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**Rotterdam Convention on the Prior Informed
Consent Procedure for Certain Hazardous
Chemicals and Pesticides in International Trade
Chemical Review Committee**

Fourth meeting

Geneva, 10–13 March 2008

Item 5 (b) (iii) of the provisional agenda*

**Inclusion of chemicals in Annex III of the Rotterdam
Convention: review of notifications of final regulatory
action to ban or severely restricted a chemical: carbaryl**

Carbaryl: supporting documentation provided by Jordan

Note by the Secretariat

The Secretariat has the honour to provide, in the annex to the present note, the supporting documentation provided by Jordan in support of its notification of final regulatory action on carbaryl.

* UNEP/FAO/RC/CRC.4/1

Annex

- **Pesticide residues in food – 1984 – excerpt on Carbaryl (JMPR)**

Pesticide residues in food - 1984

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**Report sponsored jointly by FAO
and WHO**

REPORT 1984

**FOOD
AND
AGRICULTURE
ORGANIZATION
OF THE
UNITED NATIONS**

4.10 CARBARYL*

Residue and analytical aspects

The meeting received the information required to deal with the matters referred from the 15th (1983) Session of the CCPR.

Carbaryl is used for the control of insect pests of bananas especially in Central and South America. It is applied by aircraft and by mist blowers. Because bananas are harvested continuously it is not possible to have an enforceable pre-harvest interval.

A series of investigations involving the treatment, sampling and analysis of bananas produced adequate evidence that the residue in bananas on the day of treatment was of the order of 5 mg/kg and that the concentration in the edible pulp was not significantly less than that in the peel. The concentration of the original deposit declined consistently over 7 days but residues in many samples still remained in the region of 5 mg/kg.

The meeting agreed that the MRL for bananas (pulp) should be amended to apply to the whole fruit.

Information received from Canada, Portugal, the UK and the USA confirmed that carbaryl is still used extensively for direct application to poultry as well as to their cages and building structures for the control of mites, lice and ticks.

Results from four trials showed that when poultry are dusted with carbaryl there is a substantial uptake by the skin but this decreases considerably within 7 days. There is similarly a significant transfer to breast and leg muscle but the levels decline fairly rapidly. The meeting concluded that the recommendations previously made for MRLs in poultry were still appropriate but recommended a change in the commodity description from "poultry (edible parts)" to "poultry meat".

4.11 CARBOSULFAN

2,3-Dihydro-2,2-dimethylbenzofuran-7-yl (dibutylaminothio)
methylcarbamate

Carbosulfan is a broad-spectrum carbamate pesticide closely related to its major metabolite carbofuran, a pesticide in its own right.

Residue and analytical aspects

Substantial residue data were available but because sufficient information on nationally approved uses was not provided or was provided too late for consideration, especially for those countries where supervised trials were conducted, the meeting could not with any confidence estimate maximum residue levels which would reflect established good agricultural practice. The meeting reviewed the

CARBARYL

Explanation

Carbaryl was first evaluated in 1965. It was re-evaluated in 1966, 1967, 1968, 1969, 1970, 1973, 1975, 1976, 1977, 1979.1/ The 15th Session of the CCPR (October 1983) requested that residue data from the use of carbaryl on bananas be submitted to the JMPR. This Session also requested that carbaryl residue data and current use patterns on poultry be provided to the JMPR. This information has been received by FAO and is reported in the following monograph addendum.

RESIDUES IN FOOD AND THEIR EVALUATIONUSE PATTERNBananas

Carbaryl is extensively used for the control of a variety of insect pests of bananas in many countries, especially Central and South America. The usual practice is to apply carbaryl wettable powder or suspension concentrate at the rate of 1.1 kg a.i./ha (1 lb a.i./acre) by aircraft (helicopter or fixed wing) in about 23 l of water/ha. Smaller producers use mist blowers for banana insect control. Because bananas crop continuously and the mature (but unripe) bunches are harvested over a long period, it is not feasible to have an enforceable interval between application and harvest. The fruit is frequently washed using a solution of sodium bisulphite after harvest (Union Carbide, 1984).

Poultry

Following the request of the CCPR, information concerning the use of carbaryl on or near poultry was received by FAO from several countries.

Carbaryl is the major pesticide used in Canada for direct application to poultry for control of mites. It is also approved for direct application to poultry against lice and as a supplement to premise treatment for chicken mites, fleas and fowl ticks. Carbaryl spray and dust is applied directly to poultry at the rate of 22.5 g/100 birds. Carbaryl dust (5 percent) is applied to poultry dusting boxes at the rate of 120 g a.i./100 birds. The treatment is not to be made within seven days of slaughter (Canada, 1984).

