CHLORDANE        JMPR 1974

Explanation


The 1974 Meeting of the CCPR has returned items 12.15 to 12.31 to step 6 and requested the 1974 Joint Meeting to review new data requested from governments. The purpose of the request was to determine whether the recommended maximum limits of 0.3 and 0.2 mg/kg for potatoes (12.15) through collards (12.31) are necessary if only the alpha (cis)-chlordane and gamma (trans)-chlordane are to be measured.

RESIDUES IN FOOD AND THEIR EVALUATION

RESIDUES RESULTING FROM SUPERVISED TRIALS

New data from member governments have not been made available to the 1974 Joint Meeting. Velsicol Chemical Corporation has submitted new data on the levels and identity of chlordane residues in potatoes, beets, asparagus, turnips, parsnips, swiss chard, pumpkin, mustard greens, spinach, and cucumbers. All data were from supervised trials reflecting registered uses in the USA. US uses are generally restricted to applications before edible parts form or to soil treatments.

Eight principal components of chlordane residues have been identified in the studies and their relative abundance measured after various periods of weathering. The residues are heptachlor, heptachlor epoxide, alpha (cis)-chlordane, gamma (trans)-chlordane, nonachlor, photo-alpha-chlordane, and "compounds C and E" which are two isomers of chlordane. Not all of the compounds were found in all samples. The additional metabolite oxychlordane is found only in animal tissues. Certain other constituents have been postulated but were not detected. The distribution of residues at any time is complex but the alpha- and gamma- isomers still appear to be the best index of chlordane residues at the point of regulation (though not always the most abundant single component).

The highest residue levels occur in the root crops, and may occasionally exceed 0.3 mg/kg when total residues are calculated. If only alpha- and gamma-chlordane are measured, the residues usually do not exceed 0.2 mg/kg. In the other vegetables studied, the total residues are usually between 0.1 and 0.2 mg/kg. If only alpha- and gamma-chlordane are measured, the residues do not exceed 0.1 mg/kg. The supervised residue trials in the USA would thus tend to support somewhat lower tolerance levels than the presently recommended
tolerances for combined alpha- and gamma-chlordane residues in the
vegetables 12.15 through 12.31. Lower tolerance levels however would
leave little latitude for the normal variations observed in crops, and
particularly in crops from countries other than the USA for which no
data are available.

METHODS OF RESIDUE ANALYSIS

The principal advance in the technology since 1970 is apparently
the availability of pure reference standards for the individual
constituents. The analytical methods employed in the Velsicol study
were not identified. Presumably they are Velsicol methods AM 0507 and
AM 0508 which were discussed in the JMPR 1970 report referred to
above. These methods, based on electron-capture gas chromatography,
determine the unchanged components of technical chlordane plus their
photolytic and metabolic conversion products. There is no single GLC
column which will provide resolution of all constituents and it is
unlikely that these methods would be suitable for regulatory purposes.
For this reason the Joint Meeting reaffirms the desirability of
regulating chlordane residues through measurement of the alpha- and
gamma-chlordane residues in plants. Satisfactory methods are available
for determination of these two components (FAO/WHO, 1971).

APPRASIAL

The 1974 Meeting of the CCPR has returned the recommended
chlordane tolerances for potatoes (12.15) through collards (12.31) to
step 6 and requested governments to submit new data for the purpose of
showing whether maximum limits of 0.3 and 0.2 mg/kg are required when
the tolerances are expressed as combined alpha (cis)-chlordane and
gamma (trans)-chlordane. Data were made available to the Joint Meeting
by the Velsicol Chemical Corporation on the identity and levels of
chlordane residue components in various root crops and vegetables from
US trails. While the data generally show that the recommended
tolerances are slightly higher than residues reported in the
supervised trials, the Joint Meeting was unable to conclude that there
was sufficient latitude to reduce the recommended tolerances.

The meeting reaffirms the desirability of expressing chlordane
maximum limits for plant products as the combined residues of alpha
(cis)-chlordane and gamma (trans)-chlordane.

FURTHER WORK OR INFORMATION

DESIRABLE

1. Information from Governments on use patterns.

2. Information from countries other than the USA on residues
resulting from approved uses.

REFERENCES

FAO/WHO (1964). Evaluation of the toxicity of pesticide residues in
food. FAO/PL/M/63/13; WHO/Food Add./23.

FAO/WHO (1965). Evaluation of the toxicity of pesticide residues in
food. FAO/PL/1965/10/1; WHO/Food Add./27.65.


See Also:

Toxicological Abbreviations
Chlordane (EHC 34, 1984)
Chlordane (HSG 13, 1988)
Chlordane (PDS)
Chlordane (PIM 574)
Chlordane (FAO Meeting Report PL/1965/10/1)
Chlordane (FAO/PL:1967/M/11/1)
Chlordane (FAO/PL:1969/M/17/1)
Chlordane (AGP:1970/M/12/1)
Chlordane (WHO Pesticide Residues Series 2)
Chlordane (Pesticide residues in food: 1977 evaluations)
Chlordane (Pesticide residues in food: 1982 evaluations)
Chlordane (Pesticide residues in food: 1984 evaluations)
Chlordane (Pesticide residues in food: 1986 evaluations Part II Toxicology)