

# **Effect of application-time on control *Orobanche cumana* in HT sunflower**

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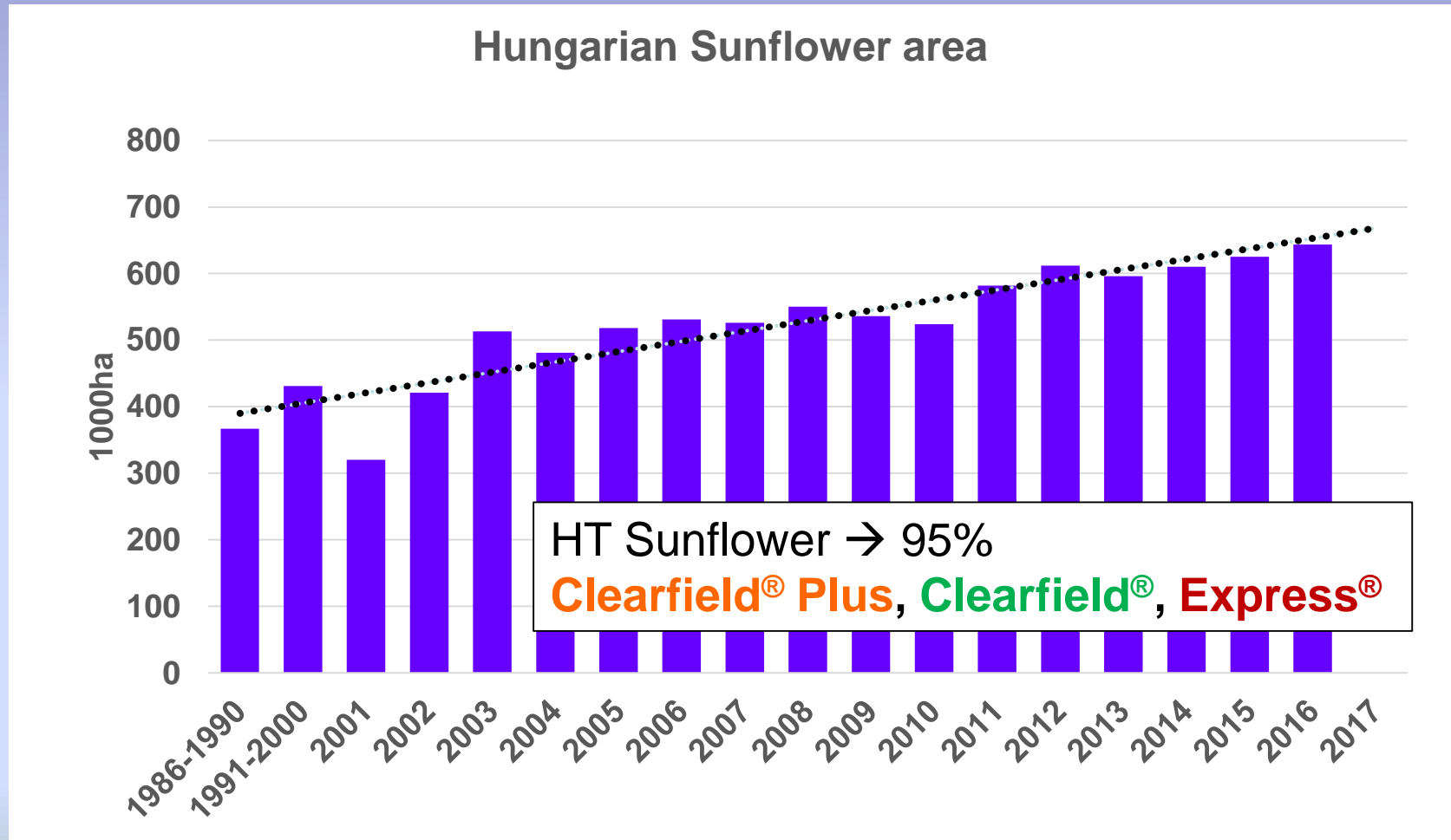
&

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**EWRS Working Group Herbicide Tolerant Varieties – Workshop**

