



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

**MEMORANDUM**

DATE: September 30, 2003

SUBJECT: **Metam-sodium.** Residue Chemistry Chapter for the Metam-sodium Reregistration Eligibility Decision (RED) Document.

PC Code: 039003  
Reregistration Case No.: 2390  
DP Barcode No.: D293347

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# METAM-SODIUM

## REREGISTRATION ELIGIBILITY DECISION

### RESIDUE CHEMISTRY CONSIDERATIONS

PC Code 039003; Case 2390

(DP Barcode D293347)

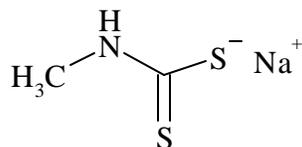
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## METAM-SODIUM



### REREGISTRATION ELIGIBILITY DECISION

### RESIDUE CHEMISTRY CONSIDERATIONS

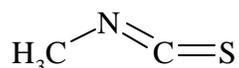
PC Code 039003; Case 2390

(DP Barcode D293347)

#### **A. INTRODUCTION**

Metam-sodium (sodium N-methyldithiocarbamate), a List B chemical, is a non-selective soil sterilant with fungicidal, herbicidal, insecticidal, and nematicidal properties. Metam-sodium is sold in the United States under the trade names Vapam, A7Vapam, Basamid-Fluid, Karbation, Maposol, Metam-fluid BASF, N-869, Sistan, and Solasan 500. The soluble concentrate, ready-to-use, and pressurized gas are the registered formulation classes of metam-sodium. Its reregistration is being supported by the Metam-sodium Task Force which currently has 4 active end-use products registered under FIFRA Section 3; however, there are a total of 51 active end-use products currently registered. Homeowner uses have been cancelled by the Task Force, and agricultural labels are general use except small-area uses which are classified as restricted-use-pesticide.

Metam-sodium is presently registered on a wide variety of crop groups including: root and tuber vegetables; bulb vegetables; leafy vegetables; Brassica (cole) leafy vegetables; legume vegetables; fruiting vegetables; cucurbit vegetables; citrus fruits; pome fruits; stone fruits; berries; tree nuts; cereal grains; nongrass livestock feeds; and herbs and spices. Metam-sodium may be applied to plant beds as a soil drench treatment. It may also be applied to field or row crops during preplant and postharvest stages via chemigation, soil broadcast treatment, soil band treatment, soil-incorporated treatment, and soil-injection treatment. The efficacy of metam-sodium is improved by water seal. When mixed with water, metam-sodium hydrolyzes to methyl isothiocyanate (MITC) and carbon disulfide (CS<sub>2</sub>). MITC, with chemical structure depicted below, is also a List B chemical (PC Code 068103; Case 2405) with no currently registered food/feed uses; the only active registered use of MITC is for wood protection treatment of seasoned forest products and finished wood products [*Source: REFS database search of 9/23/03*].



The qualitative nature of the residue in plants is adequately understood. Based on the results of an acceptable turnip metabolism study, HED has determined (DP Barcode D215298, 6/26/96, S. Willett) that no tolerances are needed with respect to the use of metam-sodium as a soil sterilant, and that there are no remaining outstanding residue chemistry data requirements.

There are currently no tolerances established for residues of metam-sodium. This residue chemistry chapter has been reviewed by the ChemSAC. The ChemSAC agreed that no plant or livestock tolerances would be needed for the use of metam-sodium as a soil sterilant as available residue data indicate no residues are expected. The metam-sodium use was determined to be a *nonfood* use.

The Metam-Sodium Phase 4 Review was issued on 5/13/91 followed by Data-Call-In Notices on 9/19/91 and 10/13/95. The Phase 4 Review identified several residue chemistry data deficiencies for the purpose of reregistration. However, as a result of HED's determination that no tolerances are needed with respect to the use of metam-sodium as a soil sterilant, no additional residue chemistry data are required for the purpose of reregistration.

HED has noted that there is a current registration for the use of metam-potassium as an antimicrobial use on sugar; however, there are no residues expected resulting from this use. Metam-potassium is added to the sugarcane slurry. There are numerous processing steps that occur after the addition of metam-potassium involving boilers, evaporators, a clarification step involving lime and/or phosphoric acid, vacuum pans, crystalizers, additional dryers, and bulk storage (Food And Agriculture Industry 9.10.1.1).

## **B. USE PATTERN SUMMARY**

### **1. Product List**

A search of the Agency's REFS database conducted on 9/23/03 identified 35 metam-sodium end-use products (EPs) registered to the Metam-sodium Task Force under FIFRA Section 3. In addition, there are 12 Special Local Need (SLN) registrations under FIFRA Section 24(c). These end-use products are listed below.

Table 1. Metam-sodium EPs registered to the Metam-sodium Task Force and all active SLN registrations.

EPA Reg. No./SLN No.	Label Date	Formulation	Product Name
1015-70	Not available	24.3% SC	Sanafoam Vaporooter II
1015-71	Not available	28.8% SC	Vaporooter
1022-562	Not available	33% SC	Chap-Fume

Table 1 (continued).

