5.5 CYAZOFAMID (281)

RESIDUE AND ANALYTICAL ASPECTS

Cyazofamid, a cyanoimidazole fungicide was considered for the first time by the JMPR in 2015 when residue definitions and health-based guidance values were established and a number of maximum residue limits were recommended for grapes and a range of vegetables.

The 2015 JMPR established an ADI of 0–0.2 mg/kg bw for cyazofamid. An ARfD of 0.2 mg/kg bw was established for 4-chloro-5-p-tolylimidazole-2-carbonitrile (CCIM) and an ARfD was determined to be unnecessary for cyazofamid.

The 2015 JMPR established the following residue definitions:

The residue definition for compliance with the MRL for plant commodities: *cyazofamid.*

The residue definition for long-term dietary risk assessment: *cyazofamid plus CCIM, expressed as cyazofamid*

The residue definition for acute dietary risk assessment: *CCIM*

The Forty-ninth Session of the CCPR (2017) scheduled cyazofamid for the evaluation of additional uses by the 2018 JMPR. The current Meeting received new GAP information for bulb vegetables, new supporting residue trial and storage stability studies.

Stability of pesticide residues in stored analytical samples

The stability of residues of cyazofamid and CCIM in crops was evaluated by the JMPR in 2015. In the listed commodities with a high water content (in the fresh legume, brassica vegetable, leafy vegetable and fruiting vegetable groups), cyazofamid residues in stored frozen samples were shown to be stable for at least 284 days and except for basil (fresh), CCIM residues were stable for at least 634 days.

In the recent studies on chives, a storage stability component was included in the experimental design, and while the fortified samples were not analysed at the beginning of the storage intervals, the data indicate that cyazofamid and CCIM are stable in stored frozen samples of fresh chives for at least 472 days, but that residues were not shown to be stable in dried chives in frozen storage.

Results of supervised residue trials on crops

The Meeting received new GAP information and/or new supporting residue information from the manufacturer for spring onions, chives and bulb onions.

For estimating dietary exposure, combined residues (cyazofamid + CCIM) were calculated by multiplying the individual sample results from field trials of CCIM by the molecular weight factor of 1.49 (cyazofamid mol. weight = 324.8, CCIM mol. weight = 217.7) and adding the result to the corresponding residue of cyazofamid. For calculation purposes, when residues below the LOQ, the residue was assumed to be at the LOQ. The “less than” designation was retained only if both residues were below the LOQ. Examples are shown below:

Cyazofamid	CCIM	Combined (expressed to two significant figures)
0.5 mg/kg	0.06 mg/kg	0.5 mg/kg + (0.06 mg/kg × 1.49) = 0.59 mg/kg
0.5 mg/kg	< 0.01 mg/kg	0.5 mg/kg + (0.01 mg/kg × 1.49) = 0.51 mg/kg

Bulb vegetables

Bulb onions, subgroup of

The GAP for cyazofamid on bulb vegetables (including dry bulb onions) in the USA is 6 × 0.087 kg ai/ha, with a minimum re-treatment interval of 7 days, a PHI of 0 days and a maximum seasonal rate of 0.47 kg ai/ha.

In 10 trials conducted in North America and matching the USA bulb vegetables GAP, residues found in onion bulbs were:

Cyazofamid: 0.032, 0.038, 0.039, 0.039, 0.041, 0.055, 0.059, 0.09, 0.097 and 0.86 mg/kg.

CCIM: < 0.01 (9) and 0.026 mg/kg with the highest individual sample residue being 0.03 mg/kg

Combined residues(cyazofamid+CCIM): 0.047, 0.053, 0.054, 0.054, 0.056, 0.067, 0.074, 0.1, 0.11 and 0.895 mg/kg (n = 10).

Noting that bulb onion is a representative commodity for the Bulb Onions subgroup, and that the GAP in the USA covered all commodities in this subgroup, the Meeting estimated a maximum residue level of 1.5 mg/kg for cyazofamid, a STMR of 0.0615 mg/kg for the combined residues of cyazofamid and CCIM and a HR of 0.03 mg/kg and STMR of 0.01 mg/kg for CCIM on the subgroup of Bulb onions.

