Evaluation of data concerning the necessity of flupyrsulfuron-methyl as a 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 flupyrsulfuron-methyl 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 eight different uses (crops) in seven Member States. The evaluation demonstrated that in general a wide range of alternative herbicide active substances to flupyrsulfuron-methyl are available for chemical weed control; 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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Evaluation of data on flupyrsulfuron-methyl to control a serious danger to plant health

Summary

Flupyrsulfuron-methyl was included in Annex I to Directive 91/414/EEC on 1 July 2001 by Commission Directive 2001/49/EC and has been deemed to be approved under Regulation (EC) No 1107/2009, in accordance with Commission Implementing Regulation (EU) No 540/2011, with the name DPX KE 459 (flupyrsulfuron-methyl). The applicant, DuPont de Nemours (Deutschland) GmbH, applied for renewal of approval in line with the provisions of Commission Regulation (EU) No 1141/2010.

Flupyrsulfuron-methyl is a herbicide active substance (a.s.) and it is used for pre-emergence and/or post-emergence control of both annual broadleaf and annual grass weeds, particularly black-grass, (Dactylis glomerata) and loose silky-bent (APESV), in winter cereal crops, linseed and seed production of forage grasses.

In 2014, during the peer review, the European Food Safety Authority (EFSA) proposed to classify flupyrsulfuron-methyl as carcinogenic category 2 (C2) and toxic for reproduction category 2 (R2), leading to a critical area of concern with regard to the approval criteria of Annex II, Point 3.6.5 of Regulation (EC) No 1107/2009 interim provisions for active substances that shall be considered to have endocrine disrupting properties.

The applicant DuPont de Nemours (Deutschland) GmbH requested derogation under Article 4(7) of Regulation (EC) No 1107/2009, submitting evidence regarding the necessity of flupyrsulfuron-methyl to control a serious danger to plant health. In January 2016, the European Commission 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 a.s.. The protocol on the methodology was published on 2 August 2016 (EFSA, 2016a).

Subsequently, the applicant was requested by the European Commission to re-submit the data following the methodology developed by EFSA. In September 2016, the European Commission forwarded to EFSA the new submission provided by the applicant, consisting of a data collection set and a report (DuPont, 2016). The applicant, included claims that the use of flupyrsulfuron-methyl is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 in relation to the uses authorised in 10 Member States (MS).

As following step, EFSA launched a commenting phase in October–November 2016 asking all MS to confirm that the uses for which the applicant requested Article 4(7) derogation are authorised, and if the use of flupyrsulfuron-methyl 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, eight different uses (winter wheat, winter barley, winter rye, oats, triticale, spelt, linseed and Dactylis glomerata (minor use)) in seven MS (Austria, Belgium, Denmark, the Netherlands, Slovakia, Sweden and the United Kingdom) were evaluated to assess the applicant’s claims or information provided by MS (Austria, Denmark for minor use in D. glomerata and spelt) on the necessity of flupyrsulfuron-methyl to control a serious danger to plant health. It can be concluded that generally a wide range, of chemical alternative herbicide a.s. are available in MS for weed control in winter wheat (except for Austria and Sweden), winter rye (except for Austria and Sweden) and triticale (except for Austria and Sweden). However, there are insufficient chemical alternatives to flupyrsulfuron-methyl for weed control in spelt (except for Belgium), oats, linseed and D. glomerata. For winter barley, there are insufficient chemical alternatives to flupyrsulfuron-methyl for weed control in Denmark, an intermediate situation in Austria and sufficient chemical alternatives are available in the United Kingdom.

Non-chemical alternatives were also evaluated for these different uses and a wide range of methods are available; however, these methods often 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.

When evaluating individually the herbicide chemical alternatives according to the criteria: ‘time of application’ and ‘weed spectrum’ one by one with the other a.s. less alternatives seem to be present among the shortlisted herbicide a.s. However, many a.s. are useful in integrated pest management (IPM), meaning that the system as a whole may be able to function without the substance under consideration. It is noted that some MS applied the protocol more strictly, while other MS such as...
Belgium and the Netherlands were in favour of a more flexible approach. To ensure consistency, EFSA rigorously followed the methodology of the protocol (EFSA, 2016a), but further discussions with MS on the subject might be useful.
1. Introduction

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

Flupyrsulfuron-methyl was included in Annex I to Directive 91/414/EEC\(^1\) on 1 July 2001 by Commission Directive 2001/49/EC\(^2\) and has been deemed to be approved under Regulation (EC) No 1107/2009\(^3\), in accordance with Commission Implementing Regulation (EU) No 540/2011\(^4\), with the name DPX KE 459 (flupyrsulfuron-methyl). The applicant, DuPont de Nemours (Deutschland) GmbH, applied for renewal of approval in line with the provisions of Commission Regulation (EU) No 1141/2010\(^5\). Flupyrsulfuron-methyl 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 the European Food Safety Authority (EFSA) on 27 September 2013 (France, 2013). In accordance with Article 16 of Regulation (EU) No 1141/2010, EFSA finalised the conclusion on the peer review for flupyrsulfuron-methyl on 22 October 2014 (EFSA, 2014).

EFSA proposed to classify flupyrsulfuron-methyl as carcinogenic category 2 (C2) and toxic for reproduction category 2 (R2), leading to a critical area of concern with regard to the approval criteria of Annex II, Point 3.6.5 of Regulation (EC) No 1107/2009 interim provisions for active substances (a.s.) that shall be considered to have endocrine disrupting properties.

The applicant DuPont de Nemours (Deutschland) GmbH requested derogation in accordance with the provisions of Article 4(7) of Regulation (EU) 1107/2009, submitting evidence regarding the necessity of flupyrsulfuron-methyl to control a serious danger to plant health which cannot be contained by other available means. In January 2016, the European Commission 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 a.s.. The protocol on the methodology was published on 2 August 2016 (EFSA, 2016a).

Subsequently, applicant was requested by the European Commission to re-submit the data following the methodology developed by EFSA. On 19 September 2016, the European Commission forwarded to EFSA the new submission provided by the applicant, consisting in a data collection set and a report (Du Pont, 2016). The applicant included claims that the use of flupyrsulfuron-methyl is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 in the following Member States (MS): Belgium, the Czech Republic, Denmark, France, Germany, the Netherlands, Poland, Slovakia, Sweden and the United Kingdom.

On 11 October 2016, EFSA launched a 6 weeks 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 flupyrsulfuron-methyl 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, Belgium, Denmark, the Netherlands, Slovakia, Sweden and the United Kingdom validated the information provided by applicant and Austria submitted new information in relation to the uses in cereals.

As a follow up, EFSA ensured that the methodology was consistently applied by MS and summarised the evaluation of flupyrsulfuron-methyl (See Appendices A and B) in the current scientific report. A final consultation process on the draft scientific report with MS was launched in February 2017.

The legal deadline to finalise the current scientific report is 19 March 2017.

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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 2001/49/EC of 28 June 2001 amending Annex I to Council Directive 91/414/EEC concerning the placing of plant protection products on the market to include DPX KE 459 (flupyrsulfuron-methyl) as an active substance, OJ L 176, 29.6.2001, p. 61–63.
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, 24.9.2009, 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 Regulation (EU) No 1141/2010 of 7 December 2010 laying down the procedure for the renewal of the inclusion of a second group of active substances in Annex I to Council Directive 91/414/EEC and establishing the list of those substances. OJ L 322, 8.12.2011, p. 10–19.
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 a.s. 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, 2016a). 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, 2016a).

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 flupyr sulfouron-methyl. EFSA considered the information provided by Member States such as the full list of authorised herbicide a.s., the shortlisted a.s. and the non-chemical methods as reliable and no further research was conducted to validate these data. Thus, Member States 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 flupyr sulfouron-methyl (DuPont, 2016), and additional information and data provided by MS after the commenting phase launched by EFSA in October–November 2016. Table 1 provides an overview of authorised uses of flupyr sulfouron-methyl (DPX KE 459) to control both annual broadleaf and annual grass weeds, particularly black-grass (ALOMY) and loose silky-bent (APESV) in Europe. A total of four formulated products containing flupyr sulfouron-methyl are registered in Europe and details, except for Austria, are provided in Appendix 1 of the applicant report (DuPont, 2016).

EFSA provides the collection data set as validated by MS (i.e. complete list/s of authorised a.s. in the relevant Member States) 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 is provided as an Appendix to this report (Appendix B).

**Table 1:** Authorised uses of flupyr sulfouron-methyl (DPX KE 459) in Europe

| Country       | Use/stage of application<sup>(a)</sup>                                                                                  |
|--------------|-----------------------------------------------------------------------------------------------------------------|
| Austria      | **Winter wheat**/BBCH 12-25 (post-emergence)                                                                     |
|              | **Winter barley**/autumn from BBCH 12 (post-emergence)                                                            |
|              | **Winter rye**/spring BBCH 13-25 (post-emergence), autumn from BBCH 12 (post-emergence)                           |
|              | **Spelt**/spring BBCH 13-25 (post-emergence), autumn from BBCH 12 (post-emergence)                               |
|              | **Triticale**/spring BBCH 13-25 (post-emergence), autumn from BBCH 12 (post-emergence)                           |
|              | Linseed<sup>(b),(c)</sup>/post-emergence of the crop, 2–10 cm height                                             |
| Belgium      | **Winter wheat**/spring BBCH 21-29 (post-emergence)                                                              |
|              | **Spelt**/spring BBCH 21-29 (post-emergence)                                                                     |
|              | **Triticale**/spring BBCH 21-29 (post-emergence)                                                                  |
|              | **Oats**/spring BBCH 21-29 (post-emergence)                                                                      |
|              | Linseed<sup>(c)</sup>/spring 3–12 cm height (post-emergence)                                                      |
| Czech Republic | **Winter wheat**/BBCH 00-09 (pre-emergence), autumn and spring BBCH 11-31 (post-emergence)                     |
|              | **Winter rye**/BBCH 00-09 (pre-emergence), autumn and spring BBCH 11-31 (post-emergence)                         |
|              | **Triticale**/BBCH 00-09 (pre-emergence), autumn and spring BBCH 11-31 (post-emergence)                         |
| Denmark      | **Winter wheat**/autumn BBCH 13-23 (post-emergence) or spring BBCH 23-30 (post-emergence) or autumn + spring (split application) |
|              | **Winter barley**/autumn BBCH 13-23 (post-emergence)                                                             |
|              | **Winter rye**/autumn BBCH 13-23 (post-emergence)                                                                 |
|              | **Triticale**/autumn BBCH 13-23 (post-emergence)                                                                 |

<sup>6</sup> The following FSM containing products are currently registered for use: flupyr sulfouron-methyl (DPX KE 459), flupyr sulfouron-methyl + metsulfuron methyl (DPX-KV953), flupyr sulfouron-methyl + thifensulfuron methyl (DPX-KV954), flupyr sulfouron-methyl + diflufenican (DPX-HGCS2).
In addition, key supporting documents to this scientific report are:

- the applicant submission in the form of a Report (DuPont, 2016) and collection data set;
- the comments received on the Applicant Report (EFSA, 2016b);
- the comments received on the draft scientific report (EFSA, 2016c).

