FINAL REGISTRATION REPORT

Part B

Section 3

Efficacy Data and Information

Concise summary

Product code: CHR/H/PENDIF

Product name(s): Cevino Trio 599.5SC, Trivino 599.5SC Chemical active substance(s):

flufenacet 312 g/L + diflufenican 250 g/L + penoxsulam 37.5 g/L

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

Applicant: Innvigo Sp. z o.o.

Submission date: November 2021

MS Finalisation date: 24/08/2022

Version history

When	What
February 2022	Dossier sent for evaluation
March 2022	Updates based on feedback from zRMS Poland
April 2022	Updates based on feedback from zRMS Poland
April 2022	zRMS evaluation of dRR
August 2022	Final version prepared by zRMS after Commenting period

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3 Efficacy Data and Information (including Value Data) on the Plant Protection Product (KCP 6)

Transformation of the dRR (applicant version) into the RR (zRMS version)

Comments of zRMS:	Conclusions from the assessment were prepared using grey commenting boxes placed at the end of each chapter.

3.1 Summary and conclusions of zRMS on Section 3: Efficacy (KCP 6)

Abstract

zRMS

The submitted efficacy data (reports from field trials) fulfil requirements and conditions determined in the EPPO guidelines, the Commission Regulation (EU) No 545/2011 of 10 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the data requirements for plant protection products. The reports and data were submitted to support the evaluation for the authorization of CHR/H/PEDIF 599.5 SC in PL.

CHR/H/PEDIF 599.5 SC contains 312 g/l flufenacet, 250 g/l diflufenican and 37,5 g/l penoxsulam and is formulated a suspension concentrate (SC). It is used as herbicide in winter wheat and winter triticale for the control of a wide range of weeds at dose rates of 0,4 l/ha (spray volume applied on the crop 200 – 300 l/ha) as post – emergence one application in autumn season.

The applicant submitted 20 reports showing the results in research into product efficacy carried out PL from 2019 to 2020 in different cultivars of *winter wheat and winter triticale* against grass and broad-leaved weeds to supports the registration of CHR/H/PEDIF 599.5 SC in PL.

<u>The following target weed species were categorized as:</u>
susceptible (S): VIOAR, BRSNW, APESV, GALAP, STEME, CAPBP, VERHE, ANTAR, GERPU, LAMPU, MATIN
- moderately susceptible (MS): CENCY
- tolerant (T): PAPRH

To sum up, it might be concluded that the application of CHR/H/PENDIF at dose rate 0,4 l/ha (spray volume 200 - 300 l/ha), post-emergence provides benefit against weeds in winter wheat and winter triticale comparable or better with standard products: Bizon 118,75 SC and Komplet 560 SC. CHR/H/PENDIF caused insufficient (tolerant) susceptibility for PAPRH. There is a need to make an appropriate label statement.
The applicant presented strategy of resistance management recommended by HRAC.
CHR/H/PENDIF was safe to the crops on which it was applied as it cause little, transient phytotoxicity symptoms observed in 3 selectivity trials. The product did not cause a negative impact on the yield of both protected crops.
The product CHR/H/PENDIF is to be expected no negative effect on the quality of plants or plant products and transformation processes.
Only cereal crops (winter wheat and winter triticale) should be sown in the autumn following harvest of a winter wheat and winter triticale crops on which CHR/H/PENDIF was applied in the autumn. In the spring after plowing: 10 cm maize can be sown; 20 cm legumes (peas, etc.) can be sown and after 30 cm oilseeds (sunflower, flax), root crops (carrots, etc.) and bulbs (onions, etc.) can be sown, following harvest of a winter wheat and winter triticale crops on which CHR/H/PENDIF was applied in the autumn. After two growing seasons from the moment of applying the CHR/H/PENDIF, after plowing of 20 cm, root crops (carrots, etc.) and bulbs (onions, etc.); after 10 cm of plowing oilseeds (sunflower, flax); without plowing maize can be sown.
In the event of crop failure for any reason of a winter wheat and winter triticale crops on which CHR/H/PENDIF has been applied, only maize should be sown after 10 cm of plowing, as a replacement crop.

The risk of adverse impact resulting from the post-emergence application of CHR/H/PENDIF at the rate of 0,4 L product/ha was acceptably low when a 5 m buffer zone was observed or with a buffer zone of 1 m when 75% drift reduction nozzles was used.
According to the above, the plant protection product CHR/H/PENDIF is recommended to be approved to use according to the table of intended uses for CHR/H/PENDIF (Table 3.1- 1). The evaluation was carried out in accordance with the Uniform Principles.

Table 3.1-1: Acceptability of intended uses (and respective fall-back GAPs, if applicable)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No. *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: developmental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener/ synergist per ha	**Conclusion**
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max			
Zonal uses (field or outdoor uses, certain types of protected crops)														
1	PL	Winter wheat (TRZAW), Winter triticale (TTLWI),	F	*Apera spica -venti*; dicotyledonous weeds	Spray, medium sprayer	autumn BBCH 11-25	a)1 b)1	n/a	a) 0.4 l/ha b) 0.4 l/ha	a) 0.2398 kg a.s./ha (0.1248 FLU + 0.1 D + 0.015 P) b) 0.2398 kg a.s./ha (0.1248 FLU + 0.1 D + 0.015 P)	200-~~400~~ 300	n/a	Doses 0,3l/ha 0,35l/ha 0,4l/ha	A
Interzonal uses (use as seed treatment, in greenhouses (or other closed places of plant production), as post-harvest treatment or for treatment of empty storage rooms)														
Minor uses according to Article 51 (zonal uses)														
Minor uses according to Article 51 (interzonal uses)														

Remarks table heading:

(a) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(b) Catalogue of pesticide formulation types and international coding system CropLife International Technical Monograph n°2, 6th Edition Revised May 2008
(c) g/kg or g/l
(d) Select relevant
(e) Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1
(f) No authorization possible for uses where the line is highlighted in grey, Use should be crossed out when the notifier no longer supports this use.

Remarks columns:

1 Numeration necessary to allow references
2 Use official codes/nomenclatures of EU Member States
3 For crops, the EU and Codex classifications (both) should be used; when relevant, the use situation should be described (e.g. fumigation of a structure)
4 F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application
5 Scientific names and EPPO-Codes of target pests/diseases/ weeds or, when relevant, the common names of the pest groups (e.g. biting and sucking insects, soil born insects, foliar fungi, weeds) and the developmental stages of the pests and pest groups at the moment of application must be named.
6 Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated.
7 Growth stage at first and last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
8 The maximum number of application possible under practical conditions of use must be provided.
9 Minimum interval (in days) between applications of the same product
10 For specific uses other specifications might be possible, e.g.: g/m³ in case of fumigation of empty rooms. See also EPPO-Guideline PP 1/239 Dose expression for plant protection products.
11 The dimension (g, kg) must be clearly specified. (Maximum) dose of a.s. per treatment (usually g, kg or L product / ha).
12 If water volume range depends on application equipments (e.g. ULVA or LVA) it should be mentioned under “application: method/kind”.
13 PHI - minimum pre-harvest interval
14 Remarks may include: Extent of use/economic importance/restrictions

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1.

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Column 15: zRMS conclusion.

A	Acceptable
R	Acceptable with further restriction
C	To be confirmed by cMS
N	Not acceptable / evaluation not possible
n.r.	Not relevant for section 3

3.2 Efficacy data (KCP 6)

Introduction

This document summarizes the information related to the efficacy of the product CHR/H/PENDIF containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37,5 g/l.
CHR/H/PENDIF applies in the Central Registration Zone for the registration of in winter wheat at autumn BBCH 11-25, winter triticale at autumn BBCH 11-25, applied once per season at the maximum rate of 124,8 g a.s./ha flufenacet + 100 g a.s./ha diflufenican+ 15 g a.s./ha penoxsulam per application for the control of dicotyledonous weeds.

General information:
Description of the plant protection product

Marketing name:
North-East Zone
product submitted to registration under three different marketing names: Cevino Trio 599.5SC, Trivino 599.5SC
Formulants content:
The information concerning ingredients of product CHR/H/PENDIF are included in the confidential part of the registration dossier: Registration Report – Part C.

Formulation of use:
SC – Suspension concentrate

General information on the plant protection product:

CHR/H/PENDIF is to be applied in autumn:
Winter wheat, winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,

The suggested dose of the product:
Used solo:
0.3-0,4 L/ha once a season in winter wheat and winter triticale which are corresponding ftom flufenacet 93,6 g a.s./ha + diflufenican 75 g a.s./ha + penoxsulam 11,25 g a.s./ha to flufenacet 124,8 g a.s./ha + diflufenican 100 g a.s./ha + penoxsulam 15 g a.s./ha CHR/H/PENDIF containing flufenacet, diflufenican and penoxsulam as the active substances is prepared for the use in agricultural practice as a herbicide in the form SC – Suspension concentrate.
Information on the composition of product CHR/H/PENDIFare included in the confidential part of the registration dossier: Registration Report – Part C.

Description of active substances

Mode of action

Active substance:
Flufenacet 312,8g/l
CAS no 142459-58-3
IUPAC name: N-(4-fluorophenyl)-N-propan-2-yl-2-[[5-(trifluoromethyl)-1,3,4-thiadiazol-2-yl]oxy]acetamide
Flufenacet is herbicide unclassified inhibition of cell division and cell growth, meristemic activity. (DAR B.3.1.2). HRAC group 15 (K3). Flufenacet is an oxyacetamide herbicide. The molecular mode of action

of the oxyacetamides is not known. Mode of action studies with the only oxyacetam-ide herbicide so far introduced (mefenacet, rice Japan) have shown a similarity with the ac-tion of chloracetanilides (e.g. alachlor, metolachlor) at the cellular and at the tissue level. The molecular mode of action of the chloroacetanilides is also not known. Oxyacetamides and chloroacetanilides both inhibit cell division after a lag phase of several hours. This inhibition results in a complete arrest of cell division in the root and shoot meristematicregions. New growth is stopped and elongating tissue may become distorted. Detailed studies with mefenacet and metolachlor have shown that cells no longer enter the division cycle, but that progress through the individual phases of cell division (pro-, meta-, ana- and telophase) is unchanged. The mitotic index is accordingly decreased.

Diflufenican 250g/l

CAS no 83164-33-4

IUPAC name: 2′,4′-difluoro-2-(α,α,α-trifluoro-mtolyloxy)

Diflufenican is a synthetic herbicide. It is absorbed by leaves and the coleoptiles of the grasses. According to the Herbicide Resistance Action Committee (HRAC) diflufenican is included in HRAC Group 12 (F1) – Inhibition of acetyl CoA carboxylase. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is the first enzyme of the fatty acid biosynthesis. The lack of fatty acids, affected by the herbicide, causes disruption of meristem around the shoot apex, followed by whole plant death. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions. Diflufenican is systemic compound presenting upward and down ward systemic properties. The upward translocation allows the product to inhibit the development.

According to DAR (DRAFT ASSESMENT REPORT) the first symptoms on weeds are extensive discoloration or whitening of new growth. The quickest effect is obtained after pre-emergence or early post-emergence treatment on young seedlings. The red-purple colour of the foliage often observed after application is a result of stress resulting from the absence of carotenoids. Later on, the seedlings suffer from necrosis and die.

Translocation in plants

In pre-emergence applications on weeds, diflufenican forms a continuous layer on the surface of the soil, which is resistant to leaching. As the shoots of germinating weeds pass through this layer, they come into contact with and absorb the product. The more even the distribution of the herbicide on the soil the better the contact. Rain after application improves contact between the herbicide and the shoot.

Diflufenican also enters the roots developing in the treated layer. Therefore weeds germinating at or very near the soil surface can receive a dose via both shoots and roots and are generally very susceptible. Due to the short distance , diflufenican can then easily reach the meristematic tissues.

Metabolism of diflufenican has been studied in wheat after pre and post emergence treatment in the greenhouse. A maximum of 2% of diflufenican applied pre emergence is taken up, translocated and metabolised within wheat and no major metabolites have been identified.

In post emergence applications, diflufenican penetrates foliar tissues. It does not diffuse directly through the phloem to the meristematic parts but, taking into account its metabolic persistence in the plants, a very small amount accumulated at the sites of action is sufficient. Furthermore, buds and young leaves, which are well exposed to the spray, particularly in broadleaf weeds, are exposed to a contact action which reinforces efficacy. Lastly, diflufenican shows some mobility in the xylem which , after root uptake in the soil surface, also contributes to efficacy. When it is applied post emergence, there is no significant translocation.

Diflufenican is use to control weeds in small grain cereals it combines those qualities required in a selective autumn herbicide:

- good efficacy on early germinating weeds or those whose emergence can be staggered and, in particular, on difficult species such as Viola arvensis, Veronica hederifolia, Stellaria media, Galium aparine.
- A very broad spectrum on broad-leaved weeds
- Sufficient soil persistence to control late germination of spring weeds, such as Polygonum spp. and Fallopia convolvulus
- Flexibility of use, with a treatment period stretching from sowing to early spring
- Considerable consistency of action, virtually independent of climatic factors

- Particular compatibility with herbicides widely used in the control of grass weeds.

Penoxsulam 37,5g/l
CAS no: 219714-96-2
IUPAC name: 2-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide

According to DAR_03_Vol3_B1-5:
DE-638 is a member of the triazolopyrimidine sulfonamides, a class of herbicides known to inhibit the plant enzyme acetolactate synthase enzyme (ALS). HRAC group 2 (B). The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours of application although visible effects may not be observed for several days. Symptoms appear first in the upper meristematic region of the plants as chlorosis and necrosis. The effects then spread to the remaining parts of the plant. In some species there is a reddening of the midrib and veins.
Complete desiccation of the plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions.
DE-638 is a systemic, phloem and xylem mobile herbicide that is absorbed via leaves, shoots and roots. The compound is translocated in plants to meristematic tissues.
Translocation – uptake and distribution – of radiolabeled DE-638 has been evaluated in rice (the proposed use species) and Echinochloa crus-galli (the main target weed species in Europe) by direct foliar application.§ Uptake through the leaves is much less in rice than that observed in E. crus-galli. In particular, Indica rice leaves are practically impermeable to
DE-638. Japonica rice leaves are slightly less impermeable than Indica leaves. This is due to the hydrophobic character of the rice leaves. Leaf cuticle acts as a major barrier to uptake. The radioactivity in E. crus-galli showed fairly even distribution throughout the plant and up into the new growth. The radioactivity in rice did not exhibit the same sort of even distribution, but the majority of radioactivity was localised in the stem region close to the site of injection. DE-638 metabolism is most rapid in Indica rice with a 0.6 day half-life, followed by Japonica rice with a 1.6 day half-life, and finally E. crus-galli with a half-life of 4.4 days. Rates of metabolism of DE-638 to inactive molecules contribute to the differential selectivity observed between these species.E. crus-galli shows the greatest uptake and the slowest metabolism following leaf applied DE-638. This results in substantial accumulation of the compound in this weed.

Table 3.2-1: Details of the active substances

Active substance	Flufenacet	Diflufenican	Penoxsulam
Concentration (Unit: g/kg or g/L...)	312 g/L	250g/l	37,5g/l
Chemical group	oxyacetamide	carbamoyl nitrogen	triazolopyrimidine sulfonamides
Mode of action	unclassified inhibition of cell division and cell growth, meristemic activity	Inhibition of acetyl CoA carboxylase	inhibit the plant enzyme acetolactate synthase enzyme (ALS)
Biological action	The molecular mode of action of the oxyacetamides is not known. Mode of action studies with the only oxyacetam-ide herbicide so far introduced (mefenacet, rice Japan) have shown a similarity with the ac-tion of chloracetanilides (e.g. alachlor,	It is absorbed by leaves and the coleoptiles of the grasses. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is	The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours

Active substance	Flufenacet	Diflufenican	Penoxsulam
	metolachlor) at the cellular and at the tissue level. The molecular mode of action of the chloroacetanilides is also not known. Oxyacetamides and chloroacetanilides both inhibit cell division after a lag phase of several hours. This inhi-bition results in a complete arrest of cell division in the root and shoot meristematicregions. New growth is stopped and elongating tissue may become distorted.	the first enzyme of the fatty acid biosynthesis. The lack of fatty acids, affected by the herbicide, causes disruption of meristem around the shoot apex, followed by whole plant death. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions. Diflufenican is systemic compound presenting upward and down ward systemic properties. The upward translocation allows the product to inhibit the development.	of application although visible effects may not be observed for several days. Symptoms appear first in the upper meristematic region of the plants as chlorosis and necrosis. The effects then spread to the remaining parts of the plant. In some species there is a reddening of the midrib and veins. Complete desiccation of the plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions.

Table 3.2-2: Simplified table of currently registered uses and requested uses for the product code.

Uses		Member State	Currently registered rate(s)		Requested rate(s)		Comments / Other relevant details on GAPs
Crop(s)	Target(s)		max. rate per appl	max. total rate per crop/season	max. rate per appl	max. total rate per crop/season	
winter wheat, winter triticale	dicotyledones weeds	PL, CZ			0.4 l/ha	0.3-0,4 l/ha	

Further details are in the table "All intended uses" in Part B - Section 0.

Description of the target pests

Table 3.2-3: Glossary of pests mentioned in the dossier.

Winter wheat

EPPO code	Scientific name	Common name*
GALAP	Galium aparine	Catchweed bedstraw
CAPBP	Capsella bursa-pastoris	Shepherd's purse

FUMOF	Fumaria officinalis	Common fumitory
APESV	Apera spica venti	loose silky-bent
VIOAR	Viola arvensis	Field violet
BRSNN	Brassica napus (self-sown plant)	Rapeseed
ANTAR	Anthemis arvensis	Mayweed
MATIN	Tripleurospermum mar. inodorum	False chamomille
STEME	Stellaria media	Common chickweed
THLAR	Thlaspi arvense	Fanweed
LAMPU	Lamium purpureum	Purple deadnettel
PAPRH	Papver rhoeas	Common popy
CENCY	Centaurea cyanus	Cornflower
VERHE	Veronica hederifolia	Ivy-leaved speedwell
GERPU	Geranium pusillum	Small-flower geranium

* optional

Winter triticale

EPPO code	**Scientific name**	**Common name***
GALAP	Galium aparine	Catchweed bedstraw
APESV	Apera spica venti	loose silky-bent
CHEAL	Chenopodium album	Common lambsquarters
AMARE	Amaranthus retroflexus	Redroot pigweed
VIOAR	Viola arvensis	Field violet
BRSNN	Brassica napus (self-sown plant)	Rapeseed
MATIN	Tripleurospermum mar. inodorum	False chamomille
STEME	Stellaria media	Common chickweed
THLAR	Thlaspi arvense	Fanweed
LAMPU	Lamium purpureum	Purple deadnettel
GERPU	Geranium pusillum	Small-flower geranium
ANTAR	Anthemis arvensis	Mayweed
CAPBP	Capsella bursa-pastoris	Shepherd's purse
PAPRH	Papver rhoeas	Common popy
CENCY	Centaurea cyanus	Cornflower
VERHE	Veronica hederifolia	Ivy-leaved speedwell
FUMOF	Fumaria officinalis	Common fumitory

* optional

Table 3.2-4: Major / minor status of intended uses (for all cMS and zRMS).

Winter wheat

Crop and/or situation	Crop status		Pests or group of pests controlled	Pest status	
	Major	**minor**		**Major**	**minor**
wnter wheat	PL,	-	Galium aparine	PL,	-
			Capsella bursa-pastoris	PL,	-
			Fumaria officinalis	PL,	-
			Apera spica venti	PL,	-
			Viola arvensis	PL,	-
			Brassica napus (self-sown plant)	PL,	-
			Anthemis arvensis	PL,	-
			Tripleurospermum mar. inodorum	PL,	-
			Stellaria media	PL,	-
			Thlaspi arvense	PL,	-
			Lamium purpureum	PL,	-
			Papver rhoeas	PL,	-
			Centaurea cyanus	PL,	-
			Veronica hederifolia	PL,	-
			Geranium pusillum	PL,	-

Winter triticale

Crop and/or situation	Crop status		Pests or group of pests controlled	Pest status	
	Major	**minor**		**Major**	**minor**
winter triticale	PL,	-	Galium aparine	PL,	-
			Apera spica venti	PL	-
			Chenopodium album	PL	-
			Amaranthus retroflexus	PL,	-
			Viola arvensis	PL	-
			Brassica napus (self-sown plant)	PL	-
			Tripleurospermum mar. inodorum	PL	-
			Stellaria media	PL,	-
			Thlaspi arvense	PL,	-
			Lamium purpureum	Pl,	-
			Geranium pusillum	PL,	-
			Anthemis arvensis	PL,	-

			Capsella bursa-pastoris	Pl,	-
			Papver rhoeas	PL,	-
			Centaurea cyanus	PL,	-
			Veronica hederifolia	PL,	-
			Fumaria officinalis	PL,	-

Compliance with the Uniform Principles

The overall assessment was performed according to the uniform principles. There were no deviations from the EPPO guidelines with the trials.

Information on trials submitted (3.1 Efficacy data)

The 8 trials (winter wheat 4 trials, winter triticale 4 trials) have been carried out in 2019, and the 12 trials (winter wheat 6 trials, winter triticale 6 trials) have been carried out in 2020 in the North-East EPPO zone within the Central registration zone to evaluate the efficacy of applied at the proposed label rate of 0,3-0,4l/ha (flufenacet 93,6 g a.s./ha + diflufenican 75 g a.s./ha + penoxsulam 11,25 g a.s./ha to flufenacet 124,8 g a.s./ha + diflufenican 100 g a.s./ha + penoxsulam 15 g a.s./ha) for the weed control in winter wheat and winter triticale (Table 3.2 5). Trials were conducted in the main winter wheat and winter triticale growing areas in the North-East EPPO zone in Poland.

Table 3.2 5. Presentation of trials efficacy trials
Winter wheat

Crop(s) *	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials)		GEP, non-GEP, official***	Comments (any other relevant information)
					North-East zone	-		
winter wheat	Galium aparine	Poland	2019	E	2(4)	-	GEP	-
			2020	E	4(6)	-	GEP	-
	TOTAL	-	2016	-	6(10)	-	-	-
winter wheat	Capsella bursa-pastoris	Poland	2019	E	2 (4)	-	GEP	-
			2020		6 (6)	-	GEP	-
	TOTAL	-		-	8 (10)	-	-	-
winter wheat	Apera spica venti	Poland	2019	E	3 (4)	-	GEP	-
			2020		4(6)	-	GEP	-
	TOTAL	-		-	7 (10)	-	-	-
winter wheat	Viola arvensis	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	5(6)	-	GEP	-
	TOTAL	-		-	8 (10)	-	-	-
winter wheat	Brassica napus (self-sown plant	Poland	2019	E	2(4)	-	GEP	-
			2020	E	6(6)	-	GEP	-
	TOTAL	-		-	8 (10)	-	-	-
winter wheat	Anthemis arvensis	Poland	2019	E	2 (4)	-	GEP	-

			2020	E	4 (6)	-	GEP	-
	TOTAL	-		-	6(10)	-	-	-
winter wheat	Tripleurospermum mar. inodorum	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	3 (6)	-	GEP	-
	TOTAL	-		-	6 (10)	-	-	-
winter wheat	Stellaria media	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	4 (6)	-	GEP	-
	TOTAL	-		-	6 (10)	-	-	-
winter wheat	Lamium purpureum	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	3 (6)	-	GEP	-
	TOTAL	-		-	6 (10)	-	-	-
winter wheat	Papver rhoeas	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	2 (6)	-	GEP	-
	TOTAL	-		-	4 (10)	-	-	-
winter wheat	Veronica hederifolia	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	4 (6)	-	GEP	-
	TOTAL	-		-	6 (10)	-	-	-
winter wheat	Geranium pusillum	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	3 (6)	-	GEP	-
	TOTAL	-		-	5 (10)	-	-	-
winter wheat	Cyanus segetum	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	1 (6)	-	GEP	-
	TOTAL	-		-	2 (10)	-	-	-

* According to the GAP table. Timing of the application(s) can be added if relevant (e.g. Pre-mergence vs post-emergence, spring vs autumn).
** P = preliminary trial, MED = minimum effective dose, E = efficacy trial.
*** GEP: Good Experimental Practices. Official: carried out by a national official organisation.

Winter triticale

Crop(s) *	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials)		GEP, non-GEP, official***	Comments (any other relevant information)
					North-East zone	-		
winter triticale	Galium aparine	Poland	2019	E	1(4)	-	GEP	-
			2020	E	6(6)	-	GEP	-
	TOTAL	-	2016	-	7(10)	-	-	-
winter triticale	Apera spica venti	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	5 (6)	-	GEP	-

	TOTAL	-		-	8 (10)	-	-	-
winter triticale	Chenopodium album	Poland	2019	E	1 (4)	-	GEP	-
			2020	-	-	-	-	-
	TOTAL	-		-	1 (4)	-	-	-
winter triticale	Amaranthus retroflexus	Poland	2019	E	1 (4)	-	GEP	-
			-	-	-	-	-	-
	TOTAL	-		-	1 (4)	-	-	-
winter triticale	Viola arvensis	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	5(6)	-	GEP	-
	TOTAL	-		-	8 (10)	-	-	-
winter triticale	Brassica napus (self-sown plant	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	5 (6)	-	GEP	-
	TOTAL	-		-	8(10)	-	-	-
winter triticale	Tripleurospermum mar. inodorum	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	2 (6)	-	GEP	-
	TOTAL	-		-	3 (10)	-	-	-
winter triticale	Stellaria media	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	4 (6)	-	GEP	-
	TOTAL	-		-	6 (10)	-	-	-
winter triticale	Thlaspi arvense	Poland	2019	E	2 (4)	-	GEP	-
			-	-	-	-	-	-
	TOTAL	-		-	2 (4)	-	-	-
winter triticale	Lamium purpureum	Poland	2019	E	2 (4)	-	GEP	-
			2020	E	1 (6)	-	GEP	-
	TOTAL	-		-	3 (10)	-	-	-
winter triticale	Geranium pusillum	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	2 (6)	-	GEP	-
	TOTAL	-		-	3 (10)	-	-	-
winter triticale	Anthemis arvensis	Poland	-	-	-	-	-	-
			2020	E	2 (6)	-	GEP	-
	TOTAL	-		-	2 (6)	-	-	-
winter triticale	Veronica hederifolia	Poland	2019	E	3 (4)	-	GEP	-
			2020	E	5 (6)	-	GEP	-
	TOTAL	-		-	8 (10)	-	-	-
winter triticale	Capsella bursa-pastoris	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	5 (6)	-	GEP	-

	TOTAL	-		-	6 (10)	-	-	-
winter triticale	Papver rhoeas	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	1 (6)	-	GEP	-
		-		-	2 (10)	-	-	-
winter triticale	Centaurea cyanus	Poland	2019	E	1 (4)	-	GEP	-
			2020	E	3 (6)	-	GEP	-
		-		-	4 (10)	-	-	-
winter triticale	Fumaria officinalis	Poland	-	-	-	-	-	-
			2020	E	1 (6)	-	GEP	-
		-		-	1 (1)	-	-	-

* According to the GAP table. Timing of the application(s) can be added if relevant (e.g. Pre-mergence vs post-emergence, spring vs autumn).
** P = preliminary trial, MED = minimum effective dose, E = efficacy trial.
*** GEP: Good Experimental Practices. Official: carried out by a national official organisation.

Table 3.2-5: Presentation of reference standards used in trials efficacy trials

Crop(s)	Reference standard	Country(ies) where the product is registered (1)	Authorization number	Active substance(s)	Formulation		Registered application	Application	Remark(4)
					Type(2)	Concentration of a.s.	rate(3)	rate in trials (per treatment)	
Winter wheat, winter triticale,	Komplet 560 SC	Poland	R-104/2014	diflufenican	S.C. - concentrated suspension	280 g/l	0,5 l/ha	0,5 l/ha	
				flufenacet		280 g/l			
Winter wheat, winter triticale,	Bizon 118,75 S.C.	Poland, Slovakia	R-623/2017d	diflufenican	S.C. - concentrated suspension	100 g/l,	1,0 l/ha	1,0 l/ha	
				florasulam		3,75 g/l			
				penoxsulam		15 g/l			

(1) only on use(s) applied for (with the test product).
(2) e.g. WP (wettable powder), EC (emulsifiable concentrate), etc.
(3) dose(s) / dose range authorized on that use in the country.
(4) Other relevant information (e.g. uses, number of applications, spray volume, method of application, etc.).

Comments of zRMS:	This report summarizes the information concerning the efficacy of the plant protection product CHR/H/PENDIF. The product contains 312 g/l of flufenacet, 250 g/l of diflufenican and 37,5 g/l of penoxsulam and is formulated a suspension concentrate (SC). It is used as herbicide in winter wheat and winter triticale. The reports and data were submitted to support of the evaluation of the CHR/H/PENDIF product authorization in PL. The active substance flufenacet is included in the Annex to Commission Implementing Regulation (EU) No 540/2011 containing the active substances approved for use in plant protection products under Regulation (EC) No 1107/2009 with the expiration of approval on 31/10/2022 .

	According to general provisions applying to all substances listed in the Annex to commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No1107/2009 of the European Parliament and of the Council as regards the list of approved active substances specific provisions of Regulation (EU) No 540/2011 were as follows: Only uses as herbicide may be authorised. For the implementation of the uniform principles as referred to in Article 29(6) of Regulation (EC) No 1107/2009, the conclusions of the review report on flufenacet, and in particular Appendices I and II thereof, as finalised in the Standing Committee on the Food Chain and Animal Health on 4 July 2003 shall be taken into account. In this overall assessment Member States: — should pay particular attention to the protection of groundwater, when the active substance is applied in regions with vulnerable soil and/or climate conditions, — should pay particular attention to the protection of algae and aquatic plants, — should pay particular attention to the protection of operators. Risk mitigation measures should be applied where appropriate. The active substance diflufenican is included in the Annex to Commission Implementing Regulation (EU) No 540/2011 containing the active substances approved for use in plant protection products under Regulation (EC) No 1107/2009 with the expiration of approval on 31/12/2022. According to general provisions applying to all substances listed in the Annex to commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No1107/2009 of the European Parliament and of the Council as regards the list of approved active substances specific provisions of Regulation (EU) No 540/2011 were as follows: PART A Only uses as herbicide may be authorised. PART B For the implementation of the uniform principles as referred to in Article 29(6) of Regulation (EC) No 1107/2009, the conclusions of the review report on diflufenican, and in particular Appendices I and II thereof, as finalised in the Standing Committee on the Food Chain and Animal Health on 14 March 2008 shall be taken into account. In this overall assessment Member States must pay particular attention to: — the protection of aquatic organisms. Risk mitigation measures such as buffer zones shall be applied, where appropriate, — the protection of non-target plants. Risk mitigation measures such as an in-field no spray buffer zones shall be applied, where appropriate. The active substance penoxsulam is included in the Annex to Commission Implementing Regulation (EU) No 540/2011 containing the active substances approved for use in plant protection products under Regulation (EC) No 1107/2009 with the expiration of approval on 31/07/2023. According to general provisions applying to all substances listed in the Annex to commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No1107/2009 of the European Parliament and of the Council as regards the list of approved active substances specific provisions of Regulation (EU) No 540/2011 were as follows: PART A Only uses as herbicide may be authorised. PART B For the implementation of the uniform principles as referred to in Article 29(6) of

	Regulation (EC) No 1107/2009, the conclusions of the review report on penoxsulam, and in particular Appendices I and II thereof, as finalised in the Standing Committee on the Food Chain and Animal Health on 22 January 2010 shall be taken into account n this overall assessment, Member States must pay particular attention to: — the protection of aquatic organisms, — the dietary exposure of consumers to residues of the metabolite BSCTA in succeeding rotational crops, — the protection of groundwater when the active substance is applied in regions with vulnerable soil and/or climatic conditions. Conditions of authorisation shall include risk mitigation measures, where appropriate.

3.2.1 Preliminary tests (KCP 6.1)

Preliminary studies on product CHR/H/PENDIF were not carried out because this herbicide contains penoxsulam 37,5 g/l + diflufenican 250 g/l flufenacet 312 g/l which are a well-known active substances that has been used for many years in agricultural practice.
According to EPPO 1/306 (1) General principles for the development of co-formulated mixtures of plant protection products, , a co-formulated mixture is defined as a plant protection product which contains more than one active substance. Mixtures may be developed for a variety of reasons, including improved effectiveness against one pest or a range of pests, better plant growth regulation, resistance management, a broader spectrum of pest control and other desirable properties such as flexibility of application or improved crop quality.

Effectivnes

CHR/H/PENDIF is a plant protection product contains three well known active substances: penoxsulam, diflufenican and flufenacet. After analising product contain penoxsulam, diflufenican and flufenacet registered in Poland and comparing time of use and pests there are strong issues supporting the authorization of a mixture.

Each of CHR/H/PENDIF active substances has different mode of action on specific important weeds:
Penoxsulam - *Echinochloa crus-galli* and monocotyledonous weeds
Flufenacet – monocotyledonous weeds
Diflufenican - dicotyledonous weeds
Product CHR/H/PENDIF control the most important weeds in cereals including Apera Spica Venti.
Combination of these three substances control impoprtant dicotyledonous and monocotyledonous weeds, combines different modes of action to prevence resistance.

Potential advantages:

Advantages in combining active substances with different properties

1. CHR/H/PENDIF contain 3 different active substances that acts in different ways and in different time, with systemic and foliar activity.

Flufenacet is herbicide unclassified inhibition of cell division and cell growth, meristemic activity. Flufenacet is an oxyacetamide herbicide, included in HRAC Group HRAC group 15 (K3). Oxyacetamides and chloroacetanilides both inhibit cell division after a lag phase of several hours. This inhibition results in a complete arrest of cell division in the root and shoot meristematicregions. New growth is stopped and elongating tissue may become distorted.

Diflufenican is a synthetic herbicide. It is absorbed by leaves and the coleoptiles of the grasses. It. is included in HRAC Group 12 (F1) – Inhibition of acetyl CoA carboxylase. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is the first enzyme of the fatty acid biosynthesis. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions.

Penoxsulam is included in HRAC group 2 (B) the inhibitions of ALS. The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours of application although visible effects may not be observed for several days. Symptoms appear first in the upper meristematic region of the plants as chlorosis and necrosis. Complete desiccation of the plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions

Active substance	**Flufenacet**	**Diflufenican**	**Penoxsulam**
Chemical group	oxyacetamide	carbamoyl nitrogen	triazolopyrimidine sulfonamides
HRAC group	15 (K3)	12 (F1)	2(B)
Time of action	Few weeks	Few weeks	7-10 days till 6-8 weeks
Mode of action,	unclassified inhibition of cell division and cell growth, meristemic activity	Inhibition of acetyl CoA carboxylase	inhibit the plant enzyme acetolactate synthase enzyme (ALS)
Biological action	The molecular mode of action of the oxyacetamides is not known. Mode of action studies with the only oxyacetam-ide herbicide so far introduced (mefenacet, rice Japan) have shown a similarity with the ac-tion of chloracetanilides (e.g. alachlor, metolachlor) at the cellular and at the tissue level. The molecular mode of action of the chloroacetanilides is also not known. Oxyacetamides and chloroacetanilides both inhibit cell division after a lag phase of several hours. This inhi-bition results in a complete arrest of cell division in the root and shoot meristematicregions. New growth is stopped and elongating tissue may become distorted.	It is absorbed by leaves and the coleoptiles of the grasses. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is the first enzyme of the fatty acid biosynthesis. The lack of fatty acids, affected by the herbicide, causes disruption of meristem around the shoot apex, followed by whole plant death. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions. Diflufenican is systemic compound presenting upward and down ward systemic properties.	The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours of application although visible effects may not be observed for several days. Symptoms appear first in the upper meristematic region of the plants as chlorosis and necrosis. The effects then spread to the remaining parts of the plant. In some species there is a reddening of the midrib and veins. Complete desiccation of the

Active substance	Flufenacet	Diflufenican	Penoxsulam
		The upward translocation allows the product to inhibit the development.	plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions.

2. Using three active substances in a mixture provide more effective control than if they are applied singly in sequence.

CHR/H/PENDIF contain three active substances with a different time and mode of action. I Poland there are fiveteen plant protection products containing diflufenican and flufenacet, twenty plant protection products containing diflufenican and eleven plant protection products containing flufenacet. There is no product contain penoxsulam solo. Three plant protection products contain penoxsulam in mixture with diflufenican and florasulam and in Germany there is one product contain penoxsulam and diflufenican.

- Applied dose was set based on knowlege with solo products. Table below shows that CHR/H/PENDIF has much more wider weeds control than solo products registered by applicant , also dose of active substances is lower. Product contain penoxsulam Bizon has comparable number and species of weeds like CHR/H/PENDIF

Product dose		*** CHR/H/PENDIF 599,5 S.C. 0,4 l/ha**		****Adiunkt 500 S.C. dose 0,3 l/ha**		*****Cetnik 500 S.C. dose 0,35 l/ha**		******Bizon dose 1,0 l/ha**
no	**weeds**	**Winter cereals - mean efficacy %**	**Efficacy**	**Winter cereals - mean efficacy %**	**Efficacy**	**Winter wheat - mean efficacy %**	**Efficacy**	**Efficacy of winter sereals**
1	*Galium aparine*	91,60	S	83,14	MS	59,06	T	S
2	*Viola arvensis*	98,85	S	96,02	S	58,83	MT	S
3	*Brassica napus (self-sown plant)*	98,34	S	-	-	62,31	MT	S
4	*Tripleurospermum mar. inodorum*	99,15	S	82,19	MS	57,53	T	S
5	*Stellaria media*	98,62	S	91,70	S	75,66	MS	S
6	*Apera Spica Venti*	98,43	S	77,20	MS	97,71	S	S
7	*Veronica hederifolia*	98,03	S	94,61	S	64,15	MT	S
8	*Capsella bursa-pastoris*	98,96	S	-	-	-	-	S
9	*Papver rhoeas*	62,30	MT	69,69	MT	-	-	S
10	*Lamium purpureum*	98,09	S	96,25	S	49,4	T	S
11	*Anthemis arvensis*	97,12	S	-	-	85,85	S	-
12	*Geranium pusillum*	97,43	S	-	-	-	-	-
13	*Cyanus segetum*	68,14	MT	66,80	MT	38,26	T	S
14	*Myosotis arvensis*	-	-	98,44	S	-	-	-
15	*Veronica persica*	-	-	94,38	S	-	-	S
16	*Vicia cracca*	-	-	90,69	S	-	-	-
17	*Bromus inermis*	-	-	-	-	100	S	-
18	*Lolium perenne*	-	-	-	-	98,58	S	-
19	*Lamium purpureum*	-	-	-	-	61,52	MT	S
20	*Consolida regalia*	-	-	-	-	43,3	T	-
21	*Alopecurus myosuroides*	-	-	-	-	48,78	T	-
22	*Thlaspi arvense*	-	-	-	-	-	-	S

* CHR/H/PENDIF 599,5 SC (flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37,5 g/l)
* CHR/H/PENDIF 599,5 S.C. dose: 0,4 l/ha (124,8 g a.s/ha flufenacet + 100 g a.s./ha diflufenican + 15 g a.s./ha penoxsulam), appliaction BBCH 11-25

**Adiunkt 500 S.C./ Herubin 500 S.C./ Saper 500 SC (diflufenican 500 g/l), dose: 0,3 l/ha (150 g a.s/ha) , application time BBCH 14-23

***Cetnik 500 S.C./ Cevino 500 S.C. (flufenacet 500 g/l), postemergance dose: 0,35 l/ha (m175 g a.s/ha, appliaction time BBCH 11-20

****Bizon (diflufenican 100 g/l + florasulam 3,75 g/l + penoxsulam 15 g/l) dose: 1,0 l/ha (diflufenican 100 g a.s/ha + florasulam 3,75 g a.s./ha + penoxsulam 15 g a.s.ha), application time BBCH 11-23

After analising data for product with solo diflufenican, flufenacet (table 1 and 2) registered in Poland it may be consider that:

- products contain only diflufenican control only 2-4 weed species.
- products contain only flufenacet control only 2-4 weed species.
- CHR/H/PENDIF control the same weed species like solo diflufenican and flufenacet and also 7 additional weeds. Spectrum of weeds controled by CHR/H/PENDIF is much bigger wide than solo products.
- Growth stage of solo products contain diflufenican and flufenacet is BBCH 10-13 and CHR/H/PENDIF has much wider BBCH 11-25
- the maximum authorized dose of a diflufenican and flufenacet has been reduced. Products dose, contain difflufenican, is 120-150g as/ha while in CHR/H/PENDIF, diflufenican dose is 100g as/ha. Products dose contain flufenacet is 192-240g as/ha while in CHR/H/PENDIF flufenacet dose is 124,8g as/ha
- Other general advantages for the mixture when compared with the solo product could include less packaging and reducing the number of operations for operators.

