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Introduction | Aims

Groundkeeper management is an integral part of CONVISO[®] SMART Stewardship. If they are not destroyed by frost, remainings of ALS-tolerant sugarbeet can produce viable seeds in the following crop, potentially resulting in the spread of ALS-tolerant weed beet. To evaluate groundkeeper control with different herbicide active ingredients, trials were conducted across several European countries.

Trial Setup

- Trials were conducted in 4 countries (Spain, Italy, Czech Republic, Poland) across 9 locations, in small plot trials with 2 replications.
- Groundkeeper simulation:
 - transplanted sugarbeet seedlings (stecks).
 - sown sugarbeet.
- A main crop (cereals & corn) was established in trials in CZ and PL.
- Application timing: pre-emergence, BBCH 12-18, BBCH 39-51.
- Assessment: 1 week after application (WAA), 2-4 WAA, 6-8 WAA.



What are groundkeepers?

Volunteers from whole sugarbeet or parts of sugarbeet remaining on the field after harvest, which can flower and potentially set seed in the following crop.

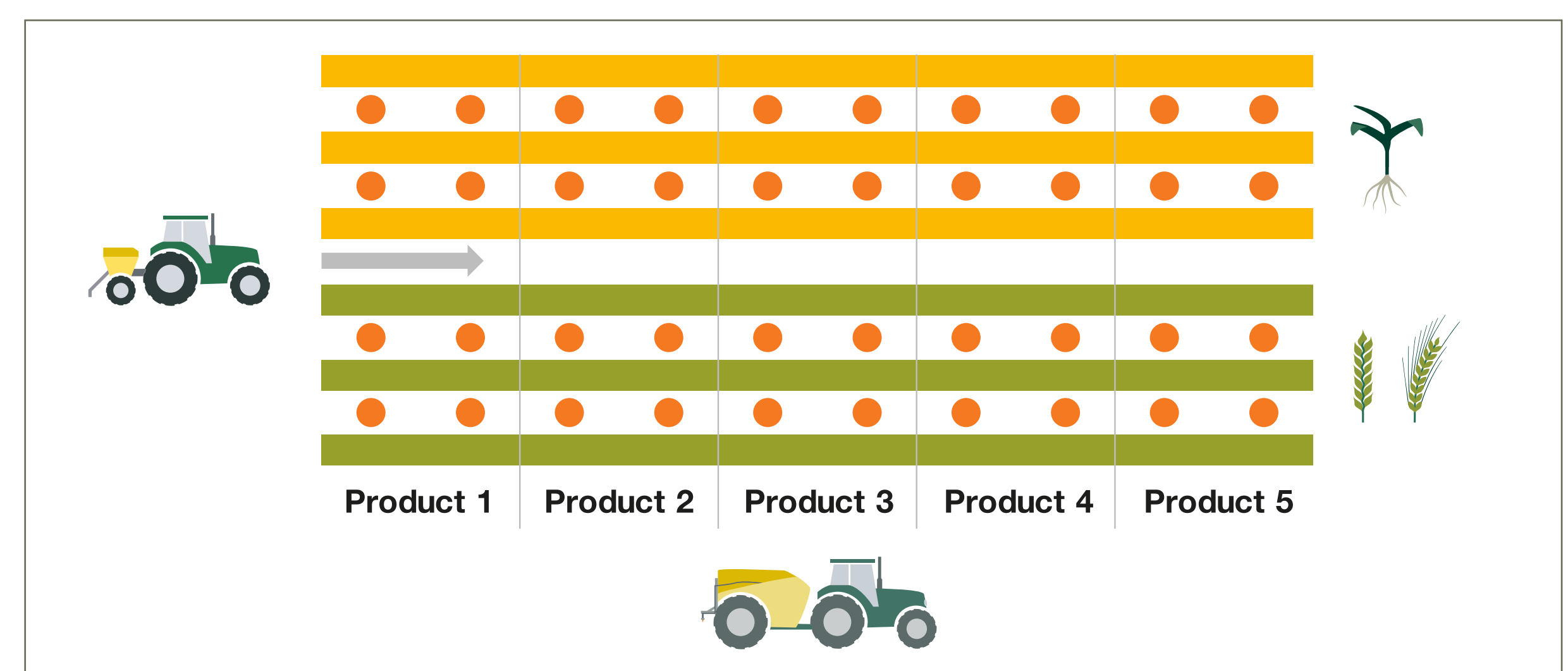


Fig. 1: Schematic setup of groundkeeper trials. Groundkeeper plants (shown in orange) are sown or transplanted into main crop (cereals or corn) and treated with different herbicides.

Cereal Herbicides

Tab. 1: Efficacy (%) of different cereal herbicide active ingredients against ALS-tolerant groundkeepers. Herbicide application conducted at BBCH 12-18 of groundkeeper plants.

Active Ingredient	HRAC	ES		IT	CZ	PL
		2022	2023			
2,4 D	4	60	83	99		
MCPA	4	65		92	75	
2,4 D + MCPA	4	73		99		
MCPA+ MCPP + dichlorprop-P	4			99	93	
MCPA+ MCPP + dicamba	4					94
MCPP	4			94		
Dicamba + MCPA	4			94		94
Dicamba	4	88	70	76		98
Fluroxypyr + clopyralid + MCPA	4			98	95	
Fluroxypyr	4	50		81		97
Aminopyralid + florasulam	4 + 2	78	22			

< 50% efficacy
50-85% efficacy
> 85% efficacy

Corn Herbicides

Tab. 2: Efficacy (%) of different corn herbicide active ingredients against ALS-tolerant groundkeepers. Herbicide application conducted at BBCH 12-18 of groundkeeper plants.

Active ingredient	HRAC	ES		IT	CZ	PL
		2022	2023			
Tembotrione	27	75	85	100	100	100
Mesotrione	27	95	17	100		
Sulcotrione	27	90	28			
Mesotrione + dicamba	27 + 4			100		
Isoxaflutole + terbuthylazine	27 + 5					100
Pyridate + mesotrione	27 + 6			99		
Isoxaflutole + thiacarbazone-m.	27 + 2	90				94
Mesotrione + terbuthylazine + s-metolachlor	27 + 5 + 15			80		100
Fluroxypyr	4			81	80	94
Dicamba	4	88	70	84	66	75
Flufenacet + terbuthylazine	15 + 5				100	

Conclusions & Recommendations

- Losses during harvest and loading should be avoided.
- If frost is expected, superficial tillage is recommended. In mild winters, intensive tillage (e.g. ploughing) is beneficial.
- A competitive following crop will support groundkeeper suppression.

- Effective herbicide active ingredients in corn are more widely available and include: **triketones (HRAC 27), auxin mimics (HRAC 4) and triazines (HRAC 5)**.
- Combinations of different actives can provide higher efficacy.

- Only **auxin mimics (HRAC group 4)** were effective against groundkeepers.
- Combinations of different actives (e.g. 2,4 D, MCPA, dicamba) show higher efficacy.
- Groundkeeper plants need to be actively growing with sufficient leaf area.

- Availability of effective herbicides is limited – actives from HRAC group 15 or 6 only provide medium efficacy (results not shown).
- Mechanical control pre-sowing is recommended.
- Application of glyphosate pre-sowing is possible if groundkeepers are actively growing.

