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Wheat biomass and yield increased when populations of the root-lesion nematode (*Pratylenchus thornei*) were reduced through sequential rotation of partially resistant winter and summer crops

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Supplementary Table S1. Monthly rainfall at the experimental site at Formartin, Queensland from 1999–2003, compared with long-term averages from farm records (65 years) and from the nearest Bureau of Meteorology (BOM) site at Bowenville, Queensland (121 years)

Month	Rainfall (mm)					Farm	Bowenville
	1999	2000	2001	2002	2003	records	BOM
January	28	52	50	28	11	79	86
February	88	60	26	69	95	72	64
March	60	8	15	77	76	42	61
April	0	6	38	0	12	33	36
May	13	23	1	4	19	35	38
June	23	30	0	37	51	30	38
July	62	8	17	0	11	30	35
August	16	4	5	41	0	25	29
September	10	0	7	3	5	28	36
October	35	31	74	9	44	53	56
November	78	48	88	18	22	67	75
December	109	50	88	137	84	80	94
Annual total	522	320	409	423	430	572	634

Supplementary Table S2a. *Pratylenchus thornei*/kg soil to 90 cm soil depth one month after removal of the Phase 2 summer crops following the Phase 1 canaryseed crop

Within each Phase 2 summer crop, cultivars are listed alphabetically

Phase 1 canaryseed Phase 2 summer crop		<i>Pratylenchus thornei</i> /kg dry soil									
Crop	Cultivar	ln(x + 500)					Soil depth (cm)				
		0–15	15–30	30–45	45–60	60–90	0–15	15–30	30–45	45–60	60–90
Maize	3202	7.06	7.28	7.59	7.17	6.97	665	956	1487	805	565
	31M10	7.47	7.38	7.76	8.00	6.66	1254	1109	1836	2484	282
	C79	7.11	7.43	7.14	6.65	6.29	724	1190	758	273	40
	C87	7.82	7.62	7.62	7.14	6.12	1988	1530	1540	762	0
	DK 689	6.85	7.42	7.31	7.23	6.51	445	1168	988	880	147
	DK 764	7.97	7.88	7.65	7.17	6.35	2393	2143	1608	798	71
	PAC 345	7.32	7.05	7.31	6.59	6.44	1015	655	1001	231	128
Millets	Japanese	7.10	7.12	7.48	7.32	6.86	712	740	1273	1010	457
	Pearl	6.62	7.39	6.58	6.93	6.79	250	1116	220	525	390
	Siberian	6.61	6.91	7.13	6.72	6.90	245	505	746	330	489
	White French	6.92	7.07	6.91	6.60	6.48	515	680	499	233	
Panicum	Panicum	6.98	6.89	7.22	7.26	6.47	580	485	866	916	146
	Panorama	6.45	7.47	7.20	7.02	6.34	132	1247	837	618	66
	Red	6.89	7.01	7.49	7.17	6.49	485	606	1282	794	160
Blackgram	Black Pearl	8.42	7.70	7.60	7.57	6.59	4018	1706	1505	1446	226
	Regur	9.21	7.96	7.94	7.34	6.46	9540	2376	2306	1039	141
Mungbean	Berken	8.15	8.30	7.91	7.65	7.05	2955	3536	2238	1605	652
	Celera	8.12	7.86	7.83	7.14	7.03	2871	2080	2013	764	632
	Delta	7.99	8.11	8.00	6.89	6.97	2450	2835	2470	485	568
	Emerald	8.02	7.59	8.28	7.54	6.90	2536	1471	3425	1373	483
	Green Diamond	9.03	8.30	8.34	7.12	6.44	7833	3516	3687	740	126
Sorghum	Blazer	6.70	7.51	7.50	7.34	6.40	311	1318	1310	1044	100
	Bonus	6.48	7.38	7.90	7.27	6.33	151	1107	2199	931	62
	DK 35	6.73	6.82	7.28	7.30	6.34	339	420	944	980	66
	DK 39Y	6.36	6.93	6.87	6.92	6.47	76	524	465	508	156
	Freedom	6.93	7.68	7.99	7.12	6.77	519	1662	2463	733	367
	Goldrush 2	6.94	6.73	6.81	6.51	6.88	532	338	407	172	473
	Jackpot	6.41	7.03	7.08	7.25	6.39	105	634	691	914	97
	MR 31	6.49	7.22	7.32	6.90	6.95	157	871	1016	495	542
	MR 43	7.28	7.70	7.41	6.90	6.45	947	1719	1157	497	135
	MR Buster	6.70	7.26	6.88	7.35	6.46	312	917	469	1054	141
	MR Goldrush	6.46	7.03	7.27	7.38	6.51	136	634	940	1103	170
	MR Maxi	7.21	7.75	7.11	6.72	6.40	849	1824	728	329	100
	New Nugget	6.78	7.28	7.10	7.08	6.70	377	953	707	686	313
	Sonic	6.40	7.27	7.42	7.24	6.18	99	932	1166	896	0
	Thunder	7.01	7.33	7.11	7.02	6.67	609	1032	719	624	288
Trinity	6.62	7.28	7.38	7.01	7.04	253	944	1105	608	641	
Soybean	Centaur	8.74	8.54	7.91	7.44	6.31	5718	4592	2232	1200	51
	Davis	9.48	7.83	7.82	6.90	6.82	12590	2020	1990	488	417
	Jabiru	7.09	7.76	7.73	7.31	6.42	696	1841	1777	998	116
	Melrose	7.99	7.36	6.96	6.58	6.36	2454	1065	556	217	77
Sunflower	Advantage	6.76	6.68	7.45	6.75	6.55	362	297	1223	356	197
	Hyoleic 31	6.84	7.20	6.45	7.19	6.29	433	838	131	821	40
	Hysun 37 S11	7.38	7.32	6.93	7.10	6.63	1102	1010	524	714	255
	Monosun 150	6.66	7.28	7.26	6.72	6.55	279	949	929	331	196
	Suncross 42	7.85	6.92	6.91	6.45	6.78	2058	516	507	130	378
	Suncross 53	7.33	7.25	7.53	6.98	6.61	1020	915	1365	578	245
	Sunoleic 02	6.87	8.05	7.11	6.85	6.70	466	2621	719	444	310

l.s.d. $P=0.05$ soil depth x cultivar 0.62

Supplementary Table S2b. *Pratylenchus thornei*/kg soil to 90 cm soil depth one month after removal of the Phase 2 summer crops following the Phase 1 wheat crop

