

ANNEX B

Pyraflufen-ethyl

B.3 Data on application and further information

B.3.1 Data on application relevant to the active substance (Annex IIA 3.1 to 3.6)

B.3.1.1 Function (Annex IIA 3.1)

Herbicide

B.3.1.2 Effects on harmful organisms (Annex IIA 3.2.1)

Pyraflufen-ethyl is a post-emergence which kills broadleaf weeds. It has contact action, and is inhibitor of chlorophyll biosynthesis.

B.3.1.3 Translocation in plants (Annex IIA 3.2.2)

Pyraflufen-ethyl is easily absorbed from surface of leaf into tissue of plant, but pyraflufen-ethyl absorbed has not observed to be transported in plant.

B.3.1.4 Fields of use (Annex IIA 3.3)

Agriculture

B.3.1.5 Pests controlled and crops protected (Annex IIA 3.4.1, 3.4.2)

Crops : winter and spring cereals (wheat, barley)

Pyraflufen-ethyl is effective against broad-leaved weeds. The active substance applied in early post-emergence at 13.5 g a.s./ha provides excellent control of important weeds such as *Anthemis arvensis*, *Lamium purpureum*, *Sinapis arvensis* and a good suppression of *Matricaria chamomilla*, *Stellaria media*, *Veronica persica* and *Viola* spp.

Pyraflufen-ethyl is used in combination with bifenox which provides complement of activity against *Capsella bursa-pastoris*, *Papaver rhoeas*, *Veronica* spp and *Viola*. Both straight products present a moderate activity on *Galium aparine*

B.3.1.6 Effects achieved - mode of action (Annex IIA 3.4.3, 3.5.1)

‘Pyraflufen-ethyl is a novel inhibitor of protoporphyrinogen IX oxidase. Inhibition of this enzyme in chloroplast causes accumulation of protoporphyrinogen IX, which results in peroxidation of foliar cell membrane lipid under the light and finally cell death.

This herbicidal mode of action of pyraflufen-ethyl is similar to that of other peroxidizing herbicides containing of diphenyl ether moiety. Herbicidal effects of pyraflufen-ethyl are revealed as yellowing and browning in the foliate portion, and then death of whole plant with leaf burn.’

B.3.1.7 Information relative to the formation of active metabolites and degradation products (Annex IIA 3.5.2, 3.5.3)

Pyraflufen-ethyl is rapidly converted into E-1, its hydrolysate carboxylic acid, E-2, its phenol form and E-3, its methoxy form. These metabolites were shown to have herbicidal activity.

‘The herbicidal activity towards weeds after foliar application between pyraflufen-ethyl and its metabolites results in the following descending order of activity : pyraflufen-ethyl > E-3 > E-1 > E-2. However, the main residues found in weeds after pyraflufen-ethyl application were parent compound and E-1. Amounts of E-2 and E-3 were negligible. In addition, the herbicidal activity induced by the application of pyraflufen-ethyl results from the inhibition of

protoporphyrinogen IX oxidase (Protox) activity in plant chloroplasts and both pyraflufen-ethyl and E-1 have shown to inhibit the oxidase activity at the *in vitro* studies.

From these observations, it is suggested that pyraflufen-ethyl and its metabolite E-1 are of major importance for the herbicidal activity after application of pyraflufen-ethyl and the transformation from pyraflufen-ethyl to E-1 might not be essential for the herbicidal activity. Contribution of E-2 and E-3 to the herbicidal activity is insignificant.'

In the plants pyraflufen-ethyl is metabolised to E-1 and then to E-9 resulting in detoxification.

B.3.1.8 Information to the possible occurrence of the development of resistance or cross-resistance (Annex IIA 3.6)

'Pyraflufen-ethyl is a new herbicide and trisubstituted phenylpyrazole compound.

The formulations including pyraflufen-ethyl are not yet marketed on a commercial basis and as such, no information on the occurrence of development of resistance from commercial uses is available.

From our own experience, based on more than 100 trials carried out in Europe, no resistance is mentioned till now.'

