

April 7, 1998

MEMORANDUM

SUBJECT: Acephate. Review of Storage Stability Data and Storage Intervals and Conditions. Case No. 0042. Chemical No. 103301. DP BARCODE D235332. MRID No. 44251701 and 44251702

FROM: Felecia A. Fort, Chemist
Chemistry Pilot Review Team
Chemistry Branch II: Reregistration Support
Health Effects Division (7509C)

THRU: Whang Phang, Ph.D., Branch Senior Scientist
Reregistration Branch I
Health Effects Division (7509C)

TO: Angel Chiri/Nancy Zahedi
Special Review Branch
Special Review and Reregistration Division (7508W)

Valent U.S.A Corporation has submitted storage stability data in response to requirements from the Registration Standard Update (1/29/92) for these data on tobacco, in the processed commodities of cottonseed, mint, peanuts, and soybeans, in dairy cattle liver and in poultry tissues stored under frozen conditions. In addition data which show the storage conditions and intervals for samples from acephate residue studies used to support current tolerances were presented.

Tolerances are established for combined residues of acephate (O,S-dimethyl acetylphosphoramidothioate) and its cholinesterase-inhibiting metabolite methamidophos (O,S-dimethyl phosphoramidothioate) in or on numerous raw agricultural commodities, including: cottonseed, 2 ppm; soybeans, 1 ppm; cattle, goats, hogs, horses, poultry, and sheep (fat, meat, and MBYP), milk and eggs, 0.1 ppm [40 CFR §180.108(a)]; and soybean meal, 4 ppm; cottonseed meal, 8 ppm; and cottonseed hulls, 4 ppm [40 CFR §186.100].

The available storage stability data indicate that the combined residues of acephate and methamidophos are stable under frozen storage conditions (-20C) in/on the following commodities: eggs (~6 months); milk (~7 months); kidney, cow (~6 months); muscle, cow (~7 months); beans, pinto (~15 months); beans, snap (~15 months); Brussels sprouts (~9 months); celery (~12 months); cottonseed (~10 months); grass, Bermuda, forage and hay (~2 months); grass, pasture, forage (~9 months); lettuce (~17 months); peas, pigeon (~14 months); peppers, bell (~13 months); rice grain and straw (~17 months); and spearmint, fresh and spent hay (~2 months).

Conclusions

The data indicate that acephate and methamidophos residues are stable for at least 14 months in green tobacco and peanut nutmeat, at least 11 months in peanut hulls, at least 4 months in peanut oil, and at least 15 months in soybean oil and corn meal. Residues showed some decline in dry shelled soybean at the first storage interval (91 days) but remained somewhat stable for up to a year. Residues in cured tobacco were excessively high (up to 224%) which probably indicate a problem with the sampling method since field weathered residues were used.

The overall database supports the reregistration of acephate on the supported commodities. No additional storage stability data are required.

Detailed Considerations

Data are available to ascertain the stability of acephate and methamidophos residues in cattle tissues (F. Fort, D225786, 4/10/97). These data will be translated to cattle liver and poultry tissues. Therefore no additional storage stability data are required for animal commodities.

The registrant has submitted data to show the stability of acephate and methamidophos residues in green and cured tobacco, peanut and its processed products, and soybean and its processed products. Additionally, the registrant wishes to use the available data for soybean oil, peanut oil, peanut hulls, and corn meal in lieu of submitting data for mint oil, cotton meal, cotton hulls and cotton oil. The registrant also submitted stability data conducted on crops which are not currently registered for acephate use to demonstrate that acephate residues are stable in a wide variety of matrices.

Storage Stability Data for Tobacco, Peanuts, Soybeans and Corn Meal

Test Commodities

Most samples used in these storage stability studies contained field weathered residues; that is, they were obtained from previously conducted acephate field trials. Treated samples that contained significant levels of residues were reanalyzed for weathered residue studies and untreated samples were used for the laboratory-fortified studies. Soybean oil was purchased from supermarkets for use in fortification studies.

One to three pound samples were homogenized and placed in polyethylene bags and stored frozen at -20C. For laboratory fortified studies, aliquots of the samples were fortified with acetone solutions containing acephate and methamidophos. The containers or bags were stored frozen until analysis. At each analysis interval, duplicate sample aliquots were removed and analyzed concurrently with an untreated sample and a freshly fortified sample. No additional freshly fortified sample was used for the zero time sample set.

For studies using field weathered residues, treated samples found to contain significant levels of acephate residues were reanalyzed after an interval of freezer storage. After the initial analysis, the bags or containers were stored frozen until the next analysis.

Samples were analyzed utilizing methods with the prefix RM-12A. These methods have previously been determined to be adequate for data collection (see N. Dodd, D183356, 9/28/93). Recovery samples were analyzed concurrently with each set of samples by fortifying at least one untreated control sample.

Results are shown in Table 1 through Table 5 below.