Within each Phase 2 summer crop, cultivars are listed alphabetically

Phase 1 wheat		<i>Pratylenchus thornei</i> /kg dry soil									
Phase 2 summer crop		Soil depth (cm)					Backtransformed mean				
Crop	Cultivar	0–15	15–30	ln(x + 500)		60–90	0–15	15–30	30–45	45–60	60–90
Maize	3202	8.63	8.46	8.09	8.01	7.11	5102	4210	2764	2498	719
	31M10	7.92	8.69	8.58	8.29	6.92	2262	5470	4809	3499	514
	C79	8.39	7.98	8.88	8.05	7.05	3913	2428	6718	2630	649
	C87	8.46	8.84	8.58	8.26	7.35	4237	6412	4823	3379	1054
	DK 689	7.82	8.52	8.30	8.17	7.39	1980	4517	3538	3043	1120
	DK 764	9.15	9.48	9.12	8.74	8.26	8878	12615	8635	5742	3351
	PAC 345	8.41	8.14	7.98	8.06	7.72	4004	2923	2420	2663	1750
Millets	Japanese	8.02	7.97	8.16	7.89	7.15	2544	2388	3006	2173	780
	Pearl	7.00	8.10	8.14	7.80	7.91	592	2810	2920	1936	2232
	Siberian	7.79	7.31	7.27	7.02	7.68	1912	991	932	623	1673
	White French	7.94	8.11	7.88	7.97	6.48	2303	2811	2142	2382	152
Panicum	Panicum	7.37	7.94	8.03	7.61	7.23	1082	2321	2587	1518	883
	Panorama	6.64	8.81	8.56	8.07	7.59	267	6172	4708	2699	1478
	Red	7.84	8.36	8.24	7.65	7.41	2047	3756	3287	1591	1146
Blackgram	Black Pearl	9.16	9.34	9.09	8.38	7.36	9036	10837	8390	3845	1072
	Regur	9.63	9.41	9.13	8.74	7.33	14756	11720	8705	5733	1021
Mungbean	Berken	8.78	8.59	8.37	8.36	7.20	6011	4854	3805	3754	841
	Celera	9.38	9.48	9.28	8.77	7.88	11341	12608	10212	5968	2141
	Delta	9.01	9.19	8.81	8.80	7.04	7645	9343	6181	6127	645
	Emerald	9.02	9.29	9.44	8.74	7.52	7745	10278	12089	5735	1335
	Green Diamond	9.50	9.80	9.15	8.47	7.73	12898	17588	8952	4268	1781
Sorghum	Blazer	7.86	8.08	8.45	7.71	7.41	2080	2731	4193	1736	1160
	Bonus	7.66	8.36	7.83	7.51	7.49	1612	3770	2004	1324	1287
	DK 35	8.10	8.67	8.23	8.16	7.56	2779	5305	3240	3005	1409
	DK 39Y	7.78	8.03	8.21	7.56	7.81	1902	2585	3160	1418	1970
	Freedom	8.37	8.69	7.94	7.88	6.98	3805	5414	2303	2145	577
	Goldrush 2	8.09	8.27	8.30	7.59	7.09	2763	3403	3542	1479	696
	Jackpot	7.54	8.18	8.51	8.14	7.04	1388	3081	4474	2926	637
	MR 31	7.93	8.30	8.49	7.71	7.40	2267	3531	4359	1740	1130
	MR 43	7.89	8.60	8.46	7.86	6.93	2159	4925	4216	2084	523
	MR Buster	7.99	7.82	8.34	7.97	7.24	2464	1998	3688	2381	894
	MR Goldrush	7.80	8.30	7.85	7.81	8.01	1935	3514	2063	1953	2517
	MR Maxi	8.08	8.19	8.04	7.29	7.12	2720	3113	2612	972	735
	New Nugget	7.87	8.59	8.42	7.60	7.67	2117	4856	4020	1502	2112
	Sonic	8.08	8.36	8.02	7.61	7.15	2738	3770	2531	1527	779
	Thunder	8.04	8.31	8.32	7.88	7.45	2606	3579	3592	2141	1214
Trinity	7.73	8.18	8.04	8.48	7.26	1786	3080	2601	4328	920	
Soybean	Centaur	9.21	9.37	8.92	8.47	7.65	9533	11288	7005	4292	1604
	Davis	9.92	8.71	8.29	8.18	7.02	19921	5566	3491	3084	618
	Jabiru	8.73	8.42	8.46	7.84	7.56	5701	4026	4232	2044	1421
	Melrose	9.29	8.95	8.42	8.32	7.92	10343	7176	4048	3587	2242
Sunflower	Advantage	8.63	8.33	8.17	7.93	7.37	5121	3635	3041	2270	1089
	Hyoleic 31	7.78	8.72	8.54	8.12	7.42	1890	5621	4633	2868	1162
	Hysun 37 S11	8.62	8.91	8.15	7.85	7.73	5050	6915	2961	2062	1770
	Monosun 150	8.22	8.66	8.40	8.38	7.01	3221	5266	3968	3877	608
	Suncross 42	8.17	8.55	8.03	8.39	7.36	3016	4675	2584	3894	1071
	Suncross 53	8.27	8.70	8.20	7.99	7.32	3389	5501	3150	2462	1014
	Sunoleic 02	8.50	8.93	8.28	8.06	7.48	4396	7018	3456	2681	1276

l.s.d. $P=0.05$ soil depth x cultivar 0.62

Supplementary Table S3. *Merlinius brevidens*/kg soil at 0–90 cm soil depth one month after removal of the Phase 2 summer crops

Within each Phase 2 summer crop, cultivars are ranked in ascending order; means of the combined Phase 1 wheat and canaryseed crops are shown; BTM, backtransformed mean; RF, reproduction factor= $M. brevidens$ /kg dry soil after harvest of the Phase 2 crops \div 274 $M. brevidens$ /kg dry soil at 0–90cm one month before planting the Phase 2 crops.