EPA Reg. No./SLN No.	Label Date	Formulation	Product Name
1448-85	Not available	33% SC	Busan 1020
1448-93	Not available	18% RTU	Busan 1016
1448-361	Not available	42.5% SC	Busan 1236
1448-371	Not available	33% SC	Busan 1020L
3008-33	Not available	32.7% SC	Woodfume
5481-350	12/98	32.7% SC	Metam Sodium
5481-418	02/95	32.7% SC	Metam Sodium Soil Fumigant for All Crops
5481-420	08/96	32.7% SC	Amvac Matam
5481-423	12/98	42% SC	Metam 426
5481-446	08/96	42% SC	Metacide 42
5481-456	09/96	38% SC	Metam Sodium 376
5481-458	08/96	38% SC	Metam 376 for Crop Use
5481-466	12/98	32.7% SC	Vapam Soil Fumigant Solution for All Crops
5481-467	01/92	32.7% SC	Vapam Soil Fumigant Soil Solution
5481-468	12/98	42% SC	Vapam HL Soil Fumigant
5481-470	Not available	32.7% RTU	Pole-Fume
5481-474	05/98	38% SC	Sodcure 376
5481-477	Not available	42% RTU	Rid-A-Vec
7001-284	Not available	32.7% SC	Metam (Soil Fumigant)
8660-129	Not available	32.7% SC	Pursell Metam Sodium
19713-298	Not available	32.7% SC	IDA, Inc. Phume
34704-647	Not available	32.7% SC	Metam Soil Fumigant
34704-769	Not available	42% SC	Clean Crop Nemasol 42%
45728-15	Not available	32.7% SC	Metam CLR 32.7% Soil Fumigant
45728-16	Not available	42% SC	Metam CLR 42%
51036-60	Not available	32.7% RTU	Fume V Soil Fumigant
61842-1	Not available	32.7% SC	OR-CAL Sectagon II
61842-3	Not available	32.7% SC	Pole Life
61842-5	Not available	32.7% SC	OR-CAL Metam - S.A.U.
61842-6	Not available	42.2% SC	Sectagon 42
64898-4	Not available	32.7% SC	Rout
64945-3	Not available	32.7% SC	Roo-Pru-Super Tri Pak

EPA Reg. No./SLN No.	Label Date	Formulation	Product Name
CA010028	--	42% SC	Metam 426
CA790044	--	32.7% SC	Stauffer Vapam 4-S Soil Fumigant Solution
CA860001	--	32.7% SC	Vapam Soil Fumifant Solution for All Crops
GA990005	--	42% SC	Vapam HL Soil Fumigant
NC830009	--	32.7% SC	Zeneca Vapam 4-S Soil Fumigant Solution
SC960006	--	42% SC	Vapam HL Soil Fumigant
VA830012	--	32.7% SC	Stauffer Vapam 4-S Soil Fumigant Solution
WA930022	--	32.7% SC	Vapam Soil Fumigant Solution for All Crops
WA930024	--	32.7% SC	Metam Sodium
WA940005	--	42% SC	Metam 426
WA960010	--	42% SC	Vapam HL
WA970015	--	42% SC	Vapam HL Soil Fumigant

## 2. Use Pattern Table

All metam-sodium end-use products are registered for use on vegetable crops, field crops, and fruit and nut crops as a soil sterilant. The timing of applications varies from preplant (including at plant bed) to postharvest. Three formulation classes are registered: soluble concentrate (SC), ready-to-use (RTU), and pressurized gas (PrGs). The maximum single application rate is 320 lb ai/A. On plant beds, metam-sodium may be applied as a soil drench treatment. On field or row crops, it may be applied via chemigation, soil broadcast treatment, soil band treatment, soil-incorporated treatment, and soil-injection treatment.

A comprehensive summary of the registered food/feed use patterns of metam-sodium was prepared by BEAD and is presented in Table 2. A tabular summary of the residue chemistry science assessments for reregistration of metam-sodium is presented in Table 3.

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

SITE NAME	LIMITATIONS				
<b>Application Timing (for any Reg.# at any rate)</b> Application Type (for any Reg.# at any rate) Application Equipment (for any Reg.# at any rate)	Max. Single Appl. Rate to a Single Site	Max. Seasonal Rate	Max. # Apps/ cc & yr	M R I	R E I PHI/PGI/PSI Use Limitations (May not apply to all Reg. #s)
<b>AGRICULTURAL CROPS/SOILS (UNSPECIFIED)</b>	Geographic allowable: CA TX Geographic disallowable: TX				
<b>Plant bed</b> Soil band treatment/Soil drench treatment/Spray Drencher/Drip irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer	7.322 lb 1K linear ft 319.5 lb A .007999 lb sq.ft	NS	NS NS	NS	48 h
<b>Postharvest</b> Broadcast/Chemigation/Soil band treatment/Soil broadcast treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Injection equipment/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	320 lb A .008062 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Band treatment/Broadcast/Chemigation/Soil band treatment/Soil broadcast treatment/Soil drench treatment/Soil fumigation/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Hose-end sprayer/Injection equipment/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler/Sprinkler can/Sprinkler irrigation	(L) 320 lb A .008062 lb sq.ft	NS	NS NS	NS	48 h Incorporate to a depth of 3 inches.
<b>ALFALFA</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation					
<b>ALMOND</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>APPLE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>BARLEY</b>					
<b>Preplant</b> Chemigation/Soil fumigation/Soil injection treatment Drip irrigation/Injection equipment/Soil injector equipment/Sprinkler irrigation	31.95 lb A	NS	NS NS	14	48 h Incorporate to a depth of 5 inches.

