



Animal Residue Data Sheet Sethoxydim

Sethoxydim is registered in Australia for use on a range of crops including wheat, oilseeds (canola, linseed, sunflowers and oilseed poppies), peanuts, soybeans, cotton, legumes (chick peas, faba beans, field peas, lentils, lupins), animal feeds (clover, lucerne, medic), vegetables (green peas, asparagus, brassicas, green beans, swedes, tomatoes, pumpkins, lettuce, cucumbers, carrots, red beet, zucchini, potatoes, sweet potatoes, and onions), and melons. Details of the registered use patterns can be found on the approved labels of registered products containing sethoxydim as the active constituent. This Animal Residue Data Sheet provides information on the possible residues in feed commodities obtained from crops treated with sethoxydim. It also provides information on the anticipated maximum dietary exposure of animals fed treated commodities, which should not result in the violation of animal MRLs.

Current MRLs

The Australian MRLs for Sethoxydim in food and animal feed commodities, as listed in Table 1 and Table 4 of the *MRL Standard* (as at March 2004) are shown below. It is noted that the sethoxydim entries in the *MRL Standard* also cover the occurrence of residues arising from registered use patterns for clethodim. The residue definition of sethoxydim (and clethodim) is the “*sum of sethoxydim and metabolites containing the 5-(2-ethylthiopropyl)cyclohexane-3-one and 5-(2-ethylthiopropyl)-5-hydroxycyclohexene-3-one moieties and their sulfoxides and sulfones, expressed as sethoxydim*”. MRLs associated with registered sethoxydim use-patterns are highlighted in shaded cells.

Code	Food	MRL, mg/kg
Food Commodities		
VS 0621	Asparagus	1
VP 0061	Beans, except broad bean and soya bean	*0.1
	Bergamot	*0.1
VP 0522	Broad bean (green pods and immature seeds)	*0.1
VB 0040	Brassica (cole or cabbage) vegetables, Head cabbages, Flowerhead brassicas	0.5
VS 0624	Celery	0.1
VL 0465	Chervil	*0.1
	Coriander (leaves, stems, roots)	*0.1
HS 0779	Coriander seed	*0.1
SO 0691	Cotton seed	0.2
HS 0730	Dill seed	*0.1
VL 0476	Endive	0.05
VA 0380	Fennel, bulb	*0.01
HS 0731	Fennel seed	*0.1
VC 0045	Fruiting vegetables, Cucurbits	*0.1
VA 0381	Garlic	0.3
HH 0092	Herbs [except thyme]	*0.1
	Kaffir lime leaves	*0.1
VA 0384	Leeks	T0.3
	Lemon grass	*0.1
DT 1111	Lemon verbena [fresh weight]	*0.1
VL 0482	Lettuce, Head	0.2
VL 0483	Lettuce, Leaf	0.2
SO 0693	Linseed	0.5
VD 0545	Lupin (dry)	0.2
	Mizuna	*0.1
VA 0385	Onion, Bulb	0.3
SO 0697	Peanut	3
VP 0063	Peas	*0.1
SO 0698	Poppy seed	0.2
VD 0070	Pulses [except lupin (dry)]	*0.1

Code	Food	MRL, mg/kg
SO 0495	Rape seed	0.5
VR 0075	Root and tuber vegetables	1
	Rose and dianthus (edible flowers)	*0.1
VL 0496	Rucola (rocket)	*0.1
HH 4731	Salad burnett	*0.1
VL 0502	Spinach	*0.1
VA 0389	Spring onion	T0.05
FB 0275	Strawberry	0.1
SO 0702	Sunflower seed	*0.1
HH 0750	Thyme	0.5
VO 0448	Tomato	0.1
HS 0794	Tumeric, root	1
GC 0654	Wheat	*0.1
Animal commodities		
MO 0105	Edible offal (mammalian)	*0.05
PE 0112	Eggs	*0.05
MM 0095	Meat (mammalian)	*0.05
ML 0106	Milks	*0.05
PO 0111	Poultry, Edible offal of	*0.05
PM 0110	Poultry meat	*0.05
Animal feed commodities		
AL 0157	Legume animal feeds [except peanut fodder and peanut forage (green)]	15
AL 0697	Peanut fodder	10
AL 1270	Peanut forage (green)	10
	Rape seed fodder and forage	10
	Wheat forage (green) [fresh weight]	*0.1
AS 0654	Wheat straw and fodder, dry	*0.1

Summary of maximum feeding levels and livestock dietary intakes

The Maximum Feeding Level (MFL, the feeding level at which the MRLs are based), the equivalent Daily Dietary Intake For Livestock (DDIL) and the equivalent daily intake of sethoxydim are summarised below.