<i>M. brevidens</i> /kg dry soil 0–90 cm													
Crop	Cultivar	ln(x+500)	BTM	RF	Crop	Cultivar	ln(x+500)	BTM	RF				
Blackgram	Black Pearl	7.73	1781	6.5	Sorghum	DK 39Y	7.01	603	2.2				
	Regur	8.33	3629	13.2		Blazer	7.07	680	2.5				
Mungbean	Delta	7.34	1045	3.8	Jackpot	7.10	710	2.6					
					Bonus	7.13	747	2.7					
	Berken	7.51	1317	4.8	Goldrush								
					2	7.30	987	3.6					
					DK 35	7.31	993	3.6					
					Sonic	7.37	1080	3.9					
Emerald	7.80	1940	7.1	MR 43	7.39	1114	4.1						
				Freedom	7.39	1125	4.1						
				New									
				Nugget	7.41	1150	4.2						
Soybean	Jabiru	7.36	1067	3.9	Trinity	7.42	1167	4.3					
					MR Maxi	7.53	1356	4.9					
	Davis	7.57	1430	5.2	MR								
					Buster	7.60	1496	5.5					
Sunflower	Centaur	7.60	1495	5.5	MR								
					Goldrush	7.64	1570	5.7					
	Melrose	7.85	2055	7.5	Thunder	7.73	1779	6.5					
					MR 31	7.97	2378	8.7					
					Hyoleic 31	7.56	1416	5.2	Panicum	Panorama	6.68	300	1.1
					Monosun 150	7.62	1532	5.6		Red	7.21	858	3.1
					Sunoleic 02	7.73	1771	6.5	Panicum	7.24	900	3.3	
					Hysun 37 S11	7.89	2173	7.9	Millet	White			
Advantage	8.10	2797	10.2	French	7.19	819	3.0						
Suncross 42	8.24	3297	12.0	Japanese	7.67	1638	6.0						
Suncross 53	8.35	3715	13.6	Pearl	8.06	2652	9.7						
Maize	3202	7.05	652	2.4	Siberian	8.76	5853	21.4					
					C79	7.31	991	3.6					
	31M10	7.63	1568	5.7									
	DK 689	7.95	2322	8.5									
	DK 764	8.08	2717	9.9									
	C87	8.08	2723	9.9									
	PAC 345	8.10	2789	10.2									

l.s.d. cultivar $P=0.05$ 0.55

**Supplementary Table S4. *Merlinius brevidens*/kg soil to 90 cm soil depth one month
after removal of the Phase 2 summer crops**

Within each Phase 2 summer crop, cultivars are listed alphabetically

		<i>Merlinius brevidens</i> /kg dry soil									
		Soil depth (cm)					Backtransformed mean				
Phase 2 summer crop		ln(x + 500)									
Crop	Cultivar	0–15	15–30	30–45	45–60	60–90	0–15	15–30	30–45	45–60	60–90
Maize	3202	7.11	7.02	7.20	7.01	6.83	720	618	836	609	426
	31M10	7.24	7.83	8.03	7.63	7.09	899	2022	2563	1549	701
	C79	7.15	7.59	7.77	6.97	6.66	778	1486	1875	559	278
	C87	8.27	8.57	8.52	7.46	7.18	3390	4763	4529	1232	813
	DK 689	7.77	8.45	8.31	7.63	7.11	1873	4189	3552	1566	729
	DK 764	8.22	8.11	8.29	7.81	7.60	3211	2823	3468	1962	1504
	PAC 345	7.99	8.55	8.26	7.34	7.80	2455	4675	3350	1036	1950
Millets	Japanese	7.71	8.10	7.76	7.43	7.01	1737	2793	1846	1191	608
	Pearl	7.88	8.03	8.41	7.91	7.80	2147	2562	3998	2223	1941
	Siberian	9.40	9.02	8.70	7.94	7.93	11532	7727	5508	2295	2278
	White French	7.65	7.07	6.70	6.86	7.09	1604	682	314	450	703
Panicum	Panicum	6.81	6.96	6.97	7.27	7.30	411	556	562	941	978
	Panorama	6.60	6.86	6.92	6.53	6.42	234	454	509	185	115
	Red	7.25	7.56	7.46	7.04	6.47	902	1426	1240	639	148
Blackgram	Black Pearl	7.52	8.15	8.14	7.43	7.16	1337	2956	2931	1181	792
	Regur	8.32	8.54	8.84	8.08	7.51	3622	4617	6436	2723	1326
Mungbean	Berken	7.24	7.74	7.76	7.56	6.95	891	1792	1838	1413	540
	Celera	7.44	7.69	8.28	8.46	8.11	1209	1677	3443	4233	2844
	Delta	7.61	7.67	7.41	7.19	6.78	1519	1640	1157	832	379
	Emerald	7.49	7.86	8.12	8.02	7.19	1284	2084	2870	2548	832
	Green Diamond	7.80	8.36	8.40	7.89	7.52	1934	3774	3945	2170	1348
Sorghum	Blazer	7.09	7.06	7.20	7.15	6.73	696	664	841	773	334
	Bonus	6.59	7.09	7.14	7.18	7.19	226	696	756	814	828
	DK 35	7.35	7.36	7.11	7.40	7.06	1051	1075	724	1135	659
	DK 39Y	7.06	6.74	6.94	6.85	7.05	669	342	537	442	653
	Freedom	7.88	7.44	7.31	7.05	7.01	2135	1204	1000	652	613
	Goldrush 2	7.87	7.17	7.14	7.11	6.98	2120	802	767	729	576
	Jackpot	6.79	7.26	7.33	6.91	6.92	389	926	1020	500	509
	MR 31	7.76	8.23	8.16	7.80	7.74	1854	3256	2988	1934	1801
	MR 43	7.86	7.33	7.34	7.21	6.93	2091	1019	1045	852	522
	MR Buster	7.71	7.97	7.63	6.74	7.36	1728	2398	1558	347	1076
	MR Goldrush	7.55	7.72	7.87	7.54	7.39	1400	1757	2119	1381	1126
	MR Maxi	8.00	7.70	7.36	7.13	7.12	2473	1712	1078	750	734
	New Nugget	7.55	7.29	7.19	7.14	7.43	1395	971	830	767	1191
	Sonic	7.67	7.28	7.46	7.11	7.06	1643	954	1241	729	665
	Thunder	7.85	7.62	7.62	7.61	7.65	2057	1545	1549	1516	1595
Trinity	7.00	7.36	7.42	7.42	7.46	597	1078	1162	1163	1230	
Soybean	Centaur	8.02	7.80	7.49	7.07	7.14	2535	1941	1294	671	759
	Davis	7.61	7.84	7.73	7.15	7.18	1525	2047	1783	780	817
	Jabiru	7.58	7.46	7.34	7.07	7.14	1458	1234	1045	681	755
	Melrose	8.20	8.30	7.78	7.37	7.26	3132	3518	1887	1089	920
Sunflower	Advantage	8.86	8.45	7.88	7.50	7.24	6515	4176	2142	1300	897
	Hyoleic 31	8.07	7.95	7.54	7.06	6.69	2706	2324	1390	661	306
	Hysun 37 S11	8.36	8.05	8.02	7.50	7.01	3793	2632	2528	1306	611
	Monosun 150	8.11	7.93	7.66	7.23	6.84	2827	2281	1625	878	430
	Suncross 42	8.92	8.28	8.02	7.32	7.55	6976	3433	2538	1005	1395
	Suncross 53	9.25	8.59	7.57	7.34	7.42	9890	4878	1436	1041	1168
	Sunoleic 02	8.49	7.92	7.29	7.10	6.89	4375	2254	972	710	479