**Novi Sad, Serbia  
29-31 May 2017**

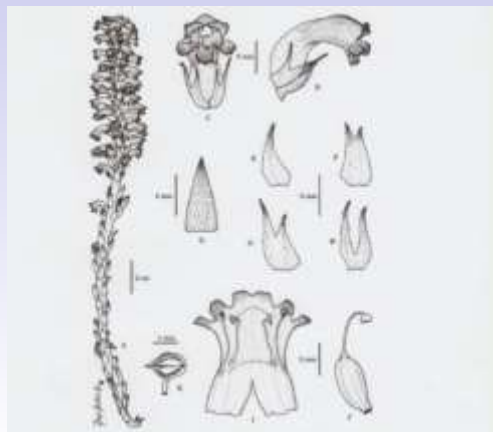
# Background



# Taxonomy

## *Orobanche cernua*:

- Native
- Short stem
- Thick inflorescence



## *Orobanche cumana*:

- Adventive
- 20-40 cm stem
- Loose inflorescence

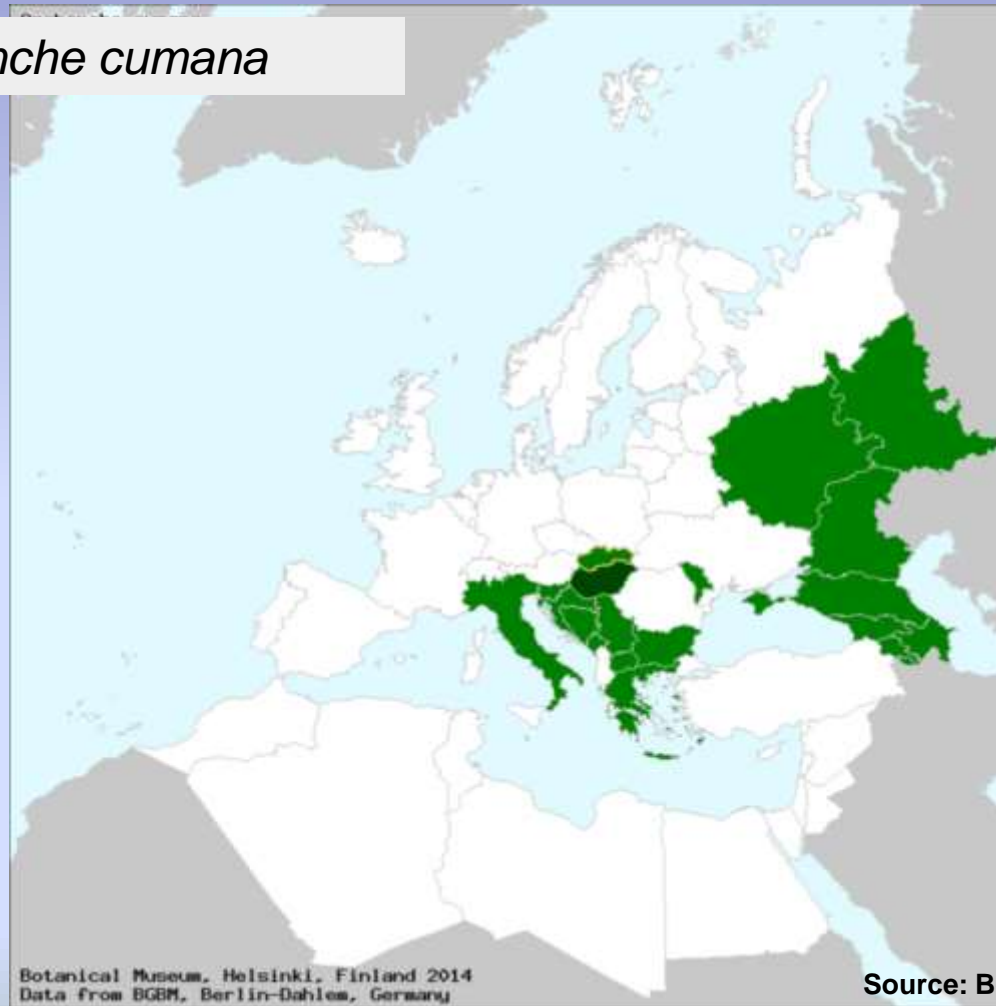


Hybridization ability → *O. cernua* subsp. *cumana*

Source: PUJADAS & VELASCO (2008)

# Habitats

*Orobanche cumana*



Source: Botanical Museum Helsinki (2014)



