

SAFETY PRECAUTIONS

Operator protection:

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

WEAR SUITABLE PROTECTIVE GLOVES AND FACE PROTECTION (FACESHIELD) when handling the concentrate.

However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.

WHEN USING DO NOT EAT, DRINK OR SMOKE.

DO NOT BREATHE SPRAY.

WASH CONCENTRATE from skin and eyes immediately.

WASH HANDS AND EXPOSED SKIN before eating and drinking, and after work.

Environmental protection:

DO NOT CONTAMINATE WATER with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

Storage and disposal:

KEEP OUT OF REACH OF CHILDREN.

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDING STUFFS.

KEEP IN ORIGINAL CONTAINER, tightly closed, in a safe place.

RINSE CONTAINER THOROUGHLY by using an integrated pressure rinsing device or manually rinsing three times. Add washings to sprayer at time of filling and dispose of safely.

DO NOT RE-USE CONTAINER for any purpose.



Dow AgroSciences



Starane® Vantage®

HERBICIDE

Product Registration Number: MAPP 10922

A suspension emulsion formulation containing
100 g/litre fluroxypyr methyl heptyl ester and 1.0 g/litre florasulam.

A post-emergence herbicide for use on all varieties of
WINTER AND SPRING WHEAT, BARLEY AND OATS
for the control of CLEAVERS and COMMON CHICKWEED.

The (COSHH) Control of Substances Hazardous to Health Regulations
may apply to the use of this product at work.

READ DIRECTIONS FOR USE ON ATTACHED LEAFLET.

**PROTECT FROM FROST
SHAKE WELL BEFORE USE**

5 Litres e

Dow AgroSciences Limited

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IRRITANT



**DANGEROUS FOR
THE ENVIRONMENT**

IRRITATING TO EYES, RESPIRATORY
SYSTEM AND SKIN.

**MAY CAUSE SENSITISATION BY
SKIN CONTACT.**

**VAPOURS MAY CAUSE DROWSINESS
AND DIZZINESS.**

**TOXIC TO AQUATIC ORGANISMS, MAY
CAUSE LONG-TERM ADVERSE EFFECTS
IN THE AQUATIC ENVIRONMENT.**

WEAR SUITABLE GLOVES.

AVOID CONTACT WITH SKIN.

IN CASE OF CONTACT WITH EYES, RINSE
IMMEDIATELY WITH PLENTY OF WATER
AND SEEK MEDICAL ADVICE.

THIS MATERIAL AND ITS CONTAINER
MUST BE DISPOSED OF IN A SAFE WAY.
USE APPROPRIATE CONTAINMENT TO
AVOID ENVIRONMENTAL CONTAMINATION.

**To avoid risks to man and the environment,
comply with the instructions for use.**

IMPORTANT INFORMATION

FOR USE ONLY AS AN AGRICULTURAL HERBICIDE

Crops	Maximum Individual Dose	Maximum Total Dose	Latest Time of Application
Winter wheat, winter barley	1.8 litres product per hectare	1.8 litres product per hectare per crop	Before flag leaf sheath opening stage (up to Zadoks 45 inclusive)
Winter oats	1.8 litres product per hectare	1.8 litres product per hectare per crop	Before second node detectable stage (up to Zadoks 31 inclusive)
Spring wheat, spring barley	1.5 litres product per hectare	1.5 litres product per hectare per crop	Before flag leaf sheath extended stage (up to Zadoks 39 inclusive)
Spring oats	1.5 litres product per hectare	1.5 litres product per hectare per crop	Before second node detectable stage (up to Zadoks 31 inclusive)

Other Specific Restrictions:

For autumn planted crops a maximum total dose of 3.75 g of florasulam must be observed for applications made between crop emergence in the year of planting and February 1st in the year of harvest.

The total amount of florasulam applied to a cereal crop must not exceed 7.5 g.

**READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL
MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS.**

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9 UKE 1213 STVT A



DIRECTIONS FOR USE

IMPORTANT: This information is approved as part of the Product Label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.