l.s.d. $P=0.05$ depth x cultivar 0.72

Supplementary Table S5. Non-parasitic nematodes (NPN)/kg soil at 0–90 cm soil depth one month after removal of the Phase 2 summer crop

Within each Phase 2 summer crop, cultivars are ranked in ascending order; means of the combined Phase 1 wheat and canaryseed crops are shown; BTM, backtransformed mean. RF, reproduction factor=NPN/kg dry soil after harvest of the Phase 2 crops ÷ 835 NPN/kg dry soil at 0–90cm one month before planting the Phase 2 crops

Non-parasitic nematodes/kg dry soil 0–90 cm										
Crop	Cultivar	$\ln(x + 500)$	BTM	RF	Crop	Cultivar	$\ln(x + 500)$	BTM	RF	
Blackgram	Black Pearl	7.73	1778	2.1	Sorghum	Freedom	7.40	1135	1.4	
	Regur	7.86	2102	2.5		MR 43	7.52	1344	1.6	
						Jackpot	7.55	1407	1.7	
Mungbean	Emerald	7.71	1725	2.1		DK 39Y	7.56	1419	1.7	
	Berken	7.84	2038	2.4		Blazer	7.64	1572	1.9	
						MR				
		Green Diamond	7.88	2140	2.6		Goldrush	7.64	1573	1.9
		Celera	7.89	2161	2.6		Goldrush 2	7.66	1616	1.9
	Delta	7.90	2207	2.6		MR Buster	7.67	1644	2.0	
						DK 35	7.68	1661	2.0	
					Sonic	7.69	1686	2.0		
					Trinity	7.72	1752	2.1		
Soybean	Jabiru	7.57	1429	1.7		MR 31	7.75	1823	2.2	
	Davis	7.60	1493	1.8		New				
	Melrose	7.75	1810	2.2		Nugget	7.80	1946	2.3	
						Bonus	7.81	1970	2.4	
		Centaur	7.79	1908	2.3		Thunder	7.83	2020	2.4
Sunflower	Sunoleic 02	8.02	2531	3.0		MR Maxi	7.91	2234	2.7	
	Hyleic 31	8.02	2539	3.0						
	Monosun 150	8.07	2685	3.2						
	Advantage	8.34	3697	4.4	Panicum	Panorama	7.45	1212	1.5	
	Hysun 37 S11	8.36	3752	4.5		Red	7.47	1261	1.5	
	Suncross 42	8.44	4113	4.9		Panicum	7.53	1363	1.6	
	Suncross 53	8.63	5067	6.1						
Maize					Millets	White				
						French	7.55	1398	1.7	
	3202	7.50	1300	1.6		Pearl	7.75	1812	2.2	
	DK 689	7.80	1934	2.3		Japanese	7.78	1890	2.3	
	PAC 345	7.83	2018	2.4		Siberian	7.93	2287	2.7	
	31M10	7.84	2046	2.5						
	DK 764	7.86	2090	2.5						
	C79	7.91	2220	2.7						
C87	7.95	2326	2.8							

l.s.d. cultivar $P=0.05$ 0.39

Supplementary Table S6. Non-parasitic nematodes/kg soil to 90 cm soil depth one month after removal of the Phase 2 summer crops

