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Herbicide resistant weeds and herbicide tolerant crops

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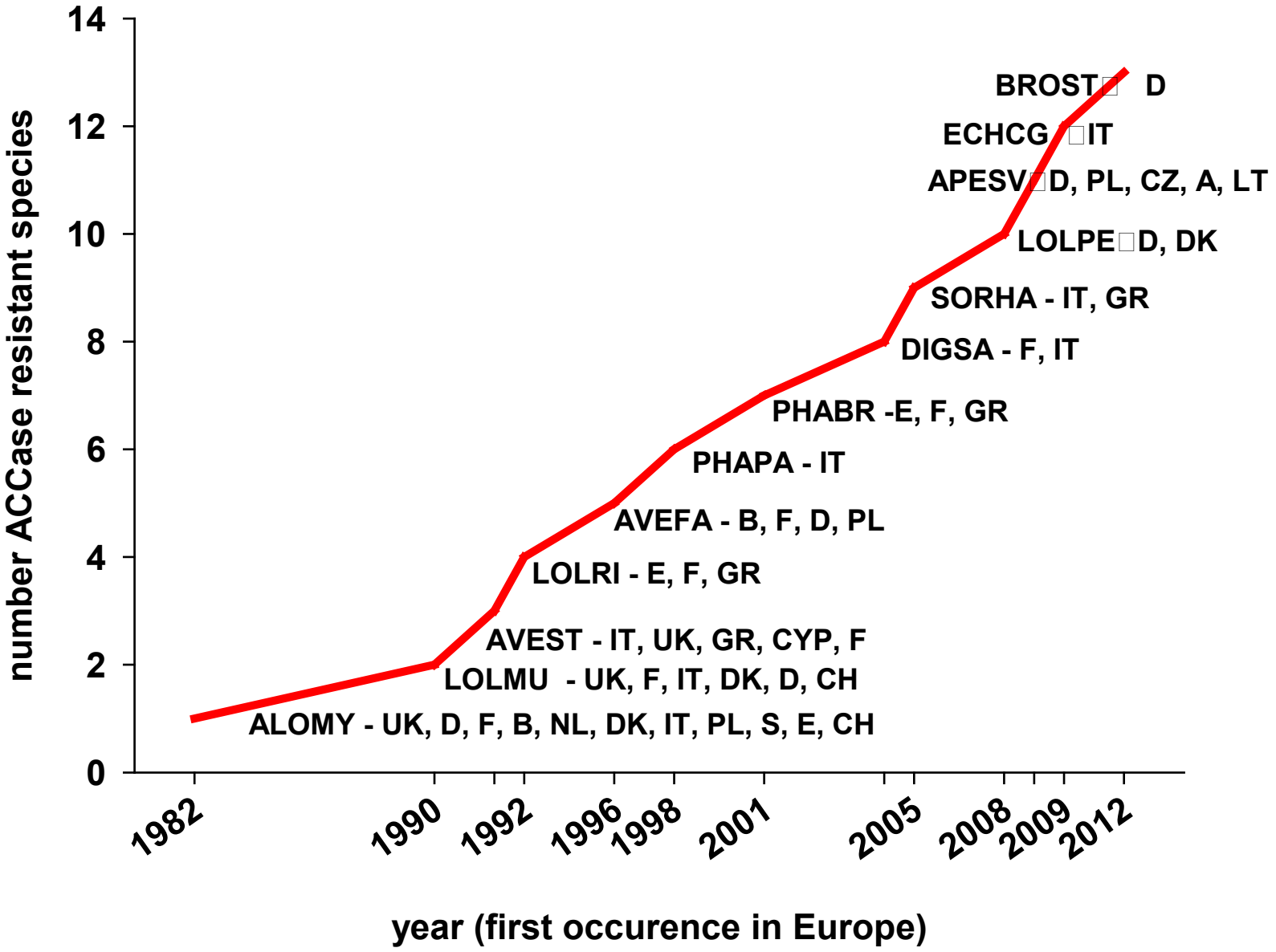
Workshop - EWRS Working Group - Herbicide Tolerant Varieties - Novi Sad - 29-31 May 2017

