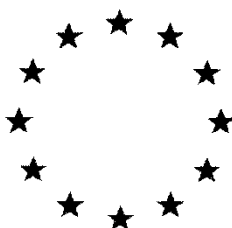


# ***European Commission***



**Draft Renewal Assessment Report prepared according to the Commission  
Regulation (EU) N° 1107/2009**

## **Ethofumesate**

### **Volume 3 – B.3 (PPP) – Ethofumesate 500 SC**

Rapporteur Member State: Austria  
Co-Rapporteur Member State: Denmark

## Version History

When	What
1998	Initial DAR
2000/12	Addendum 8
2015/01	DRAR

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## **B.3. DATA ON APPLICATION AND EFFICACY**

### **B.3.1. FIELD OF USE ENVISAGED**

Ethofumesate SC 500 is a post-emergence herbicide for agricultural use in

- Sugar beet
- Fodder beet
- Red beet

### **B.3.2. EFFECTS ON HARMFUL ORGANISMS**

Ethofumesate belongs to the benzofurane group of herbicides.

Ethofumesate is a potent inhibitor of cell division in susceptible weeds, although the biochemical site of action is unknown at present. The symptoms of ethofumesate vary between weed species. Pre-emergence treatment may result in complete inhibition of seedling emergence. Alternatively, where shoots do emerge, they are severely stunted and deformed and eventually become necrotic and die. Post-emergence treatments generally cause severe growth inhibition (particularly in the apical region) often resulting in a dark green coloration and leaf deformity in broad-leaved species.

Ethofumesate is absorbed by both shoots and roots. As ethofumesate is non-volatile, uptake always occurs from the aqueous solution. For some susceptible species, the most effective route of uptake is via the emerging shoot as it passes through the layer of treated soil. However, for other species, root uptake of ethofumesate is also important to give effective control.

## B.3.3. DETAILS OF INTENDED USE

Crop and/or situation (a)	Member State	Product Name	F G I (b)	Pests or group of pests controlled (c)	Formulation		Application				Application rate per treatment			PHI (days) (l)	Remarks (m)
					Type (d-f)	Conc of a.i. g/kg (i)	Method kind (f-h)	Growth stage and season (j)	Number min max (k)	Interval between applications (min)	Kg a.i./hl min max (g/hl)	Water l/ha min max	Lk a.i./ha min max (*) (g/ha)		
Sugar beet, fodder beet, red beet	North and South EU	Ethofumesate SC 500	F	Annual dicot weeds and annual grasses	SC	500 g/l	Overall spray	Post-emergence BBCH16 to BBCH18	1-3	5	0.05-1	100-400	0.2 – 1.0	*	The maximum amount of active substance must not exceed 1.0 kg/ha every 3 years.  * PHI is covered by the normal vegetation period between last application and harvest

\* For uses where the column „Remarks“ in marked in grey further consideration is necessary. Uses should be crossed out when the notifier no longer supports this use(s).

- (a) For crops, the EU and Codex classification (both) should be taken into account ; where relevant, the use situation should be described (e.g. fumigation of a structure)
- (b) Outdoor or field use (F), greenhouse application (G) or indoor application (I)
- (c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
- (d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
- (e) GCPF Codes – GIFAP Technical Monograph N° 2, 1989
- (f) All abbreviations used must be explained
- (g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
- (h) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plant – type of equipment used must be indicated

- (i) g/kg or g/L. Normally the rate should be given for the active substance (according to ISO) and not for the variant in order to compare the rate for same active substances used in different variants (e.g. fluoroxyppyr). **In certain cases, where only one variant synthesised, it is more appropriate to give the rate for the variant (e.g. benthiavalicarb-isopropyl).**

- (j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application

- (k) Indicate the minimum and maximum number of application possible under practical conditions of use
- (l) The values should be given in g or kg whatever gives the more manageable number (e.g. 200 kg/ha instead of 200 000 g/ha or 12.5 g/ha instead of 0.0125 kg/ha)
- (m) PHI - minimum pre-harvest interval

**B.3.4. APPLICATION RATE AND CONCENTRATION OF THE ACTIVE SUBSTANCE**

Ethofumesate SC 500 is formulated as a suspension concentrate containing 500 g/l ethofumesate.

The product is used as a post-emergence herbicide in sugar-, fodder- and red beet.

It is a well-known standard herbicide, widely used for many years in nearly all sugar beet areas of the world.

1-3 applications with 0.2 – 1.0 kg ethofumesate /ha in 100 – 400 L /ha are proposed, the maximum dose rate is fixed to be 1.0 kg ethofumesate every 3 years.

The concentrations of active substance in material used are covered in document D1. The methods of application are conventional spraying equipment such as tractor-drawn or tractor-mounted boom sprayers.

**B.3.5. METHOD OF APPLICATION**

Ethofumesate like most herbicides is applied over the field as water-based sprays using ground equipment, which booms are commonly achieving 18 to 24 m width and equipped with flat-fan nozzles spaced about every 50 cm. A standard water volume can be in the range of 100 to 400 l/ha

**B.3.6. NUMBER AND TIMING OF APPLICATIONS AND DURATION OF PROTECTION**

One to three applications between BBCH 10 to 18 are done on sugar beet, fodder beet or red beet.

Post-emergence rates of use can vary between 0.2 and 1.0 kg a.s./ha depending on growth stage of the weeds or the crop and the choice / dosage of tank-mix mixture partner. Economical and more effective use of the plant protection product such as Ethofumesate SC 500 can be best achieved when reduced rates are applied in repeated or sequential applications. Hence, low-dose pre-emergence or post-emergence treatments can be used, with second and third post-emergence applications being made at 5 -14 day intervals when the next flush (emergence) of weeds occurs. Therefore, post-emergence dosages may be limited to one to three applications of 200 - 500 g per treatment, with a maximum total dose per season of 1000 g a.s./ha.

**B.3.7. NECESSARY WAITING PERIODS OR OTHER PRECAUTIONS TO AVOID PHYTOTOXIC EFFECTS ON SUCCEEDING CROPS**

Ethofumesate is intended for early-season use in sugar/fodder beet and beetroot. As described in MCA section 6, confined rotational crop studies, as well as field rotational crop studies have shown that phytotoxicity can occur in cereals re-planted after a short time interval (approx. 30 - 100 days). Therefore, it is recommended that succeeding cereals should not be sown/drilled until at least 120 days after application of ethofumesate because of its possible phytotoxicity effects. If crop failure occurred during this period only leafy crops or root crops can be planted/sown.

**B.3.8. PROPOSED INSTRUCTIONS FOR USE**

Ethofumesate SC 500 is a suspension concentrate formulation containing 500 g/L ethofumesate. It is a broad-spectrum herbicide controlling a wide range of annual grasses and broad-leaved weeds in beet crops sugar, fodder and red beets. When used at post-emergence, the application is either by overall spray or band-spray

application. This preparation is mainly active through the soil where it is taken up by the emerging shoot or roots of sensitive weed species suppressing their growth and they eventually die. Soil activity will be enhanced where soil moisture is present. Where dry spring conditions are anticipated, activity can be improved by light incorporation of the product to 2 - 3 cm depth before sowing or planting the crop. In post-emergence use, Ethofumesate SC 500 will be active via the soil as well as by foliar uptake. Ethofumesate SC 500 has a wide weed spectrum. At reduced rates in post-emergence it will strengthen the activity of contact-type herbicides and extend the interval between foliar applications. It will significantly increase reliability of weed control obtained with individual products.

### **B.3.9. EFFECTIVENESS**

Ethofumesate has a useful weed spectrum that includes the control of *Alopecurus myosuroides*, *Setaria* spp., *Poa annua*, *Amaranthus retroflexus* and *Mercurialis annua* and an outstanding control of *Stellaria media*. Beyond that, it was the first herbicide to give some control of the difficult weed *Galium aparine*.

In sugar beet it has primarily a marked effect on *Chenopodium album*, *Polygonum* spp., and *Avena fatua* and strengthens the level of control achieved by other herbicides when used in coformulations or tank mixtures. The weed spectrum of Ethofumesate is complementary with several currently marketed products. Hence, its weakness on *Matricaria* spp and *Sinapis* spp can be overcome by the addition of chloridazon, lenacil or phenmedipham, whereas Ethofumesate provides improved control of grass weeds, *Galium aparine*, *Chenopodium*, *Polygonum*. The main value of Ethofumesate is its residual action in the soil that helps to provide a control of the succeeding flushes of weed germination without requiring too many repeated applications; Compared to other pre-emergence herbicides, its efficacy is less bound to soil moisture. Indeed, the use of Ethofumesate in pre-emergence provides some flexibility to position following applications in post emergence. This property has been the basis for the low-dose/ low volume techniques that have been developed in some European countries like UK (so called FAR technology). Another approach has been, in parallel, to develop a series of various 2- and 3-way herbicide coformulations requiring only one-third of the active substance per hectare that used to be previously involved in beet production during the last 20 years. These reduced rates, have resulted into improved crop safety and yield enabling much earlier herbicides applications for a better weeds to be control. Beyond the biological efficacy, these new products containing Ethofumesate offer substantial benefits in terms of reduction of operator exposure and environmental pollution as well as a less constraints on the choice of following crops.

Within the turf and grassland markets, Ethofumesate offers a fairly unique mode of action and selectivity which can provide control of important weeds in establishing grass crops such as *Poa annua*, *Alopecurus myosuroides* and *Stellaria media* within preferred grass species such as *Lolium* and *Agrostis* and even *Festuca*. It can also assist in rejuvenating established grass swards, so avoiding the need for expensive ploughing up and re-seeding and the consequential losses of production in the interim.

### **B.3.10. INFORMATION ON THE DEVELOPMENT OF RESISTANCE**

There is no evidence of the development of resistance to ethofumesate by grass weeds or broad-leaved weeds in over 30 years of use.

To avoid the development of resistance, repeated use of high rates is not recommended and the implementation of low-dose sequential applications, usually in co-formulations or tank-mixtures with other herbicides, has allowed the rates of use to be reduced progressively over the years. Since the active substance is generally used in mixtures and/or sequences with other herbicides in any one season, and due to crop rotational practices, it would not usually be re-applied on an annual basis to the same field.

#### **B.3.11. ADVERSE EFFECTS ON TREATED CROPS**

In normal conditions, means moisture and temperature compatible with sugar beet growth, Ethofumesate is safe for sugar beet. It can be applied both in pre-emergence as well as in post-emergence of the crop. In case of application in difficult growing conditions, such as frost or high temperature some symptoms can be visible such as leaf deformation and stunting but the recovery is excellent so that in the end no impact on the final yield can be recorded. Attention should be paid on peculiar soils salty or with extreme pH.

#### **B.3.12. OBSERVATIONS ON OTHER UNDESIRABLE OR UNINTENDED SIDE-EFFECTS**

Years of commercial uses have demonstrated that Ethofumesate when used according to the label recommendation is particularly safe and does not induce any particular undesirable effects such as carry over on the following crops. This explains why this active is a corner stone in sugar beet weeding.

#### **B.3.13. REFERENCES RELIED ON**

<b>Data Point</b>	<b>Author(s)</b>	<b>Year</b>	<b>Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not</b>	<b>Vertebrate study Y/N</b>	<b>Data protection claimed Y/N</b>	<b>Justification if data protection is claimed</b>	<b>Owner</b>	<b>Previous evaluation</b>
-	-	-	-	-	-	-	-	-