REGISTRATION REPORT

Part B

Section 3

Efficacy Data and Information

Concise summary

Product code: ADM.4651.H.1.A

Product name: Nikita

Chemical active substances:

Dicamba: 312,5 g/kg
Mesotrione: 150 g/kg
Nicosulfuron: 100 g/kg

Central Zone

Zonal Rapporteur Member State: zRMS

CORE ASSESSMENT

Applicant: ADAMA

Submission date: February 2021

MS Finalisation date: April 2021(initial Core Assessment)

June 2022 (final Core Assessment)

Version history

When	What
February 2021	Initial dRR – ADAMA
April 2021	Initial zRMS assessment The report in the dRR format has been prepared by the Applicant, therefore all comments, additional evaluations and conclusions of the zRMS are presented in grey commenting boxes. Minor changes are introduced directly in the text and highlighted in grey. Not agreed or not relevant information are ~~struck through and shaded for transparency~~.
June 2022	Final report (Core Assessment updated following the commenting period). No additional information or assessments after the commenting period.

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

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

Abstract

Abstract by zRMS:

Introduction
ADM.4651.H.1.A, is a co-formulation of mesotrione, nicosulfuron and dicamba (MoA groups 27, 2 and 4, respectively, HRAC 2020) intended for the control of perennial grass weeds, and the control of annual grass and broad-leaved weeds in maize (ZEAMX). The formulation of the three actives is new in Poland. The product is intended for exclusive use with adiuvants or with the partner herbicide Efica 960 EC (S-metolachlor). The latter tank-mix partner is meant to provide an additional efficacy against monocotyledonous weeds.

Application only with adiuvants
All adiuvants tested altered the efficacy of the test item to a different degree in different weeds. Of all the weed species responding positively to the adiuvants the species of CHEAL, FUMOF, GALAP, GERPU, MATCH, THLAR and VIOAR are important weeds in maize cultures, which justifies the recommendation of using the test item ADM.4651.H.1.A only with adiuvants.

MED
The dose rate of 0,4L/ha of the test item ADM.4651.H.1.A is considered as the proper minimum effective dose rate for all types of tank-mixtures, including all the reliable tank-mix partners for ADM.4651.H.1.A.

The efficacy
The applicant has submitted 21 efficacy trials carried out in 2018-2020 in Poland (North-Eastern zone) and the Czech Republic (Maritime zone). For the proposed use with adiuvants (including different dose rates) and with the partner herbicide, the presentation of weed susceptibility for each individual weed species is rather tricky, and it is not attempted here - in the abstract part - but can be seen in the form of detailed tables in the commenting box following the efficacy chapter (starting in the page 40).

Phytotoxicity
Within 21 efficacy field trials conducted in 2018-2020, weak symptoms of necrosis (<5%) were observed only in a single trial, and this in all experimental treatments, including standard reference product. No phytotoxic symptoms were observed in any other efficacy trials. In 10 selectivity trials conducted in 2019 and 2020 no phytotoxic effects were observed either.

Succeeding crops
The applicant submitted no additional data on potential effect on rotational crops, based on the assumption that the active substances contained in ADM.4651.H.1.A have been applied for many years. Indeed, all 3 actives of the tetst item as well as the S-metolachlor contained in the partner Efica 960 EC (MoA group 15, HRAC 2020) are in use based on two-way mixtures or solo products. Nevertheless, the applicant provided some information, in the project of the Polish label, which is probably based on succeeding crops data generated for these products. To the opinion of zRMS this label information must be retained. The label warning is translated and quoted in the zRMS box following the 3.5.1 chapter: Impact on succeeding crops, p. 58.

Yield
Yield was recorded in 10 trials. No negative effect on yield or its parameters was observed in any of the selectivity trials, following application of the test item with proposed adiuvants or the partner herbicide Efica 960 EC, at 1N and 2N dose rates.

Resistance management
The resistance risk inherent in the actives of the test item has been assessed as being medium to high for nicosulfuron, low to medium for dicamba and low for mesotrione. Single application is proposed and the product is intended for exclusive application with tank-mix adiuvants or the partner herbicide Efica 960 EC. Provided that, next to the

specific label recommendations, the standard IPM practice is implemented, to the opinion of zRMS there is no need for any additional risk modifiers. The unmodified resistance risk is acceptable.

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. (e)	**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	**zRMS conclusions:**
					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 ***A18032E/ ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha Mesotrione a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha Dicamba a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha Nicosulfuron 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	Poland	Corn (ZEAMX)	F	Annual/perennial grass and broadleaved weeds	Foliar, spraying, overall	- / BBCH 12-14 Spring	a) 1 b) 1	n.a.	a) 0.4 b) 0.4	a) 60 b) 60	a) 125 b) 125	a) 40 b) 40	200-300	n.a.	Tank-mixed adjuvant needed (e.g. Adigor: 1.0 - 1.5 L/ha, Olejan: 1.5 L/ha, Styk (Insert): 0,2 L)	A
2	Poland	Corn (ZEAMX)	F	Annual/perennial grass and broadleaved weeds	Foliar, spraying, overall	- / BBCH 12-14 Spring	a) 1 b) 1	n.a.	a) 0.4 b) 0.4	a) 60 b) 60	a) 125 b) 125	a) 40 b) 40	200-300	n.a.	Application in tank mix with 0.8 L/ha Efica 960 EC	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)																
None																
Minor uses according to Article 51 (zonal uses)																
None																
Minor uses according to Article 51 (interzonal uses)																
None																

* 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
*** A18032E is the alternative, formerly used code for ADM.4651.H.1.A. Both these codes stand for the same formulation. In the present document (B3), predominantly the ADM.4651.H.1.A code is used, whereas A18032E is only used once in the applicant`s text: in the GAP table.

Column 15 "zRMS conclusions"

A	Acceptable, Safe use
R	Further refinement and/or risk mitigation measures required
C	To be confirmed by cMS
N	No safe use

3.2 Efficacy data (KCP 6)

Introduction

This document summarises the information related to the efficacy data of the plant protection product ADM.4651.H.1.A which is a co-formulation of mesotrione, nicosulfuron and dicamba for the control of perennial grass weeds, and the control of annual grass and broad-leaved weeds in corn (ZEAMX).
ADM.4651.H.1.A is a water dispersible granule formulation containing 31.25% of dicamba, 15% of mesotrione and 10% of nicosulfuron for use on corn(ZEAMX). The efficacy spectrum of the product is broad and includes annual as well as perennial broadleaf and grass weed species. The product is applied post emergence of the weeds, at crop BBCH 12-14.
The proposed use of product is:
Tank-mix with adjuvants:
ADM.4651.H.1.A(0,4 kg/ha) + Olejan 85 EC (1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Adigor 440 EC (1,0-1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Styk (Insert) (0,2 L/ha)
Tank - mix with product Efica 960 EC
ADM.4651.H.1.A(0,4 kg/ha) + Efica 960 EC (Dual Gold 960 EC) - S-metolachlor 960 g/L (0,8 L/ha)

Product ADM.4651.H.1.A is recommended to be use only with tank mix partners presented in this document.

In order to support the proposed use for ADM.4651.H.1.A with tank mix partners, efficacy and crop tolerance data are presented from 21 efficacy trials and 10 selectivity trials, conducted in corn over three seasons (2018 - 2020) in the North-Eastern (Poland) and Maritime (Czech Republic) EPPO zones. ADM.4651.H.1.A applied with tank mix partners will provide broad spectrum control against annual and perennial weeds, with good crop safety in post-emergent application.

Description of active substances

Dicamba belongs to the chemical class of benzoic acid derivatives ~~(HRAC group O)~~ (HRAC group 4 , HRAC 2020). Being a functional synthetic auxin, it acts as auxin agonist and mimics the natural auxin indole-3-acetic acid (IAA) in binding membrane-associated or soluble protein carriers, i.e. auxin binding proteins (ABPs). Dicamba is approved under Commission Directive 2008/69/EC of 1 July 2008 amending Council Directive 91/414/EEC, inclusion date 01/01/2009.
Mesotrione ~~(HRAC group F2)~~ (HRAC group 27, Triketones , HRAC 2020) is a competitive inhibitor of the essential plant enzyme 4-hydroxy-phenyl-pyruvate-dioxygenase (4-HPPD enzyme). By binding to the enzyme's active site, it prevents the normal substrate (4-hydroxyphenyl-pyruvate) from binding and inactivates the enzyme. The direct result of blocking the function of 4-HPPD is that the compounds plastoquinone and alpha-tocopherol are not synthesized. Without these compounds, the formation of carotenoid pigments is stopped. Mesotrione is approved under Regulation EC No 1107/2009, Commission Implementing Regulation (EU) 2017/725 of 24 April 2017, inclusion date 01/06/2017.
Nicosulfuron, a sulfonylurea class active substance ~~(HRAC group B)~~ (HRAC group 2 , HRAC 2020), is a systemic herbicide which inhibits the acetolactate synthase enzyme (ALS enzyme), also known as acetohydroxyacid synthase (AHAS). This enzyme catalyses the first phase of the biosynthesis of the branched chain amino acids (e.g. valine, leucine and isoleucine). Nicosulfuron is approved under Commission Directive 2008/40/EC of 28 March 2008 amending Council Directive 91/414/EEC, inclusion date 01/01/2009.

Mode of action

Table 3.2-1: Details of the active substances

Active substance	DICAMBA	MESOTRIONE	NICOSULFURON
Concentration (Unit: g/kg)	312,5 g/kg	150 g/kg	100 g/kg
Chemical group	Benzoates	Triketones	Sulfonylurea
Mode of action	auxin agonist (mimics the indoleacetic acid)	Inhibition of 4-hydroxyphenyl-pyruvate-dioxygenase (4-HPPD)	inhibition of the acetolactate synthase enzyme (ALS)
Biological action	post-emergence herbicide	post-emergence herbicide	post-emergence herbicide

Description of the plant protection product

ADM.4651.H.1.A is a water dispersible granule formulation containing 31.25% of dicamba, 15% of mesotrione and 10% of nicosulfuron for use on corn.

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

Uses		Member State	Requested rate(s)	Comments / Other relevant details on GAPs
Crop	Target(s)			
Zea mays/corn	Annual/perennial grass and broadleaved weeds	PL	ADM.4651.H.1.A / Nikita: 0,4 kg/ha + Efica 960 EC : 0,8 L/ha ADM.4651.H.1.A / Nikita: 0,4 kg/ha + Olejan 85 EC : 1,5 L/ha ADM.4651.H.1.A / Nikita: 0,4 kg/ha + Adigor 440 EC 1,0 -1,5 L/ha ADM.4651.H.1.A / Nikita: 0,4 kg/ha +Styk (Insert): 0,2 L/ha	Recommended use only in tank mix

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.

EPPO code	Scientific name
CHEAL	*Chenopodium album*
VIOAR	*Viola arvensis*
AMARE	*Amaranthus retroflexus*
SETPF(SETPU)	*Setaria pumila*
SETVI	*Setaria viridis*
LAMPU	*Lamium purpureum*
POLCO	*Polygonum convolvulus*
POLPE	*Persicaria maculosa*
POLAV	*Polygonum aviculare*
VERPE	*Veronica persica*
THLAR	*Thlaspi arvense*
HELAN	*Helianthus annuus*

EPPO code	Scientific name
ABUTH	*Abutilon theophrasti*
SOLNI	*Solanum nigrum*
DATS	*Datura stramonium*
STEME	*Stellaria media*
CAPBP	*Capsella bursa – pastoris*
MATCH	*Matricaria chamomilla*
CHEHY	*Chenopodium hybridum*
GALAP	*Galium aparine*
ALOMY	*Alopecurus myosuroides*
MATIN	*Tripleurospermum inodorum*
GERPU	*Geranium pusillum*
FUMOF	*Fumaria officinalis*
ECHCG	*Echinochloa crus-galli*
ANGAR	*Anagallis arvensis*
MELAL	~~*Silene latifolia*~~ *Melandrium album**
BRSNW	*Brassica napus*

~~* optional~~
* after PL20HEZEAMX005E trial report

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

Crop and/or situation	Crop status		Pests or group of pests controlled	Pest status	
	Major	minor		Major	minor
ZEAMX	PL		Annual/perennial grass	PL	
			broadleaved weeds	PL	

Compliance with the Uniform Principles

Trials were carried out by testing organisations, all of which followed the available EPPO guidelines and are officially recognized by the competent authorities to carry out field registration trials in accordance with the principles of Good Experimental Practice (GEP). The design and analysis of results and reporting of the studies were carried out in compliance with the general EPPO Guidelines PP 1/50(3), PP /135(4), PP 1/181(4), PP 1/152(4)

Information on trials submitted (3.1 Efficacy data)

Table 3.2-5: Presentation of trials (efficacy trials)

Crop(s) *	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials): NE	Maritime	GEP, non-GEP, official***	Comments (any other relevant information)
ZEAMX (post emergence)	*Chenopodium album* (CHEAL)	Poland	2018 2019 2020	E E E	5(5) 5(5) 4(4)	5(5)	GEP	
	TOTAL	-	2018-2020	-	14(14)	5(5)	-	
ZEAMX(post emergence)	*Echinochloa crus-galli* (ECHCG)	Poland	2018 2019 2020	E E E	5(5) 5(5) 4(4)	5(5)	GEP	

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)**
					NE	**Maritime**		
	TOTAL	-	2018-2020	-	14(14)	5(5)	-	
ZEAMX(post emergence)	*Brassica napus* (BRSNW)	Poland	2018 2019 2020	E E E	5 (5) 1(1) 1(1)	3(3)	GEP	
	TOTAL	-	2018-2020	-	7 (7)	3(3)	-	
ZEAMX(post emergence)	*Viola arvensis* (VIOAR)	Poland/Czech Republic	2018 2019 2020	E E E	1 (1) 3(3) 1(1)	1(1)	GEP	
	TOTAL	-	2018-2020	-	5 (5)	1(1)	-	
ZEAMX(post emergence)	*Amaranthus retroflexus* (AMARE)	Poland/Czech Republic	2018	E	2 (2)	5(5)	GEP	
	TOTAL	-	2018	-	2(2)	5(5)	-	
ZEAMX(post emergence)	*Setaria pumila* (SETPF)	Poland	2018 2019 2020	E E E	1(1) 2(2) 2(2)	-	GEP	
	TOTAL	-	2018-2020	-	5 (5)	-	-	
ZEAMX(post emergence)	*Setaria viridis* (SETVI)	Poland	2020	E	2(2)	-	GEP	
	TOTAL	-	2020	-	~~3(3)~~ 2(2)	-	-	
ZEAMX(post emergence)	*Polygonum convolvulus* (POLCO)	Poland/Czech Republic	2018 2019 2020	E E E	1 (1) 2(2) 2(2)	2(2)	GEP	
	TOTAL	-	2018-2020	-	5 (5)	2(2)	-	
ZEAMX(post emergence)	*Persicaria maculosa* (POLPE)	Poland/Czech Republic	2018 2020	E E	 3(3)	~~2~~ 3(2)	GEP	
	TOTAL	-	2018	-	3 (3)	~~2~~ 3(2)	-	
ZEAMX(post emergence)	*Veronica persica* (VERPE)	Poland	2018 2019 2020	E E E	2 (2) 2(2) 2(2)	-	GEP	
	TOTAL	-	2018-2019	-	6 (6)	-	-	
ZEAMX(post emergence)	*Thlaspi arvense* (THLAR)	Poland/Czech Republic	2018 2019 2020	E E E	1 (1) 2(2) 2(2)	2(2)	GEP	
	TOTAL	-	2018-2019	-	5 (5)	2(2)	-	
ZEAMX(post emergence)	*Helianthus annuus* (HELAN)	Czech Republic	2018	E	~~2(2)~~ -	~~-~~ 2 (2)	GEP	
	TOTAL	-	2018	-	~~2(2)~~ -	~~-~~ 2 (2)	-	
ZEAMX(post emergence)	*Abutilon theophrasti* (ABUTH)	Czech Republic	2018	E	~~2(2)~~ -	~~-~~ 2 (2)	GEP	

Crop(s) *	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials): NE	Maritime	GEP, non-GEP, official***	Comments (any other relevant information)
	TOTAL	-	2018	-	~~2(2)~~ -	~~-~~ 2 (2)	-	
ZEAMX(post emergence)	*Solanum nigrum* (SOLNI)	Poland/Czech Republic	2018 2019	E	 1(1)	2(2)	GEP	
	TOTAL	-	2018-2019	-	1 (1)	2(2)	-	
ZEAMX(post emergence)	*Datura stramonium* (DATST)	Czech Republic	2018	E		1 (1)	GEP	
	TOTAL	-	2018	-		1 (1)	-	
ZEAMX(post emergence)	*Stellaria media* (STEME)	Poland	2019 2020	E E	1 (1) 4(4)	-	GEP	
	TOTAL	-	2019-2020	-	5 (5)	-	-	
ZEAMX(post emergence)	*Capsella bursa – pastoris* (CAPBP)	Poland	2018 2019 2020	E E	 3(3) 2(2)	1(0)	GEP	
	TOTAL	-	2018 2019 2020	-	5 (5)	1(0)	-	
ZEAMX(post emergence)	*Matricaria chamomilla* (MATCH)	Poland	2018 2019	E	2(2)	1(0)	GEP	
	TOTAL	-	2018 2019	-	2(2)	1(0)	-	
ZEAMX(post emergence)	*Chenopodium hybridum* (CHEHY)	Poland	2019	E	1(1)	-	GEP	
	TOTAL	-	2019	-	1(1)	-	-	
ZEAMX(post emergence)	*Galium aparine* (GALAP)	Poland	2019 2020	E E	1(1) 1(1)	-	GEP	
	TOTAL	-	2019-2020	-	2(2)	-	-	
ZEAMX(post emergence)	*Alopecurus myosuroides* (ALOMY)	Poland	2019 2020	E E	1(1) 3(3)	-	GEP	
	TOTAL	-	2019-2020	-	4(4)	-	-	
ZEAMX(post emergence)	*Tripleurospermum inodorum* (MATIN)	Poland	2019 2020	E E	1(1) 1(1)	-	GEP	
	TOTAL	-	2019-2020	-	2(2)	-	-	
ZEAMX(post emergence)	*Geranium pusillum* (GERPU)	Poland	2019 2020	E E	1(1) 1(1)	-	GEP	
	TOTAL	-	2019-2020	-	2(2)	-	-	

Crop(s) *	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials): NE	Maritime	GEP, non-GEP, official***	Comments (any other relevant information)
ZEAMX(post emergence)	*Fumaria officinalis* (FUMOF)	Poland	2019 2020	E E	1(1) 3(3)	-	GEP	
	TOTAL	-	2019-2020	-	4(4)	-	-	
ZEAMX(post emergence)	*Lamium purpureum* (LAMPU)	Poland	2018 2019 2020	E E E	1(1) 2(2) 1(1)	-	GEP	
	TOTAL	-	2019-2020	-	4(4)	-	-	
ZEAMX(post emergence)	Polygonum aviculare (POLAV)	Poland	2020	E	1(1)	-	GEP	
	TOTAL	-	2020	-	1(1)	-	-	
ZEAMX(post emergence)	Anagallis arvensis (ANGAR)	Poland	2020	E	1(1)	-	GEP	
	TOTAL	-	2020	-	1(1)	-	-	
ZEAMX(post emergence)	~~Silene latifolia~~ Melandrium album (MELAL)	Poland	2020	E	1(1)	-	GEP	
	TOTAL	-	2020	-	1(1)	-	-	
~~1~~	28	-	2018-2020	-	~~21(21)~~ 16 (16)	~~-~~ 5 (4)	~~-~~	

* 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 3.2-6: Presentation of reference standards used in trials ~~(efficacy trials, preliminary trials...)~~

Crop(s)	Reference standard	Country where the product is registered (1)	Authorization number	Active substance(s)	Formulation: Type(2)	Formulation: Concentration of a.s.	Registered application rate(3)	Application rate in trials (per treatment)	Remark(4)
ZEAMX	Lumax 357,5 SE	PL	R-70/2008 (24.10.2008)	Mesotrione S-metolachlor Terbutyloazyna	SE	37,5 g/L 312,5 g/L 187,5 g/L	3,5-4,0 L/ha	4,0 L/ha	
	Lumax 357,5 SE	CZ	The authorization no. for this standard is not reported in any of the Czech Republic trials	Mesotrione S-metolachlor Terbutyloazyna	SE	37,5 g/L 312,5 g/L 187,5 g/L		4,0 L/ha	
	Sulcotrek 500 S.C	PL	R-255/2017 (19.12.2017)	Sulcotrione Terbutyloazyna	SC	173 g/L 327 g/L	2,0 L/ha	2,0 L/ha	

(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.).

