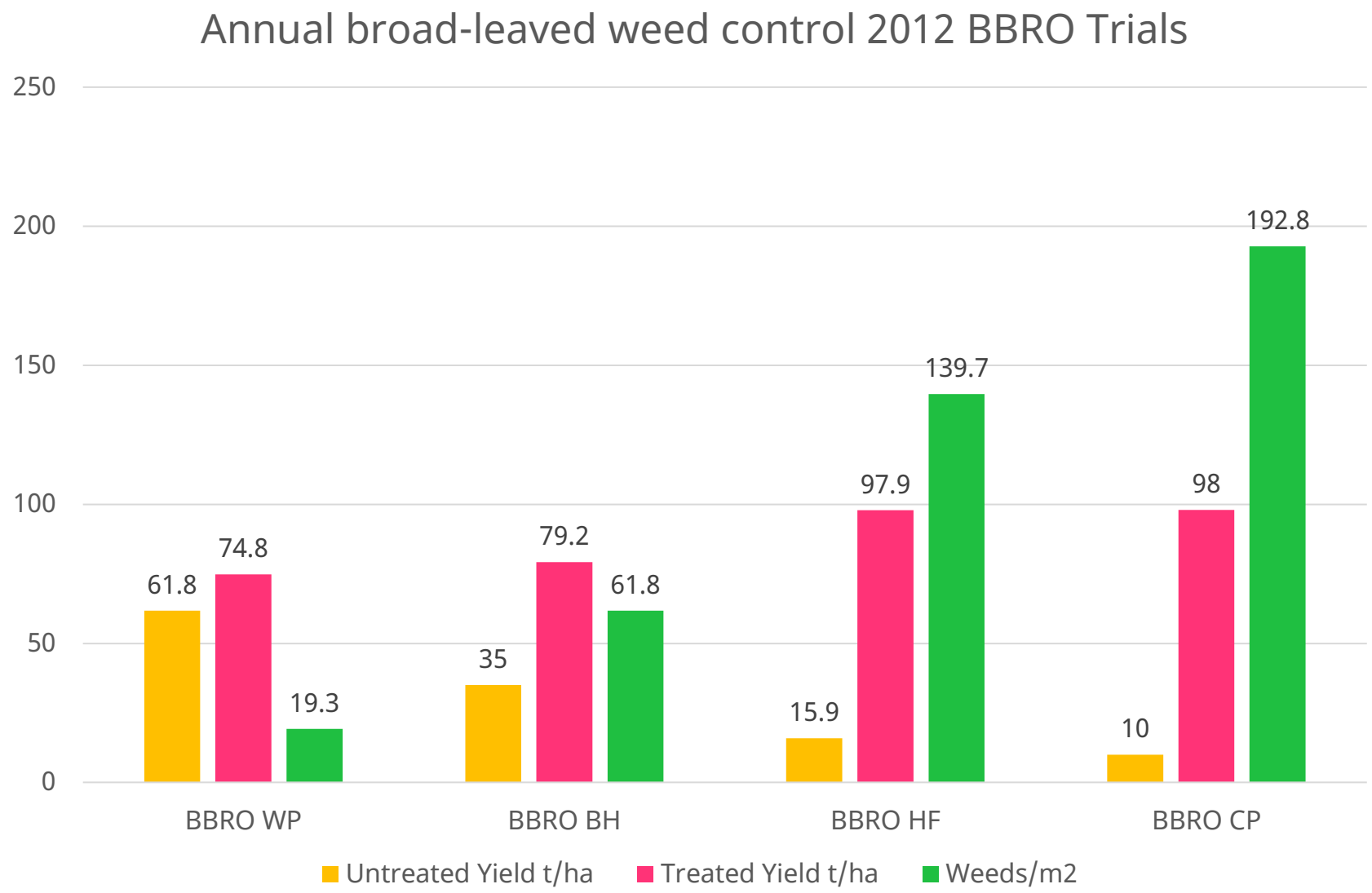
Weed control in sugar beet herbicide changes/impact and issues

Pamela A Chambers

03.11.22

Why is weed control necessary in sugar beet?



