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Evaluation of data concerning the necessity of bromoxynil as herbicide to control a serious danger to plant health which cannot be contained by other available means, including non-chemical methods

European Food Safety Authority (EFSA)

Abstract

EFSA was requested by the European Commission to provide scientific assistance under Article 31 of Regulation (EC) No 178/2002 regarding the evaluation of data concerning the necessity of bromoxynil as a herbicide to control a serious danger to plant health which cannot be contained by other available means including non-chemical methods, in accordance with Article 4(7) of Regulation (EC) No 1107/2009. In this context, EFSA organised a commenting phase with Member States in order to collect and validate the data submitted by the applicant. The current scientific report summarises the outcome of the evaluation of different uses (crops/crop groups) in 11 Member States. The evaluation demonstrated that in general a wide range of alternative herbicide active substances to bromoxynil are available to control broadleaved weeds; however, for some uses, no sufficient chemical alternatives are available. The evaluation included an assessment of non-chemical alternatives for the presented uses. A wide range of non-chemical methods are available; however, often these methods do not have the same efficacy as chemical methods or have economic limitations. A combination of both chemical and non-chemical methods seems often possible.

Keywords: bromoxynil, pesticide, herbicide, Article 4(7) of Regulation (EC) No 1107/2009

Requestor: European Commission

Question numbers: EFSA-Q-2018-00055

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Summary

Bromoxynil was included in Annex I of Directive 91/414/EEC on 1 March 2005 by Commission Directive 2004/58/EC and has been deemed to be approved under Regulation (EC) No 1107/2009 According to Regulation (EU) No 540/2011. Commission Implementing Regulation (EU) 2017/841 of 17 May 2017 lays down the extension of the approval period for Bromoxynil till 31 July 2018. Bromoxynil is a herbicide active substance (a.s.) and it is used for post-emergence control of annual broadleaved weeds.

The applicant, Bromoxynil Task Force (Bayer CropScience and Nufarm UK Limited), applied for renewal of approval in line with the provisions of Commission Regulation (EU) No 844/2012. The European Food Safety Authority (EFSA) finalised the conclusion on the peer review of the pesticide risk assessment of bromoxynil (variant evaluated bromoxynil octanoate) in April 2017.

In 2017, during the peer review, EFSA proposed to classify bromoxynil (and its esters) as toxic for reproduction category 1B, leading to a critical area of concern with regard to the approval criteria of Annex II, Point 3.6.4 of Regulation (EC) No 1107/2009. In addition, bromoxynil and its esters are currently classified as toxic for reproduction category 2, in accordance with the provisions of Regulation (EC) No 1272/2008, and toxic effects on the endocrine organs were observed in the data available during the peer review; therefore, the conditions of the interim provisions of Annex II, Point 3.6.5 of Regulation (EC) No 1107/2009 concerning human health for the consideration of endocrine disrupting properties may be met.

The applicant Nufarm UK Limited requested derogation under Article 4(7) of Regulation (EC) No 1107/2009, submitting evidence regarding the necessity of bromoxynil to control a serious danger to plant health. In January 2016, the European Commission (EC) requested EFSA to provide scientific assistance as regards the consideration of evidence that the application of an active substance is necessary to control a serious danger to plant health which cannot be contained by other available means including non-chemical methods. In order to address this request, EFSA set up a working group (WG) to develop a specific methodology for the assessment of herbicide active substances. The protocol on the methodology was published on 2 August 2016.

Subsequently, the applicant was requested by the European Commission to re-submit the data following the methodology developed by EFSA. On 10 January 2018, the applicant submitted to EFSA and European Commission a data collection set and a report (Nufarm, 2017), the submission was further revised in March 2018. The applicant, included claims that the use of bromoxynil is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 in relation to the uses authorised in 17 Member States (MS).

As following step, EFSA launched a commenting phase in February-April 2018 asking all MS to confirm that the uses for which the applicant requested Article 4(7) derogation are authorised, and if the use of bromoxynil is considered essential to control a serious danger to plant health, giving clear justification for each use that is considered as essential. In addition, all MS were invited to submit information related to respective national authorisations for different crops or non-agricultural uses, evidence on resistance risk and uses that were not covered by applicant's submission (e.g. minor uses).

Overall, more than 20 different uses (crop/crop groups) in 10 MS (Austria, Belgium, Denmark, Finland, Germany, Hungary, the Netherlands, Poland, Slovakia and the United Kingdom) were evaluated to assess the applicant's claims or information provided by MS (Ireland) on the necessity of bromoxynil to control a serious danger to plant health. Generally, a wide range of chemical alternative herbicide a.s. are available in MS for broadleaved weed control in alfalfa, red clover (except for clover species in Austria: insufficient), maize (except for Ireland: intermediate), sweet maize (except for the United Kingdom: intermediate; Ireland: insufficient), leeks (except for the United Kingdom: insufficient), asparagus, flax (except for Belgium: intermediate), bulb vegetables (including garlic, shallots, onions (except for Hungary: insufficient), spring onions), cereals, sorghum, ornamentals (only for the UK), and game and wildlife cover.

The situation for the control of broadleaved weed is inconclusive for the following crop/crop groups: chive (sufficient in Belgium and intermediate in Austria), different classes of wheat (insufficient in Ireland, intermediate in Hungary and sufficient in Slovakia), rye and triticale (intermediate in Slovakia), different classes of barley (insufficient, except for Slovakia: intermediate) and *Miscanthus* (intermediate in Germany and insufficient in the United Kingdom). The intermediate situations would require an overall conclusion by the respective MS if the available non-chemical control methods are an alternative, so that an overall conclusion based on the chemical and non-chemical assessment can be drawn.

Based on the feedback received from MS, insufficient chemical alternatives to bromoxynil are available for weed control in different grass types (except for grass species (propagation) in Austria), hop, pumpkin, oat, millet, sunflower, winter oilseed rape, ornamental bulbs and ornamentals (except for ornamentals in the United Kingdom: sufficient).

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

Bromoxynil was included in Annex I of Directive 91/414/EEC[1] on 1 March 2005 by Commission Directive 2004/58/EC[2], and has been deemed to be approved under Regulation (EC) No 1107/2009[3], in accordance with Commission Implementing Regulation (EU) No 540/2011[4], as amended by Commission Implementing Regulation (EU) No 541/2011[5]. The expiry date of bromoxynil was extended to 31 July 2018 by Commission Implementing Regulation (EU) No 2017/841[6].

The applicant, Bromoxynil Task Force (Bayer CropScience and Nufarm UK Limited), applied for renewal of approval in line with the provisions of Article 14 of Regulation (EC) No 1107/2009. Bromoxynil (variant evaluated bromoxynil octanoate) was evaluated by France as rapporteur Member State (RMS). The RMS delivered its initial evaluation of the dossier in the Renewal Assessment Report (RAR), which was received by EFSA on 21 March 2016 (France 2016, 2017). In accordance with Article 13 of Regulation (EU) No 844/2012[7], EFSA finalised the conclusion on the peer review for bromoxynil on 7 April 2017 (EFSA, 2017).

In 2017, during the peer review, EFSA proposed to classify bromoxynil (and its esters) as toxic for reproduction category 1B, leading to a critical area of concern with regard to the approval criteria of Annex II, Point 3.6.4 of Regulation (EC) No 1107/2009. In addition, bromoxynil and its esters are currently classified as toxic for reproduction category 2, in accordance with the provisions of Regulation (EC) No 1272/2008[8], and toxic effects on the endocrine organs were observed in the data available during the peer review; therefore, the conditions of the interim provisions of Annex II, Point 3.6.5 of Regulation (EC) No 1107/2009 concerning human health for the consideration of endocrine disrupting properties may be met.

The applicant Nufarm UK Limited requested derogation in accordance with the provisions of Article 4(7) of Regulation (EU) 1107/2009, submitting evidence regarding the necessity of bromoxynil to control a serious danger to plant health which cannot be contained by other available means. In January 2016, EC requested by a general mandate to EFSA to provide scientific assistance as regards the consideration of evidence that the application of an active substance is necessary to control a serious danger to plant health which cannot be contained by other available means including non-chemical methods. In order to address this request EFSA set up a working group (WG) to develop a specific methodology for the assessment of herbicide active substances (a.s.). The protocol on the methodology was published on 2 August 2016 (EFSA, 2016).

On 10 January 2018, the applicant submitted to EFSA and EC a data collection set and a report (Nufarm, 2017), the submission was further revised in March 2018. The applicant included claims that the use of bromoxynil is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 in the following Member States: Austria, Belgium, Croatia, Czech Republic, Denmark,

[1] Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market. OJ L 230, 19.8.1991, p. 1–32.

[2] Commission Directive 2004/58/EC of 23 April 2004 amending Council Directive 91/414/EEC to include alpha-cypermethrin, benalaxyl, bromoxynil, desmedipham, ioxynil and phenmedipham as active substances. OJ L 120, 24.4.2004, p. 26–29.

[3] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC. OJ L 309, 24.11.2009, p. 1–50.

[4] Commission Implementing 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 list of approved active substances. OJ L 153, 11.6.2011, p. 1–186.

[5] Commission Implementing Regulation (EU) No 541/2011 of 1 June 2011 amending Implementing Regulation (EU) No 540/2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the list of approved active substances. OJ L 153, 11.6.2011, p. 187–188.

[6] Commission Implementing Regulation (EU) 2017/841 of 17 May 2017 amending Implementing Regulation (EU) No 540/2011 as regards the extension of the approval periods of the active substances alpha-cypermethrin, Ampelomyces quisqualis strain: aq 10, benalaxyl, bentazone, bifenazate, bromoxynil, carfentrazone ethyl, chlorpropham, cyazofamid, desmedipham, diquat, DPX KE 459 (flupyrsulfuron-methyl), etoxazole, famoxadone, fenamidone, flumioxazine, foramsulfuron, Gliocladium catenulatum strain: j1446, imazamox, imazosulfuron, isoxaflutole, laminarin, metalaxyl-m, methoxyfenozide, milbemectin, oxasulfuron, pendimethalin, phenmedipham, pymetrozine, s-metolachlor, and trifloxystrobin . C/2017/3160.OJ L 125, 18.5.2017, p. 12–15.

[7] Commission Implementing Regulation (EU) No 844/2012 of 18 September 2012 setting out the provisions necessary for the implementation of the renewal procedure for active substances, as provided for in Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market. OJ L 252, 19.9.2012, p. 26–32.

[8] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, p. 1–1355.

Finland, France, Germany, Hungary, Italy, Luxembourg, the Netherlands, Poland, Portugal, Slovakia, Spain, the United Kingdom.

On 22 February–18 April 2018 EFSA launched a commenting phase asking all MS to confirm that the uses for which the applicant requests Article 4(7) derogation are authorised and if the use of bromoxynil is considered essential to control the serious danger to plant health, giving clear justification for each use that is considered as critical. In addition, all MS were invited to supplement the information provided by the applicant with information from their own MS uses also considering other uses not presented by the applicant (e.g. minor uses). During the commenting phase 10 MS (Austria, Belgium, Denmark, Finland, Germany, Hungary, Netherlands, Poland, Slovakia, and the United Kingdom) validated the information provided by the applicant and Ireland submitted new information in relation to the uses in flax leeks, sweet maize, maize, onions/shallots, oats, wheat and barley. Upon the original submission submitted from the applicant, also Austria, Belgium, Hungary and Slovakia submitted additional information on the uses authorised in their countries.

As a follow up, EFSA ensured that the methodology was consistently applied by MS and summarised the evaluation of bromoxynil (See Appendices A and B) in the current scientific report. A final consultation process on the draft scientific report with MS was launched in June 2018.

The legal deadline to finalise the current scientific report is 10 July 2018.

2. Data and methodologies

2.1. Methodologies

The assessment was conducted in line with the methodology for the evaluation of data concerning the necessity of the application of herbicide active substances to control a serious danger to plant health which cannot be contained by other available means, including non-chemical methods, published on 2 August 2016 (EFSA, 2016). The submission provided by the applicant in the form of a collection data set and a report, was also in line with the EFSA methodology (EFSA, 2016).

The role of EFSA is to act as the co-ordinator of the process, ensuring that the methodology is applied consistently and providing a scientific report on the evaluation of bromoxynil. EFSA considered the information provided by MS such as the full list of authorised herbicide active substances, the shortlisted a.s. and the non-chemical methods as reliable and no further research was conducted to validate these data. Thus, MS had the full responsibility for the accuracy and correctness of the data provided to EFSA to perform the assessment.

2.2. Data and information

This report presents the information contained in the applicant report on bromoxynil submitted in January 2018 as revised by the applicant in March 2018 (Nufarm, 2017), and additional information and data provided by MS after the commenting phase launched by EFSA in February–April 2018. Table 1 provides an overview of authorised uses of bromoxynil to control broadleaved weeds in cereals, maize, sweet corn, bulb crops, flax, sorghum, millet and a number of specific crops including minor uses, in Europe. A total of six formulated products containing bromoxynil (straight or in co-formulation with other herbicide a.s., e.g. terbuthylazine, diflufenican) are registered in Europe, further details are provided in the applicant report (Nufarm, 2017).

EFSA provides the collection data set as validated by MS (i.e. complete list/s of authorised a.s. in the relevant MS) and evaluated by EFSA, as an Appendix to this scientific report (Appendix A). Also, an overview of the shortlisting process and a summary of the final shortlisted herbicide active substances for each use (crop) and MS are provided as an Appendix to this report (Appendix B).

Table 1: Authorised uses of bromoxynil to control annual broadleaved weeds in Europe

Country	Use/stage of application[a]
Austria	Alfalfa[b]/post-emergence
	Chive/post-emergence
	Maize/post-emergence
	Sweetcorn/post-emergence
	Onions/post-emergence
	Leeks/post-emergence
	Asparagus/post-emergence
	Red clover and clover species/post-emergence
	Grass species (propagation), grassland species (propagation), canary grass/post-emergence
	Hop/post-emergence
	Sorghum, millet/post-emergence
	Pumpkin/post-emergence
Belgium	Flax/post-emergence
	Garlic/shallots/post-emergence
	Maize/post-emergence
	Onions/post-emergence
	Chives
	Spring onions
	Leeks
	Sweet corn
Croatia	Maize/post-emergence
Czech Republic	Maize/post-emergence
Denmark	Bulb vegetables/post-emergence
	Leeks/post-emergence
	Asparagus/post-emergence
	Cereals/post-emergence
	Maize/post-emergence
Finland	Cereals/post-emergence
	Sweet corn/post-emergence
	Bulb vegetables/post-emergence
	Leeks/post-emergence
	Asparagus/post-emergence
France	Bulb vegetables/post-emergence
	Cereals/post-emergence
	Flax/post-emergence
	Maize/post-emergence
	Sorghum/post-emergence
Germany	*Miscanthus*/post-emergence
	Alfalfa/post-emergence
	Red clover/post-emergence
	Grass (propagation)/post-emergence
	Maize/post-emergence
	Sorghum/post-emergence
Hungary	Maize/post-emergence
	Onions/post-emergence
	Winter wheat/post-emergence
	Winter oilseed rape (desiccation)/post-emergence
	Sunflower (desiccation)/post-emergence
	Ornamentals/post-emergence

Country	Use/stage of application[(a)]
Ireland	Flax/post-emergence
	Leeks/post-emergence
	Sweetcorn/post-emergence
	Maize/post-emergence
	Onions/shallots/post-emergence
	Oats/post-emergence
	Wheat/post-emergence
	Barley/post-emergence
Italy	Maize/post-emergence
	Cereals/post-emergence
	Bulb vegetables/post-emergence
	Flax/post-emergence
	Rice/post-emergence
	Sorghum/post-emergence
Luxembourg	Flax/post-emergence
	Garlic/post-emergence
	Shallots/post-emergence
	Maize/post-emergence
	Onions/post-emergence
Netherlands	Flax/post-emergence
	Garlic/post-emergence
	Maize/post-emergence
	Onions/post-emergence
	Shallots/post-emergence
Poland	Bulb vegetables/post-emergence
	Ornamental bulbs/post-emergence
	Maize/post-emergence
Portugal	Maize/post-emergence
Slovakia	Maize/post-emergence
	Wheat (spring and winter)
	Barley (spring and winter)
	Rye
	Triticale
	Oat
Spain	Bulb vegetables/post-emergence
United Kingdom	Bulb vegetables/post-emergence
	Cereals/post-emergence
	Flax/post-emergence
	Leeks/post-emergence
	Maize/post-emergence
	Game and wildlife cover/post-emergence
	Millet/post-emergence
	Miscanthus/post-emergence
	Ornamental bulbs/post-emergence
	Ornamentals/post-emergence
	Sweetcorn/post-emergence

(a): The uses proposed in the following table correspond to the list provided by the applicant in the excel files (Nufarm, 2017) as validated by MS, except for the information provided by MS for Ireland on cereals (oat, wheat, barely), flax, maize, sweet maize, onions/shallots and leeks; Austria on sweet maize, grass and grass species, canary grass, red clover and clover species, hop, sorghum, millet, pumpkin, leeks and asparagus; Hungary on sunflower, winter oilseed rape and ornamentals; and Slovakia on wheat (spring and winter), barley (spring and winter), rye, triticale, oat; Belgium on chives, spring onions, leek and sweet corn; and Poland on ornamental bulbs.

(b): Alfalfa or Lucerne (*Medicago sativa*).

In addition, key supporting documents to this scientific report are:

- the applicant submission in the form of a Report (Nufarm, 2017) and collection data set;
- the comments received on the Applicant Report (EFSA, 2018a);
- the comments received on the draft scientific report (EFSA, 2018b).