Within each Phase 2 summer crop, cultivars are listed alphabetically

Phase 2 summer crop		Non-parasitic nematodes/kg dry soil									
Crop	Cultivar	ln(x + 500)					Soil depth (cm)				
		0–15	15–30	30–45	45–60	60–90	0–15	15–30	30–45	45–60	60–90
Maize	3202	7.71	7.24	7.47	7.79	6.93	1723	900	1255	1910	519
	31M10	8.47	7.62	7.80	7.91	7.05	4252	1538	1950	2214	649
	C79	8.58	7.91	7.92	7.62	7.06	4819	2224	2255	1539	659
	C87	8.57	7.94	8.24	7.56	7.11	4793	2312	3273	1419	726
	DK 689	8.33	8.00	7.88	7.40	7.06	3644	2479	2152	1128	661
	DK 764	8.28	8.02	7.96	7.50	7.49	3428	2529	2354	1307	1291
	PAC 345	8.58	7.91	7.92	7.62	7.06	3688	2282	1674	891	1202
Millets	Japanese	8.10	7.87	7.87	7.58	7.30	2803	2105	2105	1460	981
	Pearl	8.31	7.59	7.72	7.44	7.41	3549	1470	1757	1195	1144
	Siberian	8.92	7.81	7.61	7.40	7.09	6991	1967	1523	1131	705
	White French	8.41	7.55	7.21	6.98	6.84	4006	1393	848	580	433
Panicum	Panicum	8.32	7.69	7.38	7.20	6.61	3594	1686	1105	838	245
	Panorama	7.99	7.50	7.56	7.13	6.80	2438	1304	1416	750	401
	Red	8.16	7.31	7.36	7.36	6.57	3013	993	1071	1073	216
Blackgram	Black Pearl	8.67	7.67	7.43	7.44	6.63	5336	1638	1180	1203	255
	Regur	8.70	7.53	7.77	7.42	7.12	5522	1355	1867	1172	732
Mungbean	Berken	8.69	7.86	7.91	7.40	6.75	5416	2097	2228	1128	358
	Celera	8.70	7.64	7.59	7.52	7.27	5517	1587	1479	1349	930
	Delta	8.67	7.96	7.94	7.66	6.82	5319	2361	2300	1619	412
	Emerald	8.51	7.42	7.60	7.37	6.99	4448	1169	1490	1093	588
	Green Diamond	8.82	8.11	7.53	7.37	6.74	6295	2816	1372	1088	346
Sorghum	Blazer	8.17	7.52	7.75	7.41	7.09	3049	1337	1819	1148	705
	Bonus	8.69	7.85	7.61	7.21	6.95	5437	2058	1521	849	548
	DK 35	7.96	7.78	7.71	7.66	7.08	2367	1892	1727	1622	682
	DK 39Y	8.03	7.55	7.64	7.32	7.10	2586	1399	1579	1016	709
	Freedom	7.91	7.51	7.30	7.22	6.79	2232	1326	980	868	393
	Goldrush 2	8.28	7.50	7.72	7.50	7.04	3431	1315	1743	1315	642
	Jackpot	8.33	7.47	7.39	6.93	7.09	3643	1262	1112	521	696
	MR 31	8.45	7.82	7.69	7.64	6.86	4173	1981	1691	1571	453
	MR 43	8.18	7.48	7.31	7.18	6.76	3051	1265	1001	812	366
	MR Buster	8.43	7.71	7.53	7.22	6.96	4082	1739	1368	870	551
	MR Goldrush	8.18	7.78	7.60	7.50	6.89	3065	1896	1488	1308	484
	MR Maxi	8.58	8.12	7.70	7.47	7.30	4807	2877	1706	1261	987
	New Nugget	8.63	7.90	7.52	7.05	7.25	5106	2201	1349	649	903
	Sonic	8.35	7.66	7.60	7.55	7.02	3739	1630	1503	1404	618
	Thunder	8.53	7.73	7.66	7.66	7.03	4569	1769	1622	1618	633
Trinity	8.51	7.50	7.61	7.13	7.32	4468	1299	1511	751	1004	
Soybean	Centaur	8.83	7.48	7.38	7.10	6.81	6359	1276	1096	710	408
	Davis	8.56	7.44	7.36	7.08	6.77	4734	1207	1075	693	371
	Jabiru	8.45	7.54	7.39	7.07	6.84	4198	1380	1122	671	433
	Melrose	8.45	7.83	7.67	7.41	7.05	4188	2012	1640	1149	657
Sunflower	Advantage	9.56	8.37	7.81	7.15	6.72	13719	3810	1976	775	332
	Hyoleic 31	9.10	8.04	7.62	7.44	6.76	8495	2600	1541	1206	363
	Hysun 37 S11	9.65	7.86	7.86	7.62	6.74	14991	2091	2090	1538	349
	Monosun 150	9.04	7.91	7.64	7.38	6.78	7970	2211	1588	1106	378
	Suncross 42	9.52	8.35	7.98	7.39	7.46	13079	3745	2424	1121	1232
	Suncross 53	9.87	8.24	8.00	7.54	7.40	18793	3279	2480	1390	1133
	Sunoleic 02	9.01	7.70	7.57	7.50	7.21	7701	1698	1444	1309	850
l.s.d. $P=0.05$ depth x cultivar		0.64	0.56	0.57	0.54	0.52					

Supplementary Table S7. Gravimetric soil moisture content (%) one month after removal of the Phase 2 summer crops

