Asulam-sodium

Annex B (Volume 3)

B.3 Data on application and further information

Version history

When	What
2016-04-18	Initial DAR

B.3 Data on application and further information

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

B 3.1.1 Function (IIA 3.1)

Asulam sodium is an herbicide, which is effective against annual and perennial weeds, both monocotyledons and dicotyledons, and on some perennial pteridophytes. It is particularly effective against certain perennial grasses and broad-leaved weeds being readily translocated to the root systems of susceptible species.

B.3.1.2 Effects on harmful organisms (IIA 3.2)

Nature of the effects on harmful organisms e.g. contact action

Asulam sodium is a systemic herbicide, mainly absorbed by the leaves. It exerts its main effect by inhibiting the process of cell division in the meristematic organs of the plant and the greatest visual effects of the treatment therefore occur in new growth. The herbicidal symptoms in susceptible species are a slow chlorosis and stunting in newly developing leaves. Weeds are normally killed several days to several weeks after the treatment with asulam sodium. Tissue which is mature at the time of asulam sodium treatment undergoes a slow senescence.

Whether or not translocated in plants and if translocated whether such translocation is apoplastic, symplastic or both

Asulam sodium is a systemic herbicide which may be taken up by leaves or roots from which it is translocated to the growing points of the plant. Uptake through the shoots is more effective than through the roots.

Growing points are usually killed rapidly but mature leaves which are present at spraying senesce slowly.

Climatic conditions affect the rate of penetration of asulam sodium and thereby control its subsequent efficacy. Optimum conditions for penetration include high relative humidity and high temperature. Application during, or immediately after a drought period, is not recommended.

Correct weed growth stage at application is important to ensure optimum level of performance. Against perennial weeds, translocation to underground meristematic organs is essential for effective control. It is necessary to wait until the aerial parts are sufficiently developed to enable sufficient absorption and to carry out treatment before the leaves start to lose their uptake capabilities.

Asulam sodium is also effective on some annual broad-leaf weeds and grasses, pre-emergence, owing to its slight residual properties. This allows it also to be used for selective weed control in some vegetables.

B.3.1.3 Field of use (IIA 3.3)

Asulam sodium is a fungicide intended for use in spinach and ornamental flower bulbs.

B.3.1.4 Harmful organisms controlled (IIA 3.4)

Details of existing and intended uses (crops, groups of crops, plants or plant products treated or protected)

Details of the actual and authorised uses in the EU are presented in Document D-2.

Asulam sodium is well tolerated by the following crops:

Spinach

Asulam sodium may be used on spinach, treating immediately after sowing and before the onset of germination and also post emergence (BBCH 12-14) at a dose rate up to 2400 g a.s./ha. It controls annual grasses and broad leaved weeds.

Tulip, hyacinth, lily

Asulam sodium may also be used on tulip, hyacinth and lily with application post emergence, when weeds have a height of 4 to 6 cm at an application rate of 1600 to 2400 g a.s/ha. It controls composite weeds, including camomile, groundsel and vetch weeds.

Details of harmful organisms against which protection is afforded

Asulam sodium is active against a wide range of annual and perennial grass weeds species as well as several broad leafed weeds such as some members of the Polygonacae, Compositae, *Matricaria spp, Senecio jacobea, Galinsoga parviflora, Chenopodium spp, Polygonum spp,* and *Solanum nigrum.*

Asulam sodium is very active against most of the Rumex species: *Rumex obtusifolius, Rumex crispus, Rumex obtusifolius x crispus hybrids* and *Rumex alpinus*. But sorrels (*Rumex acetosa* and *Rumex acetosella*) are not controlled.

Crop	Crop code	Organism	Organism code
Spinach	SPQOL	Broadleaved and grass weeds	Annual broad-leaved plants: BBBAN Annual grasses: GGGAN
Tulip	TULSS	Composite weeds (camomile, groundsel) and vetch weeds.	Compositae: FFFCO Chamomile: ANTNO, ANTAR, MATCH Groundsel: BACHA Vetch: VICSA
Hyacinth	HYAOR		
Lily	LILSS		

Effects achieved e.g. sprout suppression

The spectrum of efficacy includes some members of the Polygonacae, Compositae, and Cruciferae.

