Table S1. Cumulative precipitation and mean temperature during 2007-2010 period and the long-term meteorological series (1973–2010) at the site of Ussana (39° N, 9° E; 114 m a.s.l.).

Months	Long-term	2007-2008	2008-2009	2009-2010
Maximum temperature (°C)				
November	19.2	20.0	20.5	21.9
December	16.1	17.5	15.4	16.8
January	15.0	19.6	15.7	14.2
February	15.3	18.4	16.0	16.8
March	17.5	18.6	19.0	18.8
April	20.0	23.7	21.4	23.2
May	25.0	27.4	28.4	24.1
June	29.7	31.2	32.2	29.1
Minimum temperature (°C)				
November	9.0	8.8	10.2	9.0
December	6.2	5.6	6.3	7.3
January	5.0	5.4	5.5	5.8
February	4.9	4.1	3.9	7.4
March	6.0	7.0	6.7	7.0
April	7.9	8.6	10.4	9.2
May	11.4	14.0	12.4	12.2
June	14.9	16.3	15.6	15.5
Total rainfall rainfall (mm)				
November	22.5	34.8	67.6	39.8
December	20.4	33.1	75.4	29
January	15.1	33	118	113
February	15.9	17.4	38.8	50.2
March	13.2	46	47.4	23.6
April	16.1	10.8	111.6	58.1
May	8.5	31.2	12	67
June	4.1	4.2	2.6	37.3

Table S2. Cumulative precipitation and mean temperature during 2007-2010 period and the long-term meteorological series (1958–2008) at the site of Ottava (40° N, 8° E; 81 m a.s.l.).

Months	Long-term	2007-2008	2008-2009	2009-2010
Maximum temperature (°C)				
November	17.6	16.0	16.3	17.1
December	14.2	12.8	12.1	13.3
January	13.3	13.3	11.6	10.8
February	13.6	13.8	12.6	12.1
March	15.4	15.3	14.5	15.0
April	17.8	18.6	17.7	19.1
May	22.2	22.9	25.3	21.4
June	26.5	27.2	28.8	27.7
Minimum temperature (°C)				
November	9.7	8.7	9.8	10.3
December	7.2	6.1	7.0	8.2
January	6.0	6.1	5.9	3.1
February	6.0	5.3	4.2	3.3
March	6.8	6.6	6.9	5.0
April	8.7	10.2	10.5	8.3
May	11.9	14.1	14.8	11.5
June	15.1	16.4	17.1	15.2
Total rainfall rainfall (mm)				
November	91.3	49.8	166.1	85.9
December	72.3	53.1	138.4	83.0
January	50.3	53.9	83.4	90.8
February	44.9	30.8	50.3	73.1
March	48.4	77.3	64.7	62.5
April	46.3	27.9	77.5	76.1
May	35.0	69.0	15.4	69.7
June	15.9	27.2	19.5	60.8

Table S3. Soil properties at Ussana (Petrocalcic Palexeralf)[1] and Ottava (Lithic Xerorthents) experimental sites at the beginning of experiment in 2007.

Soil parameters	Sites	
	Ussana	**Ottava**
Clay (%)	22.1	16.5
Silt (%)	21.5	16.0
Field capacity (%)	33	30
Wilting point (%)	17	17
Bulk density (g m^{-3})	1.25	1.27
pH	7.9	8.4
Total N (%)	0.07	0.21
Soil organic matter (%)	1.2	1.7
Organic C (%)	0.83	2.98

[1] [88]

Table S4. Agronomical management at both experimental fields

Cultivation details		
Previous crop		Winter cereals
Tillage operations		
	Ploughing	25 cm
	Harrowing	15 cm
Seedbed preparation	Rolling	
Sowing		
	Cultivar	Kabel
	Density	120 seeds m^{-2}
	Depth	2 cm
Fertilization		
	At sowing	36 kg N ha^{-1}; 92 kg P_2O_5 ha^{-1}
	Before flowering	92 kg N ha^{-1}

Table S5. Less relative weed abundant (%) species during the 3-year experiment at Ottava site. See also data repository for raw data (http://dx.doi.org/10.17632/gmg62gv9y9.1).

Year	Treatment		*Beta vulgaris* L.	*Geranium molle* L.	*Medicago polymorpha* L.	*Polygonum aviculare* L.	*Stellaria media* (L.) Vill.	*Veronica persica* Poir.
2008	T		0.0	0.0	0.0	0.0	0.0	0.0
	M50		0.0	0.0	0.0	0.0	0.0	0.0
	M75		0.0	0.0	0.0	0.0	0.0	0.0
	M100		0.0	0.0	0.0	0.0	0.0	0.0
	PE		0.0	0.0	0.0	0.0	0.0	0.0
	W		0.0	0.0	0.0	0.0	0.0	0.0
2009	M25		10.0	0.0	6.9	0.0	0.0	0.0
	M50		6.1	0.0	4.0	0.0	0.0	0.0
	M75		0.0	0.0	0.0	0.0	0.0	0.0
	M100		0.0	0.0	0.0	0.0	0.0	0.0
	PE		2.9	0.0	7.4	0.0	0.0	0.0
	W		6.2	0.0	5.4	0.0	0.0	0.0
2010	M25		0.0	7.3	0.0	3.1	6.1	6.4
	M50		0.0	5.0	0.0	7.3	0.0	0.0
	M75		0.0	0.0	0.0	0.0	0.0	0.0
	M100		0.0	0.0	0.0	0.0	0.0	0.0
	PE		0.0	5.3	0.0	6.5	6.4	5.6
	W		0.0	5.9	0.0	6.0	0.0	0.0
Analysis of variance	Year (T)	2	**	**	**	*	***	***
	Treatment (T)	5	***	***	**	**	***	***
	YxT	10	***	***	**	***	***	***

M25, M50, M75, M100 = metazachlor at 25%, 50%, 75%, 100% of the labelled dose, respectively; T = Trifluralin; PE = post-emergence treatment; W = weedy treatment.

The asterisks *, **, ***, or ns indicate statistical differences at $P < 0.05$, $P < 0.01$, $P < 0.001$, or non significant, respectively.