The applicant submitted the information in relation to 17 Member States (Austria, Belgium, Croatia, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Luxembourg, the Netherlands, Poland, Portugal, Slovakia, Spain and the United Kingdom); 10 MS (Austria, Belgium, Denmark, Finland, Germany, Hungary, the Netherlands, Poland, Slovakia and the United Kingdom) verified the information submitted by the applicant. Seven MS (Croatia, the Czech Republic, France, Italy, Luxembourg, Portugal and Spain) did not verify the information. Ireland submitted information for the use of bromoxynil on flax leeks, sweet maize, maize, onions/shallots, oats, wheat and barley. Furthermore, upon the original information submitted by the applicant, Austria submitted additional information on the use of bromoxynil on sweet maize, grass and grass species, canary grass, red clover and clover species, hop, sorghum, millet, pumpkin, leeks and asparagus. Belgium submitted additional information on chives, spring onions, leek and sweet maize. Hungary submitted additional information for the use of bromoxynil on sunflower (desiccation), winter oilseed rape (desiccation), and ornamentals. Slovakia submitted additional information for the use of bromoxynil on wheat (spring and winter), barley (spring and winter), rye, triticale, and oat. Poland submitted additional information for the use of bromoxynil on ornamental bulbs.

3. Evaluation and assessment

3.1. Evaluation of chemical alternatives

3.1.1. Alfalfa

Table 2 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in alfalfa in Austria and Germany. Further details on the evaluation are reported in Appendices A and B.

Table 2: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in lucerne/alfalfa in Austria and Germany

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Alfalfa	AT	2	2	n.a.[(b)]	Sufficient
Alfalfa	DE	2	1	n.a.[(b)]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for alfalfa to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, four preventive and curative methods are listed as available to control broadleaved weeds in alfalfa in Germany. Two preventive methods (primary tillage, cover crops/mulching) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. In Austria, seven preventive methods are listed as available to control broadleaved weeds in lucerne. Three preventive methods (primary tillage, false seed beds, increased crop competitiveness) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

3.1.2. Red clover

Table 3 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in red clover and clover species in Austria and Germany. Further details on the evaluation are reported in Appendices A and B.

Table 3: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in red clover and clover species in Austria and Germany

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Red clover	AT	3	2	n.a.[b]	Sufficient
Clover species	AT	1	0	0	Insufficient
Red clover	DE	2	1	n.a.[b]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for red clover and clover species to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, four preventive and curative methods are listed as available to control broadleaved weeds in red clover in Germany. Two preventive methods (primary tillage, cover crops/mulching) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. Six preventive methods are listed as available to control broadleaved weeds in red clover and clover species in Austria. Four preventive methods (primary tillage, false seed beds, increased crop competitiveness, crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

3.1.3. Chive

Table 4 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in chive in Austria and Belgium. Further details on the evaluation are reported in Appendices A and B.

Table 4: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in chive in Austria and Belgium

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Chive	AT	3	0	0	Insufficient
Chive	BE	5	5	n.a.[b]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for chive to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, nine preventive and curative methods are listed as available to control broadleaved weeds in chives in Austria, and eight are available in Belgium. Three preventive methods (primary tillage, false seed beds, crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately or not effective. One curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) and is highly effective in Belgium, whereas in Austria hand-weeding is also practised on a large scale but seems only moderately effective, and has economic limitations.

3.1.4. Maize

Table 5 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in maize in Austria, Belgium, Denmark, Germany, Hungary, Ireland, the Netherlands, Poland, Slovakia and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 5: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in maize in Austria, Belgium, Denmark, Germany, Hungary, Ireland, the Netherlands, Poland, Slovakia and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Maize	AT	> 20	14	n.a.[b]	Sufficient
Maize	BE	> 20	23	n.a.[b]	Sufficient
Maize	DK	7	5	n.a.[b]	Sufficient
Maize	DE	> 20	13	n.a.[b]	Sufficient
Maize	HU	> 20	15	n.a.[b]	Sufficient
Maize	IE	17	8	8.0	Intermediate
Maize	NL	> 20	20	n.a.[b]	Sufficient
Maize	PL	> 20	21	n.a.[b]	Sufficient
Maize	SK	> 20	21	n.a.[b]	Sufficient
Maize	UK	20	14	n.a.[b]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for maize to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, several preventive and curative methods are listed as available to control broadleaved weeds in maize in Austria, Belgium, Germany, Hungary, Poland, Slovakia, Ireland and the United Kingdom. Usually, the three preventive methods: primary tillage, false seed beds and crop rotation are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. For Ireland and for the United Kingdom, the preventive method false seed and crop rotation for Denmark is practised on a large scale with moderate effectivity. For the Netherlands, no information was provided on non-chemical control methods.

3.1.5. Sweet corn

Table 6 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in sweet corn in Austria, Belgium, Finland, Ireland and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 6: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in sweet corn in Austria, Belgium, Finland, Ireland and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Sweet corn	AT	9	6	n.a.[b]	Sufficient
Sweet corn	BE	7	7	n.a.[b]	Sufficient
Sweet corn	FI	2	2	n.a.[b]	Sufficient
Sweet corn	IE	3	0	0	Insufficient
Sweet corn	UK	10	6	8.0	Intermediate

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for sweet corn to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, eight preventive and curative methods are listed as available to control broadleaved weeds in sweet corn in Austria, Belgium, and Ireland. Three to two (Austria) preventive methods (primary tillage, false seed beds (except for Austria), crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are

only moderately effective. For the Netherlands, no information was provided on non-chemical control methods. For sweetcorn, none of the listed non-chemical control methods are used on large scale and are not or only moderate effective in Finland, Ireland and the United Kingdom.

3.1.6. Grass and grass land species

Table 7 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in grass, grassland species, canary grass and grass for seeds in Austria and Germany. Further details on the evaluation are reported in Appendices A and B.

Table 7: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in grass, grassland species, canary grass and grass for seeds species in Austria and Germany

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Grass species	AT	8	6	6.5	Intermediate
Grassland species	AT	6	2	3.5	Insufficient
Canary grass	AT	2	1	1.5	Insufficient
Grass for seed	DE	5	4	3.5	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for grass, grassland species, canary grass and grass for seeds to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, four preventive and curative methods are listed as available to control broadleaved weeds in grass for seeds in Germany. Two preventive methods (primary tillage, cover crops/mulching) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. Six preventive methods are listed as available to control broadleaved weeds in grass, grass land species and canary grass in Austria. For canary grass, two (primary tillage, crop rotation) and for grass/grass land species four preventive methods (primary tillage, false seed beds, increased crop competitiveness, crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

3.1.7. Hop

Table 8 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in hop in Austria. Further details on the evaluation are reported in Appendices A and B.

Table 8: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in hop in Austria

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Hop	AT	2	0	0	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for hop to control broadleaved weeds are provided in the data collection forms in Appendix A. Austria stated that most non-chemical control methods cannot be applied to control broadleaved weeds in hop.

3.1.8. Pumpkin

Table 9 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as

bromoxynil for use in pumpkin in Austria. Further details on the evaluation are reported in Appendices A and B.

Table 9: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in pumpkin in Austria

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Pumpkin	AT	3	0	0	Insufficient
Oil pumpkin	AT	9	1	3	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for pumpkin to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, six preventive and curative methods are listed as available to control broadleaved weeds in pumpkin and oil pumpkin in Austria. Two methods (primary tillage and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

3.1.9. Leeks

Table 10 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in leeks in Austria, Belgium, Denmark, Finland, Ireland and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 10: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in leeks in Austria, Belgium, Denmark, Finland, Ireland and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Leeks	AT	7	2	n.a.[(b)]	Sufficient
Leeks	BE	9	8	n.a.[(b)]	Sufficient
Leeks	DK	6	1	n.a.[(b)]	Sufficient
Leeks	FI	5	2	n.a.[(b)]	Sufficient
Leeks	IE	12	3	n.a.[(b)]	Sufficient
Leeks	UK	12	2	2.0	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for leeks to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, several preventive and curative methods are listed as available to control broadleaved weeds in leek in Belgium, Austria and Denmark, Finland, Ireland and the United Kingdom. Three preventive methods (primary tillage, false seed beds, crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective or not effective in Austria, Belgium, Finland, Denmark, Ireland and the United Kingdom. One curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) but is only moderately effective, and has economical limitations.

3.1.10. Asparagus

Table 11 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in asparagus in Austria, Denmark and Finland. Further details on the evaluation are reported in Appendices A and B.

Table 11: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in asparagus in Austria, Denmark and Finland

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Asparagus	AT	9	4	9	Sufficient
Asparagus	DK	3	1	n.a.[(b)]	Sufficient
Asparagus	FI	3	2	n.a.[(b)]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for asparagus to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, seven preventive and curative methods are listed as available to control broadleaved weeds in asparagus in Denmark and Finland, but none of them are used on a large scale. Austria stated that non-chemical control methods cannot be applied to control broadleaved weeds in asparagus.

3.1.11. Flax

Table 12 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in flax in Belgium, Ireland, the Netherlands and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 12: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in flax in Belgium, Ireland, the Netherlands and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Flax	BE	13	7	6.5	Intermediate
Flax	IE	11	3	n.a.[(b)]	Sufficient
Flax	NL	12	6	n.a.[(b)]	Sufficient
Flax	UK	11	3	n.a.[(b)]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for flax to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, four preventive methods are listed as available to control broadleaved weeds in flax in Belgium. One method (crop rotation) is feasible and practised on a large scale (above 50% of the acreage) but is only moderately effective. For the Netherlands, in total nine preventive and curative methods are listed as available to control broadleaved weeds in flax. Two methods (primary tillage, crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. For flax, none of the listed non-chemical control methods are used on large scale and are effective in the United Kingdom and Ireland.

3.1.12. Bulb vegetables

Table 13 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in bulb vegetables in Austria, Belgium, Denmark, Finland, Hungary, Ireland, the Netherlands, Poland and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 13: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in bulb vegetables in Austria, Belgium, Denmark, Finland, Hungary, Ireland, the Netherlands, Poland and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Bulb vegetables	DK	8	1	n.a.[b]	Sufficient
Bulb vegetables	FI	11	3	n.a.[b]	Sufficient
Bulb vegetables	PL	13	6	n.a.[b]	Sufficient
Bulb vegetables	UK	18	4	n.a.[b]	Sufficient
Garlic/shallots	BE	13	9	n.a.[b]	Sufficient
Garlic	NL	10	3	n.a.[b]	Sufficient
Shallots	NL	15	6	n.a.[b]	Sufficient
Onions	AT	6	5	n.a.[b]	Sufficient
Onions	BE	16	10	n.a.[b]	Sufficient
Onions	HU	9	0	0[c]	Insufficient
Onions/shallots	IE	17	4	n.a.[b]	Sufficient
Onions	NL	19	7	n.a.[b]	Sufficient
Spring onions	BE	7	6	n.a.[b]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).
(c): Hungary claimed that no alternative herbicide a.s. to control weeds (annual broadleaved weeds) in onions is currently authorised in Hungary (EFSA, 2018b).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for bulb vegetables to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, several preventive and curative methods are listed as available to control broadleaved weeds in bulb vegetables in Denmark, Finland, Poland and the United Kingdom. Three preventive methods (primary tillage, false seed bed and rotation) are feasible and practised on a large scale (above 50% of the acreage) but only moderate or not effective. One curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) only moderate effective, and has economical limitations.

In summary, seven preventive and curative methods are listed as available to control broadleaved weeds in garlic and shallot in Belgium. Three preventive methods (primary tillage, false seed beds and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. In Belgium one curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) but is only moderately effective, and has economical limitations.

In summary, eight to nine preventive and curative methods are listed as available to control broadleaved weeds in spring onions and onions in Austria, the Netherlands, Belgium, Hungary and Ireland. Three preventive methods (primary tillage, false seed beds and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately or not effective. One curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) but is only moderately effective, and has economical limitations, except for spring onions in Belgium where hand-weeding is not practised on a large scale.

In summary, nine preventive and curative methods are listed as available to control broadleaved weeds in shallots in the Netherlands. Three preventive methods (primary tillage, false seed beds and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately or not effective. One curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) but is only moderately effective, and has economical limitations.

3.1.13. Cereals, sorghum and millet

Table 14 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in cereals (barley, rye, oats, triticale and wheat), sorghum and millet in Austria, Denmark, Finland, Germany, Hungary, Ireland, Slovakia and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 14: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in cereals (barley, rye, oats, triticale and wheat), sorghum and millet in Austria, Denmark, Finland, Germany, Hungary, Ireland, Slovakia and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Cereals	DK	19	6	10.5	Sufficient
Cereals	FI	> 20	21	n.a.[(b)]	Sufficient
Cereals	UK	> 20	16	8.5	Sufficient
Barley	IE	> 20	15	3.5	Insufficient
Winter barley	SK	14	12	6.5	Intermediate
Spring barley	SK	12	10	3.5	Insufficient
Winter rye	SK	14	12	6.5	Intermediate
Oats	IE	20	13	3.5	Insufficient
Spring oat	SK	11	9	3.5	Insufficient
Winter triticale	SK	13	11	6.5	Intermediate
Wheat	HU	> 20	17	6.5	Intermediate
Wheat	IE	> 20	18	3.5	Insufficient
Winter wheat	SK	15	13	9.5	Sufficient
Spring wheat	SK	10	8	3.5	Insufficient
Sorghum halepense var. *sudanese*	AT	1	1	1.5	Insufficient
Sorghum bicolor	AT	9	7	11	Sufficient
Sorghum	DE	6	6	11	Sufficient
Millet (*Panicum miliaceum*)	AT	1	1	1.5	Insufficient
Millet (*Setaria italica*)	AT	1	1	1.5	Insufficient
Millet	UK	2	1	1.5	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for cereals, sorghum and millet to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, five preventive methods are listed as available to control broadleaved weeds in cereals in the United Kingdom. Four methods (primary tillage, false seed beds, increased crop competitiveness and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. In Denmark and Finland, several preventive and curative methods are listed as available to control broadleaved weeds in cereals. One method (crop rotation) is feasible and practised on a large scale (above 50% of the acreage) but is only moderately effective in Denmark. In Finland, none of the listed methods is used on a large scale and effective. Several preventive and curative methods are listed as available to control broadleaved weeds in winter and spring wheat, winter and spring barley, winter rye, winter triticale and spring oat in Slovakia and Ireland (not curative methods). Preventive methods, such as primary tillage, false seed beds, increased crop competitiveness and crop rotation, are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. For wheat, no information was provided on non-chemical control methods by the applicant and by Hungary. In summary, five and six preventive

methods and one curative method (for Austria only) are listed as available to control broadleaved weeds in sorghum and millet in Austria, Germany and the United Kingdom. In Austria two methods (primary tillage and crop rotation) in Germany and the United Kingdom four methods (primary tillage, false seed beds, increased crop competitiveness and crop rotation) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

3.1.14. *Miscanthus*

Table 15 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in *Miscanthus* in Germany and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 15: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in *Miscanthus* in Germany, and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Miscanthus	DE	5	4	6.5	Intermediate
Miscanthus	UK	15	8	3.5	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for *Miscanthus* to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, three to five preventive and curative methods are listed as available to control broadleaved weeds in *Miscanthus*, in Germany and the United Kingdom. In Germany, two preventive methods (primary tillage and cover crops/mulching) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective. For *Miscanthus*, none of the five listed non-chemical control methods are used on large scale and are only moderate effective in the United Kingdom.

3.1.15. Sunflower

Table 16 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in sunflower in Hungary. Further details on the evaluation are reported in Appendices A and B.

Table 16: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in sunflower in Hungary

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Sunflower desiccation	HU	2	2	4	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

For sunflower, no information was provided on non-chemical control methods by Hungary (see Appendix A).

3.1.16. Winter oilseed rape

Table 17 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in winter oilseed rape in Hungary. Further details on the evaluation are reported in Appendices A and B.

Table 17: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in winter oilseed rape in Hungary

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Winter oilseed rape desiccation	HU	2	2	4	Insufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).

For winter oilseed rape, no information was provided on non-chemical control methods by Hungary (see Appendix A).

3.1.17. Ornamentals and ornamental bulbs

Table 18 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in ornamentals and ornamentals bulbs in Hungary, Poland and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 18: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in ornamentals and ornamental bulbs in Hungary, Poland and the United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[a]	Results
Ornamental bulbs	PL	5	1	3	Insufficient
Ornamental bulbs	UK	4	2	4.5	Insufficient
Ornamentals	HU	0	0	0[b]	Insufficient
Ornamentals	UK	> 20	16	n.a.[c]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): Hungary claimed that no alternative herbicide a.s. to control weeds (annual broadleaved weeds) in ornamentals are authorised in Hungary.
(c): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for ornamentals and ornamental bulbs to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, up to eight preventive and curative methods are listed as available to control broadleaved weeds in ornamental bulbs in Poland and the United Kingdom. Two preventive methods (primary tillage and false seed beds) are practised on a large scale (above 50% of the acreage) but not effective in the United Kingdom. In Poland, three preventive methods (primary tillage, false seed beds and rotation) are practised on a large scale (above 50% of the acreage) but not effective or only moderately effective (crop rotation), and one curative method (hand-weeding) is practised on a large scale (above 50% of the acreage) only moderate effective and has economical limitations. In summary, six preventive methods are listed as available to control broadleaved weeds in ornamentals in United Kingdom. Four preventive methods (primary tillage, false seed beds, increased crop competitiveness and crop rotation) are practised on a large scale (above 50% of the acreage) but only moderately effective. For ornamentals no information was provided on non-chemical control methods by Hungary.

