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.

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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.

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, 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/EEC1 on 1 March 2005 by Commission Directive 2004/58/EC2, and has been deemed to be approved under Regulation (EC) No 1107/20093, in accordance with Commission Implementing Regulation (EU) No 540/20114, as amended by Commission Implementing Regulation (EU) No 541/20115. The expiry date of bromoxynil was extended to 31 July 2018 by Commission Implementing Regulation (EU) No 2017/8416.

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 844/20127, 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 1272/20088, 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, Luxembourg, Portugal, Spain, Sweden, United Kingdom.

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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, bifenthrine, bromoxynil, carfentrazone ethyl, chlorpropham, cyazofamid, desmedipham, diquat, DPX KE 459 (flupyradiflorin-methyl), eptoxazole, fomoxadone, fenamidone, flumioxazine, foramsulfuron, Gliocladium catenulatum strain: J1446, imazamox, imazosulfuron, isoxaflutole, lanmarin, meta-xy-l-n, methoxyfenzoide, 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(s)                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Austria          | Alfalfa<sup>(a)</sup>/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<sup>(a)</sup>                                                                 |
|-------------|----------------------------------------------------------------------------------------------------------|
| 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                                                                                  |

<sup>(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, barley), 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.</sup>

<sup>(b): Alfalfa or Lucerne (Medicago sativa).</sup>
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, pumpkins, 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.
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.

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  |

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.
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, Ireland, the Netherlands, Poland, Slovakia, 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.

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, grassland 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                | 2.0                                                    | Insufficient |
| Leeks | UK    | 12              | 2                |                                                        |          |

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.
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.

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.

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**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).

**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.

**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

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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 moderately 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.
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 ornamental bulbs in Hungary, Poland and the United Kingdom. Further details on the evaluation are reported in Appendices A and B.

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 crop rotation) are practised on a large scale (above 50% of the acreage) but only moderately 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 the evaluation 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 |
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 |
|-------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| 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 |
| Pyridate                | C3         | Post-emergence          | BLW killer    |                                                                                   |

(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 one product authorised: Boxer (Reg. No 2525/0) The use is only permissible in chives grown for bulb production |

(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 |
|-------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Nicosulfuron            | B          | Post-emergence          | BLW killer    |                                                                                   |
| Prosulfuron             | B          | Post-emergence          | BLW killer    |                                                                                   |
| 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 |
|------------------------|------------|-------------------------|--------------|----------------------------------------------------------------------------------|
| Thifensulfuron         | B          | Post-emergence          | BLW killer   | AT: In AT, for use in maize, thifensulfuron is only authorised in combination with dicamba |
| Tritosulfuron*         | B          | Post-emergence          | BLW killer   | AT: In Austria, tritosulfuron is only available in mixture with other a.s., e.g. mesotrinone, flufenacet |
| Terbuthylazine*        | C1         | Post-emergence          | Annual BLW & grasses | AT: In Austria, terbuthylazine is only available in mixture with other a.s., e.g. mesotrinone, flufenacet |
| Pyridate               | C3         | Post-emergence          | BLW killer   | AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |
| Mesotrione             | F2         | Post-emergence          | BLW killer   |                                                                                   |
| 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   |                                                                                   |
| Clopyralid             | O          | Post-emergence          | BLW killer   |                                                                                   |
| Dicamba                | O          | Post-emergence          | BLW killer   |                                                                                   |
| 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 |                                                                                   |
| Foramsulfuron          | B          | Post-emergence          | Annual and perennial grasses, annual broadleaved |                                                                                   |
| 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 |
|------------------------|------------|-------------------------|--------------|----------------------------------------------------------------------------------|
| Pendimethalin          | K1         | Pre & early post        | BLW killer   |                                                                                   |
| Dimethenamid-p         | K3         | Pre & early post        | BLW killer   |                                                                                   |
### 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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|-----------------------------------|------------|--------------------------|---------------|-----------------------------------------------------------------------------------|
| 3 Terbuthylazine                   | C1         | Post-emergence           | BLW killer    | 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 Pyridate                         | C3         | Post-emergence           | Annual BLW & grasses | AT: In Austria, pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |
| 5 Mesotrione                       | F2         | Post-emergence           | BLW killer    | AT: Mesotrione is only available in mixture with other a.s., e.g. mesotrinone, flufenacet |
| 6 Tembotrione                      | F2         | Post-emergence           | BLW killer    | AT: Tembotrione shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |
| Pendimethalin                      | K1         | Pre & early post         | BLW killer    | AT: Not shortlisted due to time of application and weed spectrum |
| Dimethenamid-p                     | K3         | Pre & early post         | BLW killer    | AT: Not shortlisted due to time of application and weed spectrum |
| 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    | AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |
| 6 Dicamba                          | O          | Post-emergence           | BLW killer    | AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |

<sup>(a)</sup>: 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<sup>(a)</sup> | 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    | AT: Pyridate shall be considered as alternative a.s. to Bromoxynil, i.e. shall be shortlisted |
| Fluazifop-P                       | A          | Post-emergence           | Grass weed killer | 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) |
| 3 Prosulfocarb                    | N          | Post-emergence           | Annual BLW & grasses | AT: Prosulfocarb is only available in mixture with other a.s., e.g. mesotrinone, flufenacet |
| 4 Glufosinate                     | H          | Pre-emergence            | Annual BLW & grasses | AT: Glufosinate is only available in mixture with other a.s., e.g. mesotrinone, flufenacet |

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

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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 |
|-------------------------|------------|------------------------|---------------|-----------------------------------------------------------------------------------|
| Dichlorprop-P           | O          | BBCH 12-21, autumn     | Broadleaved weeds |                                                                                  |
| Pendimethalin           | K1         | BBCH 13-29             | Annual BLW    |                                                                                  |
| Fluroxypyr*             | O          | Post-emergence         | Annual BLW    | AT: Only authorised in combination with florasulam + clopyralid: Product Ariane C (Pfl. Reg. No 3338/0) |
| Florasulam              | B          | BBCH 13-29             | Annual BLW    |                                                                                  |
| 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 |                                                                                  |
| 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.
*(a): 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 |
|-------------------------|------------|------------------------|---------------|-----------------------------------------------------------------------------------|
| Proslufocarb            | N          | Pre-emergence          | Annual grasses and BLW |                                                                                  |
| Amidosulfuron           | B          | Post-emergence, 8-10 cm crop height | Annual BLW |                                                                                  |
| 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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Fluzifop-P              | B          | 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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Fluzifop-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 Thifensulfuron        | 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.
(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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Dimethenamid-p K3       | 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): 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): 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 **asparagus** in Austria

| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|--------------------------|---------------|----------------------------------------------------------------------------------|
| Isoxaben                         | 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 |                                                                                  |

**Notes:**
- 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 **leek** in Austria

| Herbicide authorised<sup>(a)</sup> | 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 |                                                                                  |

**Notes:**
- a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
| Herbicide authorised<sup>(a)</sup> | 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.

<sup>a</sup>: Active substance is only authorised in co-formulation with other a.s.

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

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### 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<sup>(a)</sup> | 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<sup>*</sup> | 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) |                                                                                  |
| Fluazipof-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.

<sup>*</sup>: Active substance is only authorised in co-formulation with other a.s.