B.3.2 Data on application relevant to the plant protection products (Annex IIIA 3)

B.3.2.1 Fields of use (Annex IIIA 3.1)

See B.3.1.4

B.3.2.2 Nature of the effects on harmful organisms (Annex IIIA 3.2)

See B.3.1.2

B.3.2.3 Pests controlled and crops protected (Annex IIIA 3.3)

Rate of application (Annex IIIA 3.4)

Concentration of active substance in material used (Annex IIIA 3.5)

Description of the method of application, type of equipment used and type and volume of diluent per unit of area or volume (Annex IIIA 3.6)

Number and timing of applications and duration of protection afforded (Annex IIIA 3.7)

The formulation EXP31279A is a post-emergence herbicide in cereals (SC containing 9 g/l pyraflufen-ethyl and 500 g/l bifenox) which will be applied at an application rate of 1-1.5 l/ha at BBCH 13-29 (9-13.5 g pyraflufen-ethyl/ha). Details of the uses in several Northern EU countries are given in the table below.

Similar intended uses are proposed for Southern Europe (max 13.5 g pyraflufen-ethyl/ha, BBCH 11-29)

SUMMARY OF PROPOSED GOOD AGRICULTURAL PRACTICES FOR PESTICIDES USES
(Application on agricultural crops)

Responsible body by reporting

: Nihon Nohyaku

Date

:May 1997

Pesticide(s) (Common name)

: pyraflufen-ethyl + bifenox

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CAS No.

: [129630-19-9], [42576-02-3], resp.

Country

: The Netherlands, Germany, Belgium & Luxembourg

Trade name(s)

: MILAN®

Main uses

: Herbicide

Crop and/or situation (a)	Member State or Country	F, G or I (b)	Pests or Group of pest controlled (c)	Formulation		Application			Application rate per treatment			PHI (days) (k)	Remarks (l)
				Type (d-f)	Conc. of `` ___s. (i)	Method kind (f-g)	Growth stage (j)	Number min max	kg a.s./hl min max	water l/ha min max	kg a.s./ha min max		
Winter and spring cereals	NL	F	Annual weeds	SC	ET-751: 9 g/l Bifenox: 500 g/l	Conventional spray	3 leaves to end of tillering	1	ET-751: 2.25-2.93 Bifenox: 125-162.5	400	ET-751: 9-11.7 Bifenox: 500-650	NA	Dose: 1-1.3 l/ha
Winter cereals	D	F	Annual weeds	SC	ET-751: 9 g/l Bifenox: 500 g/l	Conventional spray	BBCH 13-29	1	ET-751: 3.38 Bifenox: 1.87	400	ET-751: 13.5 Bifenox: 750	NA	Dose: 1.5 l/ha
Summer barley	D	F	Annual weeds	SC	ET-751: 9 g/l Bifenox: 500 g/l	Conventional spray	BBCH 13-29	1	ET-751: 2.25 Bifenox: 1.25	400	ET-751: 9 Bifenox: 500	NA	Dose: 1 l/ha
Winter barley and winter	B & L	F	Annual weeds	SC	ET-751: 9 g/l	Conventional spray	BBCH 21->29	1	ET-751: 2.25-3	150 - 400	ET-751: 9-12	NA	Dose: 1-1.33 l/ha

wheat					Bifenox: 500 g/l				Bifenox: 125-444		Bifenox: 500-665		
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B.3.2.4 Minimum waiting periods or other precautions between last application and sowing or planting succeeding crops - Limitations on choice of succeeding crops (Annex IIIA 3.8)

‘The proposed use pattern for pyraflufen-ethyl on cereals is such that under normal agricultural practices, at least 4 months are expected to elapse between treatment and installation of next crop.

In case of failure of the treated crop, a waiting period of 1 month between the application of pyraflufen-ethyl and sowing/planting of the succeeding crops should be observed. This proposal is based on observations made in the field soil dissipation studies. These studies indicate that 1 month after application in spring of pyraflufen-ethyl to bare soil at the very high rate of 200 g/ha, no parent compound is left, whereas residues of metabolites E-1 + E-3 are in the range of 0.16 to 0.19 mg/kg in the top 0-5 cm layer of soil. Following application at the highest recommended rate of 18 g/ha, residues in soil ploughed to 20 cm depth would be in the range of 0.004 mg/kg, a concentration low enough to rule out any significant residue in the succeeding crop at harvest.