3.2.1 Preliminary tests (KCP 6.1)

ADM.4651.H.1.A is a water dispersible granules formulation containing 31.25% of dicamba, 15% of mesotrione and 10% of nicosulfuron for use on grain and forage corn. The proposed maximum rate of ADM.4651.H.1.A is 0.4 kg/ha, which will deliver 125 g dicamba, 60 g mesotrione and 40 g nicosulfuron per hectare. ~~Sales~~ Solo formulations containing dicamba, mesotrione or nicosulfuron as single active substance are well-known and widely used in post-emergence on corn crop to control perennial broadleaved weeds ("BANVEL” brand), annual broadleaved weeds ("CALLISTO" brand) or annual and perennial grass weeds (“MILAGRO” brand). Additionally it is common practice to mix them in the spray tank, when the weed flora combines annual or perennial grass and broadleaved weeds. Therefore, no preliminary range-finding tests have been carried out.

NEED OF ADIUVANT
Granule formulations generally do not contain built-in adjuvants. Therefore external adjuvants are assumed to optimize foliar absorption of the herbicide, resulting in an increased post-emergence efficacy. Thus it is intended to recommend to use ADM.4651.H.1.A post-emergent together with adjuvants (commercially available oil-based adjuvants for use with herbicides in the respective country).

Background information on tested adjuvants
Adigor 440 EC is an emulsifiable concentrate adjuvant, containing 47% w/w methylated rapeseed oil. Initially developed by Syngenta for use in cereals with pinoxaden-based herbicide products, Adigor increases the foliar uptake of herbicidal active substances into the weeds. Olejan 85 EC is an emulsifiable concentrate adjuvant, containing rapeseed oil (natural origin) - 85%. Olejan 85 EC reduces the surface tension of the spray ~~volume~~ of plant protection products, improves the uniformity of the plant surface coverage, prevents from washing off by rainfall and dew. Styk (Insert) contains 81 % of ethoxylated fatty alcohols, lowers the surface tension, prevents drift, reduces washability and positively influences ~~on~~ performance of plant protection products in unfavourable weather conditions such as low humidity and low air temperature.

Materials and methods
To demonstrate the favourable impact of the addition of addition of external adjuvants, totally **21 efficacy trials were carried out** within 2018-2019, 3 products were selected from among over a dozen different adjuvants available on the market: Adigor 440 EC, Olejan 85 EC and Styk (Insert).
The comparison between ADM.4651.H.1.A applied solo at the target dose rate: 0,4 kg/ha and ADM.4651.H.1.A + selected adjuvants was tested in 2018 and 2020 in the same trials that tested the product efficacy:
ADM.4651.H.1.A(0,4 kg/ha) + Olejan 85 EC (1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Adigor 440 EC (1,0-1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Styk (Insert) (0,2 L/ha)

Table 3.2.1-1: Summary of comparison trials conducted in 2018 -2020: ADM.4651.H.1.A(0,4 kg/ha) + Adigor 440 EC (1,0-1,5 L/ha)

EPPO zone	Country	Year 2018	Year 2019	Year 2020
Maritime	Czech Republic	~~3~~ 5 (4*)	-	-
North-Eastern	Poland	~~6~~ 5	5	6
	Total	~~17~~ **21 (20*)**		

* (valid trials)

Table 3.2.1-2: Summary of comparison trials conducted in 2018 -2020: ADM.4651.H.1.A(0,4 kg/ha) + Olejan 85 EC (1,5 L/ha)

EPPO zone	Country	Year 2018	Year 2019	Year 2020
North-Eastern	Poland	-	5	6
	Total	**11**		

Table 3.2.1-3: Summary of comparison trials conducted in 2018 -2020: ADM.4651.H.1.A(0,4 kg/ha) + Styk (Insert) (0,2 L/ha)

EPPO zone	Country	Year 2018	Year 2019	Year 2020
North-Eastern	Poland	2	-	6
	Total	**8**		

A single post emergence application of ADM.4651.H.1.A at 0,4 kg/ha was compared with
ADM.4651.H.1.A at 0,4 kg/ha + Adigor 440 EC (1,0-1,5 L/ha) - Table 3.2.1-4 and 3.2.1-5
ADM.4651.H.1.A at 0,4 kg/ha + Olejan 85 EC (1,5 L/ha) - Table 3.2.1 -6
ADM.4651.H.1.A at 0,4 kg/ha + Styk (Insert) 0,2 L/ha - Table 3.2.1-7

Table 3.2.1-4 Efficacy results of comparison of ADM.4651.H.1.A at 0,4 kg/ha + Adigor 440 EC (1,0 L/ha) assessed 43-68 DAA , BBCH 51-59 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	**DAA 43-68**								
CROP BBCH	**CROP BBCH 51-59**								
	UNCK PLA/m2			**ADM.4651.H.1.A 0,4 kg/ha**			**ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,0 L/ha**		
	MEAN	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**
ABUTH	21,50	17,00	26,00	90,05	88,80	91,30	100	100	100
n	2			2			1		
ALOMY	11,00	8,50	14,50	35,00	30,00	40,00	80,45	71,30	91,25
n	4			2			3		
AMARE	15,57	8,70	28,00	94,17	88,00	100	99,58	98,30	100
n	6			6			4		
BRSNW (N)	9,70	5,00	22,00	80,93	60,00	100	96,26	82,50	100
n	9			9			5		
CAPBP	6,60	5,00	8,50	56,70	45,00	86,00	85,00	85,00	85,00
n	5			5			2		
CHEAL (N)	18,51	8,00	30,00	72,17	42,40	97,50	94,49	81,30	100
n	18			17			9		
ECHCG (N)	12,51	5,30	21,00	52,73	0,00	93,80	75,14	30,00	95,00

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A 0,4 kg/ha			ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,0 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
⊐	18			17			9		
FUMOF	6,35	5,30	8,30	55,63	42,50	92,50	86,93	85,00	90,80
⊐	4			4			3		
GALAP	15,40	11,50	19,30	63,25	37,00	89,50	70,20	70,20	70,20
⊐	2			2			1		
GERPU	7,75	7,50	8,00	31,25	12,50	50,00	81,30	81,30	81,30
⊐	2			2			1		
HELAN	8,50	7,00	10,00	84,40	81,30	87,50	98,00	98,00	98,00
⊐	2			2			1		
LAMPU	6,05	5,70	6,50	89,65	86,00	92,10	100	100	100
⊐	4			4			2		
POLCO	5,59	5,00	6,30	73,75	25,00	100	76,38	42,50	100
⊐	7			6			4		
POLPE	~~6,82~~ 6,96	6,25	8,00	92,58	78,75	100	87,83	80,00	100
⊐	~~5~~ 4			3			4		
SOLNI	7,60	6,80	8,70	95,67	87,00	100	100	100	100
⊐	3			3			1		
STEME	7,92	5,30	13,50	62,70	47,50	87,50	90,63	85,00	97,50
⊐	5			4			4		
SETPF	9,12	6,00	12,30	59,46	32,50	86,00	71,25	47,50	91,25
⊐	5			5			3		
SETVI	5,50	5,50	5,50	40,00	40,00	40,00	85,00	85,00	85,00
⊐	2			2			2		
THLAR	5,96	5,00	8,30	83,21	47,50	100	96,25	85,00	100
⊐	7			7			4		
VERPE	8,62	5,50	19,00	78,50	67,50	93,30	80,00	52,50	90,00
⊐	6			5			4		
VIOAR	7,87	6,30	10,50	71,10	60,00	89,50	71,30	71,30	71,30
⊐	3			3			1		

Table 3.2.1-5 Efficacy results of comparison of ADM.4651.H.1.A at 0,4 kg/ha + Adigor 440 EC (1,5 L/ha) assessed 43-68 DAA , BBCH 51-59 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A 0,4 kg/ha			ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,5 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	35,00	30,00	40,00	82,03	63,80	97,50
⊐	4			2			4		
BRSNW	9,70	5,00	22,00	80,93	60,00	100	97,26	92,50	100
⊐	9			9			5		
CAPBP	6,60	5,00	8,50	56,70	45,00	86,00	90,76	87,50	100
⊐	5			5			5		
CHEAL	18,51	8,00	30,00	72,17	42,40	97,50	95,42	87,60	100
⊐	18			17			13		

DAA	**DAA 43-68**								
CROP BBCH	**CROP BBCH 51-59**								
	UNCK PLA/m2			**ADM.4651.H.1.A 0,4 kg/ha**			**ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,5 L/ha**		
	MEAN	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**
ECHCG	12,51	5,30	21,00	~~64,00~~ 52,73	~~64,00~~ 0,00	~~64,00~~ 93,80	83,14	27,50	100
n	18			~~1~~ 17			13		
FUMOF	6,35	5,30	8,30	55,63	42,50	92,50	91,90	87,50	100
n	4			4			4		
GALAP	15,40	11,50	19,30	63,25	37,00	89,50	91,55	84,80	98,30
n	2			2			2		
GERPU	7,75	7,50	8,00	31,25	12,50	50,00	61,25	57,50	65,00
n	2			2			2		
LAMPU	6,05	5,70	6,50	89,65	86,00	92,10	100	100	100
n	4			4			3		
MATCH	5,65	5,30	6,00	64,15	37,50	90,80	77,90	56,30	99,50
n	2			2			2		
POLCO	5,59	5,00	6,30	73,75	25,00	100	79,32	45,00	100
n	7			6			5		
POLPE	6,96	6,25	8,00	92,58	78,75	100	91,89	85,00	100
n	4			3			4		
SOLNI	7,60	6,80	8,70	95,67	87,00	100	100	100	100
n	3			3			2		
STEME	7,92	5,30	13,50	62,70	47,50	87,50	91,16	87,50	98,75
n	5			4			5		
SETPF	9,12	6,00	12,30	59,46	32,50	86,00	72,76	50,00	97,30
n	5			5			4		
SETVI	5,50	5,50	5,50	40,00	40,00	40,00	86,30	86,30	86,30
n	2			2			2		
THLAR	5,96	5,00	8,30	83,21	47,50	100	95,26	87,50	100
n	7			7			5		
VERPE	8,62	5,50	19,00	78,50	67,50	93,30	85,63	72,50	100
n	6			5			4		
VIOAR	7,87	6,30	10,50	71,10	60,00	89,50	89,45	80,00	100
n	3			3			4		

Table 3.2.1-6 Efficacy results of comparison of ADM.4651.H.1.A at 0,4 kg/ha + Olejan 85 EC (1,5 L/ha) assessed 43-68 DAA , BBCH 51-59 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	**DAA 43-68**								
CROP BBCH	**CROP BBCH 51-59**								
	UNCK PLA/m2			**ADM.4651.H.1.A 0,4 kg/ha**			**ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha**		
	MEAN	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**
ALOMY	11,00	8,50	14,50	35,00	30,00	40,00	65,63	50,00	95,00
n	4			2			4		
BRSNW	9,70	5,00	22,00	80,93	60,00	100	100	100	100
n	9			9			2		
CAPBP	6,60	5,00	8,50	56,70	45,00	86,00	86,26	82,50	98,80
n	5			5			5		
CHEAL	18,51	8,00	30,00	72,17	42,40	97,50	91,23	82,50	100
n	18			17			9		
ECHCG	12,51	5,30	21,00	52,73	0,00	93,80	77,08	22,50	100
n	18			17			9		
FUMOF	6,35	5,30	8,30	55,63	42,50	92,50	88,33	82,50	100
n	4			4			4		

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A 0,4 kg/ha			ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
GALAP	15,40	11,50	19,30	63,25	37,00	89,50	88,80	77,60	100
n	2			2			2		
GERPU	7,75	7,50	8,00	31,25	12,50	50,00	71,00	60,00	82,00
n	2			2			2		
LAMPU	6,05	5,70	6,50	89,65	86,00	92,10	100	100	100
n	4			4			3		
MATCH	5,65	5,30	6,00	64,15	37,50	90,80	74,80	53,80	95,80
n	2			2			2		
POLCO	5,59	5,00	6,30	73,75	25,00	100	54,40	2,50	93,80
n	7			6			4		
POLPE	6,96	6,25	8,00	92,58	78,75	100	83,75	80,00	86,25
n	4			3			3		
STEME	7,92	5,30	13,50	62,70	47,50	87,50	87,20	82,50	92,50
n	5			4			5		
SETPF	9,12	6,00	12,30	59,46	32,50	86,00	69,06	35,00	100
n	5			5			4		
SETVI	5,50	5,50	5,50	40,00	40,00	40,00	81,30	81,30	81,30
n	2			2			2		
THLAR	5,96	5,00	8,30	83,21	47,50	100	91,58	82,50	100
n	7			7			4		
VERPE	8,62	5,50	19,00	78,50	67,50	93,30	79,90	47,50	100
n	6			5			4		
VIOAR	7,87	6,30	10,50	71,10	60,00	89,50	82,03	55,00	97,80
n	3			3			3		

Table 3.2.1-7 Efficacy results of comparison of ADM.4651.H.1.A at 0,4 kg/ha + Styk (Insert) (0,2 L/ha) assessed 43-68 DAA , BBCH 51-59 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A 0,4 Kg/ha			ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha +0,2 L/ha		
	MEAN	MIN	MAX	MED.	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	35,00	30,00	40,00	65,83	40,00	90,00
n	4			2			3		
BRSNW	9,70	5,00	22,00	80,93	60,00	100	~~97,26~~ 93,33	~~92,50~~ 90,00	100
n	9			9			3		
CAPBP	6,60	5,00	8,50	56,70	45,00	86,00	85,00	85,00	85,00
n	5			5			2		
CHEAL	18,51	8,00	30,00	72,17	42,40	97,50	90,60	86,30	98,30
n	18			17			6		
ECHCG	12,51	5,30	21,00	52,73	0,00	93,80	68,98	0,00	87,50
n	18			17			6		
FUMOF	6,35	5,30	8,30	55,63	42,50	92,50	81,70	72,50	86,30

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A 0,4 Kg/ha			ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha +0,2 L/ha		
	MEAN	MIN	MAX	MED.	MIN	MAX	MEAN	MIN	MAX
n	4			4			3		
GALAP	15,40	11,50	19,30	63,25	37,00	89,50	61,30	61,30	61,30
n	2			2			1		
GERPU	7,75	7,50	8,00	31,25	12,50	50,00	40,00	40,00	40,00
n	2			2			1		
LAMPU	6,05	5,70	6,50	89,65	86,00	92,10	100	100	100
n	4			4			1		
POLCO	5,59	5,00	6,30	73,75	25,00	100	37,50	17,50	57,50
n	7			6			2		
POLPE	6,82	6,25	8,00	92,58	78,75	100	84,08	81,25	86,00
n	5			3			3		
STEME	7,92	5,30	13,50	62,70	47,50	87,50	89,08	85,00	93,75
n	5			4			4		
SETPF	9,12	6,00	12,30	59,46	32,50	86,00	63,13	32,50	93,75
n	5			5			2		
SETVI	5,50	5,50	5,50	40,00	40,00	40,00	83,80	83,80	83,80
n	2			2			2		
THLAR	5,96	5,00	8,30	83,21	47,50	100	92,50	85,00	100
n	7			7			2		
VERPE	8,62	5,50	19,00	78,50	67,50	93,30	66,00	42,50	89,50
n	6			5			2		
VIOAR	7,87	6,30	10,50	71,10	60,00	89,50	65,00	50,00	80,00
n	3			3			2		

Summary

Products efficacy was assessed 43-68 days after application. ADM.4651.H.1.A used alone at dose rate 0,4 kg/ha and with adjuvants: Adigor 440 EC (1,0-1,5 L/ha), Olejan 85 EC (1,5 L/ha) and Styk (Insert) (0,2 L/ha) was compared in its efficacy against different ~~weeds, consisting of~~ annual and perennial broadleaf and grass species.

Addition of adjuvants to product ADM.4651.H.1.A applied at the dose of 0.4 kg / ha significantly influenced the level of effectiveness of controlling both monocotyledonous and dicotyledonous weed plants. The difference in the level of control is about 5% to 30% in general. POLCO is an exception, in the case of comparing the effectiveness of product ADM.4651.H.1.A solo and product ADM.4651.H.1.A with adjuvant Olejan 85 EC applied at a dose of 1.5 l / ha, the product ADM.4651.H.1.A applied solo showed ~~a slightly better effectiveness~~ higher efficacy: 73.5% ~~effectiveness once using product ADM.4651.H.1.A solo~~ compared to 54.4% of the control efficiency with the adjuvant Olejan 85 EC. Similar situation occurred with the application of the adjuvant Styk (Insert) : 37.50% compared to 73.75% for the product ADM.4651.H.1.A applied alone. In the case of using the adjuvant Styk (Insert), the effectiveness in controlling GALAP and VERPE was also slightly higher than that of the ~~when using~~ product ADM.4651.H.1.A used solo.

Comments of zRMS:

For the purpose of **adjuvant justification**, the respective efficacy trials have been summarized based on the aggregated dataset from the Maritime and the North-Eastern EPPO zones, and on the assessments on 43-68 DAA, *i.e.* at the crop`s BBCH 51-59. The test item was always tested in its target rate 0,4 L/ha. In principle, all adiuvants **altered** the efficacy of the test item to a different degree in different weeds.

Adigor 440 EC was tested at two dose rates. Adding 1,0 L/ha Adigor to ADM.4651.H.1.A altered efficacy compared to solo application by 17% on average (**-5** to +50%), and using the 1,5L/ha dose rate of this adiuvant further increased efficacy compared to 1,0L/ha dose by 2% on average (**-20** to +21%). However, in 8 weed species: ALOMY, BRSNW, CAPBP, ECHCG, FUMOF, GALAP, SETPF and SETVI, the advantage of using 1,0L/ha Adigor was ≥5% compared to solo application, and in CAPBP, ECHCG, FUMOF and GALAP using the 1,5L/ha Adigor further increased efficacy compared to 1,0L/ha dose rate by ≥5%, up to 21% in GALAP, compared to 1,0 L/ha Adigor.

Using **Olejan 85 EC** at the 1,5L/ha dose rate altered efficacy compared to solo application by 16% on average (**-19** to +41%). The advantage was >≥5% in ALOMY, BRSNW, CAPBP, CHEAL, CHEHY, ECHCG, FUMOF, GALAP, GERPU, LAMPU, MATCH, STEME, SETPF, SETVI, THLAR and VIOAR, and the two negative responses were observed in POLCO (-19%) and POLPE (-9%).

Using **Styk (Insert)** at the 0,2L/ha dose rate altered efficacy compared to solo application by 12% on average (**-36** to +44%). The advantage was >≥5% in ALOMY, BRSNW, CAPBP, CHEAL, ECHCG, FUMOF, GERPU, LAMPU, STEME, SETVI and THLAR, and the negative responses were observed in GALAP (-2%), POLCO (-36%), , POLPE (-8%), VERPE (-12%) and VIOAR (-6%).
Of all the weed species responding positively to adiuvant partner, the species of CHEAL, FUMOF, GALAP, GERPU and MATCH are considered important weeds in maize cultures, which justifies the recommendation of using the test item ADM.4651.H.1.A with adiuvants, as well as the use of one of them (Adigor) at the higher of the two proposed dose rates: 1,5L/ha. It has been noted that Styk (Insert) increased the test item`s efficacy to a lesser degree (12% on average) compared to Adigor (17%) and Olejan (16%), and that it had higher number of weeds which responded negatively (5 species) compared to Adigor (1 case) or Olejan (2 cases).

3.2.2 Minimum effective dose tests (KCP 6.2)

Out of total 21 trials performed in growth seasons: 2018-2020 , ~~11~~ 9 trials conducted in Poland (NE), in 2019 and 2020 seasons included ~~minimum effective dose~~ lower dose rate (0,3 L/ha) of the test item in ~~its~~ their treatment lists.

In growth season 2019
Reduced dose rate (75%) of product ADM.4651.H.1.A was applied to 3 out of 4 requested indications with adiuvants: Adigor 440 EC, Olejan 85 EC and product Efica 960 EC:

ADM.4651.H.1.A + Adigor 440 EC
0,3 kg/ha + 1,5 L/ha
ADM.4651.H.1.A + Olejan 85 EC
0,3 kg/ha + 1,5 L/ha
ADM.4651.H.1.A + Efica 960 EC
0,3 kg/ha +0,8 kg/ha

In growth season 2020
Reduced dose rate (75%) of product ADM.4651.H.1.A was applied for all requested indications with adiuvants: Adigor 440 EC, Olejan 85 EC , Styk (Insert) and product Efica 960 EC:

ADM.4651.H.1.A + Adigor 440 EC
0,3 kg/ha + 1,5 L/ha
ADM.4651.H.1.A +Styk (Insert)
0,3 kg/ha + 0,2 L/ha
ADM.4651.H.1.A + Olejan 85 EC
0,3 kg/ha + 1,5 L/ha
ADM.4651.H.1.A + Efica 960 EC
0,3 kg/ha +0,8 kg/ha

The aim of conducted MED trials was determination of minimum effective dose rate for the control of mono- and dicotyledonous weed plants in corn (ZEAMX).