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>BASIL</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>BEANS</b>					
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>BLACKBERRY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation					
<b>BLUEBERRY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>BROCCOLI</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CABBAGE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

equipment/Soil injector equipment/Sprinkler irrigation					
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CABBAGE, CHINESE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CARROT (INCLUDING TOPS)</b>	Geographic allowable: ID NV OR WA				
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil fumigation/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	319.5 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CELERY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CHERRY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CHIVE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation					
<b>CITRUS</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CLOVER</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

equipment/Soil injector equipment/Sprinkler irrigation					
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CORN, FIELD</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CORN, SWEET</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>COTTON (UNSPECIFIED)</b>					
<b>At planting</b> Soil band treatment/Soil in-furrow injection/Soil in-furrow treatment/Soil incorporated treatment/Soil injection treatment Drag tube/Injection equipment/Shank/Soil incorporation	.1234 lb 1K linear ft 37.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

equipment/Soil injector equipment/Sprayer					
<b>Postplant</b> Chemigation Drip irrigation	37.6 lb A	NS	NS NS	NS	48 h
<b>CRANBERRY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>CUCUMBER</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>DILL</b>					

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>FIBER CROPS</b>	Geographic allowable: TX Geographic disallowable: TX				
<b>Plant bed</b> Soil band treatment/Soil drench treatment/Spray Drencher/Drip irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer	7.322 lb 1K linear ft 319.5 lb A .007999 lb sq.ft	NS	NS NS	NS	48 h
<b>Postharvest</b> Broadcast/Chemigation/Soil band treatment/Soil broadcast treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Injection equipment/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	320 lb A .008062 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Band treatment/Broadcast/Chemigation/Soil band treatment/Soil broadcast treatment/Soil drench treatment/Soil fumigation/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Hose-end sprayer/Injection equipment/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler/Sprinkler can/Sprinkler irrigation	(L) 320 lb A .008062 lb sq.ft	NS	NS NS	NS	48 h
<b>GARLIC</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>GRAPES</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	319.5 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>GRASS FORAGE/FODDER/HAY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation					
<b>IRRIGATION SYSTEMS</b>	Geographic allowable: CA				
<b>When needed</b> Chemigation/Spray Power sprayer/Sprinkler irrigation	8.175 lb 1K sq.ft	NS	NS 1/1 yr	NS	48 h
<b>LAKES/PONDS/RESERVOIRS (WITH HUMAN OR WILDLIFE USE)</b>	Geographic allowable: CA				
<b>When needed</b> Chemigation/Spray Power sprayer/Sprinkler irrigation	8.175 lb 1K sq.ft	NS	NS 1/1 yr	NS	48 h
<b>LETTUCE, HEAD</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>MARJORAM/OREGANO</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b>	316.6 lb A	NS	NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	.0079 lb sq.ft		NS		
<b>MELONS, CANTALOUPE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>MINT</b>					
<b>Preplant</b> Broadcast/Chemigation/Soil fumigation Drip irrigation/Injection equipment/Sprayer/Sprinkler irrigation	319.5 lb A	NS	NS NS	NS	48 h Incorporate to a depth of 2 inches.
<b>MUSTARD</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>ONION</b>	Geographic allowable: ID NV OR WA				
<b>Preplant</b> Soil band treatment/Soil fumigation Sprayer	319.5 lb A	NS	NS NS	NS	48 h
<b>ORCHARDS (UNSPECIFIED)</b>	365 day(s) preharvest interval. Geographic allowable: WA				
<b>Foliar</b> Soil incorporated treatment by irrigation Tractor-mounted sprayer	318 lb A	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil fumigation/Soil incorporated treatment by irrigation/Soil treatment Band sprayer/Drip irrigation/Not on label/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation/Tractor-mounted sprayer	324.94 lb A 318 lb A-in. .00795 lb sq.ft .1264 lb tree	NS	NS NS	30	48 h 365 day(s) preharvest interval.
<b>PEACH</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>PEANUTS</b>	Geographic allowable: NC VA				
<b>Preplant</b> Soil fumigation Soil injector equipment	65.4 lb A	NS	NS NS	NS	NS
<b>PEANUTS (UNSPECIFIED)</b>	Geographic allowable: GA SC				

