

Supplementary material

Can 'on-farm' seed priming and chitosan seed treatments induce host defences in winter barley (*Hordeum vulgare*) under field conditions?

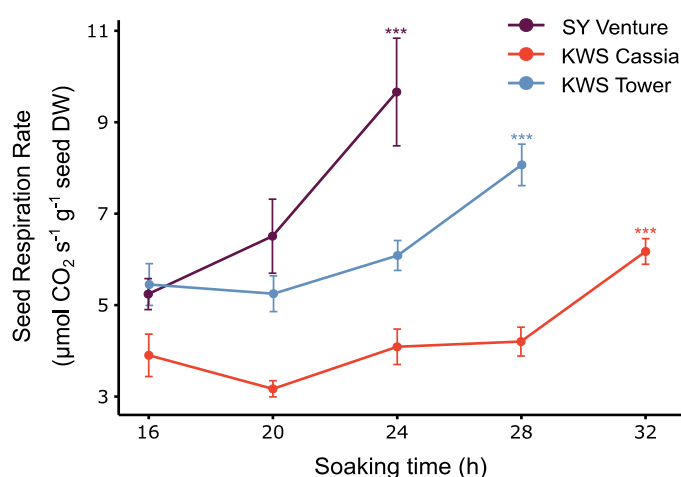


Figure S1. Changes in seed respiration rate during priming 'on-farm' seed priming for each cultivar. Data are means \pm SE ($n = 3$ replicates of 150 seeds soaked in distilled water (1:6 (w/v)) in 100 ml plastic pots, at 20 °C in the dark) for each soaking time and cultivar as in Carrillo-Reche et al. [26]. Asterisks denote significant differences in seed respiration (***) $P < 0.001$) at a soaking time relative to its immediate previous soaking time within each cultivar (LSD test). The soaking interval prior to the significant increase in respiration was taken as the optimal priming duration.



Figure S2. Illustration of seedling counting method. **a)** Shows the area of the picture counted and, **b)** shows the zoom at which seedlings are counted using the Cell Counter plugin in FIJI to record the counts.