GENERAL INFORMATION

STARANE® VANTAGE® is mainly absorbed through the foliage of weeds. The ideal timing for application is when the weeds are small and actively growing.

NOTES

Do not spray when crops are under stress from cold, drought, pest damage, nutrient deficiency etc.

Do not roll or harrow 7 days before or after application.

Take extreme care to avoid drift onto crops and non-target plants outside the target area.

WEED SUSCEPTIBILITY AND MAXIMUM SIZE CONTROLLED

Weed	Size Controlled
Cleavers*	Flowering
Chickweed	Flowering

*Cleavers which germinate after application will not be controlled

CROPS

STARANE VANTAGE can be used on all varieties of winter and spring wheat, barley and oats.

SOIL

STARANE VANTAGE may be used on all soil types.

TIMING

Winter wheat, winter barley

STARANE VANTAGE should be applied from 3 leaves (Zadoks 13) up to before flag leaf sheath opening stage (Zadoks 45).

Spring wheat, spring barley

STARANE VANTAGE should be applied from 3 leaves (Zadoks 13) up to and including before flag leaf sheath extending stage (Zadoks 39).

Winter oats, spring oats

STARANE VANTAGE should be applied from 3 leaves (Zadoks 13) up to and including before second node detectable stage (Zadoks 31).

RATES OF USE

One application of up to 1.8 litres/ha in winter crops or 1.5 litres/ha in spring crops will control all susceptible emerged weeds. A split application may be applied up to a maximum total dose of 1.8 litres/ha (winter crops) or 1.5 litres/ha (spring crops) where weed germination takes place over an extended period.

APPLICATION

STARANE VANTAGE may be applied through tractor-mounted hydraulic sprayers providing they are in good working order and have been calibrated according to the manufacturers' recommendations.

Do not apply through CDA applicators.

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WATER VOLUME

Apply STARANE VANTAGE in 150 to 250 litres of water per hectare. The lower volume must only be used in open crops on small weeds.

FOLLOWING CROPS

Crops that can be sown in the year of treatment with STARANE VANTAGE:

Cereals, oilseed rape¹, field beans, vegetable brassicas as transplants, grass.

¹Vigour reductions may be seen in following crops of oilseed rape after a dry summer. This will be outgrown and will not result in yield loss.

Crops that can be sown the calendar year following treatment with STARANE VANTAGE:

Cereals, oilseed rape, field beans, carrots, vegetable brassicas as transplants, grass, linseed, pea, sugar beet, potatoes, maize, clover (for use in grass/clover mixtures).

JOINT APPLICATION

A joint application is the use of a product in tank mixture or sequence with another product.

IMPORTANT NOTE: Joint applications should only be made within the label recommendations of every product in the application.

Only one other product with an ALS-inhibitor mode of action may be applied to a cereal crop treated with STARANE VANTAGE. However a further application of STARANE VANTAGE or another product containing florasulam may also be made providing the **maximum total dose of florasulam is not exceeded**¹.

STARANE VANTAGE may be applied in joint application to the same cereal crop with one of the following ALS products:

Absolute	Hunter ¹
Alias SX	Inka SX
Ally Max SX	iodosulfuron-methyl sodium (MAPP 12364, 15174)
Avro SX	Jubilee SX
Barton WG ¹	Lexus Class
Biplay SX	Lexus Millenium
Boxer ¹	Lexus SX
Broadway Star ¹	Lorate
Broadway Sunrise ¹	mesosulfuron-methyl + iodosulfuron-methyl sodium (MAPP 12049, 12478, 14524, 14541, 14604)
Bullion	mesosulfuron-methyl + iodosulfuron-methyl sodium + diflufenican (MAPP 12695)
Calibre SX	Oklar SX
Chimera SX	Oriel 50SX
Concert SX	Presite SX
Ductis SX	Ratio SX
Exceed SX	Simba SX
Finish SX	Slalom ¹
Galaxy ¹	Spitfire ¹
GEX 353	Staka SX
GF-184 ¹	Starane Gold ¹
GF-2070	Starane Vantage ¹
Harmony M SX	Starane XL ¹
Headland Sure-Fire Gold ¹	Thor
Hiker ¹	Traton SX

¹ The maximum total dose of florasulam applied to the crop must not exceed 7.5 g. For autumn planted crops a maximum total dose of 3.75 g of florasulam, must be observed for applications made between crop emergence in the year of planting and February 1st in the year of harvest.