Weed control in sugar beet spring 1961

Weed control time-line

1950 & 60’s beet herbicides were introduced

Initially herbicides were used in conjunction with tractor hoeing and hand weeding

Band spraying was used in the early 1960’s

Low dose techniques became popular as from the 1970’s

Overall spraying used extensively in the early 1980’s onwards

Hand pulling for weed beet, tractor hoeing and weed wiping still used

2019 Conviso One authorisation granted

Active	Year of introduction
chloridazon	1964
chlorpropham	1951
cycloate	1966
desmedipham	1969
lenacil	1965
phenmedipham	1967
trifluralin	1961

Herbicides for annual broad-leaved weeds (2022)

Active (s)	Residual	Contact	Pre	Post	HRAC (2020)
clopyralid		✓		✓	4
dimethenamid - p	✓			✓	15
ethofumesate	✓	✓	✓	✓	15
foramsulfuron*		✓		✓	2
Lenacil	✓			✓	5
Metamitron	✓	✓	✓	✓	5
Phenmedipham		✓		✓	5
Quinmerac	✓		✓	✓	4
thiencarbazone-methyl*	✓	✓		✓	2
triflusulfuron-methyl		✓		✓	2

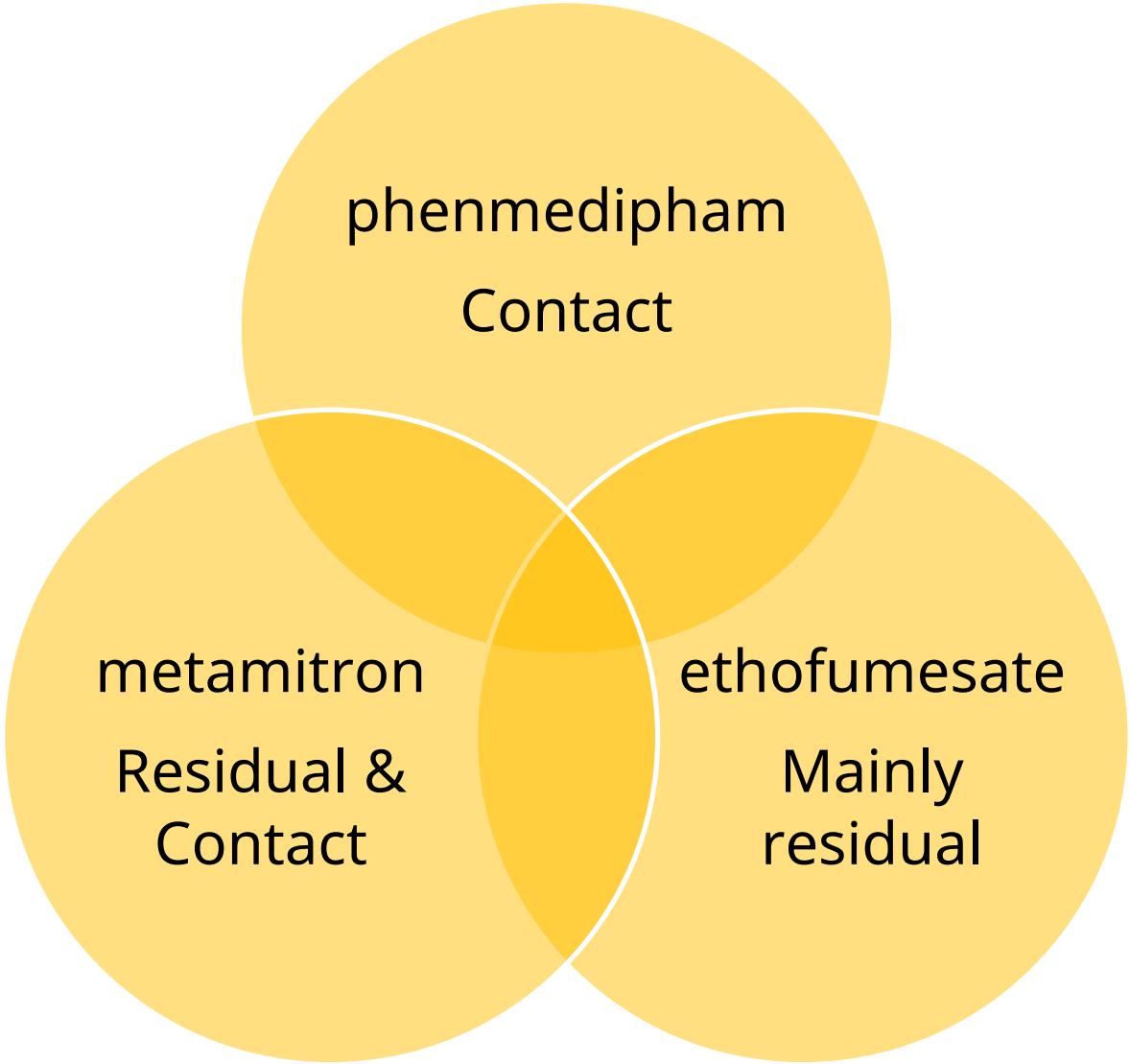
* Conviso One chemistry

Renewal status of annual broad-leaved beet actives (2022)

Active Substance	Date introduced (Global)	Date EC 1107/220 inclusion expires	Date GB approval expires
clopyralid	1977	30.09.36	30.04.24
dimethenamid-p	1999	31.08.34	31.08.34
ethofumesate	1969	31.10.31	31.10.31
foramsulfuron*	1995	31.05.35	31.05.35
lenacil	1965	31.12.22	31.12.24
metamitron	1975	31.08.23	31.08.25
phenmedipham	1967	31.07.23	31.07.24
quinmerac	1993	31.07.24	30.07.24
thiencarbazone-methyl*	2008	30.09.24	30.09.24
triflusulfuron-methyl	1992	31.12.22	31.12.24

* Conviso One chemistry

Annual broad leaved weed control - key actives



Position regarding triflusulfuron-methyl (TSM)

European Regulation - Rapporteur Member State (RMS) – France

May 2022	European Food Safety Authority (EFSA) conclusions published following the peer review. TSM meets the cut-off criteria for non-approval concerning endocrine disruptor (ED)
	Derogation under Article 4.7 requested regarding the necessity of TSM to control a serious danger to plant health. This is supported by a number of Member States.
July 2022	An extension of the current approval which expires 31.12.22 was in principle agreed but has not yet been published
	The Commission is supposed to submit the draft regulation within 6 months of receiving the EFSA conclusion at the (Standing Committee of Plants, Animals, Food and Feed (SCoPAFF) which they received in May
December 2024	Approval of active expires in G.B.

Position regarding phenmedipham (PMP) EU process

European Regulation - Rapporteur Member State (RMS) - Finland

May 2022	concluded that phenmedipham meets the criteria for an endocrine disruptor (ED)
June 2022	PMP Task Force (TF) Bayer Crop Science and UPL Europe Ltd issued a statement disagreeing with the conclusion of RMS **PMP has been sufficiently tested and does not meet the ED criteria**
August 2022	public comment/consultation closed
2023	European Food Safety Authority (EFSA) conclusion due to be published. The commission then has 6 months to submit a draft regulation after publication
	Derogation under Article 4.7 could be requested regarding the necessity of phenmedipham to control a serious danger to plant health if EFSA conclude non-renewal

Position regarding phenmedipham (PMP) G.B. process

Following Brexit, G.B. approval of phenmedipham was granted a three-year extension in line with transitional provisions