<sup>(a)</sup>: 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 |               |                                                                                  |
| Chlorpropham           | K2         | Pre- and post-emergence | Annual grass weeds; Annual dicotyledonous weeds | BE: Different timing is not relevant in IPM                                      |
| Isoxaben               | L          | > BBCH 011 | Annual BLW |                                                                                  |
| Bentazone              | C3         | BBCH 11-14 | Annual BLW |                                                                                  |
| 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) |                                                                                  |
| Pyridate               | C3         | 2-3 weeks after planting or BBCH 09-19 | Annual BLW |                                                                                  |
| 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 |                                                                                  |
| Chloridazon            | C1         | BBCH 12-19 | Annual grass weeds; Annual dicotyledonous weeds |                                                                                  |
| Fluroxypyr             | O          | BBCH 11-15 | BLW (annual and perennial) |                                                                                  |
| 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 |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Dimethenamide-P        | K3         | BBCH 12-14 | Annual grass weeds; Annual dicotyledonous weeds |                                                                                  |
| Pyridate               | C3         | BBCH 10-12 | Annual BLW |                                                                                  |
| Pendimethalin          | K1         | Pre-emergence | Annual BLW |                                                                                  |
| Metamitron             | C1         | Pre-emergence | Annual BLW |                                                                                  |
| 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<sup>(a)</sup> | 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.

<sup>(a)</sup>: Active substance is only authorised in co-formulation with other a.s.

<sup>(a)</sup>: 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<sup>(a)</sup> | 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 |                                                                                   |
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

| No. | 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.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. Thiacarbazine-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 | BE: Only available in co-formulation or with a synergist |
| 9. Terbutylazine*       | C1         | Pre- or post-emergence   | Annual BLW | BE: Only available in co-formulation |
| 10. Pyridate            | C3         | BBCH 12-18               | Annual BLW | BE: Available as solo product and in co-formulations |
| 11. Mesotrione          | F2         | BBCH 12-18               | Annual dicotyledonous weeds Annual grass weeds | BE: Only available 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) | BE: Available as solo product and in co-formulations |
| 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 |
### 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<sup>a</sup> | 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    | BE: Available as solo product and in co-formulations                            |
| 2 Mesotrione                    | F2         | BBCH 12-18              | Annual dicotyledonous weeds<br>Annual grass weeds | BE: Available as solo product and in co-formulations                             |
| 3 Tembotrione<sup>*<sup>    | F2         | BBCH 12-18              | Annual grass weeds<br>Annual dicotyledonous weeds | BE: Only available in co-formulation                                            |
| 4 Fluroxypyr                    | O          | BBCH 132-16             | 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                      |

*a.s.*: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.

<sup>*</sup>: Active substance is only authorised in co-formulation with other a.s.

(a): The bold indicates the a.s. shortlisted.

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EVALUATION OF DATA ON BROMOXYNIL TO CONTROL A SERIOUS DANGER TO PLANT HEALTH

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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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| 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 |
| Halauxifen                       | O          | POST spring             | Broadleaved weeds | DK: Concerning halauxifen the reason why it should not be included in the shortlist is different weed spectrum rather than different application time |
| 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    |                                                                                   |

*a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.  
<sup>(a)</sup>: The bold indicates the a.s. shortlisted.
| Herbicide authorised<sup>a</sup> | 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 Diflufenan** | 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 |
| Flupyr-sulfuron | 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 fluroxypyr 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 |

<sup>a</sup>: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.

<sup>(a)</sup>: 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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|-----------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Mesotrione                        | F2         | Pre/Post                |               |                                                                                  |
| Iodosulfuron                      | B          | Pre/Post                |               |                                                                                  |
| Foramsulfuron                     | B          | Pre/Post                |               |                                                                                  |
| Bentazon*                         | C3         | Pre/Post                |               |                                                                                  |
| Fluroxypyr                        | O          | Post                    |               |                                                                                  |
| Thifensulfuron                    | B          | Post                    |               |                                                                                  |
| Pendimethalin                     | K1         | Pre/Post-GS 00-13       |               |                                                                                  |

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

*a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.

### 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<sup>(a)</sup> | 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           |                                                                                  |
| Cycloxydim                        | A          | Post-emergence          | GR            |                                                                                  |
| Diquat                            | D          | Pre                     | TOTAL         |                                                                                  |
| Pendimethalin                     | K1         | Pre-early/Post          | BLW/GR        |                                                                                  |
| Glyphosate                        | G          | Pre-sowing              | TOTAL         |                                                                                  |
| Prosulfocarb                      |            | Pre-early post          | BLW           |                                                                                  |

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

*a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds; GR: Grass weeds.