Asulam sodium is very active against most of Rumex species: *Rumex obtusifolius, Rumex crispus, Rumex obtusifolius x crispus hybrids* and *Rumex alpinus*. It controls annual grasses and *Matricaria spp, Senecio jacobea, Galinsoga parviflora, Chenopodium spp, Polygonum spp, Solanum nigrum.* It controls especially *Brassica spp*, *Matricaria spp, Senecio vulgaris, Poa annua and Polygonum spp.*

B 3.1.5 Mode of action (IIA 3.5)

Statement of the mode of action of the active substance in terms of biochemical and physiological mechanism(s) and biochemical pathway(s) involved

Asulam is a sulfonamide and can be formulated as a sodium salt. It is very water soluble and is very systemic herbicide following foliar and root uptake. Its physicochemical properties are optimal for mobility in the plant.

Asulam sodium has been classed as a carbamate herbicide and has been stated as having a mode of action identical to N-phenylcarbamates. These are classed as inhibitors of microtubule assembly or function. Although there is one report that asulam sodium treatment caused onion root tips to be in arrested metaphase, asulam sodium appears to target folic acid biosynthesis. It has structural similarity to 4-aminobenzoic acid, one of the substrates for 7,8-dihydropteroate synthesis. Furthermore, asulam is structurally related to sulfanilamide and to sulfonamide antimicrobial drugs, which are competitive inhibitors of 7,8-dihydropteroate synthase (DHPS). Asulam sodium caused inhibition of 7,8-dihydropteroate synthesis in a cell-free extract of wheat seedlings. Asulam sodium induced growth inhibition of carrot cell cultures was reversed by 4-aminobenzoic acid and depletion of folate derivatives in treated plants provides further evidence that the synthesis of folic acid is the primary target of asulam. More recently, transformation of potato with a modified bacterial DHPS (sul 1) which is resistant to sulfonamide resulted tolerance to asulam. Therefore, it seems certain that the target site of asulam is DHPS and the chlorotic symptoms and stunting plus mitotic irregularities are a consequence of decreased levels of dihydrofolate and a reduction of one carbon donors necessary for the biosynthesis of purines and pyrimidine components of nucleic acids and other essential metabolites. The mechanism of selectivity to asulam is reported as being greater metabolic degradation in tolerant species.

Details of active metabolites and degradation products, cross referenced to the toxicological and residues data provided

There are no active metabolites or degradation products.

Information relative to the formation of active metabolites and degradation products

Asulam sodium does not metabolise or degrade to active products.

B 3.1.6 Information on the occurrence or possible occurrence of the development of resistance and appropriate management strategies (IIA 3.6)

The applicant has provided the following:

The risk of resistance is directly linked to the frequency of use of plant protection products with the same mode of action.

Therefore it is recommended to alternate the use of herbicides having different modes of action.

However, asulam sodium is classified in group I by HRAC (Inhibition of DHP (dihydropteroate) synthase) and is unique in this group. There have been no resistant biotypes reported to present. The risk of resistance is therefore low.

B 3.2 Data on application relevant to the plant protection product – 'Asulox' (IIIA 3.1 to 3.9)

B.3.2.1 Field of Use (IIIA 3.1)

Asulox® is applied in pre or post emergence application on spinach. Other crops where Asulox® may be used on include tulip, hyacinth and lily.

B.3.2.2 Effects on harmful organisms (IIIA 3.2)

Asulam sodium is a systemic herbicide, mainly absorbed by the leaves. It exerts its main effect by inhibiting the process of cell division in the meristematic organs of the plant and the greatest visual effects of the treatment therefore occur in new growth. The herbicidal symptoms in susceptible species are a slow chlorosis and stunting in newly developing leaves. Weeds are normally killed several days to several weeks after the treatment with asulam sodium. Tissue which is mature at the time of asulam sodium treatment undergoes a slow senescence.

B.3.2.3 Details of intended uses (IIIA 3.3)

Details of existing and intended uses (crops, groups of crops, plants or plant products treated or protected)

There are currently no registered uses of asulam sodium. Details of the intended uses are presented in the following GAP table.

Table B.3.1 Details of intended uses

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.s./hl min max (g/hl)	Water l/ha min max	Kg a.s./ha min max (*) (g/ha)		
Spinach	Belgium, Nether-lands	Asulox	F	Pre-emergence broadleaved and grass weeds. Post-emergence broadleaved and grass weeds.	SL	400 g/L asulam = 438 g/L asulam sodium	Ground boom sprayers	Until 3 days after sowing at the latest. The seed may not be pre-emerged. (spring-summer) **or** Post-emergence BBCH 12-14 (spring-summer)	1	-	-	200-600	2.4 asulam = 2.628 asulam sodium	28	For consumption and for seed cultivation.
Tulip, hyacinth and lily (bulb production)	Netherlands	Asulox	F	Composite weeds (camomile, groundsel) and vetch weeds.	SL	400 g/L asulam = 438 g/L asulam sodium	Ground boom sprayers	Post-emergence when the weeds have a height of 4 to 6 cm (spring-summer)	1	-	-	200-600	1.6- 2.4 asulam = 1.752 - 2.628 aslam sodium	n.a	Apply on a hardened and dry crop. During spraying and until a few hours later the weather has to be dry and growing