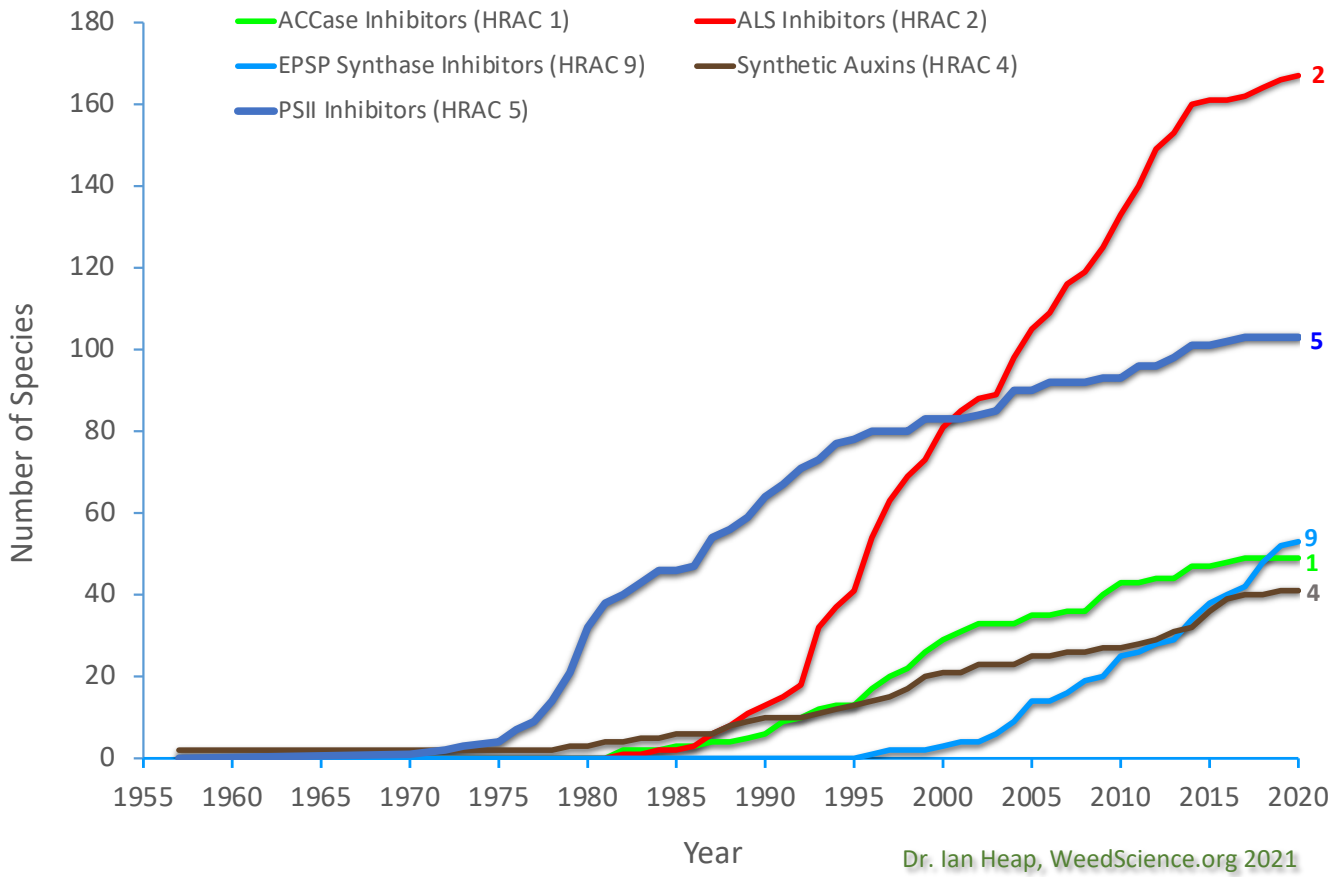
July 2021	GB renewal application submitted by UPL/Bayer Task Force to meet CRD deadline
January 2022	Submission of renewal dossier in G.B. (only submission of EU dossier required at this stage)
December 2024	Approval of active expires in G.B

The G.B. renewal programme is currently under development. Further guidance expected from HSE to clarify whether any dossier updates are then required to support active substance reviews in GB.

Herbicide resistance – ALS chemistry

ALS inhibitors used in sugar beet in G.B are foramsulfuron and thiencarbazone-methyl as in Conviso One and triflusulfuron-methyl.