Apart from these specific joint applications STARANE VANTAGE must NOT be applied with any other product containing an ALS-inhibitor, for example amidosulfuron or triasulfuron.

CROP FAILURE

In the event of a crop failure in the spring with STARANE VANTAGE, only the following crops may be planted: spring wheat, spring barley, spring oats, maize or ryegrass.

MIXING

Half fill the spray tank with water and add the required amount of STARANE VANTAGE. Fill up the spray tank, agitating continuously to ensure thorough mixing, and maintain agitation until spraying is complete. Use only clean water for mixing.

SPRAY QUALITY

Apply STARANE VANTAGE as a MEDIUM spray as defined by the BCPC system.

TANK MIXTURES

Where tank mixes are used, and unless directed otherwise, the preferred order of addition of products to the spray tank is as follows: water dispersible granules, wettable powders, suspension concentrates (flowables), emulsifiable concentrates, solution concentrates. Each product should be added to the half-full sprayer and be fully dispersed before the addition of the next product.

TANK CLEANING

To avoid subsequent injury to crops other than cereals, all spraying equipment must be thoroughly cleaned both inside and out, using All Clear Extra spray cleaner as follows:

1. Immediately after spraying, drain tank completely. Any contamination on the outside of the spraying equipment should be removed by washing with clean water.
2. Rinse inside of tank with clean water and flush through booms and hoses using at least one tenth of the spray tank volume. Drain tank completely.
3. Half fill tank with clean water and add All Clear Extra at the recommended rate. Agitate and then briefly flush the boom and hoses with the cleaning solution. Top up with water making sure the tank is completely full and allow to stand for 15 minutes with agitation. Flush the boom and hoses and drain tank completely.
4. Nozzles and filters should be removed and cleaned separately with All Clear Extra solution containing 50 ml of All Clear Extra per 10 litres of water.
5. Rinse the tank with clean water and flush through the boom and hoses using at least one tenth of the spray tank volume. Drain tank completely.
6. For disposal of washings, follow Code of Practice for Using Plant Protection Products. Do not spray onto sensitive crop or land intended for cropping with sensitive crop.

Note: If it is not possible to drain the tank completely, step 3 must be repeated before going onto step 4.

TRADEMARK ACKNOWLEDGEMENTS

STARANE, VANTAGE, Boxer, Barton, Broadway, Galaxy, Hiker, Hunter, Slalom, Spitfire and Sunrise are trademarks of Dow AgroSciences LLC.

All other brand names referred to are trademarks of other manufacturers for which proprietary rights may exist.

DOW AGROSCIENCES CONDITIONS OF SUPPLY

All goods supplied by us are of high grade and we believe them to be suitable but, as we cannot exercise control over their storage, handling, mixing or use, or the weather conditions before, during or after application which may affect the performance of the goods, all conditions and warranties, statutory or otherwise, as to the quality or fitness for any purpose of our goods are excluded. No responsibility will be accepted by us or re-sellers for any failure in performance, damage or injury whatsoever arising from their storage, handling, application or use. These conditions cannot be varied by our staff or agents whether or not they supervise or assist in the use of such goods.

Safety Data Sheet

This Safety data Sheet does not form part of the approved product label.