3.1.18. Game and wildlife cover

Table 19 summarises the number of authorised herbicide a.s. and potential chemical alternatives (shortlisted herbicide a.s.) that have the same spectrum of weed control and time of application as bromoxynil for use in game and wildlife in United Kingdom. Further details on the evaluation are reported in Appendices A and B.

Table 19: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaved weeds) in game and wildlife in United Kingdom

Use	Country	Authorised a.s.	Shortlisted a.s.	Evaluation of chemical alternatives (HR score)[(a)]	Results
Game and wildlife	UK	> 20	23	n.a.[(b)]	Sufficient

a.s.: active substance; HR: highest residue.
(a): HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016).
(b): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration.

The evaluation of non-chemical alternatives and detailed information on possible reasons preventing or limiting the applicability of each method for game and wildlife cover to control broadleaved weeds are provided in the data collection forms in Appendix A. In summary, eight preventive and curative methods are listed as available to control broadleaved weeds in game and wildlife cover in the United Kingdom. Two preventive methods (primary tillage and false seed beds) are feasible and practised on a large scale (above 50% of the acreage) but are only moderately effective.

4. Conclusions

The evaluation of applicant's claims that the use of bromoxynil is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 for each authorised use in the considered MS and other uses submitted by MS and not presented by the applicant were evaluated following the EFSA methodology (EFSA, 2016).

Overall, over 20 different uses in crops/crop groups in 11 MS (Austria, Belgium, Denmark, Finland, Germany, Hungary, Ireland, the Netherlands, Poland, Slovakia and the United Kingdom) were evaluated to assess the applicant's claims or information directly provided by MS (Ireland on flax leeks, sweetcorn, maize, onions/shallots, oats, wheat and barley; Austria on sweetcorn, grass and grass species (propagation), canary grass, red clover and clover species, hop, sorghum, millet, pumpkin, leeks and asparagus; Hungary on sunflower (desiccation), winter oilseed rape (desiccation), and ornamentals; Slovakia on wheat (spring and winter), barley (spring and winter), rye, triticale, and oat and from Belgium on chives, spring onions, leek and sweet maize); on the necessity of bromoxynil to control a serious danger to plant health.

An overview of the outcome of chemical alternative substances to bromoxynil is provided (Table 20).

Table 20: Outcome of the evaluation of applicant's claims and information directly provided by MS on the necessity of bromoxynil to control a serious danger to plant health according to Article 4(7) of Regulation (EC) No 1107/2009 for more than 20 different uses (crop/crop groups) in 11 Member States

Crop	Country	Authorised a.s.	Shortlisted a.s.	Score[(a)]	Results
Alfalfa	AT	2	2	n.a.[(a)]	Sufficient
Alfalfa	DE	2	1	n.a.[(a)]	Sufficient
Red clover	AT	3	2	n.a.[(a)]	Sufficient
Red clover	DE	2	1	n.a.[(a)]	Sufficient
Clover species	AT	1	0	0	Insufficient
Chive	AT	3	0	0	Insufficient
Chive	BE	5	5	n.a.[(a)]	Sufficient
Maize	AT	> 20	14	n.a.[(a)]	Sufficient
Maize	BE	> 20	> 20	n.a.[(a)]	Sufficient
Maize	DK	7	5	n.a.[(a)]	Sufficient
Maize	DE	> 20	13	n.a.[(a)]	Sufficient
Maize	HU	> 20	15	n.a.[(a)]	Sufficient
Maize	IE	17	8	8	Intermediate
Maize	NL	> 20	19	n.a.[(a)]	Sufficient
Maize	PL	> 20	> 20	n.a.[(a)]	Sufficient
Maize	SK	> 20	> 20	n.a.[(a)]	Sufficient
Maize	UK	20	14	n.a.[(a)]	Sufficient

Crop	Country	Authorised a.s.	Shortlisted a.s.	Score[(a)]	Results
Sweet corn	AT	9	6	n.a.[(a)]	Sufficient
Sweet corn	BE	7	7	n.a.[(a)]	Sufficient
Sweet corn	FI	2	2	n.a.[(a)]	Sufficient
Sweet corn	IE	3	0	0	Insufficient
Sweet corn	UK	10	6	8.0	Intermediate
Grass species (propagation)	AT	8	6	6.5	Intermediate
Grass (propagation)	DE	5	4	3.5	Insufficient
Grassland species (propagation)	AT	6	2	3.5	Insufficient
Canary grass	AT	2	1	1.5	Insufficient
Hop	AT	2	0	0	Insufficient
Pumpkin	AT	3	0	0	Insufficient
Oil pumpkin	AT	9	1	3	Insufficient
Leek	AT	7	2	n.a.[(a)]	Sufficient
Leek	BE	9	8	n.a.[(a)]	Sufficient
Leek	DK	6	1	n.a.[(a)]	Sufficient
Leek	FI	5	2	n.a.[(a)]	Sufficient
Leek	IE	12	3	n.a.[(a)]	Sufficient
Leek	UK	12	2	2	Insufficient
Asparagus	AT	9	4	9	Sufficient
Asparagus	DK	3	1	n.a.[(a)]	Sufficient
Asparagus	FI	3	2	n.a.[(a)]	Sufficient
Flax	BE	13	7	6.5	Intermediate
Flax	IE	11	3	n.a.[(a)]	Sufficient
Flax	NL	12	6	n.a.[(a)]	Sufficient
Flax	UK	11	3	n.a.[(a)]	Sufficient
Bulb vegetables	DK	8	1	n.a.[(a)]	Sufficient
Bulb vegetables	FI	11	3	n.a.[(a)]	Sufficient
Bulb vegetables	PL	13	6	n.a.[(a)]	Sufficient
Bulb vegetables	UK	18	5	n.a.[(a)]	Sufficient
Garlic and shallots	BE	13	9	n.a.[(a)]	Sufficient
Garlic	NL	10	3	n.a.[(a)]	Sufficient
Shallots	NL	15	6	n.a.[(a)]	Sufficient
Onions	AT	7	5	n.a.[(a)]	Sufficient
Onions	BE	16	10	n.a.[(a)]	Sufficient
Onions	HU	9	0	0	Insufficient
Onions/shallots	IE	17	4	n.a.[(a)]	Sufficient
Onions	NL	19	7	n.a.[(a)]	Sufficient
Spring onions	BE	7	6	n.a.[(a)]	Sufficient
Cereals	DK	19	6	10.5	Sufficient
Cereals	FI	> 20	> 20	n.a.	Sufficient
Cereals	UK	> 20	16	8.5	Sufficient
Wheat	HU	> 20	17	6.5	Intermediate
Wheat	IE	> 20	18	3.5	Insufficient
Winter wheat	SK	15	13	9.5	Sufficient
Spring wheat	SK	10	8	3.5	Insufficient
Oats	IE	20	13	3.5	Insufficient
Spring oat	SK	11	9	3.5	Insufficient
Barley	IE	> 20	15	3.5	Insufficient
Winter barley	SK	14	12	6.5	Intermediate
Spring barley	SK	12	10	3.5	Insufficient

Crop	Country	Authorised a.s.	Shortlisted a.s.	Score[(a)]	Results
Winter rye	SK	14	12	6.5	Intermediate
Winter triticale	SK	13	11	6.5	Intermediate
Sorghum bicolor	AT	9	7	11	Sufficient
Sorghum halepense var. *Sudanese*	AT	1	1	1.5	Insufficient
Sorghum	DE	6	6	11	Sufficient
Millet *(Panicum miliaceum)*	AT	1	1	1.5	Insufficient
Millet *(Setaria italica)*	AT	1	1	1.5	Insufficient
Millet	UK	3	1	1.5	Insufficient
Miscanthus	DE	5	4	6.5	Intermediate
Miscanthus	UK	15	8	3.5	Insufficient
Sunflower (desiccation)	HU	2	2	4	Insufficient
Winter oilseed rape (desiccation)	HU	2	2	4	Insufficient
Ornamental bulbs	PL	5	1	3.0	Insufficient
Ornamental bulbs	UK	4	2	4.5	Insufficient
Ornamentals	HU	0	0	0	Insufficient
Ornamentals	UK	> 20	16	n.a.[(a)]	Sufficient
Game and wildlife cover	UK	> 20	> 20	n.a.[(a)]	Sufficient

a.s.: active substance; HR: highest residue.
(a): n.a. = not applicable, as there is another a.s. with the same MoA as the a.s. under consideration (MoA bromoxynil: C3).

A wide range of chemical alternative herbicide a.s. are available in MS for broadleaved weed control in alfalfa, red clover (except for clover species in Austria: insufficient), maize (except for Ireland: intermediate), sweet corn (except for the United Kingdom: intermediate; Ireland: insufficient), leeks (except for the United Kingdom: insufficient), asparagus, flax (except for Belgium: intermediate), bulb vegetables (including garlic, shallots, onions (except for Hungary: insufficient), spring onions), cereals, sorghum, ornamentals (only for the UK), and game and wildlife cover.

The situation for the control of broadleaved weed is inconclusive for the following crop/group groups: chive (sufficient in Belgium and intermediate in Austria), different classes of wheat (insufficient in Ireland, intermediate in Hungary, and sufficient in Slovakia), rye and triticale (intermediate in Slovakia), different classes of barley (insufficient, except for Slovakia: intermediate) and *Miscanthus* (intermediate in Germany and insufficient in the United Kingdom). The intermediate situations would require an overall conclusion by the respective MS if the available non-chemical control methods are an alternative, so that an overall conclusion based on the chemical and non-chemical assessment can be drawn.

There are insufficient chemical alternatives to bromoxynil for weed control in different grass types (except for grass species (propagation) in Austria), hop, pumpkin, oat, millet, sunflower, winter oilseed rape, ornamental bulbs and ornamentals (except for ornamentals in United Kingdom: sufficient).

Non-chemical alternatives were also evaluated for the different uses. A wide range of preventive and curative methods are available, used on a large scale, but all these methods do not have the same efficacy as chemical methods or have economic limitations. A combination of both chemical and non-chemical methods seems often possible.

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Abbreviations

a.s.	active substance
BBCH	growth stages of mono- and dicotyledonous plants
BLW	broadleaved weeds
DAR	Draft Assessment Report
GR	Grass weeds
GS	growth stage
HR	Herbicide Resistance
HRAC	Herbicide Resistance Action Committee
IPM	Integrated Pest Management
MCPA	2-methyl-4-chlorophenoxyacetic acid
MoA	Mode of Actions
MS	Member State
RAR	Renewal Assessment Report
RMS	Rapporteur Member State
WG	Working Group

Appendix A – Data collection set

Validated Excel files submitted by MS (Austria, 2018; Belgium, 2018; Denmark, 2018; Finland, 2018; Germany, 2018; Hungary, 2018; Ireland, 2018; Netherlands, 2018; Poland, 2018, Slovakia, 2018; United Kingdom, 2018) and evaluated by EFSA.

Appendix B – Shortlisted herbicide active substances

Overview of the shortlisting process and final shortlisted herbicide active substances (bold) in relation to each use (crop) and Member State.

Table B.1: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **alfalfa** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pendimethalin**	K1	Pre- & early post	BLW killer	AT: In AT, there is currently only one product authorised: Stomp Aqua, Reg. No 3107/0 1) The use is only permissible in alfalfa grown for propagation purposes –> therefore, pendimethalin cannot completely substitute Bromoxynil (use in alfalfa grown for animal feeding is not possible) 2) Stomp Aqua is authorised only for post-emergence control (as from BBCH 13 of the crop onwards) and not for pre-emergence, as indicated by the applicant
2	**Pyridate**	C3	Post-emergence	BLW killer	

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.2: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **chive** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Dimethenamid-p	K3	Post-emergence crop/pre-emergence weeds	BLW killer	
	Pendimethalin	K1	Post-emergence crop/pre-emergence weeds	BLW killer	AT: In AT, there is one product authorised: Stomp Aqua (Reg. No 3107/0). The use is permissible only for pre-emergence control in the crop --> no alternative in terms of application time
	Prosulfocarb	N	Only 10–14 days after planting	BLW killer	AT: In AT, there is only one product authorised: Boxer (Reg. No 2525/0) The use is **only permissible in chives grown for bulb production**

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.3: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Nicosulfuron**	B	Post-emergence	BLW killer	
2	**Prosulfuron**	B	Post-emergence	BLW killer	
3	**Rimsulfuron**	B	Post-emergence	BLW killer	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
4	**Thifensulfuron**	B	Post-emergence	BLW killer	
5	**Tritosulfuron***	B	Post-emergence	BLW killer	AT: In AT, for use in maize, tritosulfuron is only authorised in combination with dicamba
6	**Terbuthylazine***	C1	Post-emergence	Annual BLW & grasses	AT: In Austria, terbuthylazine is only available in mixture with other a.s., e.g. mesotrione, flufenacet
7	**Pyridate**	C3	Post-emergence	BLW killer	AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted
8	**Mesotrione**	F2	Post-emergence	BLW killer	
9	**Tembotrione**	F2	Post-emergence	BLW killer	
	Aclonifen	F3	Pre & early post --> pre-emergence	BLW killer	
	Pendimethalin	K1	Pre & early post	BLW killer	
	Dimethenamid-p	K3	Pre & early post	BLW killer	
	Flufenacet	K3	Pre & early post	BLW killer	
	S-Metolachlor	K3	Pre & early post	BLW killer	AT: not short-listed due to time of application and weed spectrum
	Pethoxamid	K3	Pre & early post	BLW killer	
10	**Clopyralid**	O	Post-emergence	BLW killer	
11	**Dicamba**	O	Post-emergence	BLW killer	
12	**Picloram***	O	Post-emergence	BLW killer	AT: in AT for use in maize, Picloram is only available in co-formulation with clopyralid
	Thiencarbazone	B	Pre & early post	Annual BLW & grasses	
	Isoxaflutole	F2	Pre & early post	Annual BLW & grasses	
13	**Foramsulfuron**	B	Post-emergence	Annual and perennial grasses, annual broadleaved	
14	**Iodosulfuron**	B	Post-emergence	Annual and perennial grasses, annual broadleaved	

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.4: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **onions** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pendimethalin**	K1	Pre & early post	BLW killer	
2	**Dimethenamid-p**	K3	Pre & early post	BLW killer	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
3	**Pyridate**	C3	Post-emergence	BLW killer	
	Glufosinate	H	Pre-emergence	Annual BLW & grasses	AT: The only product currently authorised is Basta 150 SL (Reg. No 3685/0): no use before cultivation of the crop is permissible!!! Only the use for weed control between onion rows (with spray shields) is authorised (see additional row below)
4	**Prosulfocarb**	N	Post-emergence	Annual BLW & grasses	
5	**Clopyralid**	O	Post-emergence	BLW killer	

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.5: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **red clover** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2-methyl-4-chlorophenoxyacetic acid (MCPA)**	O	Post-emergence	BLW killer	AT: In AT, Dicopur M (Reg. No 3052/0) is authorised in red clover **as undersown crop**
2	**Pyridate**	C3	Post-emergence	BLW killer	
	Fluazifop-P	A	Post-emergence	Grass weed killer	

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.6: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sweet corn** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Terbuthylazine**	C1	Post-emergence	Annual BLW & grasses	AT: In Austria, terbuthylazine is only available in mixture with other a.s., e.g. mesotrione, flufenacet
2	**Pyridate**	C3	Post-emergence	BLW killer	AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted
3	**Mesotrione**	F2	Post-emergence	BLW killer	
4	**Tembotrione**	F2	Post-emergence	BLW killer	
	Pendimethalin	K1	Pre & early post	BLW killer	
	Dimethenamid-p	K3	Pre & early post	BLW killer	
	S-Metolachlor	K3	Pre & early post	BLW killer	AT: not shortlisted due to time of application and weed spectrum
5	**Clopyralid**	O	Post-emergence	BLW killer	
6	**Dicamba**	O	Post-emergence	BLW killer	

a.s.: active substance; BLW: broadleaved weeds; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.7: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **grass species** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	Dichlorprop-P	O	BBCH 12-21, autumn	Broadleaved weeds	
2	Pendimethalin	K1	BBCH 13-29	Annual BLW	
3	Fluroxypyr*	O	Post-emergence	Annual BLW	AT: Only authorised in combination with florasulam + clopyralid: Product Ariane C (Pfl. Reg. No 3338/0)
4	Florasulam	B	BBCH 13-29	Annual BLW	
5	Clopyralid*	O	BBCH 20-32	Broadleaved weeds	AT: Only authorised in combination with florasulam + fluroxypyr: Product Ariane C (Pfl. Reg. No 3338/0)
	Diflufenican*	F1	during the vegetation period	Annual BLW	AT: Only authorised in combination with florasulam: Product Saracen Delta (Pfl. Reg. No 3656/0)
	Glufosinate	H	BBCH 13, BBCH 20-32	Annual grasses and BLW	
6	Tribenuron*	B	BBCH 12-21, autumn	Annual BLW	AT: Only authorised in combination with florasulam: Product Saracen Max (Pfl.Reg.Nr. 3691/0)

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.8: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **grassland** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Prosulfocarb	N	Pre-emergence	Annual grasses and BLW	
1	**Amidosulfuron**	B	Post-emergence, 8–10 cm crop height	Annual BLW	
2	**MCPA**	O	Post-emergence	BLW	
	Propyzamide	K1	Before emergence or after planting	Annual grasses and BLW	
	Haloxyfop-P	A	BBCH 12-29	Annual grasses	
	Ethofumesat	N	BBCH 22-29	Annual grasses and BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.9: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **clover species** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Fluazifop-P		After crop emergence until BBCH 51	Grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants.
(a): The bold indicates the a.s. shortlisted.