Number Resistant Species for Several Herbicide Sites of Action (HRAC Codes)



Dr. Ian Heap, WeedScience.org 2021

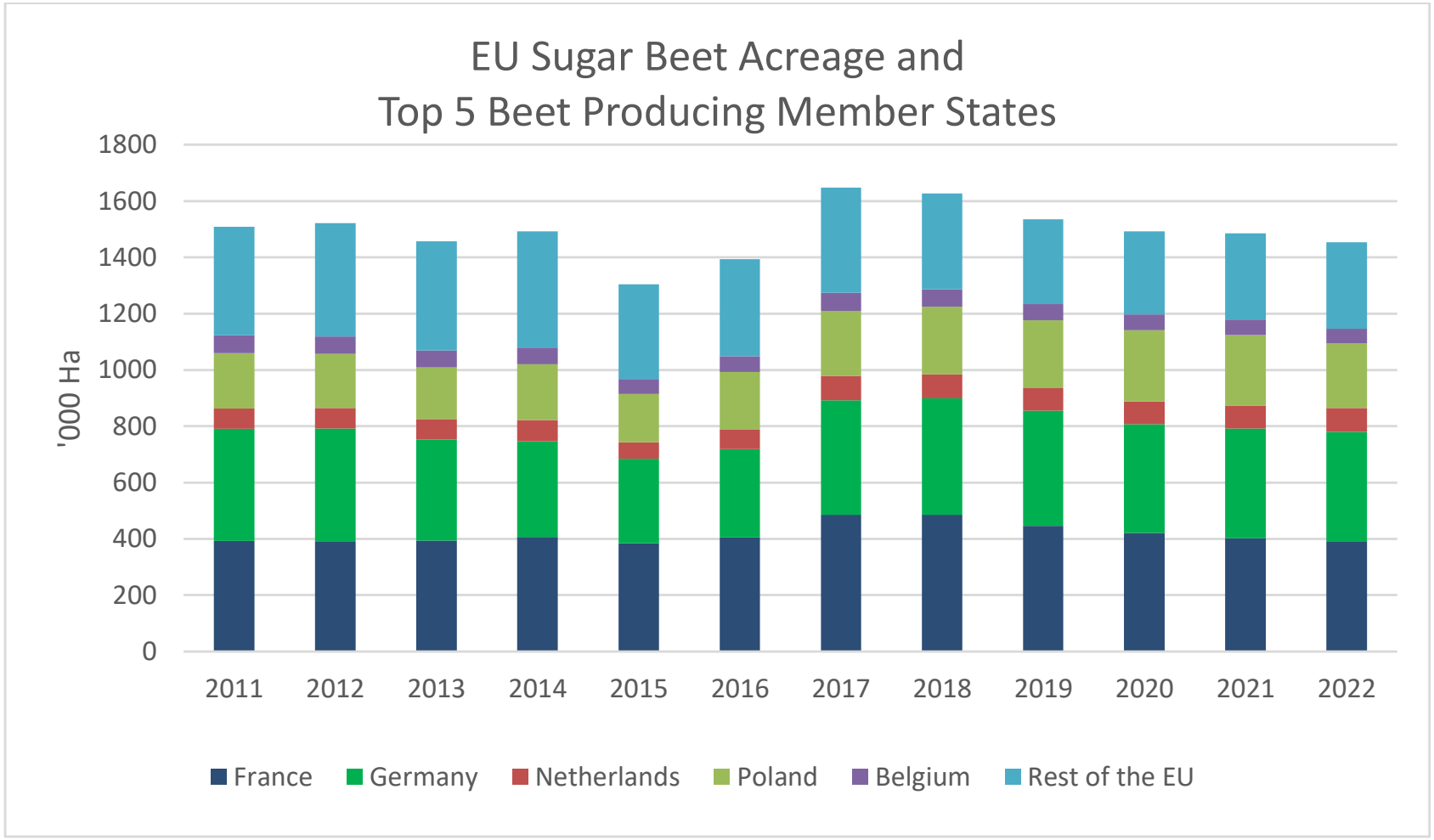
Weeds occurring in sugar beet with resistance to ALS herbicides (HRAC 2)