Section 1. Identification of the substance/preparation and of the company/undertaking

1.1 Product identifiers

Product Name

STARANE VANTAGE® Herbicide

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Plant Protection Product

1.3 Details of the supplier of the safety data sheet

COMPANY IDENTIFICATION

Dow AgroSciences Limited
A Subsidiary of The Dow Chemical Company
Latchmore Court, Brand Street
SG5 1NH Hitchin
United Kingdom

SDSQuestion@dow.com

1.4 EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 00 31 115 694 982

Local Emergency Contact: 00 31 115 694 982

Section 2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Xi	R36/37/38	Irritating to eyes, respiratory system and skin.
	R43	May cause sensitisation by skin contact.
	R67	Vapours may cause drowsiness and dizziness.
N	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

2.2 Label elements

Labelling according to EC Directives

Hazard Symbol:

Xi - Irritant.
N - Dangerous for the environment.

Risk Phrases :

R36/37/38 - Irritating to eyes, respiratory system and skin.
R43 - May cause sensitisation by skin contact.
R67 - Vapours may cause drowsiness and dizziness.
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases :

S2 - Keep out of the reach of children.
S13 - Keep away from food, drink and animal feeding stuffs.
S24 - Avoid contact with skin.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S35 - This material and its container must be disposed of in a safe way.
S37 - Wear suitable gloves.
S46 - If swallowed, seek medical advice immediately and show this container or label.
S57 - Use appropriate containment to avoid environmental contamination.

To avoid risks to man and the environment, comply with the instructions for use.

2.3 Other Hazards

No information available.

Section 3. Composition/information on ingredients

3.2 Mixture

This product is a mixture.

CAS-No. / EC-No. / Index	REACH No.	Amount	Component	Classification: REGULATION (EC) No 1272/2008
CAS-No. 81406-37-3 EC-No. 279-752-9 Index 607-272-00-5	—	14.6 %	fluroxypyr-meptyl (ISO)	Aquatic Acute, 1, H400 Aquatic Chronic, 1, H410
CAS-No. 145701-23-1 EC-No. Not available Index 613-230-00-7	—	0.1 %	Florasulam (ISO)	Aquatic Acute, 1, H400 Aquatic Chronic, 1, H410
CAS-No. Not available EC-No. 918-668-5	01-2119455851-35	> 30.0 - < 40.0 %	Hydrocarbons, C9, aromatics	Flam. Liq., 3, H226 Asp. Tox., 1, H304 STOT SE, 3, H335 STOT SE, 3, H336 Aquatic Chronic, 2, H411
CAS-No. 57-55-6 EC-No. 200-338-0	01-2119456809-23	< 5.0 %	Propylene glycol#	Not classified

CAS-No. / EC-No. / Index	Amount	Component	Classification: 67/548/EEC
CAS-No. 81406-37-3 EC-No. 279-752-9 Index 607-272-00-5	14.6 %	fluroxypyr-meptyl (ISO)	N: R50, R53
CAS-No. 145701-23-1 EC-No. Not available Index 613-230-00-7	0.1 %	Florasulam (ISO)	N: R50, R53
CAS-No. Not available EC-No. 918-668-5	> 30.0 - < 40.0 %	Hydrocarbons, C9, aromatics	R10; Xn: R65; Xi: R37; R66; R67; N: R51/53
CAS-No. 57-55-6 EC-No. 200-338-0	< 5.0 %	Propylene glycol#	Not classified.

Substance(s) with an Occupational Exposure Limit.

For the full text of the H-Statements mentioned in this Section, see Section 16.

See Section 16 for full text of R-phrases.

Section 4. First-aid measures

4.1 Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control centre or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Skin Contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice. Suitable emergency safety shower facility should be available in work area.

Eye Contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control centre or doctor for treatment advice. Suitable emergency eye wash facility should be available in work area.

Ingestion: No emergency medical treatment necessary.

4.2 Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

4.3 Indication of immediate medical attention and special treatment needed

Maintain adequate ventilation and oxygenation of the patient. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control centre or doctor, or going for treatment.

Skin contact may aggravate preexisting dermatitis.

Section 5. Fire Fighting Measures

5.1 Extinguishing Media

To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

5.2 Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn.

