

Supplemental Table S1. Analysis of variance of genotypic, environmental and farming system effects on grain yield and quality characteristics of waxy and non-waxy cultivars (the table shows the sources of variation and probability for the *F* test of each factor and their interactions)

	F-value of the source of variance						
	Factor			Interaction of factors			
	Genotype	Year	Farming system	G×Y	G×F	Y×F	G×Y×F
Grain yield characteristics							
Grain Yield / all genotypes	28.1**	18.3**	190.5**	1.2	0.6	0.5	0.9
waxy	13.8**	24.0**	106.0**	0.5	0.1	0.0	2.4
non-waxy	3.5	2.7	90.1**	0.3	0.1	0.9	0.2
N use efficiency / all genotypes	30.1**	22.4**	2.0	1.4	0.2	3.0	1.0
waxy	16.4**	29.3**	0.5	1.2	0.4	1.2	3.5
non-waxy	3.6	3.7	1.5	0.5	0.0	1.9	0.3
Grain N yield (uptake) / all genotypes	41.7**	7.9**	233.8**	6.0**	2.6	2.7	1.3
waxy	18.5**	0.6	119.4**	0.3	0.4	0.0	2.6
non-waxy	0.8	15.7**	121.2**	3.1	0.1	3.6	0.1
Fertiliser N % used for grain / all genotypes	46.3**	7.5*	0.4	6.5**	0.1	1.3	1.0
waxy	23.0**	0.8	1.1	1.0	0.1	0.1	4.0
non-waxy	0.8	15.1**	0.0	3.4	0.0	1.3	0.0
Grain chemical composition and quality characteristics							
Protein content / all genotypes	12.1**	487.8**	2.2	5.5**	3.5*	3.1	1.6
waxy	1.1	260.7**	2.0	0.1	0.7	6.0*	0.0
non-waxy	10.7**	243.0**	7.9*	4.7*	0.4	0.2	2.6
Phosphorus content / all genotypes	0.6	0.2	52.6**	1.8	2.5	1.7	3.2*
waxy	0.4	1.1	31.5**	0.6	0.4	2.4	2.2
non-waxy	1.1	0.2	21.4**	3.7	6.7**	0.1	6.6**
Test weight / all genotypes	277.4**	1655.4**	865.0**	134.0**	38.8**	228.4**	36.8**
waxy	53.8**	1961.5**	223.5**	68.3**	1.9	106.2**	0.0
non-waxy	256.8**	276.3**	661.2**	107.3**	0.4	123.3**	86.8**
Particle size index / all genotypes	365.6**	194.0**	19.1**	7.2**	0.1	2.8	2.8
waxy	17.9**	45.0**	11.2**	0.0	0.0	0.1	0.2
non-waxy	0.6	169.9**	8.0*	2.4	0.0	7.4*	3.7
Sedimentation / all genotypes	437.3**	164.7**	11.9**	21.2**	10.1**	54.8**	4.1*
waxy	0.5	47.5**	4.1	0.6	0.2	15.7**	0.6
non-waxy	6.1**	117.4**	26.9**	19.4**	0.0	39.2**	0.2
Falling number / all genotypes	16444.2**	276.4**	22.7**	93.9**	9.6**	121.3**	41.6**
waxy	160.2**	0.2	8.2*	4.2	1.5	1.5	0.2
non-waxy	2.7	276.6**	24.5**	3.5	1.4	123.4**	0.1
Wet gluten content / all genotypes	1.9	101.1**	4.8*	12.9**	3.8*	0.2	0.8
waxy	6.09*	35.3**	0.8	2.1	0.0	1.7	0.4
non-waxy	0.5	67.1**	9.1**	13.1**	1.2	0.0	1.1
Gluten index / all genotypes	38.3**	42.3**	1.1	11.1**	1.0	2.9	1.0
waxy	21.4**	44.5**	0.1	5.4*	0.1	0.3	0.3
non-waxy	2.6	2.5	6.13*	4.0	0.5	5.6*	3.6
Gluten water absorption / all genotypes	13.7**	72.2**	3.8	9.0**	2.0	18.0**	4.0*
waxy	7.4*	50.7**	3.4	0.1	2.0	16.2**	1.0
non-waxy	5.3**	25.0**	0.4	17.7**	1.7	1.9	0.2
Flour and dough quality characteristics							
Flour yield / all genotypes	342.7**	77.5**	0.4	2.7	8.0**	42.1**	1.5
waxy	56.6**	40.2**	4.2	2.1	8.7**	24.9**	0.0
non-waxy	0.0	39.2**	3.4	4.2	7.6*	17.5**	2.8