Common name	Latin name	Europe	UK
Black-grass	*Alopecurus myosuroides*	✓	✓
Chickweed	*Stellaria media*	✓	✓
Common poppy	*Papaver rhoeas*	✓	✓
Fat hen	*Chenopodium album*	✓	
Groundsel	*Senecio vulgaris*	✓	
Italian ryegrass	*Lolium multiflorum*	✓	✓
Meadow and rye brome	*Bromus*		✓ *(suspected)*
Oilseed rape	*Oilseed rape (Clearfield®)*		
Perennial ryegrass	*Lolium perenne*	✓	
Scented mayweed	*Matricaria recutita*	✓	
Scentless mayweed	*Tripleurospermum inodorum*	✓	✓
Shepherds purse	*Capsella bursa pastoris*	✓	
Sow thistle	*Sonchus spp.*	✓	✓
Sterile brome	*Anisantha sterilis*	✓	✓
Wild-oat	*Avena fatua*	✓	✓
Winter wild-oat	*Avena sterilis*	✓	✓

In order to pro-actively minimize or manage the risk for the development of ALS resistance it is advised to follow Integrated Weed Management Principles (IWM)

EU Sugar Beet Acreage – impact on herbicide availability

Graph 1 - EU Sugar Beet Acreage



UK Sugar Beet Acreage 95K ha 2023/24

France, Germany and Poland could influence decisions

Source: FAS EU Posts based on Eurostat data.

Government policies and the impact on pesticide use

The demand for greater sustainability in agriculture and stricter regulatory conditions for Plant Protection Products are driving the development of novel weed control technologies.

The European Union's Farm to Fork Strategy (FTF) and the EU Biodiversity Strategy envisages cutting the use of pesticides in half by 2030.

Future Live – Robotic weeding in the field. A partnership between University of Göttingen and the German sugar beet research institute IfZ together with KWS
80% reduction in herbicide use compared to conventional spraying
70% reduction in weed population

FarmerSpace – supported by funds of the Federal Ministry of Food and Agriculture (BMEL) based on a decision of the Parliament of the Federal Republic of Germany. A trial field for digital crop protection in sugar beet
Remote sensing and drone technology
Robotics

IIRB Seminar 2021 "Advancing weed control in sugar beet with sensors and field robotics"

