

time, Kanakis, Ramirez, and Torrese showed high levels of CSBMV resistance, whereas Ismur and Dorato were susceptible.

All cultivars classified as resistant or moderately resistant in previous trials exhibited comparable reactions in 2011, and consistent responses also were observed for all those previously classified as susceptible or moderately susceptible except for Anco Marzio, Creso, and Imhotep, which expressed a susceptible reaction only in terms of symptom expression.

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CEREAL QUALITY RESEARCH UNIT (CRA) OF THE ITALIAN RESEARCH COUNCIL

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Comparison between bread wheat and barley in the inner hillside of south-central Italy.

Mauro Fornara, Massimiliano Camerini (University of Molise, Department S.A:V.A), Michelina Colonna (ARSIAM-Molise), Carlo Rossi, Ferdinando Sereni, and Fabrizio Quaranta.

In 2009 and 2010, field experiments were carried out in Colletorto, a location in the Molise region (41°40' N), an inner hill environment (515 masl) surrounded by the Central Apennine Mountain Range. In this location, 14 bread wheat cultivars and 19 barley cultivars for livestock feeding are tested yearly. Trials are in a randomized complete block design with three replications. Bread wheat cultivars are catalogued according with the Synthetic Quality Index method (Indice Sintetico di Qualità, ISQ), from the strongest type, FF (frumento di forza, improver wheat), particularly used for manufacturing products with a strong and well-leavened structure, to the weakest type, FAU (frumento per altri usi, wheat for other purposes). The intermediate wheat categories, FPS (frumento panificabile superiore, superior bread making wheat) and FP (frumento panificabile, ordinary bread making wheat), present properties suitable for ordinary bread making. The average yields for the period were similar for both crops (4.15 t/ha for bread wheat and 4.19 t/ha for barley (Table 1, p. 95)). An overall yield reduction in 2009, compared to 2010, was observed for both barley and bread wheat. Five bread wheat genotypes (Epidoc, Exotic, Blasco, Genesi, and Adelaide) reached a yield greater than 4.5 t/ha with yield indices higher than 100 in every year. Among these cultivars, Blasco and Adelaide showed a very interesting test weight average (84.8 kg/hL and 82.1 kg/hL, respectively), a character very important for milling industry.

Seven barley cultivars (Estival, Oleron, Shangrila, Mattina, Campagne, Calanque, and Aldebaran) exceeded a yield of 4.5 t/ha, with yield indices higher than 100 in each year. Among these, only Calanque exceeded a 70 kg/hL average test weight value.

Table 1. ISQ class, growth cycle, grain yield, and test weight of 14 Italian bread wheat cultivars and 19 Italian barley cultivars tested during a 2-year period (2010–11) in the Molise region of Italy.

