5.31 PYRIMETHANIL (226)

RESIDUE AND ANALYTICAL ASPECTS

Pyrimethanil was most recently evaluated for toxicology and residues by the JMPR in 2007. The Meeting derived an ADI of 0.2 mg/kg bw per day and decided that an ARfD is unnecessary.

In 2007 the Meeting agreed that the residue definition for both enforcement and dietary intake for plant commodities is parent pyrimethanil. The Meeting further concluded that the residue definition for both enforcement and dietary exposure considerations for milk is the sum of pyrimethanil and 2-anilino-4,6-dimethylpyrimidin-5-ol, expressed as pyrimethanil; and for livestock tissues (excluding poultry) is the sum of pyrimethanil and 2-(4-hydroxyanilino)-4,6-dimethylpyrimidine, expressed as pyrimethanil.

The compound was listed by the Forty-fourth Session of the CCPR for the evaluation of additional MRLs. The 2013 JMPR received residue data for pome fruit, stone fruit, lemons and ginseng.

Methods of analysis

The Meeting received information on the analytical methods used for determination of pyrimethanil residues in samples obtained from supervised trials on pome fruit, stone fruit, lemon, and ginseng. The residues were measured using GC/MS or HPLC/UV with LOQs of 0.05 mg/kg. The methods were reviewed by the JMPR in 2007, which concluded that adequate analytical methods for pyrimethanil exist for both data collection and enforcement purposes. The methods used in the trials submitted to the 2013 Meeting are essentially identical to those accepted at the 2007 Meeting.

Stability of residues in stored analytical samples

Detailed information from the 2007 JMPR showed that pyrimethanil residues are stable (> 70% remaining) in frozen storage for at least 12 months in the tested commodities, i.e., apple, grape, tomato, lettuce, carrot, pea, peach, and plum. Concurrent storage stability studies were submitted with the ginseng trials and demonstrated residue stability for at least 259 days.

The periods of demonstrated stability cover the frozen storage intervals in the residue studies.

Results of supervised residue trials on crops

The 2007 JMPR received supervised trials for many crops, including pre- and post-harvest uses of pome and stone fruit. However, due to incomplete GAP information, pome fruit thermofog data were not included in the pome fruit MRL recommendation. The 2013 JMPR received complete GAP information for pome and stone fruits, as well as expanded post-harvest residue data. For completeness, all relevant pome and stone fruit supervised trial data for pyrimethanil are considered in the following sections. The USA GAP allows for pre- and post-harvest applications of pyrimethanil to pome and stone fruit; however, few trials reflect residues from the combined pre- and post-harvest applications.

Lemon

In the USA, pyrimethanil is registered for use on lemons for up to 4 treatments at a rate of 1.7 kg ai/ha, with a PHI and a retreatment interval of 7 days. Five supervised field trials are available at this GAP from the USA.

Rank-order pyrimethanil residues in lemon were (n=5): 0.18, 0.21, <u>0.27</u> (2), and 0.82 mg/kg.

The Meeting noted that there is a current MRL for citrus fruit at 7 mg/kg based on post-harvest uses and concluded that the current MRL for citrus is adequate to cover the submitted pre-harvest-use lemon data. Therefore, the Meeting confirms its previous recommendation.

Pome fruits

In 2007, the Meeting reviewed residue values on pome fruits from pre-harvest and post-harvest trials according to Belgium, France, Germany, Greece, Italy, Netherlands, United Kingdom, and USA GAPs. Residues from post-harvest GAPs were higher and served as the basis for the previous recommendations for maximum residue level, STMR, and HR estimates of 7(Po), 0.7, and 3.8 mg/kg, respectively.

The 2013 Meeting has evaluated data from the USA and Europe matching a new GAP for uses of pyrimethanil as a post-harvest thermofog treatment. Although the GAP for thermofog uses in the US has a higher application rate than the GAPs in European countries (one application at 9.6 kg ai/1000 kg fruits vs. one application at the rate of 5.6 to 8 kg ai/1000 kg fruits), the residues resulting from the trials conducted according to the GAP in Europe were approximately 10-fold higher than the trial conducted according to the US GAP; therefore, the meeting selected data according to GAP in Europe.