The applicant submitted the information in relation to 10 Member States (Belgium, the Czech Republic, Denmark, France, Germany, the Netherlands, Poland, Slovakia, Sweden, and the United Kingdom); six MS (Belgium, Denmark, the Netherlands, Slovakia, Sweden and the United Kingdom) verified the information submitted by the applicant. Germany was not able to validate the information provided by the applicant as it was not possible to adjust the received information with the one available in the national database and therefore an accurate mapping was not possible. Furthermore, three MS (the Czech Republic, France and Poland) did not verify the information. Austria submitted information in relation to the uses in cereals.

| Country     | Use/stage of application<sup>(a)</sup>                                                                 |
|-------------|----------------------------------------------------------------------------------------------------------|
| France      | Spelt/<i>autumn</i> BBCH 13-23 (<i>post-emergence</i>) or spring BBCH 23-30 (<i>post-emergence</i>) or  |
|             | autumn + spring (split application)                                                                     |
|             | <i>Dactylis glomerata</i>/autumn BBCH 20-26 (<i>post-emergence</i>), minor use                           |
| Germany     | Winter wheat/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | Winter barley/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | Spelt/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>)     |
|             | <i>Triticale</i>/BBCH 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | Oats/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>)     |
|             | Forage grass/<i>BBCH</i> > 25 (<i>post-emergence</i>)                                                   |
| Netherlands | Winter wheat/<i>BBCH</i> 12-25 (<i>post-emergence</i>), <i>BBCH</i> 00-09 (<i>pre- and early post-emergence</i>) |
|             | to control ALOMY and APESV                                                                            |
| Poland      | Winter wheat/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | Winter rye/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | <i>Triticale</i>/BBCH 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
|             | Oats/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>)     |
| Slovakia    | Winter wheat/<i>BBCH</i> <i>autumn</i> and spring BBCH 11-29 (<i>post-emergence</i>)                  |
|             | Winter rye/<i>BBCH</i> <i>autumn</i> and spring BBCH 11-29 (<i>post-emergence</i>)                   |
|             | <i>Triticale</i>/BBCH 12-31 December (<i>post-emergence</i>) autumn                                    |
| Sweden      | Winter wheat/<i>BBCH</i> 11-29 (<i>post-emergence</i>)                                                  |
|             | Winter rye/<i>BBCH</i> 11-29 (<i>post-emergence</i>)                                                   |
|             | <i>Triticale</i>/BBCH 11-29 (<i>post-emergence</i>)                                                   |
| United       | Winter wheat/<i>BBCH</i> 00-09 (<i>pre-emergence</i>), autumn and spring BBCH 11-31 (<i>post-emergence</i>) |
| Kingdom     | Winter rye/<i>BBCH</i> 12 – 31 December (<i>post-emergence</i>) autumn                                |
|             | Winter barley/<i>BBCH</i> 00-09 (<i>pre-emergence</i>) (<i>pre-emergence</i>) autumn                   |
|             | <i>Triticale</i>/BBCH 12-31 December (<i>post-emergence</i>) autumn                                    |
|             | Oats/<i>BBCH</i> 12-31 December (<i>post-emergence</i>) autumn                                        |

<sup>(a)</sup> The uses proposed in the following table correspond to the list provided by the applicant in the excel files (DuPont, 2016) as validated by MS, except for the information provided by MS for Austria, and on <i>Dactylis glomerata</i> and spelt for DK.

<sup>(b)</sup> For <i>Linum usitatissimum</i>, the terminology 'linseed' is used throughout this document in line with the European terminology (Plant variety database - European Commission).

<sup>(c)</sup> The approved plant protection product contains two a.s: flupyrsulfuron methyl and metsulfuron.

BBCH: growth stages of mono- and dicotyledonous plants.
3. Evaluation and assessment

3.1. Evaluation of chemical alternatives

3.1.1. Winter wheat

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 flupyrdsuluron-methyl for use in winter wheat in Austria, Belgium, Denmark, the Netherlands, Slovakia, Sweden and the United Kingdom.

Table 2: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in winter wheat in Austria, Belgium, Denmark, the Netherlands, Sweden, Slovakia and the United Kingdom

| Use           | Country | Authorised a.s. | Shortlisted a.s. |
|---------------|---------|----------------|-----------------|
| Winter wheat  | AT      | > 20           | 1               |
| Winter wheat  | BE      | > 20           | 7               |
| Winter wheat  | DK      | > 20           | 3               |
| Winter wheat  | NL      | > 20           | 3               |
| Winter wheat  | SE      | > 20           | 1               |
| Winter wheat  | SK      | > 20           | 6               |
| Winter wheat  | UK      | > 20           | 4               |

a.s.: active substance.

The information provided by Austria on the necessity of flupyrdsuluron-methyl in winter wheat to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsuluron-methyl resulted in herbicide resistance (HR) strategy score of 2.7 This means that with one shortlisted herbicide a.s. chlorotoluron (C2) and one mode of action (MoA) insufficient chemical alternatives are available in Austria.

Following the approach proposed by EFSA protocol (2016a), according to which, ‘if a registered product consists of two or more a.s. (a mixture8), the information should be provided for each a.s. in the mixture separately’ and the assessment is conducted for each a.s. individually; EFSA initially proposed to shortlist also the a.s. mesosulfuron methyl (only authorised in Austria in co formulation with other a.s.). However, as the weed spectrum is not comparable with the weed spectrum of the a.s. under consideration, Austria proposed not to consider mesosulfuron methyl as a chemical alternative (details are provided in Appendices A and B, TableB.1). In addition, in Austria, there is one authorised plant protection product (PPP) which contains two herbicide a.s. (florasulam (B)9 and pinoxaden (A)9) only available in co-formulation. The PPP has the same time of application (BBCH 13-25) and controls the same weed spectrum (annual broadleaf weeds and annual grass weeds (ALOMY and APESV)) as the substance under consideration (details are provided in Appendix B, Table B.1). According to the protocol (EFSA, 2016a), only a.s. that have the same spectrum of weed control and time of application as the substance under consideration should be retained on the shortlist. This is not the case when considering the two a.s individually (pinoxaden controls only annual grass weeds and florasulam controls only annual broadleaf weeds), therefore, these two a.s. have not been shortlisted.

The information provided by the applicant on the necessity of flupyrdsuluron-methyl in winter wheat to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsuluron-methyl in Belgium, resulted in the following shortlisted herbicide a.s: chlorotoluron (C2), flufenacet (K3), mesosulfuron methyl (B), pendimethalin (K1), prosulfocarb (N), pyroxsulam (B), and sulfosulfuron (B). Three of the shortlisted herbicide a.s. (mesosulfuron methyl, pyroxsulam and sulfosulfuron) have the same MoA as the a.s. under consideration (flupyrdsuluron-methyl). The EFSA protocol (EFSA 2016a) states that ‘if one of the shortlisted a.s. has the same MoA [and site of action] as the a.s. under consideration, withdrawal of the a.s. under consideration has no implications for herbicide resistance

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7 HR scores: lower or equal 6: insufficient chemical alternatives; higher than 8: sufficient chemical alternatives; between 6 and 8: intermediate situation (EFSA, 2016a).
8 It is considered ‘mixture’ when an active substance is only authorised in co-formulation with other a.s. in a plant protection Product.
9 The active substance is available in a mixture of an authorised plant protection product.
management. Consequently, justifying derogation based on a reduced number of MoAs no longer holds. This leads to the conclusion that there are sufficient chemical alternatives for winter wheat available in Belgium and there is no need to calculate a HR score (details are provided in Appendix B, Table B.2). A similar situation occurred for Denmark and Slovakia.

In Denmark, the evaluation resulted in following shortlisted herbicide a.s.: mesosulfuron methyl (B), pyroxasulam (B) and prosulfocarb (N). Two of the shortlisted herbicide a.s. (mesosulfuron methyl and pyroxasulam) have the same MoA as the a.s. under consideration (flupyrsulfuron-methyl (B)), leading to the conclusion that there are sufficient chemical alternatives available for winter wheat in Denmark, and there is no need to calculate a HR score (details are provided in Appendix B, Table B.3). One of the a.s. mesosulfuron methyl (B) is registered in co-formulation with other a.s.

In Slovakia, the evaluation resulted in following shortlisted herbicide a.s.: chlorotoluron (C2), flufenacet (K3), flumioxazin (E), mesosulfuron methyl (B), pendimethalin (K1) and pyroxasulam (B). Two of the shortlisted herbicide a.s. (mesosulfuron methyl and pyroxasulam) have the same MoA as the a.s. under consideration (flupyrsulfuron-methyl (B)), leading to the conclusion that there are sufficient chemical alternatives available for winter wheat in Slovakia and there is no need to calculate a HR score (details are provided in Appendix B, Table B.5).

The evaluation of applicant’s claim on the necessity of flupyrsulfuron-methyl in winter wheat to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl resulted in HR strategy scores of 9, 3 and 127 for the Netherlands, Sweden and the United Kingdom, respectively.

In the Netherlands, it is assumed that considering the herbicide a.s. flufenacet (K3), pendimethalin (K1) and prosulfocarb (N) and three MoAs, sufficient chemical alternatives for sustainable HR management are available.

In Sweden, it is assumed that considering the herbicide a.s. prosulfocarb (N) and one MoA insufficient chemical alternatives for sustainable HR management are available.

In addition, Sweden claimed that flupyrsulfuron-methyl is essential for use in winter wheat for the very good efficiency against spill rape seed, and there is no other alternative available. Spill rape seed needs to be controlled already in autumn, to avoid amplifying the fungus disease club rot, for the control of corn flower and scentless mayweed. Furthermore, flupyrsulfuron-methyl is one of the three remaining a.s. that may be used for control of black-grass. Black-grass is a very difficult weed that easily becomes resistant to herbicides. In those parts of Sweden where black-grass is a major problem, the PPP has an important role in a resistance strategy, where the growers need to combine different a.s.

In the United Kingdom, it is assumed that considering the herbicide a.s. flufenacet (K3), flumioxazin (E), prosulfocarb (N) and pendimethalin (K1) and four MoAs sufficient chemical alternatives for sustainable HR management are available.

For further details on the evaluation, see Appendices A and B.

3.1.2. Winter barley

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 flupyrsulfuron-methyl for use in winter barley in the Austria, Denmark and the United Kingdom.

| Use        | Country | Authorised a.s. | Shortlisted a.s. |
|------------|---------|----------------|------------------|
| Winter barley | AT      | > 20           | 3                |
| Winter barley | DK      | > 20           | 1                |
| Winter barley | UK      | > 20           | 3                |

a.s.: active substance.

