

## Chitosan as a rainfastness adjuvant for agrochemicals

Brett L. Symonds<sup>†\*</sup>, Niall R. Thomson<sup>‡</sup>, Christopher I. Lindsay<sup>‡</sup> and Vitaliy V. Khutoryanskiy<sup>†\*</sup>

<sup>†</sup>Reading School of Pharmacy, The University of Reading, P.O. Box 224, Reading RG6 6AD, UK

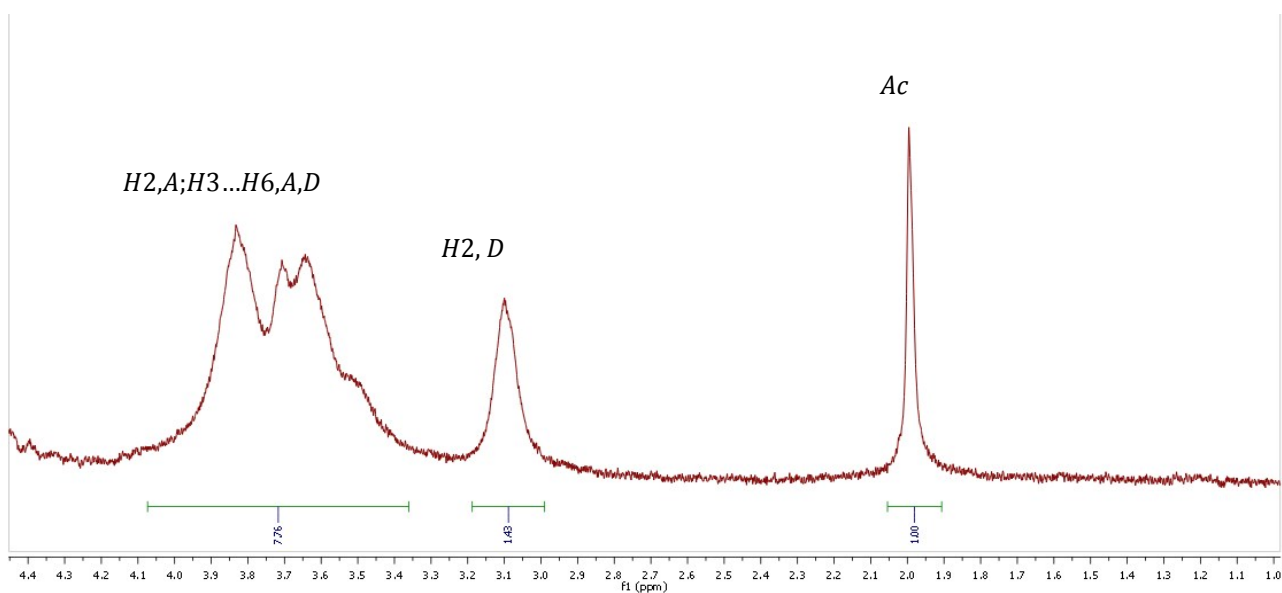
<sup>‡</sup>Syngenta, Jealott's Hill International Research Centre, Bracknell, Berkshire, RG42 6EY, UK

Corresponding Author

\*Email: [v.khutoryanskiy@reading.ac.uk](mailto:v.khutoryanskiy@reading.ac.uk)

Tel: +44 (0)11183786119

## Supporting Information



**Fig. S1** Exemplary assigned  $^1\text{H}$  NMR spectrum of chitosan obtained in  $\text{D}_2\text{O}$  and using a Brüker 400MHz spectrometer.