### 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<sup>(a)</sup> | 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           |                                                                                  |
| Diquat                            | D          | Pre                     | TOTAL         |                                                                                  |
| Glyphosate                        | G          | Pre-sowing              | TOTAL         |                                                                                  |

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

*a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
### 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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|--------------------------|---------------|---------------------------------------------------------------------------------|
| Amidosulfuron                    | B          | Post-emergence           | BLW           |                                                                                 |
| Florasulam                       | B          | Post-emergence           | BLW           |                                                                                 |
| Iodosulfuron-M-Na                | B          | Post-emergence           | BLW/GR        |                                                                                 |
| Metsulfuron-M                    | B          | Post-emergence           | BLW/GR        |                                                                                 |
| Propoxycarbazone-sodium          | B          | Post-emergence           | BLW/GR        |                                                                                 |
| Pyroxasulam                      | B          | Post-emergence           | BLW           |                                                                                 |
| Sulfoxyuron                      | B          | Post-emergence           | BLW           |                                                                                 |
| Thifensulfuron-M                 | B          | Post-emergence           | BLW           |                                                                                 |
| Tribenuron-M                     | B          | Post-emergence           | BLW           |                                                                                 |
| Tritosulfuron                    | B          | Post-emergence           | BLW           |                                                                                 |
| Bentazon                         | C3         | Post-emergence           | BLW/GR        |                                                                                 |
| Bifenox                          | E          | Post-emergence           | BLW/GR        |                                                                                 |
| Carfentrazzone-E                 | E          | Post-emergence           | BLW/GR        |                                                                                 |
| Prosulfocarb                     | N          | Pre-early post           | BLW           |                                                                                 |
| 2,4-D                            | O          | Post-emergence           | BLW           |                                                                                 |
| 2,4-DP-P Dichlorprop             | O          | Post-emergence           | BLW           |                                                                                 |
| Aminopyralid                     | O          | Post-emergence           | BLW           |                                                                                 |
| Clopyralid                       | O          | Post-emergence           | BLW           |                                                                                 |
| Fluroxypyr                       | O          | Post-emergence           | BLW           |                                                                                 |
| Halauxifen-methyl                | O          | Post-emergence           | BLW           |                                                                                 |
| MCPA                             | O          | Post-emergence           | BLW           |                                                                                 |
| Mecoprop-P (MCPP-P)              | O          | Post-emergence           | BLW           |                                                                                 |
| Fenoxaprop-P-E                   | A          |                         | GR            |                                                                                 |
| Pinoxaden                        | A          |                         | GR            |                                                                                 |
| Glyphosate                       | G          | PRE-SOWING               | TOTAL         |                                                                                 |

<sup>(a)</sup>: 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<sup>(a)</sup> | 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           |                                                                                 |
| Pendimethalin                    | K1         | PRE                      | BLW           |                                                                                 |

<sup>(a)</sup>: 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           |                                                                                  |
| Prospulfocarb          | N          | Pre-early post          | BLW           |                                                                                  |
| 2 Pyridate             | C3         | Post-emergence          | BLW           |                                                                                  |
| Aclonifen              | F3         | PRE-EARLY POST          | BLW/GR        |                                                                                  |
| 3 Metamiton            | 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 |
|------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Prospulfocarb          | 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<sup>(a)</sup> | 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 Fluoroxypyr                     | 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.*

### 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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Foramsulfuron                    | B          | Post-emergence          | BLW killer    |                                                                                 |
| 2 Iodosulfuron                    | B          | Post-emergence          | BLW killer    |                                                                                 |
| 3 Proslufuron                     | 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<sup>*</sup>             | C3         | Post-emergence          | BLW killer    | DE: restricted used in several areas                                             |
| 9 Mesotrine                       | F2         | Post-emergence          | BLW killer    |                                                                                 |
| 10 Tembotrine                     | F2         | Post-emergence          | BLW killer    |                                                                                 |
| 11 Sulcotrine                     | F2         | Post-emergence          | BLW killer    |                                                                                 |
| 12 Dicamba                        | O          | Post-emergence          | BLW killer    |                                                                                 |
| Terbutylazine<sup>*</sup>         | 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    |                                                                                 |
| Isoxaliflute                      | 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.*

*<sup>*</sup>: 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 Terbutylazine         | 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   |                                                                                  |
### 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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|-----------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| **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            |
| 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. |

<sup>a.s.:</sup> active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.