(a) For crops, the EU and Codex classifications (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 sucking insects, soil born insects, foliar fungi, weeds
(d) *e.g.* wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) CropLife International Technical Monograph no 2, 6th Edition. Revised May 2008. Catalogue of pesticide
(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. fluoroxypyr). **In certain cases, where only one variant is synthesised, it is more appropriate to give the rate for the variant (e.g. benthiavalicarb-isopropyl).**
(j) Growth stage range from first to 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 applications 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

Details of harmful organisms against which protection is afforded

Crop	Crop code	Disease/Organism	Disease/Organism code
Spinach	SPQOL	Broad leaved and grass weeds	Annual broad-leaved plants: BBBAN Annual grasses: GGGAN
Tulip	TULSS	Composite weeds (camomile, groundsel) and vetch weeds.	Compositae: FFFCO Chamomile: ANTNO, ANTAR, MATCH Groundsel: BACHA Vetch: VICSA
Hyacinth	HYAOR		
Lily	LILSS		

Spinach

The application should be made at pre emergence and post emergence (BBCH 12-14) in 1 application at 2400 g as/ha of asulam.

It controls most of the Rumex species: *Rumex obtusifolius, Rumex crispus, Rumex obtusifolius x crispus hybrids* and *Rumex alpinus* and it controls annual grasses and *Matricaria spp, Senecio jacobea, Galinsoga parviflora, Chenopodium spp, Polygonum spp, Solanum nigrum, Brassica spp, Senecio vulgaris.*

Tulip, hyacinth, lily

Asulam may also be used on tulip, hyacinth and lily with application post emergence, when weeds have a height of 4 to 6 cm at an application rate of 1600 to 2400 g a.s/ha. It controls composite weeds, including camomile, groundsel and vetch weeds.

Effects achieved

Spectrum of efficacy includes some members of the Polygonacae, Compositae, and Cruciferae.

Asulam sodium is very active against most of the Rumex species: *Rumex obtusifolius, Rumex crispus, Rumex obtusifolius x crispus hybrids* and *Rumex alpinus*. It controls annual grasses and *Matricaria spp, Senecio jacobea, Galinsoga parviflora, Chenopodium spp, Polygonum spp, Solanum nigrum.* It controls especially *Brassica spp*, *Matricaria sp, Senecio vulgaris, Poa annua and Polygonum spp.*

B.3.2.4 Application rate (IIIA 3.4)

Rate of application per unit treated (ha, m^2, m^3, tonne), in terms of g or kg of preparation and active substance

Spinach	6 L product/ha (2.4 kg a.s./ha)
Tulip, Hyacinth, Lily	4 - 6 L product/ha (1.6 - 2.4 kg a.s./ha)

For the intended use in spinach the recommended application rate is 6 kg of Asulox® (equivalent to 2.4 kg of asulam and 2.628 kg of asulam sodium).

B.3.2.5 Concentration of active substance in material used (IIIA 3.5)

Concentration of active substance in material used (e.g. diluted spray, baits, treated seed) in g/L, g/kg, mg/kg or g/tonne

Spinach	400 - 1200 g a.s./L
Tulip, Hyacinth, Lily	270 - 1200 g a.s./L

Asulox® is a SL formulation containing 400g/L of asulam and 438 g/L of asulam sodium. It has other brand names such as Asilax, Asulox 40, Asulox N, Sempalox and Asulam 400.

B.3.2.6 Method of application (IIIA 3.6)

Description of the method of application, type of equipment used and type and volume of diluent per unit of area or volume

Method of application:	High volume spray
Type of equipment used:	Ground boom sprayer
Volume of diluent per unit of area or volume Spinach: Tulip, hyacinth, lily:	 200 - 600 L/ha 200 - 600 L/ha

Asulox® is applied using conventional terrestrial boom sprayer equipment.

Asulox® should be applied in a volume of 200 – 600 L/ha of water. A spray pressure of at least 2 bar is advised. Good even spray coverage is essential for optimum efficacy.