Table B.10: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **hop** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Fluazifop-P	A	After hop shoots (bines) start to climb up the strings	Monocotyledonous species	
	MCPA	O	When the shoots reached the end of the trellis, as from BBCH 51 of the crop	Dicotyledonous species, *Equisetum* sp.	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants.
(a): The bold indicates the a.s. shortlisted.

Table B.11: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **canary grass** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Thiefensulfuron**	B	As from BBCH 13 of the crop	Annual BLW	
	Dichlorprop-P	O	BBCH 21-29 of the crop	Annual BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.12: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for ***Sorghum bicolor*** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Dicamba**	O	BBCH 12-18	BLW	
2	**Terbuthylazine***	C1	Post-emergence	Annual BLW	AT: In Austria for use in *Sorghum bicolor* terbuthylazine is only available in mixture with S-metolachlor : Gardo Gold (Reg. No 2775/0)
3	**S-Metolachlor**	K3	Post-emergence	Annual grasses	
4	**Dimethenamid-p**	K3	Post-emergence	Annual BLW, some grass weed species	
5	**Thifensulfuron**	B	Post-emergence	Annual BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
6	**Pendimethalin**	K1	Post-emergence	Annual BLW	
7	**Tritosulfuron***	B	Post-emergence	Annual BLW	AT: For use in *Sorghum bicolor* only authorised in combination with dicamba: Arrat (Pfl. Reg. No. 3133/0)
	2,4-D*	O	Before sowing	BLW	AT: For use in *Sorghum bicolor* only authorised in combination with glyphosate: Kyleo (Pfl. Reg. No. 3325/0)
	Glyphosate*	G	Before sowing	BLW and grasses	AT: For use in *Sorghum bicolor* only authorised in combination with 2,4-D: Kyleo (Pfl. Reg. No. 3325/0)

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.13: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for millet ***(Panicum miliaceum)*** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Thifensulfuron**	B	Post-emergence	Annual BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.14: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for millet (***Setaria italica***) in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Thifensulfuron**	B	Post-emergence	Annual BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.15: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for ***Sorghum halepense* var. *sudanese*** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Thifensulfuron**	B	Post-emergence	Annual BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.16: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **oil pumpkin** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Isoxaben	L	Before emergence of the crop	Annual BLW	
	Clomazone	F4	Pre-emergence until BBCH 12	*Galium aparine*, *Stellaria media*, *Lamium* spp.	
	S-Metolachlor	K3	Pre-emergence	Millet species	
	Fluazifop-P	A	Post-emergence	Annual monocotyledonous species	
	Dimethenamid-p	K3	Before emergence of the crop or before planting	Annual BLW, millet species	
	Pethoxamid	K3	Before emergence	Annual grasses and BLW	
	Clomazone	F4	Before emergence until BBCH 12	Annual grasses and BLW	
1	**Glufosinate**	H	During vegetation period with spray shields	Annual grasses and BLW	
	S-Metolachlor	K3	Before emergence	Millet weed species	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.17: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **pumpkin** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Dimethenamid-p	K3	Only in Cucurbita pepo hybrids grown on plastic mulch (mulch film) before emergence OR before planting	Annual BLW, millet species	
	Pendimethalin	K1	Only in Cucurbita pepo hybrids grown on plastic mulch (mulch film) inter-row treatment only before emergence OR before planting	Annual BLW, millet species	
	Glufosinate	H	Only in Cucurbita pepo hybrids grown on plastic mulch (mulch film) inter-row treatment only during vegetation period	Annual grasses and BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.18: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leek** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Cycloxydim	A	Post-emergence	Grasses	
	Prosulfocarb	N	BBCH 11-13 or 7 days after planting	Annual grasses and BLW	
	Dimethenamid-p	K3	BBCH 12-13; in planted crops: 5–7 days after start of growth	Annual BLW, weed millet species, *Poa annua*	
	Pendimethalin	K1	Post-emergence until BBCH 11; until 7 days after planting	Annual BLW	
1	**Pyridate**	C3	BBCH 12-BBCH 41	Annual BLW	
	Glyphosate	G	After sowing, before crop emergence	Annual grasses and BLW	
2	**Glufosinate**	H	During vegetation period with spray shields, inter-row treatment	Annual grasses and BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.19: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **asparagus** in **Austria**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Isoxaben		Only in the year of sowing of the crop, not in established crops	Annual BLW	
	Fluazifop-P		In recently established crops OR after harvest in yielded crops	Grasses	
1	**Dimethenamid-P**	K3	In harvested crops: after harvest	Annual BLW, weed millet species	
2	**Flufenacet***	K3	In harvested crops: after harvest, before re-growth of the crop	Annual grasses and BLW	AT: Only authorised in combination with metribuzin: Product Artist (Pfl. Reg. No 2913/0)
3	**Metribuzin***	C1	In harvested crops: after harvest, before re-growth of the crop	Annual grasses and BLW	AT: Only authorised in combination with flufenacet: Product Artist (Pfl. Reg. No 2913/0)
4	**Pendimethalin**	K1	In harvested crops: after harvest	Annual BLW, *Echinochloa crus-galli*, *Poa annua*	
	Glyphosate	G	Only in crops not yet harvested, apply with spray shields, inter-row treatment	Grasses and BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pyridate	C3	In harvested crops: after harvest; under leaf spraying	Annual BLW	
	Glufosinate	H	After harvest spraying with shields, inter-row treatment	Annual grasses and BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.20: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **flax** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Metsulfuron-methyl**	B	3–12 cm crop hight	Dicotyledonous weeds (annual and perennial)	
	Propaquizafop	A	Pre- and post-emergence	Annual grass weeds	
2	**MCPA**	O	5–15 cm crop hight	Dicotyledonous weeds (annual and perennial)	
3	**Sulcotrione**	F2	Pre-emergence	Dicotyledonous weeds (annual)	BE: Different timing is not relevant in IPM
4	**Iodosulfuron-methyl-sodium**	B	BBCH 12-17	Dicotyledonous weeds (annual)	
5	**Flupyrsulfuron-methyl***	B	3–12 cm crop hight	Dicotyledonous weeds (annual and perennial)	BE: Flupyrsulfuron is not registered in flax as solo product but only in co-formulation
6	**Amidosulfuron**	B	4–12 cm crop hight	Dicotyledonous weeds (annual and perennial)	
7	**Clopyralid**	O	12–18 cm crop hight	Dicotyledonous weeds (annual and perennial)	BE: Efficient against groundsel (SENVU)
	Cycloxydim	A	Post-emergence	Grass weeds	
	Diquat	D	BBCH 89 Fully ripe	Dicotyledonous weeds (annual)	
	Fluazifop-P-Butyl	A1	Up to 15 cm	Grass weeds	
	Quizalofop-P-ethyl	A	Post-emergence	Grass weeds	
	Quizalofop-P-tefuryl	A	Post-emergence	Grass weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.21: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **garlic and shallots** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Propaquizafop	A		Annual and perennial grass weeds	
1	**Chlorpropham**	K2	Pre- and post-emergence	Annual grass weeds Annual dicotyledonous weeds	
2	**Isoxaben**	L	> BBCH 011	Annual BLW	BE: Different timing is not relevant in IPM
3	**Bentazone**	C3	BBCH 11-14	Annual BLW	
4	**Dimethenamide-P**	K3	BBCH 12-14	Annual grass weeds Annual dicotyledonous weeds	BE: Different timing is not relevant in IPM
	Fluazifop-p-butyl	A1		Perennial grass weeds (Poaceae)	
5	**Pyridate**	C3	2–3 weeks after planting or BBCH 09-19	Annual BLW	
6	**Pendimethalin**	K1	BBCH 01-08 or BBCH 11-12	Annual BLW	BE: Different timing is not relevant in IPM
	Quizalofop-p-tefuryl	A	Post-emergence	Annual grass weeds	
7	**Chloridazon**	C1	BBCH 12-19	Annual grass weeds Annual dicotyledonous weeds	
8	**Fluroxypyr**	O	BBCH 11-15	BLW (annual and perennial)	
9	**Aclonifen**	F3	Pre-emergence	Annual grass weeds Annual dicotyledonous weeds	
	Quizalofop-P-ethyl	A	Post-emergence	Perennial grass weeds (Poaceae)	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants.
(a): The bold indicates the a.s. shortlisted.

Table B.22: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **chives** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Dimethenamide-P**	K3	BBCH 12-14	Annual grass weeds Annual dicotyledonous weeds	
2	**Pyridate**	C3	BBCH 10-12	Annual BLW	
3	**Pendimethalin**	K1	Pre-emergence	Annual BLW	
4	**Metamitron**	C1	Pre-emergence	Annual BLW	
5	**Prosulfocarb**	N	Pre-emergence	Annual grass weeds Annual dicotyledonous weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.23: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **onions** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Propaquizafop	A		Annual grass weeds	
1	**Chlorpropham**	K2	Pre-emergence and BBCH 11-19	Annual grass weeds Annual dicotyledonous weeds	
2	**Isoxaben**	L	> BBCH 11	Annual BLW	BE: Different timing is not relevant in IPM
3	**Bentazone**	C3	BBCH 11-14	Annual BLW	
4	**Dimethenamide-P**	K3	BBCH 12-14	Annual grass weeds Annual dicotyledonous weeds	BE: Different timing' is incorrect ('timing of application' was provided incorrectly)
	Fluazifop-p-butyl	A		Perennial grass weeds (Poaceae)	
5	**Pyridate**	C3	BBCH 10-12	Annual BLW	
6	**Pendimethalin**	K1	BBCH 01-08 or BBCH 11-12	Annual BLW	
	Quizalofop-p-tefuryl	A	Post-emergence	Annual grass weeds	
7	**Chloridazon**	C1	BBCH 012-19	Annual grass weeds Annual dicotyledonous weeds	BE: Different timing' is incorrect ('timing of application' was provided incorrectly)
8	**Fluroxypyr**	O	BBCH 11-15	BLW (annual and perennial)	
	Clethodim	A		Grass weeds	
	Haloxyfop-p-methyl	A	BBCH 11-40	Annual Grass weeds	
9	**Glyphosate**	G	Pre-emergence	Total herbicide	BE: Different timing is not relevant in IPM
10	**Aclonifen**	F3	BBCH 12-15	Annual grass weeds Annual dicotyledonous weeds	
	Quizalofop-p-ethyl	A	Post-emergence	Grass weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.24: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **spring onions** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Chlorpropham**	K2	Pre- and post-emergence	Annual grass weeds Annual dicotyledonous weeds	
2	**Dimethenamide-P**	K3	BBCH 12-14	Annual grass weeds Annual dicotyledonous weeds	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
3	**Pyridate**	C3	BBCH 10-12	Annual BLW	
4	**Pendimethalin**	K1	BBCH 01-08 or BBCH 11-12	Annual BLW	
5	**Fluroxypyr**	O	BBCH 11-15	BLW (annual and perennial)	
	Haloxyfop-p-methyl	A	BBCH 11-40	Annual Grass weeds	
6	**Glyphosate**	G	Pre-emergence	Total herbicide	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.25: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leek** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Isoxaben**	L	After planting	Annual BLW	
2	**Pyridate**	C3	2–3 weeks after planting	Annual BLW	
	Haloxyfop-p-methyl	A	BBCH 11-15	Annual Grass weeds	
3	**Dimethenamide-P**	K3	Pre-emergence BBCH 01-16	Annual and perennial grass weeds and dicotyledonous weeds	
4	**Metazachlor**	K3	5–21 days after planting	Annual grass weeds and annual BLW	
5	**Pendimethalin**	K1	Within 21 days after planting	Annual BLW	
6	**Prosulfocarb**	N	7–14 days after planting	Annual grass weeds and annual BLW	
7	**Chlorpropham**	K2	Pre- and post-emergence	Annual grass weeds Annual dicotyledonous weeds	
8	**Propyzamide**	K1	Pre-emergence	Annual and perennial grass weeds and dicotyledonous weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.26: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Tritosulfuron***	B	BBCH 13-16	Dicotyledonous weeds (annual and perennial)	BE: Tritosulfuron is only available in co-formulation
2	**Prosulfuron**	B	BBCH 12-19	Dicotyledonous weeds (annual and perennial)	BE: Available as solo product and in co-formulations
3	**Nicosulfuron**	B	BBCH 12-18	Annual grass weeds (Poaceae) annual dicotyledonous weeds	BE: Available as solo product and in co-formulations
4	**Foramsulfuron***	B	BBCH 12-18	Annual grass weeds Annual dicotyledonous weeds	BE: Only available in co-formulation
5	**Thiencarbazone-methyl***	B	BBCH 12-18	Annual grass weeds Annual dicotyledonous weeds	BE: Only available in co-formulation
6	**Florasulam**	B	BBCH 13-16	Annual BLW	BE: Available as solo product and in co-formulations
7	**Iodosulfuron-methyl-sodium***	B	BBCH 12-16	Annual BLW and annual grass	BE: Only available in co-formulation
8	**Rimsulfuron**	B	BBCH 14-18	Annual grass weeds Annual dicotyledonous weeds	
9	**Terbuthylazine***	C1	Pre- or post-emergence	Annual BLW	BE: Only available in co-formulation
10	**Pyridate**	C3	BBCH 12-18	Annual BLW	
11	**Mesotrione**	F2	BBCH 12-18	Annual dicotyledonous weeds Annual grass weeds	BE: Available as solo product and in co-formulations
12	**Tembotrione***	F2	BBCH 12-18	Annual grass weeds Annual dicotyledonous weeds	BE: Only available in co-formulation or with a synergist
13	**2,4-D**	O	Plant height 5–10 cm or higher than 25 cm	Dicotyledonous weeds (annual and perennial)	
14	**Fluroxypyr**	O	BBCH 12-16	Annual and perennial dicotyledonous weeds	BE: Available as solo product and in co-formulations
15	**Dicamba**	O	BBCH 12-16	Perennial BLW	BE: Available as solo product and in co-formulations
16	**Clopyralid**	O	BBCH 16-19	Asteraceae	BE: Available as solo product and in co-formulations
17	**Isoxaflutole***	F2	Pre-emergence	Annual and perennial grass weeds Annual and perennial BLW	BE: Different timing is not relevant in IPM; only available in co-formulations
18	**Glyphosate**	G	BBCH 01-08	Weeds	BE: Alternative that can reduce early weed pressure in IPM

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
19	**Pendimethalin**	K1	Pre-emergence	Annual BLW	BE: Alternative that can reduce early weed pressure in IPM
20	**Flufenacet**	K3	BBCH 01-15	Annual grass weeds Annual dicotyledonous weeds	BE: Alternative that can reduce early weed pressure in IPM; only available in co-formulations
21	**Pethoxamid**	K3	Pre-early post	Annual grass weeds Annual dicotyledonous weeds	BE: Alternative that can reduce early weed pressure in IPM
22	**Dimethenamide-P**	K3	BBCH 01-16	Annual grass weeds Annual dicotyledonous weeds	BE: Alternative that can reduce early weed pressure in IPM; Available as solo product and in co-formulations
	S-Metolachlor	K3	Pre-emergence or BBCH 12-14	ECHCG (barnyard grass)	BE: Alternative that can reduce early weed pressure in IPM; Available as solo product and in co-formulations
	Cycloxydim	A	BBCH 12-19	Annual and perennial grass weeds	
23	**Sulcotrione**	F2	BBCH 12-16	Annual dicotyledonous weeds Annual grass weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.27: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sweet corn** in **Belgium**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	BBCH 12-18	Annual BLW	
2	**Mesotrione**	F2	BBCH 12-18	Annual dicotyledonous weeds Annual grass weeds	BE: Available as solo product and in co-formulations
3	**Tembotrione***	F2	BBCH 12-18	Annual grass weeds Annual dicotyledonous weeds	BE: Only available in co-formulation
4	**Fluroxypyr**	O	BBCH 1~~3~~2-16	Annual and perennial dicotyledonous weeds	BE: Available as solo product and in co-formulations
5	**Clopyralid**	O	BBCH 16-19	Asteraceae	BE: Available as solo product and in co-formulations
6	**Pendimethalin**	K1	Pre-emergence	Annual BLW	BE: Alternative that can reduce early weed pressure in IPM

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
7	**Dimethenamide-P**	K3	BBCH 01-16	Annual grass weeds Annual dicotyledonous weeds	BE: Alternative that can reduce early weed pressure in IPM; Available as solo product and in co-formulations