Within each Phase 2 summer crop, cultivars are listed alphabetically

Phase 2 summer crop		Soil moisture content (%)				
Crop	Cultivar	Soil depth (cm)				
		0–15	15–30	30–45	45–60	60–90
Maize	3202	38.1	45.3	42.6	39.3	37.6
	31M10	35.7	43.4	40.0	38.5	36.3
	C79	35.2	41.8	38.1	34.9	36.1
	C87	35.9	44.9	40.3	36.5	36.4
	DK 689	36.1	44.2	40.9	37.6	37.0
	DK 764	35.1	41.8	36.9	35.0	35.6
	PAC 345	39.3	47.3	42.7	38.4	38.7
Millets	Japanese	36.9	47.2	48.0	47.5	45.7
	Pearl	35.8	45.4	42.7	38.0	38.3
	Siberian	30.7	40.2	39.3	39.4	41.2
	White French	34.4	40.6	40.0	40.0	41.5
Panicum	Panicum	36.4	47.1	48.5	47.6	44.6
	Panorama	34.7	40.9	40.6	41.0	41.6
	Red	34.8	41.0	39.3	40.5	41.6
Blackgram	Black Pearl	36.4	43.8	40.5	38.9	40.1
	Regur	36.2	44.8	41.5	38.8	39.2
Mungbean	Berken	36.1	43.7	42.5	41.0	40.8
	Celera	35.9	44.7	43.8	41.6	41.8
	Delta	34.0	42.4	40.8	41.0	41.9
	Emerald	36.6	44.0	42.3	40.1	39.3
	Green Diamond	36.3	44.2	40.4	38.7	39.4
Sorghum	Blazer	34.4	41.9	40.8	38.5	38.7
	Bonus	33.1	42.1	40.4	38.8	38.4
	DK 35	35.1	43.4	42.6	40.6	40.0
	DK 39Y	33.1	41.1	40.9	39.0	38.2
	Freedom	33.1	40.8	40.8	39.9	39.3
	Goldrush 2	31.8	39.5	36.7	37.0	38.2
	Jackpot	33.9	42.9	42.1	40.5	40.2
	MR 31	33.9	40.9	40.0	38.7	38.1
	MR 43	33.0	39.6	39.1	37.4	37.3
	MR Buster	31.5	38.1	36.8	36.0	37.2
	MR Goldrush	33.6	43.0	42.6	40.4	38.9
	MR Maxi	32.3	38.6	37.2	35.8	37.3
	New Nugget	33.9	43.2	41.4	39.1	39.2
	Sonic	32.9	38.5	37.7	37.2	37.4
	Thunder	34.3	43.1	42.5	40.5	40.2
Trinity	31.5	40.8	40.1	39.7	40.8	
Soybean	Centaur	34.8	41.3	38.2	38.5	36.6
	Davis	35.4	42.9	37.7	36.8	37.7
	Jabiru	34.8	43.4	38.5	36.7	37.5
	Melrose	35.3	42.6	38.1	37.0	37.4
Sunflower	Advantage	37.8	42.2	38.6	37.5	36.7
	Hyoleic 31	35.4	41.7	38.5	38.7	37.6
	Hysun 37 S11	35.6	40.5	40.0	39.2	38.5
	Monosun 150	36.9	42.5	40.4	39.1	37.5
	Suncross 42	36.5	41.8	39.3	37.1	38.5
	Suncross 53	35.6	41.8	38.3	37.6	38.0
	Sunoleic 02	36.4	41.2	39.7	38.0	37.7
l.s.d. $P=0.05$ soil depth x cultivar		2.7	4.1	4.8	4.2	3.0

Supplementary Table S8. Regression equations for predicting biomass of Phase 3 wheat cv. Strzelecki using populations of *Pratylenchus thornei* collected one month after harvest of the Phase 2 summer crops to 90 cm soil depth from Phase 1 canaryseed and wheat plots; $P<0.001$; and *Pratylenchus thornei* collected 15 months after harvest of the Phase 2 summer crops only from Phase 1 wheat plots, $P<0.001$ (except where marked). Biomass loss was determined for the minimum and maximum population densities of *P. thornei* within the range of the data by solving the respective regression equations and expressing the result as a percentage

BM; Biomass, plant dry weight (kg/ha) of Phase 3 wheat cv. Strzelecki 3-months after planting; Pt, $\ln(x+500)$ *Pratylenchus thornei*/kg dry soil one month after harvest of the summer crops (15 months before planting the final year wheat crop). Number in parentheses indicates backtransformed mean

Accumulated soil depth (cm)	Equation	Adjusted R ²	Range of data ^a		BM loss (%)
			Min.	Max.	
<i>Pt</i> 1 month after harvest of Phase 2 crops, all data $n=96$					
0–15	BM=12165-1115.7Pt	0.61	6.35 (70)	9.94 (20305)	79
0–30	BM=14074-1333.4Pt	0.67	6.61 (241)	9.78 (17240)	80
0–45	BM=15148-1464.0Pt	0.68	6.65 (275)	9.61 (14409)	80
0–60	BM=15688-1543.0Pt	0.68	6.69 (305)	9.44 (12077)	79
0–90	BM=16348-1667.0Pt	0.69	6.59 (231)	9.06 (8099)	77
<i>Pt</i> 1 month after harvest of Phase 2 crops, Phase 1 canaryseed $n=48$					
0–15	BM=10566-841Pt	0.50	6.35 (70)	9.39 (11517)	49
0–30	BM=12246-1054Pt	0.44	6.61 (241)	9.05 (8022)	49
0–45	BM=13321-1191Pt	0.44	6.65 (275)	8.82 (6256)	48
0–60	BM=13819-1266Pt	0.39	6.69 (305)	8.66 (5293)	47
0–90	BM=14303-1364Pt	0.35	6.59 (231)	8.35 (3713)	45
<i>Pt</i> 1 month after harvest of Phase 2 crops, Phase 1 wheat $n=48$					
0–15	BM=7452-595Pt	0.30	6.61 (245)	9.94 (20305)	57
0–30	BM=9003-764Pt	0.31	7.03 (625)	9.78 (17240)	58
0–45	BM=9737-850Pt	0.31	7.13 (745)	9.61 (14409)	57
0–60	BM=10169-909Pt	0.31	7.08 (692)	9.44 (12077)	57
0–90	BM=8847-773Pt	0.16 ^a	7.37 (1088)	9.06 (8099)	41
<i>Pt</i> 15 months after Phase 2 crops, Phase 1 wheat $n=48$					
0–15	BM=9183-870Pt	0.25	6.56 (210)	8.72 (5641)	54
0–30	BM=9884-905Pt	0.24	7.24 (891)	8.99 (7497)	48
0–45	BM=10338-952Pt	0.19 ^b	7.61 (1528)	9.00 (7578)	43
0–60	BM=10723-1000Pt	0.19 ^b	7.66 (1614)	9.00 (7598)	44
0–90	BM=9982-923Pt	0.14 ^c	7.52 (1339)	8.90 (6860)	42