5.3 Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Burning liquids may be extinguished by dilution with water. Burning liquids may be moved by flushing with water to protect personnel and minimise property damage. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Section 6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures: No smoking in area. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Ventilate area of leak or spill. Refer to Section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

6.2 Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

6.3 Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay, Dirt, Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

Section 7. Handling and Storage

7.1 Precautions for safe handling

Handling

General Handling: Keep out of reach of children. Keep away from heat, sparks and flame. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapour or mist. Use with adequate ventilation. Wash thoroughly after handling. Keep container closed. Containers, even those that have been emptied, can contain vapours. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

7.2 Conditions for safe storage, including any incompatibilities

Storage

Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

7.3 Specific end uses

Refer to product label.

Section 8. Exposure Controls / Personal Protection

8.1 Control parameters

Exposure Limits

Component	List	Type	Value
fluroxypyr-meptyl (ISO)	Dow IHG	TWA	10 mg/m3
Hydrocarbons, C9, aromatics	DNEL-Worker:	Dermal - Systemic Long Term.	25 mg/kg bw/day
	DNEL-Worker:	Inhalation - Systemic Long Term.	100 mg/m3
	DNEL-Consumer:	Dermal - Systemic Long Term.	11 mg/kg bw/day
	DNEL-Consumer:	Inhalation - Systemic Long Term.	32 mg/m3
	DNEL-Consumer:	Oral - Systemic Long Term.	11 mg/kg bw/day
Propylene glycol	Ireland OELV	TWA Particulate.	10 mg/m3
	UK WEL	TWA Particulate.	10 mg/m3
	UK WEL	TWA Total vapour and particulates.	474 mg/m3 150 ppm
	WEEL	TWA Aerosol.	10 mg/m3

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

8.2 Exposure controls

Personal Protection

Eye/Face Protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 4 or higher (breakthrough time greater than 120 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 1 or higher (breakthrough time greater than 10 minutes according to EN 374) is recommended. **NOTICE:** The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. Use the following CE approved air-purifying respirator: Organic vapour cartridge with a particulate pre-filter, type AP2.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Section 9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance

Physical State

Colour

Odour

Odour Threshold

pH

Melting Point

Freezing Point

Boiling Point (760 mmHg)

Flash Point - Closed Cup

Evaporation Rate (Butyl Acetate = 1)

Flammable Limits in Air

Vapour Pressure

Vapour Density (air = 1)

Specific Gravity (H2O = 1)

Solubility in water (by weight)

Partition coefficient, n-octanol/water (log Pow)

Autoignition Temperature

Decomposition Temperature

Explosive properties

Oxidising properties

9.2 Other information

Surface tension

Appearance

Physical State

Colour

Odour

Odour Threshold

pH

Melting Point

Freezing Point

Boiling Point (760 mmHg)

Flash Point - Closed Cup

Evaporation Rate (Butyl Acetate = 1)

Flammable Limits in Air

Vapour Pressure

Vapour Density (air = 1)

Specific Gravity (H2O = 1)

Solubility in water (by weight)

Partition coefficient, n-octanol/water (log Pow)

Autoignition Temperature

Decomposition Temperature

Explosive properties

Oxidising properties

Suspension

Off-white

Characteristic

No test data available

6.2 (@ 1 %) *CIPAC MT 75.2* (1% aqueous suspension)

Not applicable

No test data available

No test data available.

63 °C *Pensky-Martens Closed Cup ASTM D 93*

No test data available

Lower: No test data available

Upper: No test data available

No test data available

No test data available

0.991 20 °C/4 °C *Pyknometer*

emulsifiable

No data available for this product. See Section 12 for individual component data.

1,006 mbar > 400 °C *92/69/EEC A15* none below 400degC

No test data available

No *EEC A14*

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

No

Section 10. Stability and Reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under recommended storage conditions. See Storage, Section 7.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to Avoid: Active ingredient decomposes at elevated temperatures.

10.5 Incompatible Materials: Avoid contact with: Acids. Strong oxidizers.

10.6 Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials.

Section 11. Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity

Ingestion

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined.

Based on information for component(s): Estimated. LD50, rat, female > 5,000 mg/kg

Based on information for component(s): LD50, rat, male > 2,000 mg/kg

Aspiration hazard

Based on physical properties, not likely to be an aspiration hazard.