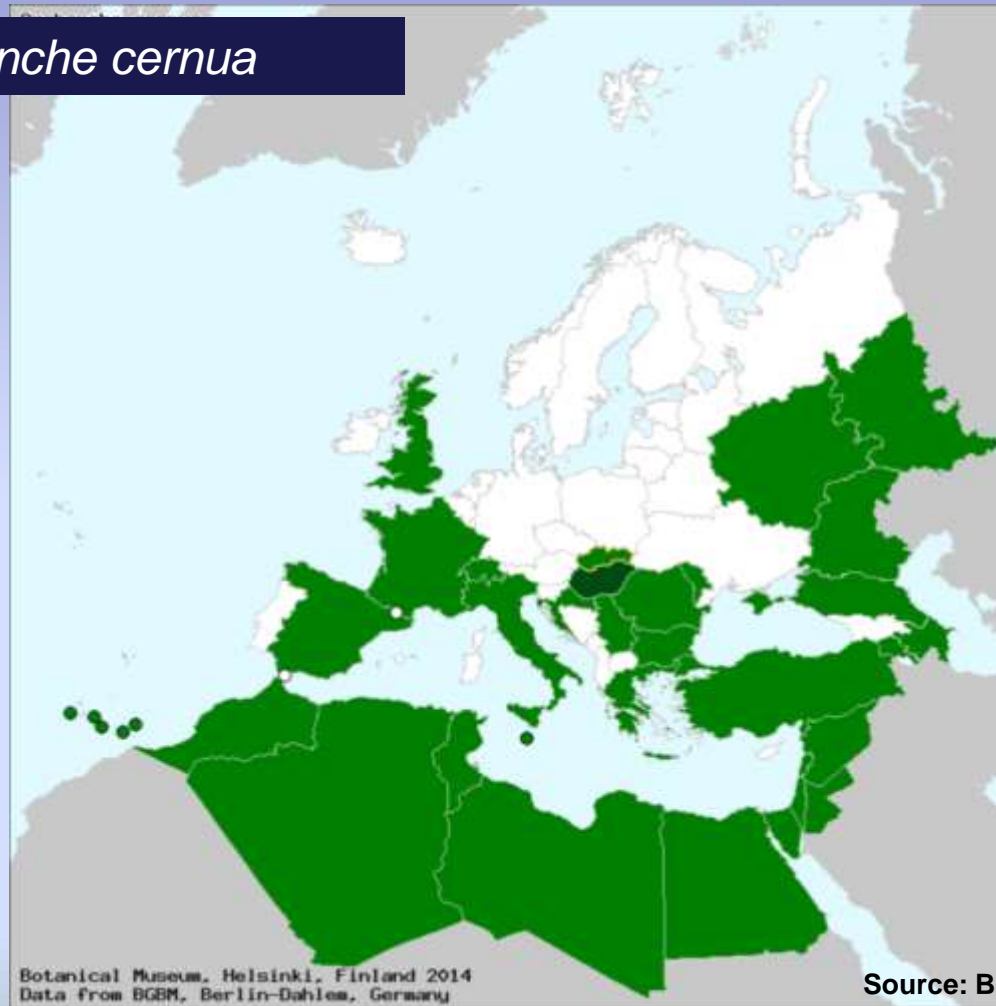
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# Habitats

*Orobanche cernua*



Source: Botanical Museum Helsinki (2014)