Analyte	Storage Interval (days)	Residue (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	0	2.76/ 0.97 2.99/ 0.98	71.9/ 78.7 71.9/ 78.7		(3.84/ 1.23) (4.16/ 1.25)
Acephate/Methamidophos	61	2.36/1.03 2.43/1.05	75.7/88.6 75.7/88.6	85.5/106.2 81.3/107.1	81.2/94.3 77.2/95.2
Acephate/Methamidophos	110	0.00	68.4/83.6 68.4/83.6	98.2/105.2 86.6/98	103.2/99 91.1/92.2
Acephate/Methamidophos	219	2.51/1.06 2.41/0.99	80.1/92.4 80.1/92.4	90.9/109.3 80.6/101	81.6/93.1 72.4/86
Acephate/Methamidophos	275	1.86/0.98 1.66/0.75	61.5/77.3 615/77.3	67.4/101 55.5/76.5	78.8/102.9 64.9/77.9
Acephate/Methamidophos	287	2.34/1.04 2.05/0.90	91.6/95.6 91.6/95.6	84.8/107.2 68.6/91.8	66.5/88.3 53.8/75.6
Acephate/Methamidophos	427	2.29/1.07 2.23/1.02	72.7/85.3 72.7/85.3	83/110.3 74.6/104.1	82.1/101.8 73.8/96

1. Field weathered samples

2. Numbers in parenthesis indicate actual residues (ppm) found at Day 0 which are corrected for % fresh fortification recovery.

Analyte	Storage Interval (days)	Residue (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	0.00	0.08/1.67 0.09/1.48	78.5/63.7 78.5/63.7		(0.102/2.62) ² (0.115/2.32)
Acephate/Methamidophos	10	0.11/2.45 0.10/2.48	68.2/80.1 68.2/80.1	137.5/146.7 111.1/167.6	158.3/116.7 127.9/133.3
Acephate/Methamidophos	52	0.08/1.91 0.09/2.32	73.0/89.3 73.0/89.3	100/114.4 100/156.8	107.5/81.6 107.5/111.6
Acephate/Methamidophos	132	0.11/2.23 0.14/2.88	75.7/85.1 75.7/85.1	137.5/133.6 155.6/194.6	142.6/100 161.3/145.7

Analyte	Storage Interval (days)	Residue ³ (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	210	0.16/3.05 0.16/3.07	70.8/70.9 70.8/70.9	200/182.6 177.8/207.4	221.8/164.1 197.1/186.4
Acephate/Methamidophos	266	0.10/2.19 0.09/2.10	55.1/68 55.1/68	125.0/131.1 100/141.9	178.1/122.8 142.5/132.9
Acephate/Methamidophos	278	0.14/3.28 0.08/3.53	81.6/84.8 81.6/84.8	175.0/196.4 88.9/238.5	168.4/147.5 85.5/179.2
Acephate/Methamidophos	418	0.17/3.00 0.21/2.49	81.8/86.7 81.8/86.7	212.5/179.6 233.3/168.2	203.9/132 223.9/123.6

1. Field Weathered samples

2. Numbers in parenthesis indicate actual residues (ppm) found at Day 0 which are corrected for % fresh fortification recovery

Analyte	Storage Interval (days)	Residue ³ (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	0	0.30/0.087 0.32/0.094	129/94 119/87	119/87 129/94	93/93 108/108
Acephate/Methamidophos	238	0.31/0.092 0.29/0.085	134/90 134/90	125/92 115/85	93/102 87/94
Acephate/Methamidophos	427	0.27/0.086 0.28/0.084	113/97 113/97	108/86 113/84	96/89 99/87
Stability of Acephate and Methamidophos Residues in/on Peanut Hull under Frozen Conditions					
Acephate/Methamidophos	0	1.2/0.18 1.1/0.20 0.99/0.15 0.95/0.16	98/90 89/81 95/77		(1.3/0.22) ² (1.2/0.24) (1.1/0.18) (1.0/0.19)
Acephate/Methamidophos	245	1.9/0.26 2.0/0.27 1.5/0.22 1.3/0.20	130/96	158/144 182/135 152/147 137/125	112/123 128/117 105/127 100/109
Acephate/Methamidophos	315	1.2/0.19 1.0/0.18 0.96/0.14 0.94/0.16	87/74	100/106 91/90 97/93 99/100	106/117 96/101 100/105 108/114
Stability of Acephate and Methamidophos Residues in/on Peanut Oil under Frozen Conditions					
Acephate/Methamidophos	0	0.310/0.093 ³ 0.324/0.106	130/106 124/94	124/94 130/106	-----
Acephate/Methamidophos	74	0.198/0.067 0.236/0.081	91/75	80/67 94/81	87/89 104/107

Acephate/Methamidophos	130	0.244/0.097 0.238/0.095	100/93	98/97 95/95	98/105 95/103
------------------------	-----	----------------------------	--------	----------------	------------------

1. Peanut hull were from weathered residues; peanut nutmeats and oil were laboratory fortified.
2. Numbers in parenthesis indicate actual residues (ppm) found at Day 0 which are corrected for % fresh fortification recovery
3. Fortification levels; 0.25 ppm acephate, 0.10 ppm methamidophos

Table 4. Stability of Acephate and Methamidophos Residues in/on Dry Shelled Soybean under Frozen Conditions¹