Status quo

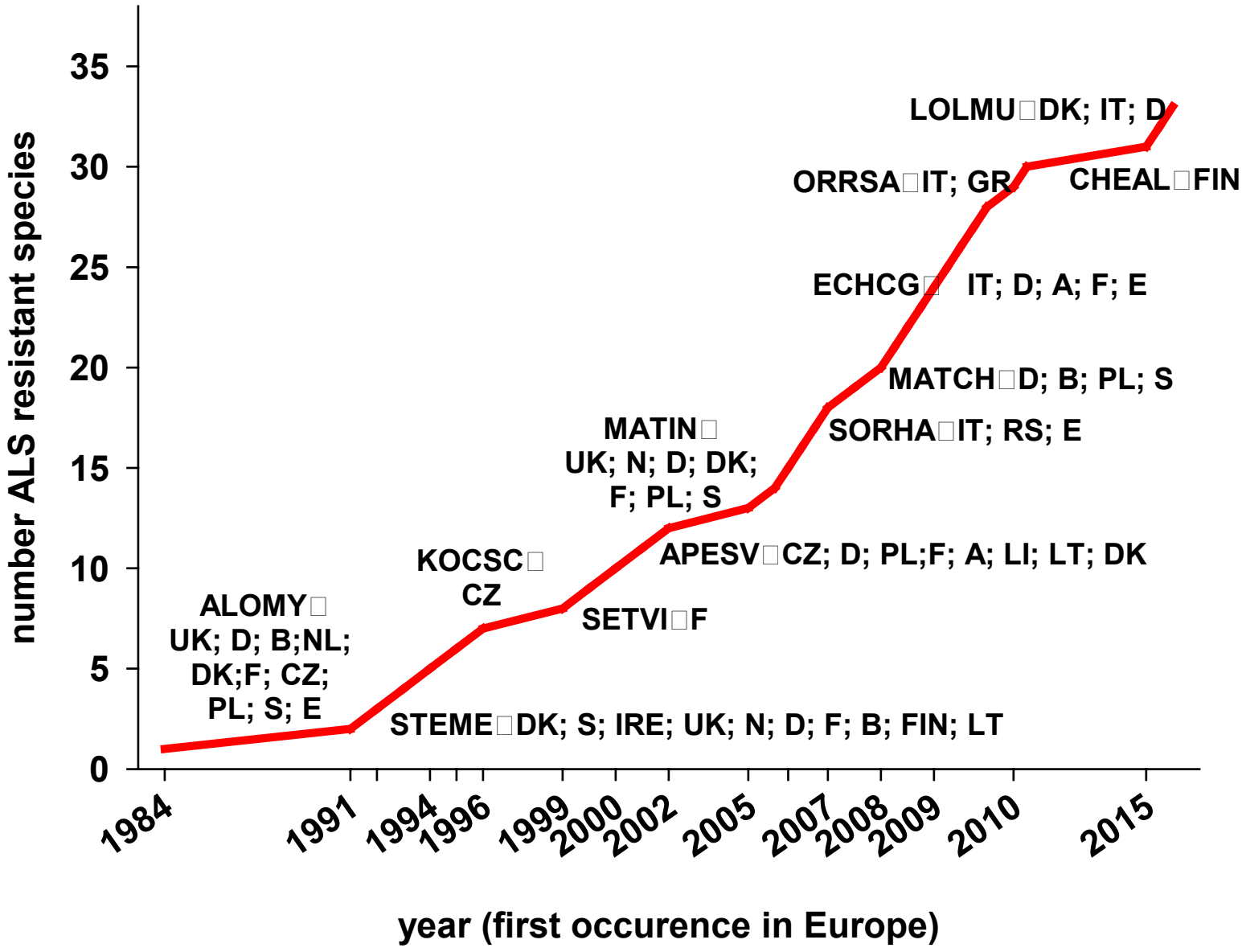
- **In Europe only tolerant crops to ACCase- and ALS-inhibitors on the market or in the pipeline**
- **For both MoA many resistant weeds are present**
- **How to manage the situation ? – programme tomorrow**
- **Interactions between resistance mechanisms and efficacy of corresponding herbicides in HT-varieties?**