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# Race classification

Chronology



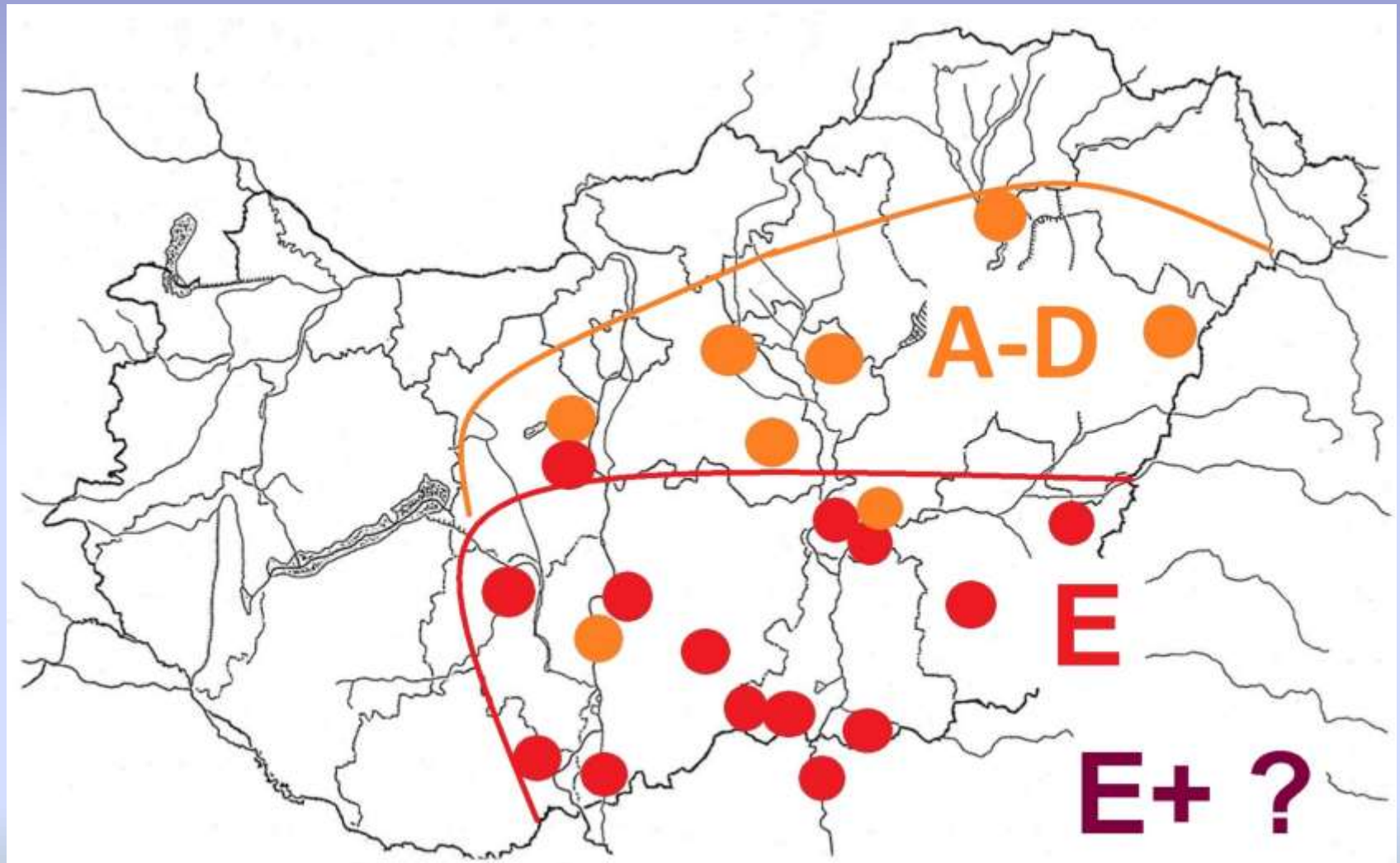
A...B...C...D...E...F...G...H



Pathogenicity



# Race classification



# Infection level





# Control strategy

- Agronomical: crop rotation
- Genetical: resistance (OR4, OR5, OR7)
- Biological: e.g. *Phytophthora orobanchia*
- Chemical: ? timing