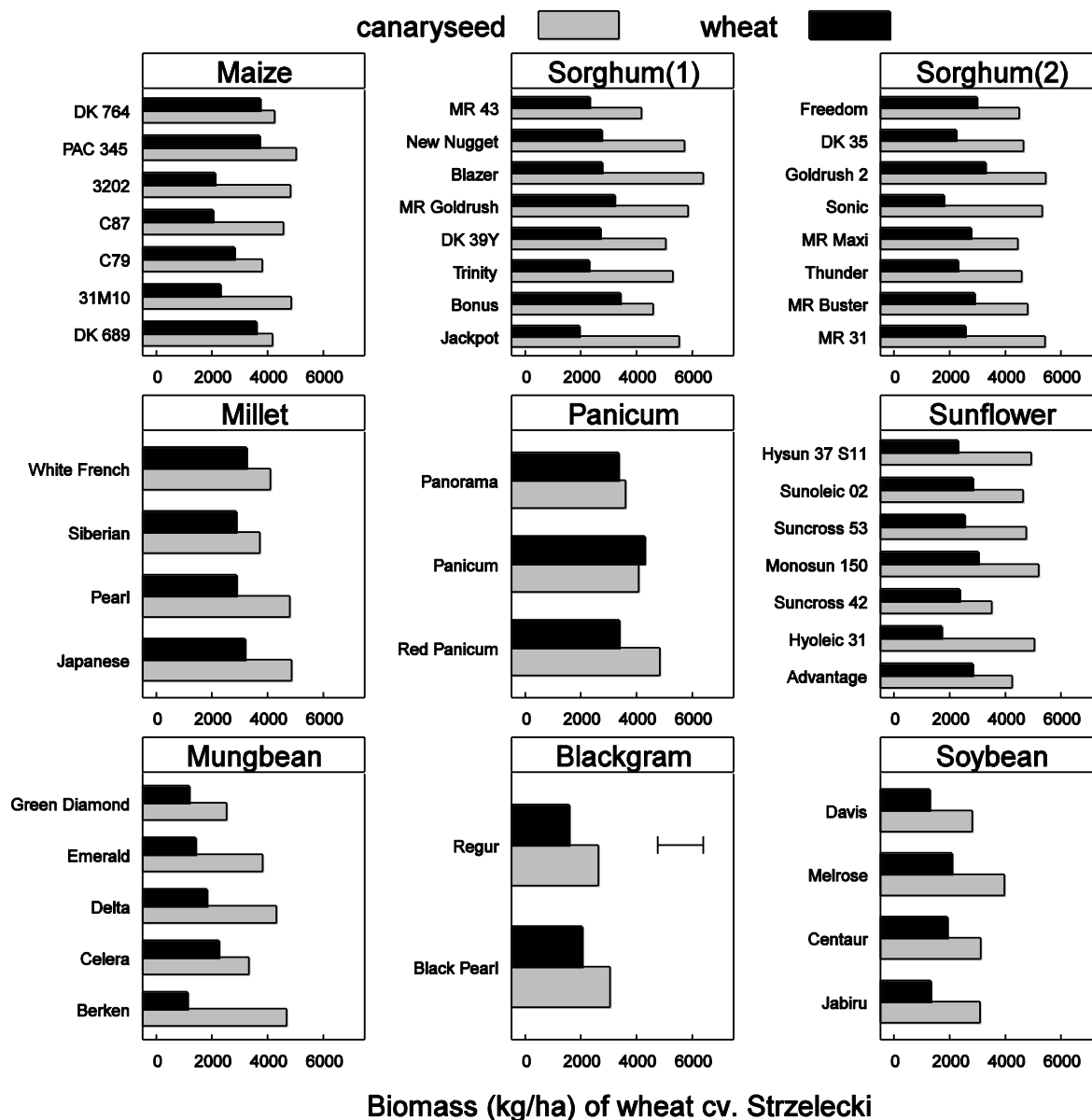
$P<0.001$ except where marked ^a $P=0.003$; ^b $P=0.001$; ^c $P=0.005$.

Supplementary Table S9. Regression equations for predicting grain yield of Phase 3 wheat cv. Strzelecki using populations of *Pratylenchus thornei* collected one month after harvest of the Phase 2 summer crops to 90 cm soil depth from Phase 1 canaryseed and wheat plots; $P<0.001$; and *Pratylenchus thornei* collected 15 months after harvest of the Phase 2 summer crops only from Phase 1 wheat plots, $P<0.001$. Yield loss was determined for the minimum and maximum population densities of *P. thornei* within the range of the data by solving the respective regression equations and expressing the result as a percentage

