

Supplementary Table S1: Primer pair used in the analyses

Primers (5'-3')	Function	Range size expected	Polymorphic Information Content (PIC)	Fis	Fit	Fst	Nm
F: CCGAGCAGCAGAGCAAGAGA R: <u>GTTTCTT</u> ATGTAGCCGAGGATGGTGAGC	EST-SSR	319-375 (171)	0.41	0.04	0.11	0.08	3.02
F: TCGATGGGCTCTGTCCTGT R: <u>GTTTCTT</u> ACAAAGTTTGTGGCGGTTCTG	EST-SSR	140-159 (145)	0.29	-0.07	-0.02	0.04	5.42
F: CTAGGGGATTACAGGGAGGGCA R: <u>GTTTCTT</u> GTTCCTTGTCCTACTCGTTACCG	gSSR	88-116 (100)	0.51	0.09	0.18	0.10	2.20
F: TGACAACCCCCTTTCCCTCGT R: <u>GTTTCTT</u> TCATCGACGCTAAGGAGGACCC	gSSR	176-226 (220)	0.20	0.07	0.10	0.04	6.59
F: GTTTCGTCCCCGTTGCCATC R: <u>GTTTCTT</u> ACGTGTCGCTTTCCATTGCCC	gSSR	140	0.36	0.05	0.13	0.08	3.07
F: TGCTGCTCATTGCTACTGTCA R: <u>GTTTCTT</u> CGATCCAGGATAACGGCTACA	EST-SSR	137-146 (142)	0.12	-0.02	0.05	0.07	3.11
F: TCTCCGAGAGGCCAAGCAGAAA R: <u>GTTTCTT</u> ATGGCGACCACCCCGAATC	EST-SSR	194-245 (125)	0.42	0.01	0.11	0.10	2.19
F: GATGACTATGACTACCAGGATGAA R: <u>GTTTCTT</u> GGAGTGAGAAGGCCGAGAAG	gSSR	112-120 (113)	0.63	0.19	0.25	0.07	3.54
Mean values			0.37	0.05	0.11	0.07	3.64

Supplementary Table S2: Phytochemical analyses. Note: code only for accessions statistically tested for phytochemical contents

Rye population	Code	Farmer / Gene bank	Origin	TPC [mg GA equiv./kg]	TFC [mg Q equiv./kg]	DPPH [mg Trolox equiv./kg]
Teglio_1		Motalli	Teglio (SO), Valtellina, Italy	1696.2 (89.17)	118.2 (11.25)	-
Teglio_2		Mazzucchelli	Triangia (SO), Valtellina, Italy	1705.5 (78.16)	111.8 (17.09)	1011.9 (60.75)
Teglio_3	T_3	Finotti	Teglio (SO), Valtellina, Italy	1712.2 (98.56)	100.5 (23.91)	2416.8 (335.02)
Teglio_4	T_4	Fanchi	Teglio (SO), Valtellina, Italy	1532.1 (195.22)	105.6 (9.89)	1778.9 (115.97)
Teglio_5		Fanchetti	Teglio (SO), Valtellina, Italy	1544.7 (91.54)	114.1 (15.62)	1267.0 (91.65)
Teglio_6	T_6	Marchetti	Teglio (SO), Valtellina, Italy	1614.8 (134.55)	118.2 (15.33)	2720.6 (114.34)
Teglio_7	T_7	Arrondini	Teglio (SO), Valtellina, Italy	1436.6 (63.59)	104.3 (14.89)	3756.2 (514.0)
Teglio_8	T_8	Saini	Teglio (SO), Valtellina, Italy	1631.0 (98.97)	129.9 (19.58)	2119.8 (469.32)
Teglio_9	T_9	Pelacchi	Teglio (SO), Valtellina, Italy	2015.9 (87.80)	136.1 (15.15)	2020.0 (18.20)
Teglio_10	T_10	De_Filippi	Teglio (SO), Valtellina, Italy	1872.6 (159.33)	129.2 (15.89)	2017.6 (223.92)
Upper_Valley	Up_V	Martinelli	Valdidentro, Valtellina, Italy	1813.8 (97.06)	112.7 (16.67)	1779.3 (196.06)
		Experimental Agriculture Centre		1865.0 (106.85)	137.0 (17.45)	1646.4 (138.08)
Laimburg	LAI		Laimburg, Adige Valley, Italy			
			Poland (Danko farm, accession SZK44)	1783.9 (59.98)	118.4 (12.57)	933.7 (95.41)
Comm_Polland_P1		Commercial seeds				
Comm_Uncertain	C_UN	Maxenti	Uncertain	1872.1 (125.32)	120.5 (15.15)	1351.7 (80.05)
		Research Institute of Plant Production, Piešťany, Slovakia	Slovakia	1850.0 (64.95)	117.3 (21.84)	1226.8 (61.52)
SVKPOL2007-40		Research Institute of Plant Production, Piešťany, Slovakia	Germany	1760.7 (47.69)	121.3 (16.17)	1305.6 (63.78)
Pluto		Research Institute of Plant Production, Piešťany, Slovakia	Russia	1951.4 (65.33)	129.4 (9.48)	1042.0 (33.79)
Voschod 1		Research Institute of Plant Production, Piešťany, Slovakia	Poland	1959.4 (61.88)	111.5 (16.38)	1283.7 (13.80)
Danokowskie nowe		Piešťany, Slovakia				
		PAS Botanical Garden-CBDC, Poland	Western Asia	2544.1 (94.68)	152.1 (15.50)	1396.5 (69.64)
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