Dermal

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product: The dermal LD50 has not been determined.

Based on information for component(s): Estimated. LD50, > 5,000 mg/kg

Inhalation

Vapour concentrations are attainable which could be hazardous on single exposure. May cause respiratory irritation and central nervous system depression. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

As product: The LC50 has not been determined.

Eye damage/eye irritation

May cause moderate eye irritation. May cause slight corneal injury. Vapour may cause eye irritation experienced as mild discomfort and redness.

Skin corrosion/irritation

Brief contact may cause slight skin irritation with local redness. May cause drying and flaking of the skin.

Sensitisation

Skin

For the active ingredient(s): Has demonstrated the potential for contact allergy in mice. For the active ingredient(s): Did not cause allergic skin reactions when tested in guinea pigs.

Respiratory

No relevant data found.

Repeated Dose Toxicity

For the active ingredient(s): Based on available data, repeated exposures are not anticipated to cause significant adverse effects. Contains component(s) which have been reported to cause effects on the following organs in animals: Blood. Eye. Kidney. Liver. Respiratory tract.

Lung. In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

Chronic Toxicity and Carcinogenicity

For similar active ingredient(s). Did not cause cancer in laboratory animals. For the minor component(s): Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown.

Developmental Toxicity

For the active ingredient(s): Has been toxic to the foetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals. Based on information for component(s): Has been toxic to the foetus in laboratory animals at doses toxic to the mother. Has caused birth defects in lab animals only at doses producing severe toxicity in the mother.

For the active ingredient(s): Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown.

Reproductive Toxicity

In animal studies, active ingredient did not interfere with reproduction. Based on information for component(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Genetic Toxicology

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Component Toxicology - Fluroxypyr 1-methylheptyl ester

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Component Toxicology - Fluroxypyr 1-methylheptyl ester

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

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Component Toxicology - Florasulam

Inhalation	LC50, 4 h, Aerosol, rat > 5.0 mg/l
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Component Toxicology - Hydrocarbons, C9, aromatics

Inhalation	LC50, 4 h, rat > 10.2 mg/l
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Component Toxicology - Propylene glycol

Inhalation	No deaths occurred at this concentration. LC50, 2 h, Aerosol, rabbit 317.042 mg/l
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Section 12. Ecological Information

12.1 Toxicity

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in the most sensitive species).

Fish Acute & Prolonged Toxicity

Based on information for component(s): LC50, rainbow trout (*Oncorhynchus mykiss*), 96 h: 13.5 mg/l

Aquatic Invertebrate Acute Toxicity

Based on information for component(s): EC50, water flea *Daphnia magna*, 48 h: 31.7 mg/l

Aquatic Plant Toxicity

ErC50, Lemna minor (duckweed), biomass growth inhibition, 14 d: > 2.248 mg/l

ErC50, *Pseudokirchneriella subcapitata* (green algae), 72 h: 24.8 mg/l

Toxicity to Above Ground Organisms

For the active ingredient(s): oral LD50, *Colinus virginianus* (Bobwhite quail): > 2,000 mg/kg

For the active ingredient(s): oral LD50, *Apis mellifera* (bees): 359 micrograms/bee

For the active ingredient(s): contact LD50, *Apis mellifera* (bees): 959 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, *Eisenia fetida* (earthworms), 14 d: 608 mg/kg

12.2 Persistence and Degradability

Data for Component: fluroxypyr-meptyl (ISO)

|| Material is not readily biodegradable according to OECD/EEC guidelines.

Stability in Water (1/2-life):

|| 454 d

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
32 %	28 d	OECD 301D Test	fail

|| Theoretical Oxygen Demand: 2.2 mg/mg

Data for Component: Florasulam (ISO)

|| Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Stability in Water (1/2-life):

|| > 30 d

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
2 %	28 d	OECD 301B Test	fail

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
7.04E-11 cm ³ /s	1.82 h	Estimated.