B.3.2.7 Number and timing of applications and duration of protection (IIIA 3.7)

Maximum number of applications and their timing

One application of Asulox® at the recommended rate should be made per crop.

For each application, growth stages of the crop or plants to be protected

Spinach (pre emergence): Until 3 days after sowing.

Spinach (post emergence): BBCH 12 -14.

Tulip, hyacinth, lily: Post emergence when weeds have height of 4 - 6 cm.

For each application, development stages of the harmful organism concerned

Inhibition process of cell division in the meristematic organs of the plant and the greatest visual effects of the treatment therefore occur in new growth .

Duration of protection afforded by each application

Protection last approximately 2-3 weeks.

Duration of protection afforded by the maximum number of applications

Protection last approximately 2-3 weeks.

B 3.2.8 Necessary waiting period or other precautions to avoid phytotoxic effects on succeeding crops (IIIA 3.8)

There is no recommended waiting period other than the normal crop duration. Asulox® is well tolerated by succeeding crops.

Minimum waiting periods or other precautions between last application and sowing or planting succeeding crops

Post-emergence application of asulam sodium to spinach at rates up to 2400 g a.s./ha is not likely to induce significant residues in following crops. As shown by the confined crop rotation study the uptake and transfer of asulam sodium from soil into the root and aerial part of plants is extremely low. Therefore, it is not necessary to define a waiting period between post-emergence application of asulam sodium to spinach and sowing or planting the succeeding crop.

Limitations on choice of succeeding crops

There are no limitations on choice of succeeding crops after application of asulam.

Description of damage to rotational crops

No information available.

B.3.3 Summary of data on application

The information supplied adequately addresses the data on application.

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

Refer to Safety Data Sheet pursuant to Article 27 of Council Directive 67/548/EEC dossier reference in dossier Document K:CA 3.7/01.

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

Reference to Safety Data Sheet pursuant to Article 27 of Council Directive 67/548/EEC dossier reference in dossier Document K:CA 3.7/01.

B.3.4.2 Procedures for destruction or decontamination (IIA 3.8.1, IIA 3.8.2)

Pyrolytic behaviour of the active substance under controlled conditions at 800°C and the content of polyhalogenated dibenzo-p-dioxins in the products of pyrolysis

Report:

Le Gren, I. (2004) Asulam Sodium: incineration as a safe means of disposal and pyrolytic behaviour under controlled conditions. Bayer CropScience, Unpublished report No.: C041487

Guidelines:

Not applicable

GLP:

Not relevant

Findings:

Incineration must be done under controlled conditions according to the EC directive 94/67:
- residence time greater than 2 seconds,
- presence of more than 6 % of oxygen.

Since asulam sodium contains less than 1% of halogens following criteria is requested: temperature above 850°C.

Detailed instructions for safe disposal

No methods other than controlled incineration are recommended for disposal.

Methods other than controlled incineration for disposal of the active substance, contaminated packaging and contaminated materials

Detailed description of such methods

Not applicable.

Data to establish their effectiveness and safety

Not applicable.

B.3.4.3 Emergency measures in case of an accident (IIA 3.8.2, IIA 3.9)

Refer to Safety Data Sheet pursuant to Article 27 of Council Directive 67/548/EEC dossier reference in dossier Document K:CA 3.7/01.

Procedures for the decontamination of water in case of an accident

Report:

Le Gren, I. (2004) Asulam Sodium – Procedure for the decontamination of water in case of accident. Bayer CropScience, Unpublished report No.: C041545

Guidelines:

Not applicable

GLP

Not relevant

Findings:

In case of contamination of water with asulam sodium by spillage due to an accident, always try to isolate and protect the contaminated area. Water should be used as sparingly as possible to clean up the area. Where feasible, the contaminated water should be pumped out and isolated for further appropriate treatment. The collected contaminated water must be burnt in a commercial incinerator. If incineration facilities are inadequate, obtain advice from the manufacturer on other decontamination methods.

In any case, the contaminated water must not come in contact with surface water. If accidentally contaminated water is used to produce drinking water, ensure with the competent authorities that the level of contamination does not reach the parametric value for drinking water.

Conclusion:

The procedure for decontamination of water is concluded to be acceptable.