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>At planting</b> Conservation tillage/Soil fumigation Injection equipment	31.95 lb A	NS	NS NS	14	48 h Incorporate to a depth of 6 inches.
<b>Preplant</b> Chemigation/Soil band treatment/Soil broadcast treatment/Soil fumigation/Soil incorporated treatment/Soil injection treatment Chisel/Drip irrigation/Injection equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	(L) 2.11 lb 1K linear ft 63.9 lb A	NS	NS NS	NS	48 h Incorporate to a depth of 6 inches.
<b>PEAR</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>PEAS (UNSPECIFIED)</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>PECAN</b>					
<b>Plant bed</b>	316.6 lb A	NS	NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Soil drench treatment Sprayer			NS		
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>PEPPER</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>PEPPERMINT</b>					
<b>Foliar</b> Spot treatment Soil incorporation equipment	319.5 lb A	NS	NS NS	NS	48 h
<b>Preplant</b> Broadcast/Soil injection treatment/Soil treatment Soil injector equipment/Sprayer	(L) 319.5 lb A	NS	NS NS	NS	48 h
<b>PLUM</b>					
<b>Plant bed</b> Soil drench treatment	316.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Sprayer					
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>POTATO, WHITE/IRISH</b>					
<b>Foliar</b> Soil injection treatment Injection equipment	127.8 lb A	NS	NS NS	NS	48 h Geographic allowable: Pacific NW State (Label verbatim)
<b>Postharvest</b> Chemigation/Soil injection treatment Soil injector equipment/Sprinkler irrigation	318 lb A	NS	NS NS	NS	48 h Geographic allowable: N. Central States (Label verbatim) Pacific NW States (Label verbatim) Geographic disallowable: CA
<b>Preplant</b> Chemigation/Soil fumigation/Soil incorporated treatment/Soil injection treatment/Soil treatment Drip irrigation/Injection equipment/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	(L) 319.5 lb A	NS	NS NS	NS	48 h Incorporate to a depth of 2 inches. Geographic allowable: N. Central States (Label verbatim) OR Pacific NW States (Label verbatim) Geographic disallowable: CA
<b>POTTING SOIL/TOPSOIL</b>					
<b>Preplant</b> Soil treatment/Soil/media treatment Mixer (mechanical)/Not on label/Sprayer/Sprinkler can	3.975 lb 1K sq.ft .01242 lb cu.ft .03975 lb sq.ft .0559 lb/.140625 gal	NS	NS NS	NS	48 h
<b>RADISH</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation					
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>RICE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SAGE</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SOIL, PREPLANT/OUTDOOR</b>					
<b>Plant bed</b>	(L)	NS	NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Soil injection treatment Soil injector equipment	63.9 lb A		NS		
<b>Preplant</b> Soil fumigation/Soil injection treatment Hose-end sprayer/Soil incorporation equipment/Soil injector equipment/Sprinkler can	11.925 lb 1K sq.ft 318 lb A	NS	NS NS	NS	48 h
<b>Summer</b> Soil fumigation Injection equipment	63.9 lb A	NS	NS NS	NS	48 h
<b>SORGHUM (UNSPECIFIED)</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SOYBEANS (UNSPECIFIED)</b>					
<b>At planting</b> Soil band treatment/Soil in-furrow injection/Soil in-furrow treatment/Soil incorporated treatment/Soil injection treatment Drag tube/Injection equipment/Shank/Soil incorporation equipment/Soil injector equipment/Sprayer	.1234 lb 1K linear ft 37.6 lb A	NS	NS NS	NS	48 h
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Postplant</b>	37.6 lb A	NS	NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Chemigation Drip irrigation			NS		
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SPEARMINT</b>	Geographic allowable: ID NV OR WA				
<b>Preplant</b> Broadcast Sprayer	319.5 lb A	NS	NS NS	NS	48 h
<b>SPINACH</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SQUASH (ALL OR UNSPECIFIED)</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>STRAWBERRY</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>SUGAR BEET</b> Geographic allowable: ID NV OR WA					
<b>At planting</b> Soil band treatment/Soil in-furrow injection/Soil in-furrow treatment/Soil incorporated treatment/Soil injection treatment Drag tube/Injection equipment/Shank/Soil incorporation equipment/Soil injector equipment/Sprayer	.1234 lb 1K linear ft 37.6 lb A	NS	NS NS	NS	48 h
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Postplant</b> Chemigation	37.6 lb A	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

Drip irrigation					
<b>Preplant</b> Chemigation/Soil band treatment/Soil fumigation/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	319.5 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>TOMATO</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil broadcast treatment/Soil incorporated treatment/Soil injection treatment Boom sprayer/Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	(L) 316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>TURNIP</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>VEGETABLES (UNSPECIFIED)</b>					
<b>Preplant</b> Soil treatment/Soil treatment (surface) Hose-end sprayer/Sprinkler can	.01193 lb sq.ft	NS	NS NS	NS	48 h

Table 2a. Food/feed Use Patterns Summary for Metam-sodium (Case 2390) Current as Of: 04/10/2003

<b>WALNUT (ENGLISH/BLACK)</b>					
<b>Plant bed</b> Soil drench treatment Sprayer	316.6 lb A	NS	NS NS	NS	48 h
<b>Postharvest</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>Preplant</b> Chemigation/Soil band treatment/Soil incorporated treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprinkler irrigation	316.6 lb A .0079 lb sq.ft	NS	NS NS	NS	48 h
<b>WHEAT</b>	Geographic allowable: ID NV OR WA				
<b>Preplant</b> Chemigation/Soil fumigation/Soil injection treatment Drip irrigation/Injection equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	31.95 lb A	NS	NS NS	14	48 h Incorporate to a depth of 5 inches.
<b>PRODUCT NUMBERS CONTAINED IN THIS REPORT</b> 001448-00085, 001448-00361, 005481-00350, 005481-00418, 005481-00420, 005481-00423, 005481-00446, 005481-00458, 005481-00466, 005481-00467, 005481-00468, 007001-00284, 019713-00298, 034704-00647, 034704-00769, 045728-00015, 045728-00016, 051036-00060, 061842-00006, CA79004400, CA86000100, GA99000500, NC83000900, SC96000600, VA83001200, WA93002400, WA94000500, WA97001500					
<b>HOMEOWNER PRODUCTS CONTAINED IN THIS REPORT</b> None					
<b>HEADER ABBREVIATIONS</b> Site Name - The site name refers to the entity (crop, building, surface or article) where a pesticide is applied and/or which is being protected. Limitations - Precautionary statements related to the use of the product(s). Application Timing - The timing of pesticide application and is the primary application sort (not aggregated). Application Type - The type of pesticide application (aggregated). Application Equipment - The equipment used to apply pesticide (aggregated).					

Max. Single Appl. Rate to a Single Site - Maximum Dose for a single application to a single site. System calculated.

Max Seasonal Rate - The maximum amount of pesticide that can be applied to a site in one growing season (/cc) and during the span of one year (/yr).

Max. # Apps/cc & yr - Maximum Number of Applications per crop cycle and per year.

M R I - Minimum Retreatment Interval (days) (at any rate). The minimum interval between pesticide application (days).

R E I - ReEntry Interval - The minimum amount of time that must elapse before workers can reenter a treated area.

PHI/PGI/PSI Use Limitations (May not apply to all Reg.#s) - Preharvest/Pregrazing/Preslaughter Interval use limitations pertinent to the application.

Current As Of: - The label data for the listed products in this report is current of this date.