Table 3.2-7 Minimum effective dose. Efficacy of ADM.4651.H.1.A + Adigor 440 EC at proposed target dose rate and reduced dose rate (75%) of ADM.4651.H.1.A, BBCH of the crop 51-59, DAA 43-68 (the North Eastern zone trials only; MED was not tested in the Maritime zone)

DAA	**DAA 43-68**								
CROP BBCH	**CROP BBCH 51-59**								
	UNCK PLA/m2			**ADM.4651.H.1.A + Adigor 440 EC 0,3 kg/ha + 1,5 L/ha**			**ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,5 L/ha**		
	~~MED.~~ **MEAN**	**MIN**	**MAX**	~~MED.~~ **MEAN**	**MIN**	**MAX**	~~MED.~~ **MEAN**	**MIN**	**MAX**
ALOMY	11,00	8,50	14,50	60,65	47,50	73,80	82,03	63,80	97,50
⊐	4			2			4		
BRSNW	9,70	5,00	22,00	100	100	100	97,26	92,50	100
⊐	8			2			5		
CAPBP	6,60	5,00	8,50	82,92	77,50	98,30	90,76	87,50	100
⊐	5			5			5		
CHEAL	18,51	8,00	30,00	88,16	78,80	100	95,42	87,60	100
⊐	18			8			13		
ECHCG	12,51	5,30	21,00	79,96	55,00	100	83,14	27,50	100
⊐	18			8			13		
FUMOF	6,35	5,30	8,30	84,10	78,80	93,80	91,90	87,50	100
⊐	4			4			4		
GALAP	15,40	11,50	19,30	83,80	81,30	86,30	91,55	84,80	98,30
⊐	2			2			2		
GERPU	7,75	7,50	8,00	56,25	52,50	60,00	61,25	57,50	65,00
⊐	2			2			2		
LAMPU	6,05	5,70	6,50	97,20	93,30	100	100	100	100
⊐	4			3			3		
MATCH	5,65	5,30	6,00	63,75	47,50	80,00	77,90	56,30	99,50
⊐	2			2			2		
POLCO	5,59	5,00	6,30	69,03	65,80	75,00	79,32	45,00	100
⊐	7			3			5		
STEME	7,92	5,30	13,50	79,58	77,50	82,50	91,16	87,50	98,75
⊐	5			4			5		
SETPF	9,12	6,00	12,30	64,58	45,00	85,80	72,76	50,00	97,30
⊐	5			4			4		
SETVI	5,50	5,50	5,50	76,30	76,30	76,30	86,30	86,30	86,30
⊐	2			2			2		
THLAR	5,96	5,00	8,30	87,83	77,50	100	95,26	87,50	100
⊐	7			4			5		
VERPE	8,62	5,50	19,00	83,77	75,00	93,80	85,63	72,50	100
⊐	6			3			4		
VIOAR	7,87	6,30	10,50	90,15	86,50	93,80	89,45	80,00	100
⊐	3			2			4		

Table 3.2-8 Minimum effective dose. Efficacy of ADM.4651.H.1.A + Olejan 85 EC at proposed target dose rate and reduced dose rate (75%) of ADM.4651.H.1.A, BBCH of the crop 51-59, DAA 43-68 (the North Eastern zone trials only)

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A + Olejan 85 EC 0,3 kg/ha + 1,5 L/ha			ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha		
	~~MED.~~ MEAN	MIN	MAX	~~MED.~~ MEAN	MIN	MAX	~~MED.~~ MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	46,90	41,3	52,5	65,63	50,00	95,00
n		4			2			4	
BRSNW	9,70	5,00	22,00	100	100	100	100	100	100
n		8			2			2	
CAPBP	6,60	5,00	8,50	79,18	71,30	94,50	86,26	82,50	98,80
n		5			5			5	
CHEAL	18,51	8,00	30	85,45	72,50	100	91,23	82,50	100
n		18			8			9	
ECHCG	12,51	5,30	21,00	76,51	40,00	100	77,08	22,50	100
n		18			8			9	
FUMOF	6,35	5,30	8,30	80,98	71,30	90,80	88,33	82,50	100
n		4			4			4	
GALAP	15,40	11,50	19,30	75,60	63,90	87,30	88,80	77,60	100
n		2			2			2	
GERPU	7,75	7,50	8,00	47,50	35,00	60,00	71,00	60,00	82,00
n		2			2			2	
LAMPU	6,05	5,70	6,50	96,57	92,80	99,90	100	100	100
n		4			3			3	
MATCH	5,65	5,30	6,00	59,40	43,80	75,00	74,80	53,80	95,80
n		2			2			2	
POLCO	5,59	5,00	6,30	48,33	35,00	60,00	54,40	2,50	93,80
n		7			3			4	
STEME	7,92	5,30	13,50	71,90	61,30	82,50	87,20	82,50	92,50
n		5			4			5	
SETPF	9,12	6,00	12,30	58,14	31,30	85,00	69,06	35,00	100
n		5			4			4	
SETVI	5,50	5,50	5,50	70,00	70,00	70,00	81,30	81,30	81,30
n		2			2		2		
THLAR	5,96	5,00	8,30	85,20	71,30	100	91,58	82,50	100
n		7			4			4	
VERPE	9,25	5,50	19,00	83,53	76,3	89,00	79,9	47,5	100
n		4			3			4	
VIOAR	7,87	6,30	10,50	88,00	84,50	91,50	82,03	55,00	97,80
n		3			2			3	

Table 3.2-9 Minimum effective dose. Efficacy of ADM.4651.H.1.A + Styk (Insert) at proposed target dose rate and reduced dose rate (75%) of ADM.4651.H.1.A, BBCH of the crop 51-59, DAA 43-68 (the North Eastern zone only)

DAA	**DAA 43-68**								
CROP BBCH	**CROP BBCH 51-59**								
	UNCK PLA/m2			**ADM.4651.H.1.A + Styk (Insert) 0,3 kg/ha +0,2L/ha**			**ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha +0,2 L/ha**		
	~~MED.~~ **MEAN**	**MIN**	**MAX**	~~MED.~~ **MEAN**	**MIN**	**MAX**	~~MED.~~ **MEAN**	**MIN**	**MAX**
ALOMY	11,50	11,50	11,50	45,00	45,00	45,00	67,50	67,50	67,50
n	1			1			1		
BRSNW	6,30	6,30	6,30	100	100	100	100	100	100
n	1			1			1		
CAPBP	6,60	5,00	8,50	73,80	73,80	73,80	85,00	85,00	85,00
n	5			2			2		
CHEAL	18,51	8,00	30,00	81,10	73,80	94,50	90,60	86,30	98,30
n	18			3			6		
ECHCG	12,51	5,30	21,00	75,00	72,50	80,00	68,98	0,00	87,50
n	18			3			6		
FUMOF	6,35	5,30	8,30	73,87	72,80	75,00	81,70	72,50	86,30
n	4			3			3		
GALAP	19,30	19,30	19,30	24,8	24,8	24,8	61,3	61,3	61,3
n	1			1			1		
GERPU	7,50	7,50	7,50	20,00	20,00	20,00	40,00	40,00	40,00
n	1			1			1		
POLCO	7,50	7,50	7,50	32,50	32,50	32,50	57,50	57,50	57,50
n	1			1			1		
POLPE	6,25	6,25	6,25	78,75	78,75	78,75	85,00	85,00	85,00
n	1			1			1		
STEME	7,92	5,30	13,50	77,12	73,80	83,75	89,08	85,00	93,75
n	5			3			4		
SETPF	9,12	6,00	12,30	54,38	27,50	81,25	63,13	32,50	93,75
n	5			2			2		
SETVI	5,50	5,50	5,50	~~48,33~~ 72,50	~~0,00~~ 72,50	72,50	83,80	83,80	83,80
n	2			2			2		
VERPE	6,00	6,00	6,00	85,30	85,30	85,30	89,50	89,50	89,50
n	1			1			1		
THLAR	5,96	5,00	8,30	86,90	73,80	100	92,50	85,00	100
n	7			2			2		

Table 3.2-10 Minimum effective dose. Efficacy of ADM.4651.H.1.A + Efica 960 EC at proposed target dose rate and reduced dose rate (75%) of ADM.4651.H.1.A , BBCH of the crop 51-59, DAA 43-68 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	DAA 43-68								
CROP BBCH	CROP BBCH 51-59								
	UNCK PLA/m2			ADM.4651.H.1.A +Efica (Dual Gold) 960 EC 0,3kg/ha + 0,8 L/ha			ADM.4651.H.1.A +Efica (Dual Gold) 960 EC 0,4kg/ha +0,8L/ha		
	~~MED.~~ MEAN	MIN	MAX	~~MED.~~ MEAN	MIN	MAX	~~MED.~~ MEAN	MIN	MAX
CAPBP	6,60	5,00	8,50	83,80	83,80	83,80	88,78	82,50	100
n		5			2			5	
CHEAL	18,51	8,00	30,00	89,43	83,80	99,30	94,67	81,30	100
n		18			3			14	
ECHCG	12,51	5,30	21,00	88,75	85,00	96,25	86,60	60,80	100
n		18			3			14	
FUMOF	6,35	5,30	8,30	86,93	85,00	89,50	91,98	88,80	100
n		4			3			4	
STEME	7,92	5,30	13,50	83,78	83,75	83,80	90,73	88,75	97,30
n		5			3		5		
SETPF	9,12	6,00	12,30	61,25	37,50	85,00	78,01	45,00	100
n		5			2			5	
SETVI	5,50	5,50	5,50	86,30	86,30	86,30	88,80	88,80	88,80
n		2			2			2	
THLAR	5,96	5,00	8,30	91,90	83,80	100	95,22	82,50	100
n		7			2			6	

Summary and conclusions on the minimum effective dose

According to the presented results, the recommended target dose rates for requested indications: ADM.4651.H.1.A + Adigor 440 EC ; ADM.4651.H.1.A +Styk (Insert); ADM.4651.H.1.A + Olejan 85 EC ADM.4651.H.1.A + Efica 960 EC, provided the best overall control and should be considered most effective against mono- and dicotyledonous weed plants in corn (ZEAMX).

Comments of zRMS:

In order to demonstrate MED, the respective efficacy trials have been summarized based on the aggregated dataset from the Maritime and the North-Eastern EPPO zones, and on the assessments on 43-68 DAA, i.e. at the crop`s BBCH 51-59. The proposed dose rate of 0,4 kg/ha test item was compared to the 0,3 kg/ha (75% target dose rate), whereas the adiuvants and the partner herbicide Efica used in the MED trials were always applied at their target rate.

The summary presented by the applicant includes **all** efficacy trials, with the result that the target dose rate of 0,4 L/ha occurs in higher number of trials compared to the lower dose (0,3 L/ha), *e.g.* CHEAL in Efica treatments: 0,3L/ha – 3 data points, 0,4L/ha – 14 data points. The zRMS considers such an approach inappropriate. Therefore the additional MED summary is proposed, including **only MED trials**. There, although differences still exist between the no. of data points for the compared dose rates, they result only from different weed incidence in trials, and not from inclusion of trials in which the 0,3L/ha dose was not tested at all. Still, any further refining of the data set, in order to analyse only equal number of trials for each weed, would result in too much data being excluded from the dossier and for that reason it was abandoned by the zRMS. The summary is pasted below as the filerable and sortable excel spreadsheet.

MED summary zRMS.xlsx

The data reveal clear dose response between the lower and the target dose rates of ADM.4651.H.1.A, mostly when used with Adigor 440 EC and with Olejan 85 EC, in all weed species except for BRSNW and LAMPU, for which the adiuvants seem to be unnecessary. In CHEHY, MATCH, and SOLNI which occurred in a limited number of trials, the data on the use with Styk (Insert) is missing completely, as this adiuvant was only used in 4 trials out of 8 intended for MED testing.
The use of the partner herbicide Efica 960 EC aims at increasing efficacy against monocot weeds compared to uses with adiuvants. This comparison is subject of Efficacy chapter. As for the test item dose response, when used with partner herbicide Efica 960 EC: In ALOMY the response to 0,4 L/ha dose rate is evident, as it is in SETPF (14 and 16% respectively). The response close to 5% was observed in ECHCG, but the efficacy increase in SETVI is negligible (2,5%).
Based on the submitted data from 8 MED trials it is concluded that the dose rate of 0,4L/ha of the test item ADM.4651.H.1.A, as used with the tested adiuvants and the partner herbicide proposed, is justified as the minimum effective dose to control the target weed species.

3.2.3 Efficacy tests (KCP 6.2)

The total of 21 efficacy trials to determine efficacy of ADM.4651.H.1.A applied with tank-mix partners: adiuvants: Adigor 440 EC, Olejan 85 EC, Styk (Insert) and herbicide: Efica 960 EC (Efica 960 EC is clone of registrated product of Dual Gold 960 EC) , in controlling annual/perennial grass and broadleaved weeds in ZEAMX , were conducted in years 2018-2020. In 2018, 5 trials were conducted in the Czech Republic (Maritime EPPO zone) and 5 trials were conducted in Poland (North-Eastern zone). In 2019 and 2020 all trials were conducted in Poland (North-Eastern zone).

Materials and methods
The total of 21 efficacy trials to determine efficacy of ADM.4651.H.1.A applied with tank-mix partners: adjuvants: Adigor 440 EC, Olejan 85 EC, Styk (Insert) and herbicide: Efica 960 EC, in controlling annual/perennial grass and broadleaved weeds in ZEAMX, were conducted in years 2018-2020 in different edaphic/climatic conditions typical for the protected tested crop plant.
Site
Trials were conducted in regions where ZEAMX is grown commercially. The experiments were established on a set of complete randomized blocks in 4 replications (18 trials) and 3 trials were established on a set of complete randomized blocks in 3 replications (CZ18HEZEAMX102C; CZ18HEZEAMX102A, CZ18HEZEAMX205C).

Testing units:
1) BIOTEK Agriculture Sp z o.o..
2) Zemedelsky vyzkumny ustav Kromeriz,s.r.o.
3) Czech University of Life Sciences Prague
4) Poznań University of Life Sciences, Research and Education Center Gorzyń 5.
5) ZS Nechanice, Štolbova 319, 503 15 Nechanice, Czech Republic
6) AGRECO Sp. z o.o. Oddział Gać 64A, 55-200 Oława
7) Staphyt Sp z o.o.
6) Fertico Sp z o.o.
The testing units have been mandated to conduct research in the field of efficacy of plant protection products and are officially GEP recognized.

Experimental details
The efficacy trials were designed, conducted and reported according to the following EPPO guidelines:
1. PP 1/135 (4) Phytotoxicity assessment;
2. PP 1/152 (4) Design and analysis of efficacy evaluation trials;
3. PP 1/181 (4) Conduct and reporting of efficacy evaluation trials including good experimental practice;
4. PP 1/50 (3) Weeds in corn

Assessment methods

Statistical Analysis

In case of statistical analysis, data were analysed using two-way analysis of variance (ANOVA). The probability of non-significant differences occurring between treatment means was 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 package of ARM Research Manager 9 Software (Gylling Data Management).

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).
- Efficacy was assessed for each weed species based on the evaluation of weed destruction comparable to control plots in percentage scale from “0” to “100”, in which “0” meant no damage whereas “100” meant a total damage found.
  Evaluation of weed control consisted of 3 elements:
- determination of the number of weed species /m^2 (COUPLA) in the untreated plots,
- assessment of the % surface coverage for each weed species – in the untreated plots,
- assessment of the visual efficacy of weed control for each individual weed.

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).

Applications methods and rates

The application were conducted with BICCAI and Schachtner SPRBIC, Sprayer with a boom P07/P10/P30 , SPRAYE/UP 02/UP 30.

Table 3.2-11: Details on trial methodology

Guidelines	General guidelines	PP 1/135(4) PP 1/181(4) PP 1/152(4) PP 1/226(2) (PL19HEZEAMX044C only)
	Specific guidelines	PP 1/50(3)
Experimental design	Plot design	RCBD (21)
	Plot size	15,05-25,20 m²
	Number of replications	3 (3) - 4 (18)
Crop	Trials per crop	ZEAMX -21 (20 valid trials)
	Varieties per crop	ZEAMX: PR39H32, SY Enigma, Cassandro, Farmerino, RGT Babexx, Sixxtus, Musixx, Amoroso, Ricardinio, LG 31.225, Farmfire, Anovi CS , Ronaldinio, SY Talisman, Rosomak
	Sowing period	ZEAMX: 25.04.2018, 25.04.2018, 25.04.2018, 25.04.2018, 25.04.2018, 27.04.2018, 27.04.2018, 27.04.2018, 28.04.2018, 03.05.2018, 19.04.2019, 22.04.2019, 21.04.2019, 25.04.2019, 29.04.2019, 14.04.2020, 21.04.2020, 22.04.2020 23.04.2020, 24.04.2020, 29.04.2020
Application	Crop stage (BBCH)* at application	ZEAMX: BBCH ~~12-15~~ 12-16
	Timing Pest stage at application (1)	Post-emergence CHEAL - BBCH 10-49 ECHCG -BBCH 09-51 BRSWN- BBCH 09-39

		VIOAR- BBCH 10-55 AMARE- BBCH 00-31 SETPF(SETPU)- BBCH 10-16 LAMPU- BBCH 12-16 POLCO – BBCH 12-31 POLPE – BBCH 11-16 POLAV – BBCH 10-12 VERPE- BBCH 10-21 THLAR- BBCH 12-31 HELAN- BBCH 10-14 ABUTH- BBCH 11-22 SOLNI – BBCH 12-16 DASTS- BBCH 12-14 STEME- BBCH 11-22 CAPBP – BBCH 12-16 MATCH- BBCH 10-30 CHEHY- BBCH 10-16 GALAP- BBCH 12-21 ALOMY- BBCH 10-13 MATIN- BBCH 10-12 GERPU- BBCH 12-16 FUMOF- BBCH 10-12 ANGAR-BBCH 10-16 MELAL -10-14
	Number of applications Intervals between applications	1 (21)
	Spray volumes	200 – 300 L/ha
Assessment	Assessment types	% of weed coverage, number of weeds/m²,assessment of the visual efficacy of weed control for each individual weed
	Assessment dates	A1 – 13-14 DAA A2- 26 -39 DAA A3 – 43-59 DAA
Other relevant information	e.g. Soil type, pH (in case of soil active substance …)	sandy clay loam, loam, sandy loam , loamy sand , silty clay loam, Clayey sand, sandy clay loam, Clay sandy loam pH: 5,7-7,19
	e.g. Natural / artificial innoculation…	N
	e.g. Field / Greenhouse...	F

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

Annual/perennial grass and broadleaved weeds in ZEAMX.

The total of 21 efficacy trials to determine efficacy of ADM.4651.H.1.A applied with tank-mix partners: adjuvants: Adigor 440 EC, Olejan 85 EC, Styk (Insert) and herbicide: Efica 960 EC , in controlling annual/perennial grass and broadleaved weeds in ZEAMX , were conducted in years 2018-2020. In 2018, 5 trials were conducted in the Czech Republic (Maritime EPPO zone) and 5 trials were conducted in Poland (North-Eastern zone). In 2019 all 5 trials and in 2020 all 6 trials were conducted in Poland (North-Eastern zone).

<u>Trials conducted in 2018 : Czech Republic (MAR) and Poland (NE)</u>
In growth season 2018 totally 10 trials were conducted: 5 in Czech Republic(MAR) and 5 in Poland . (NE) .
~~Trials~~ In trials: CZ18HEZEAMX102A, CZ18HEZEAMX102B , CZ18HEZEAMX102C, 2 out of requested indications were tested:
Product ADM.4651.H.1.A with lower dose rate of adiuvant Adigor 440 EC : 0,4 kg/ha + 1,0 L/ha and
Product ADM.4651.H.1.A with target dose rate of product Efica 960 EC : 0,4 kg/ha + 0,8 L/ha.
In all 3 trials tank mix of ADM.4651.H.1.A with adiuvant was tested on 2 separate experimental treatments: in one of the treatments the product was applied (A) at BBCH 13-14 of the crop plant

(CZ18HEZEAMX102A) on second of the treatment the application was slightly later (B) - at BBCH 15-16 of the crop plant (CZ18HEZEAMX102A). ~~on~~ In the second ~~of~~ trial: CZ18HEZEAMX102B, the products were applied accordingly: at BBCH 12-13 (A) and at BBCH 14-15 (B). ~~on~~ In the third ~~of~~ trial: CZ18HEZEAMX102C the products were applied at BBCH 13-14 (A) and BBCH 14-18 (B).