Table 1

PPP name	PENDIF - 0,4l/ha; 0,35l/ha	Clayton Dome 500 S.C. / Clayton El Nino	Daman / Kwash / Ryś	Dina 500 S.C. / Difenikan 500 S.C.	Diflanil 500 S.C. / Ukulele 500 S.C.	Diflato 500 S.C. / Somnus 500 S.C. / Violan 500 S.C.	Diflotex 500 S.C.	Fluto 500 SC	Legato 500 S.C. / Stakato 500 S.C.	Premazor Sad 500 SC
as g/ha	Flufenacet-124,8; Diflufenican-100; Penoxsulam-15g/ha	diflufenican 150g/ha	diflufenican 150g/ha	diflufenican 150g/ha	diflufenican 150g/ha	diflufenican 150g/ha	diflufenican 125g/ha	diflufenican 150g/ha	diflufenican 150g/ha	diflufenican 150g/ha
growth stage when use	BBCH 11-25	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13	BBCH 12-13
	sensitive weeds									
weeds species	Geranium pusillum									
	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis
	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media	Stellaria media
	Lamium purpureum						Lamium purpureum			
	Tripleurospermum maritimum									
	miotła zbożowa								miotła zbożowa	
	Veronica hederifolia	Veronica hederifolia			Veronica hederifolia	Veronica hederifolia	Veronica hederifolia, Veronica persica	Veronica hederifolia	Veronica hederifolia	
	Galium aparine				Galium aparine		Galium aparine			

	Anthemis arvensis						Anthemis arvensis			
	Brasica napus volunteer									
	Capsella bursa-pastoris	Capsella bursa-pastoris		Capsella bursa-pastoris	Capsella bursa-pastoris	Capsella bursa-pastoris		Capsella bursa-pastoris	Capsella bursa-pastoris	Capsella bursa-pastoris
							Papaver rhoeas			
							Myosotis arvensis			

Table 2

PPP name	PENDIF - 0,4l/ha; 0,35l/ha	Diplomat 480 S.C. / Osprey 480 S.C. / Palisade 480 S.C.	Fence 480 SC	Fluent 500 S.C.	Glosset 600 SC	Ramtic 500 S.C. / Shelter 500 S.C. / Starfire 500 S.C. / Sunfire 500 S.C.	Vulcanus
as g/ha	Flufenacet-124,8; Diflufenican-100; Penoxsulam-15g/ha	Flufnacet 240g/ha	Flufnacet 240g/ha	flufenacet 192g/ha	Flufnacet 240g/ha	Flufnacet 240g/ha	Flufnacet 240g/ha
growth stage when use	BBCH 11-25	BBCH 11-12	BBCH 11-12	BBCH 10-16	BBCH 10-13	BBCH 10-23	BBCH 10-13
	sensitive weeds						
weeds species	Geranium pusillum						
	Viola arvensis	Viola arvensis	Viola arvensis	Viola arvensis			
	Stellaria media		Stellaria media				
	Lamium purpureum						
	Tripleurospermum maritimum						
	Apera Spica Venti	Apera Spica Venti	Apera Spica Venti	Apera Spica Venti	Apera Spica Venti	Apera Spica Venti	Apera Spica Venti
	Veronica hederifolia						
	Galium aparine	Galium aparine	Galium aparine		Galium aparine		Galium aparine
	Anthemis arvensis						
	Brasica napus volunteer						
	Capsella bursa-pastoris						
					Poa annua	Poa annua	Poa annua
					Alopecurus myosuroides		

3. Justification for the ratio of active substances

- There is no overlap in activity against the target pests a case based on the rates of the solo products

- Applied dose of each individual active substance in a mixture is not greater than the corresponding dose of the same active substance in a solo product.

- the primary tests were not conduct becuose there is no product with diflufenican, flufenacet and penoxsulam but each active substance is well know in all over the Europe. There is a lot of product registered in Poland with solo diflufenican, flufenacet and also in mixture diflufenican + flufenacet and diflufenican +penoxsulam. There are 15 products registered in Poland with mixture diflufenican and flufenacet and one mixture registered in Germany with diflufenican and penoxsulam, what means that mixing diflufenican, flufenacet and penoxsulam is well known and is not new use for market.

Product	Registration no	active substances	dose /ha	active substances dose g/ha	crop
Arnold	R-189/2018	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley, winter triticale, winter rye
Bat 600 SC	R-83/2018	diflufenican - 200 g, flufenacet - 400 g	0,35	FLU 140g; DIF 70g	winter wheat, winter barley, winter triticale, winter rye
Battle Delta 600 SC	R-144/2016	diflufenican - 200 g, flufenacet - 400 g	0,35	FLU 140g; DIF 70g	winter wheat, winter barley, winter triticale, winter rye
Carthago SC	R-7/2020 wu	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley, winter triticale, winter rye
Expert 600 SC	R-91/2014	diflufenican - 200 g, flufenacet - 400 g	0,35	FLU 140g; DIF 70g	winter wheat, winter barley, winter triticale, winter rye
Komandos 560 SC	R-36/2015 h.r.	diflufenican - 280 g, flufenacet - 280 g	0,5	FLU 140g; DIF 140g	winter wheat, winter barley, winter triticale, winter rye
Kompleks 560 SC	R-69/2016 h.r.	diflufenican - 280 g, flufenacet - 280 g	0,5	FLU 140g; DIF 140g	winter wheat, winter barley, winter triticale, winter rye
Komplet 560 S.C.	R-104/2014	diflufenican - 280 g, flufenacet - 280 g	0,5	FLU 140g; DIF 140g	winter wheat, winter barley, winter triticale, winter rye
Łucznik	R-76/2020	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley,
Mertil 600 SC	R-86/2018	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley, winter triticale, winter rye

Naceto SC	R-25/2019wu	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley,
Nucleus 600 SC	R-45/2021	flufenacet - 400 g, diflufenican - 200 g	0,35	FLU 140g; DIF 70g	winter wheat, winter barley, winter triticale, winter rye
Premium 560 SC	R-31/2020 h.r	diflufenican - 280 g, flufenacet - 280 g	0,5	FLU 140g; DIF 140g	winter wheat, winter barley, winter triticale, winter rye
Reksio 600 SC	R-45/2021 h.r	diflufenican - 200 g, flufenacet - 400 g	0,35	FLU 140g; DIF 70g	winter wheat, winter barley, winter triticale, winter rye
Falkon	026330-00/00-001	100 g Diflufenican 15 g Penoxsulam	1,0	DIF-100g/ha; PEN-15g/ha;	winter wheat, winter barley, winter triticale, winter rye
Reliance 600 SC	R-85/2018	diflufenican - 200 g, flufenacet - 400 g	0,6	FLU 240g; DIF 120g	winter wheat, winter barley, winter triticale, winter rye
Bizon	r R – 182/2021d	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	1,0	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	winter wheat, winter barley, winter triticale, winter rye
Legion	R-622/2017d	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	1,0	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	winter wheat, winter barley, winter triticale, winter rye
Viper	R - 624/2017d	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	1,0	diflufenican - 100 g, penoxsulam 15 g, florasulam 3,75g	winter wheat, winter barley, winter triticale, winter rye

4. Acceptability of the resistance risk

CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l. Flufenacet is grouped into the inhibition of the biosynthesis of very long chain fatty acids group (VLCFAs) resulting in inhibition of cell division and cell growth (HRAC group: 15, legacy K3). This group of herbicides is quite well known and has been applied commercially for decades. The weed resistance to flufenacet occured only in two weed species: Lolium perenne ssp. multiflorum and Alopecurus myosuroides. All cases of weed resistance to diflufenican have been reported in the Australia and Israel with no evidence of resistance in Europe. The risk of resistance developing to diflufenican is low, particularly in Europe. There are many cases of weed resistance to penoxsulam and HRAC group 2 (ALS inhibitors), but none of them simultaneously showed resistance to flufenacet and diflufenican and other herbicides from HRAC groups: 15 (legacy K3) and 12 (legacy B).

According to submitted efficacy data none of the tested weeds showed high tolerance to the product CHR/H/PEDIF 599.5 SC. CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l, which belong to different HRAC groups (different mode of action). The mode of action involving a 'multi-site' action may indicate a lower risk to developing weeds resistance. Accroding to EPPO PP 1/213 (4) Resistance risk analysis weeds usually only produce one generation per year and development of resistance is usually a relatively slow process. In conclusion, in the applicant's opinion, this level of weeds resistance risk should be considered to be acceptable.

comments of zRMS: dRR point 3.2.1	Preliminary studies on product CHR/H/PENDIF were not carried out. The product contains well-known active substances that has been used for many years in agricultural practice: penoxsulam 37,5 g/l, diflufenican 250 g/l, flufenacet 312 g/l. The Applicant presented justification for potential advantages of the new mixture. Three substances have different mode of action and act in different time, with systemic and foliar activity CHR/H/PENDIF might be a good alternative to weed resistance management in cereals, compared to the herbicides containing one or two actives already registered. Efficacy of tested formulation was compared to efficacy of products based on solo active substances: Adiunkt 500 S.C.(dose rate 0,3 l/ha) containg diflufenican as active substance and Cetnik 500 S.C. (dose rate 0,35 l/ha) showing better efficacy in controling of targeted weeds species. What is more dose rates of both actives that candidate for substitution: diflufenican and flufenacet have been reduced in the product in comparison to solo products. The product containig three active substances including penoxsulam, diflufenican and florasulam, (2 common actives with CHR/H/PENDIF: penoxsulam, diflufenican with the same dose rates of actives per ha) showed similar level of weeds controling in comparison to CHR/H/PENDIF. This product (Bizon) was a reference product in the efficacy trials. This might also indicate that chosen substances in CHR/H/PENDIF are beneficial in controlling weeds. The Applicant showed advantages of the new mixture what might be enough justification to place CHR/H/PENDIF on the market.

Table 3.2-6: Efficacy of active substance components in test product – not applicable

Not applicable

Table 3.2-7: Percentage of control of the different ratios at timing of assessment (e.g. 10 to 14 days after application).- not applicable

Not applicable

Summary and conclusions on the preliminary trials

Not applicable

3.2.2 Minimum effective dose tests (KCP 6.2)

Applicant didn't conduct separately trials for minimum effective dose, this dose was evaluated in efficacy trials. The 20 field trials postemergence use were established in order to determine the minimum effective dose for the control of the winter wheat and winter triticale. The CHR/H/PENDIF was tested at doses: 0.2 to 0.4L/ha (119,90 – 179,85 g of active substances) in winter wheat and winter triticale for the control of mono and dicot weeds. The rates reflect the proposed label rate of the full recommended rate of CHR/H/PENDIF, in accordance with the EPPO standard PP 1/225 'Minimum effective dose'.

Winter wheat and winter triticale
Used solo:

0.3 L/ha once a season in winter wheat and winter triticale, which are corresponding to 179,85 g a.s./ha (flufenacet 93,6 g a.s./ha + diflufenican 75 g a.s./ha + penoxsulam 11,25 g a.s./ha)

Crop(s) 1 AND/OR Target(s) 1

Not applicable

Table 3.2-8: Minimum effective dose. Efficacy of product at proposed label rate, at X% and Y% dose rates on target 1 at assessment timing against "Crop(s) 1 AND/OR Target(s) 1".

No specific studies were conducted to fill this data point.

Crop(s) 2 AND/OR Target(s) 2

Not applicable

Summary and conclusions on the minimum effective dose

According to the presented results, the minimum dose of CHR/H/PENDIF is 0.3 L/ha once a season in winter wheat and winter triticale. As a result, the proposed rate should be considered the minimum effective dose to deliver broad spectrum control of weeds under a wide range of environmental conditions.

comments of zRMS: dRR point 3.2.2	**Minimum effective dose tests** The Applicant did not presented separate data to confirm minimum effective dose. The CHR/H/PENDIF was tested at dose rates: 0,2; 0,3; 0,35 and 0,4 l/ha in winter wheat and winter triticale for the control of mono and dicot weed in efficacy trials, to establish the minimum effective dose.

3.2.3 Efficacy tests (KCP 6.2)

<u>Materials and methods</u>
The applicant submitted 8 reports (in total) showing the results in research into product efficacy carried out in 2019 in winter wheat (4 trials) and winter triticale (4 trials) and in 2020 the applicant submitted 12 reports (in total) showing the results in research into product efficacy in winter wheat (6 trials) and winter triticale (6 trials). List of these reports is contained in Appendix 1

<u>Site</u>
Trials were conducted in different regions in Poland, where winter wheat and winter triticale are grown commercially. The experiment was established on a set of complete randomized blocks in 4 replications. Details on trial sites, applications and data on effectiveness are included in Appendix 4 and 5
Testing units

Efficacy studies on herbicide CHR/H/PENDIF were performed in 2019 by:
- SynTech Research Poland Sp. z o.o., ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland
- A.T Sp. z o.o., ul. Przemysłowa 3, 88-300 Mogilno, Poland
- Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland

Efficacy studies on herbicide CHR/H/PENDIF were performed in 2020 by:
- SynTech Research Poland Sp. z o.o., ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland
- A.T Sp. z o.o., ul. Przemysłowa 3, 88-300 Mogilno, Poland
- Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland

<u>Experimental details</u>
The efficacy trials were designed, conducted and reported according to the following EPPO guidelines:

- PP 1/135 (4) Phytotoxicity assessment
- PP 1/152 (4) Design and analysis of efficacy evaluation trials
- PP 1/181 (4) Conduct and reporting of efficacy evaluation trials including good experimental practice

They were carried out on the field in the conditions of natural agrofag infestation. The efficacy trials were concluded according to the EPPO standards:

- PP 1/93 (3) Weeds in cereals

Assessment methods

Statistical Analysis

In case of statistical analysis, data were analysed using a two way analysis of variance (ANOVA). The probability of no significant differences occurring between treatment means is calculated as the F probability value (Prob(F)). Student-Newman-Keuls test was then applied to separate any treatment differences that may be implied by the ANOVA TEST (Prob(F)<0.05) and these are indicated by the LSD-value and by a letter-test.

Statistical analysis was carried out with the use of statistic pack of ARM 9.0. The trial results were statistically analyzed using Student&Newman&Keuls Test (p=0,05).

Results were analyzed by the means of Student and Newman & Keuls (p=0.05). Results were calculated statistically according to ARM 9.0 and ARM 2019.4.

Statistical preparation of the results was based on the analysis of variance for the randomized block experiment design. Differences significance was tested using Tukey's semi-interval confidence, while the least significant difference was given at the significance level LSDα=0.05. Experimental data were calculated using the statistical program AWAR, version 2.0. Data from the statistical analyses were placed into result tables.

Assessment of efficacy

The assessment of efficacy in the treated plots was made in relation to the untreated plot on an overall plot basis (scale 0-100 %, 0 % =no efficacy). The assessment date was determined by the speed of action and period of efficacy of the test items.
The number of weeds/m² was counted in 5 x 0,1 m² quadrats with the measuring scale 'Göttinger Zähl- und Schätzrahmen‘. The coverage level (ground cover) of the weed population by species was assessed by visual estimation using a scale 0-100 % (100 %=total ground cover).

An efficacy was evaluated through assessments of damage weeds on plots treated compared to untreated (check) plots. The results was presented in percentage of efficacy (%). On untreated plots estimated number of weeds on 1 square meter.

The effectiveness of weed control were evaluated visually by comparing the state of individual weed species on plots treated by herbicides and untreated plots. The results are shown as a percentage of destruction. Before application and at each assessment were determined also the number of weeds, on the surface of $1m^2$.

Assessment of phytotoxicity

Phytotoxicity (chlorosis and necrosis), stunting and thinning were assessed by visual estimation of the intensity on an overall plot basis on a percentage scale 0-100 % (0=no damage). The assessment date was determined by the speed of action and period of efficacy of the test substances.

The selectivity was assessed by a visual estimation of an intensity of chlorosis, necrosis, leave curling etc. found on overall areas of treated plots, with references to untreated plots. Results were described in percent of destruction injury of plant for herbicides treatment compared in comparison to plant from untreated, where 0% means no phytotoxicity and 100% - complete crop destruction.

Phytotoxicity assessments of tested preparations were done by a visual estimation of an intensity of chlorosis, necrosis, leave curling, reduction in turgor of plants etc. found on overall areas of treated plots and by comparison of each treated plot with untreated plot. Assessments were done directly on plantation. Results were shown using 0-100 scale, where: 0 – lack of phytotoxicity, 100 – total plant destruction.

Phytotoxicity (F) of tested herbicides was evaluated in %, by determination crop state and comparison to untreated plots and standard product activity.
phytotoxicity - susceptibility of plants to herbicides in % where:
0 - no reaction of crop
100 - crop damaged

Applications methods and rates

The applications were carried out by a SPRBIC, BACCAI in cereals.

Tested herbicide was applied at spring the growth stage in winter wheat and winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,

The product CHR/H/PENDIF has been used:
in winter wheat at the following rates of 0.2, 0.3, 0.35. 0.4 L/ha
in winter triticale at the following rates of 0.2, 0.3, 0.35. 0.4 L/ha

Bizon 118,75 SC and Komplet 560 SC were used as a reference product in winter wheat, winter triticale

Experiment pattern:
Winter wheat, winter triticale

No.	**Name**	**Rate (l/ha)**	**other rate (g a.s./ha)**	**Appl code**	**Growth Stage BBCH**
1	Untreated Check				
2	CHR/H/PENDIF	0,2	120	A	BBCH 11-25
3	CHR/H/PENDIF	0,3	180	A	BBCH 11-25
4	CHR/H/PENDIF	0,35	210	A	BBCH 11-25
5	CHR/H/PENDIF	0,4	240	A	BBCH 11-25
6	Bizon 118,75 SC	1,0	119	A	BBCH 11-25
7	Komplet 560 SC	0,5	280	A	BBCH 11-25

Details of experiments

Winter wheat

Report code	CHR_H_PENDIF_EFF_PL01	A.T/2019/089/PO	A.T/2019/090/PO	AH/19/PO/30/Pr/PENDIF/1	AH/20/PO/33/Pr/2	AH/20/PO/33/Br/1	A.T/2020/143/PO	A.T/2020/144/PO	CHR_H_PENDIF20_EFF_PL02	CHR_H_PENDIF20_EFF_PL01
Location	Jankowice Wielkie / Poland	Modrze / Poland	Wilcze / Poland	Przybroda / Poland	Przybroda / Poland	Brody / Poland	Kocanowo / Poland	Angowice / Poland	Wawolnica / Poland	Owczary / Poland
Plant/cultivar	Winter wheat /Patras	Winter wheat / Euforia	Winter wheat / Arkadia	Winter wheat / Arkadia	Winter wheat / Arkadia	Winter wheat / Tonacja	Winter wheat / Apostel	Winter wheat / RGT Bilanz	Winter wheat / Ponticus	Winter wheat / Linus
Seeding date	2019-09-26	2019-09-27	2019-09-16	2019-09-24	2020-10-02	2020-09-23	23.09.2020	15.09.2020	28.09.2020	05.10.2020
Seeding rate	200 kg/ha	140 kg/ha	200 kg/ha	220 kg/ha	200 kg/ha	260 kg/ha	165 kg/ha	185 kg/ha	185 kg/ha	180 kg/ha
Forecrop	winter oilseed rape	winter barley	winter wheat	winter oilseed rape	spring wheat	spring barley	winter oilseed rape	winter wheat	winter oilseed rape	winter oilseed rape
Type of sprayer	BACCAI	BACCAI	BACCAI	SPRBIC	SPRBIC	SPRBIC	BACCAI	BACCAI	BACCAI	BACCAI
Date of treatment	2019-11-05	2019-10-14	2019-10-25	2019-10-18	2020-11-04	2020-10-19	28.10.2020	17.10.2020	22.10.2020	28.10.2020
Plant development phase	BBCH 12-14	BBCH 11-12	BBCH 21-23	BBCH 11-14	BBCH 19-21	BBCH 12	BBCH 19-22	BBCH 11-13	BBCH 11-13	BBCH 11-12
Soil type	sandy clay	sandy loam	sandy loam	sandy loam	sandy loam	loamy sand	loamy sand	sandy loam	silt loam	sandy loam
pH	6,90	7,90	6,30	5,80	6,00	6,30	6,8	5,2	6,5	6,4
Water (l/ha)	300	200	300	200	200	230	200	200	200	300
Plot size	3x5=15m2	2,5x4,5=11,25m2	2,5x7,0=17,5m2	2x12=24m2	1,5x12=18m2	2x9=12m2	2,5x5=12,5m2	2,5x7,25=18,125m2	3x4=12m2	3x5=15m2

Winter triticale

Report code	AH/20/PszO/33 /Br/3	CHR_H_PEND IF_EFF_PL02	AH/19/PszO/30 /Zł/PENDIF/3	AH/19/PszO/30 /Pr/PENDIF/2	A.T/2019/091/P ŻO	CHR_H_PEND IF_EFF_PL03	CHR_H_PEND IF_EFF_PL04	A.T/2020/145/P ŻO	A.T/2020/146/P ŻO	A.T/2020/147/P ŻO
Location	Brody / Poland	Bazyny / Poland	Złotniki / Poland	Przybroda / Poland	Kopaszyn / Poland	Kłoda / Poland	Łajsy / Poland	Zamarte / Poland	Lichnowy / Poland	Białe Błota / Poland
Plant/cultivar	Winter triticale / Twingo	Winter triticale / Fredro	Winter triticale / Aliko	Winter triticale / Grenado	Winter triticale / Trapero	Winter triticale/ Orinoko	Winter triticale / Tadeus	Winter triticale / Orinoko	Winter triticale/ Orinoko	Winter triticale / Borowik
Seeding date	23.09.2020	25.09.2019	26.09.2019	24.09.2019	17.09.2019	05.10.2020	29.09.2020	24.09.2020	26.09.2020	24.09.2020
Seeding rate	180 kg/ha	180 kg/ha	190 kg/ha	175 kg/ha	180 kg/ha	170 kg/ha	180 kg/ha	150kg/ha	180 kg/ha	200 kg/ha
Forecrop	spring wheat	winter oilseed rape	winter oilseed rape	winter oilseed rape	winter wheat	oats	spring barley	spring barley	winter triticale	spring barley
Type of sprayer	SPRBIC	BACCAI	SPRBIC	SPRBIC	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI
Date of treatment	19.10.2020	23.10.2019	05.11.2019	18.10.2019	15.10.2019	03.11.2020	22.10.2020	30.10.2020	03.11.2020	16.10.2020
Plant development phase	BBCH 12-13	BBCH 12-13	BBCH 19-22	BBCH 12-14	BBCH 12-13	BBCH 13	BBCH 11-13	BBCH 19-21	BBCH 13-21	BBCH 10-12
Soil type	loamy sand	sandy loam	loamy sand	sandy loam	loamy sand	sandy loam	sandy loam	sandy loam	loamy sand	sand
pH	5,8	4,91	6,60	6,00	7,2	6,3	5	6,2	4,8	6
Water (l/ha)	230	200	200	200	300	200	200	200	200	200
Plot size	2x9=18m2	3x7=21m2	2,5x8=20m2	2x10=20m2	2,5x5,5=13,75m 2	3x4=12m2	3x7=21m2	2,5x6=15m2	2,5x5=12,5m2	2,5x5,5=13,75m 2

Details of agricultural measures, fertilization, and other plant protection products applied during the experiments are included in detailed field study reports listed above.

Summary of the data from effectiveness trials can be found at Appendix 5

Efficacy tests
The 20 trials in total (winter wheat 10 trials and winter triticale 10 trials) were carried out in winter wheat, winter triticale, in 2019 and 2020 in Poland. The herbicide CHR/H/PENDIFwas applied once per season at the following rates:
in winter wheat at the following rates of 0.2, 0.3, 0.35. 0.4 L/ha
in winter triticale at the following rates of 0.2, 0.3, 0.35. 0.4 L/ha

Bizon 118,75 SC and Komplet 560 SC were used as a reference product in winter wheat, winter triticale

Tested herbicide was applied at the growth stage winter wheat and winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,

Table 3.2-9: Details on trial methodology

Guidelines	General guidelines	PP 1/152 (3) Design and analysis of efficacy evaluation trials
		PP 1/181 (3) Conduct and reporting of efficacy evaluation trials including good experimental practice
		PP 1/135 (3) Phytotoxicity assessment
	Specific guidelines	PP 1/93(2) Weeds in cereals
Experimental design	Plot design	Randomized Complete Block (RCB) – (20)
	Plot size	Winter wheat: 11,25-24 m^2 Winter triticale: 12-21 m^2
	Number of replications	4 (20)
Crop	Trials per crop	Autumn use Winter wheat (10) Winter triticale (10)
	Varieties per crop	Winter wheat: Patras, Euforia, Tonacja, Apostel, Arkadia, RGT Bilanz, Ponticus Winter triticale: Fredro, Borowik, Twingo, Aliko, Grenado, Orinoko, Tadeus
	Sowing period	Winter wheat: 16.09.2019 - 04.11.2020 Winter triticale: 17.09.2019 - 03.11.2020
Application	Crop stage (BBCH)* at application	Winter wheat: BBCH 11-23 Winter triticale: BBCH 11-22
	Timing Pest stage at application (1)	The data available in Appendix 4
	Number of applications Intervals between applications	1 (20 trials), interval – n/a
	Spray volumes	Winter wheat: 200 - 300 L/ha Winter triticale: 200 - 300 L/ha

Assessment	Assessment types	Assessment of efficacy Assessment of phytotoxicity
	Assessment dates	Assessment dates deatalis is available in Appendix 4
Other relevant information	e.g. Soil type, pH (in case of soil active substance …)	Winter wheat pH: 5,8 – 7,9 Winter triticale pH: 4,9 – 7,2
	e.g. Natural / artificial innoculation…	n/a
	e.g. Field / Greenhouse...	n/a
	...	n/a

* BBCH for weeds, pre-emergence, preventive / curative application, insect stage…

Crop(s) 1 AND/OR Target(s) 1

The 20 trials in total (winter wheat 10 trials and winter triticale 10 trials) were carried out in 2019 and 2020 in Poland.

3.2.3-1 Efficacy tests of CHR/H/PENDIF

Extrapolation of studies performed in 2019 and 2020 from winter wheat to winter triticale
In reference to **EPPO norm PP 1/226(4) "Efficacy evaluation of plant protection products Number of efficacy trials"**, according to point: Number of trials for direct efficacy (effectiveness) **-** "The number of trials is primarily determined by the importance of the crop and the pest (major or minor), and the possibility of extrapolation between crops and pests".
Under point: Reduced number of trials – the following information is available:
"In some situations, there may be the opportunity to reduce the number of trials done, and a case may be made for this as follows:
• Where there is a large amount of supporting evidence from use of the product, or of similar products with the same active substance, on closely related pests or against the same pests on different crops, the number of trials necessary will be determined by the amount of supporting evidence and the similarity of the pests and crops sought". In making extrapolations between crops or pests, it is important to explain and justify the reasoning for the extrapolation.
According to **COMMISSION REGULATION (EU) No. 545/2011 of 10 June 2011 implementing Regulation (EC) No. 1107/2009 of the European Parliament and of the Council as regards the data requirements for plant protection products** [14, 17]**, point 6. Efficacy data:**
"If to the opinion of the applicant the trials from the first season adequately confirm the validity of claims made on the basis of extrapolation of results from other crops, commodities or situations or from tests with closely similar preparations, a justification, which is acceptable to the competent authority for not carrying out a second season's work must be provided."
CRD - PROPOSALS FOR EXTENDING AND HARMONIZING EFFICACY AND CROP SAFETY EXTRAPOLATIONS TO REDUCE THE NEED FOR EFFICACY TRIALS ON MINOR CROPS
The following document was prepared by the Chemicals Regulation Directorate (CRD, formerly PSD), the UK pesticide regulatory authority, under the European Commission (DG SANCO) contract [15]. It presents lists of specific extrapolations for efficacy and crop safety trials. The proposals in the lists are intended as a framework for evaluators, to be used alongside expert judgment and regulatory experience.
One of main strategies proposed in order to address efficacy data requirements is to extrapolate from extant registered uses, and this was elaborated in a EPPO standard (PP1/257) [16] published in the Bulletin OEPP/EPPO Bulletin Vol. 37(3), December 2007. The EPPO standard is based on the extrapolation document developed by Chemicals Regulation Directorate (CRD, formerly PSD).

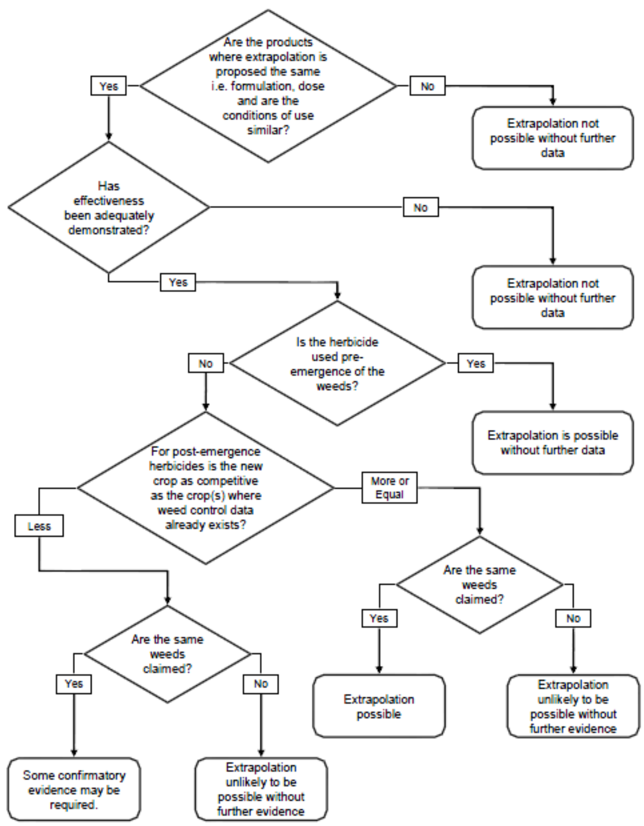
Although, this document refers to minor uses, it shall be noted that pt. 1.1. paragraph 3. contains the following information:
„3. Extrapolations will normally only be used to support the authorization of products for use on minor crops. Authorizations for the use of PPPs on major crops must always be supported by data. **However, the amount of data required to support a use on a major crop may be reduced from that normally required, by extrapolating data from similar crops or targets."**

According to paragraph 5.:

"5. Extrapolations may only be accepted for the extension of use of a given PPP used at the same rate and dose applied at similar timings and with similar equipment."

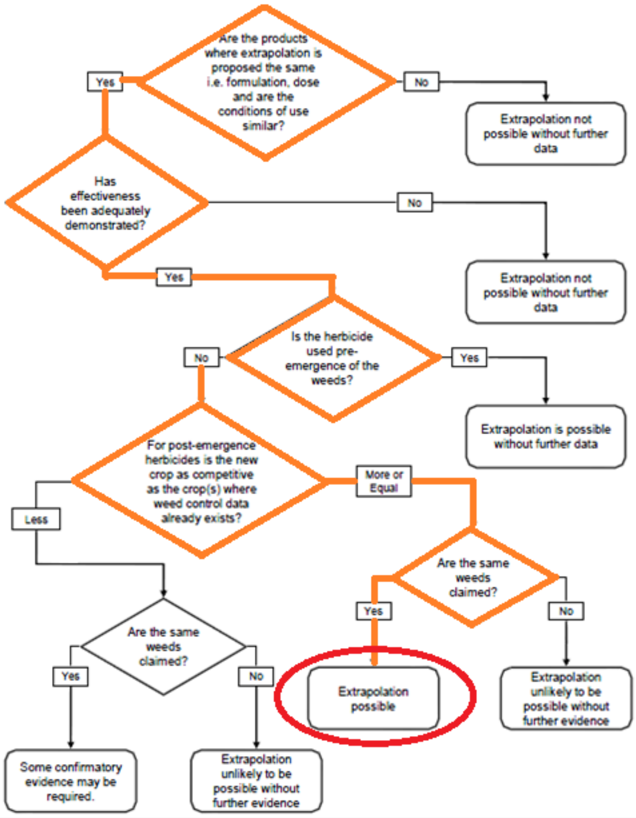
Under pt. 2.2. of this document the following graph is found: a decision-making scheme designed to act as a prompt when considering extrapolations of weed control claims between crops. The list of factors is not exhaustive and the mode of action, conditions of use, and extent of existing product knowledge will affect whether extrapolation is appropriate in each case.

Figure 2; Effectiveness extrapolations between crops for the same target weed



Following the flowchart and considering the product CHR/H/PENDIF, with a view to possible extrapolation from winter wheat to winter triticale the following pathway applies:

Figure 2; Effectiveness extrapolations between crops for the same target weed



The following table is derived from the document prepared by CRD. It presents a list of specific extrapolations for efficacy and crop safety. The proposals in the lists are intended as a framework for evaluators, to be used alongside expert judgment and regulatory experience (pt. 2.3.2.1.)

HERBICIDES

Table 9 Extrapolations between crops for the same target weed Test crop:	**Can extrapolate to:**
Pre-emergence, pre-sowing or pre-planting application of one crop	Pre-emergence, pre-sowing or pre-planting application of another crop (only if growing conditions are the same).
Any drilled flower, tree nursery or perennial crop.	Planted crop of the same species
Any planted flower, tree nursery or perennial crop.	Drilled crop of the same species
Any non-competitive crop e.g. Orchards, HONS, amenity vegetation, land not intended to bear vegetation.	Any other non-competitive crop, poorly competitive crop e.g. Sugar beet, peas, onions, linseed, horticultural brassicas, or competitive crop e.g. Cereals, grassland, oilseed rape (contact herbicides only)
Any poorly competitive crop e.g. Sugar beet, peas, onions, linseed, horticultural brassicas	Any other poorly competitive crop or competitive crop e.g. Cereals, grassland, oilseed rape (contact herbicides only)
Any competitive crop e.g. cereals, grassland, oilseed rape	**Any other competitive crop (contact herbicides only)**

Outside open field culture of tulip, narcissus or hyacinth (spring flowering crops)	Outside and protected cultures in open field of other spring flowering flower bulb- and bulb flower crops
Outside open field culture of lily or gladiolus (summer flowering crops)	Outside and protected cultures in open field of other summer flowering flower bulb- and bulb flower crops
Protected culture of bulb flowers in trays or containers (contact herbicide only)	Protected open field culture of bulb flowers (contact herbicide only)
Protected open field culture of bulb flowers (contact herbicide only)	Protected culture of bulb flowers in trays or containers (contact herbicide only)
Outside open field culture of flower bulb culture	Outside open field culture of bulb flower culture
Outside open field culture of bulb flower culture	Outside open field culture of flower bulb culture
Newly sown grass	Established grass (except where target weed is a perennial weed that is beyond the seedling stage)

(http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PSD/SANCO_D3_S12-395857.pdf)

SUMMARY:

In reference to the above listed documents and information, applicant have extrapolated 10 efficacy trials performed on winter wheat in 2019 and 2020 to winter triticale. Furthermore, this extrapolation is supported by 10 additional efficacy trials carried out on winter triticale in 2019 and 2020, which proved product's efficacy against weeds to be comparable in winter wheat and triticale.

The extrapolation was performed in view of using the results of studies against harmful organism (weeds) on one crop (winter wheat) for the purpose of analyzing efficacy against the same harmful organism on another crop (winter triticale), provided that:

the rates of product applied in the studies are the same - YES	
Winter wheat	Winter triticale
0,2l/ha, 0,3l/ha, 0,35l/ha, 0,4l/ha	0,2l/ha, 0,3l/ha, 0,35l/ha, 0,4l/ha
the amount of spray solution used is the same - YES	
Winter wheat	Winter triticale
200-300l/ha	200-300l/ha
the timing of application is the same - YES	
Winter wheat	Winter triticale
14.10.2019 – 05.11.2019; 17.10.2020 – 04.11.2020	15.10.2019 – 05.11.2019; 16.10.2020 – 03.11.2020
crop development phases during application are comparable - YES	
Winter wheat	Winter triticale
BBCH 11-23	BBCH 11-22

In view of the above, authors of his report find it fully justified to extrapolate the results of efficacy trials performed on product CHR/H/PENDIF from winter wheat to winter triticale.

Winter wheat
The ten trials were carried out in winter wheat in 2019 (4 trials) and 2020 (6 trials). The herbicide CHR/H/PENDIF was applied once per season at the following rates of 0.2, 0.3,0.35 0.4 L/ha. The treatments was conducted at the growth stage from 1 leaf unfolded to 3 tillers detectable BBCH 11-23.

Winter triticale
The ten trials were carried out in winter wheat in 2019 (4 trials) and 2020 (6 trials). The herbicide CHR/H/PENDIF was applied once per season at the following rates of 0.2, 0.3,0.35 0.4 L/ha. The treatments was conducted at the growth stage from 1 leaf unfolded to 2 tillers detectable BBCH 11-22.

3.2.3-1.1 The efficacy of CHR/H/PENDIF in control of APESV Apera Spica Venti

The efficiency of CHR/H/PENDIF in control of APESV Apera Spica Venti were investigated in 14 trials – 6 trials in winter wheat and 8 trials in winter triticale.

Winter wheat
The efficiency of CHR/H/PENDIF in control of APESV Apera Spica Venti was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 128-238 DA-A. The effectiveness fluctuated from 82,37-98,50 %.
The effectiveness at rate 0.2 l/ha fluctuated from 76,30 % to 93,30%, at rate 0.3 l/ha from 80,00 % to 100,00 % at rate 0.35 l/ha from 94,00 % to 100,0%, at rate 0.4 l/ha from 94,80 % to 100,0 %. The standard Bizon 118,75 SC mean efficacy was 90,05% and fluctuated from 70,00% to 100,00%. The standard Komplet 560 SC mean efficacy was 96,32% and fluctuated from 89,50% to 99,30%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 1).

Winter triticale
The efficiency of CHR/H/PENDIF in control of APESV Apera Spica Venti was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at high level of efficacy 128-238 DA-A . The effectiveness fluctuated from 78,75% – 98,30 %.
The effectiveness at rate 0.2 l/ha fluctuated from 75,00 % to 82,50%, at rate 0.3 l/ha from 83,80 % to 100,00 % at rate 0.35 l/ha from 88,80 % to 100,0%, at rate 0.4 l/ha from 93,30 % to 100,0 %. The standard Bizon 118,75 SC mean efficacy was 85,98% and fluctuated from 47,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 96,08% and fluctuated from 88,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standard Komplet 560SC and on higher level than Bizon 118,75SC. (Appendix 5 tab. 2).

3.2.3-1.2 The efficacy of CHR/H/PENDIFin control of GALAP Galium aparine

The efficiency of CHR/H/PENDIF in control of GALAP Galium aparine were investigated in 13 trials – 6 trials in winter wheat and 7 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of GALAP Galium aparine was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 151-243 DA-A. The effectiveness fluctuated from 84,70 - 94,52%.
The effectiveness at rate 0.2 l/ha fluctuated from 80,00 % to 89,50%, at rate 0.3 l/ha from 81,50 % to 100,00 % at rate 0.35 l/ha from 82,80 % to 100,0%, at rate 0.4 l/ha from 87,50 % to 100,0 %. The standard Bizon 118,75 SC mean efficacy was 94,90% and fluctuated from 87,80% to 100,00%. The standard Komplet 560 SC mean efficacy was 93,85% and fluctuated from 82,00% to 100,00%. The tested

product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 3).

Winter triticale
The efficiency of CHR/H/PENDIF in control of GALAP Galium aparine triloba was investigated in 7 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 156 - 249 DA-A . The effectiveness fluctuated from 76,26 – 91,08 %.
The effectiveness at rate 0.2 l/ha fluctuated from 70,00 % to 91,30%, at rate 0.3 l/ha from 65,00 % to 94,50 % at rate 0.35 l/ha from 80,00 % to 99,0%, at rate 0.4 l/ha from 85,00 % to 99,00 %. The standard Bizon 118,75 SC mean efficacy was 97,47% and fluctuated from 94,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 92,18% and fluctuated from 88,80% to 95,30%. The tested product CHR/H/PENDIF ad doses 0,35-0,4 was on the same efficacy level like standards. The report no A.T/2019/091/PŻO is show separately because of weather conditions – rainfall day after application and GALAP BBCH 17. Product shows very good efficacy for BBCH 10-14 and lower if GALAP is at higher growth stage. (Appendix 5 tab. 4).

3.2.3-1.3 The efficacy of CHR/H/PENDIFin control of PAPRH Papaver rhoeas

The efficiency of CHR/H/PENDIF in control of PAPRH Papaver rhoeas were investigated in 6 trials – 4 trials in winter wheat and 2 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIFin control of PAPRH Papaver rhoeas was investigated in 4 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the low level of efficacy at 138-174 DA-A. The effectiveness fluctuated from 30,65 – 54,95%.
The effectiveness at rate 0.2 l/ha fluctuated from 25,00 % to 36,30%, at rate 0.3 l/ha from 29,80 % to 55,00 % at rate 0.35 l/ha from 41,30 % to 56,30%, at rate 0.4 l/ha from 47,50 % to 65,0 %. The standard Bizon 118,75 SC mean efficacy was 67,65% and fluctuated from 51,30% to 81,00%. The standard Komplet 560 SC mean efficacy was 55,15% and fluctuated from 31,50% to 90,30%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 5).

Winter triticale
The efficiency of CHR/H/PENDIFin control of PAPRH Papaver rhoeas was investigated in 2 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at low level of efficacy 195 - 237 DA-A . The effectiveness fluctuated from 61,30 – 69,65 %.
The effectiveness at rate 0.2 l/ha fluctuated from 61,30 % to 61,30%, at rate 0.3 l/ha from 44,30 % to 68,80 % at rate 0.35 l/ha from 50,00 % to 77,50%, at rate 0.4 l/ha from 59,30 % to 80,00 %. The standard Bizon 118,75 SC mean efficacy was 92,40% and fluctuated from 91,00% to 93,80%. The standard Komplet 560 SC mean efficacy was 81,40% and fluctuated from 72,50% to 90,30%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the lower level of efficacy than standards. (Appendix 5 tab. 6).

3.2.3-1.4 The efficacy of CHR/H/PENDIFin control of STEME Stelaria media

The efficiency of CHR/H/PENDIF in control of STEME Stelaria media were investigated in 12 trials – 6 trials in winter wheat and 6 trials in winter triticale.

Winter wheat

The efficiency of CHR/H/PENDIFin control of STEME Stelaria media was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 151-190 DA-A. The effectiveness fluctuated from 95,90 – 98,10%.
The effectiveness at rate 0.2 l/ha fluctuated from 90,30 % to 100,00%, at rate 0.3 l/ha from 91,30 % to 100,00 % at rate 0.35 l/ha from 92,80 % to 100,00%, at rate 0.4 l/ha from 93,80 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,52% and fluctuated from 91,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 97,77% and fluctuated from 91,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 7).

Winter triticale
The efficiency of CHR/H/PENDIF in control of STEME Stelaria media was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 156 - 231 DA-A . The effectiveness fluctuated from 96,26 – 99,13 %.
The effectiveness at rate 0.2 l/ha fluctuated from 91,00 % to 100,00%, at rate 0.3 l/ha from 94,80 % to 100,00 % at rate 0.35 l/ha from 95,50 % to 100,00%, at rate 0.4 l/ha from 95,80 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 98,22% and fluctuated from 95,00% to 100,00%. The standard Komplet 560 SC mean efficacy was 99,00% and fluctuated from 96,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 8).