Resistance development ACCase-inhibitors



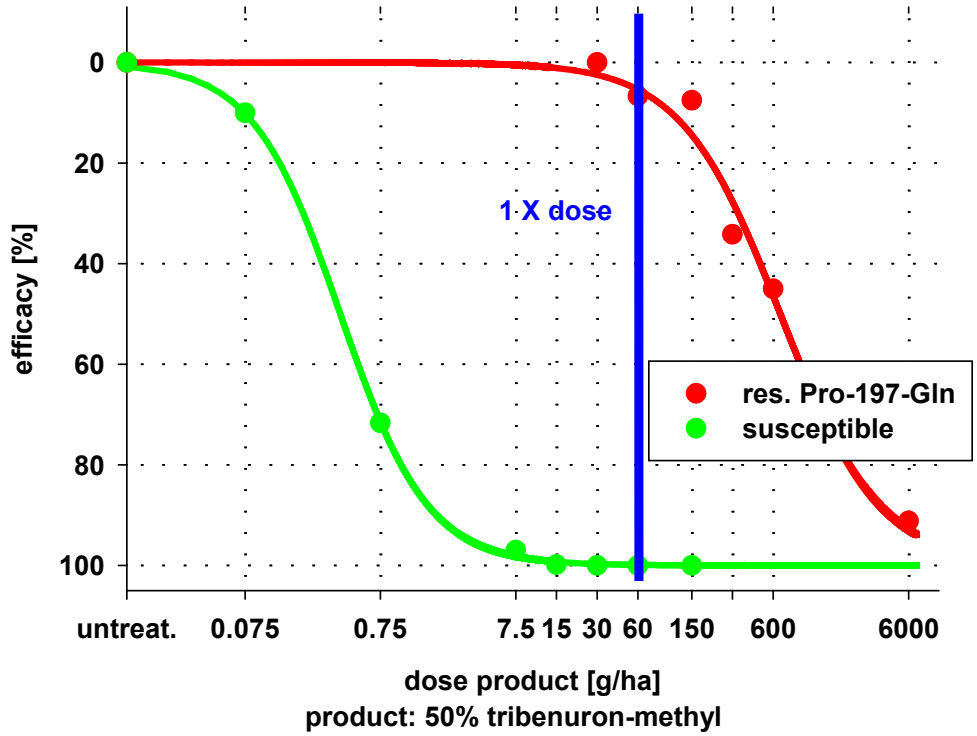
after HEAP, 2017

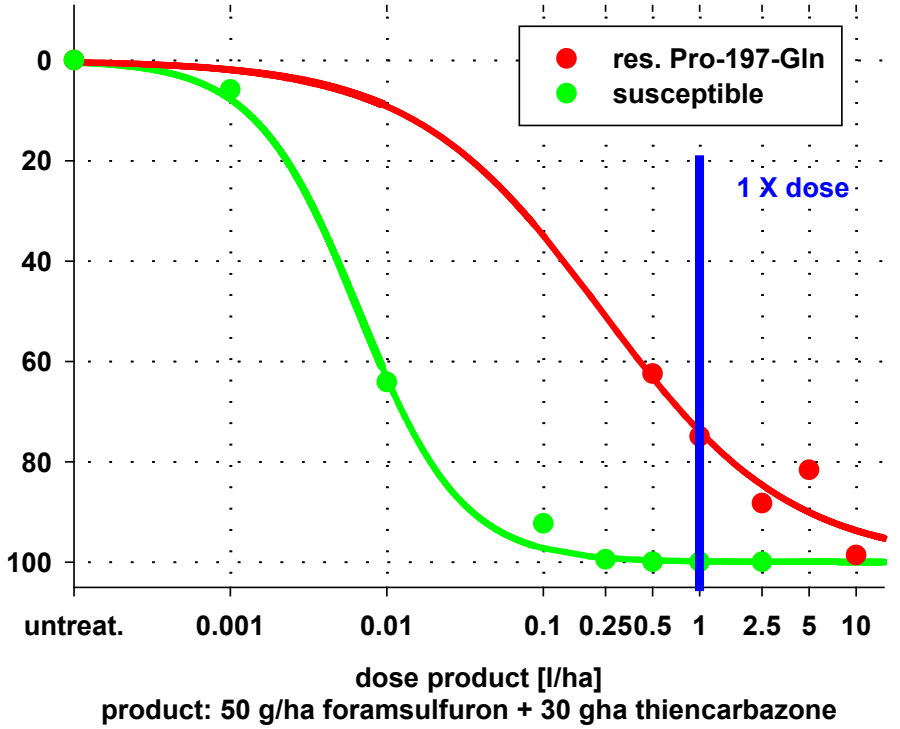
Resistance development ALS-inhibitors

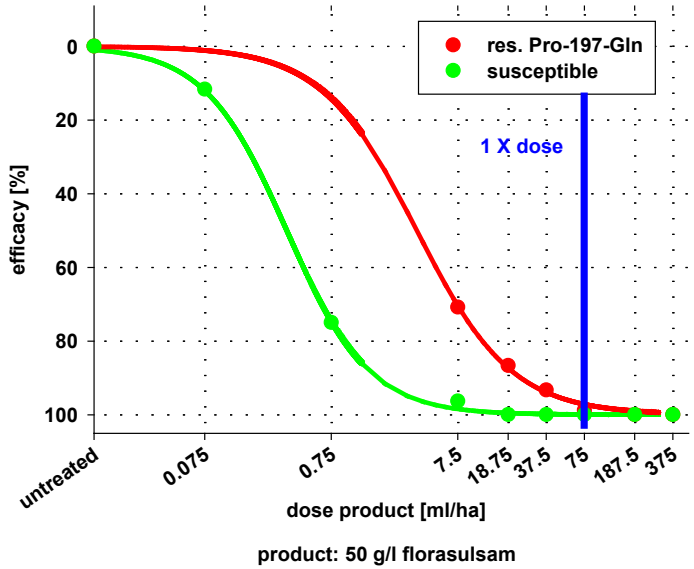


Interactions between TSR-mutation, herbicide and weed species

Efficacy of different ALS-inhibitors on ALS-TSR *Matricaria inodora*







RF ED50	tribenuron	forams.+thi.	florasulam
Susceptible	1	1	1
resistant	1887	36	11

Efficacy of 3 ALS inhibitor on ALOMY depending on resistance mechanisms

population	efficacy foramsulfuron + thiencarbazone	efficacy sulfometuron	efficacy metsulfuron + iodosulfuron	197 WT	574 WT	heterozygous	homozygous	mutation
Seemann	0	0	0	5	0	5	0	5X T-G/T-G (Trp/Leu)
16-047	0	0	0	5	0	5	0	5X T-G/T-G (Trp/Leu)
11-526	0	78	0	5	0	5	0	5X T-G/T-G (Trp/Leu)
16-032	20	0	0	5	3	1	1	1X T-G/T-G (Trp/Leu) 1X TTG (Leu)
16-037	20	20	30	5	4	1	0	1X T-G/T-G (Trp/Leu)
16-003	20	55	60	5	2	3	0	3X T-G/T-G (Trp/Leu)
16-012	48	55	0	5	2	3	0	3X T-G/T-G (Trp/Leu)