~~Regarding~~ In the trial CZ18HEZEAMX102A, due to not sufficient infestation level for key weeds: BRSNW , ECHCG and CHEAL, the investigators decided to introduce more weed plants by sowing them directly on experimental plots. In the respective trial report, ~~we can find different separate~~ the data of number and coverage of introduced and naturally occurred weed plants: BRSNW , ECHCG and CHEAL are reported separately, and ~~also~~ the efficacy for the introduced and naturally occurred weed plants: BRSNW , ECHCG and CHEAL, is calculated separately either.
There are not enough information and ~~needed~~ necessary details about the reasons of such such attitude, which make these records not realistic and not representative. Therefore the data obtained from this trial are not included in efficacy calculation.
Regarding trials CZ18HEZEAMX102B, CZ18HEZEAMX102C and also trials performed in Poland in growth season 2018: PL18HEZEAMX099A, PL18HEZEAMX099B, PL18HEZEAMX099C, the aim of 2 application terms for tank mix of product ADM.4651.H.1.A with lower dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,0 L/ha was ~~determination of~~ to determine differences in efficacy to control weed plants present on the trial locations, depending on earlier or later post emergence application. The efficacy of treatment after later application in each one of the situations was significantly lower. The highest efficacy was reached 5 weeks after application at the early post emergence term.
Slight, lessening , symptoms of phytotoxicity (1,3%- 2,0%) were recorded at the first assessment (14 DAA).
In trial CZ18HEZEAMX102C, additional assessment was performed at BBCH 87 of the crop (119DAA/107 DAB), showing very high level of weed control, nevertheless significantly lower on treatment where later application (B) was performed.

In trials PL18HEZEAMX099A, PL18HEZEAMX099B, PL18HEZEAMX099C, conducted in Poland in growth season 2018, 2 out of requested indications were tested:
Product ADM.4651.H.1.A with lower dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,0 L/ha and
Product ADM.4651.H.1.A with target dose rate of product Efica 960 EC: 0,4 kg/ha + 0,8 L/ha.
In all 3 trials the tank mix of ADM.4651.H.1.A with adiuvant was tested on 2 separate experimental treatments: in one of the treatments product was applied (A) at BBCH 12 of the crop plant (PL18HEZEAMX099A) and at BBCH 14 (PL18HEZEAMX099B , PL18HEZEAMX099C) in the second treatment the application was slightly later (B) - at BBCH 14 of the crop plant (PL18HEZEAMX099A), at BBCH 16 (PL18HEZEAMX099B) or at BBCH 15 (PL18HEZEAMX099C).
In the trial : PL18HEZEAMX099A, the efficacy of the product ADM.4651.H.1.A with lower dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,0 L/ha applied at 2 different BBCH stages of the crop plant does not differ, stays on the same level, as both application terms are included within GAP.
In the trials: PL18HEZEAMX099B and PL18HEZEAMX099C the efficacy of the product ADM.4651.H.1.A with lower dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,0 L/ha applied at 2 different BBCH stage of the crop plant differs significantly, as the second application term is later then recommended in GAP .

In the trials CZ18HEZEAMX205B and CZ18HEZEAMX205C one of the requested indication was tested: the product ADM.4651.H.1.A with higher dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,5 L/ha, in both trials the application (A) was done at one BBCH term: 14-15 in trial CZ18HEZEAMX205B and 13-15 in trial CZ18HEZEAMX205C. The highest efficacy recorded in both trials was reached 5 - 6 weeks after application. In the CZ18HEZEAMX205C trial, additional assessment was performed at BBCH crop stage 87 (117 DAA) showng high level of weed control.

In trials PL18HEZEAMX100C and PL18HEZEAMX100B, conducted in Poland in 2018, 2 out of requested indications were tested:the product ADM.4651.H.1.A with higher dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,5 L/ha and the product ADM.4651.H.1.A with the target dose rate of adiuvant Styk (Insert) : 0,4 kg/ha + 0,2 L/ha. In both trials, one application (A) was performed at BBCH 14 of the crop plant. The highest efficacy recorded in both trials was reached 4 weeks after the application.

Trials conducted in Poland in growth season: 2019

Totally 5 efficacy trials were conducted in Poland (NE) in the growth season 2019.
In all 5 trials, 3 out of the requested indications were tested:
The product ADM.4651.H.1.A with higher dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,5 L/ha,
The product ADM.4651.H.1.A with target dose rate of adiuvant Olejan 85 EC : 0,4 kg/ha + 1,5 L/ha
The product ADM.4651.H.1.A with target dose rate of product Efica 960 EC : 0,4 kg/ha + 0,8 L/ha
In all 5 trials one application (A) was performed , at BBCH 12-13 of the crop plant (PL19HEZEAMX044A, PL19HEZEAMX044B, PL19HEZEAMX044C, PL19HEZEAMX044D), or at BBCH 14 (PL19HEZEAMX044E). The highest efficacy recorded on both trials was reached 4 weeks after application.

Trials conducted in Poland growth season 2020

Totally 6 efficacy trials were conducted in Poland (NE) in the growth season 2020:
In all 6 trials all requested indications were tested :
The product ADM.4651.H.1.A with higher dose rate of adiuvant Adigor 440 EC: 0,4 kg/ha + 1,5 L/ha
The product ADM.4651.H.1.A with target dose rate of adiuvant Styk (Insert): 0,4 kg/ha + 0,2 L/ha
The product ADM.4651.H.1.A with target dose rate of adiuvant Olejan 85 EC: 0,4 kg/ha + 1,5 L/ha
The product ADM.4651.H.1.A with target dose rate of product Efica 960 EC: 0,4 kg/ha + 0,8 L/ha
In all 6 trials one application (A) was performed, at BBCH 12-13 of the crop plant (PL20HEZEAMX005A), BBCH 13 (PL20HEZEAMX005B, PL20HEZEAMX005C, PL20HEZEAMX005E), or at BBCH 13-15 (PL20HEZEAMX005D, PL20HEZEAMX005F). The first symptoms of weed control (wilting and delicate discoloration of the leaves) occurred 4-6 days after the application (4-6 DA-A). The highest efficacy recordedion both trials was reached 4 weeks after application.

Granule formulations generally do not contain built-in adjuvants. Therefore external adjuvants are assumed to optimize foliar absorption of the herbicide, resulting in an increased post-emergence efficacy. Thus it is intended to recommend to use ADM.4651.H.1.A post-emergence together with an adjuvant (commercially available adjuvants for use with herbicides in the respective country), therefore all efficacy data presented in the dossier cover~~ing~~ tank-mix applications only.
The product: ADM.4651.H.1.A is applied post emergence of the weeds, at crop BBCH 12-15, ~~in~~ as:
Tank-mix with adjuvants:
ADM.4651.H.1.A(0,4 kg/ha) + Olejan 85 EC (1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Adigor 440 EC (1,0-1,5 L/ha)
ADM.4651.H.1.A (0,4 kg/ha)+ Styk (Insert) (0,2 L/ha)
Tank - mix with product Efica 960 EC;
ADM.4651.H.1.A(0,4 kg/ha) + Efica 960 EC (0,8 L/ha).
Efficacy data are presented in tables below:

ADM.4651.H.1.A + Adigor 440 EC (0,4kg/ha + 1,0-1,5L/ha) control of annual/perennial grass and broadleaved weeds in ZEAMX

Indication: ADM.4651.H.1.A (0,4kg/ha) + Adigor 440 EC (1,0 -1,5L/ha) was tested in 15 trials, in growth seasons 2018-2020, in controlling annual/perennial grass and broadleaved weeds in post-emergence application in ZEAM. The highest level of control was recorded after 6-8 weeks after application (BBCH of the crop 51-59, DAA 43-68).
ADM.4651.H.1.A (0,4kg/ha) + Adigor 440 EC at lower dose: 1.0 L/ha was tested in 11 trials in growth seasons: 2018 and 2020.
ADM.4651.H.1.A (0,4kg/ha) + Adigor 440 EC at higher dose: 1,5 L/ha was tested in 15 trials in growth seasons: 2018-2020.
Majority of broadleaved weed plants present~~ed~~ in trial location were susceptible and highly susceptible to the applied tank-mix: ADM.4651.H.1.A (0,4kg/ha) + adiuvant Adigor 440 EC at both dose rates (1,0 L/ha -1,5 L/ha), best efficacy recorded controlling LAMPU – 100% , SOLNI - 100%, AMARE- 98,25% and 99,58% , FUMOF – 91,9% and 86,93% , STEME – 91,16% - 90,63% respectively for options with higher and lower dose of Adigor 440 EC.
Annual/perennial grasses were mostly moderately susceptible to the applied tank-mix: ADM.4651.H.1.A (0,4kg/ha) + adiuvant Adigor 440 EC at both dose rates (1,0L/ha -1,5L/ha), ALOMY -82,03 % and

80,45%, SETPU 72,76% - 71,25% , SETVI 86,3% and 85 % respectively for options with higher and lower dose of Adigor 440 EC.
ADM.4651.H.1.A (0,4kg/ha) +Adigor 440 EC (1,0 -1,5L/ha) performed at very high or high level of control for single appeared weed plants: ABUTH – 98,8%; ANGAR - 87,5% (only with 1,5L/ha Adigor), CHEHY -100%, DATS – 93,8%% (only with 1,5L/ha Adigor), HELAN - 95%, MATIN - ~~100 %~~ 91,3-96,3% with 1,0-1,5L/ha Adigor. ~~ECHCG~~ Detailed efficacy records are specified in tables: 3.2.12 and 3.2.-13.

Table 3.2-12 Efficacy of product ADM.4651.H.1.A (0,4 kg/ha) applied with tank-mix partner: Adigor 440 EC (1,5 L/ha); BBCH of the crop 51-59, DAA 43-68 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	**DAA 43-68**														
CROP BBCH	**CROP BBCH 51-59**														
	UNCK PLA/m2			**ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,5 L/ha**			**LUMAX 537,5 SE 3,5 L/ha**			**LUMAX 537,5 SE 4 L/ha**			**Sulcotrek 500 SC 2 L/ha**		
	MEAN	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**
ALOMY	11,00	8,50	14,50	82,03	63,80	97,50	-			-			14,08	0,00	56,30
n	4			4			-			-			4		
AMARE	15,57	8,70	28,00	98,25	96,50	100	100	100	100	100	100	100	-		
n	6			2			2			2			-		
ANGAR	14,50	14,50	14,50	87,50	87,50	87,50	-			-			98,3	98,3	98,3
n	1			1			-			-			1		
BRSNW	9,70	5,00	22,00	97,26	92,50	100	99,80	99,80	99,80	100	100	100	100	100	100
n	9			5			1			3			2		
CAPBP	6,60	5,00	8,50	90,76	87,50	100	-			-			99,76	98,80	100
n	5			5			-			-			5		
CHEAL	18,51	8,00	30,00	95,42	87,60	100	100	100	100	100	100	100	99,58	96,30	100
n	18			13			2			3			9		
ECHCG	12,51	5,30	21,00	83,14	27,50	100	52,50	45,00	60,00	93,33	90,00	100	64,56	0,00	100
n	18			13			2			3			9		
FUMOF	6,35	5,30	8,30	91,90	87,50	100	-			-			96,75	90,00	100
n	4			4			-			-			4		
GALAP	15,40	11,50	19,30	91,55	84,80	98,30	-			-			97,25	94,50	100
n	2			2			-			-			2		
GERPU	7,75	7,50	8,00	61,25	57,50	65,00	-			-			93,40	86,80	100
n	2			2			-			-			2		
LAMPU	6,05	5,70	6,50	100	100	100	-			100	100	100	100	100	100
n	4			3			-			1			3		
MATCH	5,65	5,30	6,00	77,90	56,30	99,50	-			-			91,00	82,00	100
n	2			2			-			-			2		
POLCO	5,59	5,00	6,30	79,32	45,00	100	100	100	100	100	100	100	93,10	84,80	99,80
n	7			5			1			1			4		
POLPE	6,82	6,25	8,00	91,89	85,00	100	100	100	100	-			78,43	70,00	92,80
n	5			4			1			-			3		
SOLNI	7,60	6,80	8,70	100	100	100	100	100	100	-			100	100	100
n	3			2			1			-			1		
STEME	7,92	5,30	13,50	91,16	87,50	98,75	-			-			94,15	87,50	100
n	5			5			-			-			5		

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Adigor 440 EC 0,4kg/ha + 1,5 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
SETPF	9,12	6,00	12,30	72,76	50,00	97,30	-			88,00	88,00	88,00	39,40	0,00	98,80
n	5			4			-			1			4		
SETVI	5,50	5,50	5,50	86,30	86,30	86,30	-			-			96,90	96,30	97,50
n	2			2			-			-			2		
THLAR	5,96	5,00	8,30	95,26	87,50	100	100	100	100	100	100	100	100	100	100
n	7			5			1			1			4		
VERPE	8,62	5,50	19,00	85,63	72,50	100	-			95,00	95,00	95,00	96,00	84,50	100
n	6			4			-			2			4		
VIOAR	7,87	6,30	10,50	89,45	80,00	100	-			-			94,67	84,50	100
n	3			4			-			-			3		

Table 3.2-13 Efficacy of product ADM.4651.H.1.A (0,4 kg/ha) applied with tank-mix partner: Adigor 440 EC (1,0 L/ha); BBCH of the crop 51-59, DAA 43-68 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Adigor 440 EC 0,4 kg/ha + 1,0 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	80,45	71,30	91,25	-			-			14,08	0,00	56,30
n	4			3			-			-			4		
AMARE	15,57	8,70	28,00	99,58	98,30	100	100	100	100	100	100	100	-		
n	6			4			2			2			-		
ANGAR	5,50	5,50	5,50	94,50	94,50	94,50	-			-			98,30	98,30	98,30
n	1			1			-			-			1		
BRSNW	9,70	5,00	22,00	96,26	82,50	100	99,80	99,80	99,80	100	100	100	100	100	100
n	9			5			1			3			2		
CAPBP	6,60	5,00	8,50	85,00	85,00	85,00	-			-			99,76	98,80	100
n	5			2			-			-			5		
CHEAL	18,51	8,00	30,00	94,49	81,30	100	100	100	100	100	100	100	99,58	96,30	100
n	18			9			2			3			9		
ECHCG	12,51	5,30	21,00	75,14	30,00	95,00	52,50	45,00	60,00	93,33	90,00	100	64,56	0,00	100
n	18			9			2			3			9		
FUMOF	6,35	5,30	8,30	86,93	85,00	90,80	-			-			96,75	90,00	100
n	4			3			-			-			4		
GERPU	7,75	7,50	8,00	81,30	81,30	81,30	-			-			93,40	86,80	100
n	2			1			-			-			2		
LAMPU	6,05	5,70	6,50	100	100	100	-			100	100	100	100	100	100
n	4			2			-			1			3		
POLCO	5,59	5,00	6,30	76,38	42,50	100	100	100	100	100	100	100	93,10	84,80	99,80
n	7			4			1			1			4		
POLPE	6,82	6,25	8,00	87,83	80,00	100	100	100	100	-			78,43	70,00	92,80

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Adigor 440 EC 0,4 kg/ha + 1,0 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
n	5			4			1			-			3		
STEME	7,92	5,30	13,50	90,63	85,00	97,50	-			-			94,15	87,50	100
n	5			4			-			-			5		
SETPF	9,12	6,00	12,30	71,25	47,50	91,25	-			88,00	88,00	88,00	39,40	0,00	98,80
n	5			3			-			1			4		
SETVI	5,50	5,50	5,50	85,00	85,00	85,00	-			-			96,90	96,30	97,50
n	2			2			-			-			2		
STEME	7,70	5,30	13,50	90,63	85	97,50	-			-			94,06	87,50	100
n	4			4			-			-			4		
THLAR	5,96	5,00	8,30	96,25	85,00	100	100	100	100	100	100	100	100	100	100
n	7			4			1			1			4		
VERPE	8,62	5,50	19,00	80,00	52,50	90,00	-			95,00	95,00	95,00	96,00	84,50	100
n	**6**			**4**			**-**			**2**			**4**		

ADM.4651.H.1.A + Olejan 85 EC (0,4kg/ha + 1,5L/ha) control of annual/perennial grass and broad-leaved weeds in ZEAMX

Indication: ADM.4651.H.1.A (0,4kg/ha) + Olejan 85 EC (1,5L/ha) was tested in 11 trials, in growth seasons 2019 and 2020, in controlling annual/perennial grass and broadleaved weeds in post-emergence application in ZEAM. The highest level of control was recorded after 6-8 weeks after application (BBCH of the crop 51-59, DAA 43-68).
Tank-mix ADM.4651.H.1.A (0,4kg/ha) + Olejan 85 EC (1,5L/ha) showed good control of most of broad-leaved weed plants present at trial locations, with the best efficacy recorded for BRSNW, LAMPU – 100% , CHEAL – 91,23%, THLAR -91,58% , FUMOF – 88,33%, STEME – 87,2% .
Annual/perennial grass weeds were moderately susceptible to applied tank-mix ADM.4651.H.1.A (0,4kg/ha) + Olejan 85 EC (1,5L/ha): ECHCG – 77,08 %, SETVI 81,3%, and moderately tolerant: ALOMY 65,63% and SETPU 69,96 %. However, the highest single value for ALOMY was 95% (PL20HEZEAMX005F) and the best single value for SETPU was 100% (PL19HEZEAMX044B).
ADM.4651.H.1.A (0,4kg/ha) + Olejan 85 EC (1,5L/ha) performed very high level of control for single appeared weed plants: CHEHY – 100%, SOLNI – 100 %, MATIN – 87,5%, and ANGAR -81,5%.

Table 3.2-14 Efficacy of product ADM.4651.H.1.A (0,4 kg/ha) applied with tank-mix partner: Olejan 85 EC (1,5 L/ha); BBCH of the crop 51-59, DAA 43-68 (only the North-Eastern zone trials available)

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	65,63	50,00	95,00	-			-			14,08	0,00	56,30
n	4			4			-			-			4		
BRSNW	9,70	5,00	22,00	100	100	100	99,80	99,80	99,80	100	100	100	100	100	100
n	9			2			1			3			2		
CAPBP	6,60	5,00	8,50	86,26	82,50	98,80	-			-			99,76	98,80	100

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
n	5			5			-			-			5		
CHEAL	18,51	8,00	30,00	91,23	82,50	100	100	100	100	100	100	100	99,58	96,30	100
n	18			9			2			3			9		
ECHCG	12,51	5,30	21,00	77,08	22,50	100	52,50	45,00	60,00	93,33	90,00	100	64,56	0,00	100
n	18			9			2			3			9		
FUMOF	6,35	5,30	8,30	88,33	82,50	100	-			-			96,75	90,00	100
n	4			4			-			-			4		
GALAP	15,40	11,50	19,30	88,80	77,60	100	-			-			97,25	94,50	100
n	2			2			-			-			2		
GERPU	7,75	7,50	8,00	71,00	60,00	82,00	-			-			93,40	86,80	100
n	2			2			-			-			2		
LAMPU	6,05	5,70	6,50	100	100	100	-			100	100	100	100	100	100
n	4			3			-			1			3		
MATCH	5,65	5,30	6,00	74,80	53,80	95,80	-			-			91,00	82,00	100
n	2			2			-			-			2		
POLCO	5,59	5,00	6,30	54,40	2,50	93,80	100	100	100	100	100	100	93,10	84,80	99,80
n	7			4			1			1			4		
POLPE	6,82	6,25	8,00	83,75	80,00	86,25	100	100	100	-			78,43	70,00	92,80
n	5			3			1			-			3		
STEME	7,92	5,30	13,50	87,20	82,50	92,50	-			-			94,15	87,50	100
n	5			5			-			-			5		
SETPF	9,12	6,00	12,30	69,06	35,00	100	-			88,00	88,00	88,00	39,40	0,00	98,80
n	5			4			-			1			4		
SETVI	5,50	5,50	5,50	81,30	81,30	81,30	-			-			96,90	96,30	97,50
n	2			2			-			-			2		
THLAR	5,96	5,00	8,30	91,58	82,50	100	100	100	100	100	100	100	100	100	100
n	7			4			1			1			4		
VERPE	8,62	5,50	19,00	79,90	47,50	100	-			95,00	95,00	95,00	96,00	84,50	100
n	6			4			-			2			4		
VIOAR	7,87	6,30	10,50	82,03	55,00	97,80	-			-			94,67	84,50	100
n	3			3			-			-			3		

ADM.4651.H.1.A + Styk (Insert) (0,4kg/ha + 0,2 L/ha) control of annual/perennial grass and broad-leaved weeds in ZEAMX

Indication: ADM.4651.H.1.A (0,4kg/ha) + Styk (Insert) (0,2 L/ha) was tested in 8 trials , in growth seasons 2018 and 2020, in controlling annual/perennial grass and broadleaved weeds in post-emergence application in ZEAMX. The highest level of control was recorded after 6-8 weeks after application (BBCH of the crop 51-59, DAA 43-68).
Tank-mix ADM.4651.H.1.A (0,4kg/ha) + Styk (Insert) (0,2 L/ha) successfully controlled most of broad-leaved weed plants present on the trial locations, with the best efficacy control recorded for: LAMPU – 100%, BRSNW – 97,26%, CHEAL – 90,6%, STEME - 89,08% and CAPBP – 85%. Annual/perennial grass weeds were moderately susceptible or moderately tolerant : ALOMY – 65,83%; ECHCG – 68,98%, SETPU – 63,13 %, SETVI – 83,8%.