<sup>(a):</sup> 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<sup>(a)</sup> | 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    |                                                                                  |
| 6 Diflufenican                     | F1         | Early post only          | Diflufenican  |                                                                                  |
| Fenoxaprop P                       | A          |                          | Grass weed Killer |                                                                                  |
| 7 Fluroxypyr                       | O          | Post-emergence           | BLW killer    |                                                                                  |
| Glyphosate                         | G          |                          | Total weedkiller |                                                                                  |
| 8 Iodosulfuron                     | B          | Post-emergence           | BLW killer    | HU: Different weed spectrum. Should be not shortlisted                              |
| MCPA                              | O          | Post-emergence           | BLW killer    |                                                                                  |
| Mecoprop-P                         | O          | Post-emergence           | BLW killer    | HU: Different weed spectrum. Should be not shortlisted                              |
| Mesosulfuron                       | B          | Post-emergence           | BLW killer    |                                                                                  |
| 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 Prosofuron                      | 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<sup>(a)</sup> | 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<sup>(a)</sup> | 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<sup>(a)</sup> | 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<sup>(a)</sup> | 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 |                                                                              |
| Prosimulocarb                     |            | Pre- & EARLY post-weed-emergence | Annual BLW & grasses |                                                                            |
| Carfentrazone-ethyl               |            | Pre-emergence           | BLW & grasses |                                                                                |
| Diquat                            | Pre-emergence | Annual BLW & Grasses  | Non-selective |                                                                                |
| Glyphosate                        |            | Pre-emergence           | BLW & grasses |                                                                                |
| Isoxaben (EAMU)                   |            | Pre-emergence           | BLW & grasses |                                                                                |
| Metazachlor                       |            | Pre-weed-emergence      | BLW & grasses |                                                                                |
| Pendimethalin                     |            | Pre-emergence           | Annual BLW & grasses |                                                                            |

<sup>(a)</sup>: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.

### 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<sup>(a)</sup> | 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         |                                                                                |

<sup>(a)</sup>: 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<sup>(a)</sup> | 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    |                              |
| Fluroxypyr                        | O          | Post-emergence          | Annual BLW    |                              |
| Mesotrione                        | F2         | Post-emergence          | Annual BLW    |                              |
| Nicosulfuron                      | B          | Post-emergence          | Annual BLW & grasses |                             |
| Rimsulfuron                       | B          | Post-emergence          | Annual BLW    |                              |
| terbuthylazine                     | C1         | Post-emergence          | Annual BLW & grasses |                             |
| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| 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): 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 |
|-------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| Clopyralid              | O          | Post-emergence          | Annual & perennial BLW |                                                |
| Bentazone               | C3         | Post-emergence          | Annual BLW    |                                                |
| Fluroxypry              | O          | Post-emergence          | Annual BLW    |                                                |
| 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): The bold indicates the a.s. shortlisted.

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
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<sup>(a)</sup> | 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<sup>(a)</sup> | 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           |                                                                                  |
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 |
|-------------------------|------------|-------------------------|---------------|-------------------------------------------------------------------------------------|
| 8 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           | 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.
| Herbicide authorised<sup>(a)</sup> | 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 |                                                                                  |

<sup>a.s.:</sup> active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.