Theoretical Oxygen Demand: 0.85 mg/mg

Data for Component: **Hydrocarbons, C9, aromatics**

For the major component(s): Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. For some component(s): Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Data for Component: **Propylene glycol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
81 %	28 d	OECD 301F Test	pass
96 %	64 d	OECD 306 Test	Not applicable

12.3 Bioaccumulative potential

Data for Component: **fluroxypyr-meptyl (ISO)**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): 5.04 Measured

Bioconcentration Factor (BCF): 26; Oncorhynchus mykiss (rainbow trout); Measured

Data for Component: **Florasulam (ISO)**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): -1.22

Bioconcentration Factor (BCF): 0.8; Fish; Measured

Data for Component: **Hydrocarbons, C9, aromatics**

Bioaccumulation: For the major component(s): Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). For the minor component(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Data for Component: **Propylene glycol**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient, n-octanol/water (log Pow): -1.07 Measured

Bioconcentration Factor (BCF): 0.09; Estimated.

12.4 Mobility in soil

Data for Component: **fluroxypyr-meptyl (ISO)**

Mobility in soil: Expected to be relatively immobile in soil (Koc > 5000).

Partition coefficient, soil organic carbon/water (Koc): 6,200 - 43,000 **Henry's Law Constant (H):** 5.5E+00 Pa*m³/mole. Measured

Data for Component: **Florasulam (ISO)**

Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient, soil organic carbon/water (Koc): 4 - 54 **Henry's Law Constant (H):** 4.35E-07 Pa*m³/mole.; 20 °C

Data for Component: **Hydrocarbons, C9, aromatics**

Mobility in soil: For the major component(s); Potential for mobility in soil is low (Koc between 500 and 2000).

Data for Component: **Propylene glycol**

Mobility in soil: Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.. Potential for mobility in soil is very high (Koc between 0 and 50).

Partition coefficient, soil organic carbon/water (Koc): < 1 Estimated.

Henry's Law Constant (H): 1.2E-08 atm*m³/mole Measured

12.5 Results of PBT and vPvB assessment

Data for Component: **fluroxypyr-meptyl (ISO)**

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Data for Component: **Florasulam (ISO)**

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Data for Component: **Hydrocarbons, C9, aromatics**

This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Data for Component: **Propylene glycol**

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Data for Component: **fluroxypyr-meptyl (ISO)**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Data for Component: **Florasulam (ISO)**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Data for Component: **Hydrocarbons, C9, aromatics**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Data for Component: **Propylene glycol**

This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Section 13. Disposal Considerations

13.1 Waste treatment methods

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

Section 14. Transport Information

ADR/RID

14.1 UN number

UN3082

14.2 UN proper shipping name

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Fluroxypyr/Florasulam

14.3 Transport hazard class(es)

Hazard Class: 9

14.4 Packing Group

PG III

14.5 Environmental hazards

Environmentally hazardous

14.6 Special precautions for user

Special Provisions: no data available

Hazard identification No:90

ADNR / ADN**14.1 UN number**

UN3082

14.2 UN proper shipping name

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Fluroxyppyr/Florasulam

14.3 Transport hazard class(es)

Hazard Class: 9

14.4 Packing Group

PG III

14.5 Environmental hazards

Environmentally hazardous

14.6 Special precautions for user

no data available

IMDG**14.1 UN number**

UN3082

14.2 UN proper shipping name

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Fluroxyppyr/Florasulam

14.3 Transport hazard class(es)

Hazard Class: 9

14.4 Packing Group

PG III

14.5 Environmental hazards

Marine pollutant

14.6 Special precautions for user

EMS Number: F-A,S-F

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

ICAO/IATA**14.1 UN number**

UN3082

14.2 UN proper shipping name

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Fluroxyppyr/Florasulam

14.3 Transport hazard class(es)

Hazard Class: 9

14.4 Packing Group

PG III

14.5 Environmental hazards

Environmentally hazardous

14.6 Special precautions for user

no data available

Section 15. Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
European Inventory of Existing Commercial Chemical Substances (EINECS)**

The components of this product are on the EINECS inventory or are exempt from inventory requirements.