Table 3.2-15 Efficacy of product ADM.4651.H.1.A (0,4 kg/ha) applied with tank-mix partner: Styk (Insert) (~~1,5~~ 0,2 L/ha); BBCH of the crop 51-59, DAA 43-68 (only the North-Eastern zone trials available)

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha +0,2 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	65,83	40,00	90,00	-			-			14,08	0,00	56,30
⊐	4			3			-			-			4		
BRSNW	9,70	5,00	22,00	~~97,26~~ 93,33	~~92,50~~ 90,00	100	99,80	99,80	99,80	100	100	100	100	100	100
⊐	9			3			1			3			2		
CAPBP	6,60	5,00	8,50	85,00	85,00	85,00	-			-			99,76	98,80	100
⊐	5			2			-			-			5		
CHEAL	18,51	8,00	30,00	90,60	86,30	98,30	100	100	100	100	100	100	99,58	96,30	100
⊐	18			6			2			3			9		
ECHCG	12,51	5,30	21,00	68,98	0,00	87,50	52,50	45,00	60,00	93,33	90,00	100	64,56	0,00	100
⊐	18			6			2			3			9		
FUMOF	6,35	5,30	8,30	81,70	72,50	86,30	-			-			96,75	90,00	100
⊐	4			3			-			-			4		
GALAP	15,40	11,50	19,30	61,30	61,30	61,30	-			-			97,25	94,50	100
⊐	2			1			-			-			2		
GERPU	7,75	7,50	8,00	40,00	40,00	40,00	-			-			93,40	86,80	100
⊐	2			1			-			-			2		
LAMPU	6,05	5,70	6,50	100	100	100	-			100	100	100	100	100	100
⊐	4			1			-			1			3		
POLCO	5,59	5,00	6,30	37,50	17,50	57,50	100	100	100	100	100	100	93,10	84,80	99,80
⊐	7			2			1			1			4		
POLPE	6,82	6,25	8,00	84,08	81,25	86,00	100	100	100	-			78,43	70,00	92,80
⊐	5			3			1			-			3		
STEME	7,92	5,30	13,50	89,08	85,00	93,75	-			-			94,15	87,50	100
⊐	5			4			-			-			5		
SETPF	9,12	6,00	12,30	63,13	32,50	93,75	-			88,00	88,00	88,00	39,40	0,00	98,80

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha +0,2 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
n	5			2			-			1			4		
SETVI	5,50	5,50	5,50	83,80	83,80	83,80	-			-			96,90	96,30	97,50
n	2			2			-			-			2		
THLAR	5,96	5,00	8,30	92,50	85,00	100	100	100	100	100	100	100	100	100	100
n	7			2			1			1			4		
VERPE	8,62	5,50	19,00	66,00	42,50	89,50	-			95,00	95,00	95,00	96,00	84,50	100
n	6			2			-			2			4		
VIOAR	7,87	6,30	10,50	65,00	50,00	80,00	-			-			94,67	84,50	100
n	3			2			-			-			3		

ADM.4651.H.1.A + Efica (Dual Gold) 960 EC (0,4kg/ha + 0,2 L/ha) control of annual/perennial grass and broadleaved weeds in ZEAMX

Indication: ADM.4651.H.1.A (0,4kg/ha) + Efica 960 EC (0,8 L/ha) was tested in 15 trials, in growth seasons 2018-2020, in controlling annual/perennial grass and broadleaved weeds in post-emergence application in ZEAM. The highest level of control was recorded after 6-8 weeks after application (BBCH of the crop 51-59, DAA 43-68.
Tank-mix ADM.4651.H.1.A (0,4kg/ha) + Efica 960 EC (0,8 L/ha) performed with very good efficacy in controlling broadleaved weed plants, the highest control being observed for: SOLNI - 100%, LAMPU – 99,58%, AMARE – 97,5%, BRSNW – 96,88 %, CHEAL – 94,67 % ,THLAR- 95,22%, VIOAR – 94,43 %, FUMOF – 91,98 %,VERPE – 90 %, STEME – 90,73% and POLPE – 90,5%.
Annual/perennial grass weeds present on the trial location were susceptible and moderately susceptible to the applied tank-mix ADM.4651.H.1.A (0,4kg/ha) + Efica 960 EC (0,8 L/ha), with the best efficacy observed on ALOMY – 77,21%, SETPU – 78,1 %, SETVI – 88,8% and ECHCG - 86,6%.

Table 3.2-16 Efficacy of product ADM.4651.H.1.A (0,4 kg/ha) applied with tank-mix partner: Efica (Dual Gold) 960 EC (0,8 L/ha); BBCH of the crop 51-59, DAA 43-68 (based on the aggregated data of Maritime and North-Eastern zones)

DAA	DAA 43-68														
CROP BBCH	CROP BBCH 51-59														
	UNCK PLA/m2			ADM.4651.H.1.A +Efica (Dual Gold) 960 EC 0,4 kg/ha +0,8 L/ha			LUMAX 537,5 SE 3,5 L/ha			LUMAX 537,5 SE 4 L/ha			Sulcotrek 500 SC 2 L/ha		
	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX	MEAN	MIN	MAX
ALOMY	11,00	8,50	14,50	77,21	60,00	91,25	-			-			14,08	0,00	56,30
n	4			4			-			-			4		
AMARE	15,57	8,70	28,00	97,50	95,00	100	100	100	100	100	100	100	-		
n	6			4			2			2			-		
BRSNW	9,70	5,00	22,00	96,88	86,30	100	99,80	99,80	99,80	100	100	100	100	100	100
n	9			6			1			3			2		
CAPBP	6,60	5,00	8,50	88,78	82,50	100	-			-			99,76	98,80	100
n	5			5			-			-			5		

DAA	DAA 43-68														
CROP BBCH	**CROP BBCH 51-59**														
	UNCK PLA/m2			**ADM.4651.H.1.A +Efica (Dual Gold) 960 EC 0,4 kg/ha +0,8 L/ha**			**LUMAX 537,5 SE 3,5 L/ha**			**LUMAX 537,5 SE 4 L/ha**			**Sulcotrek 500 SC 2 L/ha**		
	MEAN	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**	**MEAN**	**MIN**	**MAX**
CHEAL	18,51	8,00	30	94,67	81,30	100	100	100	100	100	100	100	99,58	96,30	100
n	18			14			2			3			9		
ECHCG	12,51	5,30	21,00	86,60	60,80	100	52,50	45,00	60,00	93,33	90,00	100	64,56	0,00	100
n	18			14			2			3			9		
FUMOF	6,35	5,30	8,30	91,98	88,80	100	-			-			96,75	90,00	100
n	4			4			-			-			4		
GALAP	15,40	11,50	19,30	82,55	65,10	100	-			-			97,25	94,50	100
n	2			2			-			-			2		
GERPU	7,75	7,50	8,00	73,75	67,50	80,00	-			-			93,40	86,80	100
n	2			2			-			-			2		
LAMPU	6,05	5,70	6,50	99,58	98,30	100	-			100	100	100	100	100	100
n	4			4			-			1			3		
MATCH	5,65	5,30	6,00	77,65	60,00	95,30	-			-			91,00	82,00	100
n	2			2			-			-			2		
MATIN	6,25	6,25	6,25	86,25	86,25	86,25	-			-			86,25	86,25	86,25
n	1			1			-			-			1		
POLCO	5,59	5,00	6,30	72,47	32,50	100	100	100	100	100	100	100	93,10	84,80	99,80
n	7			6			1			1			4		
POLPE	6,82	6,25	8,00	90,50	80,00	100	100	100	100	-			78,43	70,00	92,80
n	5			4			1			-			3		
SOLNI	7,60	6,80	8,70	100	100	100	100	100	100	-			100	100	100
n	3			2			1			-			1		
STEME	7,92	5,30	13,50	90,73	88,75	97,30	-			-			94,15	87,50	100
n	5			5			-			-			5		
SETPF	9,12	6,00	12,30	78,01	45,00	100	-			88,00	88,00	88,00	39,40	0,00	98,80
n	5			5			-			1			4		
SETVI	5,50	5,50	5,50	88,80	88,80	88,80	-			-			96,90	96,30	97,50
n	2			2			-			-			2		
THLAR	5,96	5,00	8,30	95,22	82,50	100	100	100	100	100	100	100	100	100	100
n	7			6			1			1			4		
VERPE	8,62	5,50	19,00	90,02	85,00	100	-			95,00	95,00	95,00	96,00	84,50	100
n	6			6			-			2			4		
VIOAR	7,87	6,30	10,50	94,43	86,50	100	-			-			94,67	84,50	100
n	3			3			-			-			3		

Minor use
n.a.

Yield (and relevant quality indicators), from efficacy trials (in the presence of challenging pest populations)
No yield data from efficacy trials have been submitted. The effect of the test product on yield of the ZEAMX is discussed further in the "Adverse effects…" (chapter 3.4), based on five selectivity trials.

Summary and conclusion
The submitted efficacy data (reports from field trials) and additional information fulfil requirements and conditions determined in 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 and ~~PP 1/51 (3) Weeds in corn~~ PP 1/50 (3) Weeds in maize. The studies fulfil 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.

ADM.4651.H.1.A is a water dispersible granule formulation containing 31.25% of dicamba, 15% of mesotrione and 10% of nicosulfuron for use on corn(ZEAMX). The intended use for ADM.4651.H.1.A in corn (ZEAMX) is a post-emergence application (BBCH 12-14) on a broad mixed weed flora (broadleaved and grass species, annual and perennial) in order to protect the early growth stages of corn from weed interference until the crop's canopy development naturally limits the emergence of weeds (approximately until the 10th-leaf growth stage of corn). Granule formulations generally do not contain built-in adjuvants. Therefore external adjuvants are assumed to optimize foliar absorption of the herbicide, resulting in an increased post-emergence efficacy. Thus it is intended to recommend to use ADM.4651.H.1.A post-emergent together with an adjuvant. Product ADM.4651.H.1.A is recommended to be used only with tank mix partners presented in this document. The proposed use of product is:
<u>Tank-mix with adjuvants:</u>
ADM.4651.H.1.A(0,4 kg/ha) + Olejan 85 EC (1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Adigor 440 EC (1,0-1,5 L/ha)
ADM.4651.H.1.A(0,4 kg/ha) + Styk (0,2 L/ha)
<u>Tank - mix with product Efica 960 EC</u>
ADM.4651.H.1.A(0,4 kg/ha) + Efica 960 EC (Dual Gold 960 EC) - S-metolachlor 960 g/L (0,8 L/ha)

In order to support the proposed use for ADM.4651.H.1.A with tank mix partners, efficacy and crop tolerance data are presented from 21 efficacy trials and 10 selectivity trials, conducted in corn over three growth seasons (2018 - 2020) in the North-Eastern (Poland) and Maritime (the Czech Republic) EPPO zones. ADM.4651.H.1.A applied with tank mix partners will provide broad spectrum control against annual and perennial weeds, with good crop safety in post-emergent application.

Table 3.2-17 describes susceptibility classification of weed plants depending on effectiveness of their control by herbicide, according to SANCO /10055/2013 Rev.4 from 3 October 2013.

Table 3.2-17

HS (Highly susceptible)	95-100%
S (Susceptible)	85-94,9%
MS (Moderately Susceptible)	70-84,9%
MT (Moderately Tolerant)	50-69,9%
T (Tolerant)	0-49,9%

Table 3.2-18 The average susceptibility classification of weed plants in corn at BBCH of the crop 51-59, DAA 43-68, based on the aggregated data set for the Maritime and North-Eastern zone. The alternative presentation of weed susceptibility, including separation of 1,0 and 1,5 L/ha dose rate of Adigor, is provided in the zRMS commenting box that follows.

classification	ADM.4651.H.1.A + Adigor 440 EC 0,4 kg/ha + 1,0- 1,5 L/ha L/ha	ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha + 0,2 L/ha	ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha	ADM.4651.H.1.A + Efica 960 EC 0,4 kg/ha + 0,8 L/ha
HS~~/S~~	AMARE(4/2)*, BRSNW(5/5), ~~CAPBP(5/5),~~ CHEAL(13 trials, HS 1,5L/ha dose rate Adigor), ~~FUMOF(/3),~~ LAMPU(2/3), ~~POLPE(4/4),~~ SOLNI(~~2/0~~ 1/2), ~~STEME(4/5), SETVI(2/2),~~ THALR (5/4), ~~VERPE (4/4)~~	~~BRSNW(3), CAPBP(2), CHEAL(6), FUMOF(3),~~ LAMPU(1), ~~POLPE(3), STEME(4), THLAR(2),~~	BRSNW(2), ~~CAPBP(5), CHEAL(9), FUMOF(4), GALAP (2),~~ LAMPU(3), SOLNI(1), ~~STEME(5), THLAR(4)~~, CHEHY(1)	ABUTH(2), ANGAR(1) HELAN(2), CHEHY(1), AMARE(4), BRSNW(6), ~~CAPBP(5), CHEAL(14), ECHCG(14), FUMOF(4),~~ LAMPU(4), ~~MATIN(1), POLPE(4),~~ SOLNI(2), ~~STEME(5), SETVI(2),~~ THLAR(6), ~~VERPE(6), VIOAR(3)~~
S	CAPBP(5/5), CHEAL(9 trials, 1,0L/ha dose rate), FUMOF(3), GALAP(2 trials, 1,5L/ha dose rate Adigor), MATIN(1), OLPE(4/4), SETVI(2/2), STEME(4/5), VERPE (4/4, 1,5 L/ha Adigor), VIOAR (4 trials, 1,5 L/ha Adigor)	BRSNW (3), CAPBP(5), CHEAL(6), STEME(4), THLAR(2),	CAPBP(5), CHEAL(9), FUMOF(4), GALAP(2), STEME(4), THLAR(4), MATIN(1)	CAPBP(5), CHEAL(14), FUMOF(4), POLPE(4/4), MATIN(1), STEME(5), SETVI(2), VERPE(6), VIOAR(3), ECHCG(16), MELAL(1)
MS	ALOMY(4/4),ECHCG(13/9), GALAP(1 trial, 1,0L/ha dose rate Adigor), GERPU (1/2), POLCO(5/4), SETPF (4/3), VERPE (4/4, 1,0 L/ha Adigor) MATCH (2/0), VIOAR (1 trial, 1,0 L/ha Adigor)	~~ALOMY(3)~~ ANGAR(1) ~~ECHCG(6),~~ FUMOF(3), ~~GALAP(1),~~ POLPE(3), ~~SETPF(2),~~ SETVI(2),	ECHCG(9), GERPU(2), MATCH(2), POLPE(3), SETVI(2),VERPE(4), VIOAR (3), ANGAR(1)	ALOMY(4), GALAP(2), GERPU(2),MATCH(2), POLCO(6), SETPF (5)
MT	no weeds classified as moderately tolerant	ALOMY(3), VERPE(2), VIOAR(2) ECHCG(6), SETPF(2), GALAP(1), MELAL(1)	ALOMY(4), MELAL(1) POLCO(4), SETPF (4)	~~no weeds classified as moderately tolerant~~ POLAV(1)
T	no weeds classified as tolerant	GERPU(1), POLCO(2), POLAV(1)	~~no weeds classified as tolerant~~ POLAV(1)	no weeds classified as tolerant

*number trial location per indication

Tank-mix preparations:
ADM.4651.H.1.A + Adigor 440 EC 0,4 kg/ha +1,0 – 1,5 L/ha,
ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha + ~~0,25 L/ha~~ 0,20 L/ha,
ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha,
and
ADM.4651.H.1.A + Efica 960 EC 0,4 kg/ha + 0,8 L/ha,

should be used once in a growth season ~~at~~, in spring, in early post-emergence at BBCH 12-14. The recommended water volume: 200- 250 L/ha.
Use of tested tank-mixtures according to the proposed GAP does not represent a hazard to rotational crops and does not ~~justify~~ require a specific labelling.*

Comments of zRMS <u>concerning rotational crops</u> *

See the zRMS comments following 3.5.1. Impact on succeeding crops, page 58.

Comments of zRMS on the efficacy chapter:

The efficacy assessment presented by the applicant have been based on the aggregated dataset from the Maritime and the North-Eastern EPPO zones, and on the assessments on 43-68 DAA, *i.e.* at the crop`s BBCH 51-59. The zRMS has added summaries of two other assessment terms that conform approximately to the EPPO guidance PP 1/50(3) *Weeds in maize*: up to 2 weeks after application and 3-4 weeks after treatment, to the extent to which data are available from the individual trial reports. The xls file embedded below also contains the summaries originally accomplished by the applicant (BBCH crop 51-59 / 43-68 DAA). The spreadsheet enables direct comparison between assessments, zones, target species and treatments as well as revealing / checking of the no. of trials in which particular weed species had occurred. The embedded file is equivalent to tens of pages of text file that otherwise would be necessary to contain the 1008 rows table.

Efficacy summaries
zRMS.xlsx

Based on the assessment of all the efficacy data, the zRMS has concluded that the time window selected by the applicant for efficacy evaluation (BBCH 51-59 / 43-68 DAA) is correct, as majority of weeds had shown the most intensive damage symptoms within that interval, or the damage was comparable to that observed on preceding assessment (21-31 DAA). For information, the weeds that had shown the most extensive damage on 21-31 DAA have their rows marked in yellow, in the excel file. Nevertheless, the weed classification shown in the corrected Table 3.2-18 and otherwise presented in the table pasted below, is based on 43-68 DAA assessment.
Please note, that although both the tables shown below may be difficult do digest for their size, they are also attached as the second and third spreadsheet in the xls file, where they can be observed more conveniently. Likewise, all the underlying data can be traced for each single target weed separately, using the filtering and sorting options in the embedded file.