Cultivars tested during a 2-year period (2010–11) in the Monse region of Italy								
Cultivar	ISQ class	Heading date (days after 1 April)	Yield			Test weight		
			Index		Mean (t/ha)	Index		Mean (kb/hL)
			2009	2010		2009	2010	
Bread wheat								
Bologna	FF	48	63	96	3.45	102	101	81.4
Valbona	FF	39	99	91	3.90	103	100	81.7
Adelaide	FPS	44	124	101	4.58	103	101	82.1
Blasco	FPS	47	120	110	4.73	105	105	84.8
Antille	FP	53	102	88	3.89	99	98	79.5
Aubusson	FP	51	94	95	3.94	100	99	79.8
Colledoro	FP	52	100	90	3.92	101	101	81.5
Epidoc	FP	51	125	118	5.02	99	98	79.1
Exotic	FP	50	127	107	4.78	97	98	78.4
Genesi	FP	50	117	106	4.60	100	101	80.9
Lilliput	FP	48	111	88	4.04	101	101	81.4
Mieti	FP	46	66	70	2.83	99	99	80.0
PR22R58	FP	51	105	91	4.02	100	100	80.4
Sollario	FAU	51	97	99	4.08	103	99	81.1
Mean		48	3.37	4.94	4.15	79.0	82.1	80.5
Barley								
Cultivar	Height (cm)	Heading date (days after 1 April)	Yield			Test weight		
			Index		Mean (t/ha)	Index		Mean (kb/hL)
			2009	2010		2009	2010	
Aldebaran	77	40	108	108	4.51	92	94	63.7
Amillis	82	38	73	79	3.24	99	103	69.1
Calanque	79	40	105	110	4.54	103	104	70.8
Campagne	82	40	124	101	4.57	100	98	67.4
Cometa	78	42	105	95	4.12	99	103	69.1
Estival	76	37	111	124	5.02	98	99	67.4
Explora	78	37	115	89	4.11	98	96	66.6
Ketos	79	40	96	97	4.06	99	101	68.4
Laverda	84	42	72	104	3.88	95	96	65.3
Lutece	80	38	97	100	4.15	98	97	66.6
Marjorie	84	38	98	105	4.30	107	104	72.0
Mattina	80	42	110	114	4.72	99	101	68.5
Meseta	75	38	115	80	3.87	104	105	71.8
Nure	80	38	95	86	3.74	102	103	70.2
Oleron	78	38	114	117	4.84	95	92	64.0
Rodorz	90	43	102	100	4.21	103	100	69.2
Sfera	80	40	87	103	4.07	104	105	71.5
Shangrila	80	39	123	109	4.78	101	98	67.9
Siberia	76	38	80	103	3.97	96	95	65.5
Mean	80	40	2.98	5.39	4.19	67.9	68.9	68.4

Conventional bread wheat: results of the 2010 – 2011 varietal evaluation in Latium region (Central Italy).

Mauro Fornara, Gaetano Bentivenga, Pierino Cacciatori, Vincenzo Miozzi, Valerio Vecchiarelli (University of Perugia), and Fabrizio Quaranta.

The Research Unit for Cereal Quality of the Italian Agricultural Research Council (CRA-QCE, Rome) performs a varietal evaluation of bread wheat cultivars in different experimental fields in Central Italy. In the 2-year period between 2010 and 2011, field experiments were carried out in Latium region (Central Italy), in four locations (Montelibretti, Rieti, Rome and Tarquinia). In every study site, trials were performed according with a RCBD with 3 replicates.

The tested cultivars are catalogued according with the Synthetic Quality Index method (Indice Sintetico di Qualità, ISQ), from the strongest type FF (frumento di forza, improver wheat), particularly used for manufacturing products with a strong and well leavened structure, to the weakest type FB (frumento da biscotto, wheat for biscuits), more appropriate to lend friableness to the products. The intermediate wheat categories, FPS (frumento panificabile superiore, superior bread making wheat) and FP (frumento panificabile, ordinary bread making wheat), present properties suitable for ordinary bread making.

The agronomic performance of the 17 bread wheat genotypes is summarized (Table 2). The overall average yield during the two-year period reached 6.20 t/ha. Eight cultivars reached yields exceeding 6.30 t/ha, with yield indexes not lower than 100 in every year. Among these, Masaccio, Altamira, Arabia, Tiepolo, and Anforeta, also showed test weights higher than 80 kg/hL. Blasco (class FPS) was characterized by the highest test weight (83.6 kg/hL); on the contrary, its productive performance (6.00 t/ha) resulted slightly below the average grain yield.

Table 2. ISQ class, grain yield, and test weight of 17 Italian bread wheat cultivars tested during a 2-year period (2010–11) at four locations in the Latium Region of central Italy.