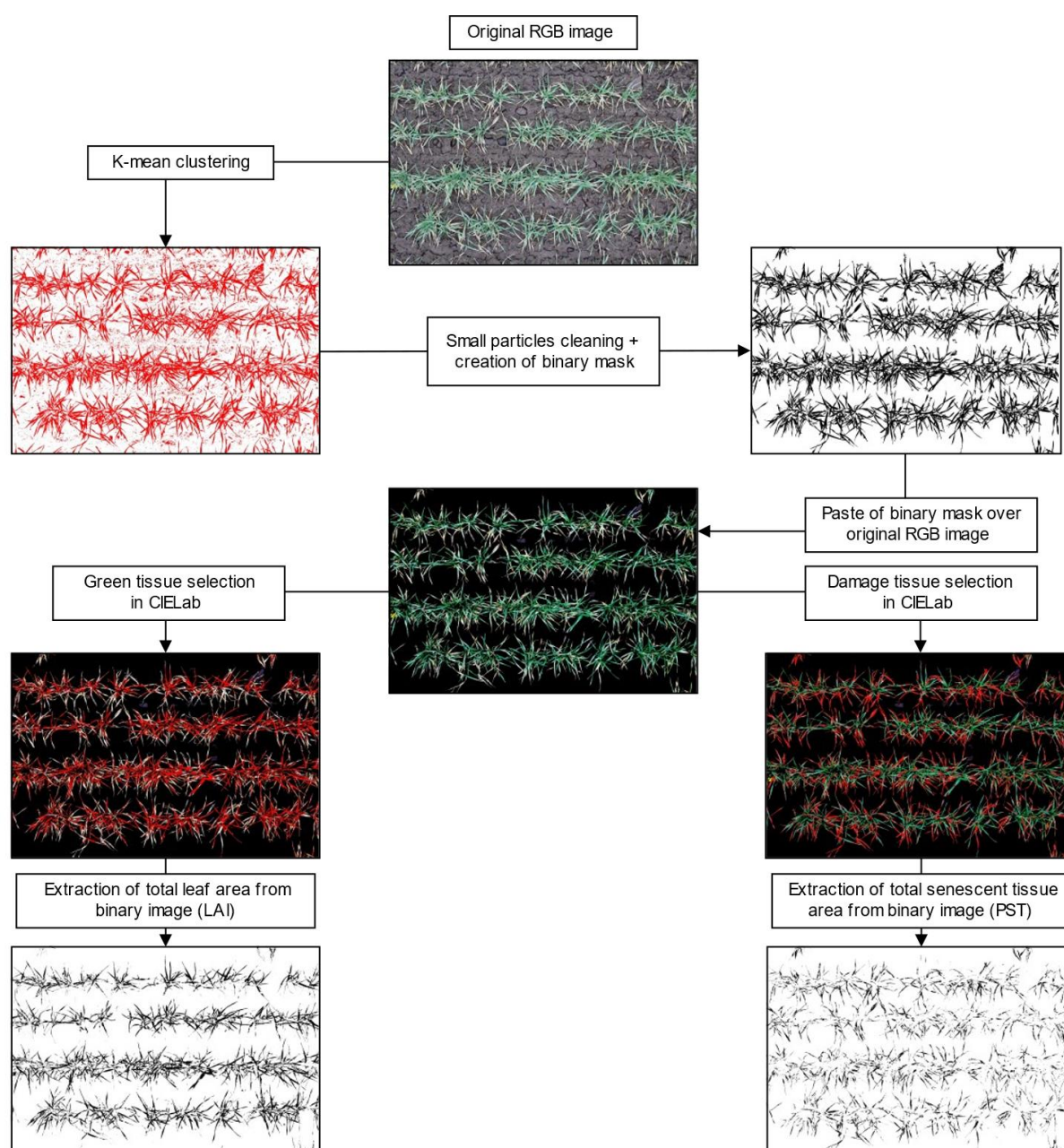


Figure S3. Flowchart of image processing for leaf area index (LAI) and percentage of senescent tissue estimation (PST).

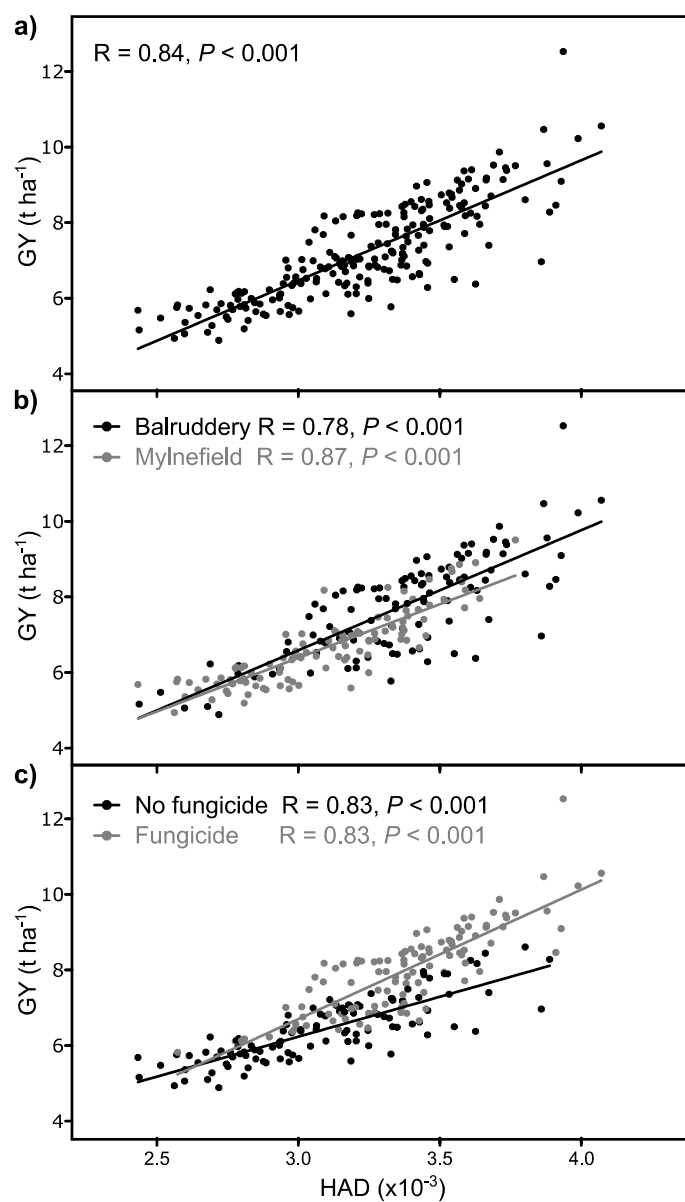


Figure S4. Visual diagnosis of linearity by relationship between yield (GY) on health area duration (HAD) of **a)** all data together, **b)** classified by site, and **c)** classified by no fungicide/fungicide treatment. R: correlation coefficient.