3.2.3-1.5 The efficacy of CHR/H/PENDIFin control of CAPBP Capsella bursa-pastoris

The efficiency of CHR/H/PENDIF in control of CAPBP Capsella bursa-pastoris were investigated in 14 trials – 8 trials in winter wheat and 6 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of CAPBP Capsella bursa-pastoris was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 151-190 DA-A. The effectiveness fluctuated from 97,27 – 98,54%.
The effectiveness at rate 0.2 l/ha fluctuated from 90,30 % to 100,00%, at rate 0.3 l/ha from 92,00 % to 100,00 % at rate 0.35 l/ha from 92,50 % to 100,00%, at rate 0.4 l/ha from 93,80 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 98,41% and fluctuated from 92,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 98,31% and fluctuated from 92,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 9).

Winter triticale
The efficiency of CHR/H/PENDIF in control of CAPBP Capsella bursa-pastoris was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 154 - 231 DA-A . The effectiveness fluctuated from 98,76 – 99,38 %.
The effectiveness at rate 0.2 l/ha fluctuated from 93,80 % to 100,00%, at rate 0.3 l/ha from 95,30 % to 100,00 % at rate 0.35 l/ha from 95,50 % to 100,00%, at rate 0.4 l/ha from 96,30 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 99,25% and fluctuated from 95,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 99,13% and fluctuated from 94,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 10).

3.2.3-1.6 The efficacy of CHR/H/PENDIFin control of VERHE Veronica hederifolia

The efficiency of CHR/H/PENDIF in control of VERHE Veronica hederifolia were investigated in 14 trials – 6 trials in winter wheat and 8 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIFin control of VERHE Veronica hederifolia triloba was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 138-190 DA-A. The effectiveness fluctuated from 86,15 – 97,88%.
The effectiveness at rate 0.2 l/ha fluctuated from 81,50 % to 91,30%, at rate 0.3 l/ha from 91,80 % to 100,00 % at rate 0.35 l/ha from 92,00 % to 100,00%, at rate 0.4 l/ha from 93,30 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,60% and fluctuated from 92,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 97,97% and fluctuated from 93,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 11).

Winter triticale
The efficiency of CHR/H/PENDIFin control of VERHE Veronica hederifolia was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 154 - 253 DA-A . The effectiveness fluctuated from 91,12 – 98,18 %.
The effectiveness at rate 0.2 l/ha fluctuated from 80,00 % to 100,00%, at rate 0.3 l/ha from 87,00 % to 100,00 % at rate 0.35 l/ha from 90,80 % to 100,00%, at rate 0.4 l/ha from 92,80 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,95% and fluctuated from 94,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 98,20% and fluctuated from 95,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 12).

3.2.3-1.7 The efficacy of CHR/H/PENDIFin control of ANTAR Anthemis arvensis

The efficiency of CHR/H/PENDIF in control of ANTAR Anthemis arvensis were investigated in 8 trials – 6 trials in winter wheat and 2 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of ANTAR Anthemis arvensis was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 151-175 DA-A. The effectiveness fluctuated from 81,85 – 99,83%.
The effectiveness at rate 0.2 l/ha fluctuated from 81,30 % to 82,50%, at rate 0.3 l/ha from 97,30 % to 100,00 % at rate 0.35 l/ha from 99,00 % to 100,00%, at rate 0.4 l/ha from 99,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 99,83% and fluctuated from 99,00% to 100,00%. The standard Komplet 560 SC mean efficacy was 96,72% and fluctuated from 90,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 13).

Winter triticale
The efficiency of CHR/H/PENDIF in control of ANTAR Anthemis arvensis was investigated in 2 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 237 - 241 DA-A . The effectiveness fluctuated from 80,05 – 94,40 %.
The effectiveness at rate 0.2 l/ha fluctuated from 76,30 % to 83,80%, at rate 0.3 l/ha from 83,80 % to 100,00 % at rate 0.35 l/ha from 88,80 % to 100,00%, at rate 0.4 l/ha from 88,80 % to 100,00 %. The

standard Bizon 118,75 SC mean efficacy was 96,90% and fluctuated from 93,80% to 100,00%. The standard Komplet 560 SC mean efficacy was 90,00% and fluctuated from 80,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 14).

3.2.3-1.8 The efficacy of CHR/H/PENDIF in control of GERPU Geranium pusillum

The efficiency of CHR/H/PENDIF in control of GERPU Geranium pusillum were investigated in 8 trials – 5 trials in winter wheat and 3 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIFin control of GERPU Geranium pusillum was investigated in 5 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 128-190 DA-A. The effectiveness fluctuated from 84,63 – 98,36%.
The effectiveness at rate 0.2 l/ha fluctuated from 81,30 % to 89,30%, at rate 0.3 l/ha from 81,30 % to 100,00 % at rate 0.35 l/ha from 92,00 % to 100,00%, at rate 0.4 l/ha from 93,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 98,06% and fluctuated from 90,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 88,12% and fluctuated from 73,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like Bizon 118,75SC and on higher level than Komplet 560 SC. (Appendix 5 tab. 15).

Winter triticale
The efficiency of CHR/H/PENDIFin control of GERPU Geranium pusillum was investigated in 3 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 195 - 249 DA-A . The effectiveness fluctuated from 85,75 – 96,50 %.
The effectiveness at rate 0.2 l/ha fluctuated from 82,50 % to 89,00%, at rate 0.3 l/ha from 91,80 % to 100,00 % at rate 0.35 l/ha from 93,30 % to 100,00%, at rate 0.4 l/ha from 94,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 94,60% and fluctuated from 91,80% to 100,00%. The standard Komplet 560 SC mean efficacy was 89,93% and fluctuated from 82,50% to 94,50%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standard Bizon 118,75SC and on higher lewel than Komplet 560 SC. (Appendix 5 tab. 16).

3.2.3-1.9 The efficacy of CHR/H/PENDIF in control of LAMPU Lamium purpureum

The efficiency of CHR/H/PENDIF in control of LAMPU Lamium purpureum were investigated in 9 trials – 6 trials in winter wheat and 3 trials in winter triticale.

Winter wheat
The efficiency of CHR/H/PENDIFin control of LAMPU Lamium purpureum was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 138-175 DA-A. The effectiveness fluctuated from 97,00 – 98,58%.
The effectiveness at rate 0.2 l/ha fluctuated from 91,00 % to 100,00%, at rate 0.3 l/ha from 91,80 % to 100,00 % at rate 0.35 l/ha from 92,80 % to 100,00%, at rate 0.4 l/ha from 94,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,72% and fluctuated from 91,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 98,10% and fluctuated from 92,30% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 17).

Winter triticale
The efficiency of CHR/H/PENDIFin control of LAMPU Lamium purpureum was investigated in 3 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha controlled this species of weed at the at high level of efficacy 195 - 220 DA-A . The effectiveness fluctuated from 92,50 – 97,60 %.
The effectiveness at rate 0.2 l/ha fluctuated from 92,50 % to 92,50%, at rate 0.3 l/ha from 93,00 % to 100,00 % at rate 0.35 l/ha from 94,80 % to 100,00%, at rate 0.4 l/ha from 95,30 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 96,70% and fluctuated from 93,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 97,27% and fluctuated from 94,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 18).

3.2.3-1.10 The efficacy of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum

The efficiency of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum were investigated in 9 trials – 6 trials in winter wheat and 3 trials in winter triticale.

Winter wheat
The efficiency of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum was investigated in 6 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 128-232 DA-A. The effectiveness fluctuated from 92,77 – 98,63%.
The effectiveness at rate 0.2 l/ha fluctuated from 88,80 % to 96,00%, at rate 0.3 l/ha from 88,80 % to 100,00 % at rate 0.35 l/ha from 92,50 % to 100,00%, at rate 0.4 l/ha from 95,50 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,68% and fluctuated from 91,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 95,10% and fluctuated from 88,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 19).

Winter triticale
The efficiency of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum was investigated in 3 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the at high level of efficacy 156 - 249 DA-A . The effectiveness fluctuated from 92,50 – 99,67 %.
The effectiveness at rate 0.2 l/ha fluctuated from 85,00 % to 100,00%, at rate 0.3 l/ha from 98,00 % to 100,00 % at rate 0.35 l/ha from 99,00 % to 100,00%, at rate 0.4 l/ha from 99,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 99,67% and fluctuated from 99,00% to 100,00%. The standard Komplet 560 SC mean efficacy was 99,00% and fluctuated from 97,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 20).

3.2.3-1.11 The efficacy of CHR/H/PENDIFin control of VIOAR Viola arvensis

The efficiency of CHR/H/PENDIF in control of VIOAR Viola arvensis were investigated in 17 trials – 8 trials in winter wheat and 9 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of VIOAR Viola arvensis was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 128-190 DA-A. The effectiveness fluctuated from 95,02 – 98,73%.
The effectiveness at rate 0.2 l/ha fluctuated from 87,50 % to 100,00%, at rate 0.3 l/ha from 92,50 % to 100,00 % at rate 0.35 l/ha from 93,00 % to 100,00%, at rate 0.4 l/ha from 94,30 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,91% and fluctuated from 93,00% to 100,00%. The standard Komplet 560 SC mean efficacy was 97,26% and fluctuated from 90,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 21).

Winter triticale
The efficiency of CHR/H/PENDIFin control of VIOAR Viola arvensis was investigated in 9 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the at high level of efficacy 156 - 249 DA-A . The effectiveness fluctuated from 93,42 – 98,98 %.
The effectiveness at rate 0.2 l/ha fluctuated from 78,80 % to 100,00%, at rate 0.3 l/ha from 93,50 % to 100,00 % at rate 0.35 l/ha from 95,80 % to 100,00%, at rate 0.4 l/ha from 96,50 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 96,52% and fluctuated from 83,80% to 100,00%. The standard Komplet 560 SC mean efficacy was 97,57% and fluctuated from 92,50% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,3-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 22).

3.2.3-1.12 The efficacy of CHR/H/PENDIFin control of BRSNN Brassica napus (self-sown plant)

The efficiency of CHR/H/PENDIF in control of BRSNN Brassica napus (self-sown plant) were investigated in 16 trials – 8 trials in winter wheat and 8 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of BRSNN Brassica napus (self-sown plant) was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the high level of efficacy at 128-190 DA-A. The effectiveness fluctuated from 96,22 – 98,13%.
The effectiveness at rate 0.2 l/ha fluctuated from 86,00 % to 100,00%, at rate 0.3 l/ha from 87,00 % to 100,00 % at rate 0.35 l/ha from 87,50 % to 100,00%, at rate 0.4 l/ha from 91,00 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 97,85% and fluctuated from 90,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 94,86% and fluctuated from 75,80% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 23).

Winter triticale
The efficiency of CHR/H/PENDIFin control of BRSNN Brassica napus (self-sown plant) was investigated in 8 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the at high level of efficacy 156 - 249 DA-A . The effectiveness fluctuated from 97,76 – 98,56 %.
The effectiveness at rate 0.2 l/ha fluctuated from 88,80 % to 100,00%, at rate 0.3 l/ha from 90,00 % to 100,00 % at rate 0.35 l/ha from 91,00 % to 100,00%, at rate 0.4 l/ha from 93,50 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 98,29% and fluctuated from 92,30% to 100,00%. The standard Komplet 560 SC mean efficacy was 91,60% and fluctuated from 80,00% to 100,00%. The tested

product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standards. (Appendix 5 tab. 24).

3.2.3-1.13 The efficacy of CHR/H/PENDIFin control of CENCY Cyanus segetum

The efficiency of CHR/H/PENDIF in control of CENCY Cyanus segetum were investigated in 6 trials – 2 trials in winter wheat and 6 trials in winter triticale

Winter wheat
The efficiency of CHR/H/PENDIF in control of CENCY Cyanus segetum was investigated in 2 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the low level of efficacy at 139-167 DA-A. The effectiveness fluctuated from 50,00 – 66,25%.
The effectiveness at rate 0.2 l/ha fluctuated from 50,00 % to 50,00%, at rate 0.3 l/ha from 51,30 % to 65,00 % at rate 0.35 l/ha from 60,00 % to 66,30%, at rate 0.4 l/ha from 62,50 % to 70,00 %. The standard Bizon 118,75 SC mean efficacy was 79,90% and fluctuated from 63,80% to 96,00%. The standard Komplet 560 SC mean efficacy was 56,25% and fluctuated from 47,50% to 65,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the same efficacy level like standard Komplet 560 SC and at lower level than Bizon 118,75 SC. (Appendix 5 tab. 25).

Winter triticale
The efficiency of CHR/H/PENDIF in control of CENCY Cyanus segetum was investigated in 4 trials. The tested product at rates: 0.2 l/ha, 0.3 l/ha, 0.35l/ha, 0.04 l/ha, controlled this species of weed at the at low level of efficacy 204 - 249 DA-A . The effectiveness fluctuated from 59,17 – 89,70 %.
The effectiveness at rate 0.2 l/ha fluctuated from 42,50 % to 70,00%, at rate 0.3 l/ha from 51,30 % to 100,00 % at rate 0.35 l/ha from 61,30 % to 100,00%, at rate 0.4 l/ha from 78,80 % to 100,00 %. The standard Bizon 118,75 SC mean efficacy was 96,33% and fluctuated from 92,50% to 100,00%. The standard Komplet 560 SC mean efficacy was 68,15% and fluctuated from 45,00% to 100,00%. The tested product CHR/H/PENDIF ad doses 0,2-0,4 was on the lower efficacy level than standards. (Appendix 5 tab. 26).

Conclusions on the biological efficacy

The obtained data in performed trials show CHR/H/PENDIF provides benefits against the most important weeds in winter wheat and winter triticale. On the basis of submitted research, it is possible to state that CHR/H/PENDIF used at dose controlled:

Winter wheat:
Dose CHR/H/PENDIF 0,2 l/ha
Susceptible: Viola arvensis (VIOAR) ,Brassica napus (self-sown plant) *(BRSNN)*, Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Capsella bursa-pastoris (CAPBP), Veronica hederifolia (VERHE), Lamium purpureum (LAMPU),
Moderately Susceptible: *Apera-Spica Venti* (APESV), Galium aparine *(GALAP)*, Anthemis arvensis (ANTAR), Geranium pusillum *(GERPU)*
Tolerant: Papver rhoeas (PAPRH), Centaurea cyanus (CENCY),
Dose CHR/H/PENDIF 0,3 l/ha
Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) *(BRSNN)*, Apera-Spica Venti (APESV), Galium aparine (GALAP), Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum

(MATIN), Stellaria media *(STEME)*, Geranium pusillum (GERPU), Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Capsella bursa-pastoris *(CAPBP)*,
Tolerant: Papver rhoeas (PAPRH), Centaurea cyanus (CENCY),

Dose CHR/H/PENDIF0,35 l/ha

Susceptible: Viola arvensis (VIOAR), Apera-Spica Venti (APESV), Galium aparine *(GALAP)*, Brassica napus (self-sown plant) *(BRSNN)*, Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Geranium pusillum *(GERPU)*, Capsella bursa-pastoris *(CAPBP)*,
Moderately Tolerant: Centaurea cyanus (CENCY),
Tolerant: Papver rhoeas (PAPRH),

Dose CHR/H/PENDIF0,4 l/ha

Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) (BRSNN), Apera-Spica Venti (APESV), Galium aparine (GALAP), Stellaria media (STEME), Capsella bursa-pastoris (CAPBP), Veronica hederifolia (VERHE), Anthemis arvensis (ANTAR), Geranium pusillum (GERPU), Lamium purpureum (LAMPU), Tripleurospermum mar. inodorum *(MATIN)*,
Moderately Tolerant: Centaurea cyanus (CENCY),
Tolerant: Papver rhoeas (PAPRH),

Winter triticale:

Dose CHR/H/PENDIF 0,2 l/ha

Susceptible: Viola arvensis (VIOAR) ,Brassica napus (self-sown plant) *(BRSNN)*, Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Capsella bursa-pastoris (CAPBP), Veronica hederifolia (VERHE), Lamium purpureum (LAMPU), Geranium pusillum (GERPU), Anthemis arvensis (ANTAR),
Moderately Susceptible: *Apera-Spica Venti* (APESV), Galium aparine *(GALAP)*,
Moderately Tolerant: Papver rhoeas (PAPRH),
Tolerant: Centaurea cyanus (CENCY),

Dose CHR/H/PENDIF 0,3 l/ha

Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) *(BRSNN)*, Apera-Spica Venti (APESV), Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Geranium pusillum (GERPU), Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Capsella bursa-pastoris (CAPBP),
Moderately Susceptible: Galium aparine (GALAP),
Moderately tolerant: Centaurea cyanus (CENCY),
Tolerant: Papver rhoeas (PAPRH),

Dose CHR/H/PENDIF0,35 l/ha

Susceptible: Viola arvensis (VIOAR), Apera-Spica Venti (APESV), Galium aparine *(GALAP)*, Brassica napus (self-sown plant) *(BRSNN)*, Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Geranium pusillum *(GERPU)*, Capsella bursa-pastoris *(CAPBP)*,
Moderately Tolerant: Centaurea cyanus (CENCY), Papver rhoeas (PAPRH),

Dose CHR/H/PENDIF0,4 l/ha

Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) (BRSNN), Apera-Spica Venti (APESV), Galium aparine (GALAP), Stellaria media (STEME), Capsella bursa-pastoris (CAPBP), Tripleurospermum mar. inodorum (MATIN), Veronica hederifolia (VERHE), Anthemis arvensis (ANTAR), Geranium pusillum (GERPU), Lamium purpureum (LAMPU),
Moderately Susceptible: Centaurea cyanus (CENCY), Papver rhoeas (PAPRH),

Table 3.2-1: Efficacy of product CHR/H/PENDIFat the timing of assessment.

Winter wheat autumn application

Target	CHR/H/PENDIFat rate	Number of trials	Infestation in the untreated control (unit)		% control							No of trials where product is >, <, = compared to standard(s)**
					Product at rate			Bizon 118,75 SC at rate 1,0 l/ha		Komplet 560 S.C. at rate 0,5l/ha		
			Mean	Min & Max	Mean	Min & Max		Mean	Min & Max	Mean	Min & Max	
Galium aparine	0,2	6	5,97	5 & 7	84,70	80,00	89,50	94,9	87,80 & 100	93,85	82,00 & 100,00	-
	0,3				90,23	81,50	100,00					
	0,35				91,20	82,80	100,00	-	-			-
	0,4				94,52	87,50	100,00	-	-			-
Viola arvensis	0,2	8	17,43	5 & 60	95,02	87,50	100,00	97,91	93,00 & 100,00	97,26	90,00 & 100,00	-
	0,3				96,94	92,50	100,00					
	0,35				97,86	93,00	100,00					-
	0,4				98,73	94,30	100,00					-
Brassica napus (self-sown plant)	0,2	8	37,98	5 & 253	96,22	86,00	100,00	97,85	90,50 & 100,0	94,86	75,80 & 100,00	-
	0,3				97,44	87,00	100,00					
	0,35				97,73	87,50	100,00	-	-			-
	0,4				98,13	91,00	100,00	-	-			-
Tripleurospermum mar. inodorum	0,2	6	8,08	5 & 12,25	92,77	88,80	96,00	97,68	91,30 & 100,00	95,1	88,80 & 100,00	-
	0,3				94,48	88,80	100,00					
	0,35				96,85	92,50	100,00	-	-			-
	0,4				98,63	95,50	100,00	-	-			-
Stellaria media	0,2	6	7,17	5 & 12	95,90	90,30	100,00	97,52	91,30 & 100,0	97,77	91,80 & 100,00	-
	0,3				97,52	91,30	100,00					
	0,35				97,88	92,80	100,00	-	-			-
	0,4				98,10	93,80	100,00	-	-			-
Apera Spica Venti	0,2	6	16,83	5 & 50	82,37	76,30	93,30	90,05	70,00 & 100,00	96,32	89,50 & 99,30	
	0,3				93,52	80,00	100,00					-
	0,35				97,58	94,00	100,00	-	-			-
	0,4				98,55	94,80	100,00	-	-			-
Veronica hederifolia	0,2	6	16,83	5 & 39	86,15	81,50	91,30	97,69	92,30 & 100,00	97,97	93,80 & 100,00	-
	0,3				96,97	91,80	100,00					
	0,35				97,52	92,00	100,00	-	-			-
	0,4				97,88	93,30	100,00	-	-			-
Capsella bursa-pastoris	0,2	8	7,85	5 & 15,5	97,27	90,30	100,00	98,41	92,50 & 100,00	98,31	92,00 & 100,00	-

	0,3				98,19	92,00	100,00					
	0,35				98,25	92,50	100,00	-	-			-
	0,4				98,54	93,80	100,00	-	-			-
Papver rhoeas	0,2	4	21,75	5 & 60	30,65	25,00	36,30	67,65	51,30 & 81	55,15	31,50 & 90,30	-
	0,3				41,90	29,80	55,00					
	0,35				49,43	41,30	56,30	-	-			-
	0,4				54,95	47,50	65,00	-	-			-
Lamium purpureum	0,2	6	6,33	5 &10	97,00	91,00	100,00	97,72	91,30 & 100,00	98,1	92,30 & 100,00	-
	0,3				97,38	91,80	100,00					
	0,35				98,05	92,80	100,00	-	-			-
	0,4				98,58	94,00	100,00	-	-			-
Anthemis arvensis	0,2	6	5,47	5 & 6,8	81,85	81,30	82,50	99,83	99,00 & 100,00	96,72	90,00 & 100,00	-
	0,3				99,38	97,30	100,00					
	0,35				99,72	99,00	100,00	-	-			-
	0,4				99,83	99,00	100,00	-	-			-
Geranium pusillum	0,2	5	9,1	5 & 19	84,63	81,30	89,30	98,06	90,30 & 100,00	88,12	73,80 & 100,00	-
	0,3				93,52	81,30	100,00					
	0,35				97,62	92,00	100,00	-	-			-
	0,4				98,36	93,00	100,00	-	-			-
Cyanus segetum	0,2	2	9,1	5 & 19	50,00	50,00	50,00	79,9	63,80 & 96,00	56,25	47,50 & 65,00	-
	0,3				58,15	51,30	65,00					
	0,35				63,15	60,00	66,30	-	-			-
	0,4				66,25	62,50	70,00	-	-			-

* A, B, C can be a "trial group" (as defined in page 10, e.g. EPPO climatic zone A) or a specific target (e.g. weed A, weed B...). In order to adapt the table to the data presented, it is possible:
- to add lines or columns,
- to duplicate the table (e.g. one table for "trial group 1", one table for "trial group 2", one table for "all").

** Optional

Winter triticale autumn application

Target	CHR/H/PENDIFat rate	Number of trials	Infestation in the untreated control (unit)		% control							No of trials where product is >, <, = compared to standard(s)**
					Product at rate			Bizon 118,75 SC at rate 1,0 l/ha		Komplet 560 S.C. at rate 0,5l/ha		
			Mean	Min & Max	Mean	Min & Max		Mean	Min & Max	Mean	Min & Max	
Galium aparine	0,2	7	13,86	5 & 50	76,26	70,00	91,30	94,26	75,26 & 100	90,66	81,50 & 95,30	-
	0,3				77,11	62,00	94,50	-	-	-	-	-
	0,35				84,73	68,30	99,00	-	-	-	-	-
	0,4				88,69	74,30	99,00	-	-	-	-	-
Viola arvensis	0,2	9	29,67	7 & 58	93,42	78,80	100,00	96,52	83,80 & 100,00	97,57	92,50 & 100,00	-

	0,3				98,46	93,50	100,00	-	-	-	-	-
	0,35				98,73	95,80	100,00	-	-	-	-	-
	0,4				98,98	96,50	100,00	-	-	-	-	-
Brassica napus (self-sown plant)	0,2	8	10,25	5 & 43	97,76	88,80	100,00	98,29	92,30 & 100,0	91,60	80,00 & 100,00	-
	0,3				97,73	90,00	100,00	-	-	-	-	-
	0,35				98,06	91,00	100,00	-	-	-	-	-
	0,4				98,56	93,50	100,00	-	-	-	-	-
Tripleurospermum mar. inodorum	0,2	3	7,67	6 & 10	92,50	85,00	100,00	99,67	99,00 & 100,00	97	97,00 & 100,00	-
	0,3				99,33	98,00	100,00	-	-	-	-	-
	0,35				99,67	99,00	100,00	-	-	-	-	-
	0,4				99,67	99,00	100,00	-	-	-	-	-
Stellaria media	0,2	6	17,92	5 & 46	96,26	91,00	100,00	98,22	95,00 & 100,00	99	96,00 - 100,00	-
	0,3				98,97	94,80	100,00	-	-	-	-	-
	0,35				99,08	95,50	100,00	-	-	-	-	-
	0,4				99,13	95,80	100,00	-	-	-	-	-
Apera Spica Venti	0,2	8	19,5	5 & 50	82,50	75,00	97,50	85,98	47,50 & 100,00	96,08	88,80 & 100,00	
	0,3				94,55	83,80	100,00	-	-	-	-	-
	0,35				96,40	88,80	100,00	-	-	-	-	-
	0,4				98,30	93,30	100,00	-	-	-	-	-
Veronica hederifolia	0,2	8	7,5	5 & 15	93,86	85,00	100,00	97,95	94,50 & 100,00	98,2	95,80 & 100,00	-
	0,3				96,29	87,00	100,00	-	-	-	-	-
	0,35				97,66	90,80	100,00	-	-	-	-	-
	0,4				98,18	92,80	100,00	-	-	-	-	-
Capsella bursa-pastoris	0,2	6	6,46	5 & 8,75	98,76	93,80	100,00	99,25	95,50 & 100,00	94,8	94,80 & 100,00	-
	0,3				99,22	95,30	100,00	-	-	-	-	-
	0,35				99,25	95,50	100,00	-	-	-	-	-
	0,4				99,38	96,30	100,00	-	-	-	-	-
Papver rhoeas	0,2	3	5	5 & 5	61,30	61,30	61,30	92,4	91,00 & 93,80	81,4	72,50 & 90,30	-
	0,3				56,55	44,30	68,80	-	-	-	-	-
	0,35				63,75	50,00	77,50	-	-	-	-	-
	0,4				69,65	59,30	80,00	-	-	-	-	-
Lamium purpureum	0,2	3	15,33	5 &35	92,50	92,50	92,50	96,7	93,30 & 100,00	97,27	94,80 & 100,00	-
	0,3				95,77	93,00	100,00	-	-	-	-	-
	0,35				97,20	94,80	100,00	-	-	-	-	-
	0,4				97,60	95,30	100,00	-	-	-	-	-
Anthemis arvensis	0,2	2	5	5 & 6	86,90	76,30	97,50	96,9	93,80 & 100,00	90	80,00 & 100,00	-
	0,3				91,90	83,80	100,00	-	-	-	-	-
	0,35				94,40	88,80	100,00	-	-	-	-	-

	0,4				94,40	88,80	100,00	-	-	-	-	-
Geranium pusillum	0,2	3	6	5 & 8	94,50	89,00	100,00	94,6	91,80 & 100,00	89,93	82,50 & 94,50	-
	0,3				94,60	91,80	100,00	-	-	-	-	-
	0,35				95,87	93,30	100,00	-	-	-	-	-
	0,4				96,50	94,00	100,00	-	-	-	-	-
Cyanus segetum	0,2	4	8,5	5 & 12	41,67	0,00	70,00	88,83	62,50 & 100,00	66,58	40,00 & 100,00	-
	0,3				61,90	10,00	100,00	-	-	-	-	-
	0,35				64,08	10,00	100,00	-	-	-	-	-
	0,4				70,03	23,80	100,00	-	-	-	-	-

* A, B, C can be a “trial group” (as defined in page 10, e.g. EPPO climatic zone A) or a specific target (e.g. weed A, weed B...). In order to adapt the table to the data presented, it is possible:
- to add lines or columns,
- to duplicate the table (e.g. one table for “trial group 1”, one table for “trial group 2”, one table for “all”).

** Optional

Crop(s) 2 / Target(s) 2

Not applicable

Minor use

Not applicable

Yield (and relevant quality indicators), from efficacy trials (in the presence of challenging pest populations)

Not applicable

Table 3.2-2: Yield (quality) effect of product in efficacy trials on crop * target 1

Not applicable

Summary and conclusion

Not applicable

Study Comments: 3.2.3 dRR point 3.2.3	
EN: Evaluator conclusion: **<u>Control of weeds in the North-east EPPO climatic zone (Poland)</u>** The applicant submitted 20 trials carried out in 2019, 2020 on winter wheat (10 trials, BBCH 11-23, varieties: Fredro, Borowik, Twingo, Aliko, Grenado, Orinoko, Tadeus) and winter triticale (10 trials, BBCH 11-22, varieties: Patras, Euforia, Tonacja, Apostel, Arkadia, RGT Bilanz, Ponticus) in different regions of Poland. Efficacy trials were carried out by organizations that are officially recognized as competent to carry out efficacy testing in accordance with Regulation (EC) 284/2013. All trials have been conducted according to GEP. The efficacy trials were designed, conducted and reported according to the following EPPO guidelines: 1. PP 1/181 (4) Conduct and reporting of efficacy evaluation trials including good experimental practice. 2. PP 1/135 (3/4) Phytotoxicity assessment	

3. PP 1/93 (3) Weeds in cereals
4. PP 1/152(4) Design and analysis of efficacy evaluation trials

Results of experiments (data on effectiveness) are contained in Appendix 5.

Trials were conducted in Poland (NE EPPO climatic zone). Trials were of randomized block design with a minimum of four replicates. Details on trial sites, applications are contained in Appendix 3 and 4 and in the table Details of experiments.

The susceptivity of weeds were evaluated according to the criteria presented below, established for PL.

<u>Weed species are classified as:</u>
susceptible (S) – 85%
moderately susceptible (MS) - 70-85%
moderately tolerant (MT) 60 -70%
tolerant (T) < 60%

The tested herbicide was applied at the rates: 0,2 l/ha, 0,3 l/ha, 0,35 l/ha, 0,4 l/ha of CHR/H/PENDIF 599.5SC (spray volume 200 – 300 l/ha) in winter wheat and winter triticale as a single post-emergence application against weeds. The most effective dose rate was 0,3 - 0,4 l/ha, as it ensured more consistent control of all targeted weeds in presented trials and gave similar results to reference products at two times of assessment (14 DAA and at the BBCH 21-29).

In accordance with GAP table results are presented below for the dose rate 0,4 l/ha. The first assessment was conducted 14 DAA and the second one was conducted during tillering of crops (after beginning of the regrowth in spring).

Species of weeds (no of trilas)	**Efficacy in TRZAW[%]**					
	DAA 12-15 (one trial DAA 21)			**TRZAW BBCH: 23 -30**		
	0,4 l/ha	**Ref. 1**	**Ref. 2**	**0,4 l/ha**	**Ref. 1**	**Ref. 2**
VIOAR (8)	55,7 (22,5 – 90,0)	55,6 (16,3 – 91,3)	56,6 (12,5 – 88,0)	98,7 (94,3 – 100)	97,9 (93,0 – 100)	97,3 (90,0 – 100)
BRSNW (8)	65,36 (39,8 – 98,5)	67,45 (36,3 – 99,0)	61,4 (35,5 – 86,0)	98,1 (91,0 - 100)	97,9 (90,5 – 100)	94,9 (75,8 – 100)
APESV (7)	63,2 (30,0 – 91,8)	62,6 (30,0 – 90,0)	65,5 (30,0 – 88,0)	95,2 (75,0 – 100)	87,1 (61,3 – 100)	93,8 (77,5 – 99,3)
GALAP (6)	63,4 (50,0 – 86,8)	63,7 (51,8 – 90,3)	63,9 (53,5 – 84,0)	92,2 (83,8 – 100)	92,0 (81,3 – 100)	93,1 (82,0 – 100)
PAPRH (4)	55,9 (37,8 – 67,8)	65,8 (37,3 – 92,5)	48,1 (37,0 – 52,8)	54,9 (47,5 – 65,0)	67,7 (51,3 – 81,0)	55,2 (31,5 – 90,3)
STEME (6)	67,3 (40 – 99,5)	68,5 (34,3 – 99,5)	65,6 (34,5 – 99,0)	98,1 (93,8 – 100)	97,5 (91,3 0 100)	97,8 (91,8 – 100)
CAPBP (8)	61,5 (22,5 – 99,8)	62,5 (30,0 – 99,8)	57,3 (15,0 – 99,3)	98,5 (93,8 – 100)	98,4 (92,5 – 100)	98,3 (92,0 – 100)
CENCY (2)	40,0 (40,0 – 40,0)	50,0 (42,5 – 57,5)	52,5 (45,0 – 60,0)	66,3 (62,5 – 70,0)	79,9 (63,8 – 96)	56,3 (47,5 – 65)
VERHE (6)	58,7 (43,3 – 76,0)	56,0 (32,3 – 74,5)	55,0 (34,0 – 67,5)	97,9 (93,3 – 100)	97,6 (92,3 – 100)	98,0 (93,8 – 100)
ANTAR (6)	62,3 (35,0 – 100)	63,6 (22,5 – 100)	58,1 (22,5 – 100)	99,8 (99,0 – 100)	99,8 (99,0 – 100)	96,7 (90,0 – 100)
GERPU (5)	52,3 (35,0 – 69,5)	51,8 (22,5 – 79,0)	45,1 (22,5 – 55,0)	98,4 (93 – 100)	98,1 (90,3 – 100)	88,1 (73,8 – 100)
LAMPU (5)* (6)	69,6 (43,3 – 100)	68,8 (32,3 – 100)	66,7 (34,0 – 100)	98,6 (94,0 – 100)	97,7 (91,3 – 100)	98,1 (92,3 – 100)
MATIN (6)* (5)	52,3 (20,0 – 71,0)	50,9 (17,5 – 68,5)	49,5 (15,0 – 67,5)	98,4 (95,5 – 100)	97,2 (91,3 – 100)	94,1 (88,8 – 100)

*no of trials at DAA 12-15

Species of weeds (no of trilas)	Efficacy in TTLWI[%]					
	DAA 14-16			TTLW BBCH: 21 -29		
	0,4 l/ha	Ref. 1	Ref. 2	0,4 l/ha	Ref. 1	Ref. 2
VIOAR (9)	56,7 (32,5 – 84,5)	61,1 (41,3 – 89,3)	58,8 (30,0 – 85,8)	98,0 (86,8 – 100)	96,3 (84,5 – 100)	96,7 (83,3 – 100)
BRSNW (8)	62,9 (36,3 – 98,8)	63,1 (41,3 – 98,5)	52,5 (30,0 – 82,8)	97,0 (84,0 – 100)	96,3 (81,0 – 100)	87,6 (70,0 – 100)
APESV (9)	62,6 (30,0 – 94,5)	58,8 (30,0 – 89,8)	60,5 (30 – 88,8)	97,1 (87,5 – 100)	89,9 (64,0 – 100)	96,7 (90,0 – 100)
GALAP (7)	60,0 (40,0 – 84,5)	64,7 (30,0 – 89,3)	60,0 (30,0 – 85,8)	88,4 (80,0 – 99,0)	93,0 (83,5 – 99,0)	90,5 (84,8 – 95,0)
PAPRH (2)	46,7 (45,0 – 48,3)	49,4 (48,3 – 50,0)	45,0 (42,4 – 47,5)	63,8 (57,5 – 70,0)	90,2 (90,0 – 90,3)	80,0 (70,0 – 90,0)
STEME (6)	67,9 (55,0 – 82,5)	70,0 (57,5 – 83,8)	68,0 (52,5 – 86,3)	97,0 (83,0 – 100)	96,0 (81,8 – 100)	96,6 (81,8 – 100)
CAPBP (6)	66,8 (52,5 – 99,3)	67,5 (52,5 – 100)	66,8 (50,0 – 98,5)	97,1 (83,8 – 100)	96,8 (81,8 -100)	96,8 (81,8 – 100)
CENCY (4)	52,0 (47,5 – 60,0)	55,7 (47,5 – 65,0)	47,0 (40,0 – 54,0)	88,8 (78,8 – 100)	94,7 (92,3 – 100)	67,8 (45,0 – 100)
VERHE (8)	61,1 (41,8 – 96,5)	61,2 (43,3 – 96,5)	59,9 (40,0 – 96,5)	96,6 (85,8 – 100)	95,8 (84,3 – 100)	96,9 (86,0 – 100)
ANTAR (2)	54,4 (53,8 – 55,0)	55,0 (52,5 – 57,5)	49,9 (49,8 – 50,0)	91,3 (88,8 – 93,8)	92,8 (87,5 – 98,0)	91,8 (87,5 – 96,0)
GERPU (3)	57,8 (47,5 – 76,0)	56,5 (47,3 – 71,0)	56,0 (46,5 – 74,0)	92,8 (87,0 – 99,0)	90,8 (82,8 – 99,0)	82,8 (71,3 – 91,3)
LAMPU (3)	58,9 (48,8 – 75,5)	57,0 (47,8 – 71,3)	58,6 (48,3 – 74,3)	94,7 (86,6 – 100)	93,3 (83,0 – 100)	94,2 (85,5 – 100)
MATIN (3)	68,4 (58,8 – 76,3)	68,4 (52,5 – 76,3)	65,9 (46,3 - 78,8)	99,3 (99,0 -100)	99,3 (99,0 -100)	98,0 (95,0 -100)

The product performed comparable or better to the both of reference products at the first assessment. Only CENCY was controlled weaker by CHR/H/PENDIF in winter wheat.
After beginning of the crops regrowth in spring CHR/H/PENDIF controlled targeted weeds comparable or better to the reference products. Only PAPRH was less controlled by the product in comparison to both references.

<u>At the dose rate 0,4 l/ha, the target weed species were categorized as:</u>
- susceptible (S): VIOAR, BRSNW, APESV, GALAP, STEME, CAPBP, VERHE, ANTAR, GERPU, LAMPU, MATIN
- moderately susceptible (MS): CENCY
- tolerant (T): PAPRH

<u>At the dose rate 0,35 l/ha, the target weed species were categorized as:</u>
- susceptible (S): VIOAR, BRSNW, APESV, GALAP, STEME, CAPBP, VERHE, ANTAR, GERPU, LAMPU, MATIN
- moderately tolerant (MT): CENCY
- tolerant (T): PAPRH

<u>At the dose rate 0,3 l/ha, the target weed species were categorized as:</u>
- susceptible (S): VIOAR, BRSNW, APESV, STEME, CAPBP, VERHE, ANTAR, GERPU, LAMPU, MATIN
- moderately susceptible (MS): GALAP
- tolerant (T): PAPRH, CENCY

To sum up, it might be concluded that the application of CHR/H/PENDIF at dose rate 0,4 l/ha (spray volume 200 - 300 l/ha), post-emergence provided benefit against weeds in winter wheat and winter triticale comparable or better with standard products: Bizon 118,75 SC and Komplet 560

SC. CHR/H/PENDIF caused insufficient (tolerant) susceptibility for PAPRH. There is a need to make an appropriate label statement.

3.3 Information on the occurrence or possible occurrence of the development of resistance (KCP 6.3)

1.1 Mode of action

CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l, which belong to different HRAC groups (different mode of action).

Flufenacet is herbicide unclassified inhibition of cell division and cell growth, meristemic activity. (DAR B.3.1.2). HRAC group 15 (K3). Flufenacet is an oxyacetamide herbicide. The molecular mode of action of the oxyacetamides is not known. Mode of action studies with the only oxyacetam-ide herbicide so far introduced (mefenacet, rice Japan) have shown a similarity with the action of chloracetanilides (e.g. alachlor, metolachlor) at the cellular and at the tissue level. The molecular mode of action of the chloroacetanilides is also not known. Oxyacetamides and chloroacetanilides both inhibit cell division after a lag phase of several hours. This inhibition results in a complete arrest of cell division in the root and shoot meristematic regions. New growth is stopped and elongating tissue may become distorted. Detailed studies with mefenacet and metolachlor have shown that cells no longer enter the division cycle, but that progress through the individual phases of cell division (pro-, meta-, ana- and telophase) is unchanged. The mitotic index is accordingly decreased.

Diflufenican is a synthetic herbicide. It is absorbed by leaves and the coleoptiles of the grasses. According to the Herbicide Resistance Action Committee (HRAC) diflufenican is included in HRAC Group 12 (F1) – Inhibition of acetyl CoA carboxylase. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is the first enzyme of the fatty acid biosynthesis. The lack of fatty acids, affected by the herbicide, causes disruption of meristem around the shoot apex, followed by whole plant death. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions. Diflufenican is systemic compound presenting upward and down ward systemic properties. The upward translocation allows the product to inhibit the development.

According to DAR (DRAFT ASSESMENT REPORT) the first symptoms on weeds are extensive discoloration or whitening of new growth. The quickest effect is obtained after pre-emergence or early post-emergence treatment on young seedlings. The red-purple colour of the foliage often observed after application is a result of stress resulting from the absence of carotenoids. Later on, the seedlings suffer from necrosis and die. In pre-emergence applications on weeds, diflufenican forms a continuous layer on the surface of the soil, which is resistant to leaching. As the shoots of germinating weeds pass through this layer, they come into contact with and absorb the product. The more even the distribution of the herbicide on the soil the better the contact. Rain after application improves contact between the herbicide and the shoot. Diflufenican also enters the roots developing in the treated layer. Therefore weeds germinating at or very near the soil surface can receive a dose via both shoots and roots and are generally very susceptible. Due to the short distance , diflufenican can then easily reach the meristematic tissues.

Metabolism of diflufenican has been studied in wheat after pre and post emergence treatment in the greenhouse. A maximum of 2% of diflufenican applied pre emergence is taken up, translocated and metabolised within wheat and no major metabolites have been identified. In post emergence applications, diflufenican penetrates foliar tissues. It does not diffuse directly through the phloem to the meristematic parts but, taking into account its metabolic persistence in the plants, a very small amount accumulated at the sites of action is sufficient. Furthermore, buds and young leaves, which are well exposed to the spray, particularly in broadleaf weeds, are exposed to a contact action which reinforces efficacy. Lastly, diflufenican shows some mobility in the xylem which, after root uptake in the soil surface, also contributes to efficacy. When it is applied post emergence, there is no significant translocation.