Analyte	Storage Interval (days)	Residue (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	0	0.148/0.068 0.151/0.072	82/81	74/68 76/72	90/84 92/89
Acephate/Methamidophos	91	0.134/0.058 0.118/0.061	97/90	67/58 59/61	69/65 61/68
Acephate/Methamidophos	199	0.111/0.062 0.114/0.060	72/70	56/62 57/60	78/89 86/66
Acephate/Methamidophos	281	0.121/0.066 0.120/0.064	91/85	61/66 60/64	67/78 66/76
Acephate/Methamidophos	360	0.087/0.048 0.117/0.052	76/71	44/48 59/52	57/68 77/73

Stability of Acephate and Methamidophos Residues in Soybean Oil

Acephate/Methamidophos	0	0.477/0.150 0.448/0.156	80/75	95/75 90/78	119/100 112/104
Acephate/Methamidophos	28	0.467/0.144 0.472/0.151	92/77	93/72 94/76	102/94 103/98
Acephate/Methamidophos	90	0.380/0.054 0.398/0.114	75/70	76/27 80/57	102/39 106/82
Acephate/Methamidophos	187	0.617/0.205 0.574/0.217	115/105	123/103 115/109	107/98 100/103
Acephate/Methamidophos	321	0.537/0.170 0.501/0.184	111/90	107/85 100/92	97/95 90/103
Acephate/Methamidophos	453	0.552/0.174 0.541/0.211	125/99	110/87 108/106	88/88 87/107

1. Laboratory fortified with 0.20 ppm acephate and 0.10 ppm methamidophos

Table 5. Stability of Acephate and Methamidophos Residues in/on Corn Meal under Frozen Conditions¹

Analyte	Storage Interval (days)	Residue (ppm)	% Fresh Fortified Recovery	% Apparent Recovery	% Corrected Recovery
Acephate/Methamidophos	0	0.12/0.05	116/103		(0.103/0.049) ²
Acephate/Methamidophos	78	0.14/0.07	133/116	117/140	102/124
Acephate/Methamidophos	184	0.11/0.06	112/108	92/120	95/114
Acephate/Methamidophos	284	0.11/0.06	104/93	92/120	102/133
Acephate/Methamidophos	366	0.11/0.06	106/99	92/120	100/125

Table 5. Stability of Acephate and Methamidophos Residues in/on Corn Meal under Frozen Conditions¹

Acephate/Methamidophos	455	0.12/0.05	111/91	100/100	105/113
------------------------	-----	-----------	--------	---------	---------

Storage Intervals and Conditions

Valent Chemical Company has submitted storage intervals and conditions for samples from magnitude of the residue studies conducted in support of current acephate tolerances and a summary of storage stability of Acephate and Methamidophos residues in frozen crops. This information, which fulfills requirements of the Acephate Registration Standard Update, are presented in Table 6.

Table 6. Storage Intervals and Conditions

Crop	Petition No.	MRIDs cited	No. of Trials/(Samples)	CropSample Storage Interval ^a	Storage Interval (Days) ^b
Beans	5F1578	00014774 thru 00014792	19(251 and 49)	1-127	0-63
Brussel Sprouts	3F1375	00014738 thru 00014740	5 (71 and 128)	1-66	2-28
Cauliflower	3F1375 and 7F1899	00015035 thru 00015037, 00015044 and 00014821 thru 00014824	8 (108 and 102)	2-402	1-28
Celery	5F1578 EPA Reg. No. 239-2418	00014768 thru 00014773, 00015323 thru 00015329	22 (162 and 150)	6-376	0-45
Cotton	3F1375	00015038 thru 00015040, & 00015206, and 000151197 thru 00015199	12 (189 and 150)	28-167	0-43
Cranberries	EPA Reg. No. 239-2418	00115589	9 (109 and 22)	21-316	4-138
Head Lettuce	3F1375	00014971 and 00014972, 00015041 thru 00015043, & 00015045	21 (342 and 339)	0-52	0-66
Macadamia Nuts	4F3101	00015321 and 00094740	7 (37 and 32)	35-290	1-31
Mint hay		00029683	22 (251 and 90)	9-352	0-92
Peanuts	2F2632	000114813 thru 00014815 & 00093722 thru 00093728	16 (246 and 98)	35-448	1-89
Bell Peppers	5F1578	00014760 thru 00014767	9 (151)	5-66	0-12
Non-Bell Peppers	4F3098	00160379	11 (84)	161-661	5-22
Soybeans	3F1375	00015049 thru 00015051 and 00015060	11 (90 and 60)	30-471 30-174 ^c	0-83
Tobacco		00015122, 00015125,	18 (212 and 44)	15-572	1-37

		00109354, 40504809			
--	--	--------------------	--	--	--

- a. Days between harvest/collection and extraction
- b. Days between extraction and measurement
- c. Longest interval if processing study T-3076 eliminated.

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
RDI: Wphang:3/19/98 WHazel: 3/11/98 Team:3/11/98:
H7509C:CBRS:CM#2:Rm805B:305-7478:FAFort/FF:3/10/98
Disk10:acephate.sto