The information provided by Austria on the necessity of flupyrsulfuron-methyl in winter barley to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl, resulted in a HR score of 7. This means that in Austria, it is assumed that considering the
herbicide a.s. chlorotoluron (C2), halaxifen-methyl (O) and prosulfocarb (N) and three MoAs this represents an intermediate situation.

Austria also highlighted that there are three authorised PPP containing more than one a.s. (co-formulations, details are provided in Appendix B, Table B.8) which have similar characteristics (time of application and weed spectrum) as the a.s. under consideration.

The evaluation of applicant's claim on the necessity of flupyrquosulfuron-methyl in winter barley to control a serious danger to plant health based on remaining chemical alternatives to flupyrquosulfuron-methyl resulted in a HR score of 37 for Denmark. This means that in Denmark it is assumed that considering the a.s. prosulfocarb (N) and one MoA insufficient chemical alternatives for sustainable HR management are available.

The evaluation of applicant's claim on the necessity of flupyrquosulfuron-methyl in winter barley to control a serious danger to plant health based on remaining chemical alternatives to flupyrquosulfuron-methyl resulted in a HR score of 97 for the United Kingdom. This means that in the United Kingdom, considering the herbicide a.s. flufenacet (K3), pendimethalin (K1), prosulfocarb (N) and three MoAs, sufficient chemical alternatives for sustainable HR management are available.

For further details on the evaluation, see Appendices A and B.

3.1.3. Winter rye

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 flupyrquosulfuron-methyl for use in winter rye in Austria, Denmark, Sweden, Slovakia and the United Kingdom.

**Table 4:** Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in winter rye in Austria, Denmark, Sweden, Slovakia and the United Kingdom

| Use       | Country | Authorised a.s. | Shortlisted a.s. |
|-----------|---------|----------------|-----------------|
| Winter rye| AT      | >20            | 1               |
| Winter rye| DK      | >20            | 3               |
| Winter rye| SE      | >20            | 1               |
| Winter rye| SK      | >20            | 5               |
| Winter rye| UK      | >20            | 5               |

a.s.: active substance.

The information provided by Austria and the evaluation of applicant’s claims for the other MS on the necessity of flupyrquosulfuron-methyl in winter rye to control a serious danger to plant health based on remaining chemical alternatives to flupyrquosulfuron-methyl, resulted in HR strategy scores of 2 and 37 for Austria and Sweden, respectively. This means that in Austria, considering the herbicide a.s. halaxifen-methyl (O) and one MoA, insufficient chemical alternatives for sustainable HR management are available. In Sweden, it is assumed that considering the herbicide a.s. prosulfocarb (N) and one MoA insufficient chemical alternatives for sustainable HR management are available.

In Austria, two herbicide a.s. (florasulam (B)\(^9\)\(^\text{10}\) and pinoxaden (A)\(^9\)) are only available in combination as PPP. The product has the same time of application (BBCH 13-25) and controls the same weed spectrum (annual broadleaf and annual grass weeds (ALOMY and APESV)) as the substance under consideration. According to the protocol (EFSA, 2016a), only a.s. that have the same spectrum of weed control and time of application as the substance under consideration should be retained on the shortlist. This is not the case when considering the two a.s individually (pinoxaden controls annual grass weeds and florasulam controls annual broadleaf weeds); therefore, it is proposed not to shortlist these two a.s. In addition, the protocol (EFSA 2016a) states that ‘if an a.s. has the same MoA and site of action (which is the case for florasulam) of the substance under consideration (flupyrquosulfuron-methyl), withdrawal of the a.s. under consideration has no implications for herbicide resistance management. Consequently, justifying derogation based on a reduced number of MoAs no longer holds’; leading to the conclusion that there are sufficient chemical alternatives available. In this

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\(^{10}\) Unless the site of action of the a.s. under consideration differs from that of the shortlisted herbicide a.s. florasulam belongs to chemical family of triazolopyrimidines, which has the same mode of action (ALS inhibitors) and site of action (HRAC group) compared to substance under consideration (flupyrquosulfuron-methyl).
particular case, such a conclusion might not be justified as the weed spectrum of florasulam is not comparable to that of flupyrdsulfon-methyl. In addition, exploring possible combinations of different a.s. having the same characteristics (weed spectrum and time of application) compared to the substance under consideration, not taking into account whether combinations of more than one a.s. are authorised as PPPs in Austria, would be a possible option to refine the list of chemical alternatives. However, such an approach would go beyond the scope of the current methodology.

In addition, Sweden claimed that flupyrdsulfon-methyl is essential for use in winter rye for the very good efficiency against spill rape seed, and there is no other alternative available. Spill rape seed needs to be controlled already in autumn, to avoid amplifying the fungus disease club rot, for the control of corn flower and scentless mayweed. Furthermore, flupyrdsulfon-methyl is one of the three remaining a.s. that may be used for control of black-grass. Black-grass is a very difficult weed that easily becomes resistant to herbicides. In those parts of Sweden where black-grass is a major problem, the PPP has an important role in a resistance strategy, where the growers need to combine different a.s.

The information provided by the applicant on the necessity of flupyrdsulfon-methyl in winter rye to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsulfon-methyl, resulted in the following shortlisted herbicide a.s. in the United Kingdom: mesosulfonyl methane (B), pyroxasulam (B), flufenacet (K3), pendimethalin (K1) and prosulfocarb (N). Two of the shortlisted herbicide a.s., (mesosulfonyl methane and pyroxasulam) have the same MoA as the a.s. under consideration (flupyrdsulfon-methyl). The protocol (EFSA 2016a) states: ‘If one of the shortlisted a.s. has the same MoA [and site of action] as the a.s. under consideration, withdrawal of the a.s. under consideration has no implications for herbicide resistance management. Consequently, justifying derogation based on a reduced number of MoAs no longer holds’. This leads to the conclusion that there are sufficient chemical alternatives available for winter rye in the United Kingdom and there is no need to calculate a HR score (details are provided in Appendix B, Table B.15). A similar situation occurred in Denmark and Slovakia.

In Denmark, the evaluation resulted in following shortlisted herbicide a.s.: mesosulfonyl methane (B), and prosulfocarb (N) and pyroxasulam (B). Two of the shortlisted herbicide a.s. (mesosulfonyl methane (B) and pyroxasulam (B)) have the same MoA as the a.s. under consideration (flupyrdsulfon-methyl (B)). This leads to the conclusion that there are sufficient chemical alternatives available for winter rye in Denmark, and there is no need to calculate a HR score.

In Slovakia the evaluation resulted in following shortlisted herbicide a.s.: chlorotoluron (C2), flufenacet (K3), flumioxazin (E), pendimethalin (K1) and pyroxasulam (B). Two of the shortlisted herbicide a.s. (mesosulfonyl methane (B) and pyroxasulam (B)) have the same MoA as the a.s. under consideration (flupyrdsulfon-methyl (B)). This leads to the conclusion that there are sufficient chemical alternatives available for winter rye in Slovakia and there is no need to calculate a HR score.

For further details on the evaluation, see Appendices A and B.

3.1.4. Oats

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 flupyrdsulfon-methyl for use in oats in Belgium and the United Kingdom.

Table 5: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in oats in Belgium and the United Kingdom

| Use   | Country | Authorised a.s. | Shortlisted a.s. |
|-------|---------|----------------|-----------------|
| Oats  | BE      | > 20           | 0               |
| Oats  | UK      | > 20           | 0               |

a.s.: active substance.

The evaluation of applicant’s claims on the necessity of flupyrdsulfon-methyl in oats to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsulfon-methyl resulted in HR strategy scores of 0 and 0.7 for Belgium and the United Kingdom, respectively. This means that in Belgium and the United Kingdom there are no other alternative chemical substances available.

In Belgium, some herbicide a.s. such as prosulfocarb are not authorised in PPP as in other MS, thus were not considered in the evaluation. In addition, Belgium flagged many a.s. that are useful in IPM, however when comparing flupyrdsulfon-methyl according to the criteria ‘time of application’ and ‘weed spectrum’ one by one with the other a.s. less alternatives seem to be present on the shortlisted
herbicide a.s. (details are provided in Appendix B, Table B.16). Some MS applied the protocol in the strict sense; other MS such as Belgium were in favour of more flexibility. To ensure consistency EFSA rigorously followed the methodology of the protocol (EFSA, 2016a), but further discussions with MS on this point would be useful.

For further details on the evaluation, see Appendices A and B.

3.1.5. Triticale

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 flupyrdsulfuron-methyl for use in winter triticale in Austria, Belgium, Denmark, Sweden, Slovakia and the United Kingdom.

Table 6: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in winter triticale in Austria, Belgium, Denmark, Sweden, Slovakia and the United Kingdom

| Use      | Country | Authorised a.s. | Shortlisted a.s. |
|----------|---------|----------------|-----------------|
| Triticale| AT      | > 20           | 2               |
| Triticale| BE      | > 20           | 5               |
| Triticale| DK      | > 20           | 3               |
| Triticale| SE      | > 20           | 1               |
| Triticale| SK      | > 20           | 5               |
| Triticale| UK      | > 20           | 5               |

a.s.: active substance.

The information provided by Austria on the necessity of flupyrdsulfuron-methyl in winter triticale to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsulfuron-methyl resulted in HR strategy scores of 4.7. This means that in Austria, it is assumed that considering the herbicide a.s. chlorotoluron (C2), halauxifen-methyl (O) and two MoAs, insufficient chemical alternatives for sustainable HR management are available.

In Austria, there is one PPP authorised which contains two herbicide a.s. (florasulam (B) and pinoxaden (A)), only available in co-formulation. The PPP has the same time of application (BBCH 13-25) and controls the same weed spectrum (annual broadleaf weeds and annual grass weeds (ALOMY and APESV)) as the substance under consideration (details are provided in Appendix B, Table B.1). According to the EFSA protocol (EFSA, 2016a), only a.s. that have the same spectrum of weed control and time of application as the substance under consideration should be retained on the shortlist. This is not the case when considering the two a.s. individually (pinoxaden controls only annual grass weeds and florasulam controls only annual broadleaf weeds), therefore, these two a.s. have not been shortlisted.

The information provided by the applicant on the necessity of flupyrdsulfuron-methyl in winter triticale to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsulfuron-methyl in Sweden resulted in HR strategy scores of 3.7. This means that in Sweden, it is assumed that considering the herbicide a.s prosulfocarb (N) and one MoA, insufficient chemical alternatives for sustainable HR management are available.

In addition, Sweden claimed that flupyrdsulfuron-methyl is essential for use in winter triticale for the very good efficiency against spill rape seed, and there is no other alternative available. Spill rape seed needs to be controlled already in the autumn, to avoid amplifying the fungus disease club rot, for the control of corn flower and scentless mayweed. Furthermore, flupyrdsulfuron-methyl is one of the three remaining a.s. that may be used for control of black-grass. Black-grass is a very difficult weed that easily becomes resistant to herbicides. In those parts of Sweden where black-grass is a major problem, the PPP has an important role in a resistance strategy, where the growers need to combine different a.s.