Diflufenican is use to control weeds in small grain cereals it combines those qualities required in a selective autumn herbicide:

- good efficacy on early germinating weeds or those whose emergence can be staggered and, in particular, on difficult species such as *Viola arvensis*, *Veronica hederifolia*, *Stellaria media*, *Galium aparine*.
- A very broad spectrum on broad-leaved weeds
- Sufficient soil persistence to control late germination of spring weeds, such as *Polygonum* spp. and *Fallopia convolvulus*
- Flexibility of use, with a treatment period stretching from sowing to early spring
- Considerable consistency of action, virtually independent of climatic factors
- Particular compatibility with herbicides widely used in the control of grass weeds.

Penoxsulam is a member of the triazolopyrimidine sulfonamides, a class of herbicides known to inhibit the plant enzyme acetolactate synthase enzyme (ALS). HRAC group 2 (B). The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours of application although visible effects may not be observed for several days. Symptoms appear first in the upper meristematic region of the plants as chlorosis and necrosis. The effects then spread to the remaining parts of the plant. In some species there is a reddening of the midrib and veins. Complete desiccation of the plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions. Penoxsulam is a systemic, phloem and xylem mobile herbicide that is absorbed via leaves, shoots and roots. The compound is translocated in plants to meristematic tissues. Translocation – uptake and distribution – of radiolabeled Penoxsulam has been evaluated in rice (the proposed use species) and *Echinochloa crus-galli* (the main target weed species in Europe) by direct foliar application. Uptake through the leaves is much less in rice than that observed in *E. crus-galli*. In particular, Indica rice leaves are practically impermeable to Penoxsulam. Japonica rice leaves are slightly less impermeable than Indica leaves. This is due to the hydrophobic character of the rice leaves. Leaf cuticle acts as a major barrier to uptake. The radioactivity in *E. crus-galli* showed fairly even distribution throughout the plant and up into the new growth. The radioactivity in rice did not exhibit the same sort of even distribution, but the majority of radioactivity was localised in the stem region close to the site of injection. Penoxsulam metabolism is most rapid in Indica rice with a 0.6 day half-life, followed by Japonica rice with a 1.6 day half-life, and finally *E. crus-galli* with a half-life of 4.4 days. Rates of metabolism of Penoxsulam to inactive molecules contribute to the differential selectivity observed between these species. *E. crus-galli* shows the greatest uptake and the slowest metabolism following leaf applied DE-638. This results in substantial accumulation of the compound in this weed.

1.2 Mechanism of resistance

CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l, which belong to different HRAC groups (different mode of action). The mode of action involving a ‘multi-site’ action may indicate a lower risk to developing weeds resistance.

Accroding to EPPO PP 1/213 (4) Resistance risk analysis weeds usually only produce one generation per year and development of resistance is usually a relatively slow process. It is difficult to class any weed species as inherently more or less likely to develop resistance to a particular herbicide.

1.3 Evidence of resistance

Flufenacet

Flufenacet is grouped into the oxyacetamide chemical group. The mode of action is based on the inhibition of the biosynthesis of very long chain fatty acids (VLCFAs) resulting in inhibition of cell division and cell growth (HRAC group: 15, legacy K3). This group of herbicides is quite well known and has been applied commercially for decades.

According to Ian Heap's website (http://www.weedscience.org) there are only two species which have been reported as resistant to HRAC group: 15, legacy K3: *Lolium perenne* ssp. *multiflorum* and *Alopecurus myosuroides* (Table 1).

According to https://weedscience.org/ :
Table 1. Herbicide resistance cases

Year	Species	Country	Actives	Crops
2005	*Lolium perenne* ssp. *multiflorum*	United States	clodinafop-propargyl, diclofop-methyl, quizalofop-ethyl, clethodim, triasulfuron, flufenacet	Lentils, Wheat, Canola, Peas, Chickpea
2007	*Alopecurus myosuroides*	Germany	fenoxaprop-ethyl, isoproturon, chlorotoluron, flufenacet, mesosulfuron-methyl, pinoxaden	Wheat
2018	*Lolium perenne* ssp. *multiflorum*	France	flufenacet	Wheat
2018	*Lolium perenne* ssp. *multiflorum*	United Kingdom	flufenacet	Wheat
2018	*Lolium perenne* ssp. *multiflorum*	United States	flufenacet	Wheat

Diflufenican

Diflufenican is a pyridinecarboxamide belonging to HRAC group 12, legacy F1. According to Ian Heap's website (http://www.weedscience.org) there are only four species which have been reported as resistant to HRAC Group 12, legacy F1. These are *Arctotheca calendula*, *Raphanus raphanistrum*, *Senecio vernalis* and *Sisymbrium orientale*. All cases reported have been in the Australia and Israel with no evidence of resistance in Europe (Table 2). Overall the risk of resistance developing to HRAC Group 12, legacy F1 is low. Resistance to diflufenican specifically has only been reported in the latter three species above, corresponding to 5 individual cases of resistance, and only in Australia and Israel. The risk of resistance developing to diflufenican is low, particularly in Europe.

According to https://weedscience.org/ :
Table 2. Herbicide resistance cases

Year	Species	Country	Actives	Crops
1998	*Raphanus raphanistrum*	Australia	chlorsulfuron, metosulam, diflufenican	Cropland
2006	*Raphanus raphanistrum*	Australia	triasulfuron, diflufenican, MCPA, 2,4-D	Cereals
2010	*Raphanus raphanistrum*	Australia	imazethapyr, chlorsulfuron, sulfometuron-methyl, metosulam, diflufenican, glyphosate, MCPA, 2,4-D	Fallow
2011	*Sisymbrium orientale*	Australia	diflufenican	Peas
2014	*Senecio vernalis*	Israel	metribuzin, diuron, carfentrazone-ethyl, diflufenican, imazamox	Carrots, Wheat
2015	*Raphanus raphanistrum*	Australia	chlorsulfuron, atrazine, diflufenican, fluridone, isoxaflutole, 2,4-D, mesotrione,	Wheat

			tembotrione	
2020	*Arctotheca calendula*	Australia	metosulam, diflufenican, glyphosate	Wheat

Penoxsulam

According to Ian Heap's website (http://www.weedscience.org) there are thirteen species which have been reported as resistant to penoxsulam (HRAC group: 2 Inhibition of ALS, Legacy: B) in five crops (Table 3).

According to https://weedscience.org/

Table 3. Herbicide resistance cases

Year	**Species**	**Country**	**Actives**	**Crops**
1999	*Alopecurus myosuroides*	Netherlands	clodinafop-propargyl, fenoxaprop-ethyl, cycloxydim, penoxsulam	Winter wheat
2000	*Cyperus difformis*	Spain	bensulfuron-methyl, penoxsulam	Rice
2005	*Echinochloa crus-galli var. crus-galli*	Italy	bispyribac-sodium, azimsulfuron, nicosulfuron, imazamox, penoxsulam	Corn (maize), Rice
2009	*Echinochloa crus-galli var. crus-galli*	Brazil	imazethapyr, bispyribac-sodium, quinclorac, penoxsulam	Rice
2009	*Sagittaria montevidensis*	Brazil	imazethapyr, bispyribac-sodium, pyrazosulfuron-ethyl, metsulfuron-methyl, ethoxysulfuron, bentazon, penoxsulam	Rice
2009	*Echinochloa phyllopogon (=E. oryzicola)*	Greece	bispyribac-sodium, nicosulfuron, rimsulfuron, imazamox, foramsulfuron, penoxsulam	Rice
2009	*Echinochloa crus-galli var. crus-galli*	Italy	cyhalofop-butyl, bispyribac-sodium, azimsulfuron, imazamox, penoxsulam, profoxydim	Rice
2009	*Alisma plantago-aquatica*	Turkey	azimsulfuron, bensulfuron-methyl, penoxsulam	Rice
2009	*Echinochloa oryzoides*	Turkey	cyhalofop-butyl, bispyribac-sodium, penoxsulam	Rice
2009	*Echinochloa crus-galli var. crus-galli*	Turkey	cyhalofop-butyl, bispyribac-sodium, penoxsulam	Rice
2010	*Echinochloa crus-galli var. formosensis*	Japan	cyhalofop-butyl, penoxsulam	Rice
2010	*Cyperus difformis*	Turkey	bispyribac-sodium, azimsulfuron, bensulfuron-methyl, penoxsulam	Rice
2010	*Cyperus iria*	United States	imazethapyr, bispyribac-sodium, halosulfuron-methyl, imazamox, penoxsulam	Rice
2011	*Echinochloa crus-galli var. crus-galli*	China	penoxsulam	Rice
2013	*Echinochloa crus-galli var. crus-galli*	France	foramsulfuron, penoxsulam	Corn (maize), Rice

2013	*Echinochloa phyllopogon (=E. oryzicola)*	France	penoxsulam	Rice
2014	*Cyperus iria*	Brazil	imazethapyr, bispyribac-sodium, pyrazosulfuron-ethyl, imazapic, penoxsulam	Rice
2014	*Alopecurus aequalis*	China	quizalofop-ethyl, fenoxaprop-ethyl, nicosulfuron, flucarbazone-Na, mesosulfuron-methyl, penoxsulam, pinoxaden	Wheat
2014	*Sagittaria trifolia*	China	pyribenzoxim, bispyribac-sodium, bensulfuron-methyl, penoxsulam	Rice
2015	*Echinochloa crus-galli var. crus-galli*	Brazil	cyhalofop-butyl, quinclorac (MOA in monocots), penoxsulam	Rice
2016	*Conyza sumatrensis*	France	flazasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
2016	*Conyza sumatrensis*	France	flazasulfuron, glyphosate, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
2017	*Echinochloa crus-galli var. crus-galli*	Ukraine	imazapyr, nicosulfuron, imazamox, penoxsulam	Rice
2018	*Galinsoga parviflora*	France	rimsulfuron, penoxsulam	Endive

1.4 Cross-resistance

According to https://hracglobal.com/files/Herbicide-Cross-Resistance-and-Multiple-Resistance-in-Plants.pdf

Cross resistance is defined as the expression of a genetically-endowed mechanism conferring the ability to withstand herbicides from different chemical classes. There are two broad cross resistance categories; target site cross resistance and non-target site cross resistance. Cross resistance occurs mainly in the group of ALS inhibitors, including penoxsulam.

Target site cross resistance occurs when a change at the biochemical site of action of one herbicide also confers resistance to herbicides from a different chemical class that inhibit the same site of action in the plant. Target site cross resistance does not necessarily result in resistance to all herbicide classes with a similar mode of action or indeed all herbicides within a given herbicide class.

Target site cross resistance to acetolactate synthase (ALS)-inhibiting herbicides Over the past decade, the most important area of herbicide chemistry has been the discovery of herbicides inhibiting acetolactate synthase (ALS). There are 15 classes of chemistry which have been described as inhibitors of ALS (Saari et al., 1994). Of these, the chemically dissimilar sulfonylurea, imidazolinone and triazolopyrimidine herbicides have been commercialized and are in widespread use. The large scale adoption and often persistent use of these herbicides has led to the appearance of weed biotypes resistant to the ALS-inhibiting herbicides. As reviewed by Saari et al. (1994), there are now many biotypes within at least 15 weed species (especially *Kochia scoparia* and *Lolium rigidum*) which have developed resistance to ALS-inhibiting herbicides, mainly through selection with sulfonylurea herbicides (presumably because they have been in commercial use for the longest period). In the vast majority of cases of resistance following selection with sulfonylurea herbicides, the resistance mechanism is a change in the target site enzyme ALS (reviewed by Saari et al., 1994). In most cases, the sulfonylurea resistant biotypes with a resistant ALS enzyme exhibit varying levels of target site cross resistance to the chemically dissimilar, but ALS-inhibiting, imidazolinone and/or triazolopyrimidine herbicides (Table 3; Hall and Devine, 1990; Christopher et al., 1992; Saari et al., 1990; 1992; 1994). The considerable variation in the level of resistance across and within various ALS-inhibiting herbicide chemistries (Table 3) is likely to be due to subtly different binding by particular herbicides on the ALS enzyme and different mutations of ALS. Evidence from competitive binding studies show that the three classes of ALS-inhibiting herbicides bind to the same, or closely overlapping sites on ALS (Durner et al., 1991; Landstein et al., 1993). The wide variation in target site cross resistance amongst biotypes with resistant ALS enzyme (Table 3) implies that there are a number of different functional mutations of the ALS gene. Knowledge of specific mutations of ALS providing resistance is now emerging. ALS gene sequences from a number of resistant biotypes of higher plants which have been examined show a substitution at a proline residue (173) in a highly conserved region of the enzyme, known as domain A. However, the proline substitutions vary in that substitutions of threonine, alanine, serine, histidine and glutamine for this proline have all been observed. Guttieri et al. (1992) examined ALS from three resistant weed species and observed Thr substitution in *Kochia scoparia* and a His substitution in *Lactuca serriola* at Pro 173. No alteration was observed in 3 domain A of ALS for a resistant biotype of *Salsola iberica*. Five other resistant biotypes of *K. scoparia* were examined and only three contained a substitution at Pro 173. In addition to changes at the Pro 173 of domain A, at least two other mutations have been observed to give sulfonylurea and/or imidazolinone resistance in higher plants; Ser 653 Asn in *Arabidopsis thaliana* (Sathasivan et al., 1991), and Trp 573 Leu in *Nicotiana tabacum* (Lee et al., 1988), and a number of other mutations providing resistance are known from yeast (Mazur and Falco, 1989). Significantly, in the only case so far published of resistance selected by an imidazolinone herbicide, a biotype of *Xanthium strumarium* resistant to imidazolinone herbicides at the whole plant and ALS enzyme level is not cross resistant to sulfonylurea or triazolopyrimidine herbicides and possesses an ALS enzyme susceptible to these herbicides (Schmitzer et al., 1993). Therefore, it is clear that there are several possible mutations of the ALS gene which will confer resistance to sulfonylurea and imidazolinone herbicides and yet retain enzyme function. It is likely, although not yet established, that these different mutations in the ALS gene provide different levels of target site cross resistance within and between ALS inhibiting herbicide chemistries. The variations in target site cross resistance among herbicide-resistant mutants indicates that the binding domains for the various classes of ALS-inhibiting herbicides do not fully overlap. It is also clear from these studies that a number of different mutations can endow resistance to various ALS-inhibiting herbicides without any significant impairment of enzyme function in vivo. As discussed below, this is also likely to be the case for herbicide-resistant ACCase, but is not the case for herbicide-resistant PS2 in which very few mutations confer resistance and yet retain full enzyme functionality. Competitive fitness studies with ALS enzyme-based resistant biotypes of *Kochia scoparia* and *Lactuca serriola* indicate there is no fitness penalty to plants carrying a resistant ALS enzyme (Mallory-Smith et al., 1992).

Non target site cross resistance is defined as cross resistance to dissimilar herbicide classes conferred by a mechanism(s) other than resistant enzyme target sites. Until recently documented for *L. rigidum* and *A. myosuroides*, non-target site cross resistance was largely unknown in herbicide-resistant weeds but is well known in the insecticide resistance literature (Brattsten et al., 1986; Georghiou, 1986).
Non target site cross resistance to ALS inhibiting herbicides The study of Heap and Knight (1986) and widespread farmer experience in Australia has been that many (but not all) *L. rigidum* populations that developed 6 resistance following selection with the ACCase inhibiting herbicide diclofop-methyl display resistance to cereal-selective ALS herbicides without any exposure to ALS herbicides (non-target site cross resistance). Similarly, a laboratory experiment Matthews and Powles (unpublished data) showed that an initially susceptible *L. rigidum* population when selected for three generations with diclofop-methyl developed resistance to diclofop-methyl and simultaneously exhibited resistance to the ALS

inhibiting herbicide chlorsulfuron without any exposure to chlorsulfuron. This study and the field observations conclusively established that selection with an ACCase-inhibiting herbicide can lead to resistant populations that display non target site cross resistance to ALS-inhibiting herbicides without exposure to these herbicides. The mechanistic basis of non-target site cross resistance to ALS herbicides has been thoroughly investigated in *L. rigidum*. As expected, cross resistance to ALS herbicides from selection with ACCase herbicides is not due to resistance at the ALS target enzyme (Matthews et al., 1990). Instead these biotypes of *L. rigidum* are resistant as a result of an enhanced rate of herbicide metabolism, which endows resistance to certain ALS-inhibiting herbicides (Figures 1 and 2). It is likely that the increased metabolism in these *L. rigidum* biotypes is catalyzed by the same Cyt P450 enzyme-based mechanism operating in wheat (Christopher et al., 1991; 1992). Wheat is resistant to many ALS-inhibiting herbicides as a result of rapid metabolism of these herbicides by aryl-hydroxylation (Sweetser et al., 1992), catalyzed by a Cyt P450 mono-oxygenase. Some chlorsulfuronresistant L. rigidum biotypes with sensitive ALS and a resistance profile to ALS-inhibiting herbicides similar to wheat can oxidatively metabolize chlorsulfuron more rapidly than the susceptible biotype (Figures 1 and 2; Christopher et al., 1991; Cotterman and Saari, 1992; Burnet et al., 1994a). The products of metabolism of chlorsulfuron in L. rigidum and wheat are also similar (Christopher et al., 1991; Cotterman and Saari, 1992), with the major metabolite identified as glucose-conjugated hydroxy-chlorsulfuron (Cotterman and Saari, 1992). Malathion which has been shown to inhibit the Cyt P450-dependent detoxification of primisulfuron, a sulfonylurea herbicide, in microsome preparations from maize (Kreuz and Fonné-Pfister, 1992) can inhibit chlorsulfuron metabolism and reduce chlorsulfuron resistance in the cross-resistant biotype SLR31 if applied in conjunction with chlorsulfuron (Christopher et al., 1994). This reversal of resistance in SLR31 by malathion confirms that detoxification plays a major role in chlorsulfuron resistance in this biotype. Taken together, these studies clearly establish that enhanced metabolism is the basis of non-target site cross resistance of *L. rigidum* to ALS herbicides. Cyt P450s are clearly implicated in enhanced metabolism of chlorsulfuron in resistant *L. rigidum*, however, the in vitro demonstration of Cyt P450-dependent chlorsulfuron metabolism in isolated microsomes has to date proved elusive (Preston and Powles, unpublished).

1.5 Sensitivity data

Applicant didn't conduct separately trials for sensitivity data, this data was evaluated in efficacy trials. The 20 field trials postemergence use were established in order to determine the sensitivity of weeds in the winter wheat and winter triticale. The CHR/H/PENDIF was tested at doses: 0.2 to 0.4 L/ha (119.90 – 179.85 g of active substances) in winter wheat and winter triticale for the control of mono and dicot weeds. None of the tested weeds showed high tolerance to the product CHR/H/PENDIF. Detailed studies on the weeds sensitivity are submitted and summarised in 3.2 Efficacy data (KCP 6).

1.6 Use pattern

Herbicide CHR/H/PENDIF has demonstrated good crop tolerance to winter wheat and winter triticale. Therefore concluded that CHR/H/PENDIF is safe usage at proposed rate and this support the label claim for the use in winter wheat and winter triticale.
Undesirable effects are not expected on succeeding crops, adjacent crop, part of plants used for propagating purposes and beneficial organisms.

Based on submitted data the following regulation on the label is proposed:
Winter wheat, winter triticale:
Recommended dose at:

CHR/H/PENDIF 0.3-0.4 L/ha
CHR/H/PENDIF is to be applied in autumn:
Winter wheat, winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,
Recommended volume of water 200-300 L/ha (winter wheat, winter triticale)
Recommended medium droplet spraying

The product CHR/H/PENDIF should be use once per season at autumn post – emergence. To avoid resistance, products contain active substance with the same group shouldn't be used year after year on the same field.

Use of CHR/H/PENDIF 599.5SC according to the proposed GAP does not represent a hazard to rotational crops and does not justify a specific labelling. CHR/H/PENDIF is not persistent in soil nor is it taken up by succeeding crops.

1.7 Resistance risk assessment of unrestricted usepattern

Not applicable

1.8 Test methods

Not applicable

1.9 Acceptability of the resistance risk

CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l. Flufenacet is grouped into the inhibition of the biosynthesis of very long chain fatty acids group (VLCFAs) resulting in inhibition of cell division and cell growth (HRAC group: 15, legacy K3). This group of herbicides is quite well known and has been applied commercially for decades. The weed resistance to flufenacet occured only in two weed species: *Lolium perenne* ssp. *multiflorum* and *Alopecurus myosuroides*. All cases of weed resistance to diflufenican have been reported in the Australia and Israel with no evidence of resistance in Europe. The risk of resistance developing to diflufenican is low, particularly in Europe. There are many cases of weed resistance to penoxsulam and HRAC group 2 (ALS inhibitors), but none of them simultaneously showed resistance to flufenacet and diflufenican and other herbicides from HRAC groups: 15 (legacy K3) and 12 (legacy B).
According to submitted efficacy data none of the tested weeds showed high tolerance to the product CHR/H/PEDIF 599.5 SC.
CHR/H/PEDIF 599.5 SC is a herbicide containing active substances: flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37.5 g/l, which belong to different HRAC groups (different mode of action). The mode of action involving a 'multi-site' action may indicate a lower risk to developing weeds resistance. Accroding to EPPO PP 1/213 (4) Resistance risk analysis weeds usually only produce one generation per year and development of resistance is usually a relatively slow process.
In conclusion, in the applicant's opinion, this level of weeds resistance risk should be considered to be acceptable.

1.10 Management strategy

Accroding to *Herbicide Resistance Action Committee (HRAC) (https://hracglobal.com/prevention-management/best-management-practices)*

Integrated Weed Management (IWM) refers to using chemical, cultural, mechanical and biological methods, in an integrated fashion, to control weeds. It does not rely excessively on any one method. When used in a integrated approach, the following tools help reduce selection pressure and survival of resistant weeds.

- Chemical - Applying herbicides to a crop.
- Mechanical - Includes measures such as hand-weeding using cultivation or ploughing to control emerged plants and bury non-germinated seed. It also includes harvest weed seed destruction such as stubble burning and cutting for hay or silage to prevent the weeds from setting seed.
- Cultural - Includes altering the crop planting date, row spacing and harvest timing to disrupt the weed cycle. It also includes planting crops that can out-compete weeds, buying certified seed that's free of weeds and using a diverse crop rotation. Growers should also sanitize farm equipment when moving between fields.
- Biological - Includes introducing insects and pathogens that control target weed species and introducing post-harvest grazing of growing weeds.

Using a diversified crop rotation allows farmers to use these different weed techniques. Avoid successive crops that use herbicides with the same mechanism of action to control the same weed species in the same field.

Guidelines for the sustainable use of herbicide site of action groups:

• Use mixtures or sequential treatments of herbicides having different sites of action. Each herbicide in the mixture should target the same weed species.

• Consider all chemical control options before planting, in-crop and after harvest.

• Avoid continued use of the same herbicides, or herbicides with the same site of action in the same field, unless integrated with other weed control practices.

• Limit the number of applications of a single herbicide or herbicides with the same site of action in a single growing season.

• Herbicide mixtures and herbicide rotations alone are not enough to prevent resistance. They must be used in a diversified plan than also incorporates mechanical, cultural and biological practices.

Growers should also do the following:

• Follow label use instructions, such as application rates, timing and equipment recommendations.

• Know the weeds in their fields and nearby non-crop areas and tailor their weed control program to weed densities and economic thresholds.

• Monitor herbicide results and be aware of any trends or changes in weed populations.

• Maintain detailed field records to confirm cropping and herbicide history.

1.11 Implementation of the management strategy

The herbicide label provides all the necessary information for preventing weed resistance to herbicides.

1.12 Monitoring, reporting and reaction to changes in performance

Accroding to https://hracglobal.com/files/Monitoring-and-Mitigation-of-Herbicide-Resistance.pdf

Managing the risk of herbicide resistance (HR) is an area of strategic importance for leading herbicide technology providers and is the focus of the Global Herbicide Resistance Action Committee (HRAC), an organization comprised of 8 major companies working as a part of Crop Life International. Early detection of HR, understanding the scope of HR in a defined area, and potential mitigation of resistance through efforts to limit its spread are important aspects of managing the risk of HR. Monitoring for HR

populations has been employed by public and private weed scientists for both early detection and defining the scope of resistance. The primary methods used to monitor for resistance include:
1) field surveys where seed from putative resistant plants are collected and tested in a controlled environment using bioassay procedures,
2) market research surveys of farmers and weed management experts, and
3) tracking farmer performance inquiries with appropriate follow up field evaluation and testing.
The most common monitoring method is the use of field surveys designed to either qualitatively (i.e., determine whether the level of resistance is high, medium, or low) or quantitatively (i.e., determine the area infested with HR populations) define existing HR. The primary method to detect resistance in new species and in new geographies is to track farmer performance inquiries. Once resistance is detected, steps may be taken to mitigate its impact. A critical aspect to mitigation is the implementation of best management practices (BMPs) which is facilitated by effective education and training programs. Education efforts can be enhanced with information obtained from monitoring studies and early detection of resistant populations using appropriate monitoring methods can improve the outcome of mitigation efforts.

Study Comments: 3.3 dRR point 3.3	**EN:** Strategy is acceptable.
CHR/H/PENDIF contains three active ingredients: flufenacet 312 g/l, diflufenican 250 g/l, penoxsulam 37.5 g/l, which belong to different HRAC groups. Flufenacet is classified by HRAC to the group 15 (inhibitor of the biosynthesis of very long chain fatty acids); Diflufenican is classified by HRAC to the group 12 (phytoene desaturase inhibitors) and penoxsulam classified by HRAC to the group 2 (inhibition of the acetolactate synthase enzyme (ALS)). The risk of resistance to active substances contained in CHR/H/PENDIF might be considered acceptable, if CHR/H/PENDIF is used according to the label instructions.	

3.4 Adverse effects on treated crops (KCP 6.4)

Information on trials submitted (3.4: Adverse effects on treated crops)

Table 3.4-1: Presentation of trials selectivity trials.

Crop*	Country	Type of trial**	Number of trials	Years	GEP, non-GEP, official***	Comments (any other relevant information)
			North-East Zone			
winter wheat	Poland	S + Y + Q	4	Spring 2019	GEP	-
	Poland	S + Y + Q	4	Spring 2020	GEP	-
winter triticale	Poland	S + Y + Q	5	Spring 2019	GEP	-
	Poland	S + Y + Q	3	Spring 2020		
TOTAL	-	-	**16**	-	-	-

* According to the GAP table
** S = selectivity trial, Y = trial with yield assessment, Q = trial with quality assessment, T = trial on the basis of the study of impact on transformation process (TP: Physical transformation, TF: transformation involving microbial fermentation), P = trial with assessment of impact on propagation
*** Official: carried out by a national official organisation

Table 3.4-2: Presentation of reference standards used in selectivity trials.

Crop(s)	Reference standard	Country(ies) where the product is registered (1)	Authorization number	Active substance(s)	Formulation		Registered application	Application	Remark(4)
					Type(2)	Concentration of a.s.	rate(3)	rate in trials (per treatment)	
Winter wheat, winter triticale,	Komplet 560 SC	Poland	R-104/2014	diflufenican	S.C. - concentrated suspension	280 g/l	0,5 l/ha	0,5 l/ha	
				flufenacet		280 g/l			
Winter wheat, winter triticale,	Bizon 118,75 S.C.	Poland, Slovakia	R-623/2017d	diflufenican	S.C. - concentrated suspension	100 g/l,	1,0 l/ha	1,0 l/ha	
				florasulam		3,75 g/l			
				penoxsulam		15 g/l			

(1) only on use(s) applied for (with the test product)
(2) e.g.WP (wettable powder), EC (emulsifiable concentrate), etc.
(3) Dose / dose range authorized in the country
(4) Other relevant information (e.g. uses, number of applications, spray volume, method of application…)

3.4.1 Phytotoxicity to host crop (KCP 6.4.1)

Materials and methods
The applicant submitted 16 reports (in total) showing the results in research into product selectivity carried out in 2019 in winter wheat (4 trials) and winter triticale (5 trials), and in 2020 in winter wheat (4 trials) and winter triticale (3 trials). List of these reports is contained in Appendix 1

Site
Trials were conducted in different regions in Poland where winter and wheat triticale are grown commercially. The experiment was established on a set of complete randomized blocks in 4 replications. Details on trial sites, applications and data on effectiveness are included in Appendix 4 and 5
Testing units
Selectivity studies on herbicide CHR/H/PENDIF were performed in 2019 by:
- SynTech Research Poland Sp. z o.o., ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland
- A.T Sp. z o.o., ul. Przemysłowa 3, 88-300 Mogilno, Poland
- Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland

Selectivity studies on herbicide CHR/H/PENDIF were performed in 2020 by:
- SynTech Research Poland Sp. z o.o., ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland
- A.T Sp. z o.o., ul. Przemysłowa 3, 88-300 Mogilno, Poland
- Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland

Experimental details
The efficacy trials were designed, conducted and reported according to the following EPPO guidelines:
- PP 1/135 (3) Phytotoxicity assessment
- PP 1/152 (3) Design and analysis of efficacy evaluation trials
- PP 1/181 (3) Conduct and reporting of efficacy evaluation trials including good experimental practice

Assessment methods
Statistical Analysis
In case of statistical analysis, data were analysed using a two way analysis of variance (ANOVA). The probability of no significant differences occurring between treatment means is calculated as the F

probability value (Prob(F)). Student-Newman-Keuls test was then applied to separate any treatment differences that may be implied by the ANOVA TEST (Prob(F)<0.05) and these are indicated by the LSD-value and by a letter-test.
Statistical analysis was carried out with the use of statistic pack of ARM 9.0. The trial results were statistically analyzed using Student&Newman&Keuls Test (p=0,05).

Results were analyzed by the means of Student and Newman & Keuls (p=0.05). Results were calculated statistically according to ARM 9.0.

Statistical preparation of the results was based on the analysis of variance for the randomized block experiment design. Differences significance was tested using Tukey's semi-interval confidence, while the least significant difference was given at the significance level LSDα=0.05. Experimental data were calculated using the statistical program AWAR, version 2.0. Data from the statistical analyses were placed into result tables.
Assessment of phytotoxicity
Phytotoxicity (chlorosis and necrosis), stunting and thinning were assessed by visual estimation of the intensity on an overall plot basis on a percentage scale 0-100 % (0=no damage). The assessment date was determined by the speed of action and period of efficacy of the test substances.
The selectivity was assessed by a visual estimation of an intensity of chlorosis, necrosis, leave curling etc. found on overall areas of treated plots, with references to untreated plots. Results were described in percent of destruction injury of plant for herbicides treatment compared in comparison to plant from untreated, where 0% means no phytotoxicity and 100% - complete crop destruction.
Phytotoxicity assessments of tested preparations were done by a visual estimation of an intensity of chlorosis, necrosis, leave curling, reduction in turgor of plants etc. found on overall areas of treated plots and by comparison of each treated plot with untreated plot. Assessments were done directly on plantation. Results were shown using 0-100 scale, where: 0 – lack of phytotoxicity, 100 – total plant destruction.
Phytotoxicity (F) of tested herbicides was evaluated in %, by determination crop state and comparison to untreated plots and standard product activity.
phytotoxicity - susceptibility of plants to herbicides in % where:
0 - no reaction of crop
100 - crop damaged

Harvest
A plot combine for intermixing-free grain-harvest in field trials was used for harvesting the centre of the plot. The total yield is given in unit/ha adjusted to a fixed moisture content.
Grain yield was harvested using "Nusermayser Elite Z 035" by Wintersteiger. Weight of 1000 grains was described in laboratory and calculated on the basis of grain moisture contents of 14 %. Weight of grain hectolitre was determined in order to PN-ISO 7971 norm
Applications methods and rates
The applications were carried out by a T-BOOM – BACCAI, plot sprayer – BACSPR, plot sprayer BICSPR, Schachtner – SPRBIC, knapsack "Gloria" in cereals.
The applications were carried out by a T-BOOM – BACCAI, plot sprayer BICSPR, Schachtner – SPRBIC in maize.

Tested herbicide was applied at spring in the growth stage in winter wheat and winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,

The product CHR/H/PENDIFhas been used:
in winter wheat at the following rates of 0.4, 0.8 L/ha
in winter triticale at the following rates of 0.4, 0.8 L/ha
Bizon 118,75 SC and Komplet 560 SC were used as a reference product in winter wheat, winter triticale

The experiment was established on a set of complete randomized blocks in 4 replications.

Experiment pattern:
Winter wheat 2019 and 2020

No.	Name	Rate (l/ha)	other rate (g a.s./ha)	Appl code	Growth Stage BBCH
1	Untreated Check				
2	CHR/H/PENDIF100 S.C.	0,4	240	A	BBCH 11-25
3	CHR/H/PENDIF100 S.C.	0,8	480	A	BBCH 11-25
4	Bizon 118,75 SC	1,0	118,75	A	BBCH 11-25
5	Bizon 118,75 SC	2,0	237,50	A	BBCH 11-25
6	Komplet 560 SC	0,5	280	A	BBCH 11-25
7	Komplet 560 SC	1,0	560	A	BBCH 11-25

Winter triticale 2019 and 2020

No.	Name	Rate (l/ha)	other rate (g a.s./ha)	Appl code	Growth Stage BBCH
1	Untreated Check				
2	CHR/H/PENDIF100 S.C.	0,4	240	A	BBCH 11-25
3	CHR/H/PENDIF100 S.C.	0,8	480	A	BBCH 11-25
4	Bizon 118,75 SC	1,0	118,75	A	BBCH 11-25
5	Bizon 118,75 SC	2,0	237,50	A	BBCH 11-25
6	Komplet 560 SC	0,5	280	A	BBCH 11-25
7	Komplet 560 SC	1,0	560	A	BBCH 11-25

Details of experiments

Winter wheat

Report code	CHR_H_PENDIF_SEL_PL01	AH/19/PO/30/Gr/sel/2	AH/19/PO/30?BR/sel/1	A.T/2019/092/PO	A.T/2020/150/PO	A.T/2020/149/PO	CHR_H_PENDIF_SEL_PL01_2020	A.T/2020/148/PO
Location	Murczyn / Poland	Gorzyń / Poland	Brody / Poland	Trzciany / Poland	Raciąż / Poland	Koronowo / Poland	Żędowo / Poland	Stęszew / Poland
Plant/cultivar	winter wheat / Hondia	Winter wheat / Jantarka	Winter wheat / Tonacja	Winter wheat / Findus	Winter wheat / Keramik	Winter wheat / Arkadia	Winter wheat / Aleksander	Winter wheat / RGT Specialist
Seeding date	21.09.2019	04.10.2019	25.09.2019	21.09.2019	26.09.2020	21.09.2020	16.10.2020	01.10.2020
Seeding rate	170 kg/ha	195 kg/ha	190 kg/ha	200 kg/ha	140 kg/ha	180 kg/ha	200kg/ha	130kg/ha
Forecrop	winter oilseed rape	Leguminous plants	maize	winter barley	sugar beet	winter wheat	winter oilseed rape	sugar beet
Type of sprayer	BACCAI	BICCAI	BICCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI
Date of treatment	21.10.2019	22.12.2019	15.10.2019	07.12.2019	10.11.2020	13.10.2020	15.11.2020	19.10.2020
Plant development phase	BBCH 12-13	BBCH 14-15	BBCH 21	BBCH 22-24	BBCH 23-24	BBCH 11-13	BBCH 13-19	BBCH 11-12
Soil type	clayey sand	loamy sand	sandy loam	loamy sand	loamy sand	sandy loam	sandy loam	sandy loam
pH	6,80	6,80	6,70	5,90	6,2	5,2	6,8	6,2
Water (l/ha)	300	200	230	200	300	200		200
Plot size	2x10=20m2	1,5x12=18=m2	2x9=18m2	2,5x8,25=20,625 m2	2,5x8,0=20m2	2,5x8,0=20m2	2,5x9=22,5m2	2,5x7=17,5m2

Winter triticale

Report code	AH/19/PszO/30/Gr/sel/3	CHR_H_PENDIF_SEL_PL 03	CHR_H_PENDIF_SEL_PL 02	A.T/2019/093/PŻO	A.T/2019/094/PŻO	A.T/2020/151/PŻO	A.T/2020/152/PŻO	AH/20/PszoO/33/Gr
Location	Gorzyń / Poland	Szałkowo / Poland	Huta / Poland	Kakulin / Poland	Lusowo / Poland	Zamarte / Poland	Białe Błoto / Poland	Gorzyń / Poland
Plant/cultivar	Winter triticale / Sekret	Winter triticale / Trapero	Winter triticale / Trapero	Winter triticale / Gringo	Winter triticale / Kasyno	Winter triticale / Orinoko	Winter triticale / Panteon	Winter triticale / Tadeus
Seeding date	04.10.2019	25.09.2019	20.09.2019	12.09.2019	30.09.2019	28.09.2020	24.09.2020	25.09.2020
Seeding rate	167 kg/ha	200 kg/ha	160 ka/ha	180 kg/ha	200 kg/ha	150 kg/ha	200 kg/ha	214 kg/ha
Forecrop	leguminous plants	winter wheat	winter barley	winter rye	winter wheat	winter wheat	spring barley	leguminous plants
Type of sprayer	BICCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI	BACCAI	SPRBIC
Date of treatment	22.10.2019	21.10.2019	18.10.2019	07.10.2019	24.10.2019	23.10.2020	16.10.2020	13.10.2020
Plant development phase	BBCH 19	BBCH 12-14	BBCH 12-14	BBCH 12-13	BBCH 11-12	BBCH 19-21	BBCH 10-12	BBCH 11
Soil type	sandy loam	fine sand	sandy loam	loamy sand	sandy loam	sandy loam	loamy sand	sandy loam
pH	5,90	4,31	6,00	4,00	6,8	5,3	4,7	6,1
Water (l/ha)	200	200	200	200	200	300	200	200
Plot size	1,5x12=18m2	3x7=21m2	3x7=21m2	2,5x8=20m2	2,5x8=20m2	2,5x11=27,5m2	2,5x8=20m2	1,5x13=19,5m2

Details of agricultural measures, fertilization, and other plant protection products applied during the experiments are included in detailed field study reports listed above.

Table 3.4-3: Phytotoxicity of product

Winter wheat, winter triticale, post emergence application 16 trials were carried out in Poland on a wide range of commercially grown varieties. There were observed phytotoxicity symptoms on tested product and standard in one trial in winter wheat and in two trials in winter triticale. Phytotoxicity have no impact on yield quality and quantity. trials no.: A.T/2020/149/PO, A.T/2019/093/PŻO, A.T/2020/151/PŻO. The phytotoxicity was transient and did not cause any effect at yield.

Winter wheat

Number of trials with		Selectivity trials (8)						Efficacy trials	
		CHR/H/PENDIF		Standard I Bizon 118		Standard II Komplet 560 SC		CHR/H/PENDIF	Standard
		N	2N (or other)	N	2N (or other)	N	2N (or other)	N	N
Maximum of phytotoxicity recorded during the trials	0% to 5%	0,0	3,5	1,5	5,3	0,0	0,8	n/a	n/a
	>5% to 10%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>10% to 15%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>15 %	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
Level of symptoms at the last assessments	0% to 5%	0,0	0,0	0,0	1,3	0,0	0,0	n/a	n/a
	>5% to 10%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>10% to 15%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>15 %	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a

Winter triticale

Number of trials with		Selectivity trials (8)						Efficacy trials	
		CHR/H/PENDIF		Standard I Bizon 118		Standard II Komplet 560 SC		CHR/H/PENDIF	Standard
		N	2N (or other)	N	2N (or other)	N	2N (or other)	N	N
Maximum of phytotoxicity recorded during the trials	0% to 5%	1,5	5,0	1,3	1,0	2,8	4,5	n/a	n/a
	>5% to 10%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>10% to 15%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>15 %	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
Level of symptoms at the last assessments	0% to 5%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>5% to 10%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a
	>10% to 15%	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a

	>15 %	0,0	0,0	0,0	0,0	0,0	0,0	n/a	n/a

Study Comments: dRR point 3.4.1	Studies are acceptable.
Phytotoxicity symptoms were checked in 8 selectivity trials on winter wheat (varieties: Findus, RGT Specialist, Arkadia, Keramik, Hondia, Aleksander, Tonacja, Jantarka) and in in 8 selectivity trials on winter triticale (varieties: Tadeus, Gring, Kasyno, Orinoko, Panteon, Trapero, Sekret). CHR/H/PENDIF was applied at the do rate of 0,4 l product/ha (1N) and 0,8 l/ha (2N) and compared to the 2 reference products. The phytotoxicity symptoms were also checked in efficacy trials and no symptoms of negative product performance on crops were found. In 1 trial in winter wheat (variety Arkadia) CHR/H/PENDIF applied at the 2N dose rate caused only relatively low levels (<5%) of phytotoxicity and/or effects on crop growth and development: bleaching (1,5%, 27 DAA, BBCH 21), chlorosis (2,8%, 44 DAA, BBCH 21), stunting (3,5%, 155 DAA, BBCH 24). In all cases these symptoms were transient and at the next date of assessment (230 DAA, BBCH 39) there were no symptoms of phytotoxicity. Both reference products gave similar effects. In 2 trials in winter triticale (variety Gringo, Orinoko) CHR/H/PENDIF applied at the 1N and 2N dose rate caused only relatively low levels (≤ 5%) of crops phytotoxicity: - variety Gringo: discoloration (0,5% for 2N dose rate, 14 DAA, BBCH 19; 0,5% for 1N dose rate and 11,3% for 2N dose rate, 24 DAA, BBCH 21). In all cases these symptoms were transient and at the next date of assessment (155 DAA, BBCH 23) there were no symptoms of phytotoxicity. Both reference products gave similar effects. - variety Orinoko: bleaching (1,5% and 3,0% for 1N and 2N dose rate respectively, 24 DAA, BBCH 22; 1,3% for 1N dose rate and 2,3% for 2N dose rate, 35 DAA, BBCH 22), stunting (5% for 2N dose rate, 144 DAA, BBCH 24). In all cases these symptoms were transient and at the next date of assessment (223 DAA, BBCH 37) there were no symptoms of phytotoxicity. Both reference products gave similar effects. In those trials relationship between phytotoxicity and yield was checked (the table 3.4-4). The following parameters were assessed: yield, moisture content, TKW, HLW, protein content and for winter wheat additionally gluten content. Phytotoxicity symptoms didn't cause any negative effect on the yield of winter wheat and winter triticale. It might concluded that crop safety of CHR/H/PENDIF599.5SC application in winter wheat and winter triticale can be claimed.	