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

B.3.5.1 Packaging (type, materials, size etc.), compatibility of the preparation with the proposed packaging materials (IIIA 4.1)

Product names: Asulox

Description and specification of the packaging and materials used in packaging, size, capacity, size of openings, types of closure and seals

Packaging

Materials: Bottle: High density polyethylene
Cap: High density polyethylene or Polypropylene co Polymer

Specifications

Shape/size:	This Plant Protection Product is allowed to be sold in e.g. 1 L, 5 L and 10 L, containers depending on the country, the market size and the biological efficient dose rate.
Opening and closure:	Screw cap 36-50-63 mm (with HF seal or internal wad or linerless) - to fit container neck as defined in ECPA One Trip Container Guidelines or DIN 6063.
Refillability or returnability of the containers:	These containers should not be refilled. The applicant does recommend a decontamination and a destruction process following the countries recommended procedures.

Report:

Juergensen, C. (2004a) SL Asulam 400 g/litre. Packaging: 1 L, 5 L, 10 L, 20 L and 25 L. United Phosphorus Limited, Unpublished report No.: C042781

Suitability of the packaging and closures: strength; leakproofness; resistance to normal transport and handling

Packaging materials & solutions have been tested and comply with Annex A.5 of ADR ([1]) respectively Annex V of RID respectively of IMDG – Code. Therefore an appropriate UN certificate has been issued and the numbers, as required by PSD ([2]) are provided below:

12 x 1 L; i.e. UN 4G / Y 17 / S /
4 x 5 L; i.e. UN 4G / Y 27 / S /
2 x 10 L; i.e. UN 4G / Y 28 / S /
1 x 20 L; i.e. UN 3H1 / Y 1.4 / 120 / (the package size is not relevant for the intended use)
1 x 25 L; i.e. UN 3H1 / Y 1.4 / 120 / (the package size is not relevant for the intended use)

Resistance of the packaging material to its contents

The material proposed for use (High Density Poly Ethylene - HDPE) is known from experience to be compatible with water based formulations, and resistant to the influences of chemicals.

However, resistance of packaging material to its contents has been tested in accordance with GIFAP Technical Monograph No 17 (May 1993). The results show that no detrimental effects were noted demonstrating the acceptability of the packaging material (CP 2.8.2/01, Document No. R004779).

B.3.5.2 Procedures for cleaning application equipment (IIIA 4.2)

Report:

([1]) European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR -1990)

([2]) UK – PSD Data Requirements Handbook Point 2.6.

Richards, K. (2008) Asulox Tank Cleaning Study. United Phosphorus Limited, Unpublished report No.: ACE-08-226

Guidelines:

PSD Guideline 302
Deviations: None

GLP:

Yes (official Recognition of Efficacy Testing Facilities or Organisations in The United Kingdom, United Kingdom)

Materials and Methods

Test Material:

Asulox® purity not stated Batch No.: not stated

Test Design:

220 mL of Asulox® was mixed with 4 litres of water in polypropylene and stainless steel tanks. The tanks were rinsed using a regime of two water rinses followed by two water + 'All Clear Extra' followed by a final water rinse. The methodology is described in the main body of the report and designed with reference to PSD Guideline 302.

Results and Discussion:

Results show that in both stainless steel and polypropylene tanks two rinses with water followed by two rinses with 'All Clear Extra' and a final rinse of water will reduce any residues left in the tanks to below ≤ 6 µg/mL.

Conclusions:

Common agricultural practice implies cleaning of application equipment with water. This will remove the remainders of Asulox® efficiently that no plant damage can be caused when equipment is used subsequently to the treatment of different crops.

Procedures for cleaning application equipment and protective clothing

General statement

All application equipment and contaminated protective clothing should be washed/cleaned with water or a diluted detergent solution and thoroughly rinsed. Care should be taken not to spill the contaminated washings from application equipment into waste water channels. Contaminated cleaning liquids should be disposed of safely according to local regulations.

Application equipment

Product left over in field spraying equipment which has not been sufficiently cleaned may cause damage during sequential treatment of sensitive crops. As a consequence, cleaning out of field spraying equipment is an essential part of the recommendations for use of plant protection product.

Procedure

Empty the spraying equipment completely on the field just spayed. Remove all filters and nozzles, scrub clean and rinse them with clean water. Put 10% clean water into tank to cover the agitator. Operate a tank flushing system if fitted. Circulate water through the pump and controls for at least one minute. Drain sprayer, collect washings. Repeat procedure once more. Pump last washing water out through boom feed hoses and pipes. Collect washings. Clean off the outside of the sprayer using minimum water volumes. Collect washings. Replace cleaned nozzles and filters. Collect and put all washings back into the tank and spray out on the field headland, or otherwise safely dispose of them. Ensure the sprayer systems are completely drained before storage. Store Plant Protection Equipment in a properly designated store.

Protective clothing

All contaminated clothing should be washed/cleaned through with a dilute detergent solution and thoroughly rinsed with clean water.

