

5.3 Benzovindiflupyr (261)

RESIDUE AND ANALYTICAL ASPECTS

Benzovindiflupyr is a broad-spectrum fungicide first evaluated by JMPR in 2013 (Toxicology) and 2014 (Residues). The toxicological review established an acceptable daily intake (ADI) of 0–0.05 mg/kg bw and an acute reference dose (ARfD) of 0.1 mg/kg bw. The definition of the residue for compliance with the MRL and for dietary risk assessment for plant and animal commodities is *benzovindiflupyr*. The residue is fat-soluble.

In 2016 the JMPR evaluated the compound for residues and recommended a number of maximum residue levels.

At the Fiftieth Session of the CCPR, benzovindiflupyr was scheduled for evaluation of additional uses by the 2019 JMPR

The current Meeting received additional analytical methods, GAP information and residue trial data from uses on bulb onion, green onion and sugar cane and processing data for sugar cane

Analytical methods

The Meeting received additional validation information on analytical methods evaluated by the 2014 JMPR for benzovindiflupyr and metabolite SYN546039 in bulb and green onion, as well as in sugar cane, refined sugar and molasses.

The Meeting concluded that the presented methods were sufficiently validated and are suitable to measure benzovindiflupyr and metabolite SYN546039 in bulb and green onion, as well as in sugar cane, refined sugar and molasses.

Results of supervised residue trials on crops

Supervised trials were available for the use of benzovindiflupyr on bulb and green onion and sugar cane.

Bulb vegetables

The critical GAP for the use on bulb vegetables in the USA allows for 4 foliar applications at a rate of 76 g ai/ha with a 7 day interval between applications and a 7 day PHI.

Bulb onion

In independent field trials with bulb onion from Canada and the USA, residues of benzovindiflupyr following GAP treatment ($\pm 25\%$) were (n = 8): < 0.01(5), 0.011, 0.012 and 0.015 mg/kg.

The Meeting estimated a maximum residue level of 0.02 mg/kg, a STMR of 0.01 mg/kg and a HR of 0.015 mg/kg for benzovindiflupyr in bulb onion (extrapolated to subgroup 009A).

Green onion

In independent field trials on green onion from Canada and the USA, residues of benzovindiflupyr following GAP treatment ($\pm 25\%$) were (n = 3): 0.11, 0.16 and 0.20 mg/kg.

The Meeting noted that green onions fall under category 3 of the minor crop classification, requiring a minimum of five supervised field trials to estimate maximum residue levels. Hence, the Meeting concluded that no maximum residue level could be estimated for benzovindiflupyr in green onion.

Grasses for sugar or syrup production

Sugar cane

Sugar cane was previously evaluated by the 2016 JMPR when a maximum residue level of 0.04 mg/kg was recommended based on a GAP from Brazil.

The Meeting received a more critical GAP for the use of benzovindiflupyr on sugar cane in the USA, allowing for 3 foliar applications at a rate of 76 g ai/ha with a 14 day interval between applications and a 30 day PHI.

In field trials on sugar cane from the USA, residues of benzovindiflupyr following GAP treatment ($\pm 25\%$) were (n = 8): 0.013, 0.031, 0.062, 0.068, 0.070, 0.13, 0.14 and 0.21 mg/kg (highest individual value: 0.25 mg/kg).

The Meeting estimated a maximum residue level of 0.4 mg/kg, a STMR of 0.069 mg/kg and a HR of 0.25 mg/kg for benzovindiflupyr in sugar cane, to replace the previous recommendation of 0.04 mg/kg.

Fate of residues during processing

The Meeting received new information on the fate of benzovindiflupyr residues during processing in sugar cane.

Table 1 Estimated processing factors for the commodities considered at this Meeting according to the residue definition (benzovindiflupyr)

Raw commodity [STMR/HR]	Processed commodity	Individual processing factors	Mean or best estimate processing factor	STMR-P = STMR _{RAC} × PF (mg/kg)
Sugar cane	Refined sugar	< 0.04, < 0.09	0.04	0.003
	Molasses	< 0.09, 0.09,	0.09	0.006

Residues in animal commodities

Farm animal dietary burden

Dietary burdens were calculated for beef cattle, dairy cattle, broilers and laying poultry based on feed items evaluated by the JMPR in 2014, 2016 and the current Meeting. The dietary burdens, estimated using the 2018 OECD Feed diets listed in Appendix XIV Electronic attachments to the 2016 Edition of the FAO manual⁶, are presented in Annex 6.

Previous evaluations included the following potential feed items: cereal (barley, oat, rye, triticale, wheat) forage, straw and grain, pea vines and seeds, peanut hay and meal, sugar cane tops, molasses and bagasse, potatoes, beans seeds, soya bean seeds and processing fractions (aspirated grain fraction, meal, hulls, okara, pollard), apple pomace, canola meal, grape pomace and tomato pomace. Additionally, the current Meeting considered higher STMRs for sugar cane tops and molasses.

Residues of benzovindiflupyr in the crops considered by the current Meeting do not significantly increase the livestock dietary burden of a maximum of 15 ppm for beef cattle, 14 ppm for dairy cattle and 2.1 ppm for laying hens using the 2018 update of the OECD Feed Calculator, and do not have an impact on the previous recommendations for residues in animal commodities made by the 2016 JMPR.

⁶ <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/jmpr/jmpr-docs/en/>

RECOMMENDATIONS

On the basis of the data obtained 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 assessments.

Definition of the residue for compliance with the MRL and for dietary risk assessment for plant and animal commodities: *benzovindiflupyr*.

The residue is fat soluble

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for benzovindiflupyr is 0–0.05 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for benzovindiflupyr 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 2019 JMPR Report.

The IEDIs ranged from 0–2% of the maximum ADI. The Meeting concluded that long-term dietary exposure to residues of benzovindiflupyr from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The ARfD for benzovindiflupyr is 0.1 mg/kg bw. The International Estimate of Short Term Intakes (IESTIs) for benzovindiflupyr 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 2019 JMPR Report.

The IESTIs varied from 0–1% of the ARfD for children and 0–2% of the ARfD for the general population. The Meeting concluded that acute dietary exposure to residues of benzovindiflupyr from uses considered by the present Meeting is unlikely to present a public health concern.