3.4.2 Effect on the yield of treated plants or plant product (KCP 6.4.2)

Influence of CHR/H/PENDIF on the yield of grains was evaluated in selectivity research. The yield was evaluated on the basis of harvested grains quantity from one hectare (t/ha). The influence of the tested product on quantity of grain was evaluated in 16 field experiments in winter wheat 8 trials, winter triticale 8 trials in Poland in 2019 and 2020. There weren't statistic difference between the treatment objects and standard.

Winter wheat

table 3.4.2.1-1 The influence of the CHR/H/PENDIF on yield quantity [t/ha]

Report code				AH/19/PO/30/Gr/sel/2	AH/19/PO/30?BR/sel/1	CHR_H_PENDIF_SEL_PL01	CHR_H_PENDIF_SEL_PL01_2020	A.T/2020/150/PO	A.T/2020/149/PO	A.T/2019/092/PO	A.T/2020/148/PO
Treatment	Dose	Unit	Code								
Untreated Check				9,13a	8,97a	9,46	7,91a	8,30a	8,43a	7,11a	8,65a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	8,84a	10,22a	9,50	7,94a	8,37a	8,85a	7,60a	8,65a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	8,59a	10,27a	9,38	7,93a	8,36a	8,61a	6,95a	8,52a
Bizon	1,00	l/ha	A	8,16a	10,00a	9,41	7,94a	8,65a	8,78a	7,81a	8,72a
Bizon	2,00	l/ha	A	8,41a	10,49a	9,57	7,91a	8,46a	8,24a	7,19a	8,64a
Komplet 560 S.C.	0,50	l/ha	A	8,48a	10,39a	9,46	7,95a	8,72a	8,83a	7,66a	8,65a
Komplet 560 S.C.	1,00	l/ha	A	8,64a	10,72a	9,47	7,91a	8,42a	8,70a	7,96a	8,54a
LSD				0,938	1,3870	0,531	0,159	0,701	0,836	0,985	0,339

Winter triticale

table 3.4.2.1-2 The influence of the CHR/H/PENDIFon yield quantity [t/ha]

Report code				AH/19/PszO/30/Gr/sel/3	CHR_H_PENDIF_SEL_PL03	CHR_H_PENDIF_SEL_PL02	A.T/2019/093/PŻO	A.T/2019/094/PŻO	A.T/2020/151/PŻO	A.T/2020/152/PŻO	AH/20/PszoO/33/Gr
Treatment	Dose	Unit	Code								
Untreated Check				6,70a	5,90	6,10	6,79a	7,02a	9,06a	6,44a	7,80a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	6,47a	6,00	6,20	6,67a	7,04a	8,62a	6,84a	7,90a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	6,73a	6,10	6,20	6,73a	6,83a	8,40a	6,42a	8,00a
Bizon	1,00	l/ha	A	6,54a	6,00	6,10	6,59a	7,23a	8,67a	6,56a	7,70a
Bizon	2,00	l/ha	A	6,52a	6,00	6,20	6,56a	6,79a	8,65a	6,54a	7,60a
Komplet 560 S.C.	0,50	l/ha	A	6,84a	5,90	6,20	6,40a	7,07a	8,64a	6,58a	8,00a
Komplet 560 S.C.	1,00	l/ha	A	6,53a	6,10	6,20	6,98a	6,95a	8,58a	6,60a	7,90a
LSD				0,627	0,3000	0,180	1,068	0,364	0,667	0,596	0,680

Table 3.4-4: Relationship between phytotoxicity and yield.

There were observed phytotoxicity symptoms on tested product and standard in one trial in winter wheat and in two trials in winter triticale. This effects didn't have any negative effect on the yield of winter wheat and winter triticale. There were not statistic difference

Winter wheat
CHR/H/PENDIF599.5SC

Test report	Variety	Maximum phyto. at 1N rate (%) (DAA)			Maximum phyto. at 2N (or other) rate (%) (DAA)			Yield in the untreated control Absolute figures t/ha (%)	Yield at 1N as % of untreated			Yield at 2N (or other) rate as % of untreated		
		Test product	Standard 1	Standard 1I	Test product	Standard 1	Standard 1I		Test product	Standard 1	Standard 1I	Test product	Standard 1	Standard 1I
A.T/2020/149/PO	Arkadia	0,5% (44DAA)	1,5% (44DAA)	0,0%	3,5% (154DAA)	5,3% (154DAA)	0,8% (44DAA)	8,43 (100%)	105%	104,2%	104,8 %	102,2 %	97,8%	103,2 %

Winter triticale
CHR/H/PENDIF599.5SC

Test report	Variety	Maximum phyto. at 1N rate (%) (DAA)			Maximum phyto. at 2N (or other) rate (%) (DAA)			Yield in the untreated control Absolute figures t/ha (%)	Yield at 1N as % of untreated			Yield at 2N (or other) rate as % of untreated		
		Test product	Standard 1	Standard 1I	Test product	Standard 1	Standard 1I		Test product	Standard 1	Standard 1I	Test product	Standard 1	Standard 1I
A.T/2019/093/PŻO	Gringo	0,5% (24DAA)	1,3% (24DAA)	0,5% (24DAA)	1,3% (24DAA)	0,5% (24DAA)	2,5% (24DAA)	6,79 (100%)	97,9%	97,1%	94,3%	99,2%	96,6%	102,8 %
A.T/2020/151/PŻO	Orinoko	1,5% (24DAA)	1,0% (24DAA)	2,8% (24DAA)	3,0(DAA)	1,0% (24DAA)	4,5% (35DAA)	9,06 (100%)	95,2%	95,8%	102%	92,7%	96,2%	97,1%

Study Comments: 3.4.2 dRR point: 3.4.2	Studies are acceptable
The Applicant presented data obtained from 16 trials selectivity trials (8 trials for winter wheat and 8 trials for winter triticale). CHR/H/PENDIF at the rates 1N and 2N had no negative effect on the yield of winter wheat and winter triticale.	

3.4.3 Effects on the quality of plants or plant products (KCP 6.4.3)

16 studies conducted in 2019 and 2020 in Poland, on winter wheat 8 trials, winter triticale 8 trials at autumn use had no negative impact of CHR/H/PENDIF on quality of plants.
Influence of CHR/H/PENDIF on the yield of grains was evaluated in selectivity research. The yield was evaluated on the basis of harvested grains quantity from one hectare (t/ha). The influence of the tested product on quantity of grain was evaluated in 16 field experiments (in winter wheat 8 trials, winter triticale 8 trials). There weren't difference between the treatment objects and standard. Details of the data shows tables below

table 3.4.3.1-1 The influence of the CHR/H/PENDIF on quality of yield
Winter wheat (HLW = weight 100 Ltr (hl))

Report code				AH/19/PO/30/Gr/sel/2	AH/19/PO/30?BR/sel/1	CHR_H_PENDIF_SEL_PL01	CHR_H_PENDIF_SEL_PL01_2020	A.T/2020/150/PO	A.T/2020/149/PO	A.T/2019/092/PO	A.T/2020/148/PO
Treatment	Dose	Unit	Code								
Untreated Check				74,85a	77,50a	80,43a	76,90a	71,73a	72,40a	75,13a	71,73a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	74,83a	78,58a	79,83a	77,20a	71,80a	72,63a	75,40a	72,05a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	74,75a	78,98a	80,50a	77,50a	71,40a	71,55a	75,50a	69,85a
Bizon	1,00			74,48a	79,00a	80,18a	77,30a	71,83a	73,30a	75,93a	70,88a
Bizon	2,00	l/ha	A	75,20a	78,78a	79,73a	77,10a	71,40a	71,83a	74,58a	72,00a
Komplet 560 S.C.	0,50	l/ha	A	75,50a	79,45a	80,18a	77,40a	72,43a	72,70a	75,78a	70,13a
Komplet 560 S.C.	1,00	l/ha	A	74,90a	78,83a	80,50a	77,10a	72,00a	72,65a	75,30a	69,90a
LSD				1,184	1,439	1,550	1,090	1,384	2,821	1,407	3,013

table 3.4.3.1-2 The influence of the CHR/H/PENDIFon quality of yield
Winter triticale (HLW = weight 100 Ltr (hl))

Report code				AH/19/PszO/30/Gr/sel/3	CHR_H_PENDIF_SEL_PL03	CHR_H_PENDIF_SEL_PL02	A.T/2019/093/PŻO	A.T/2019/094/PŻO	A.T/2020/151/PŻO	A.T/2020/152/PŻO	AH/20/PszoO/33/Gr
Treatment	Dose	Unit	Code								
Untreated Check				70,03a	69,80a	70,08a	71,70a	69,45b	73,43a	65,23a	66,30a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	70,30a	69,08a	70,03a	72,40a	70,60ab	73,23a	66,88a	63,83a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	69,85a	69,01a	70,00a	72,40a	69,90ab	73,13a	66,80a	63,75a
Bizon	1,00			70,00a	69,98a	70,40a	72,10a	70,08ab	72,48a	65,80a	63,23a
Bizon	2,00	l/ha	A	69,93a	69,05a	70,53a	72,50a	70,08ab	73,13a	65,95a	62,88a
Komplet 560 S.C.	0,50	l/ha	A	70,08a	69,97a	70,43a	72,50a	70,80a	73,45a	55,48a	63,83a
Komplet 560 S.C.	1,00	l/ha	A	70,65a	68,55a	70,45a	72,20a	70,85a	73,10a	66,28a	64,33a
LSD				1,466	1,951	0,771	1,120	0,843	0,843	2,059	1,399

table 3.4.3.1-3 The influence of the CHR/H/PENDIF on quality of yield
Winter wheat thousand weight grain

Report code				AH/19/PO/30/Gr/ sel/2	AH/19/PO/30?BR/ sel/1	CHR_H_PENDIF_SEL_ PL01	CHR_H_PENDIF_SEL_PL01 _2020	A.T/2020/150/ PO	A.T/2020/149/ PO	A.T/2019/092/ PO	A.T/2020/148/ PO
Treatment	Dose	Unit	Code								
Untreated Check				51,40a	48,99a	50,50a	45,00a	41,31a	38,11a	40,56a	38,15a
CHR/H/PEN DIF 599.5S.C.	0,40	l/ha	A	50,78a	48,87a	50,65a	45,50a	40,73a	38,98a	41,18a	38,3a
CHR/H/PEN DIF 599.5S.C.	0,80	l/ha	A	50,65a	49,48a	49,83a	45,00a	42,26a	37,09a	40,3a	36,24a
Bizon	1,00			51,03a	49,13a	50,78a	44,90a	40,51a	39,44a	41,76a	36,54a
Bizon	2,00	l/ha	A	51,08a	48,71a	51,08a	44,90a	41,54a	36,6a	38,93a	39,17a
Komplet 560 S.C.	0,50	l/ha	A	50,35a	49,28a	50,28a	45,00a	41,82a	39,41a	41,08a	36,22a
Komplet 560 S.C.	1,00	l/ha	A	50,35a	48,86a	50,35a	45,60a	41,55a	39,29a	41,44a	35,71a
LSD				1,279	1,8792	1,429	1,230	1,677	2,409	3,981	4,547

table 3.4.3.1-4 The influence of the CHR/H/PENDIFon quality of yield
Winter triticale thousand weight grain

Report code				AH/19/PszO/30/Gr/sel/3	CHR_H_PENDIF_SEL_PL03	CHR_H_PENDIF_SEL_PL02	A.T/2019/093/PŻO	A.T/2019/094/PŻO	A.T/2020/151/PŻO	A.T/2020/152/PŻO	AH/20/PszoO/33/Gr
Treatment	Dose	Unit	Code								
Untreated Check				37,45a	40,28a	42,48a	45,00a	40,87a	45,81a	37,36a	39,48a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	37,13a	40,19a	42,33a	45,00a	41,50a	45,35a	37,36a	40,60a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	36,05a	40,26a	42,33a	45,10a	41,72a	44,78a	36,72a	40,10a
Bizon	1,00			36,90a	40,28a	42,53a	45,30a	41,80a	44,1a	34,59a	39,50a
Bizon	2,00	l/ha	A	37,78a	40,05a	42,35a	44,60a	41,30a	44,06a	38,2a	40,18a
Komplet 560 S.C.	0,50	l/ha	A	37,65a	40,59a	42,73a	44,20a	43,63a	46,71a	37,04a	40,30a
Komplet 560 S.C.	1,00	l/ha	A	37,83a	39,92a	42,25a	44,70a	43,34a	44,5a	35,82a	41,63a
LSD				1,275	1,3380	0,607	1,870	2,049	2,544	3,094	3,070

table 3.4.3.1-5 The influence of the CHR/H/PENDIFon quality of yield
Winter wheat protein content [%]

Report code				CHR_H_PENDIF_SEL_PL01	CHR_H_PENDIF_SEL_PL01_2020	A.T/2020/150/PO	A.T/2020/149/PO	A.T/2019/092/PO	A.T/2020/148/PO
Treatment	Dose	Unit	Code						
Untreated Check				13,23a	12,80a	11,78a	12,95a	12,25a	12,9a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	13,30a	12,50a	11,93a	13,08a	12,7a	12,95a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	13,13a	12,80a	11,58a	12,43a	12,75a	14,38a
Bizon	1,00			13,23a	13,00a	12,08a	12,65a	12,38a	13,78a
Bizon	2,00	l/ha	A	13,25a	12,70a	11,10a	13,65a	12,65a	12,65a
Komplet 560 S.C.	0,50	l/ha	A	13,15a	12,90a	12,28a	12,33a	12,33a	14,03a
Komplet 560 S.C.	1,00	l/ha	A	13,28a	12,70a	11,83a	12,6a	12,95a	14,15a
LSD				0,493	0,950	0,922	0,950	0,957	2,304

table 3.4.3.1-6 The influence of the CHR/H/PENDIFon quality of yield
Winter triticale protein content

Report code				A.T/2019/093/PŻO	A.T/2019/094/PŻO	A.T/2020/151/PŻO	A.T/2020/152/PŻO	AH/20/PszoO/33/Gr
Treatment	Dose	Unit	Code					
Untreated Check				11,90a	9,85a	11,8a	10,95a	11,50a
CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	11,90a	10,05a	11,8a	11,38a	11,50a
CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	12,00a	10,6a	12,15a	12,18a	11,70a
Bizon	1,00			12,40a	10,15a	12,05a	11,00a	11,70a
Bizon	2,00	l/ha	A	12,20a	9,95a	12,03a	11,93a	11,40a
Komplet 560 S.C.	0,50	l/ha	A	12,00a	10,03a	11,93a	11,25a	11,70a
Komplet 560 S.C.	1,00	l/ha	A	11,80a	10,28a	12,05a	11,58a	11,40a
LSD				1,000	0,532	0,328	0,847	

Study Comments: 3.4.3 dRR point: 3.4.3	Studies are acceptable
The Applicant presented data obtained from 16 selectivity trials (8 trials for winter wheat and 8 trials for winter triticale). The following yield quality parameters were checked: HLW, TKW, protein content. It might be concluded that a single application of CHR/H/PENDIF at the proposed range of 0,4 l product/ha has no adverse impact on the quality of plants or plant products in winter wheat and winter triticale.	

3.4.4 Effects on transformation processes (KCP 6.4.4)

3.4.4 Effects on transformation processes (KCP 6.4.4)

Lack of additional tests in this range. Active substances comprising in this product has been applied for many years, not only in Poland but also in the other countries of Europe.

Penoxsulam

According to magnitude of residues in plants provided in Section B7 in core dossier all residues are below 0.01 mg/kg. Therefore, no impact for effects on yeasts or lactic bacteria are predicted.

Diflufenican

According to magnitude of residues in plants provided in Section B7 in core dossier no significant residues, i.e. >0.1 mg/kg, were found in grain and therefore processing studies are not required. No further studies have been performed. Therefore, no impact for effects on yeasts or lactic bacteria are predicted

Flufenacet

According to magnitude of residues in plants provided in Section B7 in core dossier no significant residues, i.e. >0.1 mg/kg, were found in grain and therefore processing studies are not required. No further studies have been performed. Therefore, no impact for effects on yeasts or lactic bacteria are predicted.

Study Comments: 3.4.4 dRR point: 3.4.4	Explanations are acceptable
The Applicant presented no data on effects on transformation processes taking note that, products containing all actives as the sole active substance or together in co-formulations have been approved and extensively used as herbicides in cereals across EU countries for many years and the residues impact for effects on yeasts or lactic bacteria are not predicted. The explanations are acceptable.	

3.4.5 Impact on treated plants or plant products to be used for propagation (KCP 6.4.5)

There is no information available pointing to presence of any limitations to using of CHR/H/PENDIF in seed crops of winter wheat AND winter triticale.
In the course of studies carried out in Poland in the season of 2019 and 2020 on product CHR/H/PENDIF the herbicide has not been observed to have any significant influence on yield.
The product may be used in seed crops of winter wheat and winter triticale.

Study Comments: 3.4.5 dRR point: 3.4.5	Explanations are acceptable
The Applicant presented no data on impact on treated plants or plant parts to be used for propagation. Products containing penoxsulam, diflufenican and flufenacet have been using for many years and are well proven to have no adverse effects on the viability of progeny seed.	

Summary and conclusion

The submitted efficacy data (reports from 20 field trials) and additional information fulfill requirements and conditions determined in the following EPPO guidelines:
- PP 1/135 (3) Phytotoxicity assessment
- PP 1/152 (3) Design and analysis of efficacy evaluation trials
- PP 1/181 (3) Conduct and reporting of efficacy evaluation trials including good experimental practice

They were carried out on the field in the conditions of natural agrofag infestation. The efficacy trials were concluded according to the EPPO standards:
- PP 1/93(2) Weeds in cereals

The studies fulfill also requirements of the Commission Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the data requirements for plant protection products.

The formulation of CHR/H/PENDIF is suspension concentrate (SC) and it comprises active substance flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37,5 g/l. The applicant submitted 20 reports in total (10 in winter wheat and 10 in winter triticale) showing the results in research into product efficacy carried out in 2019 and 2020 in winter wheat and winter triticale.

The obtained data in performed trials show that CHR/H/PENDIF 599.5SC provides benefits against the most important weeds in winter wheat and winter triticale, as shown in the table below.

The following table describes the effectiveness of weeds

S (Susceptible)	> 85% (within each trial the average must be higher than 85%)
MS (Moderately Susceptible)	70 – 85%
MT (Moderately Tolerant)	60 – 70%
T (Tolerant)	< 60%

The following table shows the average sensitivity of weeds in winter wheat :

Target	CHR/H/PENDIF at rate	Number of trials	% control			Efficacy
			Mean	Min & Max		
Galium aparine	0,2	6	84,70	80,00	89,50	MS
	0,3		90,23	81,50	100,00	S
	0,35		91,20	82,80	100,00	S
	0,4		94,52	87,50	100,00	S
Viola arvensis	0,2	8	95,02	87,50	100,00	S
	0,3		96,94	92,50	100,00	S
	0,35		97,86	93,00	100,00	S
	0,4		98,73	94,30	100,00	S
Brassica napus (self-sown plant)	0,2	8	96,22	86,00	100,00	S
	0,3		97,44	87,00	100,00	S
	0,35		97,73	87,50	100,00	S
	0,4		98,13	91,00	100,00	S

Tripleurospermum mar. inodorum	0,2	6	92,77	88,80	96,00	S
	0,3		94,48	88,80	100,00	S
	0,35		96,85	92,50	100,00	S
	0,4		98,63	95,50	100,00	S
Stellaria media	0,2	6	95,90	90,30	100,00	S
	0,3		97,52	91,30	100,00	S
	0,35		97,88	92,80	100,00	S
	0,4		98,10	93,80	100,00	S
Apera Spica Venti	0,2	6	82,37	76,30	93,30	MS
	0,3		93,52	80,00	100,00	S
	0,35		97,58	94,00	100,00	S
	0,4		98,55	94,80	100,00	S
Veronica hederifolia	0,2	6	86,15	81,50	91,30	S
	0,3		96,97	91,80	100,00	S
	0,35		97,52	92,00	100,00	S
	0,4		97,88	93,30	100,00	S
Capsella bursa-pastoris	0,2	8	97,27	90,30	100,00	S
	0,3		98,19	92,00	100,00	S
	0,35		98,25	92,50	100,00	S
	0,4		98,54	93,80	100,00	S
Papver rhoeas	0,2	4	30,65	25,00	36,30	T
	0,3		41,90	29,80	55,00	T
	0,35		49,43	41,30	56,30	T
	0,4		54,95	47,50	65,00	T
Lamium purpureum	0,2	6	97,00	91,00	100,00	S
	0,3		97,38	91,80	100,00	S
	0,35		98,05	92,80	100,00	S
	0,4		98,58	94,00	100,00	S
Anthemis arvensis	0,2	6	81,85	81,30	82,50	MS
	0,3		99,38	97,30	100,00	S
	0,35		99,72	99,00	100,00	S
	0,4		99,83	99,00	100,00	S
Geranium pusillum	0,2	5	84,63	81,30	89,30	MS
	0,3		93,52	81,30	100,00	S
	0,35		97,62	92,00	100,00	S
	0,4		98,36	93,00	100,00	S
Cyanus segetum	0,2	2	50,00	50,00	50,00	T
	0,3		58,15	51,30	65,00	T
	0,35		63,15	60,00	66,30	MT
	0,4		66,25	62,50	70,00	MT

The following table shows the average sensitivity of weeds in winter triticale:

Target	CHR/H/PENDIF at rate	Number of trials	% control			Efficacy
			Mean	Min & Max		
Galium aparine	0,2	7	76,26	70,00	91,30	MT
	0,3		77,11	62,00	94,50	MT
	0,35		84,73	68,30	99,00	MS
	0,4		88,69	74,30	99,00	S
Viola arvensis	0,2	9	93,42	78,80	100,00	S
	0,3		98,46	93,50	100,00	S
	0,35		98,73	95,80	100,00	S
	0,4		98,98	96,50	100,00	S
Brassica napus (self-sown plant)	0,2	8	97,76	88,80	100,00	S
	0,3		97,73	90,00	100,00	S
	0,35		98,06	91,00	100,00	S
	0,4		98,56	93,50	100,00	S
Tripleurospermum mar. inodorum	0,2	3	92,50	85,00	100,00	S
	0,3		99,33	98,00	100,00	S
	0,35		99,67	99,00	100,00	S
	0,4		99,67	99,00	100,00	S
Stellaria media	0,2	6	96,26	91,00	100,00	S
	0,3		98,97	94,80	100,00	S
	0,35		99,08	95,50	100,00	S
	0,4		99,13	95,80	100,00	S
Apera Spica Venti	0,2	8	82,50	75,00	97,50	MS
	0,3		94,55	83,80	100,00	S
	0,35		96,40	88,80	100,00	S
	0,4		98,30	93,30	100,00	S
Veronica hederifolia	0,2	8	93,86	85,00	100,00	S
	0,3		96,29	87,00	100,00	S
	0,35		97,66	90,80	100,00	S
	0,4		98,18	92,80	100,00	S
Capsella bursa-pastoris	0,2	6	98,76	93,80	100,00	S
	0,3		99,22	95,30	100,00	S
	0,35		99,25	95,50	100,00	S
	0,4		99,38	96,30	100,00	S
Papver rhoeas	0,2	3	61,30	61,30	61,30	MT
	0,3		56,55	44,30	68,80	T
	0,35		63,75	50,00	77,50	MT
	0,4		69,65	59,30	80,00	MT

Lamium purpureum	0,2	3	92,50	92,50	92,50	S
	0,3		95,77	93,00	100,00	S
	0,35		97,20	94,80	100,00	S
	0,4		97,60	95,30	100,00	S
Anthemis arvensis	0,2	2	86,90	76,30	97,50	S
	0,3		91,90	83,80	100,00	S
	0,35		94,40	88,80	100,00	S
	0,4		94,40	88,80	100,00	S
Geranium pusillum	0,2	3	94,50	89,00	100,00	S
	0,3		94,60	91,80	100,00	S
	0,35		95,87	93,30	100,00	S
	0,4		96,50	94,00	100,00	S
Cyanus segetum	0,2	4	41,67	0,00	70,00	T
	0,3		61,90	10,00	100,00	MT
	0,35		64,08	10,00	100,00	MT
	0,4		70,03	23,80	100,00	MS

The following table shows the average sensitivity of weeds in winter wheat and winter triticale:

Target	CHR/H/PENDIFat rate	Winter triticale- mean efficacy %	Efficacy	Winter wheat - mean efficacy %	Efficacy	Winter cereals- mean efficacy %	Efficacy
Galium aparine	0,2	76,26	MT	84,70	MS	80,48	MS
	0,3	77,11	MT	90,23	S	83,67	MS
	0,35	84,73	MS	91,20	S	87,96	S
	0,4	88,69	S	94,52	S	91,60	S
Viola arvensis	0,2	93,42	S	95,02	S	94,22	S
	0,3	98,46	S	96,94	S	97,70	S
	0,35	98,73	S	97,86	S	98,30	S
	0,4	98,98	S	98,73	S	98,85	S
Brassica napus (self-sown plant)	0,2	97,76	S	96,22	S	96,99	S
	0,3	97,73	S	97,44	S	97,58	S
	0,35	98,06	S	97,73	S	97,89	S
	0,4	98,56	S	98,13	S	98,34	S
Tripleurospermum mar. inodorum	0,2	92,50	S	92,77	S	92,63	S
	0,3	99,33	S	94,48	S	96,91	S
	0,35	99,67	S	96,85	S	98,26	S
	0,4	99,67	S	98,63	S	99,15	S
Stellaria media	0,2	96,26	S	95,90	S	96,08	S
	0,3	98,97	S	97,52	S	98,24	S
	0,35	99,08	S	97,88	S	98,48	S
	0,4	99,13	S	98,10	S	98,62	S
Apera Spica Venti	0,2	82,50	MS	82,37	MS	82,43	MS
	0,3	94,55	S	93,52	S	94,03	S

	0,35	96,40	S	97,58	S	96,99	S
	0,4	98,30	S	98,55	S	98,43	S
Veronica hederifolia	0,2	93,86	S	86,15	S	90,01	S
	0,3	96,29	S	96,97	S	96,63	S
	0,35	97,66	S	97,52	S	97,59	S
	0,4	98,18	S	97,88	S	98,03	S
Capsella bursa-pastoris	0,2	98,76	S	97,27	S	98,01	S
	0,3	99,22	S	98,19	S	98,70	S
	0,35	99,25	S	98,25	S	98,75	S
	0,4	99,38	S	98,54	S	98,96	S
Papver rhoeas	0,2	61,30	MT	30,65	T	45,98	T
	0,3	56,55	T	41,90	T	49,23	T
	0,35	63,75	MT	49,43	T	56,59	T
	0,4	69,65	MT	54,95	T	62,30	MT
Lamium purpureum	0,2	92,50	S	97,00	S	94,75	S
	0,3	95,77	S	97,38	S	96,58	S
	0,35	97,20	S	98,05	S	97,63	S
	0,4	97,60	S	98,58	S	98,09	S
Anthemis arvensis	0,2	86,90	S	81,85	MS	84,38	MS
	0,3	91,90	S	99,38	S	95,64	S
	0,35	94,40	S	99,72	S	97,06	S
	0,4	94,40	S	99,83	S	97,12	S
Geranium pusillum	0,2	94,50	S	84,63	MS	89,57	S
	0,3	94,60	S	93,52	S	94,06	S
	0,35	95,87	S	97,62	S	96,74	S
	0,4	96,50	S	98,36	S	97,43	S
Cyanus segetum	0,2	41,67	T	50,00	T	45,83	T
	0,3	61,90	MT	58,15	T	60,03	MT
	0,35	64,08	MT	63,15	MT	63,61	MT
	0,4	70,03	MS	66,25	MT	68,14	MT

On the basis of submitted research, it is possible to state that the CHR/H/PENDIF controlled weeds in crop of winter wheat, winter triticale at level:

Winter wheat, winter triticale:
Dose CHR/H/PENDIF 0,2 l/ha
Susceptible: Viola arvensis (VIOAR) ,Brassica napus (self-sown plant) *(BRSNN)*, Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Capsella bursa-pastoris (CAPBP), Veronica hederifolia (VERHE), Lamium purpureum (LAMPU),
Moderately Susceptible: *Apera-Spica Venti* (APESV), Galium aparine *(GALAP)*, Anthemis arvensis (ANTAR), Geranium pusillum *(GERPU)*
Tolerant: Papver rhoeas (PAPRH), Centaurea cyanus (CENCY),
Dose CHR/H/PENDIF 0,3 l/ha
Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) *(BRSNN)*, Apera-Spica Venti (APESV), Galium aparine (GALAP), Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Geranium pusillum (GERPU), Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Capsella bursa-pastoris (CAPBP),

Moderately Susceptible: Galium aparine (GALAP),
Tolerant: Papver rhoeas (PAPRH), Centaurea cyanus (CENCY),
Dose CHR/H/PENDIF0,35 l/ha
Susceptible: Viola arvensis (VIOAR), Apera-Spica Venti (APESV), Galium aparine *(GALAP)*, Brassica napus (self-sown plant) *(BRSNN)*, Veronica hederifolia (VERHE), Tripleurospermum mar. inodorum *(MATIN)*, Stellaria media *(STEME)*, Lamium purpureum (LAMPU), Anthemis arvensis *(ANTAR)*, Geranium pusillum *(GERPU)*, Capsella bursa-pastoris *(CAPBP)*,
Moderately Tolerant: Centaurea cyanus (CENCY),
Tolerant: Papver rhoeas (PAPRH),
Dose CHR/H/PENDIF0,4 l/ha
Susceptible: Viola arvensis (VIOAR), Brassica napus (self-sown plant) (BRSNN), Apera-Spica Venti (APESV), Galium aparine (GALAP), Stellaria media (STEME), Capsella bursa-pastoris (CAPBP), Veronica hederifolia (VERHE), Anthemis arvensis (ANTAR), Geranium pusillum (GERPU), Lamium purpureum (LAMPU), Tripleurospermum mar. inodorum *(MATIN)*,
Moderately Tolerant: Centaurea cyanus (CENCY),
Tolerant: Papver rhoeas (PAPRH),

Herbicide CHR/H/PENDIF has demonstrated good crop tolerance to winter wheat and winter triticale. Therefore concluded that CHR/H/PENDIF is safe usage at proposed rate and this support the label claim for the use in winter wheat and winter triticale.

Undesirable effects are not expected on succeeding crops, adjacent crop, part of plants used for propagating purposes and beneficial organisms.

According to the above, the plant protection product CHR/H/PENDIF 599.5SC can be approved to the market and use in Poland according to proposed range of use – GAP
Based on submitted data the following regulation on the label is proposed:
Winter wheat, winter triticale:
Recommended dose at:
CHR/H/PENDIF 0,3-0,4 l/ha
CHR/H/PENDIF is to be applied in autumn:
Winter wheat, winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,
Recommended volume of water 200-300 l/ha (winter wheat, winter triticale)
Recommended medium droplet spraying

The product CHR/H/PENDIFshould be use once per season at autumn post – emergence. To avoid resistance, products contain active substance with the same group shouldn't be used year after year on the same field.

Use of CHR/H/PENDIF 599.5SC according to the proposed GAP does not represent a hazard to rotational crops and does not justify a specific labelling. CHR/H/PENDIF is not persistent in soil nor is it taken up by succeeding crops.

3.5 Observations on other undesirable or unintended side-effects (KCP 6.5)

3.5.1 Impact on succeeding crops (KCP 6.5.1)

No separate studies have been carried out concerning the influence of product CHR/H/PENDIFon succeeding plants. The owner of the product CHR/H/PENDIF and of its registration documentation is referring to available sources in literature treating on herbicide penoxsulam, flufenacet and diflufenican.

Waiting period before planting succeeding crops		**Overall waiting period proposed by zRMS for CHR/H/PENDIF100 SC**
Crop group	**Led by penoxsulam, flufenacet, diflufenican**	
Leafy vegetables	NR	Non specific plant back restriction related to CHR/H/PENDIF 599.5 SC are required.
Root vegetables	NR	
Oilseed	NR	
Cereals	NR	

~~Table 3.5-1: PEC-values and TER-calculation of test product (active substance) based on NOER-values.~~

~~Succeeding crop[(1)]~~	~~Days after application[(2)]~~	~~NOER mg/ha (3)~~	~~PEC[(4)]~~		~~TER[(5)]~~	
			~~mg/kg soil e.g. 5 cm~~	~~mg/kg soil e.g. 20 cm~~	~~EC10/PEC e.g. 5 cm~~	~~EC10/PEC e.g. 20 cm~~
~~*Pisum sativum*~~	~~21~~	~~61 215~~	~~0.653~~	~~0.1632~~	~~93 744~~	~~375 091~~
~~*Helianthus annuus*~~	~~21~~	~~61 215~~	~~0.653~~	~~0.1632~~	~~93 744~~	~~375 091~~
~~*Daucus carota*~~	~~21~~	~~15 303.75~~	~~0.653~~	~~0.1632~~	~~23 436~~	~~93 773~~
~~*Linum usitatissimum*~~	~~21~~	~~15 303.75~~	~~0.653~~	~~0.1632~~	~~23 436~~	~~93 773~~
~~*Allium cepa*~~	~~21~~	~~30 607.5~~	~~0.653~~	~~0.1632~~	~~46 872~~	~~187 546~~
~~*Zea mays*~~	~~21~~	~~489 720~~	~~0.653~~	~~0.1632~~	~~749 954~~	~~3 000 735~~
~~*Pisum sativum*~~	~~21~~	~~31831.8~~	~~0.653~~	~~0.1632~~	~~48 747~~	~~195 048~~
~~*Helianthus annuus*~~	~~21~~	~~12 243~~	~~0.653~~	~~0.1632~~	~~18 749~~	~~75 018~~
~~*Daucus carota*~~	~~21~~	~~4 897.2~~	~~0.653~~	~~0.1632~~	~~7 499~~	~~30 007~~
~~*Linum usitatissimum*~~	~~21~~	~~12 243~~	~~0.653~~	~~0.1632~~	~~18 749~~	~~75 018~~
~~*Allium cepa*~~	~~21~~	~~31 831.8~~	~~0.653~~	~~0.1632~~	~~48 747~~	~~195 048~~

~~Succeeding crop[(1)]~~	~~Days after application[(2)]~~	~~NOER mg/ha (3)~~	~~PEC[(4)]~~		~~TER[(5)]~~	
			~~mg/kg soil e.g. 5 cm~~	~~mg/kg soil e.g. 20 cm~~	~~EC10/PEC e.g. 5 cm~~	~~EC10/PEC e.g. 20 cm~~
~~*Zea mays*~~	~~21~~	~~489 720~~	~~0.653~~	~~0.1632~~	~~749 954~~	~~3 000 735~~

~~(1) possible following crops in a regular crop rotation~~

~~(2) adequate value for following crop in a regular crop rotation~~

~~(3) NOER values of succeeding crops~~

~~(4) PEC (soil depth e.g. 5/20 cm)~~

~~(5) TER (soil depth e.g. 5/20 cm)~~

~~The TER values of CHR/H/PENDIF 599.5 SC do exceed a trigger value 1 , then no further trials are required.~~

According to EPPO guidance PP 1/207 worst case NOER from Seedling Emergence study (A. Arendarczyk, Study code: G-44-20):

Table 3.5-1: Recalculated NOER-value for test product

Crop	Worst case NOER from seedling emergence study [ml/ha]	Recalculated NOER to g/ha using product's density = 1.2243 g/ml	Recalculated NOER from g/ha to mg/kg soil using factor 750 (5 cm depth and 1.5 g/cm soil's density)
Helianthus annuus	12.5	15.30	0.0204
Linum usitatissimum	12.5	15.30	0.0204
Pisum sativum	25	30.61	0.0408
Daucus carota	6.3	7.71	0.0103
Allium cepa	6.3	7.71	0.0103
Zea mays	100	122.43	0.1632

Predicted Environmental Concentrations (PEC) for the individual actives are performed with equations (1) and (2) (cfr. EPPO guidance PP 1/207(2)):

(1) $$PECini = \frac{A . (1\text{-}fint)}{100 . d . b}$$

(2) PECact (t) = PECini . e-k.t = PECini . e-t.ln2/DT50

Whereby A = application rate (g active/ha), fint = fraction intercepted by crop cover (25% for winter cereals at BBCH 11-19), d = depth of soil layer (cm) and bd = bulk density of soil.
DT50 = 248.4 days – used diflufenican's DT50 as worst case scenario for product's DT50

Table 3.5-2: PEC-values and TER-calculation of test product (active substance) based on NOER-values.

Succeeding crop(1)	Days after application(2)	NOER mg/kg soil (3)	PEC(4)				TER(5)			
			mg/kg soil e.g. 5 cm	mg/kg soil e.g. 10 cm	mg/kg soil e.g. 20 cm	mg/kg soil e.g. 30 cm	NOER/PEC e.g. 5 cm	NOER/PEC e.g. 10 cm	NOER/PEC e.g. 20 cm	NOER/PEC e.g. 30 cm
Helianthus annuus	1	0.0204	0.4897	0.1632	0.1224	0.05441	0.04167	0.12500	0.16667	0.37500
	30		0.4504	0.1501	0.1126	0.05005	0.04530	0.13591	0.18121	0.40773
	60		0.41425	0.1381	0.10356	0.04603	0.04926	0.14777	0.19703	0.44332
	90		0.3810	0.1270	0.09525	0.04233	0.05356	0.16067	0.21423	0.48201
	350		0.1845	0.0615	0.0461	0.0205	0.11060	0.33181	0.44242	0.99544
	360		0.1794	0.0598	0.0449	0.0199	0.11373	0.34120	0.45493	1.02360
	640		0.08216	0.02739	0.02054	0.00913	0.24836	0.74507	0.99343	-
	650		0.07990	0.02663	0.01997	0.00888	0.25538	0.76615	1.02153	-
	740		0.06216	0.02072	0.01554	0.00691	0.32826	0.98478	-	-
	750		0.06045	0.02015	0.01511	0.00672	0.33754	1.01263	-	-
	1130		0.02094	0.00698	0.00524	0.00233	0.97422	-	-	-
	1140		0.02037	0.00679	0.00509	0.00226	1.00178	-	-	-
Linum usitatissimum	1	0.0204	0.4897	0.1632	0.1224	0.05441	0.04167	0.12500	0.16667	0.37500
	30		0.4504	0.1501	0.1126	0.05005	0.04530	0.13591	0.18121	0.40773
	60		0.41425	0.1381	0.10356	0.04603	0.04926	0.14777	0.19703	0.44332
	90		0.3810	0.1270	0.09525	0.04233	0.05356	0.16067	0.21423	0.48201
	350		0.1845	0.0615	0.0461	0.0205	0.11060	0.33181	0.44242	0.99544
	360		0.1794	0.0598	0.0449	0.0199	0.11373	0.34120	0.45493	1.02360

Succeeding crop(1)	Days after application(2)	NOER mg/kg soil (3)	PEC(4)				TER(5)			
			mg/kg soil e.g. 5 cm	mg/kg soil e.g. 10 cm	mg/kg soil e.g. 20 cm	mg/kg soil e.g. 30 cm	NOER/PEC e.g. 5 cm	NOER/PEC e.g. 10 cm	NOER/PEC e.g. 20 cm	NOER/PEC e.g. 30 cm
	640		0.08216	0.02739	0.02054	0.00913	0.24836	0.74507	0.99343	-
	650		0.07990	0.02663	0.01997	0.00888	0.25538	0.76615	1.02153	-
	740		0.06216	0.02072	0.01554	0.00691	0.32826	0.98478	-	-
	750		0.06045	0.02015	0.01511	0.00672	0.33754	1.01263	-	-
	1130		0.02094	0.00698	0.00524	0.00233	0.97422	-	-	-
	1140		0.02037	0.00679	0.00509	0.00226	1.00178	-	-	-
Pisum sativum	1	0.0408	0.4897	0.1632	0.1224	0.05441	0.08333	0.25000	0.33333	0.75000
	30		0.4504	0.1501	0.1126	0.05005	0.09061	0.27182	0.36243	0.81546
	60		0.41425	0.1381	0.10356	0.04603	0.09851	0.29554	0.39406	0.88663
	100		0.3705	0.1235	0.0926	0.0412	0.11014	0.33043	0.44057	0.99129
	110		0.3603	0.1201	0.0901	0.0400	0.11326	0.33978	0.45303	1.01933
	390		0.1650	0.0550	0.0413	0.0183	0.24732	0.74196	0.98928	-
	400		0.1605	0.0535	0.0401	0.0178	0.25432	0.76295	1.01726	-
	490		0.1248	0.0416	0.0312	0.0139	0.32689	0.98066	-	-
	500		0.1214	0.0405	0.0304	0.0135	0.33613	1.00840	-	-
	890		0.04091	0.01364	0.01023	0.00455	0.99760	-	-	-
	900		0.03978	0.01326	0.00995	0.00442	1.02581	-	-	-
Daucus carota	1	0.0103	0.4897	0.1632	0.1224	0.05441	0.02100	0.06300	0.08400	0.18900
	30		0.4504	0.1501	0.1126	0.05005	0.02283	0.06850	0.09133	0.20550

Succeeding crop(1)	Days after application(2)	NOER mg/kg soil (3)	PEC(4)				TER(5)			
			mg/kg soil e.g. 5 cm	mg/kg soil e.g. 10 cm	mg/kg soil e.g. 20 cm	mg/kg soil e.g. 30 cm	NOER/PEC e.g. 5 cm	NOER/PEC e.g. 10 cm	NOER/PEC e.g. 20 cm	NOER/PEC e.g. 30 cm
	60		0.41425	0.1381	0.10356	0.04603	0.02483	0.07448	0.09930	0.22343
	90		0.3810	0.1270	0.09525	0.04233	0.02699	0.08098	0.10797	0.24293
	590		0.09446	0.03149	0.02361	0.01050	0.10888	0.32663	0.43551	0.97990
	600		0.09186	0.03062	0.02296	0.01021	0.11196	0.33587	0.44783	1.00762
	880		0.04207	0.01402	0.01052	0.00467	0.24448	0.73344	0.97791	-
	890		0.04091	0.01364	0.01023	0.00455	0.25139	0.75418	1.00558	-
	990		0.03095	0.01032	0.00774	0.00344	0.33227	0.99682	-	-
	1000		0.03010	0.01003	0.00752	0.00334	0.34167	1.02501	-	-
	1380		0.01043	0.00348	0.00261	0.00116	0.98613	-	-	-
	1390		0.01014	0.00338	0.00254	0.00113	1.01403	-	-	-
Allium cepa	1	0.0103	0.4897	0.1632	0.1224	0.05441	0.02100	0.06300	0.08400	0.18900
	30		0.4504	0.1501	0.1126	0.05005	0.02283	0.06850	0.09133	0.20550
	60		0.41425	0.1381	0.10356	0.04603	0.02483	0.07448	0.09930	0.22343
	90		0.3810	0.1270	0.09525	0.04233	0.02699	0.08098	0.10797	0.24293
	590		0.09446	0.03149	0.02361	0.01050	0.10888	0.32663	0.43551	0.97990
	600		0.09186	0.03062	0.02296	0.01021	0.11196	0.33587	0.44783	1.00762
	880		0.04207	0.01402	0.01052	0.00467	0.24448	0.73344	0.97791	-
	890		0.04091	0.01364	0.01023	0.00455	0.25139	0.75418	1.00558	-
	990		0.03095	0.01032	0.00774	0.00344	0.33227	0.99682	-	-

Succeeding crop(1)	Days after application(2)	NOER mg/kg soil (3)	PEC(4)				TER(5)			
			mg/kg soil e.g. 5 cm	mg/kg soil e.g. 10 cm	mg/kg soil e.g. 20 cm	mg/kg soil e.g. 30 cm	NOER/PEC e.g. 5 cm	NOER/PEC e.g. 10 cm	NOER/PEC e.g. 20 cm	NOER/PEC e.g. 30 cm
	1000		0.03010	0.01003	0.00752	0.00334	0.34167	1.02501	-	-
	1380		0.01043	0.00348	0.00261	0.00116	0.98613	-	-	-
	1390		0.01014	0.00338	0.00254	0.00113	1.01403	-	-	-
Zea mays	1	0.1632	0.4897	0.1632	0.1224	0.05441	0.33333	1.00000	1.33333	3.00000
	30		0.4504	0.1501	0.1126	0.05005	0.36243	-	-	-
	60		0.41425	0.1381	0.10356	0.04603	0.39406	-	-	-
	390		0.1650	0.0550	0.0413	0.0183	0.98928	-	-	-
	400		0.1605	0.0535	0.0401	0.0178	1.01726	-	-	-

(1) possible following crops in a regular crop rotation
(2) adequate value for following crop in a regular crop rotation
(3) NOER-values of succeeding crops
(4) PEC (soil depth e.g. 5/20 cm)
(5) TER (soil depth e.g. 5/20 cm)

The TER values of CHR/H/PENDIF 599.5 SC do exceed a trigger value 1 , then no further trials are required when:

	Date of sowing	Crop rotation
		DT50= 248.5
Crop		
Helianthus annuus	April	Normal crop roation after plowing on 30 cm depth before sowing
Linum usitatissimum	April	Normal crop roation after plowing on 30 cm depth before sowing
Pisum sativum	April	Normal crop roation after plowing on 20 cm depth before sowing
Daucus carota	April	Normal crop roation after plowing on 30 cm depth before sowing or every second season after plowing on 20 cm depth befoe sowing
Allium cepa	April	Normal crop roation after plowing on 30 cm depth before sowing or every second season after plowing on 20 cm depth befoe sowing
Zea mays	April	Normal crop roation after plowing on 10 cm depth before sowing

Labeling in Succeding crop sections:

- 10 cm before sowing, you can sow maize;
- 20 cm before sowing, you can sow legumes (peas, etc.);
- 30 cm before sowing, you can sow oilseeds (sunflower, flax, etc.) root crops (carrots, etc.) and bulbs (onions, etc.)
- without plowing : winter wheat and winter triticale

After two growing seasons from the moment of applying the CHR / H / PENDIF agent, after plowing 20 cm, before sowing, you can sow root crops (carrots, etc.) and bulbs (onions, etc.)