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.28: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **bulb vegetables** in **Denmark**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Aclonifen	F3	Pre-early/Post	BLW/GR	DK: Concerning aclonifen the reason why it should not be included in the shortlist is different weed spectrum rater than different application time
	Clopyralid	O	Post-emergence	BLW	DK: Clopyralid should not be on the shortlist as its selectivity is marginal and therefore only is used in field with large populations of chamomile species
	Cycloxydim	A	Post-emergence	GR	
	Diquat	D	PRE	TOTAL	
	Glyphosate	G	Pre-sowing	TOTAL	
	Pendimethalin	K1	Pre-early/Post	BLW/GR	
	Prosulfocarb	N	Pre-early post	BLW	
1	**Pyridate**	C3	Post-emergence	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; GR: Grass weeds; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.29: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **cereals** in **Denmark**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Halauxifen	O	POST spring	Broadleaved weeds	DK: No straight products. Products containing haluxifen are not considered alternatives to bromoxynil du to different weed spectrum
	Aminopyralid	O	POST autumn & spring; not in cereals undersown with clover, lucern or other legumes	Broadleaved weeds	DK: No straight products. Products containing haluxifen are not considered alternatives to bromoxynil due to different weed spectrum
	Fenoxaprop	A	POST autumn & spring	Grass weeds	
	Clodinafop	A	POST autumn & spring	Grass weeds	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pyroxsulam	B	POST autumn & spring; not in undersown cereals	Broadleaved weeds & grass weeds	
1	**Diflufenican**	F1	PRE/POST autumn & spring; not in undersown cereals	BLW	DK: Only an alternative with no undersown crops likes grass for seed production
	Metsulfuron	B	POST after BBCH 20; not in undersown cereals	BLW	
2	**Tribenuron**	B	POST autumn & spring	BLW	DK: Also an alternative with undersown grass but tribenuron may disappear from the market soon due to EU regulation
3	**Thifensulfuron**	B	POST spring	BLW	
	Iodosulfuron	B	POST autumn & spring; not in barley; not in undersown cereals	Broadleaved weeds & grass weeds	DK: One product containing iodosulfuron, mesosulfuron and diflufenican is an alternative but only without undersown grass
	Mesosulfuron	B	POST autumn & spring; not in barley; not in undersown cereals	Broadleaved weeds & grass weeds	DK: One product containing iodosulfuron, mesosulfuron and diflufenican is an alternative but only without undersown grass
	Flupyrsulfuron	B	POST autumn & spring; in spring only in winter wheat; not in undersown cereals	Broadleaved weeds & grass weeds	
	MCPA	O	POST spring; not in undersown cereals	BLW	
	2,4-D	O	POST spring	BLW	DK: No straight 2,4-D products and those containing 2,4-D are not alternatives due to different weed spectrum
	Picolinafen	F1	POST autumn & spring; only in winter cereals; not in undersown cereals	BLW	
4	**Florasulam**	B	POST spring; not in cereals undersown with clover, lucern or other legumes	BLW	
	Fluroxypyr	O	POST spring; not in cereals undersown with clover, lucern or other legumes	BLW	DK: Products containing fluroxyopyr are not considered alternatives to bromoxynil due to different weed spectrum
5	**Pendimethalin**	K1	PRE/POST autumn & spring	BLW	DK: Only an alternative with no undersown grass for seed production
6	**Prosulfocarb**	N	POST autumn & spring; in spring only in winter wheat	BLW	DK: Only an alternative with no undersown crops likes grass for seed production

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.30: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Denmark**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Mesotrione**	F2	Pre/Post		
2	**Iodosulfuron**	B	Pre/Post		
3	**Foramsulfuron**	B	Pre/Post		
4	**Bentazone***	C3	Pre/Post		
	Fluroxypyr	O	Post		
5	**Thifensulfuron**	B	Post		
	Pendimethalin	K1	Pre/Post-GS 00-13		

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; GS: growth stage.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.31: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leek** in **Denmark**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	Post-emergence	BLW	
	Cycloxydim	A	Post-emergence	GR	
	Diquat	D	Pre	TOTAL	
	Pendimethalin	K1	Pre-early/Post	BLW/GR	
	Glyphosate	G	Pre-sowing	TOTAL	
	Prosulfocarb	N	Pre-early post	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.32: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **asparagus** in **Denmark**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	Post-emergence	BLW	
	Diquat	D	Pre	TOTAL	
	Glyphosate	G	Pre-sowing	TOTAL	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.33: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **cereals** in **Finland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Amidosulfuron**	B	Post-emergence	BLW	
2	**Florasulam**	B	Post-emergence	BLW	
3	**Iodosulfuron-M-Na**	B	Post-emergence	BLW/GR	
4	**Metsulfuron-M**	B	Post-emergence	BLW/GR	
5	**Propoxycarbazone-sodium**	B	Post-emergence	BLW/GR	
6	**Pyroxsulam**	B	Post-emergence	BLW	
7	**Sulfosulfuron**	B	Post-emergence	BLW	
8	**Thifensulfuron-M**	B	Post-emergence	BLW	
9	**Tribenuron-M**	B	Post-emergence	BLW	
10	**Tritosulfuron**	B	Post-emergence	BLW	
11	**Bentazone**	C3	Post-emergence	BLW	
12	**Bifenox**	E	Post-emergence	BLW/GR	
13	**Carfentrazone-E**	E	Post-emergence	BLW/GR	
	Prosulfocarb	N	Pre-early post	BLW	
14	**2.4-D**	O	Post-emergence	BLW	
15	**2.4-DP-P Dichlorprop**	O	Post-emergence	BLW	
16	**Aminopyralid**	O	Post-emergence	BLW	
17	**Clopyralid**	O	Post-emergence	BLW	
18	**Fluroxypyr**	O	Post-emergence	BLW	
19	**Halauxifen-methyl**	O	Post-emergence	BLW	
20	**MCPA**	O	Post-emergence	BLW	
21	**Mecoprop-P (MCPP-P)**	O	Post-emergence	BLW	
	Fenoxaprop-P-E	A		GR	
	Pinoxaden	A		GR	
	Glyphosate	G	PRE-SOWING	TOTAL	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.34: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sweet corn** in **Finland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	Post-emergence	BLW	
2	**Pendimethalin**	K1	PRE	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.35: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **bulb vegetables** in **Finland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Bentazone**	C3	Post-emergence	BLW	
	Prosulfocarb	N	Pre-early post	BLW	
2	**Pyridate**	C3	Post-emergence	BLW	
	Aclonifen	F3	PRE-EARLY POST	BLW/GR	
3	**Metamitron**	C1	Post-emergence	BLW/GR	
	Pendimethalin	K1	PRE-EARLY POST	BLW/GR	
	Clethodim	A	Post-emergence	GR	
	Cycloxydim	A	Post-emergence	GR	
	Propaquizafop	A	Post-emergence	GR	
	Diquat	D	PRE	TOTAL	
	Fluazifop-P-butyl	A	Post-emergence	GR	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.36: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leek** in **Finland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Prosulfocarb	N	Pre-early post	BLW	
1	**Pyridate**	C3	Post-emergence	BLW	
	Cycloxydim	A	Post-emergence	GR	
	Diquat	D	PRE	TOTAL	
2	**Pendimethalin**	K1	Post-emergence	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.37: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **asparagus** in **Finland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	Post-emergence	BLW	
	Diquat	D	PRE	TOTAL	
2	**Pendimethalin**	K1	Post-emergence	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.38: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for ***Miscanthus*** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emerged weeds	Diverse weeds	
1	**Thifensulfuron**	B	Post	BLW killer	
2	**Rimsulfuron**	B	Post	BLW killer	
3	**Mesotrione**	F2	Post	BLW killer	
4	**MCPA**	O	Post	BLW killer	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.39: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **alfalfa (lucerne)** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emerged weeds	BLW killer	
1	**Pyridate**	C3		BLW killer	DE stated that bromoxynil is necessary for weed control in alfalfa. However, justification why the shortlisted a.s. could not be considered as an alternative was not provided by DE (EFSA, 2018b)

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.40: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **red clover** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emerged weeds	BLW killer	
1	**Pyridate**	C3		BLW killer	DE stated that bromoxynil is necessary for weed control in red clover. However, justification why the shortlisted a.s. could not be considered as an alternative was not provided by DE (EFSA, 2018b)

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.41: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **grass for seeds** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emerged weeds	BLW killer	
1	**Clopyralid**	O		BLW killer	
2	**Fluroxypyr**	O		BLW killer	
3	**Florasulam**	B		BLW killer	
4	**Dichlorprop-P**	O		BLW killer	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.42: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Foramsulfuron**	B	Post-emergence	BLW killer	
2	**Iodosulfuron**	B	Post-emergence	BLW killer	
3	**Prosulfuron**	B	Post-emergence	BLW killer	
4	**Nicosulfuron**	B	Post-emergence	BLW killer	
5	**Thifensulfuron**	B	Post-emergence	BLW killer	
6	**Rimsulfuron**	B	Post-emergence	BLW killer	
7	**Metosulam**	B	Post-emergence	BLW killer	
8	**Pyridate**	C3	Post-emergence	BLW killer	
	Bentazone*	C3	Post-emergence	BLW killer	DE: restricted used in several areas
9	**Mesotrione**	F2	Post-emergence	BLW killer	
10	**Tembotrione**	F2	Post-Emergence	BLW killer	
11	**Sulcotrione**	F2	Post-emergence	BLW killer	
12	**Dicamba**	O	Post-emergence	BLW killer	
	Terbuthylazine*	C1		BLW killer	DE: restricted used in several areas
	Thiencarbazone	B	Pre-emergence	BLW killer	
	Glyphosate	G	Total herbicide	Total herbicide	
13	**Pendimethalin**	K1	Pre-emergence	BLW killer	
	Isoxaflutole	F2	Pre-emergence	BLW killer	
	Flufenacet	K3	Pre-emergence	BLW killer	
	Dimethenamid-P	K3	Pre-emergence	BLW killer	
	S-Metolachlor	K3	Pre-emergence	BLW killer	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.43: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sorghum** in **Germany**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Dicamba**	O		BLW killer	DE stated that bromoxynil is necessary for weed control in sorghum. However, justification why the shortlisted a.s. could not be considered as an alternative was not provided by DE. (EFSA, 2018b)
2	**Tritosulfuron**	B		BLW killer	
3	**Pendimethalin**	K1	Pre-emergence	BLW killer	
4	**Dimethenamid-P**	K3	Pre-emergence	BLW killer	
5	**Terbuthylazine**	C1		BLW killer	
6	**S-Metolachlor**	K3	Pre-emergence	BLW killer	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.44: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Hungary**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Nicosulfuron	B	Post-emergence	BLW killer	HU: The correct weed spectrum of nicosulfuron in Hungary: annual grasses and some BLW. Should be not shortlisted
1	**Thifensulfuron-methyl**	B	Post-emergence	BLW killer	
2	**Prosulfuron**	B	Post-emergence	BLW killer	
3	**Iodosulfuron**	B	Post-emergence	BLW killer	
4	**Foramsulfuron**	B	Post-emergence	BLW killer	
5	**Tritosulfuron**	B	Post-emergence	BLW killer	
	Rimsulfuron	B	Post-emergence	BLW killer	HU: The correct weed spectrum of rimsulfuron in Hungary: annual grasses and some BLW. Should be not shortlisted
6	**Florasulam**	B	Post-emergence	BLW killer	
7	**Thiencarbazone methyl**	B	Post-emergence	BLW killer	
8	**Bentazone***	C3	Post-emergence	BLW killer	HU stated that bentazone should be deleted as it is authorised in co-formulation with other a.s. (EFSA, 2018b) This is not in line with the EFSA methodology (2016)
9	**Mesotrione**	F2	Post-emergence	BLW killer	
10	**Tembotrione**	F2	Post-emergence	BLW killer	
11	**Sulcotrione**	F2	Post-emergence	BLW killer	
	Clopyralid	O	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
12	**Fluroxypyr**	O	Post-emergence	BLW killer	
13	**Picloram**	O	Post-emergence	BLW killer	
14	**2,4-D**	O	Post-emergence	BLW killer	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
15	**Dicamba**	O	Post-emergence	BLW killer	
	Glyphosate	G	Pre-crop	total weedkiller	
	Terbuthylazine	C1	Pre	BLW killer	
	Flumioxazin	E	Pre	BLW killer	
	Isoxaflutole	F2	ppi pre	BLW killer	
	Pendimethalin	K1	Ppi pre	BLW killer	
	Dimethenamid-p	K3	Ppi pre	BLW killer	HU: The correct weed spectrum in Hungary: annual grasses and some BLW
	Pethoxamid	K3	Pre-emergence	BLW killer	HU: The correct weed spectrum in Hungary: annual grasses and some BLW
	S-Metolachlor	K3	Ppi pre	BLW killer	HU: The correct weed spectrum in Hungary: annual grasses and some BLW

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.45: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **onions** in **Hungary**

Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
Pyridate	C3	Post-emergence	BLW killer	HU: the weed spectrum of pyridate is different from the a.s. under evaluation (bromoxynil). Pyridate is not an alternative in case of more important weeds in Hungary: volunteer sunflower, *Hibiscus trionum*, *Persicaria maculosa*, *Persicaria lapathifolia*, *Xanthium* species and *Sinapis arvensis*. Pyridate should be not shortlisted. (EFSA, 2018b)
Clopyralid	O	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
Pendimethalin	K1	Pre	BLW killer	HU: The correct weed spectrum in Hungary: annual grasses and some BLW. Different application time. Should be not shortlisted
Chlorpropham	K2	Pre	BLW killer	HU: Different application time. Should be not shortlisted
Clethodim	A		Grass weeds	HU: The weed spectrum is annual and perennial grasses. Should be not shortlisted.
Fluazifop-P	A		Grass weeds	HU: The weed spectrum is annual and perennial grasses. Should be not shortlisted
Haloxifop-P (haloxifop-P)	A		Grass weeds	HU: The weed spectrum is annual grasses. Should be not shortlisted
Propaquizafop	A		Grass weeds	HU: The weed spectrum is annual and perennial grasses. Should be not shortlisted
Quizalofop-P	A		Grass weeds	HU: The weed spectrum is annual and perennial grasses. Should be not shortlisted

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.46: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **wheat** in **Hungary**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	2,4-D	O	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
1	**Amidosulfuron**	B	Post-emergence	BLW killer	
2	**Aminopyralid**	O	Post-emergence	BLW killer	
3	**Carfentazone-ethyl**	E	Post-emergence	BLW killer	
	Chlortoluron	B	Post-emergence	BLW killer	HU: The correct weed spectrum of chlorotoluron in Hungary: annual grasses and some BLW. Should be not shortlisted
	Clopyralid	O	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
4	**Dicamba**	O	Post-emergence	BLW killer	
5	**Dichlorprop-P**	O	Post-emergence	BLW killer	
	Diflufenican	F1	Early post only	Diflufenican	
	Fenoxaprop P	A		Grass weed Killer	
6	**Florasulam**	B	Post-emergence	BLW killer	
	Flufenacet	K3	Pre-em or early post	Grass & BLW	
	Flumioxazin	E	Pre-em or early post	BLW killer	
7	**Fluroxypyr**	O	Post-emergence	BLW killer	
	Glyphosate	G		Total weedkiller	
8	**Iodosulfuron**	B	Post-emergence	BLW killer	
	MCPA	O	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
9	**Mecoprop-P**	O	Post-emergence	BLW killer	
	Mesosulfuron	B	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
	Metribuzin	C1	Pre-weed emergence	Grass & BLW	
10	**Metsulfuron**	B	Post-emergence	BLW killer	
11	**Metsulfuron Methyl**	B	Post-emergence	BLW killer	
	Pendimethalin	K1	Pre-em or early post	BLW killer	
	Pinoxaden	A		Grass weed Killer	
	Propoxycarbazone	B	Post-emergence	BLW killer	
	Prosulfocarb	N	Pre-em or early post	BLW killer	
12	**Prosulfuron**	B	Post-emergence	BLW killer	
13	**Pyraflufen-ethyl**	E	Post-emergence	Grass & BLW	
14	**Pyroxulam**	B	Post-emergence	Grass & BLW	
	Sulfosulfuron	B	Post-emergence	BLW killer	HU: Different weed spectrum. Should be not shortlisted
15	**Tribenuron**	B	Post-emergence	BLW killer	
16	**Thifensulfuron-methyl**	B	Post-emergence	BLW killer	
17	**Tritosulfuron**	B	Post-emergence	BLW killer	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.47: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sunflower** in **Hungary**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Glyphosate**	G	Before harvest	Annual and perennial BLW & grasses	
2	**Diquat**	D	Before harvest	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.48: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **winter oilseed rape** in **Hungary**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Glyphosate**	G	Before harvest	Annual and perennial BLW & grasses	
2	**Diquat**	D	Before harvest	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.49: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **flax** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Amidosulfuron		Post-emergence	Annual BLW	
1	**Bentazone**	C3	Post-emergence	Annual BLW	
2	**Clopyralid**	O	Post-emergence	Annual BLW	
3	**Metsulfuron-methyl**	B	Post-emergence	BLW and grasses	
	Metazachlor		Pre-weed emergence	BLW and grasses	
	Napropamide		Pre-weed emergence	BLW and grasses	
	Diquat		Pre-emergence	BLW and grasses	
	Glyphosate		Pre-emergence	BLW and grasses	
	Propaquizafop			Grass weeds (monocotyledons)	
	Quizalofop-P-ethyl			Grass weeds (monocotyledons)	
	Cycloxydim			Grass weeds (monocotyledons)	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.50: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leeks** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Bentazone**	C3	Post-emergence	Annual BLW	
2	**Fluroxypyr (EAMU)**	O	Post-emergence	Annual BLW	
3	**Pyridate**	C3	Post-emergence	Annual BLW	
	Cycloxydim		Post-emergence	Grasses	
	Dimethenamid-P		Pre-emergence	Annual BLW & grasses	
	Prosulfocarb		Pre- & EARLY post-weed-emergence	Annual BLW & grasses	
	Carfentrazone-ethyl		Pre-emergence	BLW & grasses	
	Diquat		Pre-emergence	Annual BLW & grasses	
	Glyphosate		Pre-emergence	Non-selective	
	Isoxaben (EAMU)		Pre-emergence	BLW & grasses	
	Metazachlor		Pre-weed-emergence	BLW & grasses	
	Pendimethalin		Pre-emergence	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.51: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sweet maize** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Carfentrazone		Pre-planting	Total	
	Diquat		Pre-planting	Total	
	Glyphosate		Pre-planting	Total	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee.
(a): The bold indicates the a.s. shortlisted.