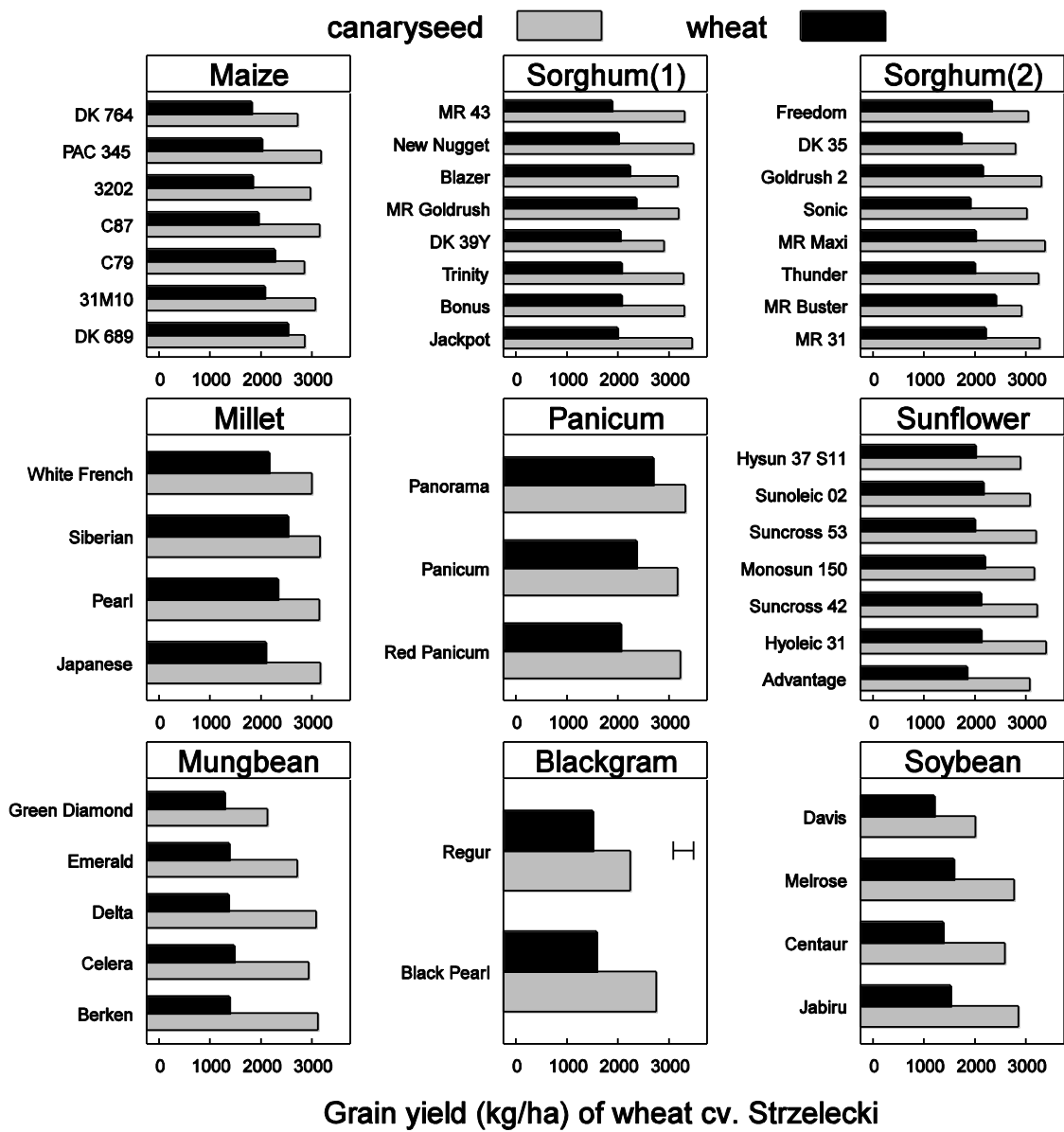
Yield, grain yield (kg/ha) of Phase 3 wheat cv. Strzelecki in the final year of the experiment; Pt, $\ln(x+500)$ *Pratylenchus thornei*/kg dry soil one month after harvest of the summer crops (15 months before planting the final year wheat crop). Number in parentheses indicates backtransformed mean

Accumulated soil depth (cm)	Equation	Adjusted R ²	Range of data ^a		Yield loss (%)
			Min.	Max.	
<i>Pt</i> 1 month after harvest of Phase 2 crops, all data $n=96$					
0–15	Yield=6866-564.3Pt	0.68	6.35 (70)	9.94 (20305)	62
0–30	Yield=7945-688.7Pt	0.79	6.61 (241)	9.78 (17240)	64
0–45	Yield=8488-754.9Pt	0.80	6.65 (275)	9.61 (14409)	64
0–60	Yield=8841-805.0Pt	0.81	6.69 (305)	9.44 (12077)	64
0–90	Yield=9208-872.6Pt	0.82	6.59 (231)	9.06 (8099)	62
<i>Pt</i> 1 month after harvest of Phase 2 crops, Phase 1 canaryseed $n=48$					
0–15	Yield=5042-281.6Pt	0.55	6.35 (70)	9.39 (11517)	26
0–30	Yield=5683-363.6Pt	0.52	6.61 (241)	9.05 (8022)	27
0–45	Yield=5987-401.9Pt	0.49	6.65 (275)	8.82 (6256)	26
0–60	Yield=6333-451.1Pt	0.49	6.69 (305)	8.66 (5293)	27
0–90	Yield=6511-486.9Pt	0.45	6.59 (231)	8.35 (3713)	26
<i>Pt</i> 1 month after harvest of Phase 2 crops, Phase 1 wheat $n=48$					
0–15	Yield=5380-412.6Pt	0.70	6.61 (245)	9.94 (20305)	52
0–30	Yield=6378-520.7Pt	0.70	7.03 (625)	9.78 (17240)	53
0–45	Yield=6863-578.0Pt	0.68	7.13 (745)	9.61 (14409)	52
0–60	Yield=7067-605.9Pt	0.66	7.08 (692)	9.44 (12077)	51
0–90	Yield=6539-559.5Pt	0.44	7.37 (1088)	9.06 (8099)	39
<i>Pt</i> 15 months after Phase 2 crops, Phase 1 wheat $n=48$					
0–15	Yield=6033-464.3Pt	0.48	6.56 (210)	8.72 (5641)	34
0–30	Yield=6499-494.4Pt	0.47	7.24 (891)	8.99 (7497)	30
0–45	Yield=7182-573.2Pt	0.47	7.61 (1528)	9.00 (7578)	28
0–60	Yield=7272-584.5Pt	0.44	7.66 (1614)	9.00 (7598)	28
0–90	Yield=7150-579.0Pt	0.38	7.52 (1339)	8.90 (6860)	29

$P<0.001$.



Supplementary Fig. S1. Biomass (kg/ha) of the Phase 3 wheat cv. Strzelecki three months after planting, following cultivars of the Phase 2 summer crops and the Phase 1 canaryseed (grey columns) or Phase 1 wheat (black columns). Bar marker, l.s.d. for Phase 2 cultivar, $P=0.05$.



Supplementary Fig. S2. Grain yield (kg/ha) of the Phase 3 wheat cv. Strzelecki following cultivars of the Phase 2 summer crops and the Phase 1 canaryseed (grey columns) or wheat (black columns). Bar marker, l.s.d., cultivar, $P=0.05$.