In case of crop failure as a succeeding crop you can sow maize (with plowing 10 cm before sowing).

Study Comments: 3.5.1 dRR point: 3.5.1	Studies are acceptable
The Applicant presented data obtained from 2 greenhouse trials carried out in line with OECD Guideline 227 (Vegetative vigour test and Seedling emergence test) and EPPO guideline PP 1/207(2) Effects on succeeding crops. Only cereal crops (winter wheat and winter triticale) should be sown in the autumn following harvest of a winter wheat and winter triticale crops on which CHR/H/PENDIF was applied in the autumn. In the spring after plowing: 10 cm maize can be sown; 20 cm legumes (peas, etc.) can be sown and after 30 cm oilseeds (sunflower, flax), root crops (carrots, etc.) and bulbs (onions, etc.) can be sown, following harvest of a winter wheat and winter triticale crops on which CHR/H/PENDIF was applied in the autumn. After two growing seasons from the moment of applying the CHR/H/PENDIF, after plowing of 20 cm, root crops (carrots, etc.) and bulbs (onions, etc.); after 10 cm of plowing oilseeds (sunflower, flax); without plowing maize can be sown. In the event of crop failure for any reason of a winter wheat and winter triticale crops on which CHR/H/PENDIF has been applied, only maize should be sown after 10 cm of plowing, as a replacement crop.	

3.5.2 Impact on other plants including adjacent crops (KCP 6.5.2)

No specific studies were conducted to fill this data point.

No phytotoxic effects were observed in the commissioned trials. Tested herbicides did not influence on yield, degree of plant lodging and tillering, weight of 1000 grains regardless of herbicide dose) it is expected the product is safe for plants of adjacent crops.

CHR/H/PENDIF effectively controlled dicotyledons plants therefore users must exercise caution to avoid drift or vapors which may cause discoloration and damage to non-target foliage.

According to A. Arendarczyk, Study code: G-44-20 and A. Gierbuszewska, Study code: G-43-20 please find results for seedling emergence and vegetative vigour below. For details for those two studies please refer to Apendix 1.(rapoty zostaną dołączone do sekcji)

Assessment of the risk for non-target plants due to the use of CHR/H/PENDIF100 SC in winter cereals

Intended use	Winter cereals
Active substance/product	CHR/H/PENDIF 599.5 SC
Application rate (g/ha)	1 x 489.72
MAF	1

Test species	**ER_{50} (g/ha)**	**Drift rate**	**$PER_{off\text{-}field}$ (g/ha)**	**TER criterion: TER ≥ 5**	
Pisum sativum	874.9 g prod/ha	0.0277	13.56	64	21 d Vegetative vigour
Helianthus annuus	148.3 g prod/ha	0.0277	13.56	10.9	21 d Vegetative vigour
Daucus carota	307.8 g prod/ha	0.0277	13.56	22.7	21 d Vegetative vigour
Linum usitatissimum	43.8 g prod/ha	0.0277	13.56	3.23	21 d Vegetative vigour
Allium cepa	108 g prod/ha	0.0277	13.56	7.96	21 d Vegetative vigour
Zea mays	489.72 g prod/ha	0.0277	13.56	36.1	21 d Vegetative vigour
Pisum sativum	122.43 g prod/ha	0.0277	13.56	9.03	21 d Seedling emergance
Helianthus annuus	99.2 g prod/ha	0.0277	13.56	7.32	21 d Seedling emergance
Daucus carota	33.1 g prod/ha	0.0277	13.56	2.44	21 d Seedling emergance
Linum usitatissimum	36.7 g prod/ha	0.0277	13.56	2.7	21 d Seedling emergance
Allium cepa	235.1 g prod/ha	0.0277	13.56	17.3	21 d Seedling emergance
Zea mays	489.72 g prod/ha	0.0277	13.56	36.1	21 d Seedling emergance

MAF: Multiple application factor; PER: Predicted environmental rate; TER: toxicity to exposure ratio. TER values shown in bold fall below the relevant trigger.

In order to reduce the off-field exposure, risk mitigation measures can be implemented. These correspond to unsprayed in-field buffer strips of a given width and/or the usage of drift reducing nozzles. The results of the risk assessment using typical mitigation measures (no-spray buffer zones of 5 or 10 m; drift-reducing nozzles with reduction by 50 %, 75 %, or 90 %) are summarised in the following table.

Risk assessment for non-target terrestrial plants due to the use of CHR/H/PENDIF 599.5 SC in winter cereals considering risk mitigation (in-field no-spray buffer zones, and drift-reducing nozzles)

Intended use		Cereals winter			
Active substance/product		CHR/H/PENDIF 599.5 SC			
Application rate (g/ha)		1 × 489.72			
MAF		1			
Buffer strip (m)	**Drift rate (%)**	**$PER_{off\text{-}field}$ (g/ha)**	**$PER_{off\text{-}field}$ 50 % drift red. (g/ha)**	**$PER_{off\text{-}field}$ 75 % drift red. (g/ha)**	**$PER_{off\text{-}field}$ 90 % drift red. (g/ha)**
1	2.77	13.56	6.78	3.39	1.36
5	0.57	2.79	-	-	-
Toxicity value		**TER**			

ER_{50} = 33.1 g/ha	**criterion: TER ≥ 1**			
1	2.44	4.88	9.76	24.3
5	11.9	-	-	-

MAF: Multiple application factor; PER: Predicted environmental rates; TER: toxicity to exposure ratio. Criteria values shown in bold breach the relevant trigger.

Based on the predicted rates of CHR/H/PENDIF 599.5 SCin off-field areas, the TER values describing the risk for non-target plants following exposure to CHR/H/PENDIF 599.5 SC according to the GAP of the formulation CHR/H/PENDIF 599.5 SC achieve the acceptability criteria TER ≥ 5 with applying:

- 5 m buffer zone
- 1 m and use of 75% drift reducing nozzles

Study Comments: 3.5.2 dRR point: 3.5.1	Studies are acceptable
The Applicant presented data obtained from 2 greenhouse trials carried out in line with OECD Guideline 227 (Vegetative vigour test and Seedling emergence test) and EPPO guideline PP 1/256(1) Effects on adjacent crops, on a representative range of monocotyledonous and dicotyledonous crop types. In spite of the fact that data in ecotoxicological section changed, the lower amount of ER_{50} being the worst case, became the same (33 l product/ha) and the final opinion did not change. Assessment of adverse impact of CHR/H/PENDIF 599.5 SC on other plants including adjacent crops were obtained by calculation of TER (Toxicity Exposure Ratio) values. The risk of adverse impact resulting from the post-emergence application of CHR/H/PENDIF 599.5 SC at the rate of 0,4 l product/ha was acceptably low when a 5 m buffer zone was observed or with a buffer zone of 1m when 75% drift reduction nozzles was used.	

Tank cleaning

Cleaning of equipment should be conducted according to the flowing procedure:

- Immediately after spraying drain tank completely. Any contamination on the outside of the spraying equipment should be removed by washing with clean water.
- Rinse inside of tank with clean water and flush through boom and hoses using at least one tenth of the spray tank volume. Drain completely.
- Fill the tank with clean water and add one of the cleaning agents recommended for clean-up of spraying equipment. Agitate for a minimum of 10 min. and then flush the boom and hoses with the cleaning solution. Nozzles and filters should be removed and cleaned up separately with a recommended cleaning agent.
- Rinse the tank with clean water and flush through the boom and hoses using at least one tenth of the spray tank volume. Drain tank completely.
- CHR/H/PENDIF100 SC is non-corrosive to equipment, non-flammable and non-volatile.
-

According to Report M. Patrzałek, Study code: ICB/115/2020 the effectiveness of cleaning was done regardts to Efficacy Guideline 305:

Effectiveness of cleaning.
The study was conducted according to Efficacy Guideline 305 and and Standard Operational Procedure SPB/39. The mixture of test item was prepared at a concentration of 0.2%(v/v), then was poured into 3

polyethylene bottles and allowed to stand at temperature (18-28°C) to next day, but not longer than 24 h. After that, the bottles were rinsed by the tap water. Then the bottles were rinsed with acetonitrile which were analysed for active ingredient content. Three different rinsing procedures were used.

Single rinse procedure.
a) The bottle was shaken, then the solution was discarded,
b) 10 mL of tap water was added, the bottle was inverted twice, and the rinsing was discarded,
c) 10 mL of acetonitrile was added, and the bottle was shaken to coat all surfaces. The acetonitrile was analysed for the active substance content.

Double rinse procedure.
a) The bottle was shaken, then the solution was discarded,
b) 10 mL of tap water was added, the bottle was inverted twice, and the rinsing was discarded,
c) point b) was repeated,
d) 10 mL of acetonitrile was added, and the bottle was shaken to coat all surfaces. The acetonitrile was analysed for the active substance content.

Triple rinse procedure.
a) The bottle was shaken, then the solution was discarded,
b) 10 mL of tap water was added, the bottle was inverted twice, and the rinsing was discarded,
c) point b) was repeated twice,
d) 10 mL of acetonitrile was added, and the bottle was shaken to coat all surfaces. The acetonitrile was analysed for the active substance content.

Effectiveness of cleaning	Efficacy Guideline 305	Single rinse procedure: >99.84 [%] penoxulam 99.85 [%] flufenacet 99.92 [%] diflufenican - Double rinse procedure: >99.84 [%] penoxulam 99.91 [%] flufenacet 99.95 [%] diflufenican - Triple rinse procedure: >99.84 [%] penoxulam 99.91 [%] flufenacet 99.94 [%] diflufenican

Study Comments: Tank cleaning procedure	Studies are acceptable
The Applicant presented data obtained from the study conducted according to Efficacy Guideline 305 and the Standard Operational Procedure SPB/39. Tre rinse procedure of tank cleaning proposed by the Applicant was sufficient to ensure that residues of plant protection products do not remain in the pesticide application equipment (PAE) after cleaning and that there is no unacceptable risk to subsequently treated crops.	

3.5.3 Effects on beneficial and other non-target organisms (KCP 6.5.3)

Detailed studies on the possible adverse effects to beneficial organisms are submitted and summarised in Part B, Section 9 (Ecotoxicology).

Compatibility with current management practices including IPM

Not applicable

Summary and conclusion

Not applicable

3.6 Other/special studies

Not performed

3.7 List of test facilities including the corresponding certificates

Table 3.7-1: List of test facilities

Test facility	Address	Certificate (Yes or No)
Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department	ul. Wojska Polskiego 28, 60-637 Poznań, Poland	Yes
SynTech Research Poland Sp. z o.o.	ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland	Yes
A.T Sp. z o.o.	ul. Przemysłowa 3, 88-300 Mogilno, Poland	Yes

Appendix 1 Lists of data considered in support of the evaluation

List of data submitted by the applicant and relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
3.2 3.4	Zdzisław Jaskólski	2020	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF_EFF_PL01 / SRPL19-390-336HE GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2021	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF20_EFF_PL01 / SRPL20-443-336HE GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2021	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF20_EFF_PL02 / SRPL20-444-336HE GEP - yes	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			Unpublished		
3.2 3.4	Dr hab. Robert Idziak	2020/21	Assessment of efficacy and phytotoxicity of herbicides CHR/H/PENDIF applied in winter wheat. Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/20/PO/33/Pr/2 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Dr hab. Robert Idziak	2020 /2021	Assessment of efficacy and phytotoxicity of herbicides CHR/H/PENDIF applied in winter wheat. Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/20/PO/33/Br/1 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Dr hab. Robert Idziak	2019 / 2020	Assessment of efficacy of herbicide CHR/H/PENDIF applied in winter wheat. Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland Report no:	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			AH/19/PO/30/Pr/PENDIF/1 GEP – yes Unpublished		
3.2 3.4	Joanna Guzińska	2020	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland Report no: A.T/2020/144/PO GEP – yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2019	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2019. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland Report no: A.T/2019/089/PO GEP – yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2019	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2019. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland Report no: A.T/2019/090/PO GEP – yes Unpublished	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
3.2 3.4	Joanna Guzińska	2020	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. Report no.: A.T/2020/143/PO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2021	Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF20_SEL_PL01 / SRPL20-447-336HE GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2020	Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF_SEL_PL01 / SRPL19-392-336HS GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2020	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. Poznań University of Life Sciences, Research and Education Center Gorzyń , Wojska Polskiego 28,	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			60-637 Poznań, Poland Report no.: A.T/2020/148/PO GEP - yes Unpublished		
3.2 3.4	Joanna Guzińska	2021	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/148/PO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2021	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/150/PO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2021	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no: A.T/2020/149/PO GEP – yes Unpublished	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
3.2 3.4	Beata Szymańska	2019	Assessment of herbicide CHR/H/PENDIF phytotoxicity in weed control in cereal winter. Poznań University of Life Sciences, Research and Education Center Gorzyń , Wojska Polskiego 28, 60-637 Poznań, Poland Report no: AH/19/PO/30/BR/sel/1 GEP – yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2020	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland 2019. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no: A.T/2019/092/PO GEP – yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2020	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF_EFF_PL02 / SRPL19-391-336HE GEP - yes Unpublished	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
3.2 3.4	Zdzisław Jaskólski	2021	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF20_EFF_PL03 / SRPL20-445-336HE GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2021	Efficacy and Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: CHR_H_PENDIF20_EFF_PL04 / SRPL20-446-336HE GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2019	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2019 A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2019/091/PŻO GEP - yes Unpublished	N	Chemirol
3.2	Joanna	2020	Efficacy evaluation of herbicide	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
3.4	Guzińska		CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/147/PŻO GEP - yes Unpublished		
3.2 3.4	Dr hab. Robert Idziak	2019 / 2020	Assessment of efficacy of herbicide CHR/H/PENDIF applied in winter triticale. Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/19/PszO/30/Zł/PENDIF/3 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Dr hab. Robert Idziak	2019 / 2020	Assessment of efficacy of herbicide CHR/H/PENDIF applied in winter triticale Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/19/PszO/30/Pr/PENDIF/2 GEP - yes	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			Unpublished		
3.2 3.4	Dr hab. Robert Idziak	2020 / 2021	Assessment of efficacy and phytotoxicity of herbicides CHR/H/PENDIF applied in winter triticale Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/20/PszO/33/Br/3 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2021	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/145/PŻO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2020	Efficacy evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020 A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/146/PŻO	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			GEP - yes Unpublished		
3.2 3.4	Zdzisław Jaskólski	2020	Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: SRPL19-394-336HS / CHR_H_PENDIF_SEL_PL03 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Zdzisław Jaskólski	2020	Selectivity of CHR/H/PENDIF 599.5SC in Winter Cereals. SynTech Research Poland Sp. z o.o. 69/1 Jagiellonska 85-027 Bydgoszcz Poland Report no.: SRPL19-393-336HS / CHR_H_PENDIF_SEL_PL02 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Beata Szymańska	2020 / 2021	Study of herbicide phytotoxicity CHR/H/PENDIF in winter triticale. Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/20/PszoO/33/Gr GEP - yes	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			Unpublished		
3.2 3.4	Beata Szymańska	2019	Assessment of herbicide CHR/H/PENDIF phytotoxicity in weed control in cereal winter. Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań Poland Report no.: AH/19/PszO/30/Gr/sel/3 GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2019	Field study to evaluate the crop safety of herbicide CHR/H/PENDIF 599.5SC when applied post-emergence in winter triticale, Poland 2019 A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2019/093/PŻO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2020	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland	N	Chemirol

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Data Vertebrate study Y/N	Owner
			Report no.: A.T/2020/151/PŻO GEP - yes Unpublished		
3.2 3.4	Joanna Guzińska	2020	Selectivity evaluation of herbicide CHR/H/PENDIF 599.5SC when applied into winter cereals to control of weeds, Poland, 2020. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2020/152/PŻO GEP - yes Unpublished	N	Chemirol
3.2 3.4	Joanna Guzińska	2019	Field study to evaluate the crop safety of herbicide CHR/H/PENDIF 599.5SC when applied post-emergence in winter triticale, Poland 2019. A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland Report no.: A.T/2019/094/PŻO GEP - yes Unpublished	N	Chemirol

Appendix 2 Additional information provided by the applicant

COMPARISON OF CLIMATIC AND AGRICULTURAL CONDITIONS IN POLAND AND THE CZECH REPUBLIC IN REFERENCE TO REGISTRATION OF PLANT PROTECTION PRODUCT CHR/H/PENDIF 599.5 SC

1. Introduction

The purpose of the following document is to compare climatic and agricultural conditions of Poland and the Czech Republic in order to enable data from efficacy and phytotoxicity trials conducted in Poland to be used for registration purposes of spring, foliar applied, cereal herbicide CHR/H/PENDIF 599.5SC in the Czech Republic.

2. Plant protection products under consideration

2.1. General

The efficacy and phytotoxicity studies were conducted in Poland, in 2019 and 2020 in cereals on the plant protection product CHR/H/PENDIF 599.5SC and a standard herbicide Bizon 118,75 SC and Komfort 500SC. Total of 20 efficacy (10 trilas in winter wheat, 10 trials in winter triticale) and 18 phytotoxicity (8 trilas in winter wheat, 8 trials in winter triticale) GEP trials were carried out to assess the product's efficacy and phytotoxic potential.

2.2. Products' characteristics:

Table 1. Products' characteristics

PRODUCT	CHR/H/PENDIF 599.5SC	Komfort 560SC	Bizon 118,75
active substance content	flufenacet 312 g/l + diflufenican 250 g/l + penoxsulam 37,5 g/l	diflufenican 280 g/l + flufenacet 280 g/l	diflufenican 100 g/l + florasulam 3,75 g/l + penoxsulam 15 g/l
formulation	SC – Suspension Concentrate	SC – Suspension Concentrate	SC – Suspension Concentrate

Table 2. Details of the active substances

Active substance	Flufenacet	Diflufenican	Penoxsulam
Concentration (Unit: g/kg or g/L...)	312 g/L	250g/l	37,5g/l
Chemical group	oxyacetamide	carbamoyl nitrogen	triazolopyrimidine sulfonamides
Mode of action	unclassified inhibition of cell division and cell growth, meristemic activity	Inhibition of acetyl CoA carboxylase	inhibit the plant enzyme acetolactate synthase enzyme (ALS)
Biological action	The molecular mode of action of the oxyacetamides is not known. Mode of action studies with the only oxyacetam-ide herbicide so far introduced (mefenacet, rice Japan) have shown a similarity with the ac-tion of chloracetanilides (e.g. alachlor, metolachlor) at the cellular and at the tissue level. The molecular mode of action of the chloroacetanilides is also not known. Oxyacetamides and chloroacetanilides both inhibit	It is absorbed by leaves and the coleoptiles of the grasses. Diflufenican in plant meristems inhibits the fatty acid biosynthesis by the acetyl-CoA carboxylase, which is the first enzyme of the fatty acid biosynthesis. The lack of fatty acids, affected by the herbicide, causes disruption of meristem	The inhibition of ALS results in a number of distinctive whole plant symptoms. Growth of sensitive species is retarded within a matter of hours of application although visible effects may not be observed for several days. Symptoms appear first in the

Active substance	Flufenacet	Diflufenican	Penoxsulam
	cell division after a lag phase of several hours. This inhi-bition results in a complete arrest of cell division in the root and shoot meristematicregions. New growth is stopped and elongating tissue may become distorted.	around the shoot apex, followed by whole plant death. Final destruction of annual and perennial grasses is achieved in a few weeks, depending on climatic conditions. Diflufenican is systemic compound presenting upward and down ward systemic properties. The upward translocation allows the product to inhibit the development.	upper meristematic region of the plants as chlorosis and necrosis. The effects then spread to the remaining parts of the plant. In some species there is a reddening of the midrib and veins. Complete desiccation of the plant may occur in 7-10 days in ideal growing conditions, but may take up to 6-8 weeks under less ideal conditions.

3. Climatic conditions

Poland and the Czech Republic are geographically very close to one another. The geographical coordinates of the Czech Republic are: latitude 49.45°N, longitude 15.30°E. The geographical coordinates of Poland are: latitude 52.00°N, longitude 20.00°E. The two countries share 615 km border .

The following map (originating from maps.google.com) illustrates the two countries.

Figure 1. Location of Poland and the Czech Republic

The following sections present and compare particular elements of Polish and Czech climate. The following parameters are compared: average monthly temperature, average maximum monthly temperature, average minimum monthly temperature, average monthly precipitation sum. To compare data in each country there were selected several locations from which average readings were calculated. The following map presents the location of climate stations included in calculations.

Figure 2. Location of climate stations

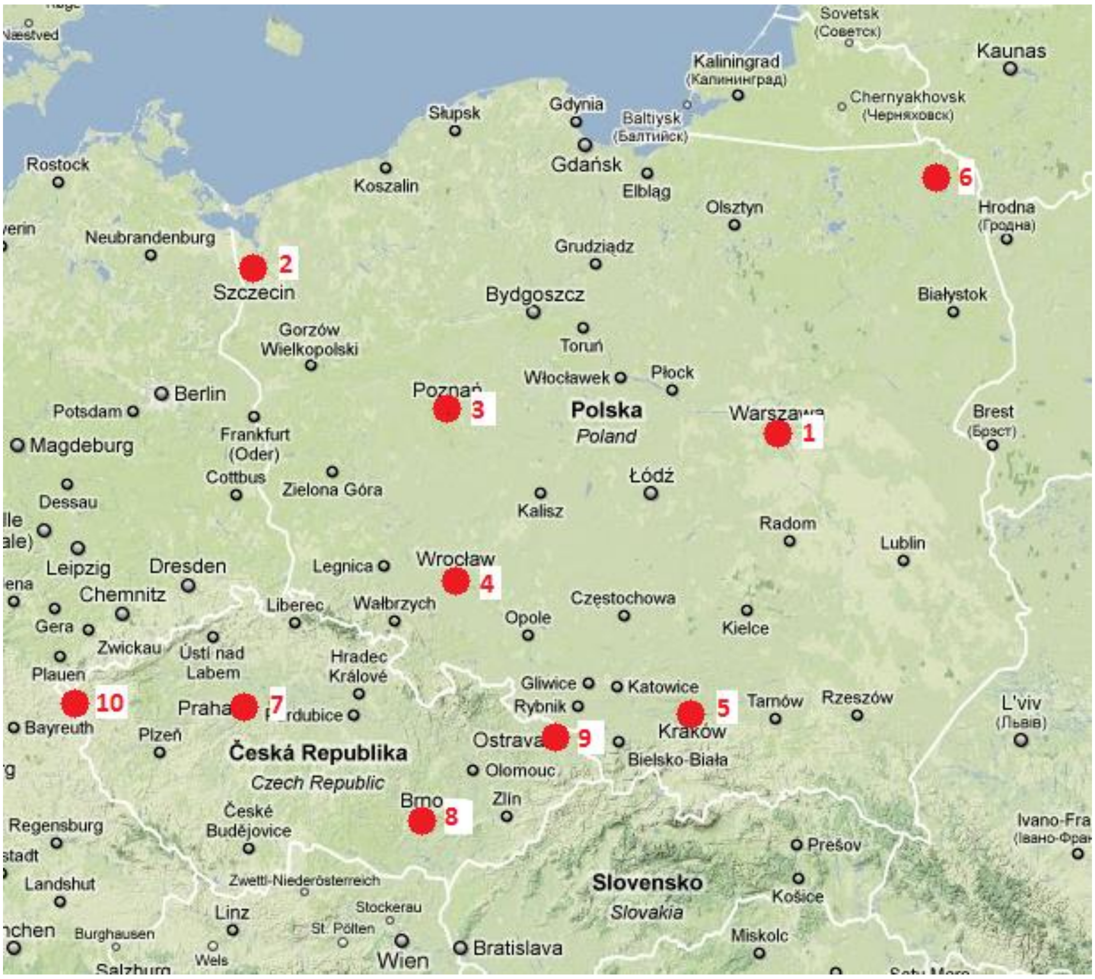


Table 3. Parameters of climate stations

Number on map	Location	Latitude	Longitude	Elevation (meters AMSL)
		POLAND		
1.	Warsaw	52,10°N	20,58°E	106
2.	Szczecin	52,35°N	14,54°E	1
3.	Poznan	52,25°N	16,50°E	86
4.	Wroclaw	51,06°N	16,53°E	120
5.	Krakow	50,05°N	19,48°E	237
6.	Suwalki	54,08°N	22,57°E	186
		THE CZECH REPUBLIC		
7.	Prague	50,00°N	14,40°E	303
8.	Brno	49,15°N	16,70°E	238
9.	Ostrava	49,68°N	18,10°E	256
10.	Cheb	50,08°N	12,40°E	474

data source: http://pl.allmetsat.com/klimat/

Climate stations were selected in a way that ensures their equal distribution throughout the area of each country. Data from Poland was collected from six stations while data from the Czech Republic was collected from four stations. The number of Czech stations is smaller than that of Polish stations as detailed climatic data was not readily available from a greater number of stations in the Czech Republic. What is more, the authors of this report believe that the number of stations taken into account is sufficient to perform the comparison of climatic conditions and that it is relative to the acreage of each country.

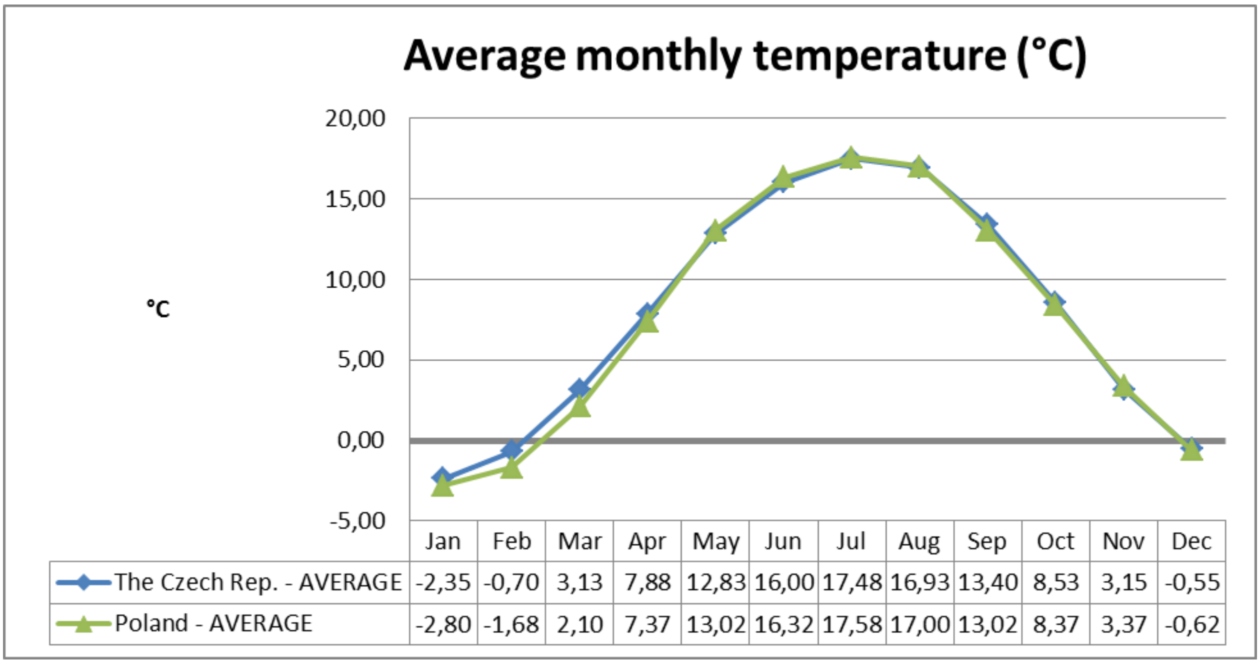
3.1. Average monthly temperature

Table 4. Average monthly temperature data

Location	Average monthly temperature (°C)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Czech Rep.: Cheb	-2,5	-1,2	2,4	6,7	11,7	15,0	16,5	15,8	12,5	7,8	2,4	-1,0
The Czech Rep.: Prague	-2,0	-0,6	3,1	7,6	12,5	15,6	17,1	16,6	13,2	8,3	3,0	-0,2
The Czech Rep.: Brno	-2,5	-0,3	3,8	9,0	13,9	17,0	18,5	18,1	14,3	9,1	3,5	-0,6
The Czech Rep.: Ostrava	-2,4	-0,7	3,2	8,2	13,2	16,4	17,8	17,2	13,6	8,9	3,7	-0,4
The Czech Rep. - AVERAGE	-2,35	-0,70	3,13	7,88	12,83	16,00	17,48	16,93	13,40	8,53	3,15	-0,55
Poland: Warsaw	-3,3	-2,1	1,9	7,7	13,5	16,7	18,0	17,3	13,1	8,2	3,2	-0,9
Poland: Poznan	-2,0	-1,0	2,7	7,6	13,3	16,7	18,0	17,4	13,4	8,8	3,8	-0,1
Poland: Wroclaw	-1,8	-0,5	3,2	8,0	13,1	16,5	17,7	17,2	13,4	8,9	3,9	0,2
Poland: Krakow	-3,3	-1,6	2,4	7,9	13,1	16,2	17,5	16,9	13,1	8,3	3,2	-1,0
Poland: Szczecin	-1,1	-0,3	3,0	7,4	12,9	16,4	17,7	17,2	13,5	9,2	4,4	0,8
Poland: Suwalki	-5,3	-4,6	-0,6	5,6	12,2	15,4	16,6	16,0	11,6	6,8	1,7	-2,7
Poland - AVERAGE	-2,80	-1,68	2,10	7,37	13,02	16,32	17,58	17,00	13,02	8,37	3,37	-0,62

data source:
http://www.climate-charts.com/; NOAA Global Climate Normals 1961-1990; National Oceanic and Atmospheric Administration (NOAA).

Figure 3. Average monthly temperature graph



The table and graph above show that average temperature in Poland and in the Czech Republic is very similar. There are slight differences only in the winter months. The time which is of most importance to the application of product CHR/H/PENDIF is autumn. It is so because product CHR/H/PENDIF 599.5SC is to be applied in winter wheat and winter triticale BBCH 12-25. In the months of September through October there is a close correlation between average temperatures in Poland and in the Czech Republic.

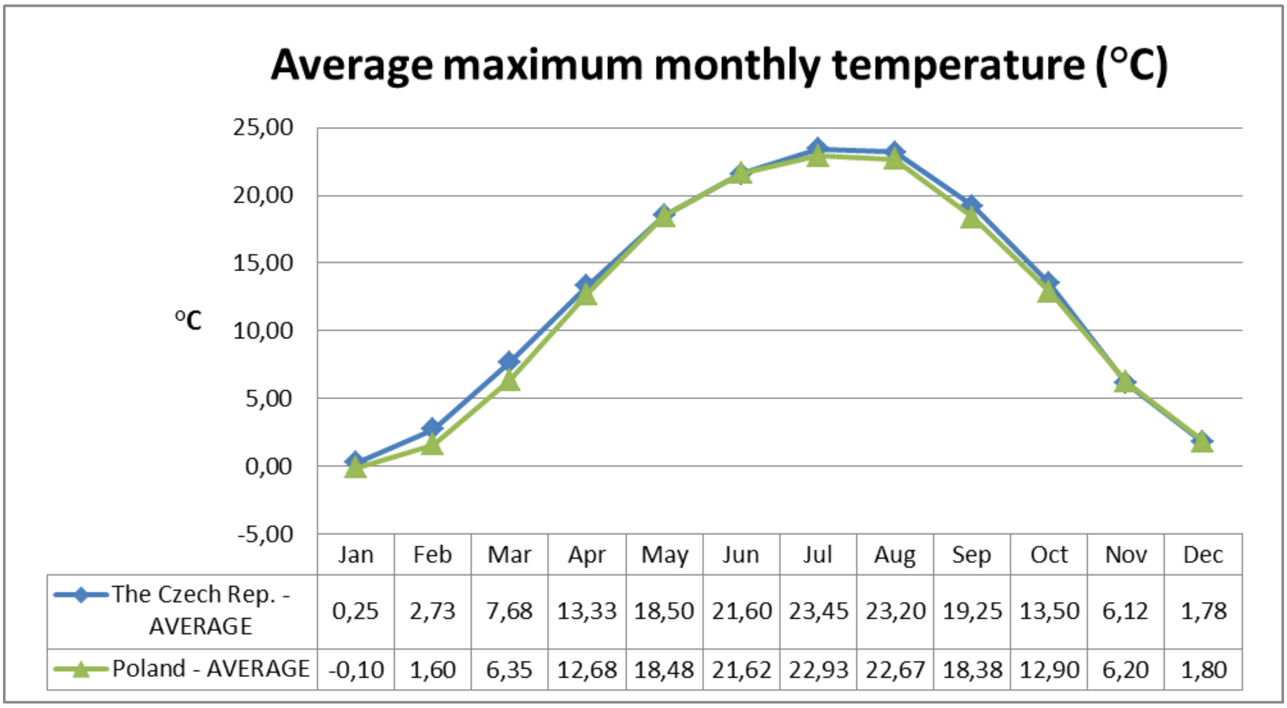
3.2. Average maximum monthly temperature

Table 5. Average maximum monthly temperature data

Location	Average maximum monthly temperature (°C)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Czech Rep.: Cheb	0,0	2,3	7,0	12,2	17,4	20,6	22,4	22,2	18,5	12,8	5,2	1,3
The Czech Rep.: Prague	0,4	2,7	7,7	13,2	18,3	21,4	23,3	23,0	19,0	13,1	6,0	1,9
The Czech Rep.: Brno	0,2	3,1	8,4	14,4	19,5	22,5	24,5	24,2	20,1	14,1	6,6	1,9
The Czech Rep.: Ostrava	0,4	2,8	7,6	13,5	18,8	21,9	23,6	23,4	19,4	14,0	6,7	2,0
The Czech Rep. - AVERAGE	0,25	2,73	7,68	13,33	18,50	21,60	23,45	23,20	19,25	13,50	6,13	1,78
Poland: Warsaw	-0,7	1,0	6,0	12,9	18,8	22,0	23,3	22,9	18,3	12,7	5,9	1,4
Poland: Poznan	0,5	2,2	6,8	13,0	18,8	22,1	23,5	23,1	18,7	13,1	6,4	2,2
Poland: Wroclaw	1,3	3,2	7,9	13,6	18,8	22,0	23,4	23,2	19,3	14,1	7,4	3,0
Poland: Krakow	-0,1	2,1	7,1	13,5	18,7	21,6	23,0	22,8	18,8	13,8	6,8	1,8
Poland: Szczecin	1,3	2,8	7,2	12,6	18,4	21,6	22,8	22,6	18,6	13,1	6,9	3,0
Poland: Suwalki	-2,9	-1,7	3,1	10,5	17,4	20,4	21,6	21,4	16,6	10,6	3,8	-0,6
Poland - AVERAGE	-0,10	1,60	6,35	12,68	18,48	21,62	22,93	22,67	18,38	12,90	6,20	1,80

data source:
http://www.climate-charts.com/; NOAA Global Climate Normals 1961-1990; National Oceanic and Atmospheric Administration (NOAA).

Figure 4. Average maximum monthly temperature graph



The table and graph above present the average maximum temperature in each month. It is clear that maximum temperature in Poland and in the Czech Republic is very similar. In the autumn months that are crucial to the application of product CHR/H/PENDIF 599.5SC average maximum temperature in both countries differs by no more than 0,60-0,87°C.

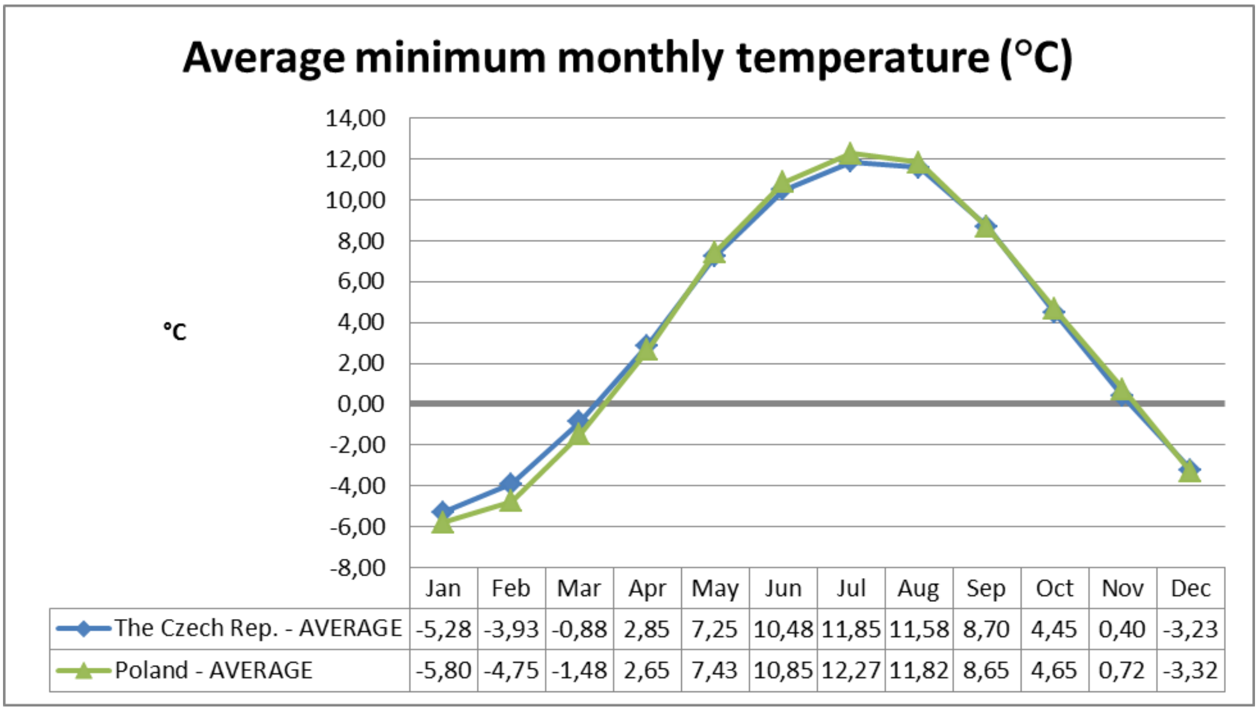
3.3. Average minimum monthly temperatures

Table 6. Average minimum monthly temperature data

Location	Average minimum monthly temperature (°C)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Czech Rep.: Cheb	-5,0	-4,1	-1,2	2,1	6,3	9,6	11,0	10,6	8,0	4,1	0,0	-3,3
The Czech Rep.: Prague	-5,3	-4,2	-1,3	2,4	7,1	10,4	11,8	11,5	8,6	4,0	-0,2	-3,4
The Czech Rep.: Brno	-5,2	-3,3	-0,2	3,9	8,3	11,3	12,7	12,6	9,5	5,0	0,9	-3,0
The Czech Rep.: Ostrava	-5,6	-4,1	-0,8	3,0	7,3	10,6	11,9	11,6	8,7	4,7	0,9	-3,2
The Czech Rep. - AVERAGE	-5,28	-3,93	-0,88	2,85	7,25	10,48	11,85	11,58	8,70	4,45	0,40	-3,23
Poland: Warsaw	-6,1	-5,0	-1,5	3,0	8,0	11,3	12,6	12,1	8,7	4,5	0,8	-3,4
Poland: Poznan	-4,8	-3,9	-0,8	2,8	7,7	11,2	12,5	12,2	9,0	5,3	1,2	-2,6
Poland: Wroclaw	-5,3	-4,0	-0,9	2,8	7,1	10,7	12,0	11,6	8,7	4,6	0,6	-3,1
Poland: Krakow	-6,7	-4,8	-1,3	3,0	7,6	10,8	12,2	11,8	8,6	4,2	0,2	-4,0
Poland: Szczecin	-3,7	-3,1	-0,4	2,9	7,5	11,1	12,9	12,3	9,5	5,8	2,0	-1,6
Poland: Suwalki	-8,2	-7,7	-4,0	1,4	6,7	10,0	11,4	10,9	7,4	3,5	-0,5	-5,2
Poland - AVERAGE	-5,80	-4,75	-1,48	2,65	7,43	10,85	12,27	11,82	8,65	4,65	0,72	-3,32

data source:
http://www.climate-charts.com/; NOAA Global Climate Normals 1961-1990; National Oceanic and Atmospheric Administration (NOAA) .