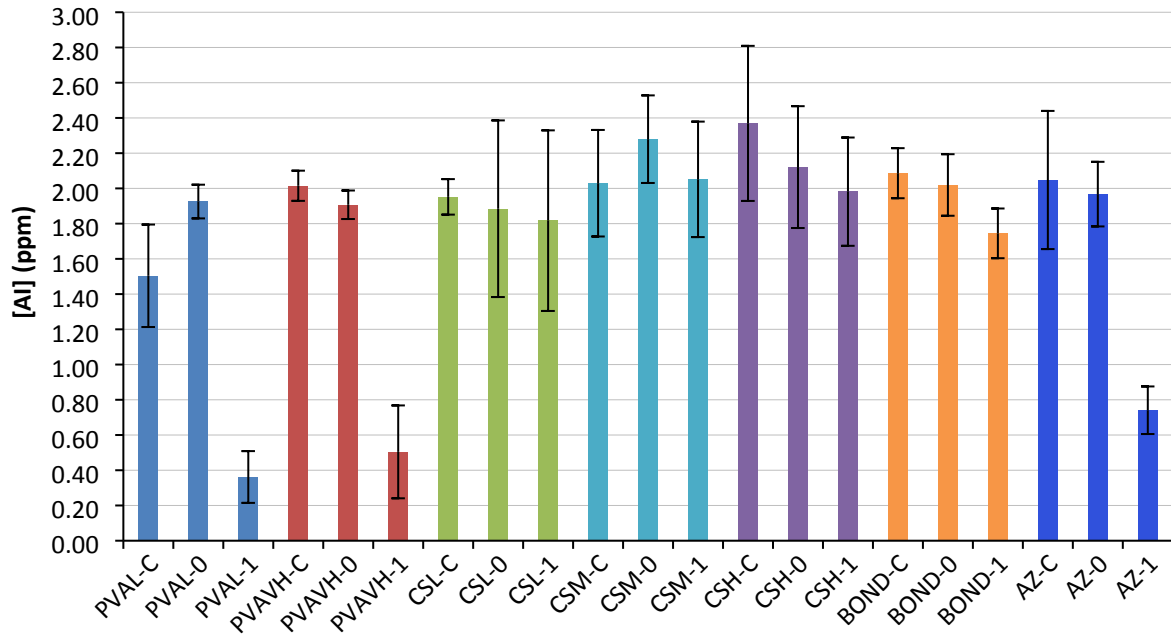
**Table S1** Parameters of polymer samples used as determined by gel permeation chromatography.

Sample	Polymer	Mn (kDa)	Mw (kDa)	Mv (kDa)	PDI
PVAVH	Poly(vinyl alcohol)	65.1	93.2	-	1.43
PVAL	Poly(vinyl alcohol)	-	9.0-20.3	-	-
CSH	Chitosan	53.0	370.0	267.2	6.97
CSM	Chitosan	35.1	124.1	106.2	3.53
CSL	Chitosan	18.2	62.3	53.8	3.42

**Table S2** An excerpt from the BBCH-scale handbook describing three growth stages for field bean.

Code	Description
	Principle growth stage 0: Germination
GS00	Dry Seed
GS01	Beginning of seed imbibition
...	
	Principal growth stage 1: Leaf development
GS10	Pair of scale leaves visible
GS11	First leaf unfolded
GS12	Two leaves unfolded
GS13	Three leaves unfolded
...	Continuous until
GS19	9 or more leaves unfolded
	Principle growth stage 2: Formation of side shoots
GS20	No side shoots
GS21	Beginning of side shoot development: first side shoot detectable
GS22	2 side shoots detectable
GS23	3 side shoots detectable
...	Continuous until
GS29	End of side shoot development: 9 or more side shoots detectable

## Supporting Information



**Fig. S2** Average azoxystrobin concentration (via LC-MS/MS) in 10 mL acetonitrile 'spot and wash' samples where the theoretical maximum concentration was 2 ppm. Samples suffixed with '-C' are the control set where the dose was spiked directly into acetonitrile, '-0' are the set of samples obtained from washing leaves that were not subjected to rain and '-1' are the set of samples obtained from leaves after undergoing 1 hour of rain. Mean values are reported (n=10) and error bars represent 95% confidence interval.