Weed susceptibility classification, based on the Maritime and the North-Eastern zones efficacy data, 43-68 DAA (BBCH crop 51-59)
Sorted by the weed code

weed code	ADM.4651.H.1.A + Adigor 440 EC; 0,4+1,0		ADM.4651.H.1.A + Adigor 440 EC; 0,4+1,5		ADM.4651.H.1.A + Olejan 85 EC; 0,4+1,5		ADM.4651.H.1.A + Styk(Insert); 0,4+0,2		ADM.4651.H.1.A + Effica 960 EC; 0,4+0,8	
ABUTH	100,00	HS	98,80	HS					100,00	HS
ALOMY	80,45	MS	82,03	MS	65,63	MT	65,83	MT	77,21	MS
AMARE	99,58	HS	98,25	HS					97,50	HS
ANGAR	94,50	S	87,50	S	81,50	MS	73,80	MS	95,00	HS
BRSNW	96,26	HS	97,26	HS	100,00	HS	93,33	S	96,88	HS
CAPBP	85,00	S	90,76	S	86,26	S	85,00	S	88,78	S
CHEAL	94,49	S	95,42	HS	91,23	S	90,60	S	94,67	S
CHEHY			100,00	HS	100,00	HS			100,00	HS
DATST			93,80	S						
ECHCG	75,14	MS	83,14	MS	77,08	MS	68,98	MT	86,60	S
FUMOF	86,93	S	91,90	S	88,33	S	81,70	MS	91,98	S
GALAP	70,20	MS	91,55	S	88,80	S	61,30	MT	82,55	MS
GERPU	81,30	MS	61,25	MT	71,00	MS	40,00	T	73,75	MS
HELAN	98,00	HS	95,00	HS					95,50	HS
LAMPU	100,00	HS	100,00	HS	100,00	HS	100,00	HS	99,58	HS
MATCH			77,90	MS	74,80	MS			77,65	MS
MATIN	91,25	S	96,25	HS	87,50	S	85,00	S	86,25	S
MELAL	78,80	MS	80,80	MS	56,30	MT	57,50	MT	93,30	S
POLAV	65,00	MT	80,00	MS	32,50	T	30,00	T	68,80	MT
POLCO	76,38	MS	79,32	MS	54,40	MT	37,50	T	72,47	MS
POLPE	87,83	S	91,89	S	83,75	MS	84,08	MS	90,50	S
SETPF	71,25	MS	72,76	MS	69,06	MT	63,13	MT	78,01	MS
SETVI	85,00	S	86,30	S	81,30	MS	83,80	MS	88,80	S
SOLNI	100,00	HS	100,00	HS	100,00	HS			100,00	HS
STEME	90,63	S	91,16	S	87,20	S	89,08	S	90,73	S
THLAR	96,25	HS	95,26	HS	91,58	S	92,50	S	95,22	HS
VERPE	80,00	MS	85,63	S	79,90	MS	66,00	MT	90,02	S
VIOAR	71,30	MS	89,45	S	82,03	MS	65,00	MT	94,43	S

The susceptibility of most weed species to the tested treatments is similar enough in Maritime *versus* North-Eastern EPPO zones to be classified within the same classes (SANCO 2013) here and there. This can be traced using summary data available in the embedded xls file. There are, however, 3 exceptions: CHEAL, POLCO and POLPE (Mar/NE: 2/11, 1/4 and 2/2 trials, respectively). These weeds are presented and classified separately for the Maritime and the North-Eastern zones:

Susceptibility classification, separately for the Maritime and the North-Eastern zones, 43-68 DAA (BBCH crop 51-59) for selected weed species: CHEAL, POLCO, POLPE

zone	weed	ADM.4651.H.1.A + Adigor 440 EC; 0,4+1,0		ADM.4651.H.1.A + Adigor 440 EC; 0,4+1,5		ADM.4651.H.1.A + Olejan 85 EC; 0,4+1,5		ADM.4651.H.1.A + Styk(Insert); 0,4+0,2		ADM.4651.H.1.A + Effica 960 EC; 0,4+0,8	
Mar	CHEAL	100,00	HS	98,90	HS					100,00	HS
NE	CHEAL	92,91	S	94,78	S	91,23	S	90,60	S	93,78	S
Mar	POLCO	100,00	HS	100,00	HS					100,00	HS
NE	POLCO	68,50	MT	74,15	MS	54,40	MT	37,50	T	66,96	MT
Mar	POLPE	100,00	HS	100,00	HS					100,00	HS
NE	POLPE	83,77	MS	89,18	S	83,75	MS	84,08	MS	87,33	S

Styk (Insert):
In the submitted data set the use of the test item with the adiuvant Styk (Insert) has never resulted in any increase but merely the maintaining of the efficacy level, **compared to uses with two other adiuvants**. Whereas the advantage of using 0,2L/ha Styk adiuvant is obvious compared to solo application of the test item (12% efficacy increase on average), the efficacy of this mixture is **apparently inferior** (by 7 to 14% on average) to the mixture of ADM.4651.H.1.A with 1,5L/ha of Adigor 440 EC or Olejan 85 EC. To the opinion of zRMS, Styk (Insert) is the second choice adiuvant for ADM.4651.H.1.A.

Efica 960 EC:
As noted in the zRMS comments to MED, the dose response to the target 0,4L/ha dose rate of the test item, when used with partner herbicide Efica 960 EC, was evident in ALOMY and in SETPF (14 and 16% respectively), close to 5% in ECHCG and negligible (2,5%) in SETVI. The response to the test item`s dose rate is one thing though, and the response to addition of partner-herbicide compared to addition of adiuvant – is another. In terms of susceptibility classification, SETVI is S to both the treatments with Efica and with Adigor adiuvant. ALOMY and SETPF are as MS to treatment with Efica as they are to the one with Adigor. Although the advantage of Efica against these 2 weeds reveals when compared to treatments with Olejan 85 EC and Styk (Insert), Adigor may be applied as partner to the same effect. The ECHCG **alone** is S to treatment with Efica partner, while it is MS or MT to treatments with adiuvants.

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

Resistance is the naturally occurring inheritable ability of some weed biotypes within a given weed population to survive a herbicide treatment that should, under normal use conditions, effectively control that weed population. Since resistance is a natural phenomenon, the genes which determine herbicide resistance may already be present in a weed species before the herbicide is introduced onto the market.
ADM.4651.H.1.A is a water dispersible granule herbicide formulation containing 312.5 g/kg (31.25%) dicamba, 150 g/kg (15%) mesotrione, and 100 g/kg (10%) nicosulfuron and is intended to be used for post-emergent grass and broadleaf weed control in corn under field conditions.

Mode of action

Dicamba belongs to HRAC/WSSA Group 4, Legacy HRAC Group O (auxin mimics), chemical family: benzoates. Other chemical classes classified as HRAC/WSSA Group 4, Legacy HRAC Group O (auxin mimics) herbicides are: phenoxy-carboxylic-acids, pyridine carboxylic acids and quinoline carboxylic acids. Dicamba is rapidly absorbed by plant leaves, stems, and roots, and works as an auxin agonist by mimicking naturally-occurring plant hormones (i.e., auxins) that regulate many plant processes such as protein synthesis and cell growth. Symptoms of plant damage typical for synthetic auxins are twisting and curling of shoots and leaf stalks (epinasty), shoot swellings, elongations and leaf deformations. These symptoms are followed by chlorosis at vegetative points, stunting, wilting and necrosis. First visible symptoms are expressed in sensitive species in a range from 2 days to several weeks, especially depending on weather and plant growth stage.
Mesotrione belongs to HRAC/WSSA Group 27, Legacy HRAC Group F2, chemical group of triketones. Mesotrione is a competitive inhibitor of 4-HPPD and by binding to the enzyme's active site it prevents the normal substrate (4-hydroxyphenyl-pyruvate) from binding ~~and~~ , thus rendering the enzyme inactive. The direct result of blocking the function of 4-HPPD is that plastoquinone and a-tocopherol are not synthesized. Without these compounds, the formation of carotenoid pigments is stopped. Since plastoquinone as redox component (enzyme cofactor) is interacting with both photosynthesis and carotenoid biosynthesis, the HPPD inhibition also leads to an inhibition of the phytoene-desaturase enzyme (PDS), interrupting the biosynthesis of carotenoids. This interruption is lethal on its own. Without protecting functions of a-tocopherol and carotenoids, light and by-products of photosynthesis (oxidative radicals) destroy chlorophyll and cell membranes, resulting in bleaching of the plants leaves within 3 to 5 days after application. Complete weed death occurs within 2 to 3 weeks after application.
Nicosulfuron belongs to HRAC/WSSA Group 2, Legacy HRAC Group B, chemical class of sulfonylureas. Nicosulfuron inhibits the acetolactate synthase enzyme (ALS enzyme) which catalyses the first phase of the biosynthesis of the branched chain amino acids (e.g. valine, leucine and isoleucine). The absence of essential amino acids decreases the cellular division; susceptible plants stop growing a few hours after the treatment. Injury symptoms appear only several days after treatment and the complete death happens one or two weeks later.

Evidence of resistance

Dicamba: The first synthetic auxins 2,4-D and MCPA, were developed in the 1940's and so widely used that weed biotypes resistant to synthetic auxins are known since 1957. In 1957 the first cases of 2,4-D resistance were reported in climbing dayflower (Commelina diffusa Burm. f.) in Hawaii and wild carrot (Daucus carota L.) in Canada. According to the International Survey of Herbicide Resistant Weeds, there are now 36 SAH-resistant weed species (30 broadleaf, 5 grass, and 1 grass-like weed species) (41, 35, 5, 1 respectively, according to the same source accessed by zRMS on Feb. 23rd 2021).
The five grasses that include smooth crab grass [Digitaria ischaemum (Schreb.) Schreb. ex Muhl.] and four Echinochloa species, (E. crus-galli [(L.) P. Beauv.], E. crus-pavonis [(Kunth) Schult.], E. zelayensis [(Kunth) Schult.], and E. colona (L.) Link), have evolved resistance to quinclorac, which has a proposed cyanide-mediated mechanism of action on grasses that is distinct from that of SAHs (synthetic auxins herbicides).

Weeds of economic importance (those that are established, spreading, and requiring a change in control tactics) exhibiting resistance to SAHs include 2,4-D- and MCPA-resistant wild radish (Raphanus raphanistrum L.) in Australia, phenoxy herbicide-resistant corn poppy (Papaver rhoeas L.) in Europe, dicamba-resistant cornflower (Centaurea cyanus) in Poland (2012), dicamba-resistant kochia [Kochia scoparia (L.) A.J. Scott] in Canada and the USA, prickly lettuce (Lactuca serriola L.) resistant to 2,4-D, dicamba, and MCPA in the USA. Additionally, tall waterhemp [Amaranthus tuberculatus (Moq.) Sauer] biotypes from Nebraska and Illinois and smooth pigweed [A. hybridus L. (syn.: A. quitensis Kunth)] in Argentina were determined to be resistant to certain SAHs.
Of lesser economic importance are 2,4-D-resistant wild carrot (Daucus carota L.) in Canada and the USA, 2,4-D-resistant musk thistle (Carduus nutans L.) and Italian thistle (Carduus pycnocephalus L.) in New Zealand, and multiple SAH-resistant wild mustard (Sinapis arvensis L.) and quinclorac-resistant false cleavers (Galium spurium L.) in Canada.(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6175398/).

Mesotrione: There are few 4-HPPD inhibiting herbicides on the market (only about ten worldwide across all crops) and no weed biotypes resistant to 4-HPPD inhibitors have been observed in Europe until now. The first case of reported resistance to mesotrione (and other HPPDs) worldwide, was recorded during 2009 in an *Amaranthus tuberculatus* (syn. rudis) and *Amaranthus palmeri* population, in a seed corn production field in Illinois, Nebrasca, Wisconsin, North Carolina, Iowa (www.weedscience.com), USA. *Amaranthus tuberculatus* and *Amaranthus palmeri* are native of the United States. Both *Amaranthus* species are reported as infrequent in Europe.

Summary of weed biotypes resistant to group ~~F2~~ 27 worldwide[1]

Weed species	Country	First year resistance occurred	Crop	Herbicides
Amaranthus palmeri	USA (Kansas)	2009	corn, sorghum	mesotrione, pyrasulfotole, tembotrione, topramezone
	USA (Nebraska)	2011	corn	mesotrione, tembotrione, topramezone
	USA Nebrasca[2]	2014[2]	corn[2]	mesotrione, tembotrione, topramezone[2]
	USA Wisconsin	2014	corn	~~Tembotrione~~ imazethapyr, tembotrione, thifensulfuron-methyl
	USA (Kansas)	2015	sorghum	2,4-D, atrazine, chlorsulfuron, glyphosate mesotrione
	USA (North Carolina)	2016	corn	Mesotrione
Amaranthus tuberculatus	USA (Illinois, Iowa)	2009	seed corn	mesotrione, tembotrione, topramezone
	USA (Iowa)	2011	corn, soybean	mesotrione, isoxaflutole
	USA (Nebraska)	2011	corn	mesotrione, tembotrione, topramezone
	USA(Illinois)	2016	corn, soybean	2,4-D, acifluorfen-sodium, atrazine, chlorimuron-ethyl, fomesafen, imazethapyr, lactofen, mesotrione, tembotrione, topramezone

[1]Heap, I.: The International Survey of Herbicide Resistant Weeds, Online, Internet December 2020. Available under: www.weedscience.com

[2]Heap, I.: The International Survey of Herbicide Resistant Weeds, Online, Internet December 2020. Available under: www.weedscience.com, accessed on 23-02-2021

Nicosulfuron: Resistance to weeds arising from treatment with ALS inhibiting herbicides was first detected in the US in 1987, five years after the first widespread commercial use of chlorosulfuron. Since that discovery, resistance to ALS inhibitors has been documented in 165 weed species worldwide. In Europe, resistance to ALS inhibitors has been documented in 43 weed species (table 6.2.8-3), most frequently in cereal crops in *Alopecurus myosuroides*, *Apera spica-venti*, *Papaver rhoeas* and *Stellaria media* populations. Among many cases of resistance to the sulfonylureas class, explicit resistance to nicosulfuron is reported ~~only~~ in *Amaranthus retroflexus* (Italy 2003 in soybean, Germany 2012 in corn), *Echinochloa crus-galli* (Italy 2005, Austria 2011, Germany 2012, Spain 2015, all cases in corn), *Stellaria media* (Germany 2011 in wheat), *Sorghum halepense* (in corn, Italy 2007, Serbia 2014, Spain, Hungary 2015), *Digitaria sanguinalis* (France 2015, in corn), *Amaranthus palmeri* (Spain 2016, in corn), and *Kochia scoparia* species (Czech Republic, 1996, railways, roadsides).

Summary of weed biotypes resistant to group ~~B~~ 2 in Europe[1]

Weed species	European country	First year resistance occurred	Crop	Herbicides
Alisma plantago-aquatica	Italy	1994	rice	bensulfuron-methyl, cinosulfuron
	Portugal	1995	rice	bensulfuron-methyl
	Spain	2000	rice	bensulfuron-methyl
	Turkey	2009	rice	azimsulfuron, bensulfuron-methyl, penoxsulam
Amaranthus retroflexus	Yugoslavia	2002	soybean	imazethapyr
	Italy	2003	soybean	imazamox, imazethapyr, nicosulfuron, oxasulfuron, thifensulfuron
	Germany	2012	corn	nicosulfuron

Weed species	**European country**	**First year resistance occurred**	**Crop**	**Herbicides**
Apera spica-venti	Czech Republic Germany Poland Germany Denmark Poland Lituania Latvia Denmark Belgium	2005 2005 2005 2009 2011 2011 2013 2015 2016 2019	cereals wheat wheat cereals wheat wheat wheat wheat wheat wheat	chlorsulfuron, iodosulfuron, mesosulfuron, sulfosulfuron, pyroxulam chlorsulfuron, florasulam, flupyrsulfuron, iodosulfuron, mesosulfuron pyroxsulam, sulfometuron, sulfosulfuron. chlorsulfuron, iodosulfuron, procarbazone, sulfosulfuron. iodosulfuron, mesosulfuron, pyroxsulam, sulfosulfuron iodosulfuron, sulfosulfuron chlorsulfuron, fenoxaprop-P-ethyl, pinoxaden, sulfometuron-methyl, sulfosulfuron iodosulfuron-methyl-sodium iodosulfuron-methyl-sodium fenoxaprop-P-ethyl, florasulam, iodosulfuron-methyl-sodium, mesosulfuron-methyl, pinoxaden foramsulfuron, iodosulfuron-methyl-sodium, mesosulfuron-methyl

Weed species	European country	First year resistance occurred	Crop	Herbicides
Avena fatua	 United Kingdom France Germany Poland	 1994 2006 2009 2011	 oilseed rape, cereals wheat sugar beets spring barley, spring wheat	imazamethabenz-methyl iodosulfuron-methyl-sodium, mesosulfuron-methyl, metsulfuron-methyl, pyroxsulam cycloxydim, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, mesosulfuron-methyl, pinoxaden iodosulfuron-methyl-sodium, mesosulfuron-methyl, propoxycarbazone-sodium, sulfometuron-methyl
Avena sterilis	Italy Turkey	2004 2008	wheat -	iodosulfuron, mesosulfuron. pyroxsulam
Bifora radians	Turkey	2008	Winter wheat	chlorsulfuron, iodosulfuron-methyl-sodium, mesosulfuron-methyl, thifensulfuron-methyl, triasulfuron, tribenuron-methyl
Bromus sterilis	France Germany	2009 2017	Wheat Wheat	iodosulfuron-methyl-sodium, mesosulfuron-methyl, propoxycarbazone-sodium, pyroxsulam propoxycarbazone-sodium
Capsella bursa-pastoris	Denmark	2012	Spring barley	florasulam, tribenuron-methyl
Centaurea cyanus	Poland	2010	wheat	chlorsulfuron, tribenuron
Chenopodium album	Finland	2015	Spring wheat	tribenuron-methyl
Conyza canadensis	Poland	2000	railways	imazapyr

Weed species	European country	First year resistance occurred	Crop	Herbicides
Conyza sumatrensis	France	2016	Grapes	flazasulfuron, iodosulfu-ron-methyl-sodium, mesosulfuron-methyl, penoxsulam
Cyperus difformis	Italy Spain Turkey	1999 2000 2010	rice rice rice	azimsulfuron, bensulfuron, cinosulfuron. bensulfuron. azimsulfuron, bensulfuron, bispyribac, penoxsulam
Digitaria sanguinalis	France	2015	Corn	foramsulfuron, nicosulfuron
Echinochloa crus galli	Serbia Italy Italy Turkey Austria Germany France Spain Ukraine	2002 2007 2009 2009 2011 2012 2013 2015 2017	soybean corn, rice rice Corn Corn Corn Corn Rice	imazethapyr azimsulfuron, bispyribac, imazamox, nicosulfuron, penoxsulam. azimsulfuron, bispyribac, imazamox, penoxsulam, profoxydim. bispyribac, penoxsulam nicosulfuron nicosulfuron foramsulfuron penoxsulam nicosulfuron imazamox imazapyr, nicosulfuro penoxsulam
Echinochloa oryzoides	Turkey	2009	rice	bispyribac-sodium, penoxsulam
Echinochloa phyllopogon (=E. oryzi-cola)	Greece France	2009 2013	Rice Rice	bispyribac-sodium, foramsulfuron, imazamox, nicosulfuron, penoxsulam, rimsulfuron penoxsulam
Galinsoga parviflora	France	2018	Endive	penoxsulam, rimsulfuron
Galium aparine	Turkey	2008	Winter wheat	chlorsulfuron, iodosulfuron-methyl-sodium, mesosulfuron-methyl, thifensulfuron-methyl, triasulfuron, tribenuron-methyl
Helianthus annuus	France	2009	sunflower	Imazamox tribenuron-methyl

Weed species	European country	First year resistance occurred	Crop	Herbicides
Kochia scoparia	Czech Republic	1996	railways, roadsides	chlorsulfuron, imazapyr, metsulfuron, nicosulfuron, prosulfuron, rimsulfuron, sulfosulfuron, thifensulfuron, tribenuron triflusulfuron
Lolium multiflorum	Italy Denmark United Kingdom Italy	1995 2010 2012 2012	alfalfa, durum wheat wheat cereals wheat	iodosulfuron, mesosulfuron. iodosulfuron, pyroxsulam mesosulfuron-methyl, pyroxsulam glyphosate, iodosulfuron-methyl-sodium, mesosulfuron-methyl
Lolium perenne	Germany	2008	wheat	iodosulfuron, pyroxsulam
Lolium rigidum	France Greece	2006 2009	Wheat Winter wheat	iodosulfuron, mesosulfuron chlorsulfuron
Matricaria chamomilla	Germany Denmark Belgium Norway Poland Sweden	2008 2010 2012 2012 2014 2014	wheat cereals wheat wheat , winter barley winter wheat wheat	tribenuron iodosulfuron, tribenuron metsulfuron-methyl metsulfuron-methyl, tribenuron-methyl tribenuron-methyl florasulam, tribenuron-methyl
Matricaria perforata (sy. M. inodora)	Germany	2009	wheat	tribenuron
Oryza sativa	Italy Greece	2010 2012	Rice Rice	Imazamox imazamox, imazethapyr