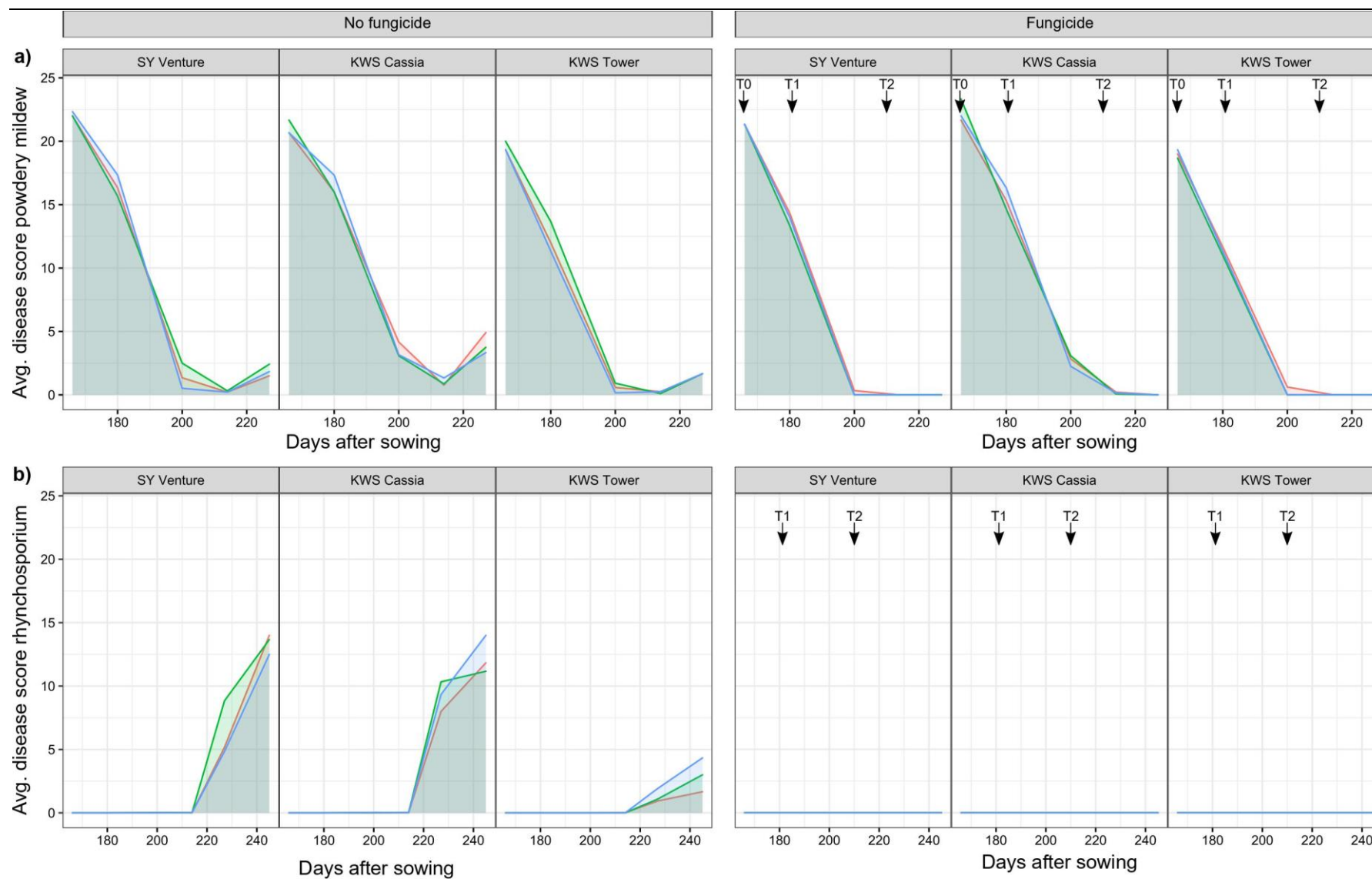


Figure S5. Area under disease curve of a) powdery mildew, and b) rhynchosporium at Balruddery. The arrows show the timing of each fungicide application.