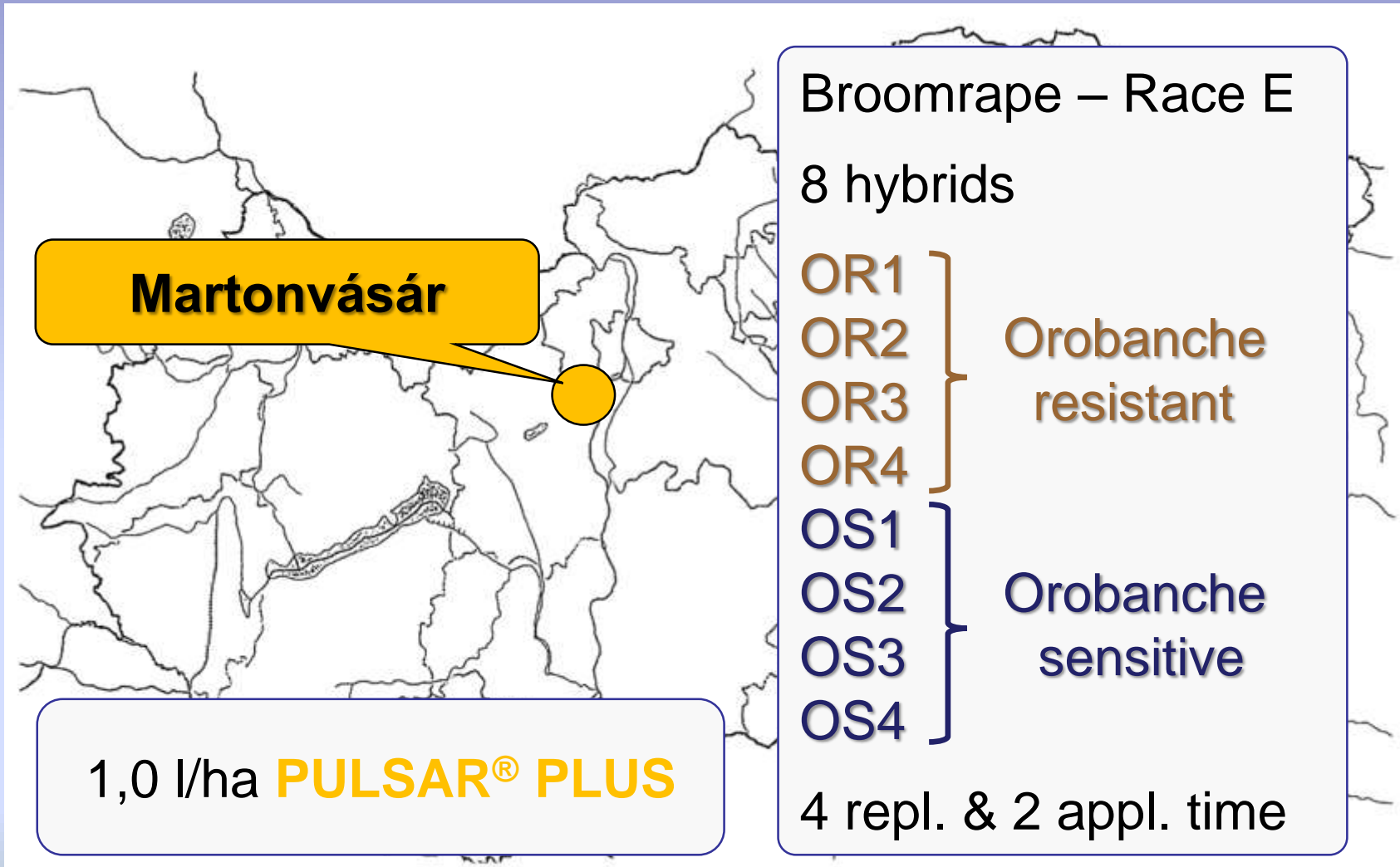
IPM ~ control on demand

## Aims

- Hybrid sensitivity
- Herbicide efficiency
- Yield



# M & M



# M & M

Application	BBCH	Date		Survey	Unit
Sowing	0	22.04.2016			
1 <sup>st</sup> treatment	16	31.05.2016			
	39	17.06.2016	→	Tuber	# & size
2 <sup>nd</sup> treatment	51	29.06.2016			
	61	06.07.2016	→	Abundance	Plant / Plant
	65	18.07.2016	→	Abundance	Plant / Plant
	69	03.08.2016	→	Abundance	Plant / Plant
Harvest	99	11.09.2016			



# Experimental design

1.7	B	34007	34004	34006	34008	34003	34005	34002	34007	34004	34005	34008	34001	34003	34005	34002	B	IV. repl.	
9.2		14007	14004	14006	14008	14003	14005	14002	14007	14004	14005	14008	14001	14003	14005	14002			
1.7	B	33003	33005	33001	33004	33003	33005	33006	33002	33003	33007	33002	33004	33003	33006	33004	B	III. repl.	
9.2		13003	13005	13001	13004	13003	13005	13006	13002	13003	13007	13002	13004	13003	13006	13004			
1.7	B	32008	32006	32005	32003	32007	32004	32003	32001	42008	42006	42002	42005	42007	42004	42003	42001	B	II. repl.
9.2		12008	12006	12002	12001	12007	12004	12003	12001	22008	22006	22002	22005	22007	22004	22003	22001		
1.7	B	31001	31002	31003	31004	31005	31006	31007	31008	41001	41002	41003	41004	41005	41006	41007	41008	B	I. repl.
9.2		11001	11002	11003	11004	11005	11006	11007	11008	21001	21002	21003	21004	21005	21006	21007	21008		
1.7	row nr.	1 - 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 - 24

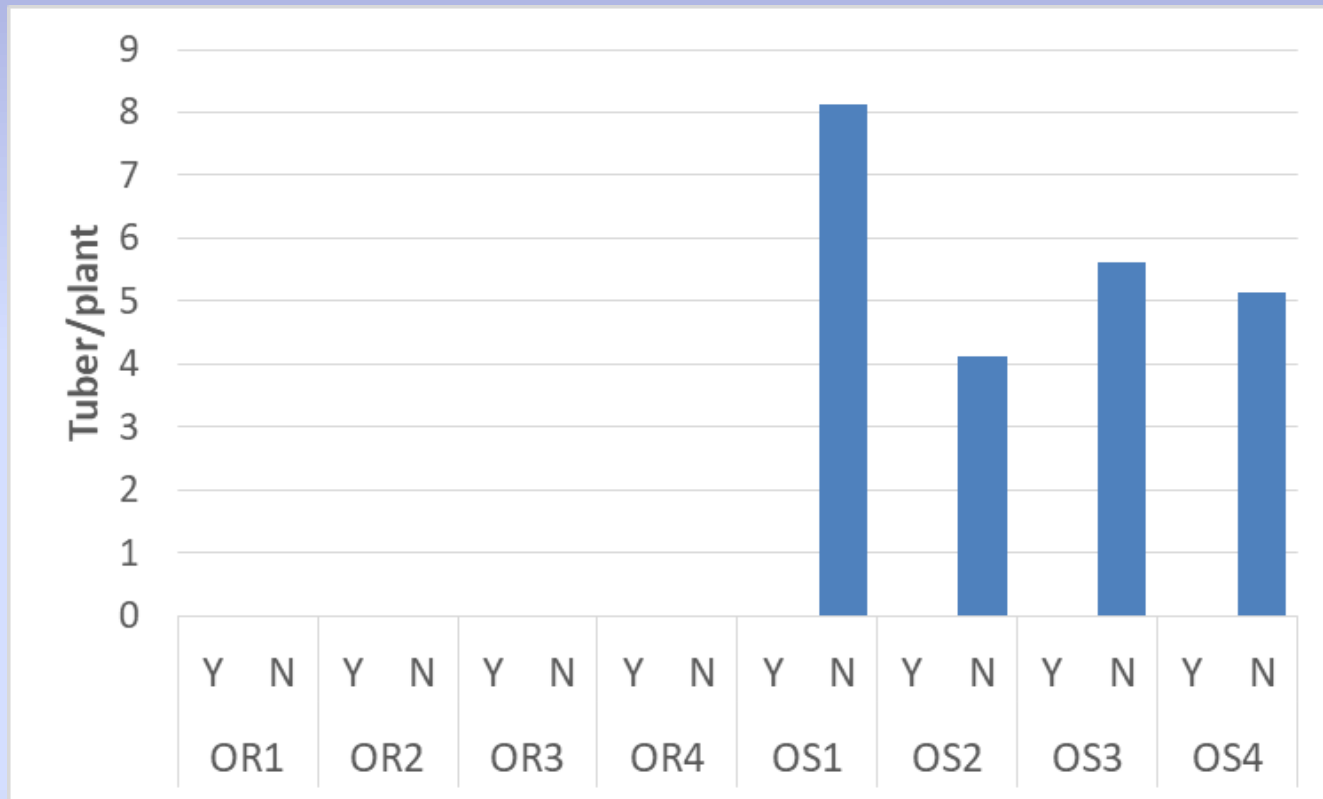
**YN – only 1st**  
**NY – only 2nd**  
**YY – both**  
**NN – non**