<sup>(a)</sup>: 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<br>Time of application = post-emergence<br>Shortlisted = Y against broadleaved weeds post-emergence of the crop<br>Exception = only available in flax for linseed<br>Remark = art. 51 extension |
| **5** MCPA                | O          | BBCH 20-39              | Broadleaved weeds | NL: Weed spectrum = broadleaved weeds<br>Time of application = post-emergence<br>Shortlisted = Y against broadleaved weeds post-emergence of the crop<br>Exception = only available in fibre flax<br>Remark = art. 51 extension |
| **6** Tembotrione         | F2         | BBCH 12-18              | BLW/grasses  | NL: Weed spectrum = annual weeds<br>Time of application = post-emergence<br>Shortlisted = Y against broadleaved weeds post-emergence of the crop<br>Exception = –<br>Remark = art. 51 extension |

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 | | |
| 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 | |
| Diquat dibromide | 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 | | |
A herbicide is authorised by the Herbicide Resistance Action Committee (HRAC) for application during a specific crop time and is targeted to a specific weed spectrum. The shortlisted herbicide active substances listed in Table B.60 were either justified for inclusion or non-inclusion on the shortlist by Member States or the European Food Safety Authority (EFSA).

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 |
|------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| 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 |                                                                                  |

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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|-----------------------------------|------------|--------------------------|---------------|---------------------------------------------------------------------------------|
| **Bentazone**                     | C3         | BBCH 13-15               | Annual BLW    |                                                                                 |
| **Pyridate**                      | C3         | 2–3 leaves               | Annual BLW    |                                                                                 |
| **Clethodim**                     | A          | BBCH 12-45               | Annual grass weeds <i>Agropyron repens</i> |                                                                                 |
| **Fluazifop-p-butyl**             | A1         | Post-emergence           | Grass weeds   |                                                                                 |
| **Propaquizafop**                 | A          | BBCH 10-19               | Annual grass weed (Poaceae) Rye-grass, wild oats |                                                                                 |
| **Pendimethalin**                | K1         | BBCH 00-09 or BBCH 10-16 | Annual BLW    |                                                                                |

<sup>(a): The bold indicates the a.s. shortlisted.</sup>
| 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    | |
| Diquatdbromide               | D          | Pre-emergence BBCH 00-09 | Annual BLW    | |
| Glufosinate-ammonium         | H          | BBCH 12-41               | Weeds         | |
| Glyphosate                   | G          | BBCH 01-08               | Weeds         | |

\(a\): The bold indicates the a.s. shortlisted.

a.s.: active substance; HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; BLW: broadleaved weeds.
### 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<sup>(a)</sup> | 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       |                                                                  |
| Fluaazifop-P-butyl               | A          | Post-emergence           | Grasses       |                                                                  |
| Haloxyfop-R methyl               | A          | Post-emergence           | Grasses       |                                                                  |
| Quizalofop-p-ethyl and quinalofop-p-teturyl | 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       |                                                                  |

<sup>a.s.:</sup> active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
<sup>(a)</sup>: 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<sup>(a)</sup> | 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       |                                                                  |
| Fluaazifop-P butyl               | A          | Post-emergence           | Grasses       |                                                                  |
| Glyphosate                       | G          | Pre-emergence            | Non-selective |                                                                  |