Table B.52: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	
	Florasulam	B	Post-emergence	Annual BLW	
3	**Fluroxypyr**	O	Post-emergence	Annual BLW	
4	**Mesotrione**	F2	Post-emergence	Annual BLW	
5	**Nicosulfuron**	B	Post-emergence	Annual BLW & grasses	
6	**Rimsulfuron**	B	Post-emergence	Annual BLW	
7	**terbuthylazine**	C1	Post-emergence	Annual BLW & grasses	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
8	**Thifensulfuron-methyl**	B	Post-emergence	BLW	
	Pendimethalin		Pre-emergence	Annual BLW & grasses	
	Dimethenamid-P		Pre-emergence	Annual BLW & grasses	
	Flufenacet		Pre-emergence	Annual BLW & grasses	
	Isoxaflutole		Pre-emergence	Annual BLW & grasses	
	S-Metolachlor		Pre-emergence	Annual BLW & grasses	
	Diquat		Pre-emergence	Total	
	Glyphosate		Pre-emergence	Total	
	Carfentrazone-ethyl		Pre-planting	Annual & perennial BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.53: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **onions** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	
2	**Bentazone**	C3	Post-emergence	Annual BLW	
3	**Fluroxypyr**	O	Post-emergence	Annual BLW	
4	**Pyridate**	C3	Post-emergence	Annual BLW	
	Flumioxazin		Pre- & EARLY post-weed-emergence	Annual BLW & grasses	
	Prosulfocarb		Pre- & EARLY post-weed-emergence	Annual BLW & grasses	
	Chloridazon		Pre-emergence	Annual BLW	
	Chlorpropham		Pre-emergence	Annual BLW	
	Dimethenamid-P		Pre-emergence	Annual BLW & grasses	
	Pendimethalin		Pre-emergence	Annual BLW & grasses	
	S-Metolachlor		Pre-emergence	Annual BLW & grasses	
	Carfentrazone-ethyl		Pre-emergence	BLW & grasses	
	Cycloxydim		Post-emergence	Grasses	
	Fluazifop-P-butyl		Post-emergence	Grasses	
	Propaquizafop		Post-emergence	Grasses	
	Glyphosate		Pre-emergence	Non-selective	
	Diquat		Pre-emergence	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.54: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **oats** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	
2	**2,4-DB**	O	Post-emergence	BLW	
	Amidosulfuron		Post-emergence	BLW	
3	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	
4	**dicamba**	O	Post-emergence	BLW	
5	**Dichlorprop-P**	O	Post-emergence	BLW	
6	**florasulam**	B	Post-emergence	Annual BLW	
7	**Fluroxypyr**	O	Post-emergence	BLW	
8	**MCPA**	O	Post-emergence	BLW	
9	**Mecoprop-P**	O	Post-emergence	BLW	
10	**Thifensulfuron-methyl**	B	Post-emergence	BLW & grasses	
11	**Tritosulfuron**	B	Post-emergence	BLW & grasses	
12	**Tribenuron-methyl**	B	Post-emergence	BLW	
13	**Metsulfuron-methyl**	B	Post-emergence	BLW & grasses	
	Prosulfocarb		Pre & EARLY post – emergence	BLW & grasses	
	Flurtamone		Pre/post-emergence	BLW & grasses	
	Diflufenican		Pre-emergence of weeds	BLW & grasses	
	Carfentrazone-ethyl		Pre-planting	BLW	
	Glyphosate			Non-selective	
	Diquat			Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.55: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **barley** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	
2	**2,4-DB**	O	Post-emergence	BLW	
	Amidosulfuron		Post-emergence	BLW	
	Chlorotoluron		Early post-emergence of weeds	BLW & grasses	
3	**Clopyralid**	O	Post-emergence	ANNUAL & PERENNIAL BLW	
4	**Dicamba**	O	Post-emergence	BLW	
5	**Dichlorprop-P**	O	Post-emergence	BLW	
6	**Florasulam**	B	Post-emergence	Annual BLW	
7	**Fluroxypyr**	O	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
8	**Halauxifen-methyl**	O	Post-emergence	BLW	
9	**Iodosulfuron-methyl-sodium**	B	Post-emergence	BLW & grasses	
10	**MCPA**	O	Post-emergence	BLW	
11	**Mecoprop-P**	O	Post-emergence	BLW	
	Picolinafen		Pre & EARLY post-emergence	BLW	
	Pinoxaden		Post-emergence	Grasses	
12	**Thifensulfuron-methyl**	B	Post-emergence	BLW & grasses	
13	**Tritosulfuron**	B	Post-emergence	BLW & grasses	
14	**Tribenuron-methyl**	B	Post-emergence	BLW	
	Pendimethalin		Pre & EARLY post-emergence	BLW & grasses	
	Prosulfocarb		Pre & EARLY post-emergence	BLW & grasses	
	Flurtamone		Pre/post-emergence	BLW & grasses	
15	**Metsulfuron-methyl**	B	Post-emergence	BLW & grasses	
	flufenacet		Pre-emergence	Annual BLW & grasses	
	Tri-allate		Pre-emergence	Grasses	
	Diflufenican		Pre-emergence of weeds	BLW & grasses	
	Carfentrazone-ethyl		Pre-planting	BLW	
	Fenoxaprop-P-ethyl		Post-emergence	Grasses	
	Glyphosate		X	Non-selective	
	Diquat		x	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.56: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **wheat** in **Ireland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	
2	**2,4-DB**	O	Post-emergence	BLW	
	Amidosulfuron		Post-emergence	BLW	
	Chlorotoluron		Early post-emergence of weeds	BLW & grasses	
3	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	
4	**Dicamba**	O	Post-emergence	BLW	
5	**Dichlorprop-P**	O	Post-emergence	BLW	
	Fenoxaprop-P-ethyl		Post-emergence	Grasses	
6	**Florasulam**	B	Post-emergence	Annual BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
7	**Fluroxypyr**	O	Post-emergence	BLW	
8	**Halauxifen-methyl**	O	Post-emergence	BLW	
9	**Iodosulfuron-methyl-sodium**	B	Post-emergence	BLW & grasses	
10	**MCPA**	O	Post-emergence	BLW	
11	**Mecoprop-P**	O	Post-emergence	BLW	
	Picolinafen		Pre & EARLY post-emergence	BLW	
	Pinoxaden		Post-emergence	Grasses	
12	**Thifensulfuron-methyl**	B	Post-emergence	BLW & grasses	
13	**Mesosulfuron-methyl**	B	Post-emergence	BLW & grasses	
14	**Metsulfuron-methyl**	B	Post-emergence	BLW & grasses	
	Propoxycarbazone-sodium		Post-emergence	BLW & grasses	
15	**Pyroxsulam**	B	Post-emergence	BLW & grasses	
16	**Sulfosulfuron**	B	Post-emergence	BLW & grasses	
17	**Tritosulfuron**	B	Post-emergence	BLW & grasses	
	Clodinafop-P		Post-emergence	Grasses	
18	**Tribenuron-methyl**	B	Post-emergence	BLW	
	Pendimethalin		Pre- & EARLY post-emergence	BLW & grasses	
	Prosulfocarb		Pre- & EARLY post-emergence	BLW & grasses	
	Ethofumesate		Pre- & EARLY post-emergence	BLW & grasses	
	Flurtamone		Pre/post-emergence	BLW & grasses	
	Flufenacet		Pre-emergence	Annual BLW & grasses	
	Tri-allate		Pre-emergence	Grasses	
	Flumioxazin		Pre-emergence	BLW & grasses	
	Diflufenican		Pre-emergence of weeds	BLW & grasses	
	Carfentrazone-ethyl	O	Pre-planting	BLW	
	Glyphosate	O	X	Non-selective	
	Diquat		x	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.57: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **flax** in the **Netherlands**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Iodosulfuron-methyl-natrium**	B	1 September–1 March Post-emergence	Annual BLW	
2	**Bentazone**	C3	BBCH 12-15	Annual BLW	
3	**Clopyralid**	O	Post-emergence	BLW	
	Mesotrione	F2	Pre-emergence	Annual BLW	
	Prosulfocarb	N	Pre-emergence	Annual weeds	
	Propaquizafop	A	BBCH 10-19	Grasses only	
	Clethodim	A	BBCH 12-45	Annual grass weeds *Agropyron repens*	
	Cycloxydim	A	BBCH 12-39	Annual, perennial grasses	
4	**Metsulfuron-methyl**	B	BBCH 12-39	Broadleaf weeds	NL: Weed spectrum = broadleaved weeds Time of application = post-emergence Shortlisted = Y against broadleaved weeds post-emergence of the crop Exception = only available in flax for linseed Remark = art. 51 extension
5	**MCPA**	O	BBCH 20-39	Broadleaved weeds	NL: Weed spectrum = broadleaved weeds Time of application = post-emergence Shortlisted = Y against broadleaved weeds post-emergence of the crop Exception = only available in fibre flax Remark = art. 51 extension
6	**Tembotrione**	F2	BBCH 12-18	BLW/grasses	NL: Weed spectrum = annual weeds Time of application = post-emergence Shortlisted = Y against broadleaved weeds post-emergence of the crop Exception = – Remark = art. 51 extension
	Glyphosate	G	BBCH 01-08	Weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.58: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **garlic** in the **Netherlands**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Pyridate**	C3	2–3 leaves	Annual BLW	
	Propaquizafop	A	BBCH 10-19	Annual grass weed (Poaceae) Rye-grass, wild oats	
	Clethodim	A	BBCH 12-45	Annual grass weeds *Agropyron repens*	
2	**Chlorpropham**	K2	Pre-emerged weeds	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = –
3	**Pendimethalin**	K1	BBCH 00-09 or BBCH 10-14	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = – Remark = art. 51 extension
	Diquatdibromide	D	Pre-emergence BBCH 00-09	Annual BLW	
	Glufosinate-ammonium	H	BBCH 12-41	Weeds	
	Glyphosate	G	BBCH 01-08	Weeds	
	Isoxaben	L	Pre-emergence or after planting BBCH 00-12	Annual BLW	
	S-Metolachlor	C1	Pre-emergence (grass weeds) Post-emergence (annual weeds)	BLW/grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.59: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **onions** in the **Netherlands**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Bentazone**	C3	BBCH 13-15	Annual BLW	
2	**Fluroxypyr**	O	BBCH 12-14	Galium aparine and Polygonaceae	
3	**Pyridate**	C3	2–3 leaves	Annual BLW	
	Clethodim	A	BBCH 12-45	Annual grass weeds *Agropyron repens*	
	Haloxyfop-p-methyl	A	BBCH 20-49 Post-emergence	Annual grass weeds	
	Fluazifop-p-butyl	A1	Post-emergence	Grass weeds	
	Propaquizafop	A	BBCH 10-19	Annual grass weed (Poaceae) Rye-grass, wild oats	
4	**Pendimethalin**	K1	BBCH 00-09 or BBCH 10-14	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = –
	Diquatdibromide	D	Pre-emergence BBCH 00-09	Annual BLW	
5	**Prosulfocarb**	N	BBCH 00-08 and BBCH 12-15	Annual weeds	NL: Weed spectrum = annual weeds Time of application = Pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = –
	S-Metolachlor	K3	Pre-emergence (crop and weeds)	Annual grass and some BLW	
	Glyphosate	G	BBCH 01-08	Weeds	
6	**Chlorpropham**	K2	Pre-emerged weeds	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = –
	Dimethenamide-P	K3	Pre-emerged weeds	Annual weeds	
	Isoxaben	L	Pre-emergence or after planting BBCH 00-12	Annual BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
7	**Chloridazon**	C1	BBCH 11-14	Annual dycot. weeds	NL: Weed spectrum = broadleaved weeds Time of application = post-emergence Shortlisted = Y against broadleaved weeds post-emergence of the crop Exception = –
	Carbetamide	K2	Post-emergence	Annual grass weeds	
	Cycloxydim	A	BBCH 12-39	Annual, perennial grasses	
	Glufosinate-ammonium	H	BBCH 12-41	Weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.60: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in the **Netherlands**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Tritosulfuron**	B	BBCH 12-18	BLW	
2	**Prosulfuron**	B	BBCH 12-16	BLW	
3	**Nicosulfuron**	B	BBCH 12-18	*Echinochloa crus-galli* *Poa annua* *Elytrigia repens* *Stellaria media*	
4	**Foramsulfuron**	B	BBCH 12-16	BLW/grasses	
5	**Florasulam**	B	BBCH 12-16	Annual BLW	
6	**Iodosulfuron-methyl-natrium**	B	BBCH 12-16	BLW/grasses	
7	**Prosulfuron**	B	BBCH 12-19	BLW (annual and perennial)	
8	**Rimsulfuron**	B	BBCH 12-18	Annual grass weeds BLW	
9	**Trisulfuron**	B	BBCH 12-18	BLW	
10	**Thifensulfuron-methyl**	B	BBCH 12-16	Annual BLW	
11	**Tritosulfuron**	B	2–8 leaves		
12	**Thiencarbazone-methyl**	B	BBCH 12-16	BLW and grasses	
13	**Fluroxypyr**	O	BBCH 12-16	Annual dicotyledonous weeds	
14	**Dicamba**	O	BBCH 12-16	Annual and perennial dicots (PPPDD)	
15	**Clopyralid**	O	BBCH 12-19	BLW	
16	**Bentazone**	C3	BBCH 12-15	Annual BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
17	**Mesotrione**	F2	BBCH 12-18	BLW/grasses	
18	**Tembotrione**	F2	BBCH 12-18	BLW/grasses	
19	**Sulcotrione**	F2	BBCH 12-16	Annual BLW	
	Terbuthylazine	C1		BLW/grasses	
	S-Metolachlor	C1		BLW/grasses	
	Isoxaflutole	F2		BLW Grass weeds	
	Glyphosate	G		Weeds	
20	**Pendimethalin**	K1	BBCH 00-09 or BBCH 10-16	Annual BLW	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence of the crop. Pre-emergence of weeds Shortlisted = Y against annual weeds, pre- and post-emergence of the crop Exception = –
	Dimethenamide-P	K3		BLW/grasses	
	Propaquizafop	A		Annual grass weed (Poaceae) Rye-grass, wild oats	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.61: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **shallots** in the **Netherlands**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Bentazone**	C3	BBCH 13-15	Annual BLW	
2	**Pyridate**	C3	2–3 leaves	Annual BLW	
	Clethodim	A	BBCH 12-45	Annual grass weeds *Agropyron repens*	
	Fluazifop-p-butyl	A1	Post-emergence	Grass weeds	
	Propaquizafop	A	BBCH 10-19	Annual grass weed (Poaceae) Rye-grass, wild oats	
3	**Pendimethalin**	K1	BBCH 00-09 or BBCH 10-14	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence Shortlisted = Y against annual grasses, pre- and post-emergence of the crop Exception = –