Figure 5. Average minimum monthly temperature graph



Average minimum monthly temperature in Poland and in the Czech Republic follows almost the same pattern, therefore, it is comparable.

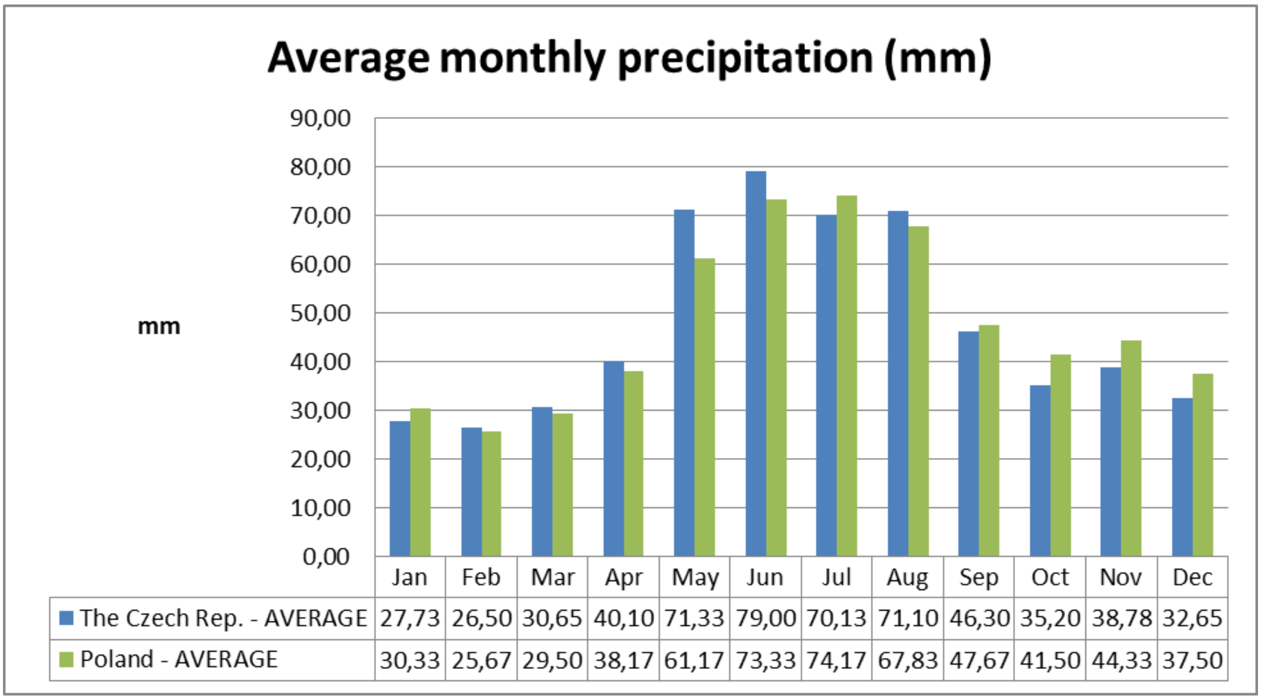
3.4. Average monthly precipitation sum

Table 7. Average monthly precipitation sum data

Location	Average monthly precipitation sum (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
The Czech Rep.: Cheb	36,1	29,5	36,3	38,3	56,0	66,9	59,2	66,5	48,4	37,5	41,1	43,9
The Czech Rep.: Prague	23,6	22,6	28,1	38,2	77,2	72,7	66,2	69,6	40,4	30,5	31,9	25,3
The Czech Rep.: Brno	24,5	23,7	24,2	31,5	60,9	72,0	64,0	56,5	37,6	30,5	37,5	27,1
The Czech Rep.: Ostrava	26,7	30,2	34,0	52,4	91,2	104,4	91,1	91,8	58,8	42,3	44,6	34,3
The Czech Rep. - AVERAGE	27,73	26,50	30,65	40,10	71,33	79,00	70,13	71,10	46,30	35,20	38,78	32,65
Poland: Warsaw	22	21	26	33	58	71	69	62	43	37	41	32
Poland: Poznan	30	24	27	36	53	60	69	57	43	39	39	38
Poland: Wroclaw	28	26	26	39	64	80	84	78	48	40	43	34
Poland: Krakow	34	32	34	48	83	97	85	87	54	46	45	41
Poland: Szczecin	36	27	32	38	52	57	61	55	44	38	46	41
Poland: Suwalki	32	24	32	35	57	75	77	68	54	49	52	39
Poland - AVERAGE	30,33	25,67	29,50	38,17	61,17	73,33	74,17	67,83	47,67	41,50	44,33	37,50

data source:
http://www.climate-charts.com/; NOAA Global Climate Normals 1961-1990; National Oceanic and Atmospheric Administration (NOAA).

Figure 6. Average monthly precipitation sum graph



Average monthly precipitation sum in Poland and in the Czech Republic is similar. The graph above shows that there is slightly more precipitation in the Czech Republic in the first half of the year while the situation is reversed in the second half of the year. The greatest difference in average precipitation sum is noted in the month of May – 10,16 mm. As mentioned above, September / October are months of expected application of the product CHR/H/PENDIF 599.5SC. Therefore, possible heavier rainfall in May would not influence the product's efficacy since it would have been absorbed by leaves shortly after application.

4. Soil conditions

Soil conditions in Poland and in the Czech Republic are not compared.

As has been mentioned above in Table 2. CHR/H/PENDIF acts primarily through foliar uptake with little or no soil activity. This allows authors of this report to disregard soil conditions as they have very limited or no influence on the efficacy of the product.

5. Agricultural practice

5.1. Winter wheat, winter triticale sowing timing

According to the MOCA Study carried out by The MARS STAT Action in Poland sowing of winter wheat takes place in the second half of September (depending on the region term of sowing ranges from September 15th till October 5th). In the Czech Republic term of sowing of winter wheat is similar – the optimum sowing time is September 15th till October 15th.

Winter triticale, follows practically the same pattern with respect to sowing and entering subsequent development phases. The crop is winter cereal, therefore, it is assumed, they are subject to the same agricultural practices at the same time in each country

5.2. Winter wheat, winter triticale growth and development

BBCH phases 11-25 that are most suitable for the application of CHR/H/PENDIF 599.5SC encompass the development of winter wheat and winter triticale from 1leaf unfolded to 5 tillers detectable.

Figure 7. Phenological crop calendar for winter wheat in Poland

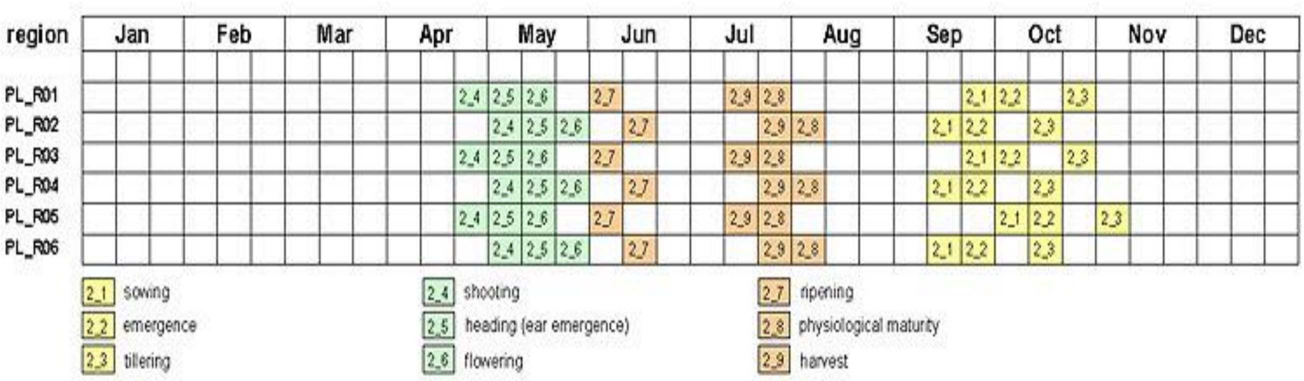


Figure 8. Phenological crop calendar for winter wheat in the Czech Republic

The data tables are incomplete with respect to tillering and shooting phases in the Czech Republic. It is so, because for financial reasons complete phenological data from the Czech Hydrometeorological Institute was not available to the authors of the MOCA Study. However, the distribution of the other available phenological phases allows for the assumption that the missing data is also comparable. In both countries climatic conditions are comparable so the development of winter wheat follows a similar pattern. 1 leaf to middle of tillering starts in September and continues in October.

In general, it may be stated that winter wheat and winter triticale develops in a similar way in Poland and in the Czech Republic.

5.3. Timing of application

CHR/H/PENDIF is to be applied in autumn:
Winter wheat, winter triticale:
BBCH 11-25 in winter wheat,
BBCH 11-25 in winter triticale,

The suggested dose of the product:
Used solo:
0.3-0,4 L/ha once a season in winter wheat and winter triticale which are corresponding ftom flufenacet 93,6 g a.s./ha + diflufenican 75 g a.s./ha + penoxsulam 11,25 g a.s./ha to flufenacet 124,8 g a.s./ha + diflufenican 100 g a.s./ha + penoxsulam 15 g a.s./ha

5.4. Target weeds

5.4.1. Weed spectrum in Europe

In the study published in 1993 by Shroeder et al. Table 4. lists 15 weeds species most important in winter cereals in Europe. Both Poland and the Czech Republic are included in this survey.

Table 8. Most abundant weeds in winter cereals in Europe

Weed species	% of maximum score (78 pts.)*
Galium aparine	69
Stellaria media	62
Cirsium arvense	58
Viola arvensis	58
Apera spica-venti	53
Lamium purpureum	50
Poa annua	50
Alopecurus myosuroides	48
Capsella bursa-pastoris	47
Agropyron repens	45
Polygonum aviculare	42
Avena fatua	41
Myosotis arvensis	41
Thlaspi arvense	41
Galeopsis tetrachit	37

* there were 26 countries included, in each recipients ranked every weed species: 3 – very frequent and abundant, 2 – frequent and abundant, 1 – less frequent and abundant; therefore, maximum score for each weed species is 26 x 3 = 78.

5.4.2. Weed spectrum in Europe

In the study published in 1993 by Shroeder et al. Table 4. lists 15 weeds species most important in Europe. Both Poland and the Czech Republic are included in this survey.
Table 9. Most abundant weeds in Europe

Rank	Weed species	% of maximum score (78 points)
1	*Chenopodium album* L.	48
1	*Stellaria media* (L.) Vill.	48
3	*Cirsium arvense* (L.) Scop.	41
4	*Polygonum aviculare* L.	37
4	*Poa annua* L.	37
6	*Echinochloa crus-galli* (L.) P. Beauv.	36
7	*Agropyron repens* (L.) P. Beauv.	35
7	*Convolvulus arvensis* L.	35
7	*Galium aparine* L.	35
10	*Polygonum persicaria* L.	34
11	*Capsella bursa-pastoris* (L.) Med.	33
12	*Amaranthus retroflexus* L.	31
13	*Solanum nigrum* L.	30
13	*Sonchus arvensis* L.	30
13	*Lamium purpureum* L.	30
13	*Fallopia convolvulus* (L.) A Loeve	30
13	*Viola arvense* Murr.	30
18	*Thlaspi arvense* L.	28
18	*Fumaria officinalis* L.	28
20	*Atriplex patula* L.	23

* there were 26 countries included, in each recipients ranked every weed species: 3 – very frequent and abundant, 2 – frequent and abundant, 1 – less frequent and abundant; therefore, maximum score for each weed species is 26 x 3 = 78.
Data source(http://www.unifr.ch/biol/ecology/muellerschaerer/group/mueller/webpage/pdf/publications/publications_1993_02_hms.pdf)

5.4.3. Weed spectrum in Poland

According to Małecka et al. (2006) Table 2. the most abundant weeds in winter wheat crops cultivated traditionally are:

Table 9. Weed abundance in winter wheat crops

Weed species	Fresh weight (g/m^2)
Viola arvensis	103,5
Apera spica-venti	94,3
Veronica hederifolia	56,8
Centaurea cyanus	23,8
Lamium purpureum	13,8
Papaver rhoeas	4,1
Brassica napus	2,7
Stellaria media	2,5
Capsella bursa-pastoris	1,9
Matricaria inodora	1,7
Geranium pusillum	1,2
Galium aparine	1,0
Consolida regalis	1,0
Polygonum convolvulus	0,1

5.4.4 Weed spectrum in the Czech Republic

According to Losová et al. (2008) Table 1. the most abundant weeds in the Czech Republic in cereals are:

Table 10. Weed abundance in cereals in the Czech Republic

Weed species	**% of vegetation plots in which the species was recorded***
Viola arvensis	79
Stellaria media	71
Fallopia convolvulus (Polygonum convolvulus)	67
Tripleurospermum inodorum (Matricaria inodora)	
Capsella bursa-pastoris	65
Cirsium arvense	
Myosotis arvensis	64
Galium aparine	61
Polygonum aviculare	58
Thlaspi arvense	57
Elytrigia repens (Agropyron repens)	57
Chenopodium album	56
Veronica persica	52
	52
	51

***** data from 2696 plots that were between 12 and 100 m^2 in size and sampled on arable land

5.4.6 Weed species controlled by CHR/H/PENDIF 599.5SC

The following table lists weeds that were included in efficacy studies of product CHR/H/PENDIF 599.5SC. These weeds were present in experimental plots and their sensitivity depended on the dose of the product applied.

Table 12. Weed species and their sensitivity to CHR/H/PENDIF 599.5SC

The following table shows the average sensitivity of weeds in winter wheat :

Target	**CHR/H/PENDIF at rate**	**Number of trials**	**% control**			**Efficacy**
			Mean	**Min & Max**		
Galium aparine	0,2	6	84,70	80,00	89,50	MS
	0,3		90,23	81,50	100,00	S
	0,35		91,20	82,80	100,00	S
	0,4		94,52	87,50	100,00	S
Viola arvensis	0,2	8	95,02	87,50	100,00	S
	0,3		96,94	92,50	100,00	S
	0,35		97,86	93,00	100,00	S
	0,4		98,73	94,30	100,00	S
Brassica napus (self-sown plant)	0,2	8	96,22	86,00	100,00	S
	0,3		97,44	87,00	100,00	S
	0,35		97,73	87,50	100,00	S
	0,4		98,13	91,00	100,00	S
Tripleurospermum mar. inodorum	0,2	6	92,77	88,80	96,00	S
	0,3		94,48	88,80	100,00	S
	0,35		96,85	92,50	100,00	S
	0,4		98,63	95,50	100,00	S

Stellaria media	0,2	6	95,90	90,30	100,00	S
	0,3		97,52	91,30	100,00	S
	0,35		97,88	92,80	100,00	S
	0,4		98,10	93,80	100,00	S
Apera Spica Venti	0,2	6	82,37	76,30	93,30	MS
	0,3		93,52	80,00	100,00	S
	0,35		97,58	94,00	100,00	S
	0,4		98,55	94,80	100,00	S
Veronica hederifolia	0,2	6	86,15	81,50	91,30	S
	0,3		96,97	91,80	100,00	S
	0,35		97,52	92,00	100,00	S
	0,4		97,88	93,30	100,00	S
Capsella bursa-pastoris	0,2	8	97,27	90,30	100,00	S
	0,3		98,19	92,00	100,00	S
	0,35		98,25	92,50	100,00	S
	0,4		98,54	93,80	100,00	S
Papver rhoeas	0,2	4	30,65	25,00	36,30	T
	0,3		41,90	29,80	55,00	T
	0,35		49,43	41,30	56,30	T
	0,4		54,95	47,50	65,00	T
Lamium purpureum	0,2	6	97,00	91,00	100,00	S
	0,3		97,38	91,80	100,00	S
	0,35		98,05	92,80	100,00	S
	0,4		98,58	94,00	100,00	S
Anthemis arvensis	0,2	6	81,85	81,30	82,50	MS
	0,3		99,38	97,30	100,00	S
	0,35		99,72	99,00	100,00	S
	0,4		99,83	99,00	100,00	S
Geranium pusillum	0,2	5	84,63	81,30	89,30	MS
	0,3		93,52	81,30	100,00	S
	0,35		97,62	92,00	100,00	S
	0,4		98,36	93,00	100,00	S
Cyanus segetum	0,2	2	50,00	50,00	50,00	T
	0,3		58,15	51,30	65,00	T
	0,35		63,15	60,00	66,30	MT
	0,4		66,25	62,50	70,00	MT

The following table shows the average sensitivity of weeds in winter triticale:

Target	**CHR/H/PENDIF at rate**	**Number of trials**	**% control**		**Efficacy**
			Mean	**Min & Max**	

Galium aparine	0,2	7	76,26	70,00	91,30	MT
	0,3		77,11	62,00	94,50	MT
	0,35		84,73	68,30	99,00	MS
	0,4		88,69	74,30	99,00	S
Viola arvensis	0,2	9	93,42	78,80	100,00	S
	0,3		98,46	93,50	100,00	S
	0,35		98,73	95,80	100,00	S
	0,4		98,98	96,50	100,00	S
Brassica napus (self-sown plant)	0,2	8	97,76	88,80	100,00	S
	0,3		97,73	90,00	100,00	S
	0,35		98,06	91,00	100,00	S
	0,4		98,56	93,50	100,00	S
Tripleurospermum mar. inodorum	0,2	3	92,50	85,00	100,00	S
	0,3		99,33	98,00	100,00	S
	0,35		99,67	99,00	100,00	S
	0,4		99,67	99,00	100,00	S
Stellaria media	0,2	6	96,26	91,00	100,00	S
	0,3		98,97	94,80	100,00	S
	0,35		99,08	95,50	100,00	S
	0,4		99,13	95,80	100,00	S
Apera Spica Venti	0,2	8	82,50	75,00	97,50	MS
	0,3		94,55	83,80	100,00	S
	0,35		96,40	88,80	100,00	S
	0,4		98,30	93,30	100,00	S
Veronica hederifolia	0,2	8	93,86	85,00	100,00	S
	0,3		96,29	87,00	100,00	S
	0,35		97,66	90,80	100,00	S
	0,4		98,18	92,80	100,00	S
Capsella bursa-pastoris	0,2	6	98,76	93,80	100,00	S
	0,3		99,22	95,30	100,00	S
	0,35		99,25	95,50	100,00	S
	0,4		99,38	96,30	100,00	S
Papver rhoeas	0,2	3	61,30	61,30	61,30	MT
	0,3		56,55	44,30	68,80	T
	0,35		63,75	50,00	77,50	MT
	0,4		69,65	59,30	80,00	MT
Lamium purpureum	0,2	3	92,50	92,50	92,50	S
	0,3		95,77	93,00	100,00	S
	0,35		97,20	94,80	100,00	S
	0,4		97,60	95,30	100,00	S
Anthemis arvensis	0,2	2	86,90	76,30	97,50	S

	0,3		91,90	83,80	100,00	S
	0,35		94,40	88,80	100,00	S
	0,4		94,40	88,80	100,00	S
Geranium pusillum	0,2	3	94,50	89,00	100,00	S
	0,3		94,60	91,80	100,00	S
	0,35		95,87	93,30	100,00	S
	0,4		96,50	94,00	100,00	S
Cyanus segetum	0,2	4	41,67	0,00	70,00	T
	0,3		61,90	10,00	100,00	MT
	0,35		64,08	10,00	100,00	MT
	0,4		70,03	23,80	100,00	MS

In summary, it may be stated that the most problematic weeds species in winter wheat and winter triticale crops in Poland and in the Czech Republic are comparable and they are almost all controlled by CHR/H/PENDIF. Therefore product CHR/H/PENDIF 599.5SC is expected to be equally highly efficient in both Poland and in the Czech Republic.

6. Conclusion

Poland and the Czech Republic are neighboring countries. Both lie in central Europe in the moderate climate zone. They share not only the border but also important climatic characteristics. Yearly temperature and precipitation patterns are very similar in both counties. This has influence on the agricultural practice in these countries and on the development of cultivated crops. Winter wheat and winter triticale which are of interest to the authors of this report, go through its development phases at relatively close calendar dates. What is more, the greatest weed problems are posed by almost the same weed species in both countries. All of these and many more are targeted by flufenacet, diflufenican, penoxsulam which are the active substances of product CHR/H/PENDIF 599.5SC.

In conclusion, authors of this report state that Poland and the Czech Republic share many elements of climatic and agricultural conditions. This allows efficacy and phytotoxicity study results acquired in Poland to be used in registration procedures of a spring, foliar applied, cereal herbicide CHR/H/PENDIF 599.5SC in the Czech Republic.

Appendix 3 Summary of data on trials site and application details per use

Test report/ research number (1)	Trial location (2); Crop cultivar; F/G (3); N/A (4)	Testing Unit (5)	Test method (6); Plot size; Sample size (7)	Treatment			
				Growth stage (8)	Interval	Total number	Spray volume (L/ha)

CHR_H_PENDIF_EFF_PL01	Jankowice Wielkie / Poland Winter wheat /Patras F N	SynTech Research Poland Sp. z o.o.; ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland	EPPO PP 1/93(3) 15m2	BBCH 12-14	n/a	1	300
A.T/2019/089/PO	Modrze / Poland Winter wheat / Euforia F N	A.T Sp. z o.o.; ul. Przemysłowa 3, 88-300 Mogilno, Poland	EPPO PP 1/93(3) 11,25 m2	BBCH 11-12	n/a	1	200
A.T/2019/090/PO	Wilcze / Poland Winter wheat/Arkadia F N	A.T Sp. z o.o.; ul. Przemysłowa 3, 88-300 Mogilno, Poland	EPPO PP 1/93(3) 17,5 m2	BBCH 21-23	n/a	1	300
AH/19/PO/30/Pr/PENDIF/1	Przybroda / Poland Winter wheat /Arkadia F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) 24 m^2	BBCH 11-14	n/a	1	200
AH/20/PO/33/Pr/2	Przybroda / Poland Winter wheat/Arkadia F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) 18 m2	BBCH 19-21	n/a	1	200
AH/20/PO/33/Br/1	Brody / Poland Winter wheat / Tonacja F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) $12m^2$	BBCH 12	n/a	1	230
A.T/2020/143/PO	Kocanowo / Poland Winter wheat / Apostel F N	A.T Sp. z o.o.; ul. Przemysłowa 3, 88-300 Mogilno, Poland	EPPO PP 1/93(3) $2,5x5=12,5m^2$	BBCH 19-22	n/a	1	200
A.T/2020/144/PO	Angowice / Poland Winter wheat / RGT Bilanz F N	A.T Sp. z o.o.; ul. Przemysłowa 3, 88-300 Mogilno, Poland	EPPO PP 1/93(3) $2,5x7,25=18,125m^2$	BBCH 11-13	n/a	1	200
CHR_H_PENDIF_EFF_PL02	Wawolnica / Poland Winter wheat / Ponticus F N	SynTech Research Poland Sp. z o. o. ul. Jagiellońska 69/1 85-027 Bydgoszcz Poland	EPPO PP 1/93(3) $3x4=12\ m^2$	BBCH 11-13	n/a	1	200
CHR_H_PENDIF_EFF_PL01	Owczary / Poland Winter wheat /	SynTech Research Poland	EPPO PP 1/93(3)	BBCH 11-12	n/a	1	300

	Linus F N	Sp. z o. o. ul. Jagiellońska 69/1 85-027 Bydgoszcz Poland	3x5=15 m^2				
AH/20/PszO/33/Br/3	Brody/Poland Winter triticale/ Twingo F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) 18 m^2	BBCH 12-13	n/a	1	230
CHR_H_PENDIF_EFF_PL02	Bazyny / Poland Winter triticale/Fredro F N	SynTech Research Poland Sp. z o.o.; ul. Jagiellońska 69/1, 85-027 Bydgoszcz, Poland	EPPO PP 1/93(3) 21 m^2	BBCH 12-13	n/a	1	200
AH/19/PszO/30/Zł/PENDIF/3	Złotniki / Poland Winter triticale/Aliko F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) 20 m^2	BBCH 19-22	n/a	1	200
AH/19/PszO/30/Pr/PENDIF/2	Przybroda /Poland Winter triticale/Gerenado F N	Poznań University of Life Sciences, Research and Education Center Gorzyń, Agronomy Department; ul. Wojska Polskiego 28, 60-637 Poznań, Poland	EPPO PP 1/93(3) 20 m^2	BBCH 12-14	n/a	1	200
A.T/2019/091/PŻO	Kopaszyn / Poland Winter triticale / Trapero F N	A.T Sp. z o.o.; ul. Przemysłowa 3, 88-300 Mogilno, Poland	EPPO PP 1/93(3) 13,75 m^2	BBCH 30-31	n/a	1	300
CHR_H_PENDIF_EFF_PL03	Kłoda / Poland Winter triticale/ Orinoko F N	SynTech Research Poland Sp. z o. o. ul. Jagiellońska 69/1 85-027 Bydgoszcz Poland	EPPO PP 1/93(3) 3x4=12 m^2	BBCH 13	n/a	1	200
CHR_H_PENDIF_EFF_PL04	Łajsy / Poland Winter triticale/ Tadeus F N	SynTech Research Poland Sp. z o. o. ul. Jagiellońska 69/1 85-027 Bydgoszcz Poland	EPPO PP 1/93(3) 3x7=21 m^2	BBCH 11-13	n/a	1	200
A.T/2020/145/PŻO	Zamarte /Poland Winter triticale / Orinoko F N	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland	EPPO PP 1/50 (3) 2,5x6=15 m^2	BBCH 19-21	n/a	1	200

A.T/2020/146/PŻO	Lichnowy / Poland Winter triticale / Orinoko F N	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland	EPPO PP 1/50 (3) 2,5x5=12,5 m^2	BBCH 13-21	n/a	1	200
A.T/2020/147/PŻO	Białe Błota /Poland Winter triticale / Borowik F N	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno, Poland	EPPO PP 1/50 (3) 2,5x5,5=13,75 m^2	BBCH 10-12	n/a	1	200

Notes:
(1): test report number including the year of establishing the trial
(2): precise place of the trial followed by the country
(3): F= field trial, G=protected crop, specify
(4): N=Natural infestation, A= Artificial inoculation
(5): Trial responsible entity/ officially recognized organization
(6): Test guideline used
(7): Sample size per plot
(8): Crop growth stage at application timing

Appendix 4 Summary of data on effectiveness trials per use

Test report (1)	**Crop/ cultivar Harmful organism/ weed species or intended use**	**Assessed part and variable (2)** **no / m^2**	**Untreated** BBCH (during application)	**Efficacy treatments (3)**				**Remarks (4)**
				Product		**Standard (s)**		
				name	**Dose [l,kg//ha]**	**name**	**dose [l /ha]**	
CHR_H_PENDIF_EFF_PL01	winter wheat /Patras APESV VIOAR BRSNW MATIN GERPU	APESV 5,3 VIOAR 19 BRSNW 8,3 MATIN 12,25 GERPU 7,5	APESV 10-14 VIOAR 10-14 BRSNW 10-14 MATIN 10-14 GERPU 10-14	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 05.11.2019 Assessment date: 05.11.2019 19.11.2019 03.12.2019 15.06.2020
A.T/2019/089/PO	winter wheat /Euforia APESV LAMPU BRSNW GALAP PAPRH STEME CAPBP ANTAR	APESV 50 LAMPU 5 BRSNW 7 GALAP 6 PAPRH 60 STEME 7 CAPBP 5 ANTAR 6	APESV 11-12 LAMPU 11-12 BRSNW 11-12 GALAP 10-11 PAPRH 11-12 STEME 11-12 CAPBP 10-12 ANTAR 10-11	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 14.10.2019 Assessment date: 28.10.2019 13.03.2020 08.05.2020 23.06.2020
A.T/2019/090/PO	winter wheat / Arkadia LAMPU CAPBP PAPRH CENCY APESV VERHE GALAP MATIN	LAMPU 10 CAPBP 13 PAPRH 8 CENCY 5 APESV 25 VERHE 6 GALAP 7 MATIN 5	LAMPU 12-14 CAPBP 11-14 PAPRH 12-16 CENCY 11-14 APESV 13-21	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 25.10.2019 Assessment date: 08.11.2019 11.05.2020 20.05.2020 24.06.2020

			VERHE 12-14 GALAP 10-12 MATIN 11-13					
AH/19/PO/30/Pr/PENDIF/1	winter wheat / Arkadia APESV VIOAR ANTAR GERPU VERHE MATIN STEME LAMPU	APESV 5 VIOAR 60 ANTAR 5 GERPU 5 VERHE 39 MATIN 8 STEME 5 LAMPU 5	APESV 10-12 VIOAR 10-12 ANTAR 10-12 GERPU 10-12 VERHE 10-12 MATIN 10-12 STEME 10-12 LAMPU 10-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 18.10.2019 Assessment date: 08.11.2019 10.04.2020 11.05.2020 13.08.2020
AH/20/PO/33/Pr/2	winter wheat / Arkadia VERHE LAMPU VIOAR FUMOF STEME CAPBP BRSNN PAPRH GALAP	VERHE 30 LAMPU 8 VIOAR 20 FUMOF 5 STEME 12 CAPBP 7 BRSNN 5 PAPRH 5 GALAP 5	VERHE 10-12 LAMPU 10-13 VIOAR 10-14 FUMOF 10-12 STEME 10-14 CAPBP 12-14 BRSNN 12-14 PAPRH 10-12 GALAP 12-22	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 04.11.2020 Assessment date: 16.11.2020 09.04.2021 27.04.2021 27.05.2021
AH/20/PO/33/Br/1	winter wheat / Tonacja VERHE STEME GERPU CAPBP MATIN VIOAR APESV GALAP BRSNW	VERHE 5 STEME 8 GERPU 8 CAPBP 5 MATIN 5 VIOAR 5 APESV 5 GALAP 6 BRSNW 5	VERHE 12-14 STEME 10-14 GERPU 12-14 CAPBP 12-14 MATIN 10-14 VIOAR 10-15 APESV10-12 GALAP 12-21 BRSNW 12-14	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 19.10.2020 Assessment date: 02.11.2020 14.11.2020 09.04.2021 27.04.2021
A.T/2020/143/PO	winter wheat / Apostel GERPU PAPRH VERHE LAMPU ANTAR STEME APESV CAPBP BRSNW VIOAR	GERPU 6 PAPRH 14 VERHE 16 LAMPU 5 ANTAR 5 STEME 5 APESV 25 CAPBP 5 BRSNW 6 VIOAR 7	GERPU 12-14 PAPRH 12-14 VERHE 14-16 LAMPU 11-12 ANTAR 11-12 STEME 13-16 APESV 11-16 CAPBP 11-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 28.10.2020 Assessment date: 11.11.2020 31.03.2021 20.05.2021 23.06.2021

			BRSNW 11-12 VIOAR 10-12					
A.T/2020/144/PO	winter wheat / RGT Bilanz CENCY BRSNW APESV GALAP VIOAR ANTAR STEME VERHE CAPBP LAMPU	CENCY 13 BRSNW 9 APESV 10 GALAP 5 VIOAR 5 ANTAR 5 STEME 6 VERHE 5 CAPBP 5 LAMPU	CENCY 11-12 BRSNW 10-12 APESV 11-12 GALAP 10-11 VIOAR 11-12 ANTAR 11-12 STEME 12-14 VERHE 11-12 CAPBP 11-12 LAMPU	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 17.10.2020 Assessment date: 11.11.2020 31.03.2021 20.05.2021 23.06.2021
CHR_H_PENDIF_EFF_PL02	winter wheat / Ponticus VIOAR BRSNW CAPBP MATIN ANTAR GERPU	VIOAR 15 BRSNW 9,5 CAPBP 15,5 MATIN 10,75 ANTAR 5 GERPU 19	VIOAR 10-12 BRSNW 10-12 CAPBP 10-12 MATIN 10-11 ANTAR 10-11 GERPU 10-11	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 22.10.2020 Assessment date: 05.11.2020 19.11.2020 03.12.2020 21.03.2021 22.06.2021
CHR_H_PENDIF_EFF_PL01	Winter wheat / Linus VIOAR BRSNW CAPBP ANTAR GALAP MATIN	VIOAR 7,5 BRSNW 7,3 CAPBP 7,3 ANTAR 6,8 GALAP 6,8 MATIN 7,5	VIOAR 11-13 BRSNW 12 CAPBP 11-13 ANTAR 11-12 GALAP 11-14 MATIN 11-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 28.10.2020 Assessment date: 12.11.2020 25.11.2020 30.03.2021 17.06.2021
AH/20/PszO/33/Br/3	Winter triticale/ Twingo BRSNN GERPU LAMPU VIOAR GALAP VERHE STEME CAPBP	BRSNN 6 GERPU 5 LAMPU 5 VIOAR 12 GALAP 5 VERHE 5 STEME 7 CAPBP 5	BRSNN 10-14 GERPU 12-14 LAMPU 12-14 VIOAR 10-13 GALAP 12-21 VERHE 10-13 STEME 10-14 CAPBP 12-14	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 19.10.2020 Assessment date: 02.11.2020 14.11.2020 09.04.2021 27.04.2021 27.05.2021
CHR_H_PENDIF_EFF_PL02	Winter triticale/ Fredro APESV VIOAR BRSNW GALAP STEME MATIN	APESV 8 VIOAR 6 BRSNW 5 GALAP 46 STEME 42 MATIN 8	APESV 10-14 VIOAR 101-4 BRSNW 10-14 GALAP 10-14 STEME 10-16	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 23.10.2019 Assessment date: 06.11.2019 20.11.2019 03.03.2020 24.06.2020

			MATIN 10-14					
AH/19/PszO/30/Zł/PENDIF/3	Winter triticale/ Aliko APESV VIOAR BRSNW VERHE THLAR GERPU LYCAR PAPRH LAMPU	APESV 6 VIOAR 50 BRSNW 6 VERHE 7 THLAR 5 GERPU 8 LYCAR 6 PAPRH 5 LAMPU 6	APESV 10-14 VIOAR 10-12 BRSNW 10-12 VERHE 10-12 THLAR 10-13 GERPU 10-14 LYCAR 10-12 PAPRH 10-12 LAMPU 10-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 05.11.2019 Assessment date: 21.11.2019 10.04.2020 18.05.2020
AH/19/PszO/30/Pr/PENDIF/2	Winter triticale/ Grenado APESV VIOAR VERHE THLAR CHEAL LAMPU AMARE CENCY	APESV 5 VIOAR 58 VERHE 15 THLAR 60 CHEAL 5 LAMPU 35 AMARE 28 CENCY 5	APESV 10-12 VIOAR 10-12 VERHE 10-12 THLAR 10-12 CHEAL 10-12 LAMPU 10-12 AMARE 10 CENCY 10-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 18.10.2019 Assessment date: 08.11.2019 04.04.2020 10.04.2020 11.05.2020
A.T/2019/091/PŻO	Winter triticale / Trapero APESV GALAP VIOAR CAPBP VERHE BRSNW	APESV 50 GALAP 17 VIOAR 7 CAPBP 10 VERHE 9 BRSNW 5	APESV 11-12 GALAP 11-12 VIOAR 10-11 CAPBP 11-12 VERHE 11-12 BRSNW 11-13	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 15.10.2019 Assessment date: 24.10.2019 17.03.2020 07.05.2020 24.06.2020
CHR_H_PENDIF_EFF_PL03	Winter triticale /Orinoko APESV CENCY GALAP STEME MATIN VERHE	APESV 31 CENCY 12 GALAP 9 STEME 5 MATIN 6 VERHE 9	APESV 11-13 CENCY 11-15 GALAP 11-13 STEME 11-15 MATIN 11-15 VERHE 12-15	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 03.11.2020 Assessment date: 17.11.2020 01.12.2020 15.03.2021 02.06.202
CHR_H_PENDIF_EFF_PL04	Winter triticale / Tadeus VIOAR BRSNW VERHT CAPBP STEME	VIOAR 19 BRSNW 6 VERHT 11,75 CAPBP 8,75 STEME 38,5	VIOAR 10-12 BRSNW 10-12 VERHT 10-12 CAPBP 10-12 STEME 10-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 22.10.2020 Assessment date: 05.11.2020 19.11.2020 07.04.2021 10.06.2021
A.T/2020/145/PŻO	Winter triticale / Orinoko	CENCY 7 ANTAR 6 CAPBP 5	CENCY 12-14 ANTAR 12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35	Bizon 118,75 SC	1,0	Application date: 30.10.2020

	CENCY ANTAR CAPBP VIOAR VERHE APESV BRSNW GALAP	VIOAR 10 VERHE 5 APESV 5 BRSNW 6 GALAP 5	CAPBP 12-14 VIOAR 12-14 VERHE 12-14 APESV 11-12 BRSNW 11-12 GALAP 10-11		0,4	Komplet 560 SC	0,5	Assessment date: 12.11.2020 02.04.2021 28.06.2021
A.T/2020/146/PŻO	Winter triticale / Orinoko VIOAR ANTAR VERHE APESV STEME CAPBP GALAP FUMOF BRSNW	VIOAR 9 ANTAR 5 VERHE 5 APESV 9 STEME 6 CAPBP 5 GALAP 5 FUMOF 8 BRSNW 5	VIOAR 12-16 ANTAR 12-14 VERHE 12-14 APESV 11-12 STEME 12-16 CAPBP 12-14 GALAP 12-14 FUMOF 12-16 BRSNW 11-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 03.11.2020 Assessment date: 17.11.2020 06.04.2021 31.05.2021
A.T/2020/147/PŻO	Winter triticale / Borowik CENCY APESV VIOAR GALAP MATIN GERPU BRSNW VERHE CAPBP	CENCY 10 APESV 43 VIOAR 52 GALAP 6 MATIN 7 GERPU 5 BRSNW 6 VERHE 5 CAPBP 5	CENCY 10-12 APESV 10-11 VIOAR 10-12 GALAP 10-21 MATIN 10-12 GERPU 10-12 BRSNW 11-12 VERHE 10-11 CAPBP 10-12	CHR/H/PENDIF CHR/H/PENDIF CHR/H/PENDIF	0,2 0,3 0,35 0,4	Bizon 118,75 SC Komplet 560 SC	1,0 0,5	Application date: 16.10.2020 Assessment date: 30.10.2020 24.03.2021 28.05.2021

Notes:
1): Test report number including the year of establishing the trial
(2): Plant part assessed and criteria for assessment
(3): efficacy or intended effect
(4): Relevant conclusions on effectiveness

Appendix 5 Summary of detailed data on herbicide effectiveness trials

Table 1. The efficacy of CHR/H/PENDIF in control of APESV Apera Spica Venti in winter wheat

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL01	A.T/2019/089/PO	AH/19/PO/30/Pr/PENDIF/1	AH/20/PO/33/Br/1	A.T.2020.144.PO	A.T.2020.143.PO	Mean	Min	Max
			DAA	128	151	175	190	167	154			
			weeds DENSITY pcs/m2	6	50	5	5	10	25			
No.	Name	Rate	weeds BBCH	21	11	12	10	.11-12	.11-16			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2					93,30ns	76,30b	77,50b	82,37	76,30	93,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	80,00b	91,80bc	95,80c	94,50ns	99,00a	100,00a	93,52	80,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	94,50ab	98,00b	94,00ns	99,00a	100,00a	97,58	94,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	97,50a	100,00a	94,80ns	99,00a	100,00a	98,55	94,80	100,00
6	Bizon	1	l/ha	100,00a	81,30d	100,00a	94,50ns	94,50a	77,50b	90,05	70,00	100,00
7	Komplet 560 SC	0,5	l/ha	97,50a	89,50c	99,30ab	93,80ns	99,00a	100,00a	96,32	89,50	99,30
8			LSD	2,910	3,680	1,410	3,200	3,940	3,220			