- Impermeable overalls, boots and face shields should be washed clean and dried
- Permeable overalls should be laundered after use
- Disposable overalls and gloves should be washed and disposed of as contaminated waste
- Gloves and boots should be washed clean, if necessary on the insides as well.

Effectiveness of the cleaning procedures

A study with field sprayers was conducted to test the tank wash behaviour of the test substance AE F074383 00 SL33 A1 (formerly EXP04668A). Dosage of 11 L/ha in 550 L/ha water. The test substance was applied with a field sprayer in order to empty it, after which the inside of the sprayer was cleaned in specified working steps. The active substance content of the rinsing liquid was analysed.

The used sprayer RAU SPRIDOMAT D2 contained already after one rinsing step with 10% of the tank capacity, a separate filter cleaning, and a complete tank refill 55.7 mg/L active substance Asulam equivalent to about 0.7% of the target concentration. This dosage could not cause damages in sensitive non target crops.

Report:

Friessleben, R. (2002) Instructions/recommendations for tank cleaning after application of Asulox Code: EXP04668A. United Phosphorus Limited, Unpublished report No.: C019817

Guidelines:

None
Deviations: No

GLP:

Yes

Materials and Methods

Test Material:

Asulox Code: EXP04668A, Batch No.: not stated

Test Design:

4.0 L of EXP04668A was mixed with 200 L of water in a tank. The tank was emptied and rinsed using a regime of two water rinses followed by separate cleaning of all filters and a final water rinse. The methodology is described in the main body of the report.

Results and Discussion:

The results show that after two water rinses, a filter clean and a complete tank refill, the amount of asulam in the cleaning liquid was below 1 mg/L.

Conclusions:
The study shows that when tank sprayers are used with Asulox® in accordance with normal good agricultural practice, no damage to non-target crops should be expected.

B.3.5.3 Re-entry periods, necessary waiting periods or other precautions to protect man, livestock and the environment (IIIA 4.3)

Due to the recommended post-harvest application at BBCH of 12-14 of Asulox® on spinach the setting of a pre-harvest interval is not relevant. Numerous trials have shown that an interval of 21 days is always met.

Pre-harvest interval (in days) for each relevant crop

For post-emergence application a pre-harvest interval of 21 days is proposed.

Re-entry period (in days) for livestock, to areas to be grazed

Not relevant, no grazing.

Re-entry period (in hours or days) for man to crops, buildings or spaces treated

Asulox® shows only a small tendency to volatilise under practical use conditions. Under practical conditions it is not necessary to perform any re-entry activities shortly after treatment in spinach or flowerbulbs during which intensive contact with treated crop will occur. Therefore a specific re-entry period is not needed.

Withholding period (in days) for animal feedingstuffs

Not relevant, no use as feeding stuff before harvest.

Waiting period (in days) between application and handling treated products

Not relevant, no use as feeding stuff before harvest.

Waiting period (in days) between last application and sowing or planting succeeding crops

Not needed, no phytotoxicity and no residues in succeeding crops if used as recommended (see also CP, point 3).

Information on any specific agricultural, plant health or environmental conditions under which the preparation may or may not be used

Test results and observations do not indicate a demand for restrictions.

B.3.5.4 Recommended methods and precautions concerning handling, storage, transport or fire (IIIA 4.4)

Statement of the risks arising and the recommended methods, precautions and handling procedures to minimise those risks, relating to-

Hazard identification:

On the basis of available information, asulam sodium is not expected to produce any significant adverse health or environmental effects when the recommended use instructions are followed.

Handling:

Handle with appropriate personal protective equipment. Avoid contact with eyes.

Store at room temperature in the dark.

Warehouse storage

Keep out of the reach of children.
Keep away from food, drink and animal feeding stuffs.
When using, do not eat, drink or smoke.
Store in the original container under usual warehouse conditions.

For more information see:

- Guidelines for the safe handling of pesticides during their formulation, packing, storage and transport (GCPF).
- Guidelines for the safe warehousing of crop protection products (GCPF).

User level storage

Keep out of the reach of children.
Keep away from food, drink and animal feeding stuffs.
When using, do not eat, drink or smoke.
Store in the original container.