Cultivar	ISQ class	Yield			Test weight		
		Index		Mean	Index		Mean
		2010	2011	t/ha	2010	2011	kg/hL
Bologna	FF	95	87	5.61	103	100	80.7
Apoteosi	FPS	84	94	5.51	102	102	81.1
Arrocco	FPS	95	99	6.01	100	100	79.7
Blasco	FPS	96	98	6.00	106	105	83.6
Tiepolo	FPS	106	102	6.46	101	100	80.0
Altamira	FP	111	103	6.64	100	102	80.1
Andana	FP	87	93	5.58	102	101	80.5
Anforeta	FP	100	104	6.36	102	103	81.4
Aubusson	FP	95	97	5.97	97	96	76.8
Bandera	FP	113	100	6.60	100	100	79.4
Masaccio	FP	112	105	6.74	101	101	80.0
Mieti	FP	91	84	5.40	99	99	78.5
PR22R58	FP	113	102	6.63	100	100	79.1
Sirtaki	FP	106	107	6.61	97	96	76.6
Solehio	FP	99	116	6.70	100	98	78.4
Arabia	FB	106	103	6.47	102	101	80.5
Artico	FB	101	95	6.08	95	96	75.5
Location		Mean (t/ha)			Mean (kg/hL)		
		5.85	6.54	6.20	77.4	81.2	79.3
Montelibretti		6.08	7.99	7.03	78.2	83.5	80.8
Roma		4.91	6.67	5.79	74.3	80.5	77.4
Rieti		6.40	4.94	5.67	76.3	79.2	77.8
Tarquinia		6.03	6.57	6.30	80.9	81.6	81.2

Conventional durum wheat: results of the 2009–11 Italian National Network Trials.

Andreina Belocchi, Maria Grazia D'Egidio, Mauro Fornara, Ester Gosparini, Valerio Mazzon, and Fabrizio Quaranta.

The Research Unit for Cereal Quality of the Italian Agricultural Research Council (CRA-QCE, Rome) coordinates national network trials for the evaluation of the overall performance of durum wheat cultivars in conventional farming. From 2009 to 2011, field experiments were performed at 50 locations, grouped into six main geographical and pedoclimatic areas (Sicily, southern Italy, Sardinia, Thyrrenic–central Italy, Adriatic–central Italy, and northern Italy). Several cultivars were evaluated; some were tested in all the environments, whereas others were considered suitable only for a part. Trials were in a randomized complete block design with three replications.

A synthesis is shown of the agronomic performance of the 13 genotypes evaluated in all the areas for the entire period between 2009 and 2011 (Table 3, pp. 97–98). Such cultivars represents a considerable amount of the durum wheat seed commercialized in Italy. The average national yield for the period reached 4.83 t/ha; the highest production was achieved in Adriatic–central Italy (6.13 t/ha) and the lowest in Sicily (3.87 t/ha). Three of the cultivars, Claudio, Tirex, and Normanno, reached yield indexes greater than or equal to 100 in all six environments. The medium-maturing cultivar Claudio confirmed an excellent yield stability, as in the previous three-year period (2007–09).

Table 3. Yield, grain protein content and test weight of 13 Italian durum wheat cultivars tested during a three-year period (2009–11) in six areas of Italy. For length of growing cycle: E = early; ME = medium early; M = medium; ML = medium late, and L = late.