#### **ABBREVIATIONS**

AN - As needed

NA - Not Applicable

NS - Not Specified (on label)

(L) - The dosage information provided is from the label in terms of product (e.g., ounces, gallons, or pounds of the product) because there was insufficient information (e.g., missing density, area, or active ingredient percentages) to provide converted dosage information. This report provides active ingredient percentage in the product for the reported chemical for all unconverted label dosage information if this information is available. This active ingredient percentage information is displayed next to the form code abbreviations (e.g., 80% WP).

#### **APPLICATION RATE**

cwt : Hundred Weight

nnE-xx : nn times (10 power -xx), for instance, "1.234E-04" is equivalent to ".0001234"

End of Report

Table 2b. Food/feed Use Patterns Summary for Metam-potassium (Case 2390) Current as Of: 04/15/2003

SITE NAME	LIMITATIONS				
<b>Application Timing (for any Reg.# at any rate)</b> Application Type (for any Reg.# at any rate) Application Equipment (for any Reg.# at any rate)	Max. Single Appl. Rate to a Single Site	Max. Seasonal Rate	Max. # Apps/ cc & yr	M R I	R E I PHI/PGI/PSI Use Limitations (May not apply to all Reg. #s)
<b>AGRICULTURAL CROPS/SOILS (UNSPECIFIED)</b>					
<b>At planting</b> Soil band treatment/Soil in-furrow injection/Soil in-furrow treatment/Soil incorporated treatment/Soil injection treatment Drag tube/Low pressure ground sprayer/Soil incorporation equipment/Soil injector equipment/Sprayer	.9652 lb 1K linear ft 42.05 lb A	NS	NS NS	NS	NS Incorporate to a maximum depth of 6 inches. Incorporate to a minimum depth of 4 inches.
<b>Postharvest</b> Chemigation/Soil band treatment/Soil broadcast treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment	346.68 lb A .05643 lb sq.ft	NS	NS NS	NS	NS Incorporate to a depth of 24 inches. Incorporate to a depth of 2 inches.
<b>Postplant</b> Chemigation Drip irrigation	42.05 lb A	NS	NS NS	NS	NS
<b>Preplant</b> Chemigation/Soil band treatment/Soil broadcast treatment/Soil drench treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	348 lb A .05643 lb sq.ft	NS	NS NS	NS	NS Incorporate to a depth of 24 inches. Incorporate to a depth of 2 inches.
<b>ALFALFA</b>					
<b>Postplant</b> Chemigation Sprinkler irrigation	34.8 lb A	NS	NS NS	NS	NS
<b>APPLE</b>					
<b>Postplant</b> Chemigation Sprinkler irrigation	69.6 lb A	NS	NS NS	NS	NS
<b>ASPARAGUS</b>					
<b>Postplant</b> Chemigation Sprinkler irrigation	69.6 lb A	NS	NS NS	NS	NS
<b>BARLEY</b>					
Geographic allowable: ID NV OR WA					
<b>Preplant</b>	34.8 lb A	NS	NS	NS	NS

Soil broadcast treatment/Soil injection treatment Soil injector equipment/Sprayer			NS		
<b>CARROT (INCLUDING TOPS)</b>	Geographic allowable: NV OR WA				
<b>Preplant</b> Soil broadcast treatment Sprayer	348 lb A	NS	NS NS	NS	NS
<b>FIBER CROPS</b>					
<b>At planting</b> Soil band treatment/Soil in-furrow injection/Soil in-furrow treatment/Soil incorporated treatment Drag tube/Low pressure ground sprayer/Soil incorporation equipment/Soil injector equipment/Sprayer	.9652 lb 1K linear ft 42.05 lb A	NS	NS NS	NS	NS Incorporate to a maximum depth of 6 inches. Incorporate to a minimum depth of 4 inches.
<b>Postharvest</b> Chemigation/Soil band treatment/Soil broadcast treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment	346.68 lb A .05643 lb sq.ft	NS	NS NS	NS	NS Incorporate to a depth of 24 inches. Incorporate to a depth of 2 inches.
<b>Postplant</b> Chemigation Drip irrigation	42.05 lb A	NS	NS NS	NS	NS
<b>Preplant</b> Chemigation/Soil band treatment/Soil broadcast treatment/Soil drench treatment/Soil injection treatment Drencher/Drip irrigation/Gravity irrigation/Soil incorporation equipment/Soil injector equipment/Sprayer/Sprinkler irrigation	348 lb A .05643 lb sq.ft	NS	NS NS	NS	NS Incorporate to a depth of 24 inches. Incorporate to a depth of 2 inches.
<b>HOPS</b>					
<b>Postplant</b> Chemigation Sprinkler irrigation	69.6 lb A	NS	NS NS	NS	NS
<b>MINT/PEPPERMINT/SPEARMINT</b>					
<b>Postplant</b> Chemigation Sprinkler irrigation	34.8 lb A	NS	NS NS	NS	NS
<b>Preplant</b> Soil broadcast treatment Sprayer	348 lb A	NS	NS NS	NS	NS Geographic allowable: ID NV OR WA