Carbaryl is approved for the treatment of pens, sheds and other structures for the control of chicken mites, lice, mealworms and fleas. A suspension containing 5 g/l is used at the rate of 11/35 sq. m. Carbaryl dust was authorized for direct application to poultry but was withdrawn in 1980 because of unpredictable residues in meat and eggs (Netherlands, 1984).

Carbaryl is not used to control pests of poultry in Poland (Poland, 1984).

In Portugal, carbaryl is approved for direct application to poultry as a 5 percent dust, with or without pyrethrum. An interval of two weeks between treatments is recommended, with an interval of seven days between the last application and slaughter (Portugal, 1984).

Carbaryl is used in the United Kingdom as a dusting powder for poultry (United Kingdom, 1984).

In the United States, carbaryl suspension concentrates, wettable powders and dusts may be applied directly to poultry for the control of

1/ See Annex 2 for FAO and WHO documentation

Northern fowl mite, chicken mite, lice and fleas. The dust is applied at the rate of 500g/100 birds and 0.5 percent sprays at the rate of 4 l/100 birds. Carbaryl dust (5 percent) is used in dust baths at the rate of 1 kg per box for each 50 birds. There is a seven day interval between the last application and day of slaughter. The relative proportion of dust and spray is not known (United States, 1984).

RESIDUES RESULTING FROM SUPERVISED TRIALS

Bananas

During 1959 and 1960, the manufacturers of carbaryl (Union Carbide Agricultural Products Company) conducted an extensive residue sampling programme involving carbaryl insecticide on bananas. In 1959 alone, a total of 105 banana samples from six locations in Central and South America were analysed. Additional residue studies were conducted the following year, in which application rates, spray volumes, number of sprays and post-harvest procedures were varied. A summary of the data collected from these studies is given in Table 1 (Union Carbide, 1984a).

The effect of multiple applications, higher rates and fruit rinsing (a common post-harvest procedure utilizing a sodium bisulfite wash) on the level of residues was investigated. In 1960, a single study reported residues higher than 10 mg/kg. However, this was detected in banana peels only (using almost twice the recommended use rates and application numbers). Significantly, when residues were analysed in pulp and whole (peel + pulp) banana samples, residues in both were below 10 mg/kg.

The residue in the pulp of bananas was only slightly less than in the peel. The residue in the whole fruit (peel + pulp) is therefore of the same order of that reported in the pulp. The same MRL would be appropriate for both bananas (whole) and banana (pulp).

The residue data clearly show that the residue in commercial bananas will generally be substantially less than the MRL as the bulk of the crop will be harvested some time after the carbaryl spray is applied to the whole plantation. The residue level seven days after treatment was about one-quarter that found on the day of treatment.

Poultry

The following summary of results from three residue trials on laying hens and poultry poult indicates the level and distribution of carbaryl residues in poultry tissues (Union Carbide, 1984b).

In Test 1, laying hens were dusted with 4 g of 5 percent dust per bird (recommended rate) three times at four day intervals (once in 28 days is recommended) and slaughtered at one and seven days after last treatment. Samples of skin, breast muscle, leg muscle, liver and gizzard were taken from each of six hens and separately analysed following each slaughter. The colorimetric method of Johnson *et al.* (1963) was used to determine carbaryl and 1-naphthol separately at a method sensitivity of 0.1 to 0.2 mg/kg. 1-naphthol residues were less than 10 percent of carbaryl residues in every case. Results below are averages of duplicate analyses on each bird.

Tissue	1-day residues (mg/kg)		7-day residues (mg/kg)	
	<u>max.</u>	<u>avg.</u>	<u>max.</u>	<u>avg.</u>
skin	35.0	19.3	3.1	2.2
breast muscle	1.1	0.4	0.1	nil
leg muscle	2.0	0.9	0.1	0.1
liver	0.2	nil	nil	nil
gizzard	nil	nil	nil	nil