<sup>a.s.:</sup> active substance; HRAC: Herbicide Resistance Action Committee; BLW: broadleaved weeds.
<sup>(a)</sup>: 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<sup>(a)</sup> | 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 |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Foramsulfuron          | B          | Post-emergence          | BLW & grasses | SK: Avena sterilis and Alopecurus myosuroides are not mentioned in Slovakia for maize |
| Iodosulfuron           | B          | Post-emergence          | BLW & grasses |                                                                                   |
| Clopyralid             | O          | Post-emergence          | BLW           |                                                                                   |
| Nicosulfuron           | B          | Post-emergence          | BLW & grasses |                                                                                   |
| Pendimethalin          | K1         | Post-emergence          | BLW & grasses | SK: Alopecurus myosuroides is not mentioned in Slovakia for maize                 |
| Picloram               | O          | Post-emergence          | BLW           |                                                                                   |
| Pyridate               | C3         | Post-emergence          | BLW           |                                                                                   |
| Rimsulfuron            | B          | Post-emergence          | BLW & grasses |                                                                                   |
| Sulcotrione            | F2         | Post-emergence          | BLW & grasses |                                                                                   |
| Tembotrione            | F2         | Post-emergence          | BLW & grasses |                                                                                   |
| Terbuthylazine         | C1         | Post-emergence          | BLW & grasses |                                                                                   |
| Thifensulfuron-methyl  | B          | Post-emergence          | BLW           |                                                                                   |
| Tritosulfuron          | B          | Post-emergence          | BLW           |                                                                                   |
| Linuron                | C2         | Pre- and post-emergence | BLW & grasses |                                                                                   |
| Mesotrione             | F2         | Pre- and post-emergence | BLW           |                                                                                   |
| Pethoxamid             | K3         | Pre-early post-emergence| BLW & grasses |                                                                                   |
| Aclofinfen             | F3         | Pre-early post-emergence| BLW & grasses |                                                                                   |
| 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         |               |                                                                                   |
| Thiencarbzone          | 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
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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| 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.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 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.
| Herbicide authorised<sup>(a)</sup> | 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<sup>(a)</sup> | 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<sup>(a)</sup> | 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           |                                                                                  |
### 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<sup>a</sup> | 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 |                                                                                  |

<sup>a</sup>: 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<sup>a</sup> | 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 Chlorosulfuron                 | 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 |                                                                                  |

<sup>a</sup>: 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<sup>(a)</sup> | 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.

<sup>(a)</sup>: The bold indicates the a.s. shortlisted.

1. **Clopyralid**
   - HRAC group: O
   - Application time: Post-emergence
   - Weed spectrum: Annual & perennial BLW
   - Justification: UK: Does not control CHEAL, SOLNI or ATXPA. Not as effective against Polygonums

2. **Pyridate**
   - HRAC group: C3
   - Application time: Post-emergence
   - Weed spectrum: Annual BLW
   - Justification: 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)

3. **Pendimethalin**
   - HRAC group: K1
   - Application time: Pre-emergence
   - Weed spectrum: Annual BLW & grasses

4. **Cycloxydim**
   - Application time: Post-emergence
   - Weed spectrum: Grasses

5. **Fluazifop-P-butyl**
   - Application time: Post-emergence
   - Weed spectrum: Grasses

6. **Propaquizafop**
   - Application time: Post-emergence
   - Weed spectrum: Grasses

7. **Chlorpropham**
   - Application time: Early post-emergence
   - Weed spectrum: Annual BLW & grass
   - Justification: 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

8. **Diquat**
   - Application time: Pre-emergence
   - Weed spectrum: Annual BLW & grasses

9. **Glyphosate**
   - Application time: Pre-emergence
   - Weed spectrum: Non-selective

10. **Bentazone**
    - HRAC group: C3
    - Application time: Post-emergence
    - Weed spectrum: Annual BLW
    - Justification: UK: Does not control CHEAL or ATXPA

11. **Fluroxypyr**
    - HRAC group: O
    - Application time: Post-emergence
    - Weed spectrum: Annual BLW
    - Justification: UK: Does not control CHEAL, CAPBP or ATXPA

12. **Prosulfocarb**
    - HRAC group: N
    - Application time: Pre- & EARLY post-emergence
    - Weed spectrum: Annual BLW & grasses
    - Justification: 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

13. **Dimethenamid-P**
    - HRAC group: K3
    - Application time: Pre- & EARLY post-emergence
    - Weed spectrum: Annual BLW & grasses
    - Justification: 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
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 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

Chloridazon C1 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

Linuron C2 Pre-emergence Annual BLW & grasses

S-Metolachlor Pre-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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| 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       | 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 |
| Chloridazon             | C1         | 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 |
| Linuron                 | C2         | Pre-emergence            | Annual BLW    |                                                                                   |
| S-Metolachlor           |            | Pre-emergence            | Annual BLW & grasses |                                                                                   |

