

# **Opinion regarding the Evaluation of Triasulfuron in the context of Council Directive 91/414/EEC concerning the placing of Plant Protection Products on the market (opinion adopted on 17 March 2000)**

## **TERMS OF REFERENCE**

The Scientific Committee on Plants (SCP) is requested to respond to the following questions in the context of the Commission's work on the implementation of Directive 91/414/EEC <sup>1</sup> concerning the placing of plant protection products on the market.

- (1) Can it be confirmed that use scenarios exist which pose no unacceptable risk to groundwater?
- (2) Can the Committee comment on the relevant metabolites for water and confirm that no unacceptable impact is to be expected for the uses reviewed on non-target aquatic organisms?

## **BACKGROUND**

Triasulfuron is an existing active substance in the context of Directive 91/414/EEC concerning the placing of plant protection products on the market and is covered by the first stage of the work programme provided for under the Directive. The Committee had been supplied with documentation comprising a dossier provided by Novartis, a monograph prepared by the French Authorities acting as Rapporteur Member State (RMS) and the recommendations of the ECCO <sup>2</sup> Peer Review Programme which involved contributions from experts of several Member States.

Triasulfuron belongs to the sulfonylurea group of herbicides. It acts on sensitive plants by inhibition of the enzyme acetolactate synthase involved in the synthesis of branched-chain amino acids. It is currently authorised in certain Member States for use as a plant protection product on small grain cereal crops. It is effective in controlling a wide spectrum of broad-leaved weed species at rates of application between 4 to 7.5 g a.s./ ha <sup>3</sup>.

## **OPINION**

### **Question 1**

Can it be confirmed that use scenarios exist which pose no unacceptable risk to groundwater?

### **Opinion**

The Committee concludes that use scenarios exist which pose no unacceptable risk to groundwater.

The Committee is of the opinion that available soil metabolism studies indicate that the risk to groundwater must include evaluation of the metabolite triazine amine. This overall conclusion is based on both model calculations, field and lysimeter experiments for the parent compound and on model calculations for triazine amine.

It is recommended that risk assessments should be conducted at Member State level. Member States should assess leaching potential in vulnerable locations (e.g. soils with high pH values) to determine whether the GAP <sup>4</sup> can achieve the desired result.

### **Scientific Background on Which the Opinion is Based**

The soil metabolism studies available for triasulfuron show that the risk to groundwater of the metabolite triazine amine (CGA 150829) also needs to be evaluated. The Committee concludes that this is not the case for the metabolite O-desmethlyl triasulfuron (CGA 195660). The latter metabolite was detected once at a level of substance corresponding with 10.2 % of the amount of parent compound added but in a duplicate value for the same soil and same sampling time a level of 2.7 % was reported, giving an average value of 6 %.

For triasulfuron nine soil adsorption studies were available but five were not reliable because the decrease in the concentration in the liquid phase was too low to be measured accurately (Boesten JJTI, 1990). The remaining four studies resulted in an average  $K_{OC}^5$  of 16 L/kg. The pH of the soil was above 6.8 for these studies. In view of the  $pK_A^6$  of 4.6, the KOC of 16 L/kg applies to the anionic form of triasulfuron (which is the most mobile form). Sorption at pH close to the pK<sub>A</sub> is probably much stronger but no measurements are available. Eleven laboratory studies on the transformation rate of triasulfuron in soil were available. Adjusting all half-lives for 20°C resulted in an average half-life of about 70 d. Almost all studies were carried out at application rates of 1-4 mg/kg which corresponds with doses in the order of 1 kg/ha (i.e. two orders of magnitude higher than the normal dose). Using a KOC of 16 L/kg, a half-life of 70 d and a dose of 7.5 g/ha will result in estimated concentrations in groundwater above 0.1 µg/L for many scenarios. There are approximately 15 field studies available on soil persistence of triasulfuron which resulted in a median  $DT_{50}^7$  value of 19 d (i.e. much shorter than the average half-life from the laboratory studies). Field  $DT_{50}$  values can only be used as input to pesticide leaching models if it has been demonstrated that the degradation is almost exclusively the result of transformation in soil (and not, for example, from loss processes at the soil surface). The Committee cannot assess this on the basis of the information provided but losses resulting from volatilisation or photochemical transformation are unlikely. Assuming a half-life of 19 days in combination with a KOC of 16 L/kg and a dose of 7.5 g/ha will result in estimated concentrations in groundwater below 0.1 µg/L for many scenarios. Accordingly, the discrepancy between the persistence in the field and in the laboratory plays a crucial role in the assessment of triasulfuron leaching for soils with high pH values. Field and lysimeter studies show variable results: in some studies triasulfuron leaches at concentrations up to 5 µg/L whereas it remains below 0.1 µg/L in other studies e.g. a lysimeter study with soil having a pH of 5-6 and with 400 mm water percolation per year. The Committee concludes that triasulfuron is unlikely to leach at concentration levels above 0.1 µg/L in soils with a pH of about 5.