Cultivar	Cycle	Yield							
		Index (yield/column mean*100)							t/ha
		Sicily	Sardinia	South	Thyrrenic–central	Adriatic–central	North	Mean	Mean
Ciccio	E	94	92	89	88	87	84	88	4.26
Duilio	E	102	103	102	101	98	100	101	4.87
Imhotep	E	103	104	99	99	95	96	99	4.77
Iride	ME	106	109	109	105	99	101	105	5.05
Saragolla	ME	103	108	107	107	99	100	104	5.02
Tirex	ME	107	105	108	109	101	104	106	5.11
Simeto	ME	98	93	95	89	89	89	92	4.43
Anco Marzio	ME	109	106	98	103	99	103	102	4.94
Latinur	M	99	102	98	92	102	95	97	4.70
Claudio	M	109	106	108	106	104	107	107	5.15
Normanno	M	100	105	102	107	102	102	103	4.98
Dylan	ML	107	98	104	108	105	107	105	5.09
Creso	L	87	83	88	90	99	91	90	4.36
Mean (t/ha)		3.87	5.82	3.90	4.85	6.13	5.42	100	4.83
Cultivar	Cycle	Grain protein content							
		Index (grain protein content/column mean*100)							% DM
		Sicily	Sardinia	South	Thyrrenic–central	Adriatic–central	North	Mean	% DM
Ciccio	E	96	99	100	101	104	102	101	13.2
Duilio	E	99	97	99	100	101	99	99	13.0
Imhotep	E	96	95	95	97	99	98	97	12.7
Iride	ME	97	95	95	96	97	95	96	12.6
Saragolla	ME	98	97	96	97	97	97	97	12.7
Tirex	ME	98	98	100	100	101	101	100	13.2
Simeto	ME	102	102	105	107	109	107	106	13.9
Anco Marzio	ME	100	99	99	99	100	98	99	13.0
Latinur	M	100	102	103	103	102	102	102	13.4
Claudio	M	97	98	100	100	101	101	100	13.1
Normanno	M	101	101	99	99	101	100	100	13.1
Dylan	ML	102	100	100	98	98	100	100	13.1
Creso	L	104	106	104	102	101	102	103	13.5
Mean (%DM)		12.4	12.7	12.7	13.5	13.9	13.5	100	13.1

Table 3. Yield, grain protein content and test weight of 13 Italian durum wheat cultivars tested during a three-year period (2009–11) in six areas of Italy. For length of growing cycle: E = early; ME = medium early; M = medium; ML = medium late, and L = late.

		Test weight							kg/hL
		Index (test weight/column mean*100)							
Ciccio	E	101	101	101	100	100	100	100	79.6
Duilio	E	100	100	100	99	100	99	99	78.9
Imhotep	E	101	101	101	101	101	101	101	80.2
Iride	ME	100	99	100	100	100	99	100	79.0
Saragolla	ME	100	99	99	99	99	98	99	78.3
Tirex	ME	103	102	102	102	101	102	102	80.9
Simeto	ME	97	97	98	97	96	96	97	77.0
Anco Marzio	ME	102	102	102	102	102	101	102	80.8
Latinur	M	102	101	101	100	101	101	101	80.2
Claudio	M	102	102	103	103	103	103	103	81.4
Normanno	M	99	100	100	99	100	99	99	78.9
Dylan	ML	101	101	101	101	101	102	101	80.4
Creso	L	102	102	101	102	101	101	101	80.5
Mean (kg/hL)		81.5	80.6	79.6	79.0	78.9	77.8	100	79.4

The nationwide average of grain protein content was 13.1%. The greatest value was detected in Adriatic–central Italy (13.9%), and the lowest in Sicily (12.4%). Simeto and Creso, were greater than the average in every area, but this was not coupled with satisfactory grain yields. Tirex, Claudio, Normanno, and Dylan were a satisfactory compromise between high yields and good protein levels.

The national test weight mean value was 79.4 kg/hL; the best results were in Sicily (81.5 kg/hL) and Sardinia (80.6 kg/hL). As in the previous 3-year study period, the grain samples collected in northern Italy (77.8 kg/hL) had lower values. Good qualitative values were achieved by all the tested genotypes, excluding Simeto, whose average test weight for the period was 77.0 kg/hL; other values ranged from 81.4 kg/hL (Claudio) to 78.3 kg/hL (Saragolla). Claudio, Tirex, Dylan, and Anco Marzio, whose average national test weight was greater than 80 kg/hL, exceeded the local average in every area, at the same time reaching satisfactory grain yields.

Organic durum wheat: results of the 2009–11 Italian National Network Trials.

Fabrizio Quaranta, Andreina Belocchi, Massimiliano Camerini (University of Molise, Department S.A:V.A), Mauro Fornara, Sahara Melloni, Stefano Pucciarmati, and Maria Grazia D'Egidio.