<b>ONION</b>					
<b>Preplant</b> Soil band treatment/Soil broadcast treatment Sprayer	348 lb A	NS	NS NS	NS	NS Geographic allowable: ID NV OR WA
<b>ORCHARDS (UNSPECIFIED)</b>					
<b>Preplant</b> Chemigation/Soil band treatment/Soil broadcast treatment Sprinkler irrigation/Sprinkler system	348 lb A	NS	NS NS	NS	NS Geographic allowable: ID NV OR WA
<b>PEANUTS (UNSPECIFIED)</b>					
<b>At planting</b> Soil injection treatment Soil injector equipment	34.8 lb A	NS	NS NS	NS	NS
<b>Preplant</b> Soil band treatment/Soil injection treatment Soil injector equipment	2.402 lb 1K linear ft 34.8 lb A	NS	NS NS	NS	NS
<b>POTATO, WHITE/IRISH</b>					
<b>Postharvest</b> Chemigation Sprinkler irrigation	348 lb A	NS	NS NS	NS	NS
<b>Postplant</b> Soil injection treatment Soil injector equipment	232 lb A	NS	NS NS	NS	NS Geographic allowable: Pacific NW States (Label verbatim)
<b>Preplant</b> Chemigation/Soil broadcast treatment/Soil injection treatment/Soil treatment Soil injector equipment/Sprinkler/Sprinkler irrigation	348 lb A	NS	NS NS	NS	NS Incorporate to a maximum depth of 14 inches. Incorporate to a minimum depth of 12 inches. Geographic allowable: ID NV OR WA
<b>SUGAR BEET</b>					
<b>Postharvest</b> Soil band treatment/Soil broadcast treatment Sprayer	348 lb A	NS	NS NS	NS	NS Geographic allowable: ID NV OR WA
<b>Preplant</b> Soil band treatment/Soil broadcast treatment Sprayer	348 lb A	NS	NS NS	NS	NS Geographic allowable: ID NV OR WA
<b>TOMATO</b>					
<b>Preplant</b>	(L)	NS	NS	NS	NS Geographic allowable: Other

Chemigation/Soil broadcast treatment/Soil injection treatment Boom sprayer/Soil injector equipment/Sprinkler irrigation			NS		
<b>WHEAT</b>	Geographic allowable: ID NV OR WA				
<b>Preplant</b> Soil injection treatment Soil injector equipment	34.8 lb A	NS	NS NS	NS	NS
<b>PRODUCT NUMBERS CONTAINED IN THIS REPORT</b> 001448-00362, 005481-00483					
<b>HOMEOWNER PRODUCTS CONTAINED IN THIS REPORT</b> None					
<b>HEADER ABBREVIATIONS</b> Site Name - The site name refers to the entity (crop, building, surface or article) where a pesticide is applied and/or which is being protected. Limitations - Precautionary statements related to the use of the product(s). Application Timing - The timing of pesticide application and is the primary application sort (not aggregated). Application Type - The type of pesticide application (aggregated). Application Equipment - The equipment used to apply pesticide (aggregated). Max. Single Appl. Rate to a Single Site - Maximum Dose for a single application to a single site. System calculated. Max Seasonal Rate - The maximum amount of pesticide that can be applied to a site in one growing season (/cc) and during the span of one year (/yr). Max. # Apps/cc & yr - Maximum Number of Applications per crop cycle and per year. M R I - Minimum Retreatment Interval (days) (at any rate). The minimum interval between pesticide application (days). R E I - ReEntry Interval - The minimum amount of time that must elapse before workers can reenter a treated area. PHI/PGI/PSI Use Limitations (May not apply to all Reg.#s) - Preharvest/Pregrazing/Preslaughter Interval use limitations pertinent to the application. Current As Of: - The label data for the listed products in this report is current of this date.					
<b>ABBREVIATIONS</b> AN - As needed NA - Not Applicable NS - Not Specified (on label) (L) - The dosage information provided is from the label in terms of product (e.g., ounces, gallons, or pounds of the product) because there was insufficient information (e.g., missing density, area, or active ingredient percentages) to provide converted dosage information. This report provides active ingredient percentage in the product for the reported chemical for all unconverted label dosage information if this information is available. This active ingredient					

percentage information is displayed next to the form code abbreviations (e.g., 80% WP).

**APPLICATION RATE**

cwt : Hundred Weight

nnE-xx : nn times (10 power -xx), for instance, "1.234E-04" is equivalent to ".0001234"

End of Report

For questions and comments please contact the OPP Label Data Team through e-mail.

### C. SUMMARY OF RESIDUE CHEMISTRY DATA REQUIREMENTS

Table 3. Summary of Residue Chemistry Data Requirements for Metam-Sodium (PC Code 039003; Case 2390).

OPPTS GLN No.	Guideline Description/Commodity	Tolerances (ppm) <sup>1</sup>	Must Additional Data Be Submitted? <sup>2</sup>	MRID Nos. <sup>3</sup>	Comments
860.1200	Directions for Use	N/A = Not Applicable	No	See Table 2	
860.1300	Nature of the Residue - Plants	N/A	No	41137101 41137102 41137103 43632602 <sup>4</sup> 92097021	
860.1300	Nature of the Residue - Livestock	N/A	No		The Metam-Sodium Phase 4 Review waived the requirement for animal metabolism studies.
860.1340	Residue Analytical Method - Plants	N/A	No	41142502 41631102 41631104 43632601 <sup>4</sup> 92098034	
860.1340	Residue Analytical Method - Livestock	N/A	No		The Metam-Sodium Phase 4 Review waived the requirement for livestock residue methods.
860.1360	Multiresidue Method	N/A	No	41631103	The Metam-Sodium Phase 4 Review waived the requirement for this GLN topic because the available multiresidue method submission(s) were deemed not suitable for the analysis of the parent and MITC in crop samples due to poor chromatographability and/or low recoveries through methods and clean-up columns.
860.1380	Storage Stability Data	N/A	No		
860.1400	Magnitude of the Residue - Water, Fish, and Irrigated Crops	None established	NA		
860.1460	Magnitude of the Residue - Food Handling	None established	NA		
860.1480	Magnitude of the Residue - Meat, Milk, Poultry, Eggs	None established	No		The Metam-Sodium Phase 4 Review waived the requirement for livestock feeding studies.

Table 3 (continued).