Green onions, subgroup of

The GAP for bulb vegetables (including spring onions and chive leaves) in the USA for cyazofamid is 6 × 0.087 kg ai/ha, a minimum re-treatment interval of 7 days, a PHI of 0 days and a maximum seasonal rate of 0.47 kg ai/ha.

Five trials on spring onions matching the GAP in the USA for bulb vegetables were available and a further five trials on chives, involving the same application rate (0.087 kg ai/ha), re-treatment intervals and PHI but with 9 applications of 0.087 kg ai/ha.

Residues in spring onions were:

Cyazofamid: 0.46, 0.48, 0.54, 0.77 and 1.1 mg/kg.

CCIM: 0.011, 0.012, 0.012, 0.013 and 0.018 mg/kg (highest single residue of 0.019 mg/kg)

Combined residues (cyazofamid+CCIM): 0.49, 0.50, 0.56, 0.79 and 1.1 mg/kg (n = 5).

The Meeting noted that in chives, residues declined rapidly (half-life of about 2 days), such that the contribution of residues from applications made more than 35 days prior to harvest would be negligible. The Meeting agreed to consider combining the data on spring onions and chives to estimate a maximum residue level for the subgroup of Green onions.

The residues in chives were:

Cyazofamid: 1.1, 1.2, 1.7, 2.8 and 3.3 mg/kg.

CCIM: 0.025, 0.029, 0.044, 0.16 and 0.2 mg/kg (highest single residue of 0.2 mg/kg)

Combined residues (cyazofamid+CCIM): 1.3, 1.3, 1.7, 3.0, and 3.3 mg/kg (n = 5).

As the median residues are within the 5-times range, and a Mann-Whitney test showed the residue populations were not from the same distribution, the Meeting agreed to estimate a maximum residue level for the green onion subgroup, based on the data set for chives.

The Meeting estimated a maximum residue level of 6 mg/kg for cyazofamid and a STMR of 1.5 mg/kg for the combined residues of cyazofamid and CCIM on the subgroup of Green onions. The Meeting estimated a HR of 0.2 mg/kg and a STMR of 0.044 mg/kg for CCIM on the subgroup of green onions.

Fate of residues during processing

In five of the outdoor trials conducted in the USA on chives, samples of fresh leaves were air-dried or dehydrated for 1–2 days before being frozen and stored for 413 days before being analysed for cyazofamid and CCIM.

The Meeting noted that residues of CCIM were not stable in dried chives and agreed the data were not sufficient to estimate maximum residue levels in dried chives.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed in Annex 1 are suitable for establishing maximum residue limits and for IEDI and IESTI assessment.

Definition of the residue for compliance with the MRL for plant commodities: *cyazofamid*

Definition of the residue for estimating long-term dietary risk assessment for plant commodities: *cyazofamid plus CCIM, expressed as cyazofamid*

Definition of the residue for acute dietary risk assessment for plant commodities: *CCIM*

Definition of the residue for compliance with the MRL and for estimating dietary exposure from animal commodities: *not defined*

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for cyazofamid is 0–0.2 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for cyazofamid were estimated for the 17 GEMS/Food Consumption Cluster Diets using the STMR or STMR-P values estimated by the JMPR. The results are shown in Annex 3 of the 2018 JMPR Report. The IEDIs ranged from 0–5% of the maximum ADI.

The Meeting concluded that long-term dietary exposure to residues of cyazofamid from uses considered by the JMPR is unlikely to present a public health concern

Acute dietary exposure

The ARfD for CCIM is 0.2 mg/kg bw. The International Estimate of Short Term Intakes (IESTIs) for CCIM were calculated for the food commodities and their processed commodities for which HRs/HR-Ps or STMRs/STMR-Ps were estimated by the present Meeting and for which consumption data were available. The results are shown in Annex 4 of the 2018 JMPR Report. The IESTIs varied from 0–3% of the ARfD for children and 0–1% for the general population.

The Meeting concluded that acute dietary exposure to residues of cyazofamid from uses considered by the present Meeting is unlikely to present a public health concern.