Table S1. Annual values of meteorological parameters in the vegetation period of winter wheat (October–June) during the long-term field experiment (1995/96–2019/20). Meteorological station Rimski šančevi (φ 45°20′ N, λ 19°51′ E, altitude 84 m).

Year	T_{mean}	T_{max}	aT_{max}	T_{min}	aT_{min}	Dtr	Etr	FD	SF	ID	WD	TD	P	P01	IP	P1	P10	ΣT_{ef}
1995/1996	7.4	12.0	33.2	3.0	-15.6	9.0	48.8	113	7	26	33	10	409	107	3.8	66	9	1369
1996/1997	8.2	13.1	33.0	3.5	-24.0	9.6	57.0	95	8	20	35	9	471	107	4.4	73	13	1398
1997/1998	9.0	14.3	33.3	4.4	-8.4	9.9	41.7	73	0	10	35	11	507	85	6.0	53	17	1440
1998/1999	8.2	13.0	31.4	3.9	-19.3	9.1	50.7	91	11	30	31	5	503	111	4.5	72	20	1456
1999/2000	9.0	14.3	36.9	4.1	-19.5	10.2	56.4	93	11	24	54	16	447	84	5.3	58	15	1593
2000/2001	10.2	16.0	32.0	5.4	-11.2	10.6	43.2	57	2	3	37	5	699	103	6.8	72	22	1666
2001/2002	9.1	14.6	37.6	4.3	-19.1	10.2	56.7	85	11	24	44	12	302	82	3.7	47	10	1630
2002/2003	8.7	13.9	36.3	3.6	-25.0	10.4	61.3	97	19	39	56	29	298	92	3.2	59	8	1717
2003/2004	8.2	12.9	30.5	4.1	-18.3	8.9	48.8	70	8	16	26	1	611	119	5.1	81	19	1349
2004/2005	8.0	12.8	32.4	3.5	-24.2	9.2	56.6	93	13	24	30	7	582	100	5.8	64	13	1464
2005/2006	8.2	12.8	34.5	3.9	-13.8	8.9	48.3	86	7	16	23	13	480	109	4.4	76	15	1401
2006/2007	11.0	16.7	36.0	5.8	-6.3	10.9	42.3	43	0	1	50	10	422	91	4.6	47	14	1802
2007/2008	9.1	14.0	34.0	4.7	-12.1	9.4	46.1	73	3	20	40	11	514	112	4.6	65	17	1534
2008/2009	9.5	14.6	32.4	5.0	-15.9	9.6	48.3	63	6	20	36	9	423	116	3.6	67	12	1652
2009/2010	9.0	13.4	34.0	5.0	-21.2	8.4	55.2	67	8	17	33	7	772	141	5.5	98	25	1564
2010/2011	8.5	13.5	33.7	4.1	-13.4	9.4	47.1	78	13	33	34	4	388	96	4.0	66	14	1524
2011/2012	8.5	13.8	36.0	3.6	-28.7	10.3	64.7	98	16	20	47	17	363	98	3.7	63	7	1557
2012/2013	9.4	14.3	34.8	5.2	-13.9	9.1	48.7	65	4	11	42	11	603	132	4.6	91	17	1576
2013/2014	10.4	15.7	33.6	5.7	-13.4	10.0	47.0	55	2	7	31	6	483	87	5.6	54	12	1732
2014/2015	9.9	14.9	33.3	5.4	-16.6	9.5	49.9	48	3	8	42	8	551	96	5.7	62	14	1602
2015/2016	10.2	15.2	34.8	5.7	-11.0	9.5	45.8	48	1	8	42	7	603	110	5.5	69	24	1656
2016/2017	8.6	13.7	36.6	3.8	-19.4	9.9	56.0	82	11	29	41	12	429	88	4.9	57	10	1576
2017/2018	10.4	15.6	34.1	5.9	-20.3	9.6	54.4	57	2	7	62	14	594	113	5.3	75	18	1799
2018/2019	10.0	15.2	33.2	5.2	-16.3	10.0	49.5	70	3	14	37	13	435	99	4.4	67	10	1714
2019/2020	10.4	16.1	34.4	5.5	-6.6	10.6	41.0	51	0	5	40	5	477	93	5.1	63	15	1719
Average	**9.2**	**14.3**	**34.1**	**4.6**	**-16.5**	**9.7**	**50.6**	**74**	**7**	**17**	**39**	**10**	**495**	**103**	**4.8**	**67**	**15**	**1579**
Max.	**11.0**	**16.7**	**37.6**	**5.9**	**-6.3**	**10.9**	**64.7**	**113**	**19**	**39**	**62**	**29**	**772**	**141**	**6.8**	**98**	**25**	**1802**
Min.	**7.4**	**12.0**	**30.5**	**3.0**	**-28.7**	**8.4**	**41.0**	**43**	**0**	**1**	**23**	**1**	**298**	**82**	**3.2**	**47**	**7**	**1349**