The Research Unit for Cereal Quality of the Italian Agricultural Research Council (CRA–QCE, Rome) coordinates a national network trials for the evaluation of the overall performance of organically

Table 4. Yield, grain protein content, and test weight of 15 organically managed, Italian durum wheat cultivars tested during a three-year period (2009–11) in three main cropping areas of Italy. For length of growing cycle: E = early; ME = medium early; M = medium; ML = medium late, and L = late.

Cultivar	Cycle	Yield				
		Index (yield/column mean*100)				t/ha
		South	Thyrrenic–central	Adriatic–central and north	Mean	Mean
Ciccio	E	102	99	88	96	3.06
Svevo	E	101	102	102	101	3.22
Duilio	E	105	105	105	105	3.34
Simeto	ME	102	98	90	97	3.09
Saragolla	ME	102	107	100	102	3.25
Neolatino	ME	99	97	94	97	3.08
Meridiano	ME	110	105	110	109	3.47
Anco Marzio	ME	98	115	108	105	3.34
Vinci	M	96	100	98	98	3.10
Claudio	M	107	106	105	106	3.37
Colosseo	M	105	96	104	103	3.28
San Carlo	M	97	97	101	99	3.14
Normanno	M	101	98	106	103	3.26
Dylan	ML	90	98	98	94	2.99
Creso	L	90	89	93	91	2.89
Mean (t/ha)		3.08	2.85	3.51	100	3.18

Table 4. Yield, grain protein content, and test weight of 15 organically managed, Italian durum wheat cultivars tested during a three-year period (2009–11) in three main cropping areas of Italy. For length of growing cycle: E = early; ME = medium early; M = medium; ML = medium late, and L = late.

		Grain protein content				
		Index (grain protein content/column mean*100)				%DM
Ciccio	E	99	105	105	102	12.3
Svevo	E	105	106	105	105	12.6
Duilio	E	98	98	97	98	11.8
Simeto	ME	105	108	107	106	12.8
Saragolla	ME	95	93	93	94	11.3
Neolatino	ME	104	103	103	104	12.5
Meridiano	ME	96	95	96	96	11.6
Anco Marzio	ME	100	97	97	98	11.8
Vinci	M	99	98	97	98	11.8
Claudio	M	99	98	101	100	12.0
Colosseo	M	101	100	99	100	12.0
San Carlo	M	101	103	101	101	12.2
Normanno	M	99	96	97	98	11.7
Dylan	ML	99	98	98	99	11.9
Creso	L	103	103	100	102	12.2
Mean (%DM)		11.6	12.0	12.7	100	12.0
		Test weight				
		Index (test weight/column mean*100)				kg/hL
Ciccio	E	101	100	100	100	80.2
Svevo	E	101	101	101	101	80.6
Duilio	E	100	99	99	99	79.2
Simeto	ME	99	98	97	98	78.2
Saragolla	ME	97	98	98	97	77.9
Neolatino	ME	100	100	100	100	80.1
Meridiano	ME	98	99	98	98	78.1
Anco Marzio	ME	101	102	102	101	80.8
Vinci	M	99	99	99	99	78.8
Claudio	M	101	101	101	101	80.9
Colosseo	M	101	101	100	101	80.6
San Carlo	M	101	101	102	101	80.8
Normanno	M	99	99	99	99	79.2
Dylan	ML	101	100	101	101	80.3
Creso	L	101	101	100	101	80.4
Mean (kg/hL)		79.9	80.6	79.3	100	79.9

managed durum wheat cultivars, in collaboration with diverse national agencies and universities.

Between 2009 and 2011, 15 durum wheat genotypes were evaluated in 17 experimental sites, grouped in three geographical macroareas (southern Italy, Thyrrenic–central Italy, and Adriatic–central–northern Italy). Trials were carried out in a randomized complete block design with three replications.