Transport

Transport information

GGVSee/IMDG Code:	3082	UN No.: 3082	MFAG: Not applicable	EmS:	F-A S-F
PG:	III	MPO:	Not applicable		
GGVE/GGVS:		Not applicable	RID/ADR:	UN 3082	
Warning sign: Hazard no.		90	Substance no.	UN 3082	
ADNR:		UN 3082	ICAO/IATA-DGR:	UN 3082	

Declaration for land shipment: No further information

Declaration for sea shipment: No further information

Declaration for shipment by air No further information

Other information: None

UN Proper Shipping Name:	Environmentally hazardous substance, liquid, n.o.s. (asulam sodium)
UN No:	3082
UN Danger Class:	9
UN Packing Group:	III
IMDG Particulars:	Marine Pollutant: No
ICAO/IATA Particulars:	As for UN
ADR/RID Particulars:	As for UN

Product packs of the product should be transported in properly secured, palletised loads. Appropriate documentation explaining the properties and hazards of the product should be provided to the transport company/driver.

Do not stow the product together with food, feed and consumable items.

Dispatch by post is not permitted.

Fire

Extinguish fires with foam or carbon dioxide (CO_2), dry powders, water spray. Avoid the escape of fire-fighting water to the environment. Wear a self-contained breathing apparatus. Water should be used as sparingly as possible and if contaminated it must not come in contact with surface water. It must be collected and burned in a commercial incinerator. If burning facilities are inadequate, obtain the manufacturer's advice on decontamination methods.

Protective clothing and equipment proposed for use in storage, transport or in the event of fire – nature

If product is handled such that there is a risk:

Respiratory protection:	Wear suitable respiratory equipment
Hand protection:	Chemical resistant gloves (PVC)
Eye protection:	Approved safety goggles.
Skin and body protection:	Wear chemical protective clothing.
Hygiene measures:	Do not eat, drink or smoke in areas where this product is used or stored. Remove contaminated clothing.
Engineering measures:	Ensure adequate ventilation of the working area.

Protective clothing and equipment proposed for use in storage, transport or in the event of fire – characteristics

Please refer to previous section above.

Sufficient data to evaluate suitability and effectiveness of the protective clothing and equipment under realistic conditions of use

Safety glasses to protect the eyes, PVC-coated gloves and protective clothing are recommended as routine hygienic measure. They are well known to sufficiently protect hands and eyes from contact with the product handled.

Procedures to minimise the generation of waste

To minimise product waste, users are required not to prepare more than they will use for the treatment.

To minimise package waste, empty and rinsed containers should be delivered to a local container collection programme, where available. Otherwise, they should be rendered unusable, e.g. by puncturing, and disposed of in accordance with local regulations.

To minimise generation of leftovers, users are recommended to store not more than will be consumed within the shelf life period of the product.

Information on combustion products likely to be generated in the event of fire

Not flammable, danger of toxic gases in smoke in case of fire (carbon and nitrogen oxides and hydrochloric acid).

B.3.5.5 Emergency measures in case of an accident (IIIA 4.5)

Detailed procedures for use in the event of an accident during transport, storage or use

Containment of spillages

Any spillage should be prevented from entering drains or watercourses. Do not wash away product spillages; use sand or earth or a commercially available inert absorbent material to

contain spillage. Contaminated absorbent material should then be collected up into a suitable container, e.g. polydrum and disposed of safely by incineration.

Decontamination of areas, vehicles and buildings

If required, steam cleaning or washing with detergent and cloths will decontaminate surfaces. Use minimum quantities of cleaning agent, collect all rinsings and cleaning materials for disposal.

Disposal of damaged packaging, adsorbents and other materials

All materials must be collected and disposed of by incineration in an authorised waste incineration plant.

Protection of emergency workers and bystanders

Keep members of the public away from any spillage or fire involving this product. Emergency workers should wear protective clothing, goggles and PVC or nitrile rubber gloves during clean up of spillages; for fire-fighting, self contained breathing apparatus should be worn.

First aid measures

Skin contact: Wash off immediately with plenty of soap and water. Remove contaminated clothing. Seek medical attention if irritation or symptoms persist. May cause sensitisation by skin contact.

Eye contact: Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Seek medical attention if irritation or symptoms persist.

Inhalation: Move the exposed person to fresh air. Seek medical attention.

Ingestion: Seek medical attention if irritation or symptoms persist. Do not induce vomiting.

B.3.5.6 Procedures for destruction or decontamination of the plant protection product and its packaging (IIIA 4.6)

a) **Neutralisation procedures (e.g. reaction with alkali to form less toxic compounds) for use in the event of accidental spillages**

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 this event collect and dispose of the residues and contaminated materials through controlled incineration according to the procedure described under B.3.5.6.b below.