Weed species	European country	First year resistance occurred	Crop	Herbicides
Papaver rhoeas	Spain Greece Italy United Kingdom Denmark France Sweden Germany Belgium Poland	1993 1998 1998 2001 2003 2007 2011 2012 2014 2014	cereals wheat wheat cereals wheat wheat wheat Cereals, Rape-seed Wheat Wheat	tribenuron chlorsulfuron, florasulam, imazamox, pyrithiobac, thifensulfuron, triasulfuron, tribenuron florasulam, iodosulfuron, tribenuron metsulfuron iodosulfuron, tribenuron iodosulfuron, mesosulfuron, metsulfuron amidosulfuron, iodosulfuron-methyl-sodium, propoxycarbazone-sodium florasulam, imazamox florasulam, metsulfuron-methyl tribenuron-methyl
Phalaris brachystachys	Turkey	2008	wheat	pyroxsulam
Poa annua	France	2015	Wheat	iodosulfuron-methyl-sodium, mesosulfuron-methyl
Poa trivialis	France	2012	Wheat	iodosulfuron-methyl-sodium, mesosulfuron-methyl
Polygonum persicaria	Norway	2009	Spring barley wheat	tribenuron-methyl
Rapistrum rugosum	Spain	2018	Winter barley , winter wheat	iodosulfuron-methyl-sodium, tribenuron-methyl
Rumex obtusifolius	France	2017	Wheat	florasulam, metsulfuron-methyl, thifensulfuron-methyl
Scirpus mucronatus	Italy	1994	rice	azimsulfuron, bensulfuron, cinosulfuron, ethoxysulfuron
Senecio vulgaris	France	2009	Wheat , grapes	flazasulfuron, florasulam, imazamox, iodosulfuron-methyl-sodium, mesosulfuron-methyl, metsulfuron-methyl, prosulfuron, thiencarbazone-methyl, tribenuron-methyl
Setaria viridis	France	2011	Corn	Foramsulfuron nicosulfuron

Weed species	European country	First year resistance occurred	Crop	Herbicides
Sinapis alba	Spain	2007	wheat	iodosulfuron, tribenuron
Sinapis arvensis	Italy Spain Turkey	2006 2011 2001 2008	wheat cereals wheat	florasulam, iodosulfuron, tribenuron iodosulfuron, tribenuron. chlorsulfuron. propoxycarbazone, thifensulfuron, triasulfuron, tribenuron.
Sonchus asper	Norway France United Kingdom	2006 2015 2016	Spring barley . spring wheat Chicory Wheat	iodosulfuron-methyl-sodium, tribenuron-methyl rimsulfuron imazamox, metsulfuron-methyl, thifensulfuron-methyl
Sorghum halepense	Italy Serbia Hungary Spain	2007 2014 2015 2015	Corn Corn Corn, fallow Corn	Nicosulfuron imazamox, nicosulfuron, propoxycarbazone-sodium, pyroxsulam, rimsulfuron foramsulfuron, nicosulfuron nicosulfuron
Spergula arvensis	Norway	2006	Winter wheat , winter barley	florasulam, tribenuron-methyl
Stellaria media	Denmark Sweden Ireland United Kingdom Norway France Belgium Finland Latvia	1991 1995 1996 2000 2002 2012 2013 2013 2016	barley wheat cereals cereals cereals wheat wheat spring barley winter wheat	chlorsulfuron, iodosulfuron, tribenuron chlorsulfuron, tribenuron metsulfuron amidosulfuron, metsulfuron iodosulfuron, metsulfuron, tribenuron florasulam, iodosulfuron, mesosulfuron, metsulfuron, thifensulfuron metsulfuron-methyl tribenuron-methyl amidosulfuron

Weed species	European country	First year resistance occurred	Crop	Herbicides
				metsulfuron-methyl
Tripleurospermum perforatum (=T. inodorum)	United Kingdom Norway Germany Denmark France Poland Sweden	2002 2006 2009 2010 2010 2014 2015	Cereals Winter wheat Wheat Spring barley, winter wheat Wheat Winter wheat Wheat	iodosulfuron-methyl-sodium, tribenuron-methyl tribenuron-methyl florasulam, iodosulfuron-methyl-sodium, tribenuron-methyl metsulfuron-methyl tribenuron-methyl florasulam, tribenuron-methyl

<u>Resistance mechanisms</u>

An altered target site may mean that a herbicide no longer binds to its normal site of action. Enhanced metabolism means that a resistant plant can degrade a herbicide to non-phytotoxic metabolites faster than a sensitive plant.

Dicamba: Despite of the weed biotypes resistant to synthetic auxins ~~are~~ being known since 1957, no confirmed mechanism of resistance is known for any of the chemical families from HRAC/WSSA Group 4, Legacy HRAC Group O (auxin mimics).

Mesotrione: binds on the active site of the enzyme HPPD. Hereby, the possible appearance of mutations that reduce the fixation of the herbicide on the enzyme HPPD mutant would also lead to a reduction of the affinity of the enzyme on the substrate of the new plant biotype, and would result in a minor catalytic efficiency of the HPPD, penalizing the competition (“fitness”) of the individuals mutated with regard to the original ones. Therefore, if any turned out resistance to the HPPD inhibitors would occur, this would likely be due to enhanced degradation rather than a mutation of the site of action, despite the fact that this mechanism is very rare in broadleaved weeds.

Nicosulfuron: The chemically dissimilar sulfonylurea, imidazolinone, and triazolopyrimidine herbicides have been commercialised 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. Several point mutations within the gene encoding ALS can result in a herbicide-resistant ALS. Thus several amino acids of the ALS were identified, the replacement of which confers the resistance to herbicides of the group B. This resistance is monogenic, dominant or half-dominant. The gene is nuclear and can be passed on by the pollen and the seeds. Moreover, these target mutations turned out to have only a low ‘genetic cost’, so contributing to a fast development of the resistance to the ALS inhibitors. Nevertheless resistance in cereals assumingly based on non-target site mechanisms (enhanced metabolism in the first place) has been described in *Alopecurus myosuroides* and Apera spica-venti biotypes in Germany[2].

[2]Petersen, J., Naruhn, G:, Raffel, H: Nicht-Zielortresistenzenbei Alopecurus myosuroides und Apera spica venti – Resistenzmuster und Resistenzfaktoren; Proceedings 25th German Conference on Weed Biology and Weed Control, 2012, pp. 43-50

<u>Potential multiple resistances</u>

Cross-resistance is resistance to two or more herbicides from different chemical classes, resulting from the presence of a single resistance mechanism. There are two broad cross-resistance categories; target site cross-resistance (by far the most common form of cross resistance to herbicides) and non-target site cross-resistance:

- 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 (i.e. that belong to the same HRAC/WSSA group). 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. From a practical viewpoint, control of target site-based resistant weed populations can often easily be achieved by the use of herbicides with a different mode of action
- Non-target site cross-resistance is defined as cross-resistance to dissimilar herbicide classes con-

ferred by a mechanism(s) other than resistant enzyme target sites (e.g. enhanced rate of herbicide metabolism).
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). In practice, it means that weed populations which developed resistance to one herbicide class can display resistance to herbicides from a dissimilar class (moreover from a different site of action; i.e. a different HRAC/WSSA group) without exposure to these herbicides.
Multiple resistance occurs when resistance to several herbicides results from two or more distinct resistance mechanisms in the same plant.
Dicamba: Multiple resistances of weed biotypes resistant to synthetic auxins (HRAC/WSSA Group 4, Legacy HRAC Group O, so far are known mainly with ALS inhibitors (group B): on *Echinochloa crus-galli* (Brazil), *Galium spurium* (Canada), *Limnocharis flava* (Malaysia), *Limnophila erecta* (Malaysia), *Raphanus raphanistrum* (Australia) and *Sisymbrium orientale* (Australia).
In Europe, only *Papaver rhoeas* (Spain and Italy) and *Sinapis arvensis* (explicitly resistant to dicamba, in Turkey) resistant biotypes are known to have multiple resistance, with herbicides from the group ~~B~~ 2 (mainly with particular sulfonylureas, but not explicitly to nicosulfuron).
Mesotrione: The only cases of reported resistance to mesotrione (and other HPPDs) worldwide were recorded in two Amaranthus species native of the United States, where they have evolved multiple resistance to three other herbicide modes of action : the ALS-inhibitors (group ~~B~~ 2), the photosystem II inhibitors (group ~~C1~~ 5) and the EPSPS inhibitors (group ~~G~~ 9, Amaranthus tuberculatus only). Multiple resistances to ALS-inhibitors have evolved mostly in the sulfonylureas class.
Nicosulfuron: For ALS inhibitors, multiple resistances are reported worldwide with herbicides in various HRAC/WSSA groups, but mainly in the group ~~A~~ 1 (ACCase inhibitors). In Europe, 12 resistant weed species out of 24 have developed a multiple resistance to at least one herbicide in another HRAC group (*Alopecurus myosuroides, Apera spica-venti, Avena fatua, Avena sterilis, Echinochloa crus-galli, Echinochloa oryzoides, Kochia scoparia, Lolium multiflorum, Lolium perenne, Papaver rhoeas, Phalaris brachystachys* and *Sinapis arvensis*).
Multiple resistances have evolved mostly to ACCase inhibitor herbicides (group ~~A~~ 1) widely used in cereal crops and in few cases to modes of action that may be used for weed control in corn: group HRAC/WSSA group 4 legacy HRAC O “synthetic auxins” (*Papaver rhoeas* and *Sinapis arvensis*), HRAC/WSSA group 5 legacy HRAC C1 “photosystem II inhibitors” (*Alopecurus myosuroides* and *Kochia scoparia*) and HRAC/WSSA group legacy HRAC K1 “dinitroanilines” (*Alopecurus myosuroides*).

<u>Conclusion about the risk of resistance inherent in ADM.4651.H.1.A</u>
The risk of the possible development of resistance inherent in ADM.4651.H.1.A depends on the risks inherent in dicamba, mesotrione and nicosulfuron. In the present state of knowledge, the risk inherent in nicosulfuron can be assumed to correspond to that of other compounds in HRAC/WSSA group 2 legacy HRAC group B (medium to high). The risk inherent to dicamba can be considered to be low to medium and the risk inherent in mesotrione can be considered to be low.
The risk of resistance inherent in a herbicide product and the target weeds can be increased by certain conditions of use. This agronomic risk is influenced by the particular characteristics of the crop and the use pattern of the product. In Europe, the good agricultural practices include, to varying degrees, the following parameters that contribute to ~~reduce~~ reduction of the selection pressure in corn crop and therefore the risk of resistance:
- Cultivation practices (ploughing),
- Stale seedbed techniques (using non-selective herbicides to control weeds germinating before crop sowing),
- Mechanical weeding
- Cleaning of the farming machinery,
- Crop rotations,
- Mixtures or ~~sequences~~ sequential application of herbicides with differing sites of action (and with similar efficacy against the target weed).

The intended use for ADM.4651.H.1.A in corn is a post-emergence application on a broad mixed weed flora (broadleaved and grass species, annual and perennial) in order to protect the early growth stages of corn from weed interference until the crop's canopy development naturally limits the emergence of weeds (approximately until the 10th-leaf growth stage of corn):

- The maximum number of applications per crop cycle for ADM.4651.H.1.A is 1;
- ADM.4651.H.1.A provides a high level of activity at the recommended rate of 0.4 kg/ha ;
- Some alternative efficient herbicide products with modes of action different from ADM.4651.H.1.A are available for the control of grass and broadleaved target weeds in corn. With respect to the above good agricultural practices and unrestricted use pattern of ADM.4651.H.1.A, the agronomic risk of evolving weeds resistance following ADM.4651.H.1.A use can be considered to be low. The unmodified risk is the risk of practical resistance (inherent risks combined with agronomic risk) under "unrestricted" conditions of ADM.4651.H.1.A use, i.e. when ADM.4651.H.1.A is used as proposed for registration to achieve the optimum weed control.

Considering that:

- the risk inherent in nicosulfuron can be assumed to correspond to that of other compounds in HRAC/WSSA group 4 2 legacy HRAC group B (medium to high),
- the risk inherent in dicamba can be considered to be low to medium,
- the risk inherent in mesotrione can be considered to be low,
- in Europe the risk of resistance to ADM.4651.H.1.A inherent in corn weed species can be considered to be low to medium,
- the agronomic risk of evolving weeds resistance following ADM.4651.H.1.A use can be considered to be low, with respect to the above good agricultural practices,

the risk of the target weed species to develop resistance to an active ingredient of ADM.4651.H.1.A can be considered acceptable (low to medium) if ADM.4651.H.1.A is used according to the label instructions.

As the resistance risk assessment demonstrates that the unmodified risk of resistance to ADM.4651.H.1.A can be considered acceptable (when ADM.4651.H.1.A is used according to the label instructions). There is no restriction proposed on ADM.4651.H.1.A use. As the unmodified risk of resistance to ADM.4651.H.1.A can be considered acceptable (when ADM.4651.H.1.A is used according to the label instructions), no specific strategy of resistance management has to be implemented.

Comments of zRMS:

The data from the www.weedscience.com has been used by both the applicant and the zRMS. However, once retained in the xls format as enabled by the website, this information yields better to sorting and filtering, thus revealing easier the key answers to the submitted query. That is why it has been pasted below by zRMS, as the Excel file with 5 spreadsheeds. It is made clear, however, that it should be treated exclusively as an **additional** way of more efficient data presentation, for it does not contain any data that would contradict those presented by the applicant.

Weedscience Data
Ian Heap database 23

It is the intention of zRMS to draw the attention of the reader to the essential facts, as represented by **numbers given in brackets by the end of the spreadsheets` names**:
There are **79** records worldwide of resistance to different SAH herbicides, including 17 cases of resistance to dicamba concerning 7 weed species, including one record in Europe. There are **11** records pertaining to HPPD inhibitors (group F2 / 27), all in the US, all but one reporting mesotrione resistance, all 11 refer to 2 species of *Amaranthus*. There are **654** records of resistance to ALS (group B / 2) herbicides, 53 of them pertaining specifically to nicosulfuron resistance, 17 of these from Europe and concerning altogether 9 weed species. There are so far **0 (zero)** cases of multiple resistance specifically to the actives of the proposed test item ADM.4651.H.1.A, combined in one target species (dicamba x mesotrione x nicosulfuron (0) spreadsheet).
There are **717** records worldwide of the multiple resistance including **different actives** belonging to the three groups of SAH, F2 and B (some of these also include other MoAs). Out of these 717, **21** records (please filter for white fonts by any column in the last spreadsheet) testify for cross-resistance between ALS and SAH herbicides, and only 2 of those 21 (red background) include the third MoA – of the F2 / 27 group, both cases in the US. Only 5 of those 21 records include specifically dicamba (3 cases) or mesotrione (2 **other** cases), and none of the 21 includes nicosulforon (column H). Only 4 of those 21 records speak of Europe (France, Greece, Italy and Spain, all PAPRH in cereal crops). None of these 4 testifies for resistance to any of the actives contained in ADM.4651.H.1.A.
Based on the information summarized, it is concluded that the resistance risk inherent in the actives of the test item has been assessed correctly by the applicant (medium to high for nicosulfuron, low to medium for dicamba and low for mesotrione).
As for the resistance management: the product itself provides 3 modes of action in a single treatment, while there are

no reports worldwide of the combined resistance to these 3 actives in a single weed species. Single application is intended per growth season, and the product is intended for exclusive application with tank-mix adiuvants that would improve retention and take-up of the actives into the target weeds, enhancing effective target exposure to their MoA. Moreover, although the advantage of using the partner herbicide Efica 960 EC over adiuvants, in terms of susceptibility classification has been convincingly demonstrated only for one monocot target: ECHCG, the potential use of the 4th additional MoA provides an extra safety measure either, that can be considered as risk modifier itself.
Provided that next to the specific label recommendations concerning application timing, dose rate and partner products, the standard IPM practice is implemented, including proper crop rotation and using non-reduced tillage techniques, there is no need for any additional risk modifiers. The unmodified resistance risk is acceptable.

3.4 Adverse effects on treated crops (KCP 6.4)

Information on trials submitted

10 selectivity trials were conducted in Poland in 2019 and 2020. Phytotoxicity assessments were also done ~~on~~ in all efficacy trials presented in this dossier.

Table 3.4-1: Presentation of selectivity trials

Crop*	Country	Type of trial**	Number of trials	Years	GEP	Comments (any other relevant information)
			Central zone			
ZEAMX/corn	Poland	S + Y	10	2019-2020	GEP	
TOTAL	-	-	**10**	-	-	

* According to GAP; ** 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	Reference standards	Country where the product is registered(1)	Authorization number	Active substance(s) (a.s)	Formulation		Registered application rate(3)	Application rate in trials (per treatment)	Remark(4)
					Type(2)	Concentration of a.s.			
ZEAMX	Sulcotrek 500 SC	PL	R-255/2017 (19.12.2017)	Sulcotrione Terbutylo-azyna	SC	173 g/L 327 g/L	2,0 L/ha	2,0 L/ha	

(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…)

Table 3.4-3: Details on trial methodology

Guidelines	General guidelines	EPPO PP 1/135(4), EPPO PP 1/152(4), EPPO PP 1/181(4)
	Specific guidelines	n.a
Experimental design	Plot design	RCBD
	Plot size	21-30 m²
	Number of replications	4
Crop	Trials per crop	ZEAMX (~~5~~ 10)
	Varieties per crop	10 varieties: KWS Kwintus, DKC 3642, Mas 26K, P9074, Reduta ,Hulk, Figaro, P9027, Kidemos, GRIGRI CS
	Sowing period	25.04.2019, 25.04.2019, 28.04.2019, 28.05.2019, 05.06.2019, 16.04.2020,

		25.04.2020, 27.04.2020, 30.04.2020, 15.05.2020
Application	Crop stage (BBCH)* at application	BBCH ~~10-14~~ 10-15
	Timing Pest stage at application (1)	Post emergence ; weed free
	Number of applications Intervals between applications	1 n.a.
	Spray volumes	200 L/ha (2 trials), 250 (8 trials) L/ha
Assessment	Assessment types	Visual estimation of phytotoxicity according to percentage scale 0-100 % Vigor of plants according to scale 0-10 Yield (kg/plot, t/ha) (5) MOICON (%) (5) STACON (5)
	Assessment dates	3 assessments in the range of 7- 54 DAA
Other relevant information	e.g. Soil type, pH	Sandy clay, loamy sand pH: 5,5 – 7,6
	e.g. Field / Greenhouse...	Field trials

* BBCH for weeds, pre-emergence, preventive / curative application, in

3.4.1 Phytotoxicity to host crop (KCP 6.4.1)

The phytotoxicity of THE product ADM.4651.H.1.A applied in tank-mix with product Efica 960 EC and adjuvants: Adigor 440 EC, Olejan 85 EC and Styk (Inert), was evaluated in 21 efficacy trials and 10 selectivity trials on ZEAMX.
In 10 selectivity trials performed in 2019 and 2020, the product ADM.4651.H.1.A and its mixing partners were applied in 1N and 2N dose rate.
<u>In 5 trials performed in the growth season 2019 :</u>
ADM.4651.H.1.A + Adigor 440 EC
ADM.4651.H.1.A + Olejan 85 EC
ADM.4651.H.1.A + Efica 960 EC
Sulcotrek 500 SC (ref)

<u>In 5 trials performed in the growth season in 2020</u>
ADM.4651.H.1.A + Adigor 440 EC
ADM.4651.H.1.A +Styk
ADM.4651.H.1.A + Olejan 85 EC
ADM.4651.H.1.A + Efica 960 EC
Sulcotrek 500 SC (ref)

<u>Tested varieties in selectivity trials:</u> KWS Kwintus, DKC 3642, Mas 26K, P9074, Reduta. Hulk, Figaro, P9027, Kidemos, GRIGRI CS
<u>Tested varieties in efficacy trials:</u> PR39H32, SY Enigma, Cassandro, Farmerino, RGT Babexx, Sixxtus, Musixx, Amoroso, Ricardinio, LG 31.225, Farm fire, Anovi CS, Ronaldinio, Talisman, Rosomak

<u>Materials and methods</u>
Totally 10 reports (S+Y) of selectivity trials are presented in the dossier, carried out in 2019 and 2020 in ZEAMX in Poland, showing the results of the research into product selectivity. The list of these reports is contained in Appendix 1.
<u>Site</u>
Trials were conducted in different regions of the Poland where ZEAMX is grown commercially. Trials were established on a set of complete randomized blocks in 4 replications.

Testing units
The field selectivity trials of the ADM.4651.H.1.A were carried out by the following units:
1) Fertico Sp. z o.o.
2) Agro Research Consulting (ARC),

The testing units have been mandated to conduct research in the field of efficacy of plant protection products by the Chief Inspector of Plant Health and Seed Inspection and are officially GEP recognized.

Experimental details
The efficacy trials were designed, conducted and reported according to the following EPPO guidelines:
1. PP 1/135 (3) Phytotoxicity assessment;
2. PP 1/152 (4) Design and analysis of efficacy evaluation trials;
3. PP 1/181 (4) Conduct and reporting of efficacy evaluation trials including good experimental practice.
4. PP 1/50(3) Weeds in ~~corn~~ maize.

Assessment methods

Statistical Analysis
Data were analysed using a two-way analysis of variance (ANOVA). The probability of non-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 Research Manager 9 Software (Gylling Data Management).