Table 2. The efficacy of CHR/H/PENDIF in control of APESV Apera Spica Venti in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	A.T/2019/091/PŻO	AH/19/PszO/30/Pr/PENDIF/2	AH/19/PszO/30/Zł/PENDIF/3	A.T.2020.147.PŻO	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL03	Mean	Min	Max
			DAA	156	253	206	195	249	241	237	211			
			weeds DENSITY pcs/m2	7	50	5	6	43	5	9	31			
No.	Name	Rate	weeds BBCH	22	11	12	14	.10-11	.11-12	.11-12	13-31			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2	l/ha					77,50c	82,50b	75,00c	80,00b	78,75	75,00	82,50
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	90,00a	100,00ns	93,00b	93,80ab	100,00a	83,80abc	95,80a	94,55	83,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	92,80a	100,00ns	94,80ab	95,80ab	100,00a	88,80ab	99,00a	96,40	88,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	98,80a	100,00ns	96,30a	99,00a	100,00a	93,30a	99,00a	98,30	93,30	100,00
6	Bizon	1	l/ha	99,00a	71,50b	100,00ns	96,50a	47,50d	100,00a	76,30bc	97,00a	85,98	47,50	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	91,30a	100,00ns	97,00a	92,50b	100,00a	88,80ab	99,00a	96,08	88,80	100,00
8	LSD			0,710	9,700		2,970	4,520	1,780	9,360	4,020			

Table 3. The efficacy of CHR/H/PENDIF in control of GALAP Galium aparine in winter wheat

Trt	Treatment		report number	AH/20/PO/33/ Br/1	A.T/2019/089/ PO	AH/20/PO/33/ Pr/2	A.T.2020.144. PO	A.T/2019/090/ PO	CHR_H_PEN DIF20_EFF_P L01	Mean	Min	Max
			DAA	190	151	174	167	243	153			
			weeds DENSITY pcs/m2	6	6	5	5	7	6,8			
No.	Name	Rate	weeds BBCH	14	11	16	.10-11	.10-12	.11-14			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2		89,30b		89,50ns	80,00c		80,00b	84,70	80,00	89,50
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	91,30ab	81,50a	91,30ns	86,00bc	91,30b	100,00a	90,23	81,50	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	91,80ab	82,80a	92,80ns	84,80bc	95,00a	100,00a	91,20	82,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	93,30a	87,50a	94,00ns	94,80ab	97,50a	100,00a	94,52	87,50	100,00
6	Bizon	1	l/ha	92,00ab	87,80a	91,80ns	99,00a	98,80a	100,00a	94,90	87,80	100,00
7	Komplet 560 SC	0,5	l/ha	93,00a	82,00a	92,80ns	99,00a	96,30a	100,00a	93,85	82,00	100,00
8	LSD			3,620	4,600	4,570	9,490	3,650				

Table 4. The efficacy of CHR/H/PENDIF in control of GALAP Galium aparine in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	AH/20/PszO/33/Br/3	A.T.2020.147.PŻO	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL03	Mean	Min	Max
			DAA	156	220	249	241	237	211			
			weeds DENSITY pcs/m2	50	5	6	5	5	9			
No.	Name	Rate	weeds BBCH	23	15	.10-21	.12-14	.10-11	.11-13			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha		91,30ns	70,00e	70,00e	70,00d	80,00d	76,26	70,00	91,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	65,00b	93,30ns	77,50d	75,00d	72,50d	94,50c	79,63	65,00	94,50
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	83,80a	94,50ns	85,00c	82,50c	80,00c	99,00a	87,47	80,00	99,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	94,50a	95,50ns	87,50c	85,00c	85,00b	99,00a	91,08	85,00	99,00
6	Bizon	1	l/ha	99,00a	94,30ns	100,00a	95,00a	97,50a	99,00a	97,47	94,30	100,00
7	Komplet 560 SC	0,5	l/ha	91,50a	95,30ns	92,50b	90,00b	95,00a	88,80b	92,18	88,80	95,30
8	LSD			1,490	4,250	3,28	3,280	2,510	4,900			

Trt	Treatment		report number	A.T/2019/091/PŻO
			DAA	253
			weeds DENSITY pcs/m2	17
No.	Name	Rate	weeds BBCH	11
1	Untreated Check		Rate Unit	
2	CHR/H/PENDIF 599,5 SC	0,2	l/ha	
3	CHR/H/PENDIF 599,5 SC	0,3	l/ha	62,00b
4	CHR/H/PENDIF 599,5 SC	0,35	l/ha	68,30b
5	CHR/H/PENDIF 599,5 SC	0,4	l/ha	74,30ab
6	Bizon	1	l/ha	75,00ab
7	Komplet 560 SC	0,5	l/ha	81,50a
8	LSD			9,630

Table 5. The efficacy of CHR/H/PENDIF in control of PAPRH Papaver rhoeas in winter wheat

Trt	Treatment		report number	A.T/2019/090 /PO	A.T/2019/089 /PO	AH/20/PO/33 /Pr/2	A.T.2020.143 .PO	Mean	Min	Max
			DAA	138	151	174	154			
			weeds DENSITY pcs/m2	8	60	5	14			
No.	Name	Rate	weeds BBCH	12	11	12	.12-14			
1	Untreated Check		Rate Unit							
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			36,30c	25,00d	30,65	25,00	36,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	55,00a	29,80c	48,30b	34,50c	41,90	29,80	55,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	56,30a	48,80b	51,30b	41,30bc	49,43	41,30	56,30
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	65,00a	54,80b	52,50b	47,50b	54,95	47,50	65,00
6	Bizon	1	l/ha	58,80a	81,00a	51,30b	79,50a	67,65	51,30	81,00
7	Komplet 560 SC	0,5	l/ha	60,00a	31,50c	90,30a	38,80bc	55,15	31,50	90,30
8	LSD			7,920	7,270	4,940	7,200			

Table 6. The efficacy of CHR/H/PENDIF in control of PAPRH Papaver rhoeas in winter triticale

Trt	Treatment		report number	A.T.2020.146 .PŻO	AH/19/PszO/ 30/ZŁ/PENDI F/3	Mean	Min	Max
			DAA	237	195			
			weeds DENSITY pcs/m2	5	5			
No.	Name	Rate	weeds BBCH	14-16	.12-14			
1	Untreated Check		Rate Unit					
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	61,30d		61,30	61,30	61,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	68,80c	44,30d	56,55	44,30	68,80
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	77,50bc	50,00c	63,75	50,00	77,50
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	80,00b	59,30b	69,65	59,30	80,00
6	Bizon	1	l/ha	93,80a	91,00a	92,40	91,00	93,80
7	Komplet 560 SC	0,5	l/ha	72,50bc	90,30a	81,40	72,50	90,30
8	LSD			7,310	5,100			

Table 7. The efficacy of CHR/H/PENDIF in control of STEME Stelaria media in winter wheat

Trt	Treatment		report number	AH/19/PO/30/ Pr/PENDIF/1	A.T/2019/089 /PO	AH/20/PO/33/ Br/1	AH/20/PO/33/ Pr/2	A.T.2020.144. PO	A.T.2020.143. PO	Mean	Min	Max
			DAA	175	151	190	174	167	154			
			weeds DENSITY pcs/m2	5	7	8	12	6	5			
No.	Name	Rate	weeds BBCH	12	11	12	12	.12-14	13-16			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			93,30ns	90,30b	100,00a	100,00a	95,90	90,30	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00ns	100,00a	93,80ns	91,30ab	100,00a	100,00a	97,52	91,30	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00ns	100,00a	94,50ns	92,80ab	100,00a	100,00a	97,88	92,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00ns	100,00a	94,80ns	93,80a	100,00a	100,00a	98,10	93,80	100,00
6	Bizon	1	l/ha	100,00ns	100,00a	93,80ns	91,30ab	100,00a	100,00a	97,52	91,30	100,00
7	Komplet 560 SC	0,5	l/ha	100,00ns	100,00a	94,80ns	91,80ab	100,00a	100,00a	97,77	91,80	100,00
8	LSD					2,220	3,130					

Table 8. The efficacy of CHR/H/PENDIF in control of STEME Stelaria media in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	AH/20/PszO/33/Br/3	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL03	CHR_H_PENDIF_EFF_PL04	Mean	Min	Max
			DAA	156	220	154	154	211	231			
			weeds DENSITY pcs/m2	46	7	5	6	5	38,5			
No.	Name	Rate	weeds BBCH	24	12		.12-16	.11-15	.10-12			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha		93,80ns	100,00a	100,00	91,00b	96,50ab	96,26	91,00	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	94,80ns	100,00a	100,00	99,00a	100,00a	98,97	94,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	95,50ns	100,00a	100,00	99,00a	100,00a	99,08	95,50	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	95,80ns	100,00a	100,00	99,00a	100,00a	99,13	95,80	100,00
6	Bizon	1	l/ha	100,00a	95,00ns	100,00a	100,00	99,00a	95,30b	98,22	95,00	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	96,00ns	100,00a	100,00	99,00a	99,00ab	99,00	96,00	100,00
8	LSD				2,79			5,15	3,81			

Table 9. The efficacy of CHR/H/PENDIF in control of CAPBP Capsella bursa-pastoris in winter wheat

Trt	Treatment		report number	A.T/2019/090/PO	A.T/2019/089/PO	AH/20/PO/33/Br/1	AH/20/PO/33/Pr/2	A.T.2020.144.PO	A.T.2020.143.PO	CHR_H_PENDIF20_EFF_PL01	CHR_H_PENDIF20_EFF_PL02	Mean	Min	Max
			DAA	138	151	190	174	167	154	153	160			
			weeds DENSITY pcs/m2	13	5	5	7	5	5	7,3	15,5			
No.	Name	Rate	weeds BBCH	13	11	12	14	.11-12	.11-12		.10-12			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			93,80ns	90,30ns	100,00a	100,00a	99,50a	100,00a	97,27	90,30	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	100,00a	93,50ns	92,00ns	100,00a	100,00a	100,00a	100,00a	98,19	92,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	100,00a	93,50ns	92,50ns	100,00a	100,00a	100,00a	100,00a	98,25	92,50	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	94,50ns	93,80ns	100,00a	100,00a	100,00a	100,00a	98,54	93,80	100,00
6	Bizon	1	l/ha	100,00a	100,00a	94,80ns	92,50ns	100,00a	100,00a	100,00a	100,00a	98,41	92,50	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	100,00a	94,50ns	92,00ns	100,00a	100,00a	100,00a	100,00a	98,31	92,00	100,00
8	LSD					3,990	3,430			0,540				

Table 10. The efficacy of CHR/H/PENDIF in control of CAPBP Capsella bursa-pastoris in winter triticale

Trt	Treatment		report number	AH/20/PszO/33/Br/3	A.T/2019/091/ PŻO	A.T.2020.147. PŻO	A.T.2020.145. PŻO	A.T.2020.146. PŻO	CHR_H_PENDIF_EFF_PL04	Mean	Min	Max
			DAA	220	253	249	154	154	231			
			weeds DENSITY pcs/m2	5	10	5	5	5	8,75			
No.	Name	Rate	weeds BBCH	12	11	.10-12	.12-14	.12-14	.10-12			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	93,80ns		100,00a	100,00	100,00a	100,00a	98,76	93,80	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	95,30ns	100,00a	100,00a	100,00	100,00a	100,00a	99,22	95,30	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	95,50ns	100,00a	100,00a	100,00	100,00a	100,00a	99,25	95,50	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	96,30ns	100,00a	100,00a	100,00	100,00a	100,00a	99,38	96,30	100,00
6	Bizon	1	l/ha	95,50ns	100,00a	100,00a	100,00	100,00a	100,00a	99,25	95,50	100,00
7	Komplet 560 SC	0,5	l/ha	94,80ns	100,00a	100,00a	100,00	100,00a	100,00a	99,13	94,80	100,00
8	LSD			2,590								

Table 11. The efficacy of CHR/H/PENDIF in control of VERHE Veronica hederifolia in winter wheat

Trt	Treatment		report number	A.T/2019/090 /PO	AH/19/PO/30/ Pr/PENDIF/1	AH/20/PO/33/ Br/1	AH/20/PO/33/ Pr/2	A.T.2020.144. PO	A.T.2020.143. PO	Mean	Min	Max
			DAA	138	175	190	174	167	154			
			weeds DENSITY pcs/m2	6	39	5	30	5	16			
No.	Name	Rate	weeds BBCH	12	12	12	12	.11-12	14-16			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			91,30ns	89,30b	81,50b	82,50b	86,15	81,50	91,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	97,50b	92,50ns	91,80ab	100,00a	100,00a	96,97	91,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	99,80a	93,30ns	92,00ab	100,00a	100,00a	97,52	92,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	94,00ns	93,30a	100,00a	100,00a	97,88	93,30	100,00
6	Bizon	1	l/ha	100,00a	100,00a	92,30ns	93,30a	100,00a	100,00a	97,60	92,30	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	100,00a	94,00ns	93,80a	100,00a	100,00a	97,97	93,80	100,00
8	LSD				1,430	2,910	3,100	1,070				

Table 12. The efficacy of CHR/H/PENDIF in control of VERHE Veronica hederifolia in winter triticale

Trt	Treatment		report number	AH/19/PszO/30/Pr/PENDIF/2	A.T/2019/091/PŻO	AH/19/PszO/30/Zł/PENDIF/3	AH/20/PszO/33/Br/3	A.T.2020.147.PŻO	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL03	Mean	Min	Max
			DAA	206	253	195	220	249	154	154	211			
			weeds DENSITY pcs/m2	15	9	7	5	5	5	5	9			
No.	Name	Rate	weeds BBCH	12	11	12	12	.10-11	.12-14	.12-14	.12-15			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2	l/ha				94,30ns	81,30b	100,00	83,8b	80,00c	91,12	80,00	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00ns	87,00b	94,50a	95,50ns	97,50a	100,00	100,00a	94,80b	96,16	87,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00ns	90,80ab	96,50a	95,00ns	100,00a	100,00	100,00a	99,00a	97,66	90,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00ns	92,80ab	97,30a	96,30ns	100,00a	100,00	100,00a	99,00a	98,18	92,80	100,00
6	Bizon	1	l/ha	100,00ns	94,50a	95,30a	94,80ns	100,00a	100,00	100,00a	99,00a	97,95	94,50	100,00
7	Komplet 560 SC	0,5	l/ha	100,00ns	95,80a	96,50a	96,30ns	100,00a	100,00	100,00a	97,00ab	98,20	95,80	100,00
8	LSD				5,050	2,930	3,510	2,480		1,54	3,82			

Table 13. The efficacy of CHR/H/PENDIF in control of ANTAR Anthemis arvensis in winter wheat

Trt	Treatment		report number	A.T.2020.144. PO	AH/19/PO/30/ Pr/PENDIF/1	A.T.2020.143. PO	A.T/2019/089/ PO	CHR_H_PENDIF20_EFF_PL02	CHR_H_PENDIF20_EFF_PL01	Mean	Min	Max
			DAA	167	175	154	151	160	153			
			weeds DENSITY pcs/m2	5	5	5	6	5	6,8			
No.	Name	Rate	weeds BBCH	.11-12	10	.11-12	.10-11	.10-11	.11-12			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	81,30b		82,30b		82,50c	81,30c	81,85	81,30	82,50
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	99,00a	97,30c	100,00a	100,00a	100,00a	100,00a	99,38	97,30	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	99,00a	99,30b	100,00a	100,00a	100,00a	100,00a	99,72	99,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	99,00a	100,00a	100,00a	100,00a	100,00a	100,00a	99,83	99,00	100,00
6	Bizon	1	l/ha	99,00a	100,00a	100,00a	100,00a	100,00a	100,00a	99,83	99,00	100,00
7	Komplet 560 SC	0,5	l/ha	99,00a	100,00a	82,50b	100,00a	90,00b	91,30b	96,72	90,00	100,00
8	LSD			1,540	0,620	2,090		2,550	2,970			

Table 14. The efficacy of CHR/H/PENDIF in control of ANTAR Anthemis arvensis in winter triticale

Trt	Treatment		report number	A.T.2020.146.PŻO	A.T.2020.145.PŻO	Mean	Min	Max
			DAA	237	241			
			weeds DENSITY pcs/m2	5	6			
No.	Name	Rate	weeds BBCH	.12-14	12			
1	Untreated Check		Rate Unit					
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	76,30b	83,80b	80,05	76,30	83,80
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	83,80ab	100,00a	91,90	83,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	88,80ab	100,00a	94,40	88,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	88,80ab	100,00a	94,40	88,80	100,00
6	Bizon	1	l/ha	93,80a	100,00a	96,90	93,80	100,00
7	Komplet 560 SC	0,5	l/ha	80,00ab	100,00a	90,00	80,00	100,00
8	LSD			10,710	1,540			

Table 15. The efficacy of CHR/H/PENDIF in control of GERPU Geranium pusillum in winter wheat

Trt	Treatment		report number	AH/20/PO/33/Br/1	AH/19/PO/30/Pr/PENDIF/1	A.T.2020.143.PO	CHR_H_PENDIF_EFF_PL01	CHR_H_PENDIF20_EFF_PL02	Mean	Min	Max
			DAA	190	175	154	128	160			
			weeds DENSITY pcs/m2	8	5	6	7,5	19			
No.	Name	Rate	weeds BBCH	12	12	.12-14	.10-14	.10-11			
1	Untreated Check		Rate Unit								
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	89,30b		83,30b		81,30b	84,63	81,30	89,30
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	91,30ab	97,00b	100,00a	81,30c	97,50a	93,52	81,30	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	92,00ab	99,50a	100,00a	96,30a	100,00a	97,62	92,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	93,00a	100,00a	100,00a	98,80a	100,00a	98,36	93,00	100,00
6	Bizon	1	l/ha	90,30ab	100,00a	100,00a	100,00a	100,00a	98,06	90,30	100,00
7	Komplet 560 SC	0,5	l/ha	93,00a	100,00a	73,80c	88,80b	85,00a	88,12	73,80	100,00
8	LSD			3,010	1,160	2,220	4,840	5,260			

Table 16. The efficacy of CHR/H/PENDIF in control of GERPU Geranium pusillum in winter triticale

Trt	Treatment		report number	AH/20/PszO/33/Br/3	AH/19/PszO/30/ZŁ/PENDIF/3	A.T.2020.147.PŻO	Mean	Min	Max
			DAA	220	195	249			
			weeds DENSITY pcs/m2	5	8	5			
No.	Name	Rate	weeds BBCH	12	13	.10-12			
1	Untreated Check		Rate Unit						
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	89,00d		82,50b	85,75	82,50	89,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	91,80c	92,00a	100,00a	94,60	91,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	94,30ab	93,30a	100,00a	95,87	93,30	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	95,50a	94,00a	100,00a	96,50	94,00	100,00
6	Bizon	1	l/ha	92,00bc	91,80a	100,00a	94,60	91,80	100,00
7	Komplet 560 SC	0,5	l/ha	94,50a	92,80a	82,50b	89,93	82,50	94,50
8	LSD			2,260	3,470	1,780			

Table 17. The efficacy of CHR/H/PENDIF in control of LAMPU Lamium purpureum in winter wheat

Trt	Treatment		report number	AH/20/PO/33/ Pr/2	AH/19/PO/30/ Pr/PENDIF/1	A.T.2020.144. PO	A.T.2020.143. PO	A.T/2019/089 /PO	A.T.2019.090. PO	Mean	Min	Max
			DAA	174	175	167	154	151	138			
			weeds DENSITY pcs/m2	8	5	5	5	5	10			
No.	Name	Rate	weeds BBCH	12	12		.11-12	.11-12	.12-14			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	91,00ns		100,00a	100,00a			97,00	91,00	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	91,80ns	100,00ns	100,00a	100,00a	100,00a	92,50a	97,38	91,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	92,80ns	100,00ns	100,00a	100,00a	100,00a	95,50a	98,05	92,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	94,00ns	100,00ns	100,00a	100,00a	100,00a	97,50a	98,58	94,00	100,00
6	Bizon	1	l/ha	91,30ns	100,00ns	100,00a	100,00a	100,00a	95,00a	97,72	91,30	100,00
7	Komplet 560 SC	0,5	l/ha	92,30ns	100,00ns	100,00a	100,00a	100,00a	96,30a	98,10	92,30	100,00
8	LSD			4,520					6,100			

Table 18. The efficacy of CHR/H/PENDIF in control of LAMPU Lamium purpureum in winter triticale

Trt	Treatment		report number	AH/19/PszO/30/Pr/PENDIF/2	AH/19/PszO/30/Zł/PENDIF/3	AH/20/PszO/33/Br/3	Mean	Min	Max
			DAA	206	195	220			
			weeds DENSITY pcs/m2	35	6	5			
No.	Name	Rate	weeds BBCH	12	.12-14	12			
1	Untreated Check		Rate Unit						
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			92,50ns	92,50	92,50	92,50
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00ns	93,00b	94,30ns	95,77	93,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00ns	96,80a	94,80ns	97,20	94,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00ns	97,50a	95,30ns	97,60	95,30	100,00
6	Bizon	1	l/ha	100,00ns	96,80a	93,30ns	96,70	93,30	100,00
7	Komplet 560 SC	0,5	l/ha	100,00ns	97,00a	94,80ns	97,27	94,80	100,00
8	LSD				1,950	2,980			

Table 19. The efficacy of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum in winter wheat

Trt	Treatment		report number	AH/20/PO/33/Br/1	CHR_H_PENDIF20_EFF_PL01	CHR_H_PENDIF20_EFF_PL02	AH/19/PO/30/Pr/PENDIF/1	A.T/2019/090/PO	CHR_H_PENDIF_EFF_PL01	Mean	Min	Max
			DAA	190	232	160	175	138	128			
			weeds DENSITY pcs/m2	5	7,5	10,75	8	5	12,25			
No.	Name	Rate	weeds BBCH	12	.11-12	.10-11	.10-12	.11-13	.10-14			
1	Untreated Check		Rate Unit									
2	CHR/H/PENDIF 599.5SC	0,2	l/ha	93,50ns	96,00b	88,80c				92,77	88,80	96,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	94,50ns	99,80a	92,50b	100,00ns	91,30a	88,80b	94,48	88,80	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	94,80ns	100,00a	100,00a	100,00ns	93,80a	92,50a	96,85	92,50	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	95,50ns	100,00a	100,00a	100,00ns	96,30a	100,00a	98,63	95,50	100,00
6	Bizon	1	l/ha	94,80ns	100,00a	100,00a	100,00ns	91,30a	100,00a	97,68	91,30	100,00
7	Komplet 560 SC	0,5	l/ha	95,50ns	100,00a	100,00a	100,00ns	93,80a	92,50b	95,10	88,80	100,00
8	LSD			2,190	1,900	3,210		4,220	4,830			

Table 20. The efficacy of CHR/H/PENDIF in control of MATIN Tripleurospermum mar. inodorum in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	A.T.2020.147.PŻO	CHR_H_PENDIF_EFF_PL03	Mean	Min	Max
			DAA	156	249	211			
			weeds DENSITY pcs/m2	10	7	6			
No.	Name	Rate	weeds BBCH	25	.10-12	.11-15			
1	Untreated Check		Rate Unit						
2	CHR/H/PENDIF 599.5SC	0,2	l/ha		100,00a	85,00b	92,50	85,00	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	100,00a	98,00a	99,33	98,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	100,00a	99,00a	99,67	99,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	99,00a	99,67	99,00	100,00
6	Bizon	1	l/ha	100,00a	100,00a	99,00a	99,67	99,00	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	100,00a	97,00a	99,00	97,00	100,00
8	LSD					2,570			

Table 21. The efficacy of CHR/H/PENDIF in control of VIOAR Viola arvensis in winter wheat

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL01	AH/19/PO/30/Pr/PENDIF/1	AH/20/PO/33/Br/1	AH/20/PO/33/Pr/2	A.T.2020.144.PO	A.T.2020.143.PO	CHR_H_PENDIF20_EFF_PL01	CHR_H_PENDIF20_EFF_PL02	Mean	Min	Max
			DAA	128	175	190	174	167	154	153	160			
			weeds DENSITY pcs/m2	20	60	5	20	5	7	7,5	15			
No.		Rate	weeds BBCH	19	12	12	12	.11-12	.10-12	.11-13	.10-12			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2	l/ha			93,30ns	90,00ns	100,00a	100,00a	99,30b	87,50d	95,02	87,50	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	96,50c	94,00ns	92,50ns	100,00a	100,00a	100,00a	92,50bc	96,94	92,50	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	98,80b	94,80ns	93,00ns	100,00a	100,00a	100,00a	96,30ab	97,86	93,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	95,50ns	94,30ns	100,00a	100,00a	100,00a	100,00a	98,73	94,30	100,00
6	Bizon	1	l/ha	100,00a	100,00a	95,30ns	93,00ns	100,00a	100,00a	100,00a	95,00b	97,91	93,00	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	99,80ab	95,80ns	92,50ns	100,00a	100,00a	100,00a	90,00cd	97,26	90,00	100,00
8	LSD				1,110	2,750	4,330			0,470	4,230			

Table 22. The efficacy of CHR/H/PENDIF in control of VIOAR Viola arvensis in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	A.T/2019/091/PŻO	AH/19/PszO/30/Pr/PENDIF/2	AH/19/PszO/30/Zł/PENDIF/3	AH/20/PszO/33/Br/3	A.T.2020.147.PŻO	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL04	Mean	Min	Max
			DAA	156	253	206	195	220	249	154	154	231			
			weeds DENSITY pcs/m2	50	7	58	50	12	52	10	9	19			
No.	Name	Rate	weeds BBCH	21	11	12	12	12	.10-12	.12-14	.12-16	.10-12			
1	Untreated Check		Rate Unit												
2	CHR/H/PENDIF 599.5SC	0,2	l/ha					93,30b	100,00a	100,00	95,00b	78,80b	93,42	78,80	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	100,00a	100,00ns	93,50a	94,80ab	100,00a	100,00	98,80ab	99,00a	98,46	93,50	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	100,00a	100,00ns	96,30a	95,80ab	100,00a	100,00	100,00a	96,50a	98,73	95,80	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	100,00ns	96,50a	96,80a	100,00a	100,00	100,00a	97,50a	98,98	96,50	100,00
6	Bizon	1	l/ha	100,00a	100,00a	100,00ns	93,80a	94,80ab	100,00a	100,00	96,30ab	83,80b	96,52	83,80	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	100,00a	100,00ns	95,80a	93,50b	100,00a	100,00	96,30ab	92,50a	97,57	92,50	100,00
8	LSD						4,600	2,980			2,840	8,720			

Table 23. The efficacy of CHR/H/PENDIF in control of BRSNN Brassica napus (self-sown plant) in winter wheat

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL01	A.T/2019/089/PO	AH/20/PO/33/Br/1	AH/20/PO/33/Pr/2	A.T.2020.144.PO	A.T.2020.143.PO	CHR_H_PENDIF20_EFF_PL01	CHR_H_PENDIF20_EFF_PL02	Mean	Min	Max
			DAA	128	151	190	174	167	154	153	160			
			weeds DENSITY pcs/m2	9	253	5	5	9	6	7,3	9,5			
No.	Name	Rate	weeds BBCH	30	11	12	12	.10-12	.11-12	.11-13	.10-12			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2				86,00b	91,30	100,00a	100,00a	100,00a	100,00a	96,22	86,00	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	100,00a	87,00b	92,50	100,00a	100,00a	100,00a	100,00a	97,44	87,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	100,00a	87,50b	94,30	100,00a	100,00a	100,00a	100,00a	97,73	87,50	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	91,00a	94,00	100,00a	100,00a	100,00a	100,00a	98,13	91,00	100,00
6	Bizon	1	l/ha	100,00a	100,00a	90,50a	92,30	100,00a	100,00a	100,00a	100,00a	97,85	90,50	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	75,80b	90,30a	92,80	100,00a	87,5b	100,00a	100,00a	94,86	75,80	100,00
8			LSD		5,880	2,690	4,070		1,780					

Table 24. The efficacy of CHR/H/PENDIF in control of BRSNN Brassica napus (self-sown plant) in winter triticale

Trt	Treatment		report number	CHR_H_PENDIF_EFF_PL02	A.T/2019/091/PŻO	AH/19/PszO/30/ZŁ/PENDIF/3	AH/20/PszO/33/Br/3	A.T.2020.147.PŻO	A.T.2020.145.PŻO	A.T.2020.146.PŻO	CHR_H_PENDIF_EFF_PL04	Mean	Min	Max
			DAA	156	253	195	220	249	241	237	231			
			weeds DENSITY pcs/m2	5	5	6	6	43	6	5	6			
No.	Name	Rate	weeds BBCH	35	12	12	12	.10-11	.11-12	.11-12	.11-19			
1	Untreated Check		Rate Unit											
2	CHR/H/PENDIF 599.5SC	0,2	l/ha				88,80c	100,00a	100,00a	100,00a	100,00a	97,76	88,80	100,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	100,00a	100,00a	91,80b	90,00bc	100,00a	100,00a	100,00a	100,00a	97,73	90,00	100,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	100,00a	100,00a	93,50ab	91,00bc	100,00a	100,00a	100,00a	100,00a	98,06	91,00	100,00
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	100,00a	100,00a	95,00a	93,50a	100,00a	100,00a	100,00a	100,00a	98,56	93,50	100,00
6	Bizon	1	l/ha	100,00a	100,00a	94,00a	92,30ab	100,00a	100,00a	100,00a	100,00a	98,29	92,30	100,00
7	Komplet 560 SC	0,5	l/ha	100,00a	82,50b	93,50ab	91,80abc	82,50b	80,00a	85,00a	100,00a	91,60	80,00	100,00
8	LSD				1,990	2,520	3,180	1,780						

Table 25. The efficacy of CHR/H/PENDIF in control of CENCY Cyanus segetum in winter wheat

Trt	Treatment		report number	A.T/2019/090/PO	A.T.2020.144.PO	Mean	Min	Max
			DAA	139	167			
			weeds DENSITY pcs/m2	5	13			
No.	Name	Rate	weeds BBCH	12	.11-12			
1	Untreated Check		Rate Unit					
2	CHR/H/PENDIF 599.5SC	0,2	l/ha		50,00c	50,00	50,00	50,00
3	CHR/H/PENDIF 599.5SC	0,3	l/ha	51,30b	65,00b	58,15	51,30	65,00
4	CHR/H/PENDIF 599.5SC	0,35	l/ha	60,00a	66,30b	63,15	60,00	66,30
5	CHR/H/PENDIF 599.5SC	0,4	l/ha	62,50a	70,00b	66,25	62,50	70,00
6	Bizon	1	l/ha	63,80a	96,00a	79,90	63,80	96,00
7	Komplet 560 SC	0,5	l/ha	65,00a	47,50c	56,25	47,50	65,00
8	LSD			5,760	10,160			

Table 26. The efficacy of CHR/H/PENDIF in control of CENCY Cyanus segetum in winter triticale

Trt	Treatment		report number	AH/19/PszO/30/Pr/PENDIF/2	A.T.2020.147.PŻO	A.T.2020.145.PŻO	CHR_H_PENDIF_EFF_PL03	Mean	Min	Max
			DAA	206	159	154	211			
			weeds DENSITY pcs/m2	5	10	7	12			
No.	Name	Rate	weeds BBCH	10	.10-12	.12-14	.11-13			
1	Untreated Check		Rate Unit							
2	CHR/H/PENDIF 599,5 SC	0,2	l/ha		42,50e	65,0b	70,00d	59,17	42,50	70,00
3	CHR/H/PENDIF 599,5 SC	0,3	l/ha	100,00	51,30d	87,50a	78,80c	79,40	51,30	100,00
4	CHR/H/PENDIF 599,5 SC	0,35	l/ha	100,00	61,30c	88,80a	86,30b	84,10	61,30	100,00
5	CHR/H/PENDIF 599,5 SC	0,4	l/ha	100,00	78,80b	90,00a	90,00b	89,70	78,80	100,00
6	Bizon	1	l/ha	100,00	93,80a	92,50a	99,00a	96,33	92,50	100,00
7	Komplet 560 SC	0,5	l/ha	100,00	51,30d	45,00c	76,30c	68,15	45,00	100,00
8	LSD				4,88	6,140	3,750			

Appendix 6 Summary of phytotoxicity trials data in summary form

Table 1 – data from phytotoxicity trials – winter wheat (selectivity trials)

<table>
<tr><td rowspan="9">AH/19/PO/30/Gr/sel/2</td><td rowspan="2">Treatment</td><td rowspan="2">Dose</td><td rowspan="2">Unit</td><td rowspan="2">Code</td><td colspan="5">DAA</td></tr>
<tr><td>7DAA</td><td>14DAA</td><td>18DAA</td><td>101DAA</td><td>112DAA</td></tr>
<tr><td>Untreated Check</td><td></td><td></td><td></td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>CHR/H/PENDIF 599.5S.C.</td><td>0,40</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>CHR/H/PENDIF 599.5S.C.</td><td>0,80</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>Bizon</td><td>1,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>Bizon</td><td>2,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>Komplet 560 S.C.</td><td>0,50</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td>Komplet 560 S.C.</td><td>1,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td></tr>
<tr><td rowspan="9">AH/19/PO/30?BR/sel/1</td><td rowspan="2">Treatment</td><td rowspan="2">Dose</td><td rowspan="2">Unit</td><td rowspan="2">Code</td><td colspan="4">DAA</td><td></td></tr>
<tr><td>7DAA</td><td>14DAA</td><td>21DAA</td><td>42DAA</td><td></td></tr>
<tr><td>Untreated Check</td><td></td><td></td><td></td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>CHR/H/PENDIF 599.5S.C.</td><td>0,40</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>CHR/H/PENDIF 599.5S.C.</td><td>0,80</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>Bizon</td><td>1,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>Bizon</td><td>2,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>Komplet 560 S.C.</td><td>0,50</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td>Komplet 560 S.C.</td><td>1,00</td><td>l/ha</td><td>A</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
<tr><td rowspan="3">CHR_H_PENDIF_SEL_PL01</td><td rowspan="2">Treatment</td><td rowspan="2">Dose</td><td rowspan="2">Unit</td><td rowspan="2">Code</td><td colspan="4">DAA</td><td></td></tr>
<tr><td>7DAA</td><td>14DAA</td><td>28DAA</td><td>56DAA</td><td></td></tr>
<tr><td>Untreated Check</td><td></td><td></td><td></td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td>0,0a</td><td></td></tr>
</table>

	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
A.T/2020/150/PO	Treatment	Dose	Unit	Code	**DAA**				
					14DAA	**27DAA**	**140DAA**	**195DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
A.T/2020/149/PO	Treatment	Dose	Unit	Code	**DAA**				
					14DAA	**27DAA**	**44DAA**	**154DAA**	**230DAA**
	Untreated Check				0,0a	0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,5a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	1,5a	2,8a	3,5a	0,0a
	Bizon	1,00	l/ha	A	0,0a	0,3a	1,5a	0,0a	0,0a
	Bizon	2,00	l/ha	A	0,0a	1,3a	2,8a	5,3a	1,3a
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	0,0a
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,3a	0,8a	0,0a	0,0a
A.T/2019/092/PO	Treatment	Dose	Unit	Code	**DAA**				
					7DAA	**21DAA**	**124DAA**	**193DAA**	

	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
A.T/2020/148/PO	Treatment	Dose	Unit	Code	**DAA**				
					10DAA	**24DAA**	**134DAA**	**210DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
CHR_H_PENDIF_SEL_PL01_2020	Treatment	Dose	Unit	Code	**DAA**				
					8DAA	**15DAA**	**22DAA**	**134DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	

Table 2 – data from phytotoxicity trials – winter triticale

	Treatment	Dose	Unit	Code	DAA			
					38DAA	**45DAA**	**59DAA**	**143DAA**
AH/19/PszO/30/Gr/sel/2	Untreated Check				0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
CHR_H_PENDIF_SEL_PL02	Treatment	Dose	Unit	Code	DAA			
					7DAA	**14DAA**	**21DAA**	**56DAA**
	Untreated Check				0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a
CHR_H_PENDIF_SEL_PL03	Treatment	Dose	Unit	Code	DAA			
					7DAA	**14DAA**	**21DAA**	**56DAA**
	Untreated Check				0,0a	0,0a	0,0a	0,0a
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a

	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
A.T/2019/093/PŻO	Treatment	Dose	Unit	Code	**DAA**				
					14DAA	**24DAA**	**186DAA**	**214DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,5a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,5a	1,3a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	1,3a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,5a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,5a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	1,3a	2,5a	0,0a	0,0a	
A.T/2019/094/PŻO	Treatment	Dose	Unit	Code	**DAA**				
					13DAA	**28DAA**	**137DAA**	**196DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
A.T/2020/151/PŻO	Treatment	Dose	Unit	Code	**DAA**				
					14DAA	**24DAA**	**35DAA**	**144DAA**	**220DAA**
	Untreated Check				0,0a	0,0D	0,0a	0,0b	0,0a

	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	1,5B	1,3bc	0,0b	0,0a
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	3,0a	2,3b	5,0a	0,0a
	Bizon	1,00	l/ha	A	0,0a	1,0c	0,5c	0,0b	0,0a
	Bizon	2,00	l/ha	A	0,0a	1,0c	0,6c	0,0b	0,0a
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	2,8a	1,0bc	0,0b	0,0a
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	3,0a	4,5a	0,0b	0,0a
A.T/2020/152/PŻO	Treatment	Dose	Unit	Code	**DAA**				
					14DAA	**25DAA**	**162DAA**	**224DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
AH/20/PszoO/33/Gr	Treatment	Dose	Unit	Code	**DAA**				
					7DAA	**14DAA**	**149DAA**	**192DAA**	
	Untreated Check				0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,40	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	CHR/H/PENDIF 599.5S.C.	0,80	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Bizon	2,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	0,50	l/ha	A	0,0a	0,0a	0,0a	0,0a	
	Komplet 560 S.C.	1,00	l/ha	A	0,0a	0,0a	0,0a	0,0a	

Table 11 – data from phytotoxicity trials Poland 2019 and 2020
Winter wheat

Test report (1)	Testing Unit GEP (2)	Country Region (3)	Dates of trials and GS (4)	Cultivar F/G (5) N/A (6)	Experimental design Test method (7) Replicates	Remarks
CHR_H_PENDIF_SEL_PL01	SynTech Research Poland Sp. z o.o. 85-027 Bydgoszcz, ul.Jagiellonska 69/1 Poland	Murczyn / Poland	21.10.2019 SPRAYE	winter wheat / Hondia F	Randomized blocks EPPO PP 1/135 (4)	Soil type: clayey sand pH 6,8
AH/19/PO/30/Gr/sel/2	Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland	Gorzyń / Poland	22.12.2019 SPRAYE	Winter wheat / Jantarka F	Randomized blocks EPPO PP 1/135 (4)	Soil type: loamy sand pH 6,8
AH/19/PO/30?BR/sel/1	Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland	Brody / Poland	15.10.2019 SPRAYE	Winter wheat / Tonacja F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 6,7

A.T/2019/092/PO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Trzciany / Poland	07.12.2019 SPRAYE	Winter wheat / Findus F	Randomized blocks EPPO PP 1/135 (4)	Soil type: loamy sand pH 5,9
A.T/2020/150/PO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Raciąż / Poland	10.11.2020 SPRAYE	Winter wheat / Keramik F	Randomized blocks EPPO PP 1/135 (4)	Soil type: loamy sand pH 6,2
A.T/2020/149/PO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Koronowo / Poland	13.10.2020 SPRAYE	Winter wheat / Arkadia F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 5,2
CHR_H_PENDIF_SEL_PL01_2020	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Żędowo / Poland	15.11.2020 SPRAYE	Winter wheat / Aleksander F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 6,8
A.T/2020/148/PO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Stęszew / Poland	19.10.2020 SPRAYE	Winter wheat / RGT Specialist F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 6,2

Notes:
(1): test report number
(2): Trial responsible entity/ officially recognized organization
(3): precise place of the trial followed by the country
(4): Crop growth stage at application timing
(5): F= field trial, G=protected crop, specify
(6): N=Natural infestation, A= Artificial inoculation
(7): Test guideline used

Winter triticale

Test report (1)	Testing Unit GEP (2)	Country Region (3)	Dates of trials and GS (4)	Cultivar F/G (5) N/A (6)	Experimental design Test method (7) Replicates	Remarks
AH/19/PszO/30/Gr/sel/2	Poznań University of Life Sciences, Research and Education Center Gorzyń, Wojska Polskiego 28, 60-637 Poznań Poland	Gorzyń / Poland	22.10.2019 SPRAYE	Winter triticale / Sekret F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 5,9
CHR_H_PENDIF_SEL_PL03	SynTech Research Poland Sp. z o.o. 85-027 Bydgoszcz, ul.Jagiellonska 69/1 Poland	Szałkowo / Poland	21.10.2019 SPRAYE	Winter triticale / Trapero F	Randomized blocks EPPO PP 1/135 (4)	Soil type: fine sand pH 4,31
CHR_H_PENDIF_SEL_PL02	SynTech Research Poland Sp. z o.o.	Huta / Poland	18.10.2019	Winter triticale / Trapero	Randomized blocks	Soil type: sandy loam

	85-027 Bydgoszcz, ul.Jagiellonska 69/1 Poland		SPRAYE	F	EPPO PP 1/135 (4)	pH 6,0
A.T/2019/093/PŻO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Kakulin / Poland	07.10.2019 SPRAYE	Winter triticale / Gringo F	Randomized blocks EPPO PP 1/135 (4)	Soil type: loamy sand pH 4,0
A.T/2019/094/PŻO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Lusowo / Poland	24.10.2019 SPRAYE	Winter triticale / Kasyno F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 6,8
A.T/2020/151/PŻO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Zamarte / Poland	23.10.2020 SPRAYE	Winter triticale / Orinoko F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 5,3
A.T/2020/152/PŻO	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Białe Błoto / Poland	16.10.2020 SPRAYE	Winter triticale / Panteon F	Randomized blocks EPPO PP 1/135 (4)	Soil type: loamy sand pH 4,7
AH/20/PszoO/33/Gr	A.T Sp. z o.o. ul. Przemysłowa 3 88-300 Mogilno Poland	Gorzyń / Poland	13.10.2020 SPRAYE	Winter triticale / Tadeus F	Randomized blocks EPPO PP 1/135 (4)	Soil type: sandy loam pH 6,1

Notes:
(1): test report number
(2): Trial responsible entity/ officially recognized organization
(3): precise place of the trial followed by the country
(4): Crop growth stage at application timing
(5): F= field trial, G=protected crop, specify
(6): N=Natural infestation, A= Artificial inoculation
(7): Test guideline used

Appendix 7 Summary of available studies: Adverse effects on beneficial organisms

None

Appendix 8 Summary of data on succeeding crop

None