Residues from post-harvest trials in apples (n=8, new data in bold) were: 1.1, 1.4 (2), 1.5, 1.6, **4.9**, **6.4**, and **7.1** mg/kg.

Residues from post-harvest trials in pears (n=4) were: 1.0, 1.6, 1.8, and 3.5 mg/kg.

As the residue data from apples and pears are from the same population, they were combined to give the following residues (n=12, median underlined): 1.0, 1.1, 1.4 (2), 1.5, 1.6 (2), 1.8, 3.5, 4.9, 6.4, and 7.1 mg/kg. The Meeting agreed to replace its previous maximum residue level recommendation of 7 mg/kg with a new estimated STMR of 1.6 mg/kg and a maximum residue level of 15 (Po) mg/kg for pome fruit.

Stone fruits

In 2007, the Meeting recommended an STMR of 1.3 mg/kg and a maximum residue level of 4 (Po) for cherries based on the post-harvest GAP for Chile. The 2013 Meeting received new information on the post-harvest GAP in the USA. Post-harvest trials were conducted at 2× the USA GAP. Since post-harvest data may not be adjusted via proportionality, there are no new data for the Meeting to use for a recommendation. Therefore, the Meeting confirmed its prior recommendations.

Berries and other small fruits

From the 2007 JMPR:

"Eight trial were conducted on the foliar application of pyrimethanil to strawberries in theUSA, where the GAP is 600 g/L SC, 0.8 kg ai/ha, 2.4 kg ai/ha/season, 1 day PHI. All trials were at maximum GAP, and the residues in ranked order (median underlined) were: 0.79, 0.93, 0.99, 1.1, 1.2, 1.3(2), and 2.3 mg/kg. The Meeting estimated an STMR of 1.2 mg/kg and a maximum residue level of 3 mg/kg for strawberries."

The current Meeting was asked to extrapolate the strawberry field trial data to Berries and Other Small Fruits [Subgroup 004E, Low Growing Berries (including Bakeapple; Cranberry (FB 0265); Cloudberry (FB 0277); Muntries (FB 0283); Partridge berry; Squaw vine; Strawberry (FB 0275); Strawberries, wild (FB 0276); Strawberry, Musky)], reflecting the USA label allowing use on the Low Growing Berry Crop Subgroup 13-07G.

Taking into account the available historic data showing that pesticide residues in strawberry are generally comparable to or higher than residues in other low-growing berries, the Meeting agreed to extrapolate the residue estimates for strawberry to commodities comprising the low-growing

berries subgroup. Therefore, for the low-growing berries subgroup (Subgroup 004E, FB 2009) the Meeting recommended a maximum residue level of 3 mg/kg and estimated an STMR of 1.2 mg/kg. The Meeting agreed to withdraw its previous recommendation of 3 mg/kg for strawberry.

Ginseng

In the USA, pyrimethanil is registered for use on ginseng for up to 3 treatments at a rate of 0.78 kg ai/ha, with a PHI of 30 days and a retreatment interval of 7 days. Three supervised field trials were available at this GAP from the USA.

Rank-order pyrimethanil residues in dried ginseng were (n=3): 0.099, 0.41, and 0.59 mg/kg.

The Meeting estimated an STMR value of 0.41 mg/kg and a maximum residue level value of 1.5 mg/kg for ginseng, dried.

Fate of residue during processing

In 2007, the Meeting estimated the following STMR-Ps for citrus juice, citrus pulp (dried) and citrus oil, respectively: 0.028 mg/kg; 1.3 mg/kg; 56 mg/kg. As these estimates adequately cover residues in lemon, the Meeting confirmed its prior recommendations for citrus.

