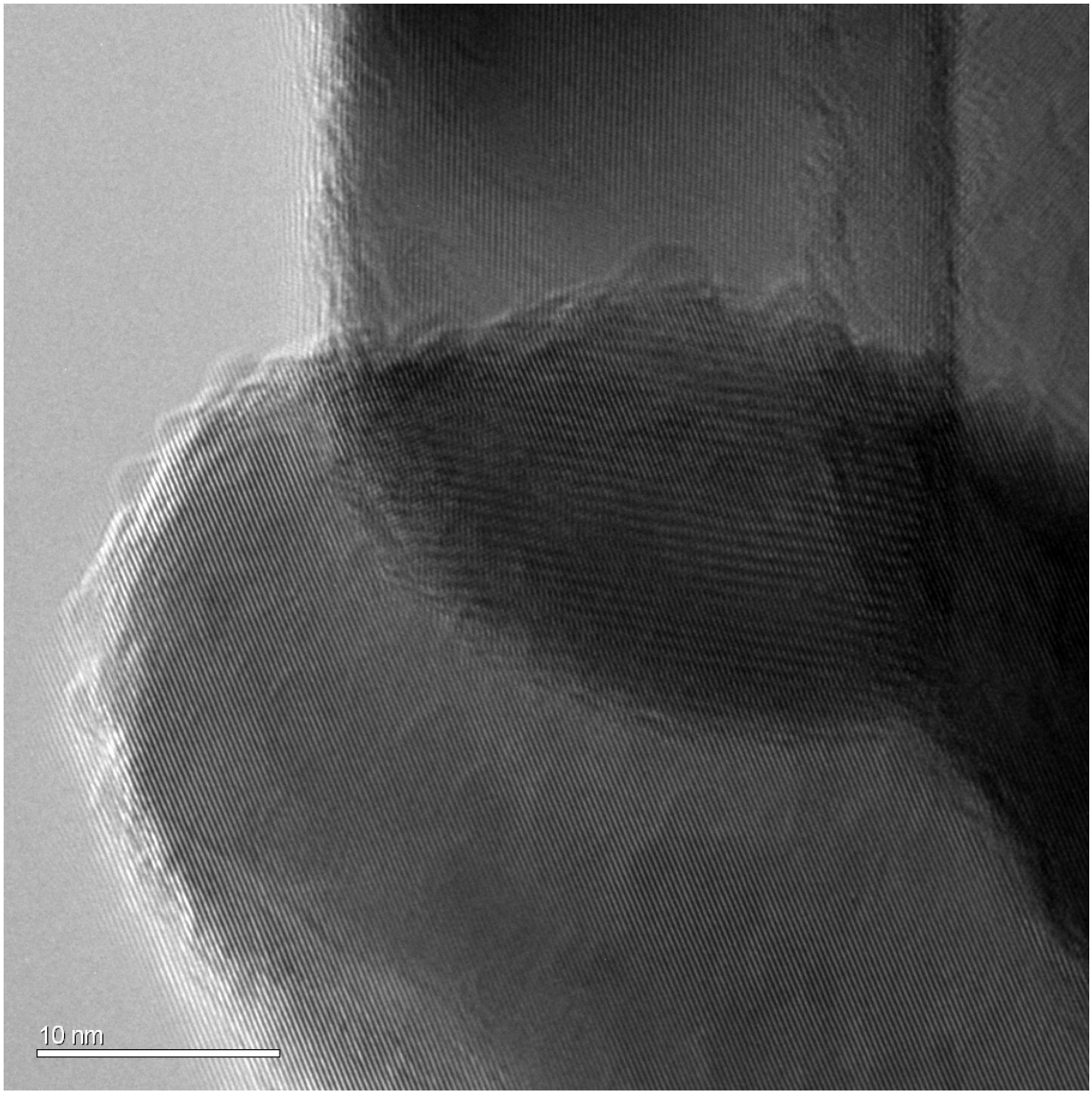

Figure S5: High resolution image of irradiated ZnO-MP showing lattice fringes (indicative of ordered layering of atoms) across the entirety of the grains imaged (indicative of completely crystalline grains).