Note : the above recommendation for a 1 month period before sowing/planting the succeeding crop in case of target crop failure is made with reference to the potential for residues in the succeeding crop, which is the issue under consideration here (i.e. notwithstanding potential phytotoxicity problems, which may require longer waiting period for certain crops).’

B.3.2.5 Proposed instructions for use as printed, or to be printed, on labels (Document C)

A draft label was proposed for the formulation EXP31279A (SC) or MILAN

B.3.3 Summary of data on application

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B.3.4 Further information on the active substance (Annex IIA 3.7 to 3.9)

B.3.4.1 Recommended methods and precautions relating to handling, storage, transport, fire (Annex IIA 3.7)

This information is presented under the form of a safety data sheet pursuant to Article 27 of Council Directive 67/548/EEC.

Hazards identification : Very toxic to algae and aquatic plants

Handling : When using, do not eat, drink or smoke.

Handle and open container with care. Do not breathe dust or vapor. Use with adequate ventilation. Avoid handling near open flame, source of heat. Prevent build-up of electrostatic charge.

Wash thoroughly with soap and water after handling. Do not contaminate water by cleaning of equipment or disposal of waste.

Personal protection : Dust mask and goggles should be used when handling. Appropriate protective clothing and gloves made of rubber or other suitable impervious materials should be worn to prevent skin contact. These must be changed and washed after use or after contamination. When removing, caution should be taken to avoid generation of dust or contact with spilled material resulting from earlier use.

Storage : Keep out of reach of children.

Keep away from food, drink and animal feeding stuffs.

Store in an authorized and dry place where only authorized persons have access.

Keep container closed, under room temperature and avoid exposure to sunlight.

Transport : · Classification Rail / Road RID / ADR : not regulated

· Classification Maritime : not regulated

· Classification Air : not regulated

Fire : *Extinguishing media* : Sprayed water jet, foam, extinguishing powder, CO₂ and sand.

Combustion gases : In the event of fire, the formation of hydrogen chloride, hydrogen fluoride, carbon monoxide and nitrogen oxides must be anticipated.

Special hazards : Avoid the escape of extinguishing media, such as fire-fighting water, to the environment (especially pond, river and lake).

Protective equipment : Fire fighters and others that may be exposed should wear full protective clothing and a self-contained breathing apparatus.

Not subject to the Regulation on Flammable liquids (VbF)

B.3.4.2 Procedures for destruction or decontamination of the active substance, contaminated packaging and contaminated materials

B.3.4.2.1 Controlled incineration - Pyrolytic behaviour under controlled conditions at 800 °C (Annex IIA 3.8.1)

‘The preferred or sole means to safely dispose of pyraflufen-ethyl, contaminated material or contaminated packaging is through controlled incineration in a licensed incinerator.’

The halogen content of pyraflufen-ethyl is less than 60%; information on the pyrolytic behaviour of the active substance is thus not required.

B.3.4.2.2 Methods other than controlled incineration for disposal of the active substance, contaminated packaging and contaminated materials (Annex IIA 3.8.2)

- Disposal considerations : This material and its container must be disposed of as hazardous waste.
It is recommended to dispose of this material by complete incineration or in a manner which complies with local regulations, such as controlled release into waste water treatment systems.
The containers should be rinsed after use and disposed of as hazardous waste recycled.
- Package product waste : Close and label the waste receptacles and, likewise, any unclean empty containers.
Dispose of them at a suitable waste incineration plant in accordance with the official regulations. When large quantities are concerned, consult the supplier.

B.3.4.3 Methods for decontamination of water in the case of an accident (Annex IIA 3.9)

'In case of contamination of water with pyraflufen-ethyl, always try to isolate and protect the contaminated area. Where feasible, the contaminated water can be pumped out and then isolated for further treatment as appropriate, such as activated charcoal.

Pyraflufen-ethyl is practically not toxic to mammals and aquatic organisms, except aquatic plants like algae and duckweed. Pyraflufen-ethyl rapidly disappears in the aquatic environment. Therefore the accidental contamination of aquatic environments should not induce persistent hazard for the environment.