OPPTS GLN No.	Guideline Description/Commodity	Tolerances (ppm) <sup>1</sup>	Must Additional Data Be Submitted? <sup>2</sup>	MRID Nos. <sup>3</sup>	Comments
860.1500	Crop Field Trials	None established	No	40951601 40951602 40951603 40951606 40951607 40951608 40951609 41097001 41097002 41097003 41142501 41142502 41142503 41218101 41218102 41218103 41218104 92098035 92098036 92098037 92098038 92098039 92098040 92098041 92098042 92098043 92098044 92098045 92098046 92098047 92098048 92098049 92098050 92098051 92098052 92098053 92098054 92098055	
860.1520	Processed Food/Feed	None established	No		
860.1850	Confined Accumulation in Rotational Crops	N/A	No		
860.1900	Field Accumulation in Rotational Crops	None established	No		

1. No tolerances for residues of metam-sodium in/on plant and livestock commodities are currently established. No tolerances are also required for reregistration when metam-sodium is used as a soil sterilant.

2. HED has determined that there are no remaining outstanding residue chemistry data requirements for the reregistration of metam-sodium when used as a soil sterilant.

3. Unless otherwise specified, all MRID submissions were reviewed in the Metam-Sodium Phase 4 Review issued 5/13/91.

4. DP Barcode D215298, CB No. 15996, 6/26/96, S. Willett.

## **D. RESIDUE CHARACTERIZATION**

### **General Discussion on Residue Chemistry of Metam-Sodium**

#### **1. Nature of the Residue in Plants**

The qualitative nature of the residue in plants is adequately understood based on an acceptable turnip metabolism study, and consists of natural plant biochemicals. In the reviewed turnip study, neither metam-sodium, MITC nor any related thioureas or methylated ureas were detected in the extractable radioactivity or the post-extraction solids. The observed radioactivity was shown to be distributed over a variety of natural products indicating complete incorporation of metam-sodium into the carbon pool. The results of the turnip study confirm the registrant's conclusions from previous metabolism studies conducted on Chinese cabbage, radish, and tomato that no metam-sodium residues of concern are metabolized in plants when the soil sterilant is applied according to label directions.

#### **2. Nature of the Residue in Livestock**

The requirement for livestock metabolism study is waived. The use of metam-sodium on food/feed crops is classified to fall under Category 3 as per 40 CFR §180.6. It is not possible to establish with certainty whether finite residues will be incurred, but there is no reasonable expectation of finite residues.

#### **3. Residue Analytical Methods**

No tolerances are to be established for residues of metam-sodium in/on plant or livestock commodities. As a result of this determination, there is no requirement for the development of enforcement analytical methods for plant or livestock commodities.

#### **4. Multiresidue Method Testing**

The reregistration requirement for multiresidue method testing is waived because tolerances are not required for soil sterilant uses of metam-sodium.

#### **5. Storage Stability Data**

The reregistration requirement for storage stability data is waived because tolerances are not required for soil sterilant uses of metam-sodium.

## **6. Magnitude of the Residue in Plants**

Because plant metabolism data show ultimate breakdown of metam-sodium to non-toxic degradates and subsequent re-incorporation into natural plant constituents, tolerances are not to be established for plant commodities, and residue data are not required when metam-sodium is used as a soil sterilant.

## **7. Magnitude of the Residue in Processed Food/Feed**

The reregistration requirement for processing studies is waived because tolerances are not required for soil sterilant uses of metam-sodium.

## **8. Magnitude of the Residue in Meat, Milk, Poultry, and Eggs**

No tolerances are to be established for metam-sodium residues in livestock commodities. The reregistration requirement for ruminant and poultry feeding studies are waived.

## **9. Confined and Field Accumulation in Rotational Crops**

The reregistration requirement for confined and field rotational crop studies are waived based on available soil metabolism data which indicate that MITC is degraded to a point where it enters the carbon and sulfur pool and generates a wide variety of intractable natural products.

## **10. Submittal of Analytical Reference Standards**

An analytical reference standard for metam-sodium is available at the EPA National Pesticide Standards Repository. However, the standard is now “expired”; the Agency may need to request a new certificate of analysis or a new standard from the registrant(s) [8/8/02 email communication from Chuck Stafford] in the future.

## **E. TOLERANCE REASSESSMENT SUMMARY**

### **1. Tolerance Reassessments for Metam-Sodium**

Metam-sodium, when used as a soil sterilant, was considered to be a *nonfood* use; therefore, tolerances are not required for metam-sodium when used as a soil sterilant. No residues of metam-sodium and MITC are expected to occur in plants. The use of metam-sodium on food/feed crops is classified to fall under Category 3 as per 40 CFR §180.6. It is not possible to establish with certainty whether finite residues will be incurred, but there is no reasonable expectation of finite residues.

### **2. Codex/International Harmonization**

No Codex MRLs are in effect for metam-sodium residues; therefore, issues of compatibility between Codex MRLs and U.S. tolerances do not exist. There are also no Canadian or Mexican MRLs established for metam-sodium residues.