The 2007 Meeting estimated a processing factor of 0.45 for apple juice, 0.37 for apple puree, and 4.1 for wet apple pomace. Applying these processing factors to the estimated STMR for pome fruit (1.6 mg/kg) resulted in STMR-P estimates of 0.72 mg/kg for apple juice, 0.59 mg/kg for apple puree, and 6.6 mg/kg for wet apple pomace. The Meeting agreed these values should replace the estimates made in 2007.

Residues in animal commodities

Dietary burden calculations for beef cattle and dairy cattle are provided below. The dietary burdens were estimated using the OECD diets listed in Appendix IX of the 2009 edition of the FAO Manual.

Potential cattle feed items include: apple pomace, almond hulls, carrot culls, citrus pulp, grape pomace, pea seed and pea straw. Pyrimethanil residues in all these feed items were as estimated by the 2007 JMPR except for apple pomace, which has a revised STMR-P of 6.6 mg/kg (the previous estimate was 2.9 mg/kg).

Summary of livestock dietary burdens (ppm of dry matter diet)

	US-Canada		EU		Australia		Japan	
	max	mean	max	mean	max	mean	max	mean
Beef cattle	0.14	0.14	4.3	3.6	4.6[a]	3.9[c]	0.0	0.0
Dairy cattle	2.5	2.1	2.8	2.1	4.1[b]	3.4[d]	0.0	0.0

[a] Highest maximum beef or dairy cattle dietary burden suitable for MRL estimates for mammalian meat

[b] Highest maximum dairy cattle dietary burden suitable for MRL estimates for mammalian milk

[c] Highest mean beef or dairy cattle dietary burden suitable for STMR estimates for mammalian meat.

[d] Highest mean dairy cattle dietary burden suitable for STMR estimates for milk.

Animal commodity maximum residue levels

The calculations used to estimate residues in animal commodities based on comparisons of the dietary burden to results of the bovine feeding study, for use in estimating maximum residue levels, STMR and HR values, are shown below.

Pyrimethanil feeding study	Feed level (ppm) for milk residues	Residues (mg/kg) in milk	Feed level (ppm) for tissue residues	Residues (mg/kg) in Muscle	Liver	Kidney	Fat
MRL beef or dairy cattle							
Feeding study [a]	3 10	< 0.01 0.017	3 10	< 0.05 < 0.05	< 0.05 < 0.05	0.08 0.13	< 0.05 < 0.05
Dietary burden and high residue	4.1	< 0.01	4.6	< 0.05	< 0.05	0.09	< 0.05
STMR beef or dairy cattle							
Feeding study [b]	3 10	< 0.01 0.017	3 10	< 0.05 < 0.05	< 0.05 < 0.05	0.066 0.12	< 0.05 < 0.05
Dietary burden and residue estimate	3.4	< 0.01	3.9	< 0.05	< 0.05	0.07	< 0.05

[a] highest residues for tissues and mean residues for milk

[b] mean residues for tissues and mean residues for milk

Residue estimates in animal commodities are unchanged relative to those recommended in 2007; therefore, the Meeting confirmed its prior recommendations: an STMR of 0.01 mg/kg for milk and estimated a maximum residue level of 0.01 mg/kg for milk. The Meeting estimated STMRs of 0.0 mg/kg for each of meat and fat and maximum residue levels of 0.05 (*) mg/kg for meat. The Meeting estimated an STMR of 0.07 mg/kg for edible offal based on the STMR value for beef cattle kidney.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for IEDI assessment.

Definition of the residue (for compliance with MRL and dietary intake) for plant commodities: *pyrimethanil.*

The residue is not fat-soluble.

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDIs) of pyrimethanil were calculated for the 13 GEMS/Food cluster diets using STMRs/STMR-Ps estimated by the current Meeting. The ADI is 0–0.2 mg/kg bw and the calculated IEDIs were 0–5% of the maximum ADI (0.2 mg/kg bw). The Meeting concluded that the long-term intakes of residues of pyrimethanil, resulting from the uses considered by the current Meeting, are unlikely to present a public health concern.

Short-term intake

The 2007 JMPR decided that an ARfD was unnecessary and concluded that the short-term intake of pyrimethanil residues is unlikely to present a public health concern.