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
4	**Prosulfocarb**	N	BBCH 00-08 and BBCH 12-15	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence Shortlisted = Y against annual grasses, pre- and post-emergence of the crop Exception = –
	S-Metolachlor	K3	Pre-emergence (crop and weeds)	Annual grass and some BLW	
5	**Chloridazon**	C1	Pre-emerged weeds	Annual BLW	NL: Weed spectrum = annual broadleaved weeds Time of application = post-emergence Shortlisted = Y against annual broadleaved weeds post-emergence of the crop Exception = –
6	**Chlorpropham**	K2	Pre-emerged weeds	Annual weeds	NL: Weed spectrum = annual weeds Time of application = pre- and post-emergence Shortlisted = Y against annual grasses, pre- and post-emergence of the crop Exception = –
	Dimethenamide-P	K3	Pre-emerged weeds	Annual weeds	
	Isoxaben	L	Pre-emergence or after planting BBCH 00-12	Annual BLW	
	Diquatdibromide	D	Pre-emergence BBCH 00-09	Annual BLW	
	Glufosinate-ammonium	H	BBCH 12-41	Weeds	
	Glyphosate	G	BBCH 01-08	Weeds	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.62: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Poland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	POST	BLW Killer	
2	**Dicamba**	O	POST	BLW Killer	
3	**Florasulam**	B	POST	BLW Killer	
4	**Fluroxypyr**	O	POST	BLW Killer	
5	**Foramsulfuron**	B	POST	BLW/grasses	
6	**iodosulfuron methyl**	B	POST	BLW/grasses	
7	**Nicosulfuron**	B	POST	BLW/grasses: annual (ECHCG), perennial (AGRRE)	
8	**Pyridate**	C3	POST	BLW Killer	
9	**Rimsulfuron**	B	POST	BLW/annual grasses	
10	**Sulcotrione**	F2	POST	BLW/grasses	
11	**Tembotrione**	F2	POST	BLW/grasses	
12	**Terbuthylazine**	C1	pre/early post	BLW/grasses	(Successor T 550 SE, terbuthylazine with pethoxamid, grass weed ctrl at emergence, BLW ctrl until the 5th leaf)
13	**Thifensulfuron-methyl**	B	POST	BLW/grasses	
14	**Tritosulfuron**	B	POST	BLW	
	Flufenacet	K3	Pre-emergence	BLW/grasses	
15	**Prosulfuron**	B	POST	BLW	
	Linuron	C2	Pre/early post	BLW/grasses	
16	**Pethoxamid**	K3	Pre/early post	BLW/grasses	
17	**Mesotrione**	F2	PRE-POST	BLW/grasses	
18	**Pendimethalin**	K1	PRE-POST	BLW/grasses	
19	**Isoxaflutole**	F2	Pre-post	BLW/grasses	
20	**Thiencarbazone-methyl**	B	Pre-post	BLW/grasses	
	Dimethenamid-P	K3	Pre-emergence	BLW/grasses	
21	S-Metolachlor	K3	Pre/early post	BLW/grasses	
	Cycloxydim	~~A~~	N/A	Grasses	
22	**Glyphosate**	G9	Pre-emergence	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.63: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **bulb vegetables** in **Poland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	
2	**Pyridate**	C3	Post-emergence	Annual BLW	
3	**Prosulfocarb**	N	Post-emergence	Annual BLW	
4	**Oxyfluorfen**	E	Post-emergence	Annual BLW	
5	**Pendimethalin**	K1	Pre- or early post-emergence or pre-post	Annual BLW & grasses	
	Cycloxydim	A	Post-emergence	Grasses	
	Fluazifop-P-butyl	A	Post-emergence	Grasses	
	Haloxyfop-R methyl	A	Post-emergence	Grasses	
	Quizalofop-p-ethyl and quizalofop-p-tefuryl	A	Post-emergence	Grasses	
	Propaquizafop	A	Post-emergence	Grasses	
6	**Chlorpropham**	K2	Post-emergence	Annual BLW	
	Glyphosate	G	Pre-emergence	Non-selective	
	Clethodim	A	Post-emergence	Grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.64: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **ornamental bulbs** in **Poland**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Linuron	C2	Pre-emergence	Annual BLW	
1	**Pendimethalin**	K1	Post-emergence	BLW/grasses	
	Cycloxydim	A	Post-emergence	Grasses	
	Fluazifop-P butyl	A	Post-emergence	Grasses	
	Glyphosate	G	Pre-emergence	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.65: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Bentazone**	C3	Post-emergence	BLW	
3	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
4	**Fluroxypyr**	O	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
5	**Foramsulfuron**	B	Post-emergence	BLW & grasses	
6	**Iodosulfuron**	B	Post- emergence	BLW & grasses	SK: *Avena sterilis* and *Alopecurus myosuroides* are not mentioned in Slovakia for maize
7	**Clopyralid**	O	Post-emergence	BLW	
8	**Nicosulfuron**	B	Post-emergence	BLW & grasses	
9	**Pendimethalin**	K1	Post-emergence	BLW & grasses	SK: *Alopecurus myosuroides* is not mentioned in Slovakia for maize
10	**Picloram**	O	Post-emergence	BLW	
11	**Pyridate**	C3	Post-emergence	BLW	
12	**Rimsulfuron**	B	Post-emergence	BLW & grasses	
13	**Sulcotrione**	F2	Post-emergence	BLW & grasses	
14	**Tembotrione**	F2	Post-emergence	BLW & grasses	
15	**Terbuthylazine**	C1	Post-emergence	BLW & grasses	
16	**Thifensulfuron-methyl**	B	Post-emergence	BLW & grasses	
	Tritosulfuron	B	Post-emergence	BLW	
17	**Linuron**	C2	Pre- and post-emergence	BLW & grasses	
18	**Mesotrione**	F2	Pre- and post-emergence	BLW	
19	**Pethoxamid**	K3	Pre-early post-emergence	BLW & grasses	
20	**Aclonifen**	F3	Pre-early post-emergence	BLW & grasses	
21	**Dimethenamid-P**	K3	Pre-early post-emergence	BLW & grasses	
	Flufenacet		Pre-emergence	BLW & grasses	
	Isoxaflutole		Pre-emergence	BLW & grasses	
	S-Metolachlor		Pre-emergence	BLW & grasses	
	Thiencarbazone		Pre-emergence	BLW & grasses	
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.66: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **winter wheat** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Amidosulfuron**	B	Post-emergence	BLW	
3	**Dicamba**	O	Post–emergence	Annual and perennial BLW	
4	**Fluroxypyr**	O	Post–emergence	BLW	
5	**Florasulam**	B	Post-emergence	BLW	
6	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
7	**Clopyralid**	O	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
8	**Carfentrazone-ethyl**	E	Post-emergence	BLW	
9	**Pendimethalin**	K1	Post-emergence	BLW & grasses	
10	**Chlorsulfuron**	B	Post-emergence	BLW	
11	**MCPA**	O	Post-emergence	BLW	
12	**Mecoprop-P**	O	Post-emergence	BLW	
13	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate	O	n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.67: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **spring wheat** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Fluroxypyr**	O	Post-emergence	BLW	
3	**Florasulam**	B	Post-emergence	BLW	
4	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
5	**Clopyralid**	O	Post-emergence	BLW	
6	**Chlorsulfuron**	B	Post-emergence	BLW	
7	**MCPA**	O	Post-emergence	BLW	
8	**Mecoprop-P**	O	Post-emergence	BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.68: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **winter barley** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Amidosulfuron**	B	Post-emergence	BLW	
3	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
4	**Fluroxypyr**	O	Post-emergence	BLW	
5	**Florasulam**	B	Post-emergence	BLW	
6	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
7	**Clopyralid**	O	Post-emergence	BLW	
8	**Pendimethalin**	K1	Post-emergence	BLW & grasses	
9	**Chlorsulfuron**	B	Post-emergence	BLW	
10	**MCPA**	O	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
11	**Mecoprop-P**	O	Post-emergence	BLW	
12	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.69: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **spring barley** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
3	**Fluroxypyr**	O	Post-emergence	BLW	
4	**Florasulam**	B	Post-emergence	BLW	
5	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
6	**Clopyralid**	O	Post-emergence	BLW	
7	**Chlorsulfuron**	B	Post-emergence	BLW	
8	**MCPA**	O	Post-emergence	BLW	
9	**Mecoprop-P**	O	Post-emergence	BLW	
10	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate		n/a	Non-selective	
	2,4-D	O	Post-emergence	BLW	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.70: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **winter rye** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Amidosulfuron**	B	Post-emergence	BLW	
3	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
4	**Fluroxypyr**	O	Post-emergence	BLW	
5	**Florasulam**	B	Post-emergence	BLW	
6	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
7	**Clopyralid**	O	Post-emergence	BLW	
8	**Pendimethalin**	K1	Post-emergence	BLW & grasses	
9	**Chlorsulfuron**	B	Post-emergence	BLW	
10	**MCPA**	O	Post-emergence	BLW	
11	**Mecoprop-P**	O	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
12	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.71: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **winter triticale** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
3	**Fluroxypyr**	O	Post-emergence	BLW	
4	**Florasulam**	B	Post-emergence	BLW	
5	**Iodosulfuron**	B	Post-emergence	BLW & grasses	
6	**Clopyralid**	O	Post-emergence	BLW	
7	**Pendimethalin**	K1	Post-emergence	BLW & grasses	
8	**Chlorsulfuron**	B	Post-emergence	BLW	
9	**MCPA**	O	Post-emergence	BLW	
10	**Mecoprop-P**	O	Post-emergence	BLW	
11	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.72: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **spring oat** in **Slovakia**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	BLW	
2	**Dicamba**	O	Post-emergence	Annual and perennial BLW	
3	**Fluroxypyr**	O	Post-emergence	BLW	
4	**Florasulam**	B	Post-emergence	BLW	
5	**Clopyralid**	O	Post-emergence	BLW	
6	**Chlorsulfuron**	B	Post-emergence	BLW	
7	**MCPA**	O	Post-emergence	BLW	
8	**Mecoprop-P**	O	Post-emergence	BLW	
9	**Metsulfuron-methyl**	B	Post-emergence	APESV & BLW	
	Tritosulfuron	B	Post-emergence	BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Glyphosate		n/a	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.73: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **bulb vegetables** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
2	**Pyridate**	C3	Post-emergence	Annual BLW	UK: Does not control Polygonums or PAPRH UK considered that there are insufficient chemical alternatives available in bulb vegetables in the UK. EFSA proposes to remain with the shortlisted a.s. to ensure consistency in the methodology (details see commenting table)
	Pendimethalin	K1	Pre-emergence	Annual BLW & grasses	
	Cycloxydim		Post-emergence	Grasses	
	Fluazifop-P-butyl		Post-emergence	Grasses	
	Propaquizafop		Post-emergence	Grasses	
	Chlorpropham		Early post-emergence	Annual BLW & grass	UK: Also effective against grass weeds. Chlorpropham can also be applied early post-emergence (up to BBCH 14); however, bromoxynil can be applied until BBCH 16. Most effective against weeds that have not yet emerged; bromoxynil will control larger emerged weeds. Not as effective against CHEAL, SOLNI and CAPBP. Not a suitable alternative
	Diquat		Pre-emergence	Annual BLW & grasses	
	Glyphosate		Pre-emergence	Non-selective	
3	**Bentazone**	C3	Post-emergence	Annual BLW	UK: Does not control CHEAL or ATXPA
4	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
	Prosulfocarb	N	Pre- & EARLY post-emergence	Annual BLW & grasses	UK: Can only be used up to BBCH 14; bromoxynil can be applied until BBCH 16. Only effective against very small weeds or weeds that have not yet emerged. Bromoxynil can control larger weeds. Not a suitable alternative
	Dimethenamid-P	K3	Pre- & EARLY post-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with pendimethalin. Can only be used up to BBCH 12; bromoxynil can be applied until BBCH 16

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Flumioxazin	E	Pre- & EARLY post-emergence	Annual BLW & grasses	UK: Flumioxazin has also been subject to an application for a derogation. Does not control CHEAL, ATXPA, SOLNI or Polygonums
	Clethodim		Post-emergence	Grasses	
	Chloridazon	C1	Pre-emergence	Annual BLW	UK: Applications can be made up to BBCH 12. Also effective against POAAN. Only controls weeds that have not yet emerged; bromoxynil will control emerged weeds. Not a suitable alternative
	Linuron	C2	Pre-emergence	Annual BLW	UK: Linuron can be applied post-emergence. However, it cannot be considered as an alternative as all authorisations of linuron expire in June 2018
	S-Metolachlor		Pre-emergence	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.74: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **cereals** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	UK: Not as effective against Polygonums, ATXPA, PAPRH or SOLNI
2	**2,4-DB**	O	Post-emergence	BLW	UK: Not as effective against ATXPA or PAPRH. Does not control SOLNI
	Amidosulfuron	B	Post-emergence	BLW	UK: Different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, or Polygonums
	Bifenox	E	Post-emergence	BLW & grasses	UK: Same timing, so potentially an alternative, but has a different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR or Polygonums. Only winter cereals
	Carfentrazone-ethyl	E	Post-emergence	BLW	UK: Does not control SOLNI, PAPRH or ATXPA
3	**Chlorotoluron***	C2	Post-emergence	BLW & grasses	UK: Only authorised in a co-formulated product containing diflufenican and pendimethalin. Does not control CHEAL, ATXPA, SOLNI or Polygonums. Only winter cereals
4	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
5	**Dicamba***	O	Post-emergence	BLW	UK: Only authorised in a co-formulated product containing mecoprop-P. Not as effective against Polygonums. Does not control ATXPA, CAPBP, SOLNI and PAPRH
6	**Dichlorprop-P***	O	Post-emergence	BLW	UK: Only authorised in a co-formulated product containing mecoprop-P and MCPA. Not as effective against Polygonums. Does not control ATXPA and SOLNI
	Fenoxaprop-P-ethyl	A	Post-emergence	Grasses	
	florasulam	B	Post-emergence	Annual BLW	UK: Same timing, so potentially an alternative, but has a different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums
	Flupyrsulfuron-methyl	B	Post-emergence	BLW	UK: Flupyrsulfuron-methyl has also been subject to an application for a derogation and was only supported in oat. Does not control CHEAL, ATXPA, SOLNI or Polygonums
7	**Fluroxypyr**	O	Post-emergence	BLW	UK: Does not control CHEAL, CAPBP or ATXPA
8	**Halauxifen-methyl**	O	Post-emergence	BLW	UK: Does not control SOLNI or ATXPA
9	**Imazosulfuron**	B	Post-emergence	BLW	UK: Winter cereals only. Does not control CHEAL, ATXPA, SOLNI or Polygonums
10	**Iodosulfuron-methyl-sodium***	B	Post-emergence	BLW & grasses	UK: Only authorised in co-formulated products with various active substances. Does not control ATXPA or PAPRH
11	**MCPA**	O	Post-emergence	BLW	UK: Does not control SOLNI. Not as effective against Polygonums or ATXPA
12	**Mecoprop-P**	O	Post-emergence	BLW	UK: Not as effective against SOLNI, ATXPA and Polygonums
13	**Picolinafen**	F1	Post-emergence	BLW	UK: Does not control CHEAL, ATXPA, SOLNI or Polygonums
	Pinoxaden	A	Post-emergence	Grasses	
	Prosulfocarb	N	Pre- & EARLY post-emergence	BLW & grasses	
	Thifensulfuron-methyl	B	Post-emergence	BLW & grasses	UK: No restriction on cereals for crop production. Can be considered an alternative. Does not control SOLNI
14	**Tribenuron-methyl**	B	Post-emergence	BLW	UK: Does not control SOLNI or ATXPA
	Pendimethalin	K1	Pre- & EARLY post-emergence	BLW & grasses	UK: Only effective against weeds that have not yet emerged
	Diflufenican	F1	Pre-emergence of weeds	BLW & grasses	UK: Only effective against weeds that have not yet emerged or very small weeds
15	**Flurtamone***	F1	Pre/post-emergence	BLW & grasses	UK: Winter cereals only. Only authorised in co-formulated products containing diflufenican (and sometimes flufenacet). Does not control CHEAL, SOLNI, CAPBP, ATXPA, PAPHR or Polygonums

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
16	**Metsulfuron-methyl**	B	Pre/post-emergence	BLW & grasses	UK: Does not control SOLNI or ATXPA
	Flufenacet	K3	Pre-emergence	Annual BLW & grasses	UK: Can also be applied post-emergence. Not very effective and limited weed spectrum when applied alone, but is useful in some co-formulated products. Does not control CHEAL, SOLNI or Polygonums
	Isoxaben	L	Pre-emergence	BLW	UK: Can be applied up to BBCH 13. However, only controls weeds that have not yet emerged
	Tri-allate	N	Pre-emergence	Grasses	
	Glyphosate	G	X	Non-selective	
	Pyroxsulam	B	Post-emergence	BLW & grasses	UK: Can be used at the same timing. However, it has a different weed spectrum and does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums. Only for use on winter wheat, rye and triticale (although other products containing pyroxsulam in addition to other active substances can also be used on spring wheat e.g. Broadway Star)
	Flumioxazin	E	Pre- & early post-emergence	Annual BLW & grasses	UK: Flumioxazin has also been subject to an application for a derogation and was not supported in cereals apart from oat. Does not control CHEAL, ATXPA, SOLNI or Polygonums
	Clodinafop-propargyl	A	Post-emergence	Grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.75: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **flax** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Amidosulfuron		Post-emergence	Annual BLW	UK: The weed spectrum differs greatly from that of bromoxynil, so could not be used to control the same weed species'
1	**Bentazone**	C3	Post-emergence	Annual BLW	UK: Does not control CHEAL or ATXPA UK considered that there are insufficient chemical alternatives available in flax in the UK. EFSA proposes to remain with the shortlisted a.s. to ensure consistency in the methodology (details see commenting table)

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
2	**Clopyralid**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
3	**Metsulfuron-methyl**	B	Post-emergence	BLW and grasses	UK: Does not control SOLNI or ATXPA
	Diquat		Pre-emergence	BLW and grasses	
	Glyphosate		Pre-emergence	BLW and grasses	
	Propaquizafop			Grass weeds (monocotyledons)	
	Quizalofop-P-ethyl			Grass weeds (monocotyledons)	
	Cycloxydim			Grass weeds (monocotyledons)	
	Fluazifop-P-butyl			Grass weeds (monocotyledons)	
	Quizalofop-P-tefuryl			Grass weeds (monocotyledons)	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.76: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **leeks** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emergence	Annual BLW & grasses	
	Cycloxydim		Post-emergence	Grasses	
	Glyphosate		Pre-emergence	Non-selective	
	Bentazone	C3	Post-emergence	Annual BLW	UK: Can only be used up to BBCH 13; bromoxynil can be applied until BBCH 19. Does not control CHEAL or ATXPA. Not a suitable alternative
1	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
	Prosulfocarb	N	Pre- & EARLY post-emergence	Annual BLW & grasses	UK: Can only be used up to BBCH 15; bromoxynil can be applied until BBCH 19. Only effective against very small weeds or weeds that have not yet emerged. Bromoxynil can control larger weeds. Not a suitable alternative
	Dimethenamid-P*		Pre- & EARLY post-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with pendimethalin. Can only be used up to BBCH 13; bromoxynil can be applied until BBCH 19
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pyridate	C3	Post-emergence	Annual BLW	UK: Can only be used up to BBCH 13; bromoxynil can be applied until BBCH 19. Does not control Polygonums, PAPRH or ATXPA. Not a suitable alternative
	Chlorpropham		Pre-emergence	Annual BLW	UK: Also effective against grass weeds. Chlorpropham can also be applied early post-emergence (up to BBCH 14); however, bromoxynil can be applied until BBCH 19. Most effective against weeds that have not yet emerged; bromoxynil will control larger emerged weeds. Not as effective against CHEAL, SOLNI and CAPBP. Not a suitable alternative
	Metazachlor (with dimethenamid-P)	K3	Post-emergence	Annual BLW	UK: This co-formulation has some effectiveness against grass weeds. Can only be used up to BBCH 13; bromoxynil can be applied until BBCH 19. Does not control CHEAL, SOLNI, Polygonums or ATXPA. Not a suitable alternative
	Linuron		Pre-emergence	Annual BLW	UK: Linuron can be applied post-emergence. However, it cannot be considered as an alternative as all authorisations of linuron expire in June 2018