University of Hohenheim

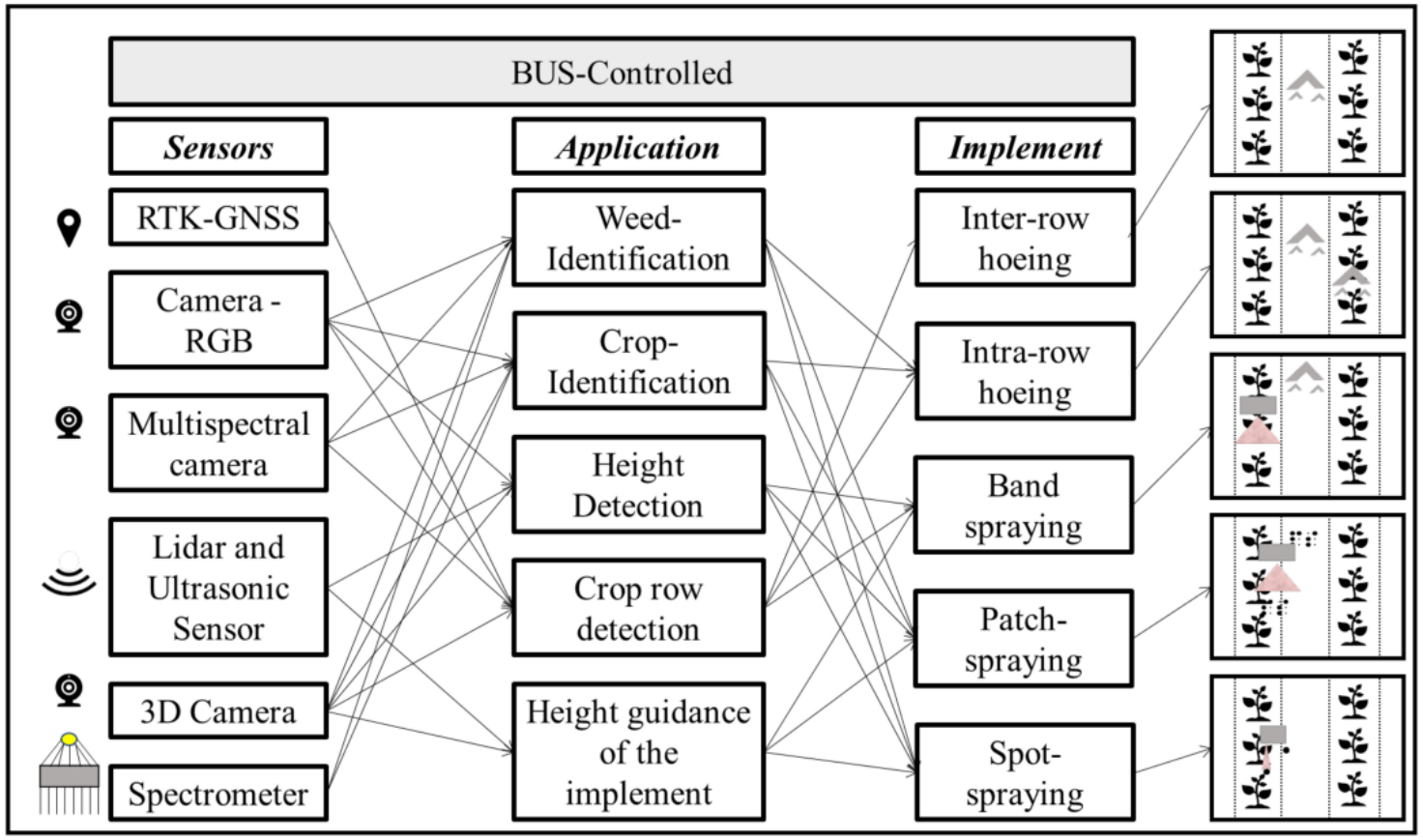
