

## Supplementary Material

### The effect of zinc fertilisation and arbuscular mycorrhizal fungi on grain quality and yield of contrasting barley cultivars

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**Table S1.** Monosaccharide analysis of grain samples from two barley cultivars (Haruna Nijo,  $n=8$ ; Compass,  $n=6$ ), including arabinoxylan (arabinose plus xylose) content and ratio of arabinose to xylose. Values in bold indicate a significantly higher value in that cultivar compared to the respective value of the other cultivar, as determined by generalised linear model.

**Table S2.** Grain dimensions of five different barley cultivars grown at two different soil Zn concentrations: no addition of Zn (Zn0) and 15 mg Zn kg<sup>-1</sup> (Zn15), and with (AMF) or without (Mock) *R. irregularis* inoculation. Values are means  $\pm$  SEM,  $n=5$ .

**Figure S1.** Mycorrhizal colonisation (% root length colonised) in the roots of five different barley cultivars inoculated with AMF and grown at two different soil Zn concentration: no addition of Zn (white bars) and 15 mg Zn kg<sup>-1</sup> (grey bars). Values are means  $\pm$  SEM,  $n = 5$ . Means followed by the same letter were not significant at the  $P < 0.05$  level (Tukey's HSD), see Table 1 for details of ANOVA results.

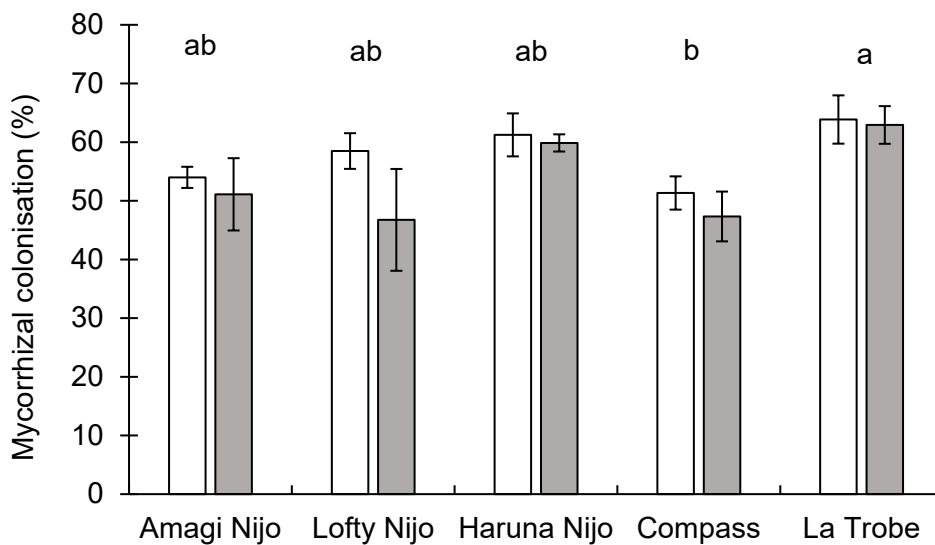
**Figure S2.** Principal components analysis (PCA) score plot displaying scores in the first two principal components (PC1: x-axis, PC2: y-axis) following PCA of the fingerprint region of the ATR-MIR spectra of the grain from two barley cultivars, Compass (blue) and Haruna Nijo (red) with (AMF) or without (Mock) *R. irregularis* inoculation.