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.77: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **maize** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	UK: Not as effective against Polygonums, ATXPA, PAPRH or SOLNI
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
3	**Dicamba**	O	Post-emergence	Annual BLW	UK: Not as effective against Polygonums. Does not control ATXPA, CAPBP, SOLNI and PAPRH
	Dimethenamid-P*	K3	Pre/early post–emergence	Annual BLW & grasses	UK: Can also be applied early post-emergence. Only authorised in a co-formulated product with pendimethalin. Can only be used up to BBCH 14; bromoxynil can be applied until BBCH 18. Not a suitable alternative
4	**Florasulam**	B	Post-emergence	Annual BLW	UK: Does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums
	Flufenacet*	K3	Pre-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with isoxaflutole

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Fluroxypyr	O	Post-emergence	GALAP cleavers only	UK: Controls weeds other than GALAP. However, does not control CHEAL, CAPBP or ATXPA. Can only be used up to BBCH 16; bromoxynil can be used up to BBCH 18
5	**Foramsulfuron***	B	Post-emergence	BLW and grasses	UK: Only authorised in a co-formulated product with iodosulfuron-methyl-sodium. Can only be used up to BBCH 16; bromoxynil can be used up to BBCH 18. Does not control ATXPA or PAPRH
6	**Iodosulfuron-methyl-sodium***	B	Post-emergence	BLW and grasses	UK: Only authorised in a co-formulated product with foramsulfuron. Can only be used up to BBCH 16; bromoxynil can be used up to BBCH 18. Does not control ATXPA or PAPRH
	Isoxaflutole*	F2	Pre-emergence	Annual BLW & grasses	UK: Isoxaflutole has also been subject to a derogation. Only authorised in a co-formulated product with isoxaflutole. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
7	**Mesotrione**	F2	Post-emergence	Annual BLW	UK: Does not control ATXPA, POLCO or POLAV
8	**Nicosulfuron**	B	Post-emergence	Annual BLW & grasses	UK: Not as effective against POLCO, SOLNI, ATXPA, POLAV and CHEAL
	Pendimethalin	K1	Pre-/early post-emergence	Annual BLW & grasses	UK: Can also be applied early post-emergence. Can only be used up to BBCH 13; bromoxynil can be applied until BBCH 19. Not a suitable alternative
9	**Prosulfuron**	B	Post-emergence	Annual BLW	UK: Not as effective against CHEAL and SOLNI
10	**Pyridate**	C3	Post-emergence	Annual BLW	UK: Does not control Polygonums or PAPRH
11	**Rimsulfuron**	B	Post-emergence	Annual BLW	UK: Not as effective against CHEAL, SOLNI and Polygonums. Does not control ATXPA, PAPRH or CAPBP
	S-Metolachlor	K3	Pre-emergence	Annual BLW & grasses	
12	**Terbuthylazine***	C1	Post-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with mesotrione
13	**Tembotrione**	F2	Post-emergence	Annual BLW & grasses	UK: Laudis has a UK authorisation
14	**Thifensulfuron-methyl***	B	Post-emergence	BLW & grasses	UK: Collage also control some grass species. Only authorised in a co-formulated product with nicosulfuron. Does not control ATXPA, SOLNI, PAPRH or CAPBP

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.78: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **game and wildlife** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
2	**2,4-D**	O	Post-emergence	Annual & perennial BLW	UK: Not as effective against Polygonums, ATXPA, PAPRH or SOLNI
	Amidosulfuron	B	Post-emergence	BLW	UK: Different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, or Polygonums
3	**Bentazone**	C3	Post-emergence	Annual BLW	UK: Does not control CHEAL or ATXPA
	Picloram*		Post-emergence	Annual BLW	UK: Only authorised in a co-formulated product with clopyralid. Only for the control of Cleavers and mayweeds.
	Triclopyr*		Post-emergence	Thistles	UK: Only authorised in a co-formulated product with clopyralid. Only for the control of creeping thistle
4	**Diflufenican**	F1	Post-emergence	Annual BLW	UK: Only effective against weeds that have not yet emerged or very small weeds
	Florasulam	B	Post-emergence	Annual BLW	UK: Same timing, so potentially an alternative, but has a different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums
5	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
6	**MCPA**	O	Post-emergence	Annual BLW	UK: Does not control SOLNI. Not as effective against Polygonums or ATXPA
7	**Mecoprop-P**	O	Post-emergence	Annual BLW	UK: Not as effective against SOLNI, ATXPA and Polygonums
8	**mesotrione**	F2	Post-emergence	Annual BLW	UK: Does not control ATXPA, POLCO or POLAV
9	**Metsulfuron-methyl**	B	Post-emergence	Annual BLW	UK: Does not control SOLNI or ATXPA
10	**Thifensulfuron-methyl**	B	Post-emergence	Annual BLW	UK: Does not control SOLNI
11	**Nicosulfuron**	B	Post-emergence	Annual & perennial BLW & grasses	UK: Not as effective against POLCO, SOLNI, ATXPA, POLAV and CHEAL
12	**Propyzamide**	K1	Post-emergence	Annual BLW & grasses	UK: Does not control ATXPA
13	**Tribenuron-methyl**	B	Post-emergence	Annual BLW	UK: Does not control SOLNI or ATXPA
14	**Prosulfuron**	B	Post-emergence	Annual BLW	UK: Not as effective against CHEAL and SOLNI
15	**Pyridate**	C3	Post-emergence	Annual BLW	UK: Does not control Polygonums or PAPRH
16	**MCPB**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, SOLNI, ATXPA, CAPBP or PAPHR

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
17	**Flufenacet**	K3	Post-emergence	Annual BLW & grasses	UK: Can also be applied post-emergence. Not very effective and limited weed spectrum when applied alone, but is useful in some co-formulated products. Does not control CHEAL, SOLNI or Polygonums
	Linuron	C2	Pre- and post-emergence	Annual BLW & grasses	UK: Linuron can be applied post-emergence. However, it cannot be considered as an alternative as all authorisations of linuron expire in June 2018
18	**Prosulfocarb**	N	Pre- & EARLY post-emergence	BLW & grasses	UK: Only effective against very small weeds or weeds that have not yet emerged. Bromoxynil can control larger weeds
	Pendimethalin	F1	Pre- and post-emergence	Annual BLW & grasses	UK: Only effective against weeds that have not yet emerged
19	**Picolinafen**	F1	Pre- and post-emergence	Annual BLW & grasses	UK: Does not control CHEAL, ATXPA, SOLNI or Polygonums
	Clomazone	F4	Pre-emergence	Annual BLW & grasses	UK: Also effective against the grass POAA
	Flufenacet and Isoxaflutole*	K3	Pre-emergence		UK: Isoxaflutole has also been subject to a derogation. Only authorised in a co-formulated product with isoxaflutole. Although Cadou Star may not be commercially available it is authorised. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
	Glyphosate		Pre-emergence	Non-selective	
	Napropamide		Pre-emergence		
	Metazachlor*	K3	Pre-emergence	Annual BLW & grasses	UK: Only in a co-formulated product with dimethenamid-P. Does not control CHEAL, SOLNI, Polygonums or ATXPA
	Dimethenamid-P*	K3	Pre-emergence	Annual BLW & grasses	UK: Only in a co-formulated product with metazachlor. Does not control CHEAL, SOLNI, Polygonums or ATXPA
20	**Ethofumesate**	N	Pre- and post-emergence	Annual BLW & grasses	UK: Although the product may not be available in the UK it is still authorised
21	**Sulfosulfuron**	B	Unknown – label not available	Annual BLW & grasses	UK: Does not control CHEAL, SOLNI, ATXPA, PAPHR, or Polygonums
	Pinoxaden			Grasses	
	Propaquizafop			Grasses	
22	**Desmedipham**	C1	Post-emergence	Annual BLW	UK: Although the product may not be available in the UK it is still authorised
23	**Phenmedipham**	C1	Post-emergence	Annual BLW	UK: Although the product may not be available in the UK it is still authorised

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.79: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **millet** in **the United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Prosulfuron**	B	Post-emergence	Annual BLW	UK: There is an EAMU in millet for the solo prosulfuron product, Peak. Not as effective against CHEAL and SOLNI
	Glyphosate		Pre-emergence	Non-selective	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
(a): The bold indicates the a.s. shortlisted.

Table B.80: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for ***Miscanthus*** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**2,4-D**	O	Post-emergence	Annual & perennial BLW	UK: Depitox is not authorised on *Miscanthus* in the UK, but the product HY-D Super is. Not as effective against Polygonums and SOLNI
	Prosulfuron*	B	Post-emergence	Annual BLW	UK: Only authorised in *Miscanthus* in a co-formulated product containing bromoxynil. Therefore, not an alternative
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Applications permitted until the end of May; bromoxynil can be applied until the end of June. Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
	Flufenacet and isoxaflutole	K3	Pre-emergence		UK: Isoxaflutole has also been subject to a derogation. Although Cadou Star may not be commercially available it is authorised. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
3	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
	Glyphosate		Pre-emergence	Non-selective	
4	**MCPA**	O	Post-emergence	Annual BLW	UK: Can only be used up to BBCH 30. Does not control SOLNI. Not as effective against Polygonums or ATXPA
5	**Mecoprop-P**	O	Post-emergence	Annual BLW	UK: Not as effective against SOLNI, ATXPA and Polygonums
6	**Metsulfuron-methyl**	B	Post-emergence	Annual BLW	UK: Does not control SOLNI or ATXPA
7	**Thifensulfuron-methyl***	B	Post-emergence	Annual BLW	UK: Only authorised in *Miscanthus* in a co-formulated product containing metsulfuron-methyl. Does not control SOLNI

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Pendimethalin	K1	Pre-emergence	Annual BLW & grasses	
	Propoxycarbazone-sodium		n/a	Grasses	
	Prosulfocarb	N	Pre- & EARLY post-emergence	BLW & grasses	UK: Can only be used up to BBCH 15; bromoxynil can be applied until the end of June. Only effective against very small weeds or weeds that have not yet emerged. Bromoxynil can control larger weeds. Not a suitable alternative
	Tri-allate		Pre-emergence	Grasses	
8	**Tribenuron-methyl**	B	Post-emergence	Annual BLW	UK: Applications permitted until the end of May; bromoxynil can be applied until the end of June. Does not control SOLNI or ATXPA

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.81: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **ornamental bulbs** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Florasulam**	B	Post-emergence	Annual BLW	UK: Different weed spectrum. Does not control CHEAL, SOLNI, ATXPA or Polygonums
	Dimethenamid-P*	K3	Pre-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with pendimethalin
	Pendimethalin*	K1	Pre-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with dimethenamid-P
2	**Propyzamide**	K1	Post-emergence	Annual BLW & grasses	UK: Does not control ATXPA

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.82: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **ornamentals** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Bentazone**	C3	Post-emergence	Annual BLW	UK: Does not control CHEAL or ATXPA
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
	Cycloxydim	A	Post-emergence	Grasses	
	Chlorpropham		Pre-emergence	Annual BLW	

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
	Diquat		Pre-emergence	Annual BLW & grasses	
	Fatty acids: pelargonic acid and maleic hydrazide		Pre-emergence	Non-selective	
	Glyphosate		Pre-emergence	Non-selective	
	Pyraflufen-ethyl*		Pre-emergence		UK: Only authorised in a co-formulated product with glyphosate
	Isoxaben		Pre-emergence	BLW	
	Linuron		Pre-emergence	Annual BLW	UK: Linuron cannot be considered as an alternative as all authorisations of linuron expire in June 2018
	Metazachlor		Pre-emergence of weeds		
	Napropamide		Pre-emergence		
	Propyzamide		Post-emergence	Annual BLW & grasses – only for Christmas tree crops	
3	**2,4-D**	O	Post-emergence	Annual & perennial BLW	UK: Not as effective against Polygonums, ATXPA, PAPRH or SOLNI
	Amidosulfuron		Post-emergence	BLW	UK: Different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, or Polygonums
4	**Carfentrazone-ethyl**	E	Post-emergence	BLW	UK: Does not control SOLNI, PAPRH or ATXPA
	Picloram*		Post-emergence	Annual BLW	UK: Only authorised in a co-formulated product with clopyralid. Only for the control of Cleavers and mayweeds. Applications limited until end of March
5	**Diflufenican**	F1	Post-emergence	BLW	UK: Only effective against weeds that have not yet emerged or very small weeds
6	**Florasulam**	B	Post-emergence		UK: Does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums
	Flumioxazin	E	Post-emergence	Annual BLW & grasses	UK: Flumioxazin has also been subject to an application for a derogation and was not supported in ornamentals. Does not control CHEAL, ATXPA, SOLNI or Polygonums
7	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
8	**Metamitron**	C1	Post-emergence	Annual BLW & grasses	UK: Not effective against Polygonums, SOLNI or PAPRH
9	**Metsulfuron-methyl**	B	Post-emergence	Annual BLW	UK: Does not control SOLNI or ATXPA
10	**Nicosulfuron**	B	Post-emergence	Annual & perennial BLW & grasses	UK: Not as effective against POLCO, SOLNI, ATXPA, POLAV and CHEAL
11	**Phenmedipham**	C1	Post-emergence	BLW	UK: Does not control ATXPA, CAPBP, SOLNI or PAPRH
12	**Rimsulfuron**	B	Post-emergence	BLW	UK: Not as effective against CHEAL, SOLNI and Polygonums. Does not control ATXPA, PAPRH or CAPBP

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
13	**Ethofumesate**	N	Pre- and post-emergence	Annual BLW & grasses	UK: Although the product may not be available in the UK it is still authorised
14	**Foramsulfuron***	B	Post-emergence	Annual BLW & grasses	UK: Although the product may not be available in the UK it is still authorised
15	**Iodosulfuron-methyl-sodium**	B	Post-emergence	Annual BLW & grasses	UK: Although the product may not be available in the UK it is still authorised
	Metribuzin	C1	Pre-emergence	Annual BLW & grasses	
	Prosulfocarb	N	Pre-emergence	BLW & grasses	
16	**Desmedipham**	C1	Post-emergence	BLW	UK: Although the product may not be available in the UK it is still authorised
	Clomazone	F4	Pre-emergence	Annual BLW	UK: Can also be used early post-emergence of the crop up to BBCH 16. However, it is only effective pre-emergence of weeds. Not an alternative
	Dimethenamid-P	K3	Pre-emergence	Annual BLW & grasses	
	Fluazifop-P-butyl	A	Pre-emergence	Grasses	
	Flufenacet	K3	Pre-emergence		UK: Although Cadou Star may not be commercially available it is authorised. Can also be applied in the product Sunfire, but is only for applications pre-weed emergence
	Isoxaflutole*	K3	Pre-emergence		UK: Isoxaflutole has also been subject to a derogation. Only authorised in a co-formulated product with isoxaflutole. Although Cadou Star may not be commercially available it is authorised. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
	Imazamox*	B	Pre-emergence		UK: Only in a co-formulated product with pendimethalin. Only effective against weeds that have not yet emerged. Not an alternative
	Pendimethalin	K1	Pre-/post-emergence	Annual BLW & grasses	UK: Can also be used post-emergence. Only effective against weeds that have not yet emerged. Not an alternative
	Quinoclamine	?	Pre-emergence	Mosses	
	S-Metolachlor	K3	Pre-emergence	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.

Table B.83: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to bromoxynil and authorised in plant protection products for **sweet corn** in the **United Kingdom**

	Herbicide authorised[(a)]	HRAC group	Application time (crop)	Weed spectrum	Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist
1	**Tembotrione**	F2	Post-emergence	Not available in UK	UK: Laudis has a UK authorisation
2	**Clopyralid**	O	Post-emergence	Annual & perennial BLW	UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums
3	**Fluroxypyr**	O	Post-emergence	Annual BLW	UK: Does not control CHEAL, CAPBP or ATXPA
	Flufenacet*	K3	Pre-emergence	Not available in UK	UK: Isoxaflutole has also been subject to a derogation. Only authorised in a co-formulated product with isoxaflutole. Although Cadou Star may not be commercially available it is authorised. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
	Isoxaflutole*	F2	Pre-emergence	Not available in UK	UK: Only authorised in a co-formulated product with flufenacet. Although Cadou Star may not be commercially available it is authorised. However, the effectiveness is predominantly pre-weed emergence and so it is not a suitable alternative
4	**Terbuthylazine***	C1	Post-emergence	Annual BLW & grasses	UK: Only authorised in a co-formulated product with mesotrione
5	**Mesotrione**	F2	Post-emergence	Annual BLW	UK: Does not control ATXPA, POLCO or POLAV
6	**Nicosulfuron**	B	Post-emergence	Annual & perennial BLW & grasses	UK: Not as effective against POLCO, SOLNI, ATXPA, POLAV and CHEAL
	Pendimethalin	K1	Pre-emergence	Annual BLW & grasses	
	S-Metolachlor	K3	Pre-emergence	Annual BLW & grasses	

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
*: Active substance is only authorised in co-formulation with other a.s.
(a): The bold indicates the a.s. shortlisted.