**YY**  
**YN**

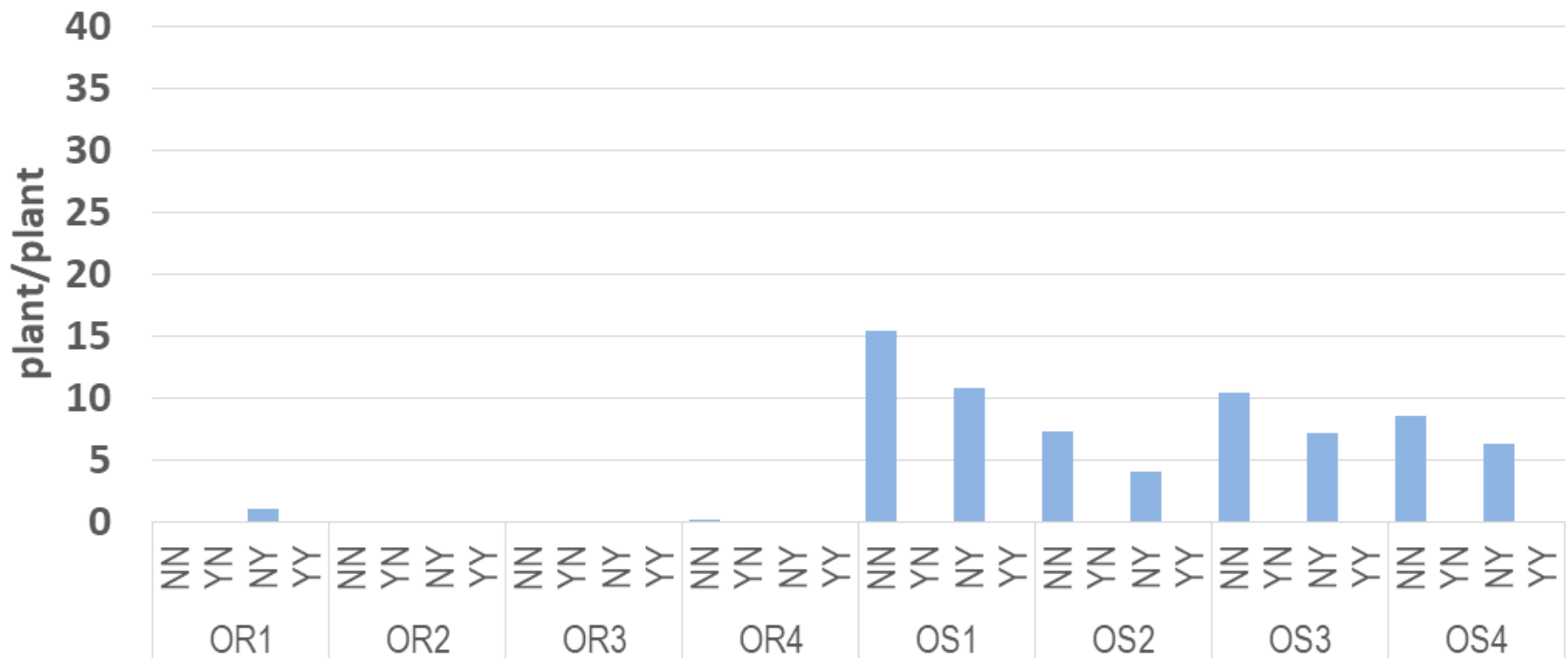
**NY**  
**NN**



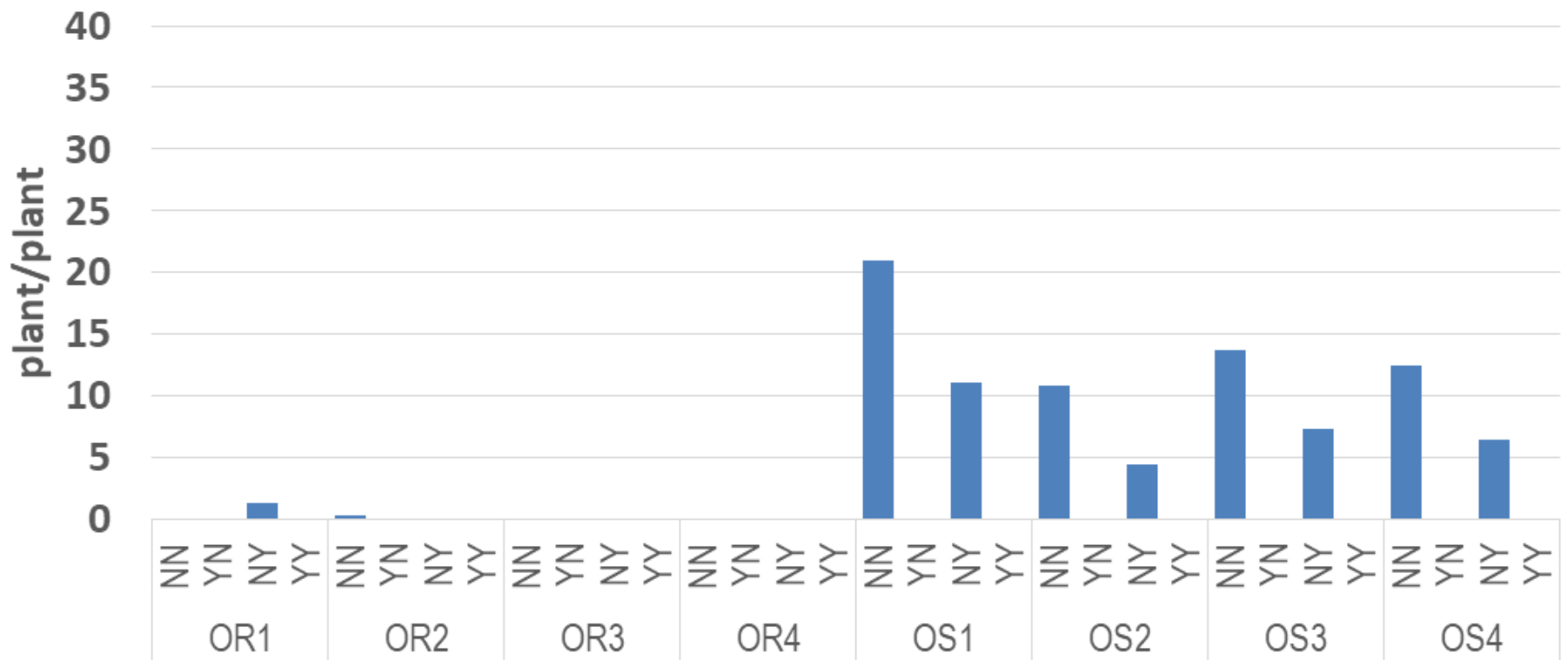