Species	MFL, ppm in diet	Equivalent DDIL, mg/kg bw	Equivalent intake of sethoxydim, mg/animal/day
Cattle ^a	25	0.66	332
Sheep ^b	25	1.0	62.5
Pig ^c	25	1.0	62.5
Poultry ^d	1	0.075	0.15

^a Based on animal transfer data where a 500 kg animal consumed 13.28 kg DM/day
^b Based on a 60 kg animal consuming 2.5 kg DM/day
^c Based on a 60 kg animal consuming 2.5 kg DM/day
^d Based on a 2 kg animal consuming 150 g DM/day

Detailed information

All feed commodities

Feed commodities that may contain residues of sethoxydim are listed in the table below. The theoretical maximum proportion of the diet that the commodity can comprise, when residues are present at the MRL, without the significant risk of animal commodity MRLs being violated is also given. For instance, were oilseeds to be fed to cattle at 30% of the diet, the remainder of the diet would need to be free of residues of sethoxydim to minimise the risk of cattle commodity MRLs being violated. It should be noted that the feeding levels assumed by the APVMA when setting animal commodity MRLs are theoretical values, and they should not be taken as recommendations of appropriate rations for livestock.

Commodity ^a	Assumed Maximum proportion of diet (%) ^b	Feed intake (kg/animal/day) ^c	MRL (mg/kg) ^d	Maximum intake of sethoxydim from commodity (mg/animal/day) ^e	Theoretical maximum proportion of diet (%) ^f
Cattle (Based on a 500 kg animal consuming 20 kg DM/day)					
Legume animal feeds (includes fodder/forage/straw of pulse crops)	100	20	15	300	100
Rape seed fodder and forage	100	20	10	200	100
Peanut fodder and forage	100	20	10	200	100
Wheat fodder and forage	100	20	*0.1	2	100
Wheat	100	20	*0.1	2	100
Lupins (dry)	100	20	0.2	4	100
Pulses [except lupin (dry)]	100	20	*0.1	2	100
Oilseeds (Cotton seed, linseed, poppy seed, rape seed, sunflower seed)	30	6	0.5	3	100
Brassica vegetables wastes	5	1	0.5	0.5	100
Root and tuber vegetable wastes	5	1	2	2	100
Sheep (Based on a 60 kg animal consuming 2.5 kg DM/day)					
Legume animal feeds (includes fodder/forage/straw of pulse crops)	100	2.5	15	37.5	100
Rape seed fodder and forage	100	2.5	10	25	100
Peanut fodder and forage	100	2.5	10	25	100
Wheat fodder and forage	100	2.5	*0.1	0.25	100
Wheat	100	2.5	*0.1	0.25	100
Lupins (dry)	100	2.5	0.2	0.50	100
Pulses [except lupin (dry)]	100	2.5	*0.1	0.25	100
Oilseeds (Cotton seed, linseed, poppy seed, rape seed, sunflower seed)	30	0.75	0.5	0.375	100
Brassica vegetables wastes	5	0.125	0.5	0.0625	100
Root and tuber vegetable wastes	5	0.125	2	0.25	100
Pigs (Based on a 60 kg animal consuming 2.5 kg DM/day)					
Wheat	100	2.5	*0.1	0.25	100
Lupins (dry)	100	2.5	0.2	0.50	100
Pulses [except lupin (dry)]	100	2.5	*0.1	0.25	100
Oilseeds (Cotton seed, linseed, poppy seed, rape seed, sunflower seed)	30	0.75	0.5	0.375	100
Brassica vegetables wastes	5	0.125	0.5	0.0625	100
Root and tuber vegetable wastes	5	0.125	2	0.25	100

Poultry (Based on a 2 kg animal consuming 150 g DM/day)					
Wheat	100	0.150	*0.1	0.015	100
Lupins (dry)	100	0.150	0.2	0.030	100
Pulses [except lupin (dry)]	100	0.150	*0.1	0.015	100
Oilseeds (Cotton seed, linseed, poppy seed, rape seed, sunflower seed)	30	0.045	0.5	0.0225	100
<p>^a The feed commodities that may contain residues of sethoxydim, and may form more than 20% of an animals diet.</p> <p>^b The maximum % of the diet that the commodity is assumed to comprise for the purposes of setting MRLs, based on Stockfeed Information Document 1</p> <p>^c The equivalent amount of feed for an animal of designated weight and feed intake that is assumed for the purposes of setting MRLs</p> <p>^d The MRL for each feed commodity (correction for dry weight basis where required)</p> <p>^e The maximum intake of sethoxydim when the commodity is fed at the maximum assumed level (Column 1) in the absence of other sources of sethoxydim.</p> <p>^f The maximum % of the diet at which the commodity could theoretically be fed without significant risk of exceeding animal commodity MRLs. It is assumed that the residue in the feed commodity is present at the MRL (or dry weight equivalent) and other dietary sources of Sethoxydim are absent.</p>					

Abbreviations and definitions

DM: Dry matter. The feed consumption for livestock and the residue levels in feed commodities are expressed on a dry matter basis.

DDIL: Daily Dietary Intake for Livestock. The level of dietary exposure for a specified chemical in a specified species that should not result in exceedance of the relevant animal commodity MRLs. Expressed in mg chemical/kg bodyweight.