14-619	55	13	38	5	1	4	0	4X T-G/T-G (Trp/Leu)
16-057	75	0	0	5	5	0	0	NTSR
13-539	83	38	0	5	0	5	0	5X T-G/T-G (Trp/Leu)
14-615	83	63	0	5	1	4	0	4X T-G/T-G (Trp/Leu)
14-620	85	0	0	5	5	0	0	NTSR
14-623	91	73	0	5	3	2	0	2X T-G/T-G (Trp/Leu)
15-575	95	80	30	5	4	1	0	1X T-G/T-G (Trp/Leu)
16-607	96	73	0	5	5	0	0	NTSR
14-563	100	0	0	5	5	0	0	NTSR
14-501	100	20	0	5	5	0	0	NTSR
14-575	100	30	0	5	5	0	0	NTSR
14-517	100	40	0	5	5	0	0	NTSR
Elbe	100	55	0	5	5	0	0	NTSR
16-014	100	95	0	5	5	0	0	NTSR
15-528	100	92	63	5	5	0	0	NTSR
senH	100	100	95	5	5	0	0	susceptible

What I have learned from „Global herbicide resistance challenge“ – Denver 15 to 18th of May 2017

- **ALS – resistance (in US) is still present after 20 year of cont. Glyphosat use**
- **DIM-herbicides (ACCase inhibitors) can be affected by NTSR**
- **More and more NTSR mechanisms are involved in resistant dicot weeds**
- **It is not enought to have a great potential of diverse herbicides (MoA), we must use the diversity to prevent herbicide resistance**