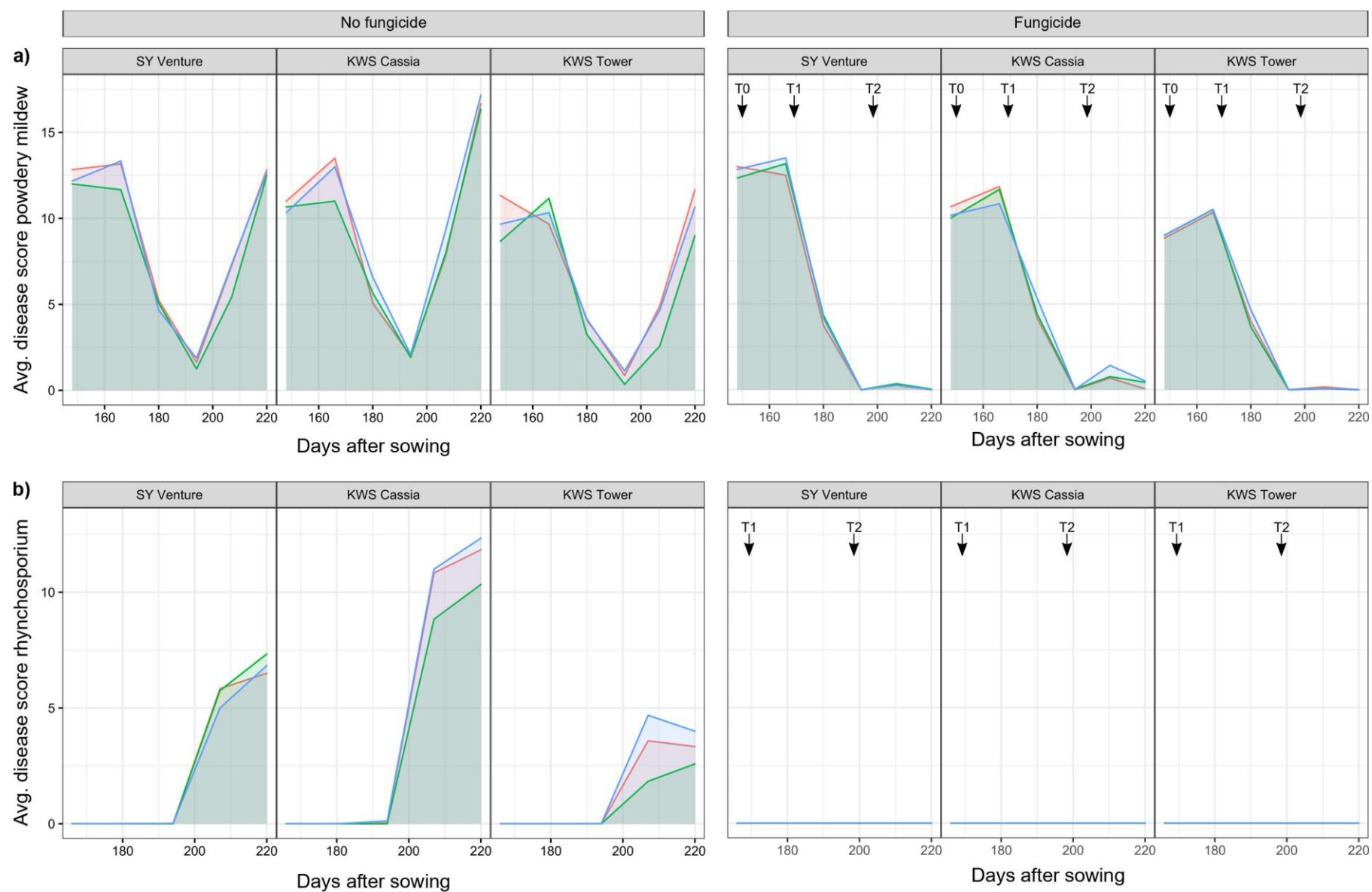


Figure S6. Area under disease curve of a) powdery mildew, and b) rhynchosporium at Mylnefield. The arrows show the timing of each fungicide application.

Table S1. Final height and time to 50 % GS49 averaged by fungicide and seed treatment. Values in each row followed by different letters differ significantly from each other: LSD test ($P > 0.05$).

Site	F0			F1		
	NP	WP	CP	NP	WP	CP
Stem elongation rate (cm d ⁻¹)						
Balruddery	-	-	-	-	-	-
Mylnefield	2.39 ^a	2.49^b	2.39 ^a	2.44 ^a	2.39 ^a	2.42 ^a
Final height (cm)						
Balruddery	71.3 ^a	72.3 ^a	71.9 ^a	74.3 ^a	73.1 ^a	73.0 ^a
Mylnefield	72.2 ^a	72.6 ^a	71.3 ^a	74.9 ^a	73.4 ^a	72.9 ^a
Time to 50 % GS49 (d)						
Balruddery	211.5 ^a	212.0 ^a	211.3 ^a	211.3 ^a	211.3 ^a	211.4 ^a
Mylnefield	209.1 ^a	209.2 ^a	208.8 ^a	209.3 ^a	208.9 ^a	208.9 ^a