T_{mean} – Mean annual air temperature (°C), T_{max} – Mean maximum annual air temperature (°C), aT_{max} – Absolutely maximum annual air temperature (°C), T_{min} – Mean minimum annual air temperature (°C), aT_{min} – Absolutely minimum annual air temperature (°C), Dtr – Diurnal temperature range (T_{max}-T_{min}) (°C), Etr – Extreme temperature range (aT_{max}-aT_{min}), FD – Number of days with frost (T_{min} <0 °C), SF – Number of days with strong frost (T_{min} ≤-10 °C), ID – Number of icy days (T_{max} <0 °C), WD – Number of warm days (T_{max} ≥25 °C), TD – Number of tropical (hot) days (T_{max} ≥30 °C), P – Annual precipitation amount (mm), P01 – Number of days with precipitation (P ≥0.1 mm), IP – Annual intensity of precipitation (amount of precipitation / number of days with precipitation), P1 – Number of days with light rain (P ≥1 mm), P10 – Number of days with heavy rain (P ≥10 mm), ΣT_{ef} – The average annual sum of effective air temperatures (T_{base} = 5 °C).

Table S2. Analyzed varieties, year of release, representation of wheat varieties in the trial, and number of tested varieties by year (1995/96–2019/20).

Varieties included in the analysis * (in the order of sowing in a 20-year period)					Varieties (in order of sowing in the 25-year period) in certain years								
Designation	Variety	Year of release**	Years in the trial		Year	Varieties							Number of varieties
V1	**Pobeda**	1990	18		**1995/96**	V1	V5	V3	V6	V2	V7	V4	V12	8
V2	**Sremica**	1974	11		**1996/97**	V1	V5	V3	V6	V2	V7	V4	V12	8
V3	**NS Rana 2**	1975	10		**1997/98**	V1	V5	V3	V6	V2	V7	V4	V12	8
V4	**Libellula**	1965 (Italy)	10		**1998/99**	NATO bombing of the FR Yugoslavia – the trial was not harvested.								-
V5	**Drina**	1973	8		**1999/00**	V1	V5	V3	V6	V2	V7	V4	V12	8
V6	**Jugoslavija**	1980	8		**2000/01**	V1	V5	V3	V6	V2	V7	V4	V8	8
V7	**Lasta**	1987	8		**2001/02**	V1	V5	V3	V6	V2	V7	V4	V8	8
V8	**Sofija**	1998	8		**2002/03**	V1	V5	V3	V6	V2	V7	V4	V8	8
V9	**Simonida**	2003	8		**2003/04**	V1	V5	V3	V6	V2	V7	V4	V8	8
V10	**NS Ilina**	2010	6		**2004/05**	V1	-	-	V2	V8	V18	V14	-	5
V11	**NS Vlajna**	2014	6		**2005/06**	V1	V19	-	V2	V8	V18	V14	V20	7
V12	**Somborka**	1986	4		**2006/07**	V20	V8	V2	V19	V18	-	-	V15	6
V13	**NS Obala**	2015	5		**2007/08**	V20	-	V15	-	-	-	V8	V19	4
V14	**Balkan**	1979	4		**2008/09**	Facultative variety "Nataša" – sown as spring wheat (first half of March) on the entire trial. These three years are not included in analyses.								-
V15	**NS 40S**	2006	4		**2009/10**									-
V16	**NS Petrija**	2013	4		**2010/11**									-
V17	**NS Epoha**	2016	4		**2011/12**	V9	V3	-	V4	-	V15	V1	V14	6
V18	**Pesma**	1995	3		**2012/13**	V15	V4	V1	-	V9	V3	V14	-	6
V19	**Ljiljana**	2000	3		**2013/14**	Strong appearance of *Puccinia striiformis* – the trial was not harvested.								-
V20	**Dragana**	2002	3		**2014/15**	-	-	V10	-	V1	V11	V9	-	4
Total:	**20**	**(1965–2016)**	**135**		**2015/16**	V13	V16	V10	-	V1	V11	V9	-	6
					2016/17	V13	V16	V10	V17	V1	V11	V9	-	7
					2017/18	V13	V16	V10	V17	V1	V11	V9	-	7
					2018/19	V13	V16	V10	V17	V1	V11	V9	-	7
					2019/20	V13	-	V10	V17	V1	V11	V9	-	6
												Total:	135