The information provided by the applicant on the necessity of flupyrdsulfuron-methyl in winter triticale to control a serious danger to plant health based on remaining chemical alternatives to flupyrdsulfuron-methyl resulted in the following shortlisted herbicide a.s for Belgium: chlorotoluron (C2), mesosulfuron methyl (B), pendimethalin (K1), prosulfocarb (N) and pyroxsulam (B). Two of the shortlisted herbicide a.s. (mesosulfuron methyl, and pyroxsulam) have the same MoA as the a.s. under consideration (flupyrdsulfuron-methyl (B)). The protocol (EFSA 2016a) states that if one of the shortlisted a.s. has the same MoA [and site of action] as the a.s. under consideration, withdrawal of
the a.s. under consideration has no implications for herbicide resistance management. Consequently, justifying derogation based on a reduced number of MoAs no longer holds. This leads to the conclusion that there are sufficient chemical alternatives available for winter triticale in Belgium and there is no need to calculate a HR score (details are provided in Appendix B, Table B.19). A similar situation occurred for Denmark, Slovakia and the United Kingdom.

In Denmark, the evaluation resulted in following shortlisted herbicide a.s.: mesosulfuron methyl (B), pyroxasulam (B) and prosulfocarb (N). Two of the shortlisted herbicide a.s. (mesosulfuron methyl and pyroxasulam) have the same MoA as the a.s. under consideration (flupyrsulfuron-methyl), leading to the conclusion that there are sufficient chemical alternatives for winter triticale available in Denmark, and there is no need to calculate a HR score. One of the a.s. mesosulfuron methyl (B) is registered in co-formulation with other a.s (details are provided in Appendix B, Table B.20).

In the Slovakia, the evaluation resulted in following shortlisted herbicide a.s.: chlorotoluron (C2), flufenacet (K3), flumioxazin (E), pendimethalin (K1) and pyroxasulam (B). One of the shortlisted herbicide a.s. (pyroxasulam) has the same MoA as the a.s. under consideration (flupyrsulfuron-methyl), leading to the conclusion that there are sufficient chemical alternatives for winter triticale available in Slovakia and there is no need to calculate a HR score.

In the United Kingdom, the evaluation resulted in following shortlisted herbicide a.s.: mesosulfuron methyl (B), pyroxasulam (B), flufenacet (K3), pendimethalin (K1) and prosulfocarb (N). Two of the shortlisted herbicide a.s. (mesosulfuron methyl and pyroxasulam) have the same MoA as the a.s. under consideration (flupyrsulfuron-methyl), leading to the conclusion that there are sufficient chemical alternatives for winter triticale available in the United Kingdom and there is no need to calculate a HR score.

For further details on the evaluation, see Appendices A and B.

3.1.6. Spelt

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 flupyrsulfuron-methyl for use in spelt in Austria, Belgium and Denmark (minor use).

Table 7: Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in spelt in Austria, Belgium and Denmark

| Use   | Country | Authorised a.s. | Shortlisted a.s. |
|-------|---------|----------------|-----------------|
| Spelt | AT      | > 20           | 1               |
| Spelt | BE      | > 20           | 6               |
| Spelt | DK      | > 20           | 0               |

a.s.: active substance.

The information provided by Austria on the necessity of flupyrsulfuron-methyl in spelt in Austria to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl, resulted in HR strategy scores of 2. This means that in Austria it is assumed that considering the herbicide a.s. halaxufien-methyl (O) and one MoA insufficient chemical alternatives for sustainable HR management are available.

The evaluation of applicant’s claims on the necessity of flupyrsulfuron-methyl in spelt to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl resulted in the following shortlisted herbicide a.s for Belgium: chlorotoluron (C2), mesosulfuron methyl (B), pendimethalin (K1), prosulfocarb (N), pyroxasulam (B) and sulfosulfuron (B). Three of the shortlisted herbicide a.s. (mesosulfuron methyl, pyroxasulam, and sulfosulfuron) have the same MoA as the a.s. under consideration (flupyrsulfuron-methyl (B)). The protocol (EFSA 2016a) states that ‘if one of the shortlisted a.s. has the same MoA [and site of action] as the a.s. under consideration, withdrawal of the a.s. under consideration has no implications for herbicide resistance management. Consequently, justifying derogation based on a reduced number of MoAs no longer holds’. This leads to the conclusion that there are sufficient chemical alternatives available for spelt in Belgium, and there is no need to calculate a HR score (details are provided in Appendix B, Table B.25).

The information provided by Denmark on the necessity of flupyrsulfuron-methyl in spelt (minor use) resulted in no shortlisted herbicide a.s. This leads to the conclusion that there are insufficient chemical alternatives for spelt available in Denmark.

For details of the evaluation, see Appendices A and B.
3.1.7. Linseed

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 flupyrsulfuron-methyl for use in linseed (*Linum usitatissimum*) in Austria and Belgium.

**Table 8:** Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY and APESV)) in linseed in Austria, and Belgium

| Use      | Country | Authorised a.s. | Shortlisted a.s. |
|----------|---------|----------------|-----------------|
| Linseed  | AT      | > 20           | 0 (a)           |
| Linseed  | BE      | 19             | 0 (a)           |

a.s.: active substance.
(a): Flupyrsulfuron-methyl is only authorised in co-formulation with metsulfuron methyl as plant protection product.

The information provided by Austria and the evaluation of applicant’s claims for Belgium on the necessity of flupyrsulfuron-methyl in linseed to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl resulted in HR strategy scores of 0º for Austria and Belgium, respectively. This means that for Austria and Belgium no chemical alternative a.s. are available, leading to insufficient chemical alternatives for sustainable HR management.

In Belgium the a.s. flufenacet is not authorised in a PPP. In addition, Belgium flagged many a.s. that are useful in IPM, however when comparing flupyrsulfuron-methyl according to the criteria ‘time of application’ and ‘weed spectrum’ one by one with the other a.s. less alternatives seem to be present on the shortlisted herbicide a.s. For example, there are herbicide a.s. which control the same weed spectrum as flupyrsulfuron-methyl but which were excluded from the shortlist due to different application time (e.g. sulcotrione pre-emergence herbicide and diquat, glyphosate as a post-emergence herbicides but only in a very late stage (BBCH 89) compared to flupyrsulfuron-methyl. If the criteria ‘application time’ was not applied the HR score would be 7º concluding that there is an intermediate situation. Some MS applied the protocol in the strict sense, while others such as Belgium were in favour of more flexibility. To ensure consistency EFSA rigorously followed the methodology of the protocol (EFSA, 2016a), but further discussions with MS on this point might be useful.

For details of the evaluation, see Appendices A and B.

3.1.8. *Dactylis glomerata*

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 flupyrsulfuron-methyl for use in *Dactylis glomerata* in Denmark.

**Table 9:** Number of authorised and shortlisted herbicide a.s. to control weeds (annual broadleaf and grass weeds (e.g. ALOMY & APESV)) in *Dactylis glomerata* (minor use) in Denmark

| Use                    | Country | Authorised a.s. | Shortlisted a.s. |
|------------------------|---------|----------------|-----------------|
| *Dactylis glomerata*   | DK      | > 20           | 0               |

a.s.: active substance.

The information provided by Denmark on the necessity of flupyrsulfuron-methyl in *Dactylis glomerata* (minor use) in Denmark to control a serious danger to plant health based on remaining chemical alternatives to flupyrsulfuron-methyl resulted in no active substances being shortlisted. Denmark noted that fenoxaprop is authorised, but it cannot be considered an alternative due to resistance in ALOMY. This means that in Denmark it is assumed that insufficient chemical alternatives for sustainable HR management are available.

For further details on the evaluation, see Appendices A and B.

3.2. Evaluation of non-chemical alternatives

Differently to what is requested in the protocol (EFSA, 2016a), the applicant provided only one evaluation for non-chemical alternatives for winter wheat, winter barley, winter rye, oats, triticale, spelt, linseed and *Dactylis glomerata*. EFSA and MS considered that in this particular case a grouping of crops in the category ‘cereals and other herbaceous non-row crops’ would be acceptable.
In all seven MS, up to 11 non-chemical methods are available. In Austria, seven preventive methods are available. Methods such as ploughing, late sowing dates, crop rotation are practised (10–50% acreage), available and effective (e.g. crop rotation between 78–96%) but these methods are not always reliable. For example, ploughing has considerable benefits but these depend on many variables, like weather, machinery, soil moisture, etc. which may have an important impact on the final results. Crop rotation is effective, but challenging, e.g. on heavy soil to control black-grass (ALOMY) and loose silky-bent (APESV) in rotational crops. Preventive methods, such as increased crop competitiveness, are practised (10–50% acreage) but have only marginal effects. Other methods such as fallow/grass ley breaks or higher seeding rates vary in their efficacy and do not reduce high black-grass infestations to acceptable levels. In Austria, two curative methods (mechanical weeding and hand weeding) are available. Mechanical weeding is practiced up to 10% acreage but as limitation regarding efficacy, which depends on a precise set of conditions, it takes significant time and damages or destroys a certain proportion of plants in the crop. Hand weeding has economic limitations.

In Belgium, five preventive methods, such as ploughing, late sowing dates, crop rotation, false seed beds and higher seeding rates are practised, available and effective (e.g. ploughing is very useful and common, intercrop cultivation of stubble and false seed beds are useful and effective, sowing date up to December are common in Belgium and rotation of crop is also a common practice). In Belgium, two curative methods (mechanical weeding and hand weeding) are technically possible, but cannot be considered as an alternative.

In Denmark, Sweden, and Slovakia, six preventive methods (primary tillage, late sowing dates, increased crop competitiveness, crop rotation, fallow/grass ley breaks and higher seed rates) are available. Regarding crop rotation, Denmark pointed out that inclusion of more spring cereals would reduce the problem with ALOMY and APESV but yield is considerable lower. The only other option for alternative crops is oilseed rape which can only be grown every fourth year. In Denmark, the same curative methods as mentioned for Austria are available. In addition related to biological weed control, it was mentioned that there are limited applications in weed control due to their target specificity. Overall, Sweden concluded that there are no mechanical alternative methods available.

In the Netherlands, nine preventive methods are available. Methods such as ploughing, late sowing dates, crop rotation, false seed beds, fallow/grass ley and higher seeding rates were not considered to be an alternative as they lower the weed pressure but are not enough effective and already practised in weed control system in the Netherlands. In the Netherlands, two curative methods (mechanical weeding and hand weeding) are technically possible, but cannot be considered as an alternative.