Flour water absorption (BF) / all genotypes	2139.7**	39.2**	0.1	1.9	1.7	5.1*	0.6
waxy	315.2**	7.5*	1.5	0.6	1.3	1.2	0.6
non-waxy	2.8	56.3**	2.2	4.3	0.0	6.4*	1.8
Dough development time (BF) / all genotypes	99.3**	14.3**	0.2	8.9**	4.7*	19.8**	8.0**
waxy	108.4**	0.1	0.4	0.5	7.0*	23.5**	1.4
non-waxy	20.4**	138.6**	0.2	20.8**	5.5*	0.1	0.9
Dough stability time (BF) / all genotypes	3.5*	1.7	1.5	1.0	4.4*	14.5**	2.1
waxy	10.0**	0.6	0.1	2.3	8.8**	3.2	0.0
non-waxy	0.0	1.2	2.1	0.7	4.2	12.2**	3.7
Degree of softening10 (BF) / all genotypes	24.3**	4.8*	0.0	1.6	3.3*	12.8**	1.0
waxy	40.4**	0.0	0.7	0.1	2.3	2.6	1.0
non-waxy	3.4	22.1**	2.4	0.3	10.1**	22.4**	2.2
Degree of softening12 (BF) / all genotypes	7.2**	13.3**	10.6**	11.8**	8.0**	66.1**	1.6
waxy	8.5**	13.2**	4.8*	17.5**	11.6**	22.3**	2.9
non-waxy	2.2	0.9	8.1*	0.5	12.3**	72.0**	0.0
BF quality number (BF) / all genotypes	18.2**	9.2**	3.2	4.1*	7.6*	28.5**	0.1
waxy	43.1**	0.0	0.1	0.4	7.0*	13.5**	0.2
non-waxy	3.0	20.1**	5.4*	1.6	14.0**	15.0**	0.2
Starch content and quality characteristics							
Starch content / all genotypes	19.2**	84.4**	19.9**	0.6	1.6	2.3	0.9
waxy	2.9	57.7**	13.4**	1.0	4.1	2.2	2.7
non-waxy	5.2*	31.2**	7.5*	0.4	1.1	0.5	0.0
A-type starch / all genotypes	5.4**	265.5**	7.7**	3.8*	1.0	5.0*	2.3
waxy	8.1*	407.3**	21.7**	6.3*	2.4	24.6**	4.4
non-waxy	0.2	66.8**	0.6	3.9	0.1	0.0	0.3
Amylose content / all genotypes	5539.3**	29.3**	1.1	5.4**	2.0	0.7	0.7
waxy	3.4	1.6	0.9	0.6	0.1	0.0	0.2
non-waxy	0.9	37.8**	5.1*	1.5	0.5	1.6	0.6
Peak viscosity (RVA) / all genotypes	78.2**	53.8**	1.7	0.7	0.9	1.8	0.3
waxy	1.5	20.7**	2.0	0.1	0.4	1.2	0.1
non-waxy	18.9**	84.9**	0.0	2.2	0.7	0.9	1.1
Trough (RVA) / all genotypes	117.5**	343.79**	1.2	9.0**	1.0	1.0	0.4
waxy	7.0**	162.9**	4.8**	11.6**	0.2	1.8	0.4
non-waxy	1.5	187.6**	0.1	3.1	0.6	0.1	0.4
Breakdown (RVA) / all genotypes	272.0**	3.3	0.9	5.0**	0.5	1.2	0.1
waxy	0.3	1.0	0.9	0.6	0.4	0.7	0.0
non-waxy	13.2**	77.5**	0.0	0.6	0.0	0.5	0.1
Final Viscosity (RVA) / all genotypes	463.8**	406.7**	2.4	5.8**	0.4	3.3	0.5
waxy	2.8	201.7**	3.9	12.0**	0.0	3.9	0.4
non-waxy	0.2	205.8**	0.1	4.9*	0.1	0.4	0.5
Setback (RVA) / all genotypes	464.2**	58.2**	1.2	6.2**	0.3	2.7	0.2
waxy	0.2	55.6**	0.3	2.3	0.1	2.3	0.1
non-waxy	1.9	8.7**	1.1	1.3	1.1	0.6	0.1
Peak Time (RVA) / all genotypes	2945.4**	81.1**	4.5*	25.4**	1.0	0.0	2.8
waxy	1.0	0.2	0.5	0.4	0.9	1.1	0.4
non-waxy	0.0	105.7**	4.2	1.5	0.3	0.2	5.0*
Viscosity temperature (RVA) / all genotypes	138.7**	1.6	1.6	0.7	0.6	0.9	2.4
waxy	0.3	1.2	0.2	0.2	0.0	0.3	1.5
non-waxy	1.2	1.2	1.4	0.6	0.3	1.2	3.0

G – genotype, Y– year, F – farming system, BF – Brabender farinograph; RVA – rapid visco analyser; * and ** significant at P<0.05 and 0.01, respectively.