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, PAPRH, 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, PAPRH 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       | UK: Same timing, so potentially an alternative, but has a different weed spectrum. Does not control CHEAL, SOLNI, ATXPA, PAPHR, CAPBP or Polygonums |
| florasulam             | B          | Post-emergence          | Annual BLW    | UK: Does not control CHEAL, CAPBP or ATXPA |
| Flupyriramuron-methyl  | B          | Post-emergence          | BLW           | UK: Flupyriramuron-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 Fluoroxypry          | O          | Post-emergence          | BLW           | UK: Does not control CHEAL, CAPBP or ATXPA |
| 8 Haloxifen-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-      | B          | Post-emergence          | BLW & grasses | UK: Only authorised in co-formulated products with various active substances. Does not control ATXPA or PAPRH |
| methyl-sodium*         |            |                         |               |                                                                                  |
| 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 |
| Pinosulfadine          | A          | Post-emergence          | Grasses       |                                                                                  |
| Prosulfadine           | N          | Pre- & EARLY post-emergence | BLW & grasses | UK: No restriction on cereals for crop production. Can be considered an alternative. Does not control SOLNI |
| Thifensulfon-methyl    | B          | Post-emergence          | BLW & grasses |                                                                                  |
| 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 |
### 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           | B          | 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' |
| 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) |

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*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.
| 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 |
|-------------------------------|------------|------------------------|--------------|----------------------------------------------------------------------------------|
| 1 Fluoroxypry                 | O          | Post-emergence         | Annual BLW   | UK: Does not control CHEAL, CAPBP or ATXPA                                        |
| Proksulfocarb                 | N          | Pre- & EARLY post-emergence | Annual BLW & grasses | UK: Can only be used up to BBCH 15; bromoxynil can be applied until BBCH 19. Does not control CHEAL or ATXPA. 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 Prosimulfuron        | 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 Terbutylazine*      | C1         | Post-emergence          | Annual BLW & grasses | UK: Only authorised in a co-formulated product with mesotrione |
| 13 Tembrotine          | 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, PAPRH, or Polygonums |
| 3 Bentazone             | C3         | Post-emergence          | Annual BLW            | UK: Does not control CHEAL or ATXPA                                               |
| Picloram*               |            |                         |                       | UK: Only authorised in a co-formulated product with clopyralid. Only for the control of Cleavers and mayweeds. |
| Triclopyr*              |            |                         |                       | 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, PAPRH, 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                          |
| 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 PAPRH                         |
| 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            | Annual BLW & grasses | 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 *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 BLW UK: Depitox is not authorised on *Miscanthus* in the UK, but the product HY-D Super is. Not as effective against CHEAL and SOLNI |
| 2 Prosulfuron* B Post-emergence Annual BLW UK: Only authorised in *Miscanthus* in a co-formulated product containing bromoxynil. Therefore, not an alternative |
| 3 Fluroxypyr O Post-emergence Annual BLW UK: Does not control CHEAL, CAPBP or ATXPA |
| Glyphosate Pre-emergence Non-selective |

### 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 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.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<sup>(a)</sup> | 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 | 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 |
| Propoxycarbazone-sodium n/a      | Grasses    | UK: Applications permitted until the end of May; bromoxynil can be applied until the end of June. Does not control SOLNI or ATXPA |
| Prosulfocarb N Pre- & EARLY post-emergence | BLW & grasses | |
| Tri-allate Pre-emergence         | Grasses    | |
| Tribenuron-methyl B Post-emergence | Annual BLW | |

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<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|----------------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| Bentazone C3 Post-emergence      | Annual BLW | UK: Does not control CHEAL, SOLNI, ATXPA or Polygonums |
| 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 |
|-------------------------------|-------------|------------------------|---------------|--------------------------------------------------------------------------------|
| Ethofumesate                  | N           | Pre- and post-emergence | Annual BLW & grasses | UK: Although the product may not be available in the UK it is still authorised |
| Foramsulfuron*                | B           | Post-emergence          | Annual BLW & grasses | UK: Although the product may not be available in the UK it is still authorised |
| 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    |                                                                  |
| 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.