Assessment of phytotoxicity
Phytotoxicity was assessed by:
- visual estimation of an intensity of deformation,
- growth reduction
- plant vigor found on overall areas of treated plots (according to scale 0-10, where: 0 –plant without vigor ; 10 –full vigor), with references to untreated plots.
- A percentage scale from “0” to “100” was used for the phytotoxicity assessment, in which “0” meant no damage whereas “100” meant a total damage found.
- Influence on yield was assessed by evaluation of kg/plot and t/ha.
- Quality assessment included moisture content (%) and starch (%).

Harvest
Grain yield from the plot was harvested
YIELD : kg/plot ; t/ha
STACON: starch content
MOICON: moisture content

Applications methods and rates
The applications were conducted with SPRBAC and BICCAI.

Table 3.4-4: Phytotoxicity of product

Number of trials with phytotoxicity symptoms		Selectivity trials (10 trials)				Efficacy trials (21 trials)	
		ADM.4651.H.1.A +Adigor 440 EC 0,4 kg/ha + 1,5 L/ha 0,8 kg/ha + 3,0 L/ha ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha 0,8 kg/ha + 3,0 L/ha ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha + 0,2 L/ha 0,8 kg/ha + 0,4 L/ha ADM.4651.H.1.A + Efica(Dual Gold) 960 EC 0,4 kg/ha + 0,8 L/ha 0,8 kg/ha + 1,6 L/ha		Sulcotrek 500 SC 2,0 L/ha 4,0 L/ha		ADM.4651.H.1.A +Adigor 440 EC 0,4 kg/ha + 1,0–1,5 L/ha ADM.4651.H.1.A + Olejan 85 EC 0,4 kg/ha +1,5 L/ha ADM.4651.H.1.A + Styk (Insert) 0,4 kg/ha + 0,2 L/ha ADM.4651.H.1.A +Efica960 EC 0,4 kg/ha + 0,8 L/ha	Lumax 357,5 SE 4,0 L/ha Sulcotrek 500 SC 2,0 L/ha
		N	2N	N	2N	N	N
Maximum of phyto-toxicity recorded during the trials	0% to 5%	0	0	0	0	1	1
	>5% to 10%	0	0	0	0	0	0
	>10% to 15%	0	0	0	0	0	0
	>15 %	0	0	0	0	0	0
Level of symptoms at the last assessments	0% to 5%	0	0	0	0	0	0
	>5% to 10%	0	0	0	0	0	0
	>10% to 15%	0	0	0	0	0	0
	>15 %	0	0	0	0	0	0

Phytotoxic effects in efficacy trials

Within 21 efficacy field trials conducted in 2018-2020 in 1 trial: CZ18HEZEAMX102B at first assessment: DAA 14, slight symptoms of necrosis (~~1,5 %~~ 1,3 % - 2,0 %) were observed on all experimental treatments including standard: Lumax 357,5 SE (1,3 %). Tested variety: Sixxtus. No phytotoxic effects were observed at the last assessment ~~on~~ in any other efficacy trial.

Phytotoxic effect in selectivity trials

10 selectivity trials were conducted in 2019 and 2020. No phytotoxic effects observed on any of selectivity trial.

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

10 selectivity trials (YIELD) were conducted in 2019 and 2020 in Poland (NE).
Test product: ADM.4651.H.1.A and its mixing partners, were applied in 1N and 2N dose rate.
No phytotoxic effects were observed at any assessment on any of selectivity trials.

Table 3.4-5: Relationship between phytotoxicity and yield. *see the zRMS comm. box following this chapter

Test report	Variety	Maximum phyto. at 1N rate (%) (DAA)		Maximum phyto. at 2N (or other) rate (%) (DAA)		Yield in the untreated control Absolute figures (unit)	Yield at 1N as % of untreated		Yield at 2N (or other) rate as % of untreated	
		Test product	Standard 1	Test product	Standard 1		Test product	Standard 1	Test product	Standard 1
n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Comments of zRMS:

According to the dRR template (2015) the summary in Table 3.4-5 is only obligatory for trials with a significant phytotoxicity, or with a negative impact on yield. As demonstrated in the following tables, no negative effect on yield or its parameters was observed in any of the selectivity trials, following application of the test item with proposed adiuvants or the partner herbicide Efica 960 EC, at 1N and 2N dose rates.

Table 3.4-5-1 YIELD (kg/plot)

Treatment	dose rate	Yield kg/plot	min	max	no. of trials
UNCK handweeded	0	12,44	8,68	23,96	10
ADM.4651.H.1.A Adigor 440 EC	0,4+1,5	12,74	8,86	23,70	10
ADM.4651.H.1.A Adigor 440 EC	0,8+3,0	12,84	9,03	24,18	10
ADM.4651.H.1.A Insert	0,4+0,2	14,06	10,08	23,70	5
ADM.4651.H.1.A Insert	0,8+0,4	13,98	10,05	24,18	5
ADM.4651.H.1.A Olejan 85 EC	0,4+1,5	12,94	9,12	24,13	10
ADM.4651.H.1.A Olejan 85 EC	0,8+3,0	12,63	8,81	24,44	10
ADM.4651.H.1.A Efica 960 EC	0,4+0,8	12,74	9,20	23,99	10
ADM.4651.H.1.A Efica 960 EC	0,8+1,6	12,67	9,14	23,66	10

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

10 selectivity trials (YIELD) were conducted in 2019 and 2020 in Poland (NE). Test product: ADM.4651.H.1.A and its mixing partners reference product were applied in 1N and 2N dose rates. Trials were harvested and yield and its quality parameters were determined.

Table 3.4.3 -1 Yield parameters: MOICON (%)

Treatment	dose rate	MOICON (%)	min	max	no. of trials
UNCK handweeded	0,00	27,59	22,05	33,43	10
ADM.4651.H.1.A Adigor 440 EC	0,4+1,5	27,94	22,63	33,43	10
ADM.4651.H.1.A Adigor 440 EC	0,8+3,0	27,87	22,68	34,65	10
ADM.4651.H.1.A Insert	0,4+0,2	28,41	23,70	31,35	5
ADM.4651.H.1.A Insert	0,8+0,4	28,47	23,06	31,38	5
ADM.4651.H.1.A Olejan 85 EC	0,4+1,5	27,69	22,63	33,43	10
ADM.4651.H.1.A Olejan 85 EC	0,8+3,0	27,75	22,55	34,65	10
ADM.4651.H.1.A Efica 960 EC	0,4+0,8	27,87	22,50	33,48	10

ADM.4651.H.1.A Efica 960 EC	0,8+1,6	27,76	23,08	33,43	10

Table 3.4.3 -2 Yield parameters: STACON (%)

Treatment	dose rate	STACON	min	max	no. of trials
UNCK handweeded	0	60,87	44,25	72,40	10
ADM.4651.H.1.A Adigor 440 EC	0,4+1,5	60,61	43,93	72,38	10
ADM.4651.H.1.A Adigor 440 EC	0,8+3,0	61,01	44,70	72,28	10
ADM.4651.H.1.A Insert	0,4+0,2	54,14	44,08	65,43	5
ADM.4651.H.1.A Insert	0,8+0,4	53,76	43,28	65,28	5
ADM.4651.H.1.A Olejan 85 EC	0,4+1,5	60,77	44,08	72,20	10
ADM.4651.H.1.A Olejan 85 EC	0,8+3,0	61,07	43,38	72,03	10
ADM.4651.H.1.A Efica 960 EC	0,4+0,8	60,53	44,65	72,03	10
ADM.4651.H.1.A Efica 960 EC	0,8+1,6	60,47	44,35	72,65	10

10 selectivity trials conducted in 2019 -2020 in Poland revealed no negative effect of the test item, ADM.4651.H.1.A, on yield and its parameters.

3.4.4 Effects on transformation processes (KCP 6.4.4)

No processing studies were carried out on harvested corn sprayed with ADM.4651.H.1.A

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

No specific studies/trials conducted.

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

3.5.1 Impact on succeeding crops (KCP 6.5.1)

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.

Comments of zRMS
concerning rotational crops issue, as mentioned by the applicant following the weed susceptibility clasification, page 39

The applicant submitted no additional data on potential effect on rotational crops, based on the assumption that the active substances contained in ADM.4651.H.1.A have been applied for many years. Indeed, all 3 actives of the test item as well as S-metolachlor contained in the partner Efica 960 EC (MoA group 15, HRAC 2020) are in use based on two-way mixtures or solo products. Nevertheless, the applicant provided information, to the following wording, in the project of the Polish label, which is probably based on rotational crops data generated for these products. To the opinion of zRMS this label information must be retained:
"*If the earlier termination of the maize culture is necessary, the succeeding crops may be maize, and winter cereals (in the latter case the soil must be ploughed before drilling). In the growth season of the treatment with ADM.4651.H.1.A, tomato and tobacco must not be grown in the field.*
In case when growing of the sensitive plants is planned (beet, legumes, winter oilseed rape, sunflower and vegetables as well as early-sown cereals) the crop damage is possible."

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

Tank cleaning

Not applicable.

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

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)
BIOTEK Agriculture Sp z o.o..	Gać 64, 55-200 Oława	Y
Zemedelsky vyzkumny ustav Kromeriz,s.r.o.	76710 Zlinsky, Kromeriz , Czech Republic	Y
Czech University of Life Sciences Prague	Czech University of Life Sciences Kamýcká 129 165 00 Prague Suchdol, Czech Republic	Y
Poznań University of Life Sciences, Research and Education Center Gorzyń	ul. Wojska Polskiego 28, 60-637 Poznań	Y
ZS Nechanice	Štolbova 319, 503 15 Nechanice, Czech Republic	Y
AGRECO Sp. z o.o.	Al.Lipowa 21, lok 1, 53-124 Wrocław, Oddział Gać 64A, 55-200 Oława	Y
Staphyt Sp z o.o.	61-164 Poznań , ul Ziębicka 2	Y

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	Vertebrate study Y/N	Owner
KCP 6	Ing. Markéta Hambálková	2018	Efficacy of NIKITA applied in early post emergence for controling of weeds on corn/Czech republic/2018 Trial ID : CZ18HEZEAMX102A GEP	N	ADAMA
KCP 6	prof. Ing. Josef Soukup, CSc.	2018	Efficacy of NIKITA applied in early post emergence for controlling of weeds on corn/Czech Republic/2018 Trial Code: CZ18HEZEAMX102B GEP	N	ADAMA
KCP 6	Ing. Petr Hornik	2018	Efficacy of NIKITA applied in early post emergence for controling of weeds on corn/Czech republic/2018 Trial Code: CZ18HEZEAMX102C GEP	N	ADAMA
KCP 6	prof. Ing. Josef Soukup, CSc.	2018	Efficacy of NIKITA with adjuvants applied in post emergence for controlling of weeds on corn/Czech Republic/2018 Trial Code: CZ18HEZEAMX205B GEP	N	ADAMA
KCP 6	Ing. Petr Hornik	2018	Efficacy of NIKITA with adjuvants applied in post emergence for controling of weeds on corn/Czech republic/2018 Trial Code: CZ18HEZEAMX205C GEP	N	ADAMA
KCP 6	Dr inż Łukasz Sobiech	2018	Badanie skuteczności i fitotoksyczności preparatu Nikita 562,5 WG w zabiegu powschodowym w zwalczaniu chwastów w uprawie kukurydzy Efficacy and phytotoxicity of Nikita 562,5 WG in post-emergence treatment of weed control in corn Trial ID: PL18HEZEAMX099A GEP	N	ADAMA
KCP 6	Dr inż katarzyna Furman-Frątczak	2018	Ocena skuteczności I selektywności preparatu stosowanego samodzielnie oraz z adiuvatami w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy and selectivity of Nikita used alone and in tank-mix with adiuvants for the control of weeds in corn. Report nr: 098/1 PL18HEZEAMX99B GEP	N	ADAMA

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 6	Dr inż katarzyna Furman-Frątczak	2018	Ocena skuteczności I selektywności preparatu stosowanego samodzielnie oraz z adiuvatami w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy and selectivity of Nikita used alone and in tank-mix with adjuvants for the control of weeds in corn. Report nr: 098/1 PL18HEZEAMX99C GEP	N	ADAMA
KCP 6	Dr inż Łukasz Sobiech	2018	Badanie skuteczności i fitotoksyczności preparatu Nikita 562,5 WG w zabiegu powschodowym w zwalczaniu chwastów w uprawie kukurydzy Efficacy and phytotoxicity of Nikita 562,5 WG in post-emergence treatment of weed control in corn Trial ID: PL18HEZEAMX100B GEP	N	ADAMA
KCP 6	Dr inż Łukasz Sobiech	2018	Badanie skuteczności i fitotoksyczności preparatu Nikita 562,5 WG w zabiegu powschodowym w zwalczaniu chwastów w uprawie kukurydzy Efficacy and phytotoxicity of Nikita 562,5 WG in post-emergence treatment of weed control in corn Trial ID: PL18HEZEAMX100C GEP	N	ADAMA
KCP 6	Dr inż Agnieszka Kukuła	2019	Ocena skuteczności preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy of NIKITA (ADM.4651.H.1.A) for the control of weeds on corn / Efficacy of ADM.4651.F.1.A applied in post emergence for controling of weeds on corn in Poland 2019) Trial code: PL19HEZEAMX044A GEP	N	ADAMA
KCP 6	Dr inż Agnieszka Kukuła	2019	Ocena skuteczności preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy of NIKITA (ADM.4651.H.1.A) for the control of weeds on corn / Efficacy of ADM.4651.F.1.A applied in post emergence for controling of weeds on corn in Poland 2019) Trial code: PL19HEZEAMX044B GEP	N	ADAMA
KCP 6	Adam Pawlak	2019	Efficacy of ADM.4651.F.1.A applied in post emergence for controling of weeds on corn in Poland 2019. Trial code:PL19HEZEAMX044C GEP	N	ADAMA
KCP 6	Łukasz Sobiech	2019	Badanie skuteczności produktu ADM.4651.H1A w zwalczaniu chwastów w uprawie kukurydzy Efficacy of ADM.4651.H1A in weed control in corn cultivation Trial code:PL19HEZEAMX044D GEP	N	ADAMA

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 6	Łukasz Sobiech	2019	Badanie skuteczności produktu ADM.4651.H1A w zwalczaniu chwastów w uprawie kukurydzy Efficacy of ADM.4651.H1A in weed control in corn cultivation Trial code:PL19HEZEAMX044E GEP	N	ADAMA
KCP 6.4	Mgr inż. Adam Szemendera	2019	Selektywność preparatu ADM.4651.H.1.A stosowanego w zwalczaniu chwastów w uprawie kukurydzy, Polska 2019 Selectivity of ADM.4651.H.1.A appled in control of weeds in corn, Poland 2019 Report number: 3_01_F19_05 Client’s number: PL19HSZEAMX051A GEP	N	ADAMA
KCP 6.4	Mgr inż. Adam Szemendera	2019	Selektywność preparatu ADM.4651.H.1.A stosowanego w zwalczaniu chwastów w uprawie kukurydzy, Polska 2019 Selectivity of ADM.4651.H.1.A appled in control of weeds in corn, Poland 2019 Report number: 3_02_F19_06 Client’s number: PL19HSZEAMX051B GEP	N	ADAMA
KCP 6.4	Mgr inż. Adam Szemendera	2019	Selektywność preparatu ADM.4651.H.1.A stosowanego w zwalczaniu chwastów w uprawie kukurydzy, Polska 2019 Selectivity of ADM.4651.H.1.A appled in control of weeds in corn, Poland 2019 Report number: 3_02_F19_07 Client’s number: PL19HSZEAMX051C GEP	N	ADAMA
KCP 6.4	Dr Dariusz Gajek	2019	Selectivity of ADM.4651.F.1.A in corn /Poland/ 2019 FINAL REPORT nr: PL19HSZEAMX051D (ARC19_ZEAMX_ADAM_01a) GEP	N	ADAMA
KCP 6.4	Dr Dariusz Gajek	2019	Selectivity of ADM.4651.F.1.A in corn /Poland/ 2019 FINAL REPORT nr: PL19HSZEAMX051E (ARC19_ZEAMX_ADAM_01b) GEP	N	ADAMA
KCP 6	Dr inż Agnieszka Kukuła	2020	Ocena skuteczności preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy of NIKITA (ADM.4651.H.1.A) for the control of weeds on corn / Efficacy of ADM.4651.F.1.A applied in post emergence for controling of weeds on corn in Poland 2019) Final report nr : 20ADA762-1 Client’s code: PL20HEZEAMX005A GEP	N	ADAMA
KCP 6	Łukasz Sobiech	2020	Ocena skuteczności preparatu ADM.4651.H.1.A stosowanego w terminie powschodowym w zwalczaniu chwastów w	N	ADAMA

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			uprawie kukurydzy Efficacy of ADM.4651.F.1.A applied in post emergence for controlling of weeds in maize cultivation Research number: 24rej/19/20/Br Trial code: AH/20/K/19/Br/005B Client's trial number: PL20HEZEAMX005B GEP		
KCP 6	Łukasz Sobiech	2020	Ocena skuteczności preparatu ADM.4651.H.1.A stosowanego w terminie powschodowym w zwalczaniu chwastów w uprawie kukurydzy Efficacy of ADM.4651.F.1.A applied in post emergence for controlling of weeds in maize cul-tivation Research number: 24rej/19/20/Zł Trial code: AH/20/K/19/Zł/005C Client's trial number : PL20HEZEAMX005C GEP	N	ADAMA
KCP 6	Adama Szemendera	2020	Skuteczność preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w kukurydzy Efficacy of NIKITA (ADM.4651.H.1.A) in control of weeds in maize Report number: 16 01_F20_25 Client's number: PL20HEZEAMX005D GEP	N	ADAMA
KCP 6	Dr inż Agnieszka Kukuła	2020	Ocena skuteczności preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w uprawie kukurydzy The evaluation of efficacy of NIKITA (ADM.4651.H.1.A) for the control of weeds on corn / Efficacy of ADM.4651.F.1.A applied in post emergence for controling of weeds on corn in Poland 2019) Final report nr : 20ADA764-1 Client's code: PL20HEZEAMX005E GEP	N	ADAMA
KCP 6	Adama Szemendera	2020	Skuteczność preparatu NIKITA (ADM.4651.H.1.A) w zwalczaniu chwastów w kukurydzy Efficacy of NIKITA (ADM.4651.H.1.A) in control of weeds in maize Report number: 271 01 720 463 Client's number: PL20HEZEAMX005F GEP	N	ADAMA
KCP 6.4	Mgr inż. Adam Szemendera	2020	Selektywność preparatu ADM.4651.H.1.A stosowanego w zwalczaniu chwastów w uprawie kukurydzy, Polska 2020 Selectivity of ADM.4651.H.1.A appled in control of weeds in corn, Poland 2020 Report number: 17_01_F20_26 Client's number: PL20HSZEAMX006A GEP	N	ADAMA

Data point	Author(s)	Year	**Title** **Company Report No.** **Source (where different from company)** **GLP or GEP status** **Published or not**	Vertebrate study Y/N	Owner
KCP 6.4	Dr inż Dariusz Gajek	2020	Selectivity of ADM.4651.F.1.A in maize /Poland/ 2020 Final report nr: PL20HSZEAMX006B (ARC20_ZEAMX_ADAM_37A) Trial number: PL20HSZEAMX006B GEP	N	ADAMA
KCP 6.4	Dr inż Dariusz Gajek	2020	Selectivity of ADM.4651.F.1.A in maize /Poland/ 2020 Final report nr: PL20HSZEAMX006C (ARC20_ZEAMX_ADAM_37B) Trial number: PL20HSZEAMX006C GEP	N	ADAMA
KCP 6.4	Mgr inż. Adam Szemendera	2020	Selektywność preparatu ADM.4651.H.1.A stosowanego w zwalczaniu chwastów w uprawie kukurydzy, Polska 2020 Selectivity of ADM.4651.H.1.A appled in control of weeds in corn, Poland 2020 Report number: 17_01_F20_27 Client's number: PL20HSZEAMX006D GEP	N	ADAMA
KCP 6.4	Adam Pawlak	2020	Selectivity of ADM.4651.F.1.A in maize /Poland/ 2020. STAPHYT Ref.: APK-20-44685-PL01 Sponsor Ref. :PL20HSZEAMX006E GEP	N	ADAMA

List of data submitted or referred to by the applicant and relied on, but already evaluated at EU peer review

Data point	Author(s)	Year	**Title** **Company Report No.** **Source (where different from company)** **GLP or GEP status** **Published or not**	Vertebrate study Y/N	Owner
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List of data submitted by the applicant and not relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
-	-	-	-	-	-

List of data relied on not submitted by the applicant but necessary for evaluation

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
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