TABLE 1. Carbaryl Residues on Bananas from Supervised Trials

Location/year	Formulation	Rate (kg a.i./ha or l/ha)	No. of sprays	Plant Part	Wash ^{1/}	Avg. Residues (mg/kg) after last application (days)				
						0	1	3	7	14
Panama/59	SEVIN 50W	1.1	1	Peel	Yes	6.45	4.45	2.85	1.40	-
Panama/59	SEVIN 50W	1.1	1	Pulp	Yes	5.05	4.15	2.50	-	-
Guatemala/59	SEVIN 50W	1.1	1	Peel	Yes	1.22	1.00	0.60	0.18	-
Guatemala/59	SEVIN 50W	1.1	1	Peel	No	1.33	1.10	0.71	0.29	-
Guatemala/59	SEVIN 50W	1.1	1	Pulp	Yes	1.24	1.10	0.65	0.23	-
Guatemala/59	SEVIN 50W	1.1	1	Pulp	No	1.34	1.11	0.69	0.17	-
Honduras/59	SEVIN 50W	1.1	1	Pulp	-	1.78	-	0.79	0.76	0.36
Honduras/59	SEVIN 50W	1.1	1	Pulp	-	3.55	-	-	0.66	0.39
Honduras/59	SEVIN 50W	2.2	1	Pulp	-	4.23	-	-	-	-
Costa Rica/59	SEVIN 85S	1.1	1	Peel	-	3.69	-	-	0.74	-
Costa Rica/59	SEVIN 85S	1.1	1	Pulp	-	3.45	-	-	0.63	-
Ecuador/59	SEVIN 85S	1.1	1	Peel	-	3.30	-	-	1.35	-
Ecuador/59	SEVIN 85S	1.1	1	Pulp	-	3.00	-	-	1.17	-
Honduras/60	SEVIN 85S	2.0	1	Peel	No	4.80	5.40	-	3.70	-
Honduras/60	SEVIN 85S	2.0	1	Pulp	No	1.90	1.10	-	3.40	-
Honduras/60	SEVIN 85S	2.0	1	Whole ^{2/}	No	3.40	3.30	-	3.60	-
Honduras/60	SEVIN 85S	2.0	2	Peel	No	9.9	9.1	-	10.9	-
Honduras/60	SEVIN 85S	2.0	2	Pulp	No	3.3	3.6	-	3.3	-
Honduras/60	SEVIN 85S	2.0	2	Whole	No	6.6	6.4	-	7.1	-
Honduras/60	SEVIN 85S	2.0	2	Whole	Yes	1.51	1.40	-	-	-
Panama/60	SEVIN 85S	4.4	1	Whole	No	1.51	1.59	-	-	-
Panama/60	SEVIN 85S	3.7	2	Whole	No	4.70	-	-	-	-

1/ Fruit mixed with sodium bisulfite wash after harvest.

2/ Whole = Peel + Pulp

In Test 2, turkey poults two weeks old were dusted with 5 percent carbaryl three times at 14-day intervals, using a squeeze bottle applying 1, 2 and 3 gms/bird, successively. Sprays of 0.5 percent were applied at the same times using 1, 1.5 ml/bird. Sampling and analyses were done as in Test 1.

<u>Tissue</u>	<u>Average residues (mg/kg)</u>	
	<u>1-day</u>	<u>7-days</u>
<u>Dusted</u>		
skin	0.99	1.06
breast	0.64	2.07
liver	1.89	1.64
<u>Sprayed</u>		
skin	1.59	0.96
breast	0.09	1.18

In Test 3, mature hens were treated using dust/bath boxes employing 5 percent carbaryl dust. Sampling and analyses were done as in Test 1.

<u>Tissue</u>	<u>7</u>	<u>Average residues (mg/kg) after (days)</u>	
		<u>14</u>	<u>28</u>
breast	nil	nil	nil
skin	0.96	0.37	0.08
liver	nil	nil	nil

In Test 4, caged layers were fogged with 4 percent carbaryl suspension. Sampling and analyses were done as in Test 1.

<u>Tissue</u>	<u>Residues (mg/kg) after (days)</u>	
	<u>0</u>	<u>7</u>
breast	0.21	nil
leg	0.17	nil
liver	nil	nil
gizzard	0.11	nil

Total edible tissue is calculated at 30 percent leg, 28 percent breast, 16 percent back and neck, 11 percent wings, 9 percent skin, 3 percent gizzard and 3 percent liver. A residue of 5 mg/kg in skin translates to 0.45 mg/kg in the whole bird.

APPRAISAL

The meeting received the information required to deal with the matters referred from the 15th Session of CCPR (1983).

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RECOMMENDATIONS

<u>Commodity</u>	<u>MRL (mg/kg)</u>
Bananas	5 [changed from 5 (in the pulp)]
Poultry meat	0.5 [changed from 0.5 for poultry (in the edible portion)]

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