* All varieties that were represented in the trial for at least three years (varieties that were sown for only 1 or 2 years were excluded from further analyses). ** Except from the old Italian variety "Libellula", the other 19 high-yielding varieties were released by the Institute of Field and Vegetable Crops, Novi Sad.

Table S3. The sequence of crop changes in crop rotation at the "ISDV" trial by years, during the research period (1995/96–2019/20).

Year	Experimental fields		
	I	II	III
1995/96	**Winter wheat**	Maize	Soybean
1996/97	Maize	Soybean	**Winter wheat**
1997/98	Soybean	**Winter wheat**	Maize
1998/99	**Winter wheat**	Maize	Soybean
1999/00	Maize	Soybean	**Winter wheat**
2000/01	Soybean	**Winter wheat**	Maize
2001/02	**Winter wheat**	Maize	Soybean
2002/03	Maize	Soybean	**Winter wheat**
2003/04	Soybean	**Winter wheat**	Maize
2004/05	**Winter wheat**	Maize	Soybean
2005/06	Maize	Soybean	**Winter wheat**
2006/07	Soybean	**Winter wheat**	Maize
2007/08	**Winter wheat**	Maize	Soybean
2008/09	Maize	Soybean	**Winter wheat**
2009/10	Soybean	**Winter wheat**	Maize
2010/11	**Winter wheat**	Maize	Soybean
2011/12	Maize	Soybean	**Winter wheat**
2012/13	Soybean	**Winter wheat**	Maize
2013/14	**Winter wheat**	Maize	Soybean
2014/15	Maize	Soybean	**Winter wheat**
2015/16	Soybean	**Winter wheat**	Maize
2016/17	**Winter wheat**	Maize	Soybean
2017/18	Maize	Soybean	**Winter wheat**
2018/19	Soybean	**Winter wheat**	Maize
2019/20	**Winter wheat**	Maize	Soybean

Table S4. Analysis of variance for wheat grain yield under different years (Y), straw management and N-fertilization treatments (SN), and varieties (V).*

Source	d.f.	SS	SS (%)	MS	F	p
Model	1352	11329.529	-	8.380	24.935	<0.001
Replicates	3	23.804	0.2	7.935	23.610	<0.001
Year (Y)	19	5610.281	49.5	295.278	878.631	<0.001
Treatment (SN)	9	3270.483	28.9	363.387	1081.296	<0.001
Variety (V)	19	341.822	3.0	17.991	53.533	<0.001
Y×SN	171	1308.077	11.5	7.650	22.762	<0.001
Y×V	96	425.154	3.8	4.429	13.178	<0.001
SN×V	171	80.484	0.7	0.471	1.401	<0.001
Y×SN×V	864	269.425	2.4	0.312	0.928	0.918
Error	4047	1360.060	-	0.336	-	-
Total	5399	12689.588	-	-	-	-

* d.f. – Degrees of freedom, SS – Sum of squares, MS – Mean squares, F – variance ratio (F-test), p – Probability value corresponding to a variance ratio.