If accidentally contaminated water is normally used to produce drinking water, ensure with the competent authorities that the level of contamination does not reach the Parametric Value for Drinking Water. A report entitled "Examination of Methods of Treatment to Remove Pesticides from Water intended for human consumption" by Grohmann and Dizer (1991), generated by the "Institut für Wasser-, Boden- und Lufthygiene des Bundesgesundheitsamtes" (Berlin, Germany) describes the methods of pesticide removal through water treatment.'

B.3.5 Further information on the plant protection product MILANTM (Annex IIIA 4)

B 3.5.1 Packagings, suitability of the packaging material to its content (Annex IIIA 4.1)

B.3.5.1.1 Description and specification of the packaging and materials used in packaging, size, capacity, size of openings, type of closure and seals (Annex IIIA 4.1.1)

'Packaging complies with GIFAP recommendation for one way agrochemical packaging design criteria for liquids and solids (GIFAP C/91/TD/705 and C/94/MF/154).'

Table B.3.5.1.1-1 : Description of receptacle for MILANTM

Type :	10 L polyethylene bottle
Material :	high density polyethylene
Opening :	internal diameter : 54 mm
Shape/Size :	404 mm x 218 mm x 173 mm
Capacity :	11000 mL
Weight of the packing :	400 g
Closure :	linerless cap 63 EZ material : high density polyethylene + linear polyethylene
Shipping unit :	corrugated cardboard for 2 x 10 L dimensions : 375 mm x 236 mm x 422 mm UN certification group II : UN identification : 4G/Y 30/S/96 4G/Y 23/S/96 F-BVT 171331 F-BVT 171352

B.3.5.1.2 Suitability of the packaging and closures (Annex IIIA 4.1.2)

'Packaging materials and solutions are approved by United Nations Regulation (UN identification : see table B.3.5.1.1-1).

United Nations Certification is in accordance with ADR, RID, IATA, OMI and IMDG'.

B.3.5.1.3 Resistance of the packaging material to its contents (Annex IIIA 4.1.3)

'The formulation EXP31279A is a suspension concentrate (SC) on an aqueous basis. Water based formulations are not expected to react with the packaging materials (linerless cap and polyethylene container).'

Report demonstrating the resistance of the packaging material to its contents according to GIFAP Monograph N 17 was not submitted.

B.3.5.2 Procedures for cleaning application equipment and protective clothing (Annex IIIA 4.2)

The notifier provided a summary of very general procedures, based also on practical experience, which are stated to have shown an adequate degree of efficiency :

- Empty the tank as completely as possible and dispose of the surplus spray liquid in agreement with existing guidelines or regulations,
- Rinse the tank walls immediately with ca. 10% of its volume or a maximum of 100 L of water (addition of detergent is usually not necessary as products already contain surfactants),
- Recirculate the rinse water through the pumping system,

- Rinse the spraying system and dispose of the rinse water by spraying it at high speed on the treated field,
- Repeat these operations twice if abundant foaming still occurs during rinsing,
- Remove filters and nozzles for separate cleaning,
- Reassemble and finally drain the tank and spraying system according to the instructions for use.

With regard to the effectiveness of the proposed cleaning procedure, it is stated that no particular difficulty is expected with EXP31279A (SC), which shows excellent suspensibility and rinsability characteristics. A substantiating study report was presented.

- MILAN (EXP 31279A) : Determination of efficiency of the cleaning procedure of spraying equipment (Perez and Forget, 1998)

Outline of test : A slurry is prepared in a commercial spraying equipment (Berthoud Bermatic, tank size 1000 L), at the average dose rate used in agricultural practice (7.5 mL ppp/L in 300 L). The slurry is sprayed, the equipment is cleaned according to a standard cleaning procedure (rinsing the tank twice with 50 L clear water) and filled again with water. The active substance is assayed, the efficacy of cleaning calculated and the concentration after cleaning compared to the no biological effect level.

Findings : Effectiveness of cleaning = 99.95% for bifenox
> 99.99% for pyraflufen-ethyl

Conclusion : The cleaning procedure used is efficient enough to avoid biological risk on next treatment for both active ingredients.