In the United Kingdom, several preventive methods such as false seed beds, late sowing dates and crop rotation are practised (10–50% acreage) and available. For black-grass control, the use of crop rotation, specifically planting of spring crops, can be highly/moderately effective as spring crops can give 88% control of black-grass (AHDB, 2014). However, yields from spring crops can in some cases make them uneconomic; there are fewer herbicide options and some of these require high capital investment and they are less suited to the heavy soils of the United Kingdom. Delayed drilling and false seed beds can be used for moderate black-grass control (31%) (AHDB, 2014). However, this is only applicable under conditions where, e.g. in the previous summer black-grass seed were not dormant. In years where there is high black-grass seed dormancy, this is not a highly effective option. Curative methods were not seen as an alternative.

4. Conclusions

The evaluation of applicant's claims that the use of flupyrad索尼on-methyl is considered essential in accordance with Article 4(7) of Regulation (EC) No 1107/2009 for each authorised use in the considered MS was evaluated following the EFSA methodology (EFSA, 2016a).

Overall, eight different uses (winter wheat, winter barley, winter rye, oats, triticale, spelt (minor use in Denmark), linseed and Dactylis glomerata (minor use)) in seven MS (Austria, Belgium, Denmark, the Netherlands, Slovakia, Sweden and the United Kingdom) were evaluated to assess the applicant's claims or information directly provided by MS (Austria, Denmark for minor use in Dactylis glomerata and spelt) on the necessity of flupyrad索尼on-methyl to control a serious danger to plant health.

An overview of the outcome of chemical alternative substances to flupyrad索尼on-methyl is provided (Table 10). It can be concluded that generally a wide range, of chemical alternative herbicide a.s. are available in MS for weed control in winter wheat (except for Austria and Sweden), winter rye (except for Austria and Sweden) and triticale (except for Austria and Sweden). However, there are insufficient chemical alternatives to flupyrad索尼on-methyl for weed control in spelt (except for Belgium), oats,
linseed and *Dactylis glomerata*. For winter barley, there are insufficient chemical alternatives to flupyrdsulfuron-methyl for weed control in Denmark, an intermediate situation in Austria and sufficient chemical alternatives are available in the United Kingdom.

Non-chemical alternatives were also evaluated for these different uses and generally a wide range of 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.

When evaluating individually the herbicide chemical alternatives according to the criteria ‘time of application’ and ‘weed spectrum’ one by one with the other a.s. less alternatives seem to be present among the shortlisted herbicide a.s. However, many a.s. are useful in IPM, meaning that the system as a whole may be able to function without the substance under consideration. It is noted that some MS applied the protocol more strictly, while other MS, such as Belgium and the Netherlands, were in favour of a more flexible approach. To ensure consistency, EFSA rigorously followed the methodology of the protocol (EFSA, 2016a), but further discussions with MS on the subject would be useful.

**Table 10:** Outcome of the evaluation of applicant’s claims on the necessity of flupyrdsulfuron-methyl to control a serious danger to plant health according to Article 4(7) of Regulation (EC) No 1107/2009 for eight different uses (crop) in seven Member States

| Crop            | Country | Authorised a.s. | Shortlisted a.s. | Score | Results     |
|-----------------|---------|-----------------|------------------|-------|-------------|
| Winter wheat    | AT      | > 20            | 1                | 2     | Insufficient|
| Winter wheat    | BE      | > 20            | 7                | n.a.  | Sufficient  |
| Winter wheat    | DK      | > 20            | 3                | n.a.  | Sufficient  |
| Winter wheat    | NL      | > 20            | 3                | 9     | Sufficient  |
| Winter wheat    | SE      | > 20            | 1                | 3     | Insufficient|
| Winter wheat    | SK      | > 20            | 6                | n.a.  | Sufficient  |
| Winter wheat    | UK      | > 20            | 4                | 12    | Sufficient  |
| Winter barley   | AT      | > 20            | 3                | 7     | Intermediate|
| Winter barley   | DK      | > 20            | 1                | 3     | Insufficient|
| Winter barley   | UK      | > 20            | 3                | 9     | Sufficient  |
| Winter rye      | AT      | > 20            | 1                | 2     | Insufficient|
| Winter rye      | DK      | > 20            | 3                | n.a.  | Sufficient  |
| Winter rye      | SE      | > 20            | 1                | 3     | Insufficient|
| Winter rye      | SK      | > 20            | 5                | n.a.  | Sufficient  |
| Winter rye      | UK      | > 20            | 5                | n.a.  | Sufficient  |
| Oats            | BE      | > 20            | 0                | 0     | Insufficient|
| Oats            | UK      | > 20            | 0                | 0     | Insufficient|
| Triticale       | AT      | > 20            | 2                | 4     | Insufficient|
| Triticale       | BE      | > 20            | 5                | n.a.  | Sufficient  |
| Triticale       | DK      | > 20            | 3                | n.a.  | Sufficient  |
| Triticale       | SE      | > 20            | 1                | 3     | Insufficient|
| Triticale       | SK      | > 20            | 5                | n.a.  | Sufficient  |
| Triticale       | UK      | > 20            | 5                | n.a.  | Sufficient  |
| Spelt           | AT      | > 20            | 1                | 2     | Insufficient|
| Spelt           | BE      | > 20            | 6                | n.a.  | Sufficient  |
| Spelt           | DK      | > 20            | 0                | 0     | Insufficient|
| Linseed         | AT      | > 20            | 0                | 0     | Insufficient|
| Linseed         | BE      | 19              | 0                | 0     | Insufficient|
| *Dactylis glomerata* | DK  | > 20            | 0                | 0     | Insufficient|

a.s.: active substance.
(a): Flupyrdsulfuron-methyl is only authorised in co-formulation with metsulfuron methyl as plant protection product.
5. **Recommendation**

A critical step in the evaluation is the development of the shortlisted alternative herbicide active substances based on the selection criteria ‘spectrum of weed control’ and ‘time of application’. A drop-down list for these two selection criteria should be provided in the data collection form to facilitate a consistent assessment.

In situations where it seems that there are no or few alternative substances available, it would be useful to analyse a subset of data such as a.s. controlling ‘broad leaf’ and a.s. controlling ‘grass weeds’ to explore if a combination of different a.s. would be lead to the same characteristics of the a.s. under consideration. The same rationale applies to ‘time of application’. Such an evaluation would reflect better the situation (including non-chemical methods). Further discussions on this point with MS would be needed.

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**Abbreviations**

a.s. active substance
BBCH growth stages of mono- and dicotyledonous plants
DAR Draft Assessment Report
| Acronym | Definition |
|---------|------------|
| HR      | herbicide resistance |
| HRAC    | Herbicide Resistance Action Committee |
| IPM     | integrated pest management |
| MoA     | mode of actions |
| MS      | Member State |
| PPP     | plant protection product |
| RAR     | Renewal Assessment Report |
| RMS     | Rapporteur Member State |
| WG      | Working Group |
Appendix A – Collection data set

Validated Excel files submitted by MS (Austria, 2016; Belgium, 2016; Denmark, 2016; Netherlands, 2016; Slovakia, 2016; Sweden, 2016 and United Kingdom, 2016) and evaluated by EFSA.
**Appendix B – Shortlisted herbicide active substances**

Overview of the shortlisting process and final shortlisted herbicide active substances 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 flupyrsulfuron-methyl and authorised in plant protection products for winter wheat 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 |
|--------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Chlorotoluron                  | C2         | BBCH 00-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV, POAAN) |                                                                                      |
| Mesosulfuron methyl*           | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | AT: Active substance is only authorised in co-formulation with other a.s. and should be shortlisted according to EFSA protocol (2016). However, as the weed spectrum is not comparable with the weed spectrum of the a.s. under consideration AT proposed not to shortlist this a.s. |
| Iodosulfuron methyl*           | B          | BBCH 13-32              | Annual broadleaf & grass (APERA, Poa annua, Lolipe) | EFSA: Not included because it has no control over ALOMY |
| Flupyrsulfuron-methyl          | B          | BBCH 13-25 in spring; from BBCH 12 in autumn | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                      |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.

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

<sup>a</sup>: 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 flupyrsulfuron-methyl and authorised in plant protection products for winter wheat in Belgium

| Herbicide authorised<sup>a</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|--------------------------------|------------|-------------------------|---------------|------------------------------------------------------------------------|
| 2,4D/2,4DB                     | O          | BBCH 29-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Amidosulfuron                   | B          | BBCH 13-39              | Annual broadleaf | BE: Spring, useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |

<sup>a</sup>: 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 from shortlist |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Beflubutamid           | F1         | BBCH 01-30              | Annual broadleaf | BE: Not registered against grasses but useful to control broadleaved weeds in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Bifenox                | E          | BBCH 21-31              | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Carfentrazone          | E          | BBCH 21-32              | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Chlorotoluron          | C2         | BBCH 01-08/BBCH 25-29   | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Clopyralid             | O          | BBCH 29-31              | Annual broadleaf | BE: Spring Control CENCY and MATCH. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Dichlorprop            | O          | BBCH 29-32              | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Diflufenican           | F1         | BBCH 01-29              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Fenoxaprop-p-ethyl     | A          | BBCH 13-31              | Annual grass (ALOMY & APESV) | BE: Useful in IPM. EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|--------------|-------------------------------------------------|
| Florasulam             | B          | BBCH 13-39               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| 2 Flufenacet           | K3         | BBCH 11-13               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Flumioxazin            | E          | BBCH 00-14               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not registered in cereals in BE. EFSA: Thus cannot be on the shortlist |
| Fluroxypyr             | O          | BBCH 13-39               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flurtamone             | F1         | BBCH 01-29               | Annual broadleaf & annual grass (APESV) | BE: Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Glyphosate             | G          | BBCH 29-32               | Broadleaf & grass (ALOMY & (APESV) | BE: Not registered in pre-emergence but useful in IPM, e.g. in intercrop. EFSA: Glyphosate is applied at pre-harvest (BBCH 89), compared to the substance under consideration (post-EM BBCH 12-29). Thus quite a different growth stage, hence it is proposed not to shortlist this a.s. |
| Iodosulfuron methyl    | B          | BBCH 21-31               | Annual broadleaf & annual grass (APESV) | BE: Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Ixosaben               | L          | BBCH 01-13               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| MCPA                   | O          | BBCH 29-32               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|------------------------|---------------|-------------------------------------------------------------|
| MCPP                   | 0          | BBCH 21-31             | Annual broadleaf | BE: Only MCPP-p is registered. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **3 Mesosulfuron methyl** | B          | BBCH 21-31             | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM. Not to be shortlisted |
| Metsulfuron methyl     | B          | BBCH 13-39             | Annual broadleaf weeds | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **4 Pendimethalin**    | K1         | BBCH 11-12/BBCH 21-25 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not registered in pre-emergence. BBCH autumn/spring. Useful in IPM |
| Picolinifen            | F1         | BBCH 21-25             | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Pinoxaden              | A          | BBCH 13-31             | Annual grass (ALOMY & APESV) | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Propoxycarbazone       | B          | BBCH 21-31             | Annual grass (ALOMY & APESV) | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **5 Prosulfocarb**     | N          | BBCH 00-13             | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM. EFSA: Application BBCH 00-13 compared to the substance under consideration (spring at BBCH 21-29). However, a.s. could be considered as early post-EM, thus proposed to be shortlisted |
| Pyroxsulam             | B          | BBCH 21-31             | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Sulfosulfuron          | B          | BBCH 13-32             | Annual broadleaf & annual grass | BE: Useful in IPM |
| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|--------------------------------|-------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| Thifensulfuron methyl | B | BBCH 13-39 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tribenuron methyl | B | BBCH 13-40 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tritosulfuron | B | BBCH 21-39 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Penoxsulam | B | BBCH 11-23 | Annual broadleaf weeds, annual grass (APESV) | BE: Not registered in cereals in BE. EFSA: Thus cannot be on the shortlist |
| Flupyrsulfuron-methyl | B | Spring at BBCH 21-29 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