The KOC value of triazine amine was assumed to be 144 L/kg (average of studies with four soils). The half-life in soil at 20 °C was assumed to be 360 d (based on the average of laboratory studies giving 243 d at approximately 25 °C). The percentage formed was assumed to be 30%. Currently no agreed scenarios for assessing pesticide leaching are available for EU registration. Accordingly, the assessment of triazine amine was based on a national scenario (i.e. the Dutch standard scenario as published in J. Environ. Qual. 20: 425-435). The metabolite was treated as if it was a parent compound. The output for the Dutch standard scenario is based on a dose of 1 kg/ha. The assessment was based on a triasulfuron application of 7.5 g/ha in spring assuming a linear relationship between dose and leaching (a conservative

approach). This resulted in an estimated concentration in groundwater of triazine amine of 0.01 µg/L.

## Question 2

Can the Committee comment on the relevant metabolites for water and confirm that no unacceptable impact is to be expected for the proposed uses on non-target aquatic organisms?

## Opinion

The relevant metabolites for water are triazine amine and O-desmethyl triasulfuron (CGA 195660). The Committee cannot confirm that no unacceptable impact is to be expected for the uses reviewed on non-target aquatic organisms.

There were no aquatic toxicity data provided for the second main metabolite (O-desmethyl triasulfuron, CGA 195660), which appears to be stable in water. Given the high toxicity of triasulfuron to aquatic plants and the limited amount of chronic toxicity data provided for the active substance and its metabolites for aquatic organisms, the Committee cannot confirm that the proposed use conditions of triasulfuron (application rate of 7.5 g a.s./ha with a 5 m buffer) will be sufficient to prevent an unacceptable impact on aquatic organisms.

## Scientific Background on Which the Opinion is Based

There are two metabolites of triasulfuron to be considered with respect to surface water contamination, triazine amine (CGA 150829) and O-desmethyl triasulfuron (CGA 195660). With regard to the latter of these, a position paper by the Notifier (SCP/TRIASUL/004)<sup>8</sup> states that CGA 195660 was identified in only two of eight soil route studies in amounts between 2 and 3%, with a short peak around 10%, and that this metabolite therefore requires no further testing. However, at least one water/sediment study performed using Rhine River water (B.7.4.3.2-2 ANNEX B) found concentrations of the metabolite to reach 11-13%. This metabolite appears to be stable in water. However, there are no aquatic toxicity data available to assess whether the concentrations of this metabolite are likely to be found in water and would pose a risk to aquatic organisms.

The maximum surface water PEC<sup>9</sup> for the triazine amine metabolite (CGA 150829) resulting from a combination of runoff and spray drift was estimated to be 0.018 µg/L (it was 0.015 µg/L for runoff alone). Acute EC50<sup>10</sup> values were calculated for **Daphnia** (16 mg/L), **Scenedesmus subspicatus** (> 90 mg/L); rainbow trout (> 200 mg/L) and aerobic bacteria (>100 mg/L). The only acute NOEC<sup>11</sup> value provided was for **Daphnia** (3.2 mg/L). Assuming a worst-case PEC<sub>surface water</sub> of 0.015 µg /L (or even 0.018) the TER<sup>12</sup> s for all of the listed species are well over 100.

The Committee notes that for **Daphnia** the metabolite CGA 150829 was one to two orders of magnitude more acutely toxic than parent triasulfuron (acute EC50 > 100 mg a.s./L, acute NOEC=32-112 mg a.s./L). The NOEC for chronic (21-day) toxicity of triasulfuron to **Daphnia** was 10 mg/L. There were no chronic toxicity data for metabolite CGA 150829 provided for **Daphnia**. However, even if this metabolite was three orders of magnitude more toxic than the active substance to **Daphnia** during chronic exposure, the TER would still be well above 100.

**Lemna gibba** was the most sensitive of the tested species to triasulfuron with an EC50 of 0.068 µg/L, a NOEC of 0.018 µg/L (Smyth et al. 1995), and corresponding TER<sub>acute</sub> values that were well below the cutoff criterion of 10 (using a PEC<sub>surface water</sub> from runoff of 0.06 µg/L). There was no information provided by the Notifier on the toxicity of metabolite CGA 150829 to **Lemna gibba**. In addition, the Committee notes that none of the exposure estimates provided in the monograph consider inputs of the active substance from drain flow. In some situations input from drain flow could increase PEC<sub>surface water</sub>, and this additional source of input should be considered with respect to local conditions.

## REFERENCES

Smyth DV, Croudace CP, Magor SE. 1995. Acute toxicity of triasulfuron to *Lemna gibba*. BL5440/B, Project ID AB0261/b.

Boesten JJTI. 1990. Influence of solid/liquid ratio on the experimental error of sorption coefficients in pesticide/soil systems. *Pesticide Science* 30: 31-41.

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<sup>1</sup> OJ L 230, 19. 08.1991, p.1

<sup>2</sup> European Community Co-ordination

<sup>3</sup> Document 7590/VI/97 rev 3

<sup>4</sup> Good Agricultural Practice

<sup>5</sup> Organic carbon adsorption coefficient

<sup>6</sup> Degradation constant

<sup>7</sup> Period required for 50% dissipation

<sup>8</sup> Position paper from Novartis - forwarded to the SCP by Ministère de l'Agriculture et de la Pêche, Paris, 29/07/99.

<sup>9</sup> Predicted environmental concentration

<sup>10</sup> Median effective concentration

<sup>11</sup> No observed effect concentration

<sup>12</sup> Toxicity Exposure ratio