## **F. BIBLIOGRAPHY**

### **1. Study Citations**

- 40951601 Jones, P. (1988) The Magnitude of Metam-sodium Residues on Snap Beans: Project I.D. PAL-ME-ICI-01. Unpublished study prepared by Morse Laboratories, Inc. 225 p.
- 40951602 Jones, P. (1988) The Magnitude of Metam-sodium Residues on Cucumbers: Project I.D. PAL-ME-ICI-02. Unpublished study prepared by Morse Laboratories, Inc. 177 p.
- 40951603 Jones, P. (1988) The Magnitude of Metam-sodium Residues on Potatoes: Project I.D. PAL-ME-ICI-03. Unpublished study prepared by Morse Laboratories, Inc. 241 p.
- 40951606 Zick, M. (1988) The Magnitude of Metam-sodium Residues on Basil: Project I.D. PAL-ME-ICI-06. Unpublished study prepared by Morse Laboratories, Inc. 124 p.
- 40951607 Jones, P. (1988) The Magnitude of Metam-sodium Residues on Tobacco: Project I.D. PAL-ME-ICI-07. Unpublished study prepared by Morse Laboratories, Inc. 124 p.
- 40951608 Zick, M. (1988) The Magnitude of Metam-sodium Residues on Cantaloupes: Project I.D. PAL-ME-ICI-08. Unpublished study prepared by Morse Laboratories, Inc. 160 p.
- 40951609 Jones, P. (1988) The Magnitude of Metam-sodium Residues on Radish: Project I.D. PAL-ME-ICI-09. Unpublished study prepared by Morse Laboratories, Inc. 183 p.

- 41097001 Jones, P. (1989) The Magnitude of Metam-sodium Residues on Turnip: Proj. ID PAL-ME-ICI-14. Unpublished compilation prepared by Morse Laboratories, Inc. 131 p.
- 41097002 Jones, P. (1989) The Magnitude of Metam-sodium Residues on Spinach: Proj. ID PAL-ME-ICI-13. Unpublished compilation prepared by Morse Laboratories, Inc. 164 p.
- 41097003 Jones, P. (1989) The Magnitude of Metam-sodium Residues on Leaf Lettuce: Proj. ID PAL-ME-ICI-10. Unpublished compilation prepared by Morse Laboratories, Inc. 125 p.
- 41137101 Bieber, W.; Krohn, R. (1989) Investigations on the Residues of Metam-Sodium in Radishes Grown on Pretreated Soil: Supplemental Report: Document No. 89/0036. Unpublished study prepared by Natec Institute. 89 p.
- 41137102 Bieber, W.; Krohn, R. (1989) Investigations on the Residues of Metam-Sodium in Chinese Cabbage Grown on Pretreated Soil: Supplemental Report: Document No. 89/0037. Unpublished study prepared by Natec Institute. 87 p.
- 41137103 Bieber, W.; Krohn, R. (1989) Investigations on the Residues of Metam-Sodium in Tomatoes Grown on Pretreated Soil: Supplemental Report: Document No. 89/0038. Unpublished study prepared by Natec Institute. 84 p.
- 41142501 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Strawberry: Project ID PAL-ME-ICI-18. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 218 p.
- 41142502 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Head Lettuce: Project ID PAL-ME-ICI-12. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 203 p.
- 41142503 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Broccoli: Project ID PAL-ME-ICI-15. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 117 p.
- 41218101 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Bulb Onion: Project ID PAL-ME-ICI-17. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 211 p.
- 41218102 Canez, V. (1989) The Magnitude of Metam-sodium Residues on Cabbage: Project ID

- PAL-ME-ICI-20. Unpublished study prepared by Morse Laboratories, Inc. in Cooperation with Pan-Agricultural Laboratories, Inc. 224 p.
- 41218103 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Garlic: Project ID PAL-ME-ICI-21. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 122 p.
- 41218104 Canez, V. (1989) The Magnitude of Metam-Sodium Residues on Green Onion: Project ID PAL-ME-ICI-11. Unpublished study prepared by Morse Laboratories, Inc. in Co-operation with Pan-Agricultural Laboratories, Inc. 212 p.
- 41631102 McKay, J. (1990) Determination of Metam-Sodium in Crops: Lab Project Number: RR90/368B. 30 p.
- 41631103 Fitzpatrick, R. (1989) Analysis of Vapam Residues by Multi-Residue Methods in FDA Pesticide Analytical Manual Volume 1: Lab Project Number: HAS/A030/005E. Unpublished study prepared by Huntingdon Analytical Services. 45 p.
- 41631104 Fitzpatrick, R. (1989) Analysis of Methyl Isothiocyanate MITC Residues by Multiresidue Analytical Methods in FDA Pesticide Analytical Manual Volume I: Lab Project Number: A030/005D. Unpublished study prepared by Huntingdon Analytical Services. 59 p.
- 43632601 Wheals, I. (1993) MITC: Independent Laboratory Confirmation of an Analytical Method for the Determination of Residues of the Metabolite Methyl Isothiocyanate (MITC) in Crops: Lab Project Number: 93JH107. Unpublished study prepared by Zeneca Agrochemicals. 21 p.
- 43632602 Davis, M.; Campbell, L. (1995) Nature of the Residue of (Carbon 14) Metam-Sodium in Turnip: Final Report: Lab Project Number: SC920140. Unpublished study prepared by Battelle. 189 p.
- 92097021 Otto, S. (1990) Basf Corporation Phase 3 Summary of MRID 41137101 and Related MRIDs 41137102, 41137103. Metam Sodium / Plant Metabolism: BASF Registration Document No. 90/6186. Prepared by NATEC INSTITUT FOR NATURWISSENSCHAFTLICH DIENSTE. 27 p.
- 92098034 Meyers, T. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41142502. Metam-Sodium Residue Method for Plants: Determination of Methyl Isothiocyanate (MITC) in Crops: Determination of Metam in Crops: Report No. WRC 88-43; Morse Labs Method No. MTF-88-AM-005; Laboratory ID No. RR 90-265B. Prepared by

MORSE LABORATORIES INC. 17 p.

- 92098035 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951606. The Magnitude of Metam-Sodium Residues on Basil: Project ID. PAL-ME-ICI-06. Prepared by PAN-AGRICULTURAL LABORATORIES, INC. 10 p.
- 92098036 