**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 flupyrsulfuron-methyl and authorised in plant protection products for winter wheat in Denmark

| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|--------------------------------|-------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| **1** Mesosulfuron methyl* | B | BBCH 13-32 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: In Denmark, mesosulfuron is used in mixture with iodosulfuron and/or diflufenican and the gap for this mixture is in control of GERSS, PAPRH and MYOAR |
| Pendimethalin | K1 | BBCH 00-12 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: The max dose is 455 g a.i./ha in DK. At this dose, the control of grasses (ALOMY and APESV) is insufficient. Gap in efficacy on MATIN, BRNSS, CENCY. High tax. EFSA: Following MS proposal as regards efficacy, this a.s. is proposed not to be shortlisted |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. 
<sup>(a)</sup>: 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 flupyrsulfuron-methyl and authorised in plant protection products for winter wheat in the Netherlands

| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Amidosulfuron*                    | B          | Post-emergence           | Annual broadleaf weeds | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Bentazon                          | C3         | Post-emergence           | Annual broadleaf weeds & patches of CYPES | NL: shortlisted = Y for annual weeds (e.g. BRSNN, MATSS) Sources: http://www.ctb.agro.nl/ctb_files/06034_10.html. EFSA: Different weed spectrum (annual grasses only) and time of application (post-EM) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV), pre-and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|---------------|-------------------------------------------------------------------|
| Clodinafop-propargyl*  | A          | Post-emergence          | Annual grass weeds & AVEFA | EFSA: Different application time (post-EM only) and weed spectrum (annual grass weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Clopyralid*            | O          | Post-emergence          | Annual broadleaf  | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Carfentrazone-ethyl    | B          | Post-emergence          | Annual broadleaf  | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Diflufenican           | F1         | Pre- and post-emergence | Annual broadleaf  | EFSA: Different application time (post-EM) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flufenacet*            | K3         | Pre- and post-emergence | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | NL: Only allowed in NL as combination (details for information below). EFSA: According to protocol (EFSA, 2016), ‘if a registered product consists of two or more a.s. (a mixture), the information should be provided for each a.s. in the mixture separately’ |
| Florasulam             | B          | Post-emergence          | Annual broadleaf  | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|----------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Fluroxypyr-methyl*   | O          | Post-emergence          | Annual broadleaf weeds | NL: shortlisted = Y for broadleaved weeds. Sources: [http://www.ctb.agro.nl/ctb_files/150206_14706.PDF](http://www.ctb.agro.nl/ctb_files/150206_14706.PDF). EFSA: different weed spectrum (annual grasses only) and time of application (post-EM) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV), pre-and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| Iodosulfuron methyl  | B          | Post-emergence          | Annual broadleaf & grass (APESV) | EFSA: Different application time (post-EM only) and no control of ALOMY compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Isoproturon*         | C2         | Post-emergence          | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: a.s. received non-approval of renewal in 2016. [http://ec.europa.eu/food/plant/pesticides.eu-pesticides-database/public/?event=activesubstance.detail&language=EN&selectedID=1495](http://ec.europa.eu/food/plant/pesticides.eu-pesticides-database/public/?event=activesubstance.detail&language=EN&selectedID=1495) Grace period 17 September 2017. Thus, a.s. cannot be on the shortlist |
| Mesosulfuron methyl* | B          | Post-emergence          | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | NL: Only allowed in NL as combination (details for information below). EFSA: According to protocol (EFSA, 2016), ‘if a registered product consists of two or more a.s. (a mixture), the information should be provided for each a.s. in the mixture separately’. NL: When the EFSA method is followed, mesosulfuron methyl should not be shortlisted due to different application timing |
| Metsulfuron methyl   | B          | Post-emergence          | Annual broadleaf weeds | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-------------------------|------------|-------------------------|--------------|---------------------------------------------------------------------|
| 2 Pendimethalin         | K1         | Pre- and post-emergence | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | NL: Authorised herbicides in NL = Activus 40 WG, Activus 400 SC, Stomp 400 SC, Sharpen 33EC. Weed spectrum = annual weeds (e.g. ALOMY and APESV), evidence/supporting data for non-inclusion shortlist: not the place to mention control of specific weeds, should be mentioned in notes sources: [http://www.ctb.agro.nl/ctb_files/10766_18.html](http://www.ctb.agro.nl/ctb_files/10766_18.html) |
| Pinoxaden               | A          | Post-emergence          | Annual grass (ALOMY & APESV) | EFSA: Different application time (post-EM only) compared to the substance under consideration (pre- and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| 3 Prosulfocarb          | N          | Pre- and post-emergence | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | NL: authorised herbicides in NL = Boxer, Fidox 800 EC. Weed spectrum = annual weeds (e.g. ALOMY, APESV, BRSNN, MATCH, GERSS and FUMOF). Crop stage should be BBCH 00-12. Evidence/supporting data = not the place to mention control of specific weeds, should be mentioned in notes. Sources: [http://www.ctb.agro.nl/ctb_files/10701_17.html#_Toc366761351](http://www.ctb.agro.nl/ctb_files/10701_17.html#_Toc366761351) |
| Pyroxsulam              | B          | Post-emergence          | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | NL: Authorised herbicides in NL = Capri. Weed spectrum = annual weeds (e.g. ALOMY, APESV & GERSS). Exception = not for NL. Evidence/supporting data = not the place to mention control of specific weeds, should be mentioned in notes. Sources: [http://www.ctb.agro.nl/ctb_files/150904_13898.PDF](http://www.ctb.agro.nl/ctb_files/150904_13898.PDF). EFSA: Different application time (post-EM only) compared to the substance under consideration (pre- and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| Tritosulfuron           | B          | Post-emergence          | Annual broadleaf weeds, CIRAR & CONAR | EFSA: Different application time (post-EM only) and no control of annual grasses compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be 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 flupyrsulfuron-methyl and authorised in plant protection products for winter wheat in Slovakia

| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-------------------------|------------|-------------------------|---------------|-----------------------------------------------------------------------|
| Tribenuron methyl       | B          | Post-emergence          | Annual broadleaf | EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrsulfuron-methyl   | B          | Pre- and post-emergence | Post-emergence against broadleaved weeds, pre- and post-emergence against ALOMY and APESV | |

**HRAC:** Herbicide Resistance Action Committee; **BBCH:** growth stages of mono- and dicotyledonous plants; **MS:** Member State.

(a): The bold indicates the a.s. shortlisted.
Table B.6: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for **winter wheat** in Sweden

| 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 |
|--------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Mesosulfuron methyl\(^{*}\)   | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | SE: The a.s is authorised in several PPP. SE stated that this a.s. is not an alternative for the a.s. under consideration due to lack of efficacy against blackgrass and weed spill rape |
| Prosulfocarb                  | N          | BBCH 00/BBCH 10-32      | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Flupyrsulfuron-methyl         | B          | BBCH 11-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.

\(^{*}\): Active substance is only authorised in co-formulation with other a.s.

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

Table B.7: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for **winter wheat** 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 |
|--------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Flufenacet                     | K3         | BBCH 00-25              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | UK: Flumioxazin also subject to an application for derogation |
| Flumioxazin                    | E          | BBCH 00-14              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Mesosulfuron methyl            | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different application time (post-EM only) compared to the substance under consideration (pre- and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| Pendimethalin                  | K1         | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Prosulfocarb                   | N          | BBCH 00/BBCH 10-32      | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Pyroxsulam                     | B          | BBCH 12-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different application time (post-EM only) compared to the substance under consideration (pre- and post-EM). Thus, this a.s. is proposed not to be 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 flupyrsulfuron-methyl and authorised in plant protection products for winter barley in Austria.

| Active substance(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 Chlorotoluron     | C2         | BBCH 00-29/BBCH 13-29   | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV, POAAN)             |                                                                                  |
| 2 Halauxifen-methyl | O          | BBCH 13-29, for Galap BBCH 30-45 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                  |
| 3 Prosulfocarb      | N          | BBCH 00-21              | Annual broadleaf weeds, annual grass weeds                                   |                                                                                  |
| Flupyrsulfuron-methyl | B         | Autumn from BBCH 12    | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV)                     |                                                                                  |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.
(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 flupyrsulfuron-methyl and authorised in plant protection products for winter barley in Denmark

| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Fenoxaprop-p-ethyl                 | A          | BBCH 11-39              | Annual grass weeds (ALOMY, APESV) | DK: Not included, DK_risk_paper_1, DK_risk_paper_2, DK_risk_paper_4. EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV). Thus, this a.s. is proposed not to be shortlisted |
| Pendiometalin                      | K1         | BBCH 00-12              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: The max dose is 455 g a.i./ha in DK. At this dose, the control of grasses (ALOMY and APESV) is insufficient. Gap in efficacy on MATIN, BRNSS, CENCY. High tax. EFSA: Following MS proposal as regards efficacy, this a.s. is proposed not to be shortlisted |
| 1 Prosulfocarb                     | N          | BBCH 00-21              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: Gap in efficacy on MATIN, PAPRH. High tax. EFSA: a.s. fulfils the main criteria ‘application time’ and weed spectrum (broadleaf & grass (ALOMY & APERA), thus, it is proposed to consider this a.s. on the shortlist |
| Flupyrsulfuron-methyl              | B          | BBCH 13-23              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. 
(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 flupyrsulfuron-methyl and authorised in plant protection products for winter barley 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 |
|-----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Fenoxaprop-p-ethyl                 | A          | BBCH 12-32              | Annual grass weeds (ALOMY, APESV) | EFSA: Different application time (post-EM only) compared to the substance under consideration (pre-EM). In addition, controls only grass weeds and not grass and broadleaved weeds. Thus, this a.s. is proposed not to be shortlisted |
| 1 Flufenacet                       | K3         | Up to BBCH 25           | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| 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 |
|-------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| Isoproturon             | C2         | BBCH 13-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: a.s. received non-approval of renewal in 2016. [Link](http://ec.europa.eu/food/plant/pesticides/eu-pesticides-databse/public/?event=activesubstance.detail&language=EN&selectedID=1495) Grace period 17 September 2017. Thus, a.s. cannot be on the shortlist |
| Pendimethalin           | K1         | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Pinoxaden               | A          | BBCH 11-33              | Annual grass (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) and time of application (post-EM) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV), and pre-EM). Thus, this a.s. is proposed not to be shortlisted |
| Proisulfocarb           | N          | BBCH 00/BBC1 0-32       | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Triallate               | N          | BBCH 00-30              | Annual grass (ALOMY) | UK: For grass weeds is considered to be an alternative. EFSA: Different weed spectrum (annual grass ALOMY only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrifuron-methyl     | B          | BBCH 00-09              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. (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 flupyrifuron-methyl and authorised in plant protection products for winter rye 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 |
|-------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| Halauxifen-methyl       | O          | BBCH 13-29, BBCH 30-45 for GALAP | Annual broadleaf weeds, grass weeds (ALOMY, APESV, Lolium) | |
| Flupyrifuron-methyl     | B          | Spring BBCH 13-25, autumn from BBCH 12 onwards | Annual broadleaf weeds, grass weeds (ALOMY, APESV, Lolium) | |

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

[Link](http://ec.europa.eu/food/plant/pesticides/eu-pesticides-databse/public/?event=activesubstance.detail&language=EN&selectedID=1495)
Table B.12: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for winter rye in Denmark

| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Fenoxaprop-p-ethyl     | A          | BBCH 11-30              | Annual grass (ALOMY, APESV) | EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Mesosulfuron methyl*   | B          | BBCH 13-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: In Denmark, mesosulfuron is used in mixture with iodosulfuron and/or diflufenican and the gap for this mixture is in control of GERSS, PAPRH and MYOAR |
| Pendimethalin          | K1         | BBCH 00-12              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: The max dose is 480 g a.i./ha in DK. At this dose, the control of grasses (ALOMY and APESV) is insufficient. Gap in efficacy on MATIN, BRNSS, CENCY. High tax. EFSA: Following MS proposal as regards efficacy, this a.s. is proposed not to be shortlisted |
| Proxysulam*            | B          | BBCH 23-39              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: Only authorised in mixture with other a.i. Gap in control of GERSS, CENCY |
| Flupyrsulfuron-methyl  | B          | BBCH 11-23              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

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

Table B.13: Shortlisted herbicide active substances with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for winter rye in Sweden

| 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 |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Fenoxaprop-p-ethyl     | A          | BBCH 12-39              | Annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be 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 flupyrsulfuron-methyl 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 |
|----------------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Mesosulfuron methyl*             | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | SE: The a.s is authorised in several PPP. SE stated that this a.s. is not an alternative for the a.s. under consideration due to lack of efficacy against blackgrass and weed spill rape |
| 1 Prosulfocarb                   | N          | BBCH 00/BBCH 10-32     | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Flupyrsulfuron-methyl            | B          | BBCH 11-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Mesosulfuron methyl*             | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | SE: The a.s is authorised in several PPP. SE stated that this a.s. is not an alternative for the a.s. under consideration due to lack of efficacy against blackgrass and weed spill rape |
| 1 Prosulfocarb                   | N          | BBCH 00/BBCH 10-32     | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Flupyrsulfuron-methyl            | B          | BBCH 11-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Chlorotoluron                    | C2         | Up to BBCH 29          | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Fenoxaprop-p-ethyl               | A          | BBCH 12-39              | Annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flufenacet                       | K3         | BBCH 00-25              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Flumioxazin                      | E          | BBCH 00-14              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Pendimethalin                    | K1         | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (only APESV) compared to the substance under consideration. Thus, this a.s. is proposed not to be shortlisted |
| Penoxsulam                       | B          | BBCH 11-23              | Annual broadleaf weeds, annual grass (APESV) | |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.
*: Active substance is only authorised in co-formulation with other a.s.
(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 flupyrsulfuron-methyl and authorised in plant protection products for **winter rye** 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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| Propoxycarbazone        | B          | BBCH 10-32              | Annual grass (ALOMY & APESV) | EFSA: Different weed spectrum (annual grasses only) and time of application (post-EM) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV), pre- and post-EM). Thus, this a.s. is proposed not to be shortlisted |
| **5** Pyroxsulam         | B          | BBCH 12-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |
| Flupyrsulfuron-methyl    | B          | BBCH 11-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.
(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 flupyrsulfuron-methyl and authorised in plant protection products for **winter rye** in the **United Kingdom**
**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 flupyrsulfuron-methyl and authorised in plant protection products for oats 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 |
|-------------------------|------------|-------------------------|---------------|-------------------------------------------------------------------------------------|
| 4 Prospulfocarb         | N          | BBCH 00/BBCH 10-32     | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                      |
| 5 Pyroxsulam            | B          | BBCH 12-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                      |
| Triallate               | N          | BBCH 00-30              | Annual grass (ALOMY)                                      | UK: For grass weeds is considered to be an alternative. EFSA: Different weed spectrum (annual grass ALOMY only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrsulfuron-methyl   | B          | BBCH 12-31 December     | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                      |
| 2,4D                    | O          | BBCH 29-32              | Annual broadleaf                                         | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Amidosulfuron           | B          | BBCH 13-39              | Annual broadleaf                                          | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Bifenox                 | E          | BBCH 21-31              | Annual broadleaf                                          | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. (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 from shortlist |
|-------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Carfentrazone           | E          | BBCH 21-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Clopyralid              | O          | BBCH 29-31              | Annual broadleaf | BE: Control CENCY and MATCH. EFSA: Different and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Dichlorprop             | O          | BBCH 29-32              | Annual broadleaf | BE: Only broadleaved weeds. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Diflufenican            | F1         | BBCH 21-32              | Annual broadleaf | BE: Only in spring application in winter oats. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Florasulam              | B          | BBCH 14-32              | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Fluroxypyr              | O          | BBCH 13-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Glyphosate              | G          | Broadleaf & grass (ALOMY & (APESV)) | BE: Not registered in pre-emergence but useful in IPM, e.g. in intercrop. EFSA: Glyphosate is applied at pre-harvest (BBCH 89), compared to the substance under consideration (post-EM BBCH 12-29). Thus, quite a different growth stage; hence, it is proposed not to shortlist this a.s. |
| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|----------------------------------|------------|-------------------------|--------------|---------------------------------------------------------------|
| Linuron                          | C2         | BBCH 01-08               | Broadleaf & grass | Different time of application, thus not shortlisted          |
| MCPA                             | O          | BBCH 29-32               | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| MCPP                             | O          | BBCH 21-31               | Annual broadleaf | BE: Only MCPP-p is registered. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Metsulfuron methyl               | B          | BBCH 13-39               | Annual broadleaf weeds | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Thifensulfuron methyl            | B          | BBCH 13-39               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tribenuron methyl                | B          | BBCH 13-40               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tritosulfuron                    | B          | BBCH 21-39               | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrsulfuron-methyl            | B          | BBCH 21-29               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |  |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.
### 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 flupyrsulfuron-methyl and authorised in plant protection products for oats 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 |
|----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Flumioxazin                      | E          | BBCH 00-09               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | MS: Only authorised as pre-emergence. EFSA: Different time of application (pre-EM) compared to the substance under consideration (post-EM). Thus, this a.s. is proposed not to be considered on the shortlist. |
| Flupyrsulfuron-methyl            | B          | BBCH 12-31 December      | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                   |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.

<sup>(a)</sup>: 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 flupyrsulfuron-methyl and authorised in plant protection products for triticale in the 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 |
|----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------------------|
| Flumioxazin                      | E          | BBCH 00-09               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | MS: Only authorised as pre-emergence. EFSA: Different time of application (pre-EM) compared to the substance under consideration (post-EM). Thus, this a.s. is proposed not to be considered on the shortlist. |
| Flupyrsulfuron-methyl            | B          | BBCH 12-31 December      | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                                   |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State.

<sup>(a)</sup>: 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 flupyrsulfuron-methyl and authorised in plant protection products for triticale in Belgium

| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|----------------------------------|------------|-------------------------|---------------|------------------------------------------------------------------------|
| 2,4D/2,4DB                       | O          | BBCH 29-32              | Annual broadleaf weeds only compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Amidosulfuron          | B          | BBCH 13-39              | Annual broadleaf | BE: Spring, useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Beflubutamid           | F1         | BBCH 01-30              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Carfentrazone          | E          | BBCH 21-32              | Annual broadleaf | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Chlorotoluron          | C2         | BBCH 01-08/ BBCH 25-29  | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Clodinafop propargyl  | BBCH 11-30 | Annual grass weeds (ALOMY, APESV) | BE: Not registered in BE. EFSA: Thus cannot be on the shortlisted |
| Clopyralid             | O          | BBCH 29-31              | Annual broadleaf | BE: Spring Control CENCY and MATCH. EFSA: Different application time (post-EM only) and weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (pre- and post-EM, and annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Diflufenican           | F1         | BBCH 01-29              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Fenoxaprop-p-ethyl     | A          | BBCH 13-31              | Annual grass (ALOMY & APESV) | BE: Useful in IPM. EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|------------------------|---------------|---------------------------------------------------------------------|
| Florasulam             | B          | BBCH 13-39             | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flufenacet             | K3         | BBCH 11-13             | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not registered in BE. EFSA: Thus cannot be on the shortlist |
| Flumioxazin            | E          | BBCH 00-14             | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not registered in cereals in BE. EFSA: Thus cannot be on the shortlist |
| Fluroxypyr             | O          | BBCH 13-39             | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flurtamone             | F1         | BBCH 01-29             | Annual broadleaf & annual grass (APESV) | BE: Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Glyphosate             | G          | BBCH 89                | Broadleaf & grass (ALOMY & (APESV)) | BE: Not registered in pre-emergence but useful in IPM, e.g. in intercrop. EFSA: Glyphosate is applied at pre-harvest (BBCH 89), compared to the substance under consideration (post-EM BBCH 12-29). Thus, quite a different growth stage; hence, it is proposed not to shortlist this a.s. |
| Iodosulfuron methyl    | B          | BBCH 21-31             | Annual broadleaf & grass (APESV) | BE: Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Ixosaben               | L          | BBCH 01-13             | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
# Herbicide authorised(a)

| Herbicide authorised(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-------------------------|------------|-------------------------|--------------|---------------------------------------------------------------------|
| MCPA                    | O          | BBCH 29-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **2 Mesosulfuron methyl** | B          | BBCH 21-31              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Metsulfuron methyl      | B          | BBCH 13-39              | Annual broadleaf weeds | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **3 Pendimethalin**     | K1         | BBCH 11-12/BBCH 21-25   | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Picolinafen             | F1         | BBCH 12-21/BBCH 21-25   | Annual broadleaf weeds | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Pinoxaden               | A          | BBCH 13-31              | Annual grass (ALOMY & APESV) | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Propoxycarbazone        | B          | BBCH 21-31              | Annual grass (ALOMY & APESV) | BE: Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **4 Prosulfocarb**      | N          | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM EFSA: Application BBCH 00-13 compared to the substance under consideration (spring at BBCH 21-29). However, a.s. could be considered as early post-EM thus proposed to be shortlisted |
| Herbicide authorised<sup>(a)</sup> | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|----------------------------------|------------|-------------------------|---------------|---------------------------------------------------------------------|
| Pyroxsulam                       | B          | BBCH 21-31              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM                                                   |
| Thifensulfuron methyl             | B          | BBCH 13-39              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tribenuron methyl                 | B          | BBCH 13-40              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tritosulfuron                     | B          | BBCH 21-39              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Penoxsulam                       | B          | BBCH 11-23              | Annual broadleaf weeds, annual grass (APESV) | BE: Not registered in cereals in BE. EFSA: Thus cannot be on the shortlist |
| Flupyrsulfuron-methyl             | B          | BBCH 21-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                      |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. 
<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 from shortlist |
|---------------------------------|------------|-------------------------|--------------|-------------------------------------------------|
| Clodinafop propargyl           | A          | BBCH 11-39              | Grass (ALOMY & APERA) | DK: With 40 g a.i./ha, it is considered efficient for control of most grasses in spring, incl. APERA and ALOMY. EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus this a.s. is proposed not to be shortlisted. |
| Fenoxaprop-p-ethyl             | A          | BBCH 11-30              | Annual grass (ALOMY, APESV) | EFSA: Different weed spectrum (annual grass ALOMY, APESV only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted. |
| **1 Mesosulfuron methyl**      | B          | BBCH 13-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: In Denmark, mesosulfuron is used in mixture with iodosulfuron and/or diflufenican and the gap for this mixture is in control of GERSS, PAPRH and MYOAR. |
| Pendimethalin                  | K1         | BBCH 00-12              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: The max dose is 480 g a.i./ha in DK. At this dose the control of grasses (ALOMY and APESV) is insufficient. Gap in efficacy on MATIN, BRNSS, CENCY. High tax. EFSA: Following MS proposal as regards efficacy, this a.s. is proposed not to be shortlisted. |
| **2 Prosimulocarb**            | N          | BBCH 00-21              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: Gap in efficacy on MATIN, PAPRH. High tax. EFSA: a.s. fulfils the main criteria 'application time' and 'weed spectrum' (broadleaf & grass (ALOMY & APERA)), thus, it is proposed to consider this a.s. on the shortlist. |
| **3 Pyroxsulam**               | B          | BBCH 23-39              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | DK: Only authorised in mixture with other a.i. Gap in control of GERSS, CENCY. |
| Flupyrsulfuron-methyl          | B          | BBCH 13-23              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                 |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. 
*: Active substance is only authorised in co-formulation with other a.s. 
(a): The bold indicates the a.s. shortlisted.
Table B.21: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for triticate in Sweden

| Herbicide authorised\(\textsuperscript{(a)}\) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|---------------------------------------------|------------|--------------------------|---------------|----------------------------------------------------------------------------------|
| Fenoxaprop-p-ethyl                         | A          | BBCH 12-39               | Annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Mesosulfuron methyl\*                      | B          | BBCH 10-32               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | SE: The a.s is authorised in several PPP. SE stated that this a.s. is not an alternative for the a.s. under consideration due to lack of efficacy against black-grass and weed spill rape |

1  Prosulfocarb

2 Flufenacet

3 Flumioxazin

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

Table B.22: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for triticate in Slovakia

| Herbicide authorised\(\textsuperscript{(a)}\) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|---------------------------------------------|------------|--------------------------|---------------|----------------------------------------------------------------------------------|
| Chlorotoluron                               | C2         | Up to BBCH 29            | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                            |
| Fenoxaprop-p-ethyl                          | A          | BBCH 12-39               | Annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flufenacet                                  | K3         | BBCH 00-25               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                            |
| Flumioxazin                                 | E          | BBCH 00-14               | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                            |
| 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         | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (only APESV) compared to substance under consideration. Thus, this a.s. is proposed not to be shortlisted |
| Penoxsulam                   | B          | BBCH 11-14              | Annual broadleaf weeds, annual grass (APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Propoxycarbazone             | B          | BBCH 10-32              | Annual grass (ALOMY & APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Pyroxasulam                  | B          | BBCH 12-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrinosulfuron-methyl     | B          | BBCH 11-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |

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

**Table B.23:** Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrinosulfuron-methyl and authorised in plant protection products for triticale 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 |
|-------------------------|------------|-------------------------|---------------|----------------------------------------------------------------------------------|
| **2** Mesosulfuron methyl | B          | BBCH 10-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                  |
| **3** Pendimethalin     | K1         | BBCH 00-13              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                  |
| Pinoxaden               | A          | BBCH 11-39              | Annual grass (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Propoxycarbazone        | B          | BBCH 10-29              | Annual grass (ALOMY, APESV) | EFSA: Different weed spectrum (annual grasses only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| **4** Prosulfocarb      | N          | BBCH 00/BBCH 10-32      | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                  |
| **5** Pyroxsulam        | B          | BBCH 12-32              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                  |
| Triallate               | N          | BBCH 00-30              | Annual grass (ALOMY) | UK: For grass weeds is considered to be an alternative. EFSA: Different weed spectrum (annual grass ALOMY only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrsulfuron-methyl   | B          | BBCH 12-31 December     | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) |                                                                  |

HRAC: Herbicide Resistance Action Committee; BBCH: growth stages of mono- and dicotyledonous plants; MS: Member State. (a): The bold indicates the a.s. shortlisted
### Table B.24: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for *spelt* in *Austria*

| Active substance(a) | HRAC group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion of a.s. on the shortlist |
|---------------------|------------|-------------------------|---------------|-----------------------------------------------------------------------------------|
| Halauxifen-methyl   | O          | BBCH 13-29, BBCH 30-45 for GALAP | Annual broadleaf weeds, grass weeds | |
| Flupyrsulfuron-methyl| B          | BBCH 13-25 spring, from BBCH 12 onwards in autumn | Annual broadleaf weeds, grass weeds (ALOMY, APESV, Lolium) | |

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

### Table B.25: Shortlisted herbicide active substance with information on MoA according to HRAC, herbicide application time and targeted weed spectrum having similar characteristics to flupyrsulfuron-methyl and authorised in plant protection products for *spelt* in *Belgium*

| Herbicide authorised(a) | HRAC Group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|-------------------------|------------|-------------------------|---------------|--------------------------------------------------------------------------------|
| 2,4D                    | O          | BBCH 29-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Amidosulfuron           | B          | BBCH 13-39              | Annual broadleaf | BE: Spring, useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Beflubutamid            | F1         | BBCH 01-30              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Bifenox                | E          | BBCH 21-31              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Carfentrazone           | E          | BBCH 21-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC Group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|---------------|-------------------------------------------------|
| Chlorotoluron          | C2         | BBCH 01-08/BBCH 25-29   | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Clopyralid             | O          | BBCH 29-31              | Annual broadleaf | BE: Clopyralid-P only acting on broadleaved. Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Dichlorprop            | O          | BBCH 29-31              | Annual broadleaf | BE: Dichlorprop-P only acting on broadleaved. Spring. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Diflufenican           | F1         | BBCH 01-29              | Annual broadleaf | BE: Usefull in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Florasulam             | B          | BBCH 13-39              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Fluroxypyr             | O          | BBCH 13-39              | Annual broadleaf | BE: Usefull in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flurtamone             | F1         | BBCH 01-29              | Annual broadleaf & annual grass (APESV) | BE: Registered against APERA. Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Glyphosate             | G          | Broadleaf & grass (ALOMY & (APESV) | BE: Not registered in pre-emergence but useful in IPM, e.g. in intercrop. EFSA: Glyphosate is applied at pre-harvest (BBCH 89), compared to the substance under consideration (post-EM BBCH 12-29). Thus quite a different growth stage, hence it is proposed not to shortlist this a.s. |
| Herbicide authorised(a) | HRAC Group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|-------------------------|---------------|-----------------------------------------------------------------------|
| Iodosulfuron methyl    | B          | BBCH 21-31              | Annual broadleaf & grass (APESV) | BE: Useful in IPM. EFSA: No control of ALOMY compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Isoproturon            | C2         | BBCH 13-29              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not approved anymore? Red fill in applicant file. EFSA: a.s. received non-approval of renewal in 2016. [http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=activesubstance.detail&language=EN&selectedID=1495](http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=activesubstance.detail&language=EN&selectedID=1495) Grace period 17 September 2017. Thus, a.s. cannot be on the shortlist |
| Ixosaben               | L          | BBCH 01-13              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| MCPA                   | O          | BBCH 29-32              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| MCPP                   | O          | BBCH 21-31              | Annual broadleaf | BE: Only MCPP-p is registered. Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Mesosulfuron methyl    | B          | BBCH 21-31              | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Metsulfuron methyl     | B          | BBCH 13-39              | Annual broadleaf weeds | BE: Useful in IPM. EFSA: different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Pendimethalin          | K1         | BBCH 11-12/ BBCH 21-25 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Not registered in pre-emergence. BBCH autumn/spring. Useful in IPM |
| Picolinafen            | F1         | BBCH 21-25              | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Herbicide authorised(a) | HRAC Group | Application time (crop) | Weed spectrum | Justification by MS or EFSA for inclusion or non-inclusion from shortlist |
|------------------------|------------|------------------------|---------------|---------------------------------------------------------------------|
| Pinoxaden              | A BBCH 13-31 | Annual grass (ALOMY & APESV) | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Proxsulfocarb         | N BBCH 00-13 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM EFSA: Application BBCH 00-13 compared to the substance under consideration (spring at BBCH 21-29). However, a.s. could be considered as early post-EM thus proposed to be shortlisted |
| Pyroxsulam            | B BBCH 21-31 | Annual Broadleaf weeds, annual grass weeds (ALOMY, APESV) | BE: Useful in IPM |
| Sulfosulfuron         | B BBCH 13-32 | Annual broadleaf & annual grass | BE: Useful in IPM |
| Thifensulfuron methyl | B BBCH 13-39 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tribenuron methyl     | B BBCH 13-40 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Tritosulfuron         | B BBCH 21-39 | Annual broadleaf | BE: Useful in IPM. EFSA: Different weed spectrum (annual broadleaf weeds only) compared to the substance under consideration (annual broadleaf weeds, annual grass weeds (ALOMY, APESV)). Thus, this a.s. is proposed not to be shortlisted |
| Flupyrdsulfuron-methyl| BBCH 21-29 | Annual broadleaf weeds, annual grass weeds (ALOMY, APESV) | |

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