MFL: Maximum Feeding Level. The level of dietary exposure for a specified chemical in a specified species that should not result in exceedance of the relevant animal commodity MRLs. Expressed in terms of ppm in the feed.

MRL: The concentration of a chemical residue, in units of mg/kg, that is legally permitted in or on a food or food commodity.

ppm in the feed: Parts per million in the feed. An alternate way of expressing the level of dietary exposure for a chemical. The level of chemical intake is calculated as though it were present uniformly in the total feed intake. The ppm in the feed is calculated using the following formula: $DDIL \text{ (mg chemical/kg bw)} \times \text{body weight (kg)} \div \text{daily feed intake (kg)}$.

STMR-P: Supervised Trial Median Residue of the processed commodity. The highest residue that livestock are likely to be exposed to in practice when fed processed commodities over a prolonged period. This is derived from the STMR of the whole commodity multiplied by the processing factor.

Attachment 1: Anticipated maximum dietary exposure

The following calculations outline the theoretical diet used to calculate the maximum anticipated dietary exposure, maximum feeding level (MFL) and the daily dietary intake for livestock (DDIL) for cattle, sheep, pigs and poultry.

Cattle

Feed group	Feed commodity	% in the diet	Feed intake, kg/animal/day ^a	MRL, mg/kg	% DM ^b	Intake of sethoxydim, mg/animal/day ^c
Legume animal feeds [100 % maximum]	Alfalfa (lucerne)	100	20	15	--	300
Total		100	20			300

^aBased on assumed feed consumption of 20 kg dry matter/day

^bEstimate of percentage dry matter. Applied to MRLs expressed on a fresh weight basis

^cBased on assumed bodyweight of 500 kg

Maximum anticipated dietary exposure: 300 mg/animal/day
 equivalent to: 0.60 mg/kg bw
 equivalent to: 15 ppm in the diet

MFL (Based on the available animal feeding data (Attachment 2)):
 25 ppm in the diet (Cows consumed 13.28 kg DM/day)
 equivalent DDIL: 0.66 mg/kg bw

Sheep

Feed group	Feed commodity	% in the diet	Feed intake, kg/animal/day ^a	MRL, mg/kg	% DM ^b	Intake of sethoxydim, mg/animal/day ^c
Legume animal feeds [100 % maximum]	Alfalfa (lucerne)	100	2.5	15	--	37.5
Total		100	2.5			37.5

^aBased on assumed feed consumption of 2.5 kg dry matter/day

^bEstimate of percentage dry matter. Applied to MRLs expressed on a fresh weight basis

^cBased on assumed bodyweight of 60 kg

Maximum anticipated dietary exposure: 37.5 mg/animal/day
 equivalent to: 0.625 mg/kg bw
 equivalent to: 15 ppm in the diet

MFL (Based on the available animal feeding data for dairy cattle (Attachment 2)):
 25 ppm in the diet
 equivalent DDIL: 1.0 mg/kg bw

Pigs

Feed group	Feed commodity	% in the diet	Feed intake, kg/animal/day ^a	MRL, mg/kg	% DM ^b	Intake of sethoxydim, mg/animal/day ^c
Vegetable by-products [5 % maximum]	Root and tuber vegetables	5	0.125	2	--	0.250
Oilseeds [30 % maximum]	Cotton seed, linseed, poppy seed, rape seed, sunflower seed	30	0.750	0.5	--	0.375
Pulses/legumes [100 % maximum]	Lupins (dry)	65	1.625	0.2	--	0.325
Total		100	2.50			0.950

^aBased on assumed feed consumption of 2.5 kg dry matter/day

^bEstimate of percentage dry matter. Applied to MRLs expressed on a fresh weight basis

^cBased on assumed bodyweight of 60 kg

Maximum anticipated dietary exposure: 0.95 mg/animal/day
 equivalent to: 0.016 mg/kg bw
 equivalent to: 0.38 ppm in the diet

MFL (Based on the available animal feeding data for dairy cattle (Attachment 2)):
 25 ppm in the diet
 equivalent DDIL: 1.0 mg/kg bw

Poultry

Feed group	Feed commodity	% in the diet	Feed intake, kg/animal/day ^a	MRL, mg/kg	% DM ^b	Intake of sethoxydim, mg/animal/day ^c
Oilseeds [30 % maximum]	Rape seed	30	0.045	0.5	--	0.0225
Pulses/legumes [100 % maximum]	Lupins (dry)	70	0.105	0.2	--	0.021
Total		100	0.150			0.0435

^aBased on assumed feed consumption of 0.150 kg dry matter/day

^bEstimate of percentage dry matter. Applied to MRLs expressed on a fresh weight basis

^cBased on assumed bodyweight of 2 kg

Maximum anticipated dietary exposure: 0.0435 mg/animal/day
 equivalent to: 0.022 mg/kg bw
 equivalent to: 0.29 ppm in the diet

MFL (Based on the available animal feeding data (Attachment 2)):
 1 ppm in the diet
 equivalent DDIL: 0.075 mg/kg bw