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PP#1E2459. Bayleton in Chick Peas. Evaluation of analytical methods and residue data.

Alfred Smith, Chemist *Alfred Smith*
Residue Chemistry Branch (TS-769)

H.M. Jacoby, Product Manager No. 21
Registration Division (TS-767)

and
Toxicology Branch
Hazard Evaluation Division (TS-769)

THRU: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769) *CT*

The Mobay Chemical Corp., proposes a tolerance for residues of the fungicide 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone and its metabolite beta-(4-chlorophenoxy)-alpha-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol (KWG0519) in or on dry chick pea seeds at 0.1 ppm. The commodity is to be imported into the United States from Mexico.

There are no established tolerances for Bayleton. Tolerances are pending for grapes and melons at 0.2 ppm (PP#0E2349); and cucumbers and tomatoes at 0.1 ppm and 0.2 ppm, respectively (PP#0E2393). A temporary tolerance for barley and wheat is also pending (PP#1G2432) at 0.1 ppm. Permanent tolerances are also pending for apples and grapes at 1.0 ppm, grass chaff at 45 ppm, and grass straw at 30 ppm (PP#1F2474).

Conclusions:

1. The nature of the residue in animals and plants is adequately delineated. The parent compound Bayleton and its metabolite KWG0519 (free and conjugated) are the significant components of plant residues.
2. The analytical method is not adequate for the determination of total residues (free and conjugated) of Bayleton and its metabolite KWG0519. Conjugated residues are not determined. the method should be modified to determine conjugated residues.
3. The residue data do not reflect total residues (free and conjugated) of Bayleton and its metabolite KWG0519. Therefore, valid conclusions on residue levels in chick peas cannot be reached. Residue data must be submitted for total residues in chick peas.
4. No feed items are involved in this petition. Therefore, no residues will occur in eggs, meat, and milk of livestock.

Recommendation

We recommend against the proposed tolerance. A favorable recommendation is contingent upon resolution of the deficiencies noted in Conclusions 2 and 3.

DETAILED CONSIDERATIONS

Proposed Use

Bayleton is formulated as a 25% wettable powder containing 25% active ingredients (a.i.). The formulation is to be used on chick peas grown in Mexico. Adequate information is available on Mexican pesticide regulation.

A maximum of two foliar applications at 2 oz act/A may be made up to seven days of harvest (7-day PHI).

The manufacturing process for technical Bayleton is included in PP#062300. Technical Bayleton consist of 92-95% Bayleton. The impurities are not likely to produce a residue problem.

~~The formulation's inert ingredients are cleared for use under 5180.1001.~~

Nature of the Residue:

We have considered the behavior of Bayleton in plants (cucumbers, tomatoes, apples) and animals in previous reviews (PP#062300, PP#0F2349). Bayleton is absorbed by roots and leaves of plants, translocated, and metabolized. Plant residues consist of the parent compound Bayleton, its metabolites KMG0519, KWG1342, and glucoside conjugates of the metabolites. The conjugated components may be freed thru acid hydrolyses.

The significant components of plant residues are the parent compound Bayleton and free and conjugated components of metabolite KMG0519.

In animals (rats, lactating cows, pigs, laying hens), Bayleton is metabolized and excreted with some transfer of residues to eggs and milk and deposition in tissues. The significant components of the residues in eggs, milk, and meat are the parent compound, Bayleton, and its metabolites KMG0519, KWG1323, and KWG1342.

The nature of the residue in animals and plants is adequately understood.

Analytical Method

A ground sample is extracted by blending with acetone followed by dichloromethane. The extracts are filtered, combined, and mixed with dilute aqueous sodium chloride. The organic phase contains the residues of Bayleton and is evaporated to dryness.

The residues are taken up with a petroleum ether: ethyl ether mixture and cleaned up on a florisil column. The residues are eluted with a mixture of hexane and ethyl acetate. The eluate is evaporated to dryness.

The residue is taken up with acetone and determined by gas chromatography using a nitrogen-sensitive detector.

Untreated (control) samples of chick peas had <0.02 ppm Bayleton or KWG0519 equivalent residues. Control samples were fortified with Bayleton and its metabolite at 0.05 ppm and 0.1 ppm. Recoveries were 54-58% at 0.05 ppm and 89-110% at 0.1 ppm.

Nitrogen-containing compounds have been tested as possible sources of interferences in the analysis of Bayleton and KWG0519 residues (PP#OE2393). Some interferences occurred, but were eliminated through the use of a different GLC column and two different detectors.

A confirmatory procedure (tested with apples and soil) is available. The method employs p-values for confirmation of the presence of Bayleton and KWG0519 (PP#OF2349).

The method appears to be adequate for the determination of free residues. However, the method is not likely to determine bound or conjugated residues. (Conjugated components are often freed through acid reflux.) The method should be modified to enable the determination of conjugated residues. A method trial may be necessary when the deficiencies have been corrected. (We raised these questions on the method's deficiencies in PP#OE2393. As yet, they have not been resolved.)

Residue Data

Samples of dry seed were obtained from crops grown in Mexico. The crops had been treated in the proposed manner (maximum of two applications at 2 oz act/A). Residues were $<0.01-0.05$ ppm at PHI's of 7-21 days.

The analytical method does not determine conjugated residues. As a result, total residues of Bayleton and its metabolite KWG0519 (free and conjugated forms) are not reflected by the residue data. In the absence of such data, valid conclusions on the residue levels expected in chick peas cannot be made.

Data for chick peas which reflect analyses for free and conjugated residues should be submitted.

Meat, Milk, and Eggs

No feed items are involved in this petition. Therefore no residues will occur in eggs, meat, and milk of livestock under the proposed use.

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