# Results – 17 DAT<sub>1</sub>



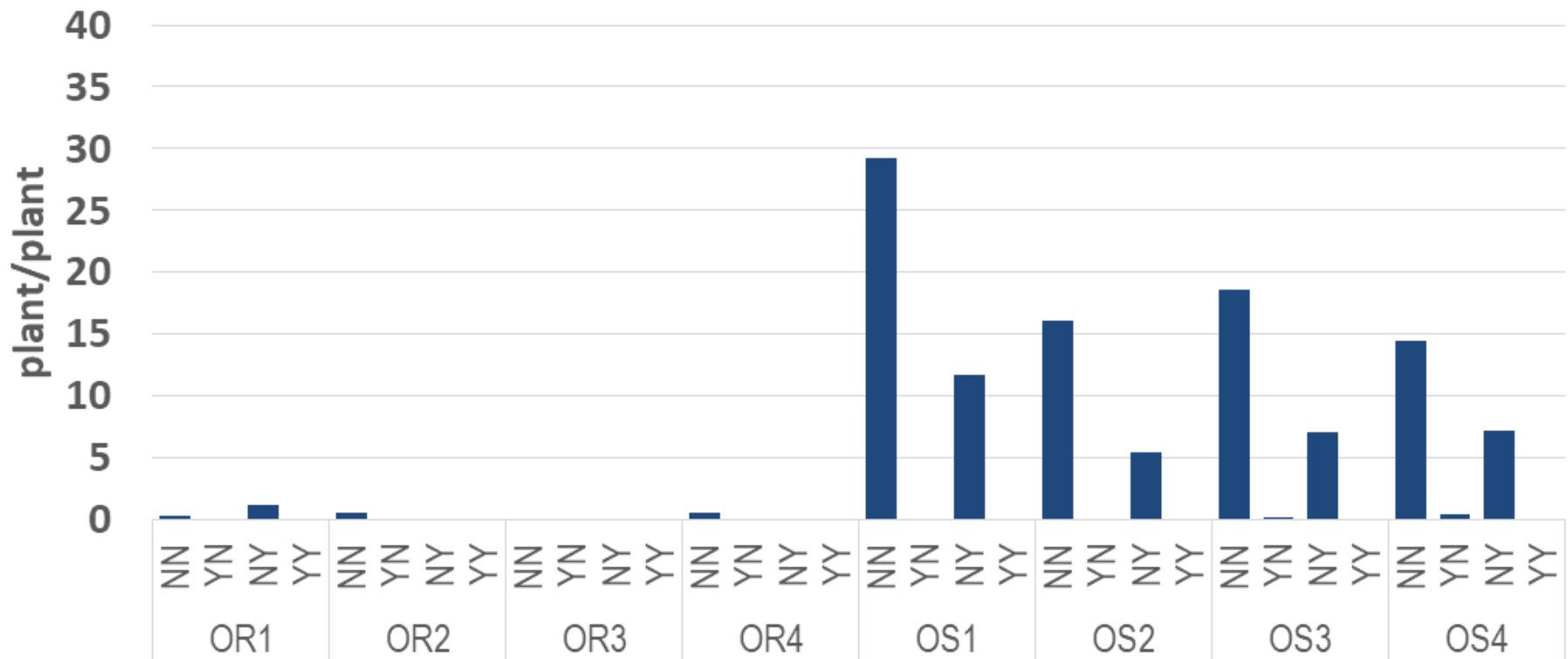
# Results – 36 DAT<sub>1</sub> / 7 DAT<sub>2</sub>