The agronomic performance of the tested genotypes are given (Table 4, pp. 98–99). The average grain yield of these cultivars for the period 2009–11 was 3.18 t/ha. The highest value was recorded in the Adriatic central–northern Italy region (3.51 t/ha); yields were lower in the Southern (3.08 t/ha) and Thyrrenic–central Italy (2.85 t/ha) areas. Five cultivars, Meridiano, Claudio, Duilio, Saragolla, and Svevo, achieved yield indexes not lower than 100 in all three areas. Meridiano, Claudio, and Duilio, as in the previous three-year period (2007–09), had indexes that were remarkably

above average in every growing area.

Grain protein content reached an average of 12.0%. Once again, the Adriatic central–northern Italy region was the highest (12.7%). Low grain protein content was detected in grains from Thyrrenic–central Italy (12.0%) and most of all from southern Italy (11.6%), despite the reduced grain yield in these areas. Svevo had a good protein content level in every environment, associated with good productivity. The overall good performance achieved by Simeto in southern Italy is worth highlighting.

The nationwide average test weight was 79.9 kg/hL, confirming that this technological parameter reaches satisfactory values in organically managed durum wheat also. Cultivars Claudio, Anco Marzio, and Svevo gave the highest values for test weight, associated with huge yields.

Triticale: results of 2010–11 cultivar trials in central Italy.

Massimiliano Camerini (University of Molise, Department S.A:V.A.), Mauro Fornara, Federico Malagesi, Sahara Melloni, Alberto Sestili, and Fabrizio Quaranta.

The Research Unit for Cereal Quality of the Italian Agricultural Research Council (CRA–QCE, Rome) carries out field trials for the evaluation of the performance of triticale cultivars in central Italy. The aim of these trials is to provide useful informations about the quali-quantitative traits of triticale cultivars, testing at the same time their suitability to specific agroclimatic conditions. In the 2-year period between 2010 and 2011, triticale field experiments were carried out in Rome (41°58'04"N), where fields are in a tight river plain. The trials were made in a randomized complete block design with three replicates.

The agro-nomic performance of 19 triticale genotypes is given (Table 5). In 2011, the overall performance of all the tested cultivars exceeded that in 2010, basically due to reduced emergence rates. The average yield for the period was 4.83 t/ha. Amarillo and Trimour, two cultivars with medium growth cycles, reached yields that remarkably exceeded the average in every year; test weight values were slightly below the mean of the period. The highest test weight was in Forricale, a cultivar with a very early growth cycle, which also reached yields higher than the field average in both years.

Table 5. Growth cycle, grain yield, and test weight of 19 Italian triticale cultivars tested during a two-year period (2010–11) in central Italy.

Cultivar	Heading date (days after 1 April)	Yield (t/ha)			test weight (kg/hL)		
		Index		Mean	Index		Mean
		2010	2011		2010	2011	
Rigel	8	99	86	4.38	100	98	68.2
Forricale	9	110	102	5.06	109	106	73.7
Trica	10	97	82	4.23	97	96	66.2
Catria	11	96	83	4.24	94	91	63.5
Oceania	12	82	96	4.39	93	91	63.2
Agrano	18	83	76	3.80	97	98	66.9
Bienvenu	18	150	93	5.46	104	101	70.2
Trimour	18	115	116	5.58	99	98	67.8
Wilfried	18	114	91	4.78	101	99	68.7
Amarillo	20	133	124	6.14	100	99	68.5
Altair	22	90	95	4.50	95	97	65.8
Universal	22	82	116	5.03	103	103	70.5
Magistral	24	90	86	4.23	98	99	67.7
Maximal	24	99	108	5.06	105	103	71.3
Costant	25	86	85	4.11	105	104	71.8
Quark	27	98	93	4.58	96	96	65.9
Tulus	28	60	114	4.57	98	101	68.3
Isotop	28	72	123	5.08	102	99	69.3
Talentro	28	30	112	4.01	100	103	69.9
Mean	19	3.42	6.24	4.83	67.2	70.2	68.7