Product Registration Number: UK: MAPP 10879/11451/10922 IRL: PCS No. 02074

Registration Information

MAPP 10922

15.2 Chemical Safety Assessment

For proper and safe use of this product, please refer to the approval conditions laid down on the product label.

Section 16. Other Information**Hazard statement in the composition section**

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Risk-phrases in the Composition section

R10	Flammable.
R37	Irritating to respiratory system.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful: may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

Revision

Identification Number: 63946 / 3027 / Issue Date 2013/08/05 / Version: 6.0

DAS Code: GF-185

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

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SAFETY PRECAUTIONS

Operator protection:

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

WEAR SUITABLE PROTECTIVE GLOVES AND FACE PROTECTION (FACESHIELD) when handling the concentrate.

However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.

WHEN USING DO NOT EAT, DRINK OR SMOKE.

DO NOT BREATHE SPRAY.

WASH CONCENTRATE from skin and eyes immediately.

WASH HANDS AND EXPOSED SKIN before eating and drinking, and after work.

Environmental protection:

DO NOT CONTAMINATE WATER with the product or its container.

Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

Storage and disposal:

KEEP OUT OF REACH OF CHILDREN.

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDING STUFFS.

KEEP IN ORIGINAL CONTAINER, tightly closed, in a safe place.

RINSE CONTAINER THOROUGHLY by using an integrated pressure rinsing device or manually rinsing three times. Add washings to sprayer at time of filling and dispose of safely.

DO NOT RE-USE CONTAINER for any purpose.

 Dow AgroSciences



Starane[®] Vantage[®]

HERBICIDE

Product Registration Number: MAPP 10922

A suspension emulsion formulation containing 100 g/litre fluroxypyr methyl heptyl ester and 1.0 g/litre florasulam.

A post-emergence herbicide for use on all varieties of WINTER AND SPRING WHEAT, BARLEY AND OATS for the control of CLEAVERS and COMMON CHICKWEED.

The (COSHH) Control of Substances Hazardous to Health Regulations may apply to the use of this product at work.

READ DIRECTIONS FOR USE ON ATTACHED LEAFLET.

**PROTECT FROM FROST
SHAKE WELL BEFORE USE**

5 Litres e


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IRRITANT



**DANGEROUS FOR
THE ENVIRONMENT**

IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

MAY CAUSE SENSITISATION BY SKIN CONTACT.

VAPOURS MAY CAUSE DROWSINESS AND DIZZINESS.

TOXIC TO AQUATIC ORGANISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT.

WEAR SUITABLE GLOVES.
AVOID CONTACT WITH SKIN.

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.

THIS MATERIAL AND ITS CONTAINER MUST BE DISPOSED OF IN A SAFE WAY. USE APPROPRIATE CONTAINMENT TO AVOID ENVIRONMENTAL CONTAMINATION. To avoid risks to man and the environment, comply with the instructions for use.

IMPORTANT INFORMATION

FOR USE ONLY AS AN AGRICULTURAL HERBICIDE

Crops	Maximum Individual Dose	Maximum Total Dose	Latest Time of Application
Winter wheat, winter barley	1.8 litres product per hectare	1.8 litres product per hectare per crop	Before flag leaf sheath opening stage (up to Zadoks 45 inclusive)
Winter oats	1.8 litres product per hectare	1.8 litres product per hectare per crop	Before second node detectable stage (up to Zadoks 31 inclusive)
Spring wheat, spring barley	1.5 litres product per hectare	1.5 litres product per hectare per crop	Before flag leaf sheath extended stage (up to Zadoks 39 inclusive)
Spring oats	1.5 litres product per hectare	1.5 litres product per hectare per crop	Before second node detectable stage (up to Zadoks 31 inclusive)

Other Specific Restrictions:

For autumn planted crops a maximum total dose of 3.75 g of florasulam must be observed for applications made between crop emergence in the year of planting and February 1st in the year of harvest.

The total amount of florasulam applied to a cereal crop must not exceed 7.5 g.

READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS.

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