# Results – 48 DAT<sub>1</sub> / 19 DAT<sub>2</sub>

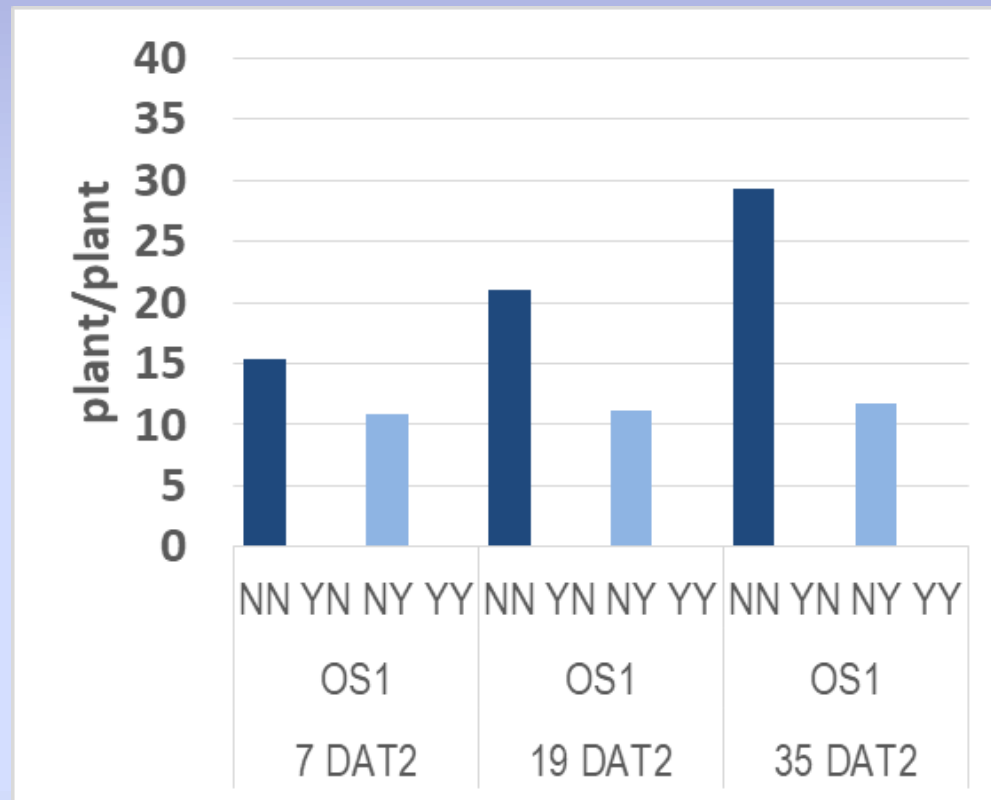


# Results – 64 DAT<sub>1</sub> / 35 DAT<sub>2</sub>





# Results – 64 DAT<sub>1</sub> / 35 DAT<sub>2</sub>



# Conclusion

- Herbicide efficiency
- Inhibition
  - growing of OROCE
- Season-long effect
- No 'curative' effect.  
(no kill Oroce but stop appear of new plants)  
→ yield loose

## Suggestions (to farmers)

Monitoring → Crop rotation → OR Hybrid →  
HT imi Hybrid → Early CL/CLP treatment



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## Thank you for your attention!



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