The notifier nevertheless remarks that the effectiveness of cleaning procedures is more depending on the technological characteristics of the application equipment than on the properties of the product, so that it is difficult to check the effectiveness of any procedure with all existing equipment.

Cleaning procedures for protective clothing were not addressed as such.

B.3.5.3 Re-entry intervals, waiting periods and other precautions to protect man, livestock and the environment

B.3.5.3.1 Pre-harvest intervals, re-entry intervals or withholding periods to minimize residues in crops, plants, plant products, treated areas or spaces (Annex IIIA 4.3.1)

Pre-harvest and re-entry periods of MILAN™

Pre-harvest interval (in days) for each relevant crop :	‘In view of the proposed use pattern (early post-emergence), a PHI of 90 days is recommended following treatment of cereals with pyraflufen-ethyl’
Re-entry period (in days) for livestock to areas to be grazed :	‘Cereals treated with pyraflufen-ethyl are normally not intended for grazing by livestock. In case of anticipated crop failure, grazing could be allowed 1 month after treatment.’
Re-entry period (in hours or days) for man to crops, buildings or spaces treated :	‘In view of the low toxicity of pyraflufen-ethyl and of initial residues on plants barely in excess of 1 mg/kg, there is no need to set a re-entry period’
Withholding period (in days) for animal feedingstuffs :	‘As there are no significant residues in crop parts used as animal feed, and hence no expected residues in food of animal origin, a withholding period before milking or slaughter is not necessary.’
Waiting period (in days) between application and handling treated products :	Not relevant
Waiting period (in days) between last application and sowing or planting succeeding crops :	‘Under normal agricultural practices, at least 4 months are expected to elapse between treatment and installation of next crop. In case of failure of the treated crop, a waiting period of 1 month between the application of pyraflufen-ethyl and sowing/planting of the succeeding crops should

be observed.

The above recommendation is made with reference to the potential for residues in the succeeding crop, i.e. notwithstanding potential phytotoxicity problems which may require longer waiting periods for certain crops.'

B.3.5.3.2 Information on any specific agricultural, plant health or environmental conditions under which the preparation may or may not be used (Annex IIIA 4.3.2)

'Avoid treating crops suffering from stress, pest, disease attack or trace element deficiency.

Application should not be made to frosted crops. Sharp or severe frost following application to winter wheat or winter barley may cause crop scorch from which the crop normally will recover.

Do not roll autumn treated crops until the spring.

Do not harrow the crop at any time after application.

Do not treat undersown cereals or those due to be undersown.

Mixtures with liquid fertilizers are not recommended at any time due to lack of information.'

B.3.5.4 Recommended methods, precautions and handling procedures to minimize the risks relating to warehouse storage, user level storage, transport, fire - Detailed procedures for use in the event of an accident during transport, storage or use (Annexes IIIA 4.4 and 4.5)

This information is presented under the form of a safety data sheet pursuant to Article 27 of Council Directive 67/548/EEC.

Hazards identification : Not classified according to 78/631/EEC, but dangerous to aquatic organisms

Handling : When using, do not eat, drink or smoke

Personal protection : wear gloves, goggles. Comply with general rules of occupational health and safety .

Calculation of operator exposure according to 3 scenarios (resp. no gloves, gloves worn during mixing and loading only or gloves worn during mixing, loading and spraying) using both English and German model demonstrated that the margins of safety obtained with pyraflufen-ethyl are very high (>> 100) and with bifenox clearly acceptable. Hence, there is no unacceptable risk to handle MILAN and thus no real need to recommend special protective clothing or gloves

Storage : Keep out of reach of children.

Keep away from food, drink and animal feeding stuffs.

Keep away from frost.

Recommended material for packaging : high density polyethylene.