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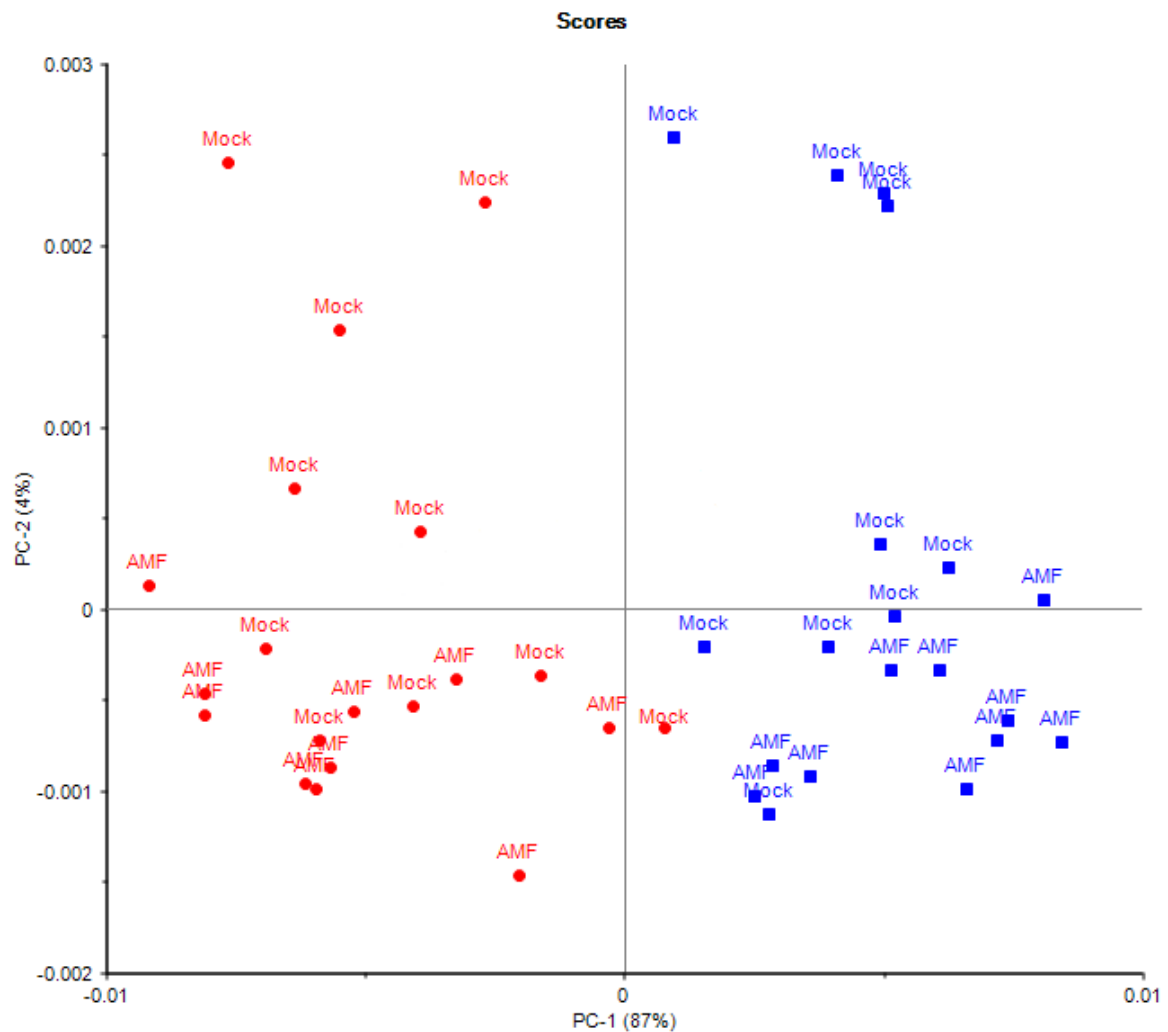
		<b>Mannose</b>	<b>Glucose</b>	<b>Galactose</b>	<b>Xylose</b>	<b>Arabinose</b>	<b>Ara+Xyl</b>	<b>Ara:Xyl</b>
Haruna Nijo	Mean	0.244	54.839	<b>0.509</b>	3.694	1.787	5.481	<b>0.485</b>
	SEM	0.014	0.755	0.008	0.103	0.041	0.144	0.003
Compass	Mean	0.225	<b>59.900</b>	0.456	<b>4.342</b>	<b>1.971</b>	<b>6.313</b>	0.455
	SEM	0.009	0.305	0.010	0.105	0.032	0.131	0.007

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Mycorrhiza	Zinc	Cultivar	Area (mm <sup>2</sup> )	SEM	Length (mm)	SEM	Width (mm)	SEM	
Mock	Zn 0	Amagi Nijo	11.65	0.17	6.07	0.08	2.46	0.03	
		Lofty Nijo	11.83	0.22	6.23	0.12	2.43	0.02	
	Zn 15	Haruna Nijo	11.35	0.18	5.94	0.13	2.45	0.10	
		Compass	11.84	0.12	6.15	0.03	2.47	0.04	
		La Trobe	11.98	0.18	6.09	0.06	2.52	0.02	
	AMF	Zn 0	Amagi Nijo	11.58	0.23	5.92	0.06	2.50	0.03
			Lofty Nijo	11.66	0.19	6.14	0.05	2.43	0.04
		Zn 15	Haruna Nijo	11.51	0.22	5.99	0.08	2.46	0.05
			Compass	11.64	0.09	6.10	0.05	2.44	0.03
			La Trobe	11.81	0.14	6.15	0.06	2.45	0.01
AMF		Zn 0	Amagi Nijo	11.75	0.20	6.05	0.11	2.49	0.03
			Lofty Nijo	11.80	0.13	6.13	0.06	2.47	0.04
		Zn 15	Haruna Nijo	12.12	0.22	6.10	0.09	2.54	0.02
	Compass		11.58	0.12	6.02	0.06	2.46	0.03	
	La Trobe		12.02	0.09	6.11	0.03	2.51	0.01	
	Zn 15	Amagi Nijo	12.10	0.18	6.17	0.03	2.51	0.03	
		Lofty Nijo	11.84	0.28	6.17	0.11	2.46	0.03	
		Haruna Nijo	11.95	0.11	6.11	0.05	2.50	0.01	
		Compass	11.84	0.17	6.10	0.03	2.48	0.03	
		La Trobe	12.02	0.04	6.15	0.01	2.50	0.01	



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