5.21 LAMBDA-CYHALOTHRIN (146)

RESIDUE AND ANALYTICAL ASPECTS

Lambda-cyhalothrin consists of two of the four enantiomers of cyhalothrin. It was first evaluated by JMPR in 1984 (T, R) and subsequently under the periodic re-evaluation programme in 2007 (T) and 2008 (R). A group ADI for cyhalothrin and lambda-cyhalothrin was established at 0–0.02 mg/kg bw and a group ARfD, 0.02 mg/kg bw. In 2008 the Meeting agreed that the residue definition for compliance with the MRL and for estimation of dietary intake for plant and animal commodities should be cyhalothrin, sum of isomers. It was listed by the Forty-sixth Session of the CCPR (2014) for the evaluation by the 2015 JMPR for additional MRLs.

The residue studies were submitted by the manufacturer and member countries for additional MRLs for basil (Thailand) and coffee.

Methods of analysis

The Meeting received new information on the analytical method (POPIT MET.044 Rev.31) for the determination of residues of lambda-cyhalothrin in plant materials including coffee beans. Lambda-cyhalothrin is extracted from samples with acetone/hexane (1:1 v/v). For coffee beans, deionised water is added to achieve phase separation and the upper (organic) phase is removed and evaporated to dryness. The evaporated residue is diluted with hexane and purified with a silica SPE column. The solvent is evaporated and the residue is dissolved in the internal standard (dicyclohexyl phthalate) and quantification is achieved by GC-ECD. The LOQ is 0.01 mg/kg for lambda-cyhalothrin in coffee beans.

For the determination of lambda-cyhalothrin in basil, a method[1] available from the scientific literature was used. The recoveries for lambda-cyhalothrin in basil tested concurrently with the analysis of trial samples ranged between 85 and 114%. The LOQ is 0.01 mg/kg for lambda-cyhalothrin in basil.

Residues resulting from supervised residue trials on crops

The Meeting received supervised trial data for the foliar application of lambda-cyhalothrin on coffee and basil. Residue trial data was made available from Brazil and Thailand.

Labels were available from Brazil and Thailand describing the registered uses of lambda-cyhalothrin.

Coffee beans

Data were available from supervised trials on coffee in Brazil.

The GAP of Brazil is maximum two foliar applications at a maximum rate of 0.005 kg ai/ha with a PHI of 1 day.

Lambda-cyhalothrin residues in green coffee beans from independent trials in Brazil matching GAP were (n=4): < 0.01 (4) mg/kg.

Based on the residues for coffee beans from trials in Brazil, the Meeting estimated a maximum residue level of 0.01 (*) mg/kg and an STMR value of 0.01 mg/kg for lambda-cyhalothrin in coffee beans.

Basil

Data were available from supervised trials on basil in Thailand.

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[1] H. Steinwandter, 1985, Universal 5-min on-line method for extracting and isolating pesticide residues and industrial chemicals

The GAP of Thailand is foliar applications when crop is infested at a maximum concentration of 0.0025 kg ai/hL with a PHI of 7 days.

Lambda-cyhalothrin residues in basil from independent trials in Thailand matching GAP were (n=4): 0.08, 0.17, 0.20 and 0.37 mg/kg.

Based on the residues for basil from trials in Thailand, the Meeting estimated a maximum residue level of 0.7 mg/kg, an STMR value of 0.19 mg/kg and an HR value of 0.40 (based on a highest residue of replicate samples) mg/kg for lambda-cyhalothrin in basil.

RECOMMENDATIONS

On the basis of the data from supervised trials, the Meeting concluded that the residue levels assessed were suitable for estimating maximum residue limits and for IEDI and IESTI assessment.

Definition of the residue for plant and animal commodities (for compliance with the MRL and for estimation of dietary intake): *Cyhalothrin, sum of isomers*

The residue is fat soluble

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDIs) of lambda-cyhalothrin were calculated for the 17 GEMS/Food cluster diets using STMRs/STMR-Ps estimated by the 2008 JMPR and the current Meeting (Annex 3). The ADI is 0-0.02 mg/kg bw and the calculated IEDIs were 2-9% of the maximum ADI (0.02 mg/kg bw). The Meeting concluded that the long-term intakes of residues of lambda-cyhalothrin, arising from the uses considered by the current Meeting, are unlikely to present a public health concern.

Short-term intake

The International Estimated Short-Term Intakes (IESTI) of lambda-cyhalothrin were calculated for food commodities and their processed commodities using HRs/HR-Ps or STMRs/STMR-Ps estimated by the current Meeting (Annex 4). The ARfD is 0.02 mg/kg bw and the calculated IESTIs were a maximum of 2% of the ARfD. The Meeting concluded that the short-term intake of residues of lambda-cyhalothrin, when used in ways that have been considered by the JMPR, is unlikely to present a public health concern.