Details of proposed procedures for small quantities

See above

Evaluation of products of neutralisation (small quantities)

See above

Procedures for disposal of neutralised waste (small quantities)

See above

Details of proposed procedures for large quantities

See above

Evaluation of products of neutralisation (large quantities)

See above

Procedures for disposal of neutralised waste (large quantities)

See above

b) Disposal procedures for the plant protection product

Detailed instructions for safe disposal of the plant protection product and its packaging

Leftover quantities of the product have to be burned in a commercial incinerator. Cover spilled liquid with inert absorbent such as lime, saw dust, clay or fuller's earth. After the liquid has been absorbed, carefully sweep it up into a disposable container. Burn the container in a commercial incinerator.

Combustible Types

Rinse the emptied containers thoroughly with plenty of water, burn them in a commercial incinerator or treat them like the non-combustible types. In field applications the washing solutions have to be added to the spray mixture, otherwise they have to be burned in a commercial incinerator.

Non-combustible Types

Rinse the emptied containers thoroughly with plenty of water and mutilate them by puncturing or other means to ensure no further use. Convey these containers to a house waste disposal area. In field applications the washing solutions have to be added to the spray mixture, otherwise they have to be burned in a commercial incinerator.

Methods other than controlled incineration for disposal

No methods other than controlled incineration are recommended for disposal.

B 3.6 Summary of further information on the active substance and plant protection product

Information supplied adequately addresses methods for handling the active substance and plant protection products.

B.3.7 References relied on

In every chapter (B.1, B.2, etc.) in Volume 3 (AS) the reference relied on heading should start with a paragraph indicating how the literature search was carried out and if this is considered acceptable. It should also be indicated if the RMS can agree with the justifications given by the notifier (especially for non-relevant literature).This is not expected to be a detailed study-by-study consideration. Relevant literature would be evaluated and assessed in the normal way within each section.

For (draft) renewal assessment reports the reference lists at the end of each section/chapter (sorted by data requirement) should include the newly submitted data relied upon as well as those original submitted tests and studies that are still considered relevant to support the application for renewal. However these studies should be clearly identified in the reference list as well as in the individual study sections. This could be done by consistent use of a statement for each study:
Previous evaluation: responded "N.A". for NAS, "Submitted for the purpose of renewal", or "In DAR (year)", "In addendum to DAR (year)" or any other appropriate

Active substance

*Details to be added during Peer review

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or Unpublished	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	*Previous evaluation
CA 3.8.1/01	Le Gren, I.	2004	Asulam Sodium: incineration as a safe means of disposal and pyrolytic behaviour under controlled conditions United Phosphorus Limited Report No.: C041487 Bayer CropScience Non GLP, unpublished	N	Y	Data protection is claimed in accordance with Article 59 of Regulation (EC) No 1107/2009	UPL	

Plant Protection Product – 'Asulox'
*Details to be added during Peer review

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or Unpublished	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	*Previous evaluation
CP 4.1.1/01	Juergensen, Ch	2004	SL: Asulam 400 g/litre Packaging: 1 L, 5 L, 10 L, 20 L and 25 L United Phosphorus Limited Report No.: C042781 Bayer CropScience, IOP, Monheim, Germany; Non GLP, unpublished	N	Y	Data protection is claimed in accordance with Article 59 of Regulation (EC) No 1107/2009	UPL	
CP 4.2/01	Richards, K.	2008	Asulox Tank Cleaning Study Agro Chemex Ltd Document No: ACE-08-226 GLP, Unpublished	N	Y	Data protection is claimed in accordance with Article 59 of Regulation (EC) No 1107/2009	UPL	
CP 4.2.2/01	Friessleben, R.	2002	Instructions/ recommendations for tank cleaning after application of Asulox Code: EXP04668A United Phosphorus Limited Report No.: C019817 Aventis CropScience GmbH Non GLP, Unpublished	N	Y	Data protection is claimed in accordance with Article 59 of Regulation (EC) No 1107/2009	UPL	
CP 4.4/01	Anon.	2013	Safety data sheet Asulox United Phosphorus Limited Report No.: not applicable Non GLP, Published	N	N	-	UPL	
CP 4.7/01	Le Gren, I.	2004 b	Asulam Sodium: incineration as a safe means of disposal and pyrolytic behaviour under controlled conditions United Phosphorus Limited Report No.: C041487 Bayer CropScience Study No.: C041487 Bayer CropScience Non GLP, unpublished ⇒ CA 3.8.1/01	N	Y	Data protection is claimed in accordance with Article 59 of Regulation (EC) No 1107/2009	UPL	