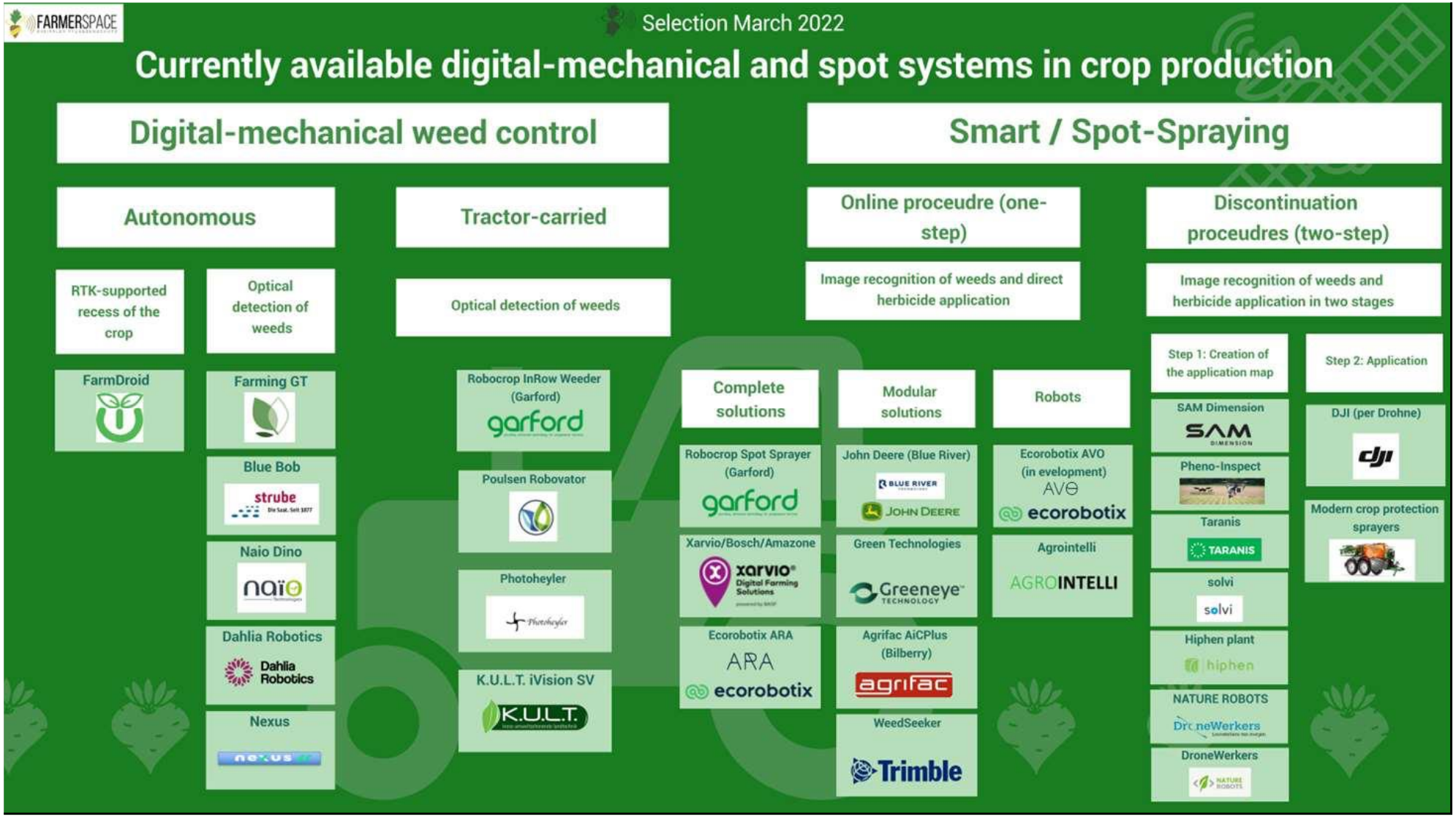


Figure 5. Overview of sensors with suitable icons, application and implementation options with drafts of the working methods, that should be possible to be controlled via ISOBUS-Connection.

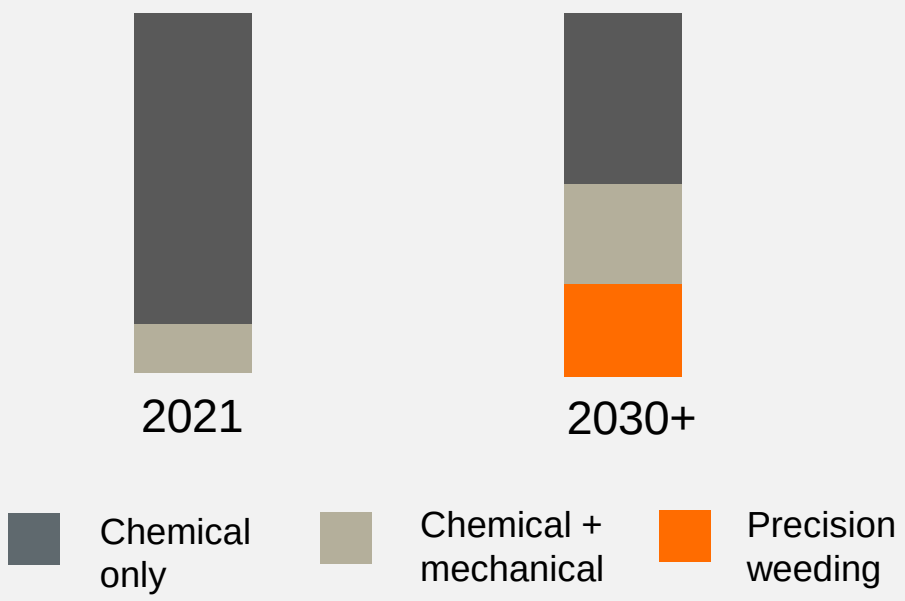
Source:-Agronomy 2022, 12, 1620. Precision Chemical Weed Management Strategies: A review and a Design of a New CNN-Based Modular Spot Sprayer

FarmerSpace - 2022



Source: S.Streit, Farmerspace digitaler pflanzenschutz

Summary



Source: KWS SAAT SE & CO. KGaA

Threats

- Legislation and loss of actives will continue to be an issue
- Resistance to herbicides
- Small acreage of sugar beet compared to Germany, France and Poland will dictate product availability in G.B.
- Pressure to use less crop protection products

The future?

- New technology is becoming more feasible, need to keep informed and be aware of advances in other beet growing regions of the world and assess what is best suited to G.B.