Transport : · RID / ADR regulation : Class: 9 n : 11 c) Kemmler code: 90

Declaration for land shipment : 3082 Environmentally hazardous substance, liquid, N.O.S., (contains bifenox), 9, 11 c), RID (or ADR)

· OMI regulation : Class: 9 UN num: 3082

IMDG Page: 9028 MFAG: - Ems: -

Declaration for sea shipment : Environmentally hazardous substance, liquid, N.O.S., (contains bifenox 42%)

· IATA regulation : not regulated

Fire : *Extinguishing media* : foam, carbon dioxide, dry powders, waterspray

Combustion gases : Danger of toxic gases in smoke in case of fire (carbon and nitrogen oxides, hydrochloric and hydrofluoric gases)

Special hazards : Avoid the escape of fire-fighting water to the environment

Protective equipment : Wear a self-contained breathing apparatus.

Accidental release measures : Prevent entry into drains, waters or soil. Recover the product by damping then sweeping or suction. Shovel up and place into a labelled tightly closed container. To clean contaminated floors and objects, wipe with a damp cloth. All contaminated cleaning materials should be placed in closable receptacles. Dispose of safely in accordance with local regulations (see B.3.5.5).

First aid measures : In case of *contact with skin*, remove contaminated clothes and carefully wash affected areas of skin with water.
In case of *contact with eyes*, rinse immediately with plenty of water for 20 minutes.
If *swallowed*, seek medical advice immediately and show this container or label.
If you feel unwell, seek medical advice (show the label where possible).
Keep the victim under medical control.

B.3.5.5 Procedures for destruction or decontamination of the formulation and its packaging

B.3.5.5.1 Neutralization procedures for use in the event of accidental spillages (Annex IIIA 4.6.1)

‘Any chemical treatment on the location of an accidental spillage would be difficult to control in terms of efficiency and safety and is therefore not recommended. In the event of a spillage, collect and dispose of the residues and contaminated materials through controlled incineration according to the procedure described under B.3.5.5.2.’

B.3.5.5.2 Controlled incineration - Pyrolytic behaviour of the active substance under controlled conditions at 800 °C (Annex IIIA 4.6.2)

‘Controlled incineration is the preferred means to safely dispose of the preparation as well as plant protection products containing it, contaminated materials or packaging. Incineration must be done under controlled conditions according to the EEC Directive 94/67 : since EXP31279A contains more than 1% of halogens, following criteria are requested :

- temperature above 1100 °C
- residence time greater than 2 seconds
- presence of more than 6% of oxygen

In case of wastes containing less than 1% of chlorine, a temperature of 850 °C is requested.

Exhaust gases should not exceed : 10 mg/m³ hydrochloric acid as an average on 24 hours
1 mg/m³ hydrofluoric acid as an average on 24 hours.’

B.3.5.5.3 Methods other than controlled incineration for disposal of the plant protection product, contaminated packaging and contaminated materials (Annex IIIA 4.6.3)

‘No other specific methods are recommended.’

B.3.6 References relied on

Author(s)	Year	Annex IIA Point Title Company, Report No.	GLP GEP Y/N	Published or not Y/N	Owner
Grohmann A., Dizer, H.	1991	IIA, 3.9 Examination of Methods of Treatment to Remove Pesticides from Water intended for human consumption Institut für Wasser-, Boden- und Lufthygiene des Bundesgesundheitsamtes (Berlin, Germany)	N	Y	-
Murata, S., Yuda, A., Nakano, A., Kimura, Y., Motoba, K., Mabuchi, T., Miura, Y., Nishizawa, H., Funayama, S.	1995	IIA, 3.5 Mechanisms of selective action of the peroxidizing herbicide ET-751 on wheat and <i>Galium aparine</i> . Brighton Crop Protection Conference - Weeds - Proceedings Volume 1, 243-248, 1995	N	Y	NN
Perez G. Forget, J.	1998	IIIA, 4.2 MILAN (EXP 31279A) : Determination of efficiency of the cleaning procedure of spraying equipment	N	N	RPA

ANNEX B

Pyraflufen-ethyl

Appendix A : Authorizations - Registrations

Country	Type of authorization	Crops/uses	Authorization details
Belgium	commercial	Winter wheat Winter barley	9078/B Expired 19-01-2001

ANNEX B

Pyraflufen-ethyl

Appendix B : Material Safety Data Sheets

List of Material Safety Data Sheets submitted by the notifier	
Active Substance	
Pyraflufen-ethyl	
Formulations	
EXP 31279A (MILAN TM)	