

PRODIVA

CROP DIVERSIFICATION AND WEEDS

Work package 2:

Crop mixtures for weed suppression

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Sown area of selected crop in Poland, 2015

CROPS	Number of hectares (in thous. ha)	% of total sown area (%)	% of total arable land (%)	% of total cereal area (%)
Cereal/legumes mix. *	41	0,4	0,3	0,5
Cereal mixed	813	7,6	5,9	10,8
Total legumes for grain	407	3,8	3,0	5,4
Total spring barley area	608	5,7	4,4	8,1
Total cereals area	7 512	69,9	54,7	
Total sown area	10 753			
Total arable land	13 736			
Total agricultural land	18 621			

Statistical Yearbook of Agriculture, Central Statistical Office, Warszawa, 2016.

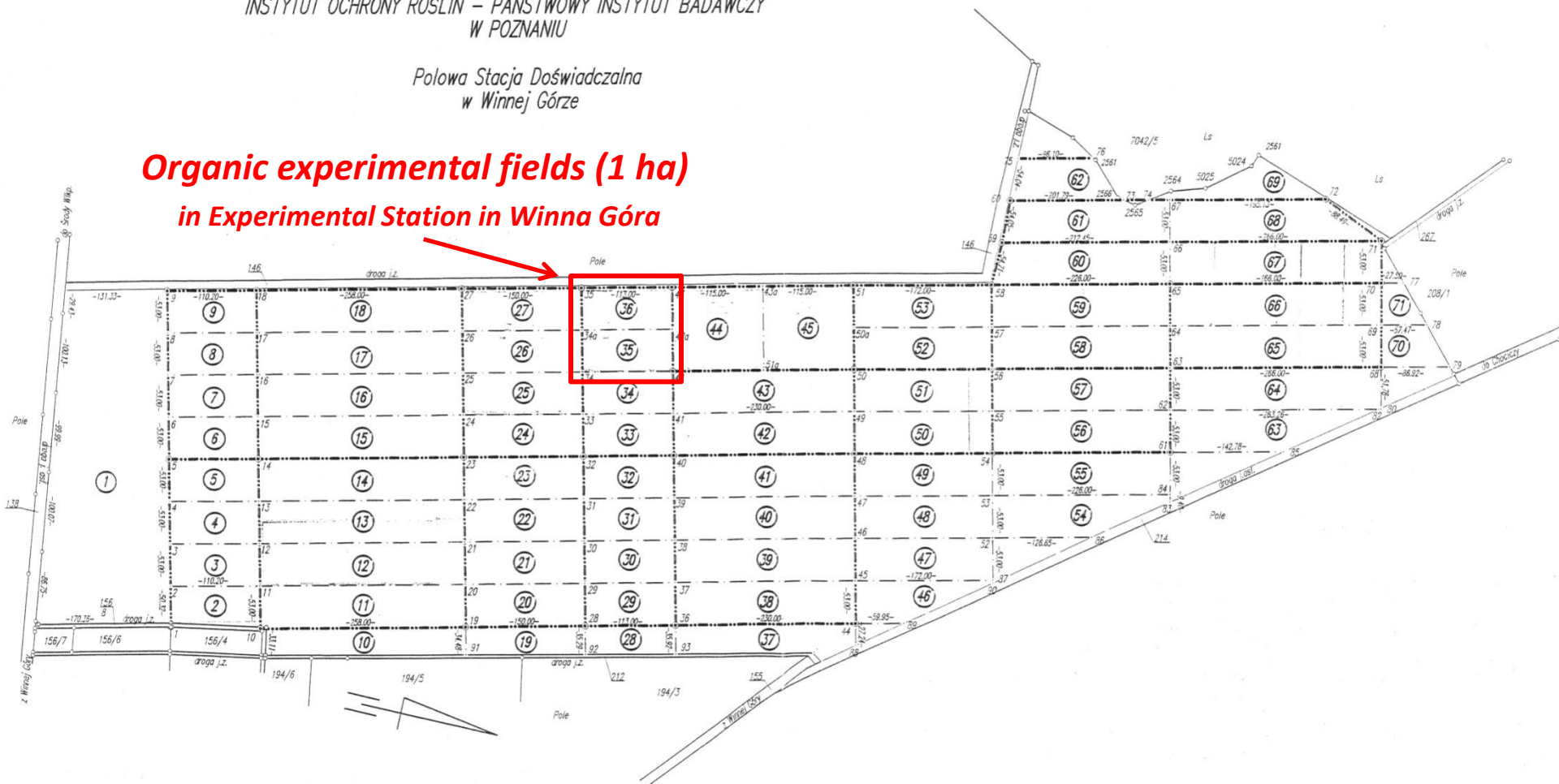
*Metodyka integrowanej ochrony mieszanek zbożowych dla producentów, IOR-PIB, 2014.

MAPA SYTUACYJNO-POGLĄDOWA POLA DOŚWIADCZALNEGO
skala 1:5000

INSTYTUT OCHRONY ROŚLIN – PAŃSTWOWY INSTYTUT BADAWCZY
W POZNANIU

Polowa Stacja Doświadczalna
w Winnej Górze

Organic experimental fields (1 ha)
in Experimental Station in Winna Góra





**Organic experimental fields (1 ha)
in Experimental Station in Winna Góra**



Fot. IWING, 2015



Design of the experiment, 2017

	15 801	13 802	16 803	12 804	11 805	14 806	
	12 701	11 702	14 703	16 704	15 705	13 706	
	5 601	3 602	6 603	2 604	1 605	4 606	
	2 501	1 502	4 503	6 504	5 505	3 506	

	3 401	6 402	5 403	1 404	4 405	2 406	
	1 301	2 302	3 303	4 304	5 305	6 306	
	13 201	16 202	15 203	11 204	14 205	12 206	
	11 101	12 102	13 103	14 104	15 105	16 106	

Number treatment	Farming system	Crop species (seed rate proportion)	Seed rate (Number seed/m ²)
1	Organic	Barley (100%)	350
2		Pea (100%)	110
3		Barley (70%) + Pea (30%)	245 + 33
4		Barley (50%) + Pea (50%)	175 + 55
5		Barley (30%) + Pea (70%)	105 + 77
6		Without crop- only natural weeds	
11	Conventional	Barley (100%)	350
12		Pea (100%)	110
13		Barley (70%) + Pea (30%)	245 + 33
14		Barley (50%) + Pea (50%)	175 + 55
15		Barley (30%) + Pea (70%)	105 + 77
16		Barley (100%)	250



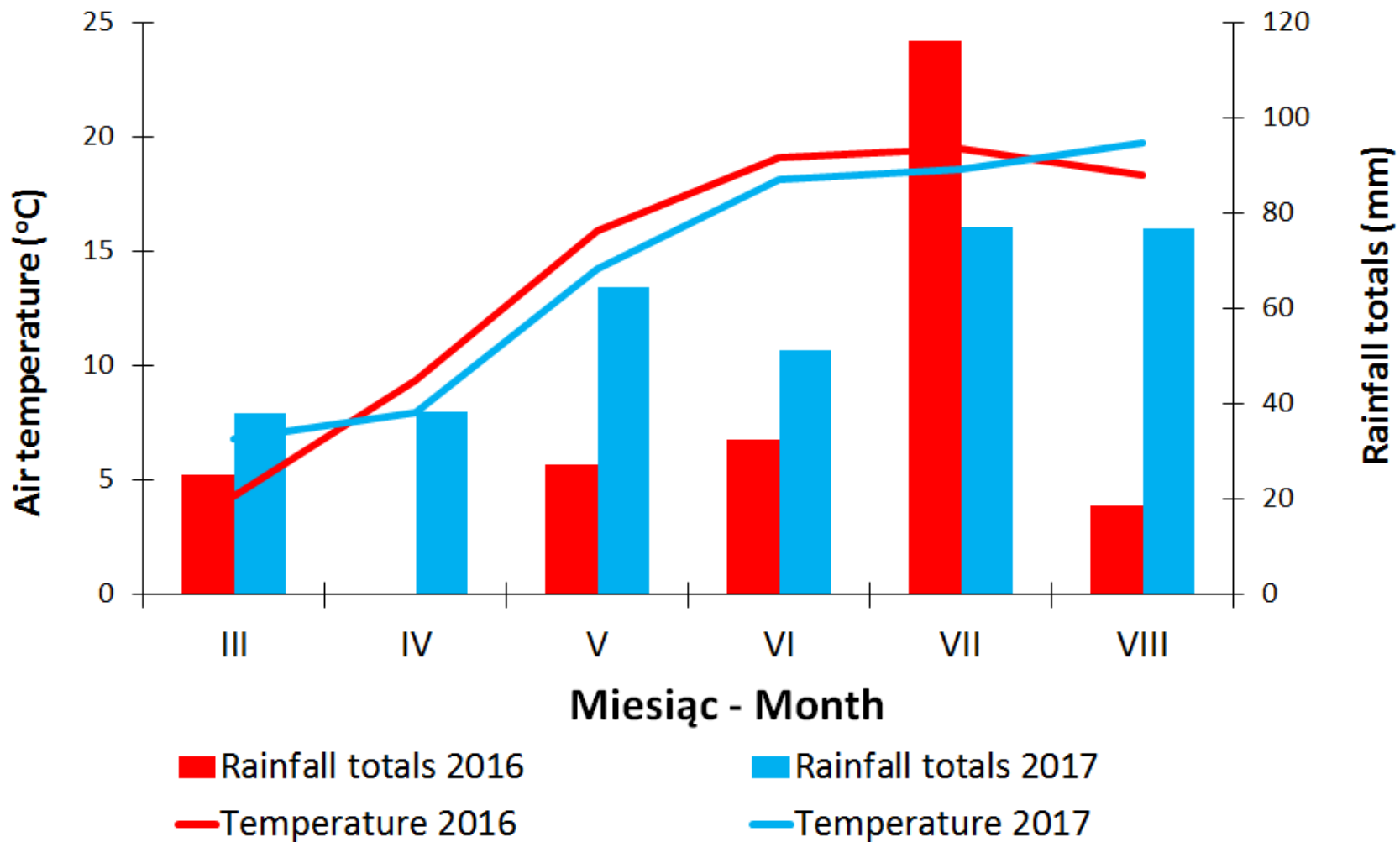
Field experiment:

- four replication,
- plots size 9 m x 1,5 m;

Analysis performed regarding to:

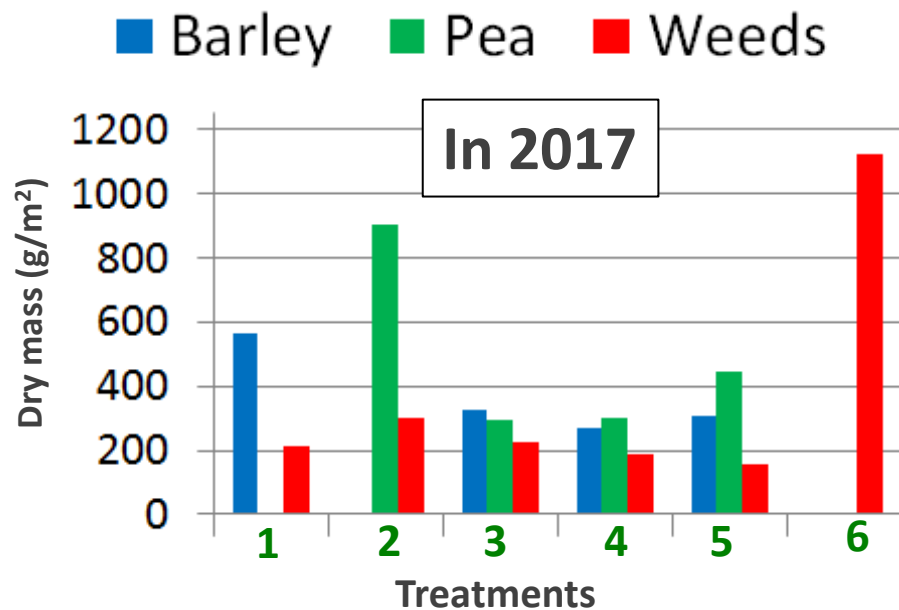
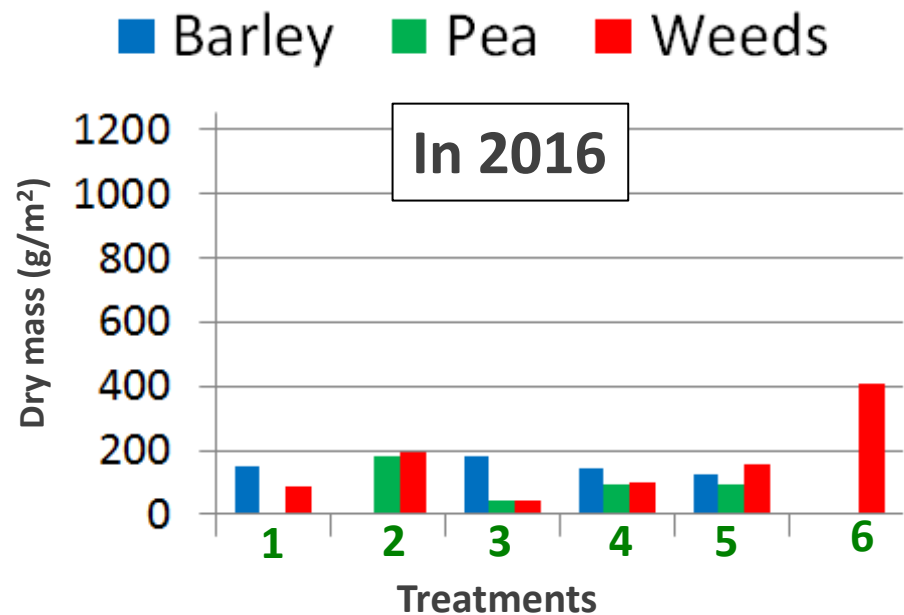
- dry weight of crops and weeds (above the ground)
- LAI, SPAD, number of ears/grain and pods/seeds (No/m²)
- quantity and quality of yield

Weather conditions, 2016-2017





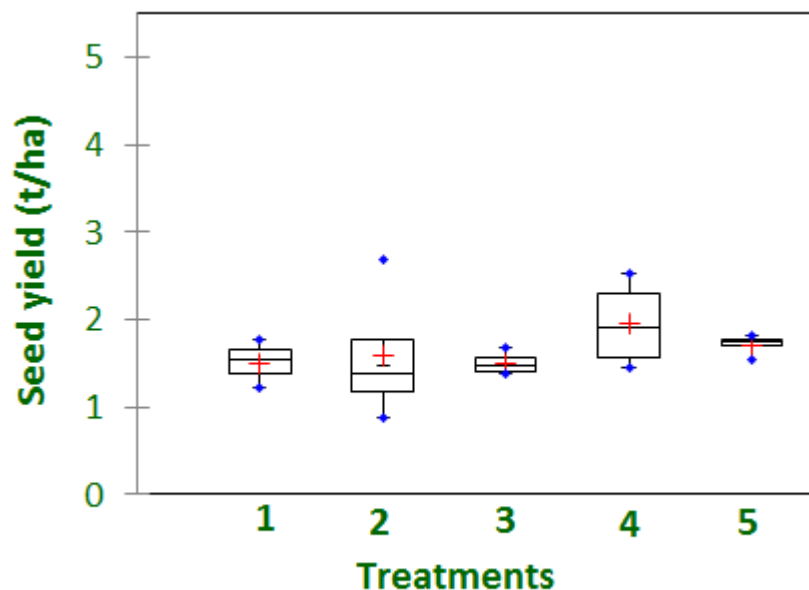
Dry mass of plants (g/m²) in organic system



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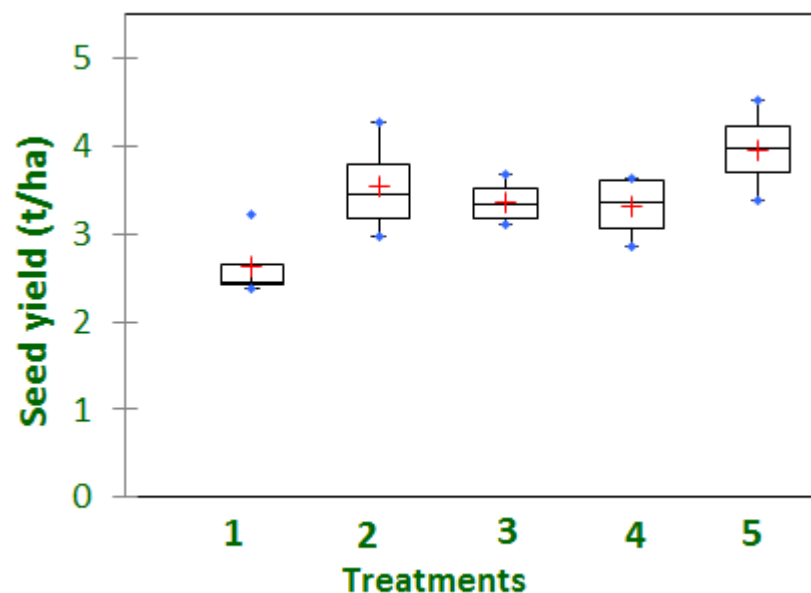
Organic system- yield of seeds (t/ha)

In 2016



+ Mean • Minimum/Maximum

In 2017

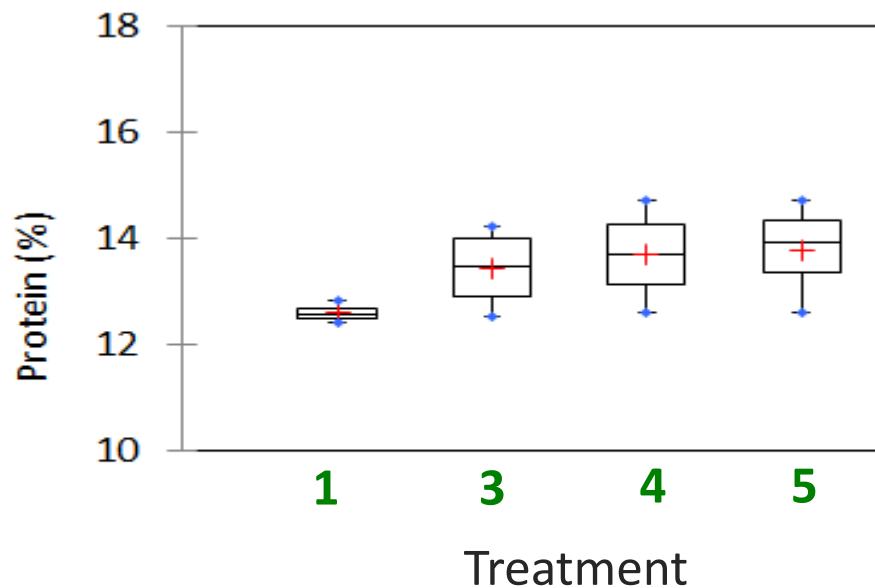


+ Mean • Minimum/Maximum

Number treatment	Farming system	Crop species (seed rate proportion)	Seeding rates number/m ²
1	Organic	Barley (100%)	350
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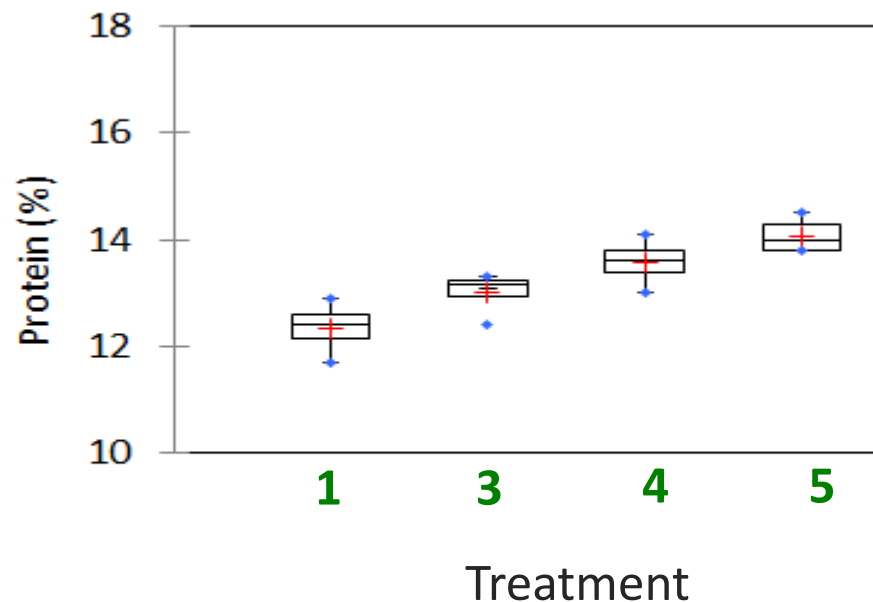
Barley seeds- protein content (%)

Organic system in 2016



+ Mean ♦ Minimum/Maximum

Organic system in 2017



+ Mean ♦ Minimum/Maximum

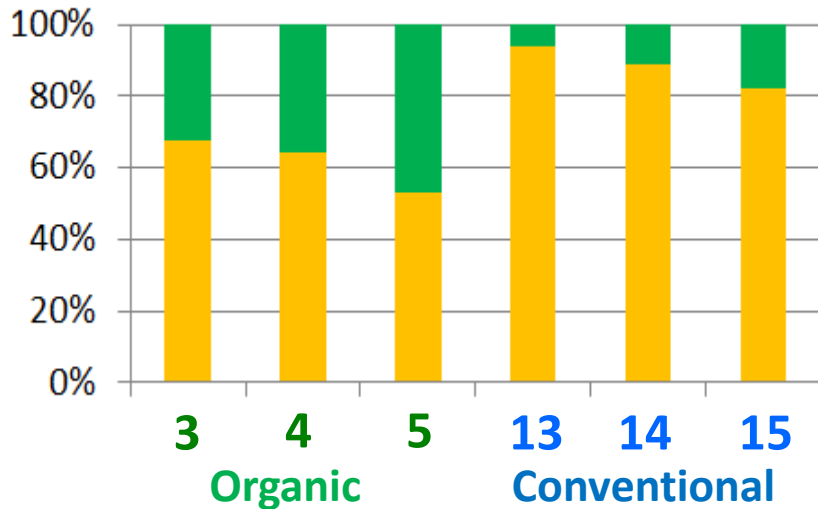
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1	Organic	Barley (100%)
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Structure of yield- percentage of BARLEY/PEA seeds (%)

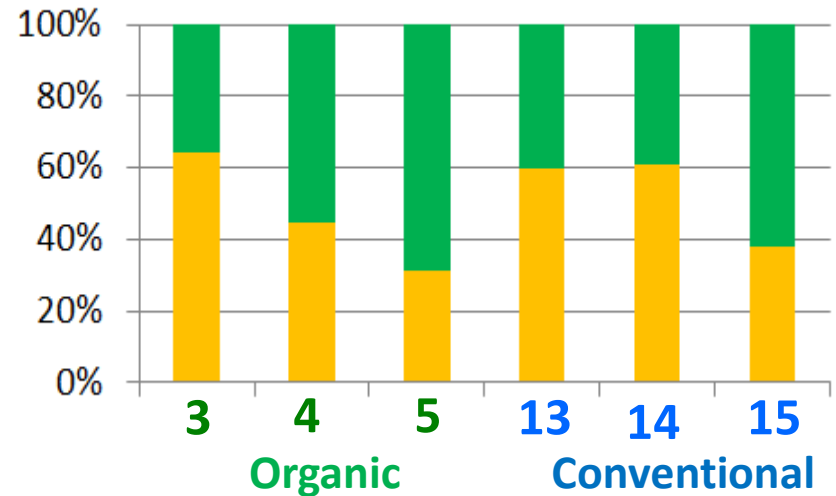
In 2016

■ Pea ■ Barley



In 2017

■ Pea ■ Barley



Number tretment	Farming system	Crop species (seed rate proportion)	Seeding rates number/m ²
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Controlled experiments with mixtures of barley and pea

1/ Glasshouse experiment : weed- *Elymus repens*

2/ Growth chamber experiment: *Sinapis alba* as a model weed

Scheme of controlled experiments (six replications)

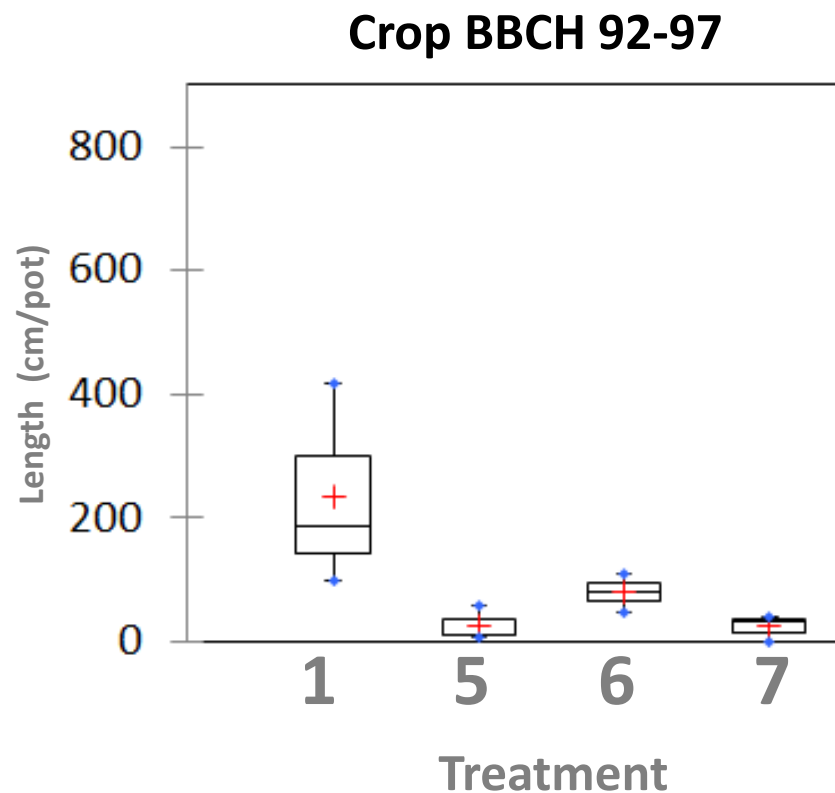
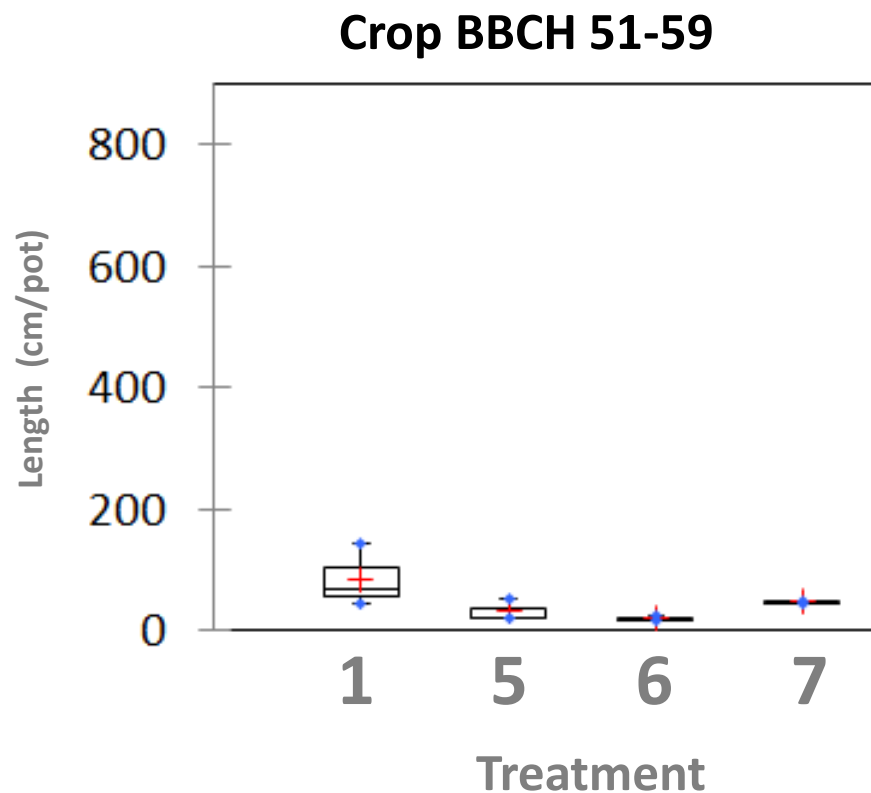
1. **Weeds** (*Elymus repens* and *Sinapis alba* as a model weed)
2. Solo pea
3. Solo barley
4. Barley and pea (50% / 50%)
5. Barley + **weeds**
6. Pea + **weeds**
7. Barley and pea (50% / 50%) + **weeds**

Analyses

- Dry mass of crops and couch grass (AGRRE)
- Couch grass rhizomes weight and length per unit
- Number and weight of seeds per unit
- Number of ears/grain and pods/seeds (No/pot)
- Yield quantity



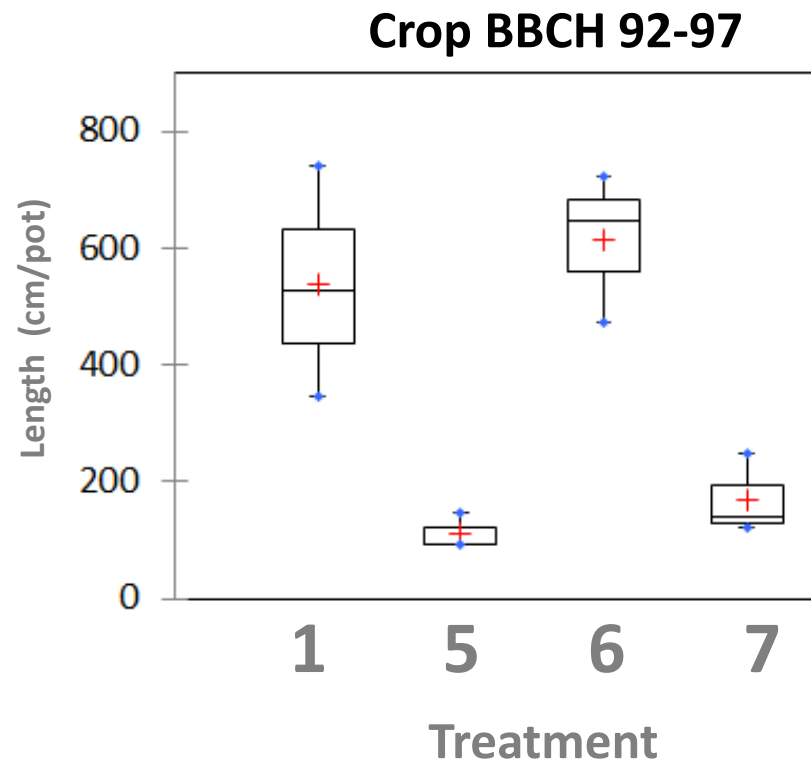
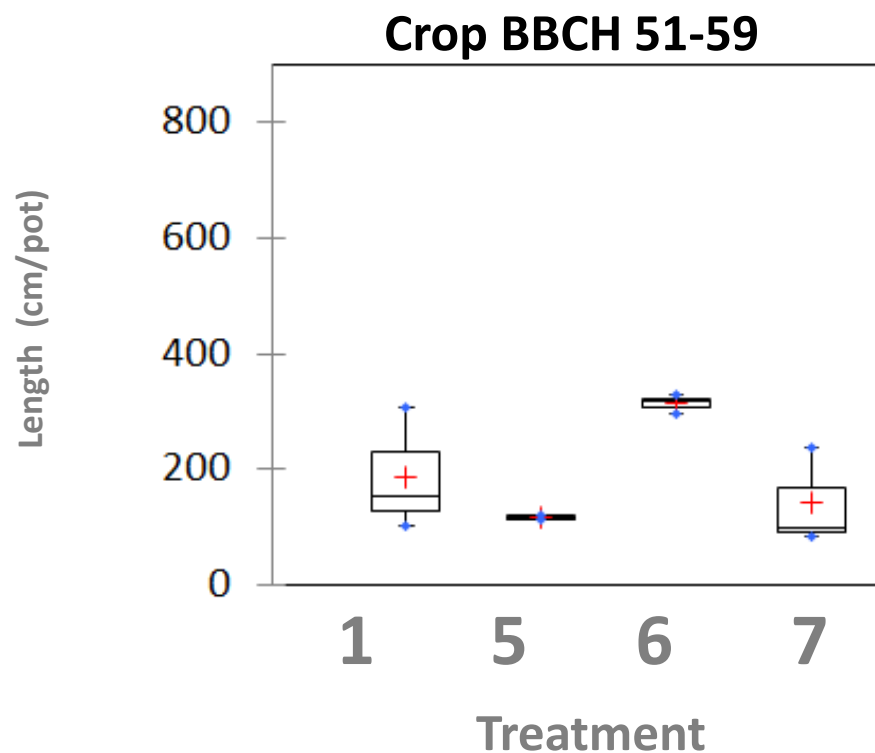
Pots experiment in 2016: rhizomes length of AGRRE (couch grass)



1. Weeds (*Elymus repens* as a model weed)
5. Barley + weeds
6. Pea + weeds
7. Barley and pea (50% / 50%) + weeds



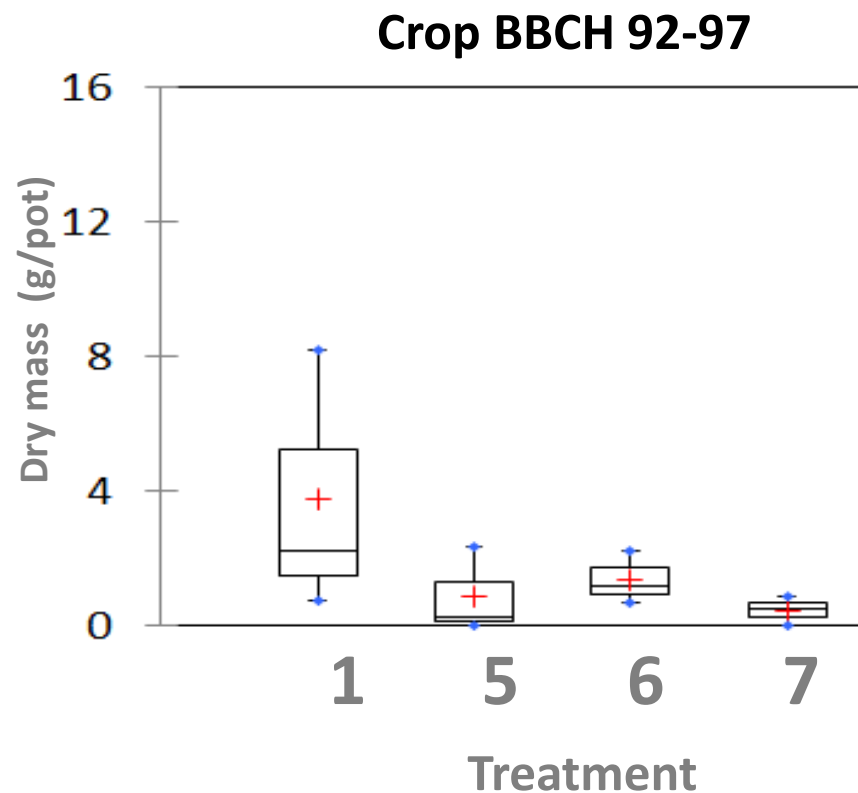
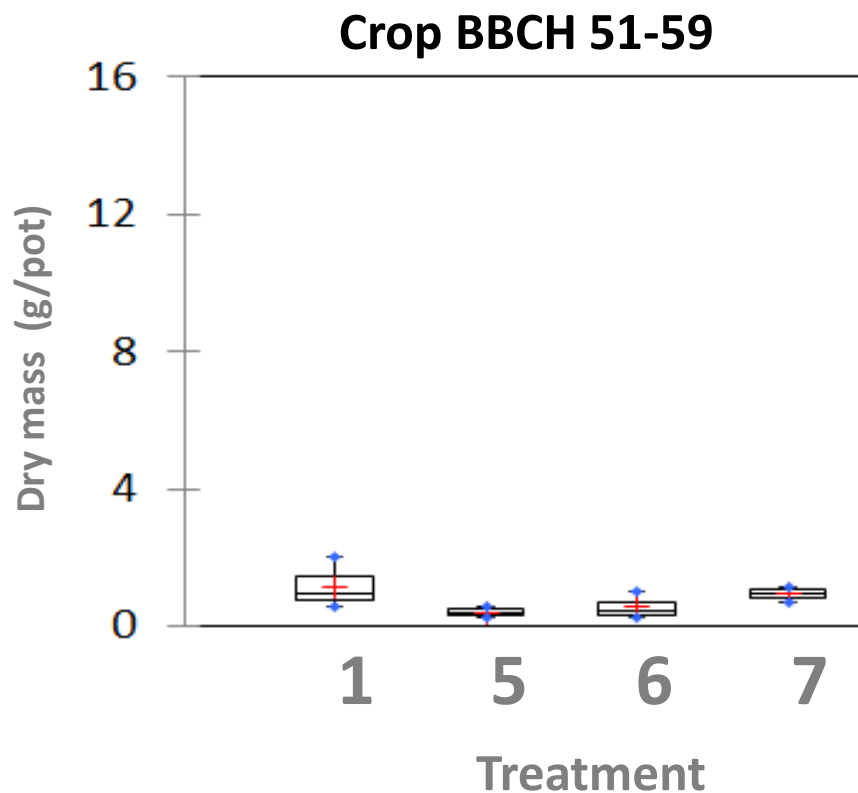
Pot experiments in 2017: rhizomes length of AGRRE (couch grass)



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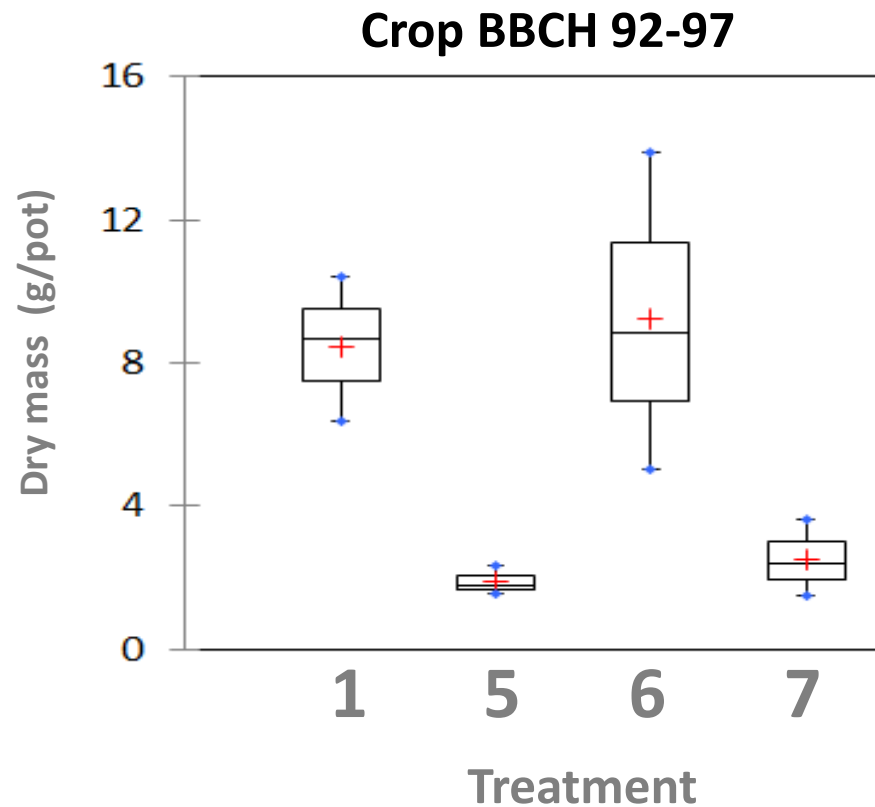
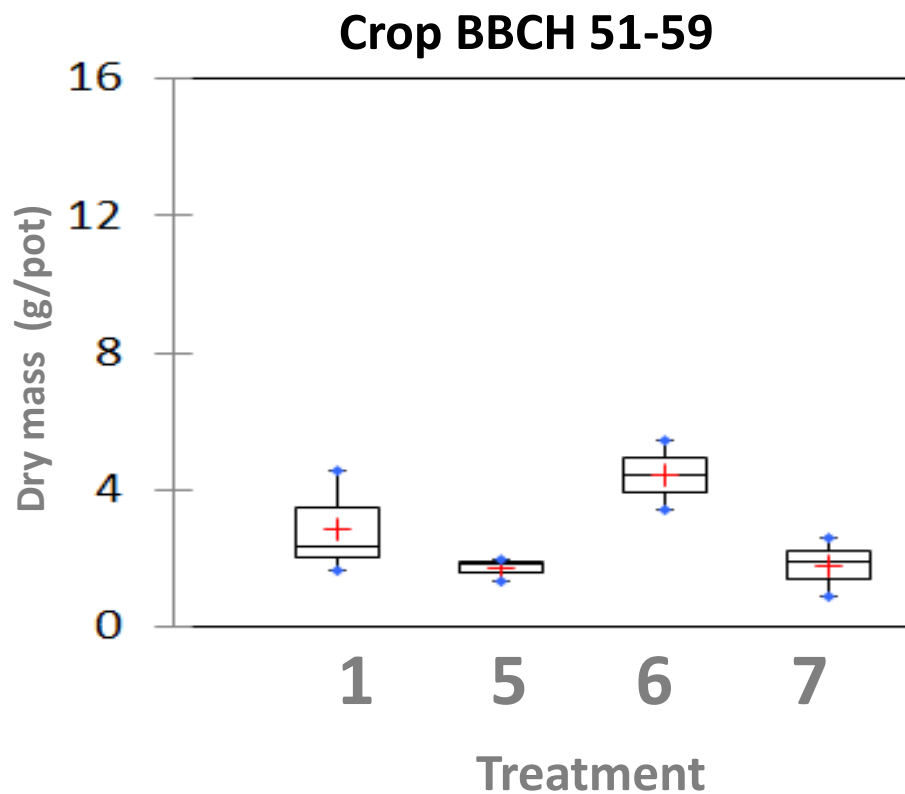
Pot experiments in 2016: rhizomes dry mass of AGRRE (couch grass)



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Pot experiments in 2017: rhizomes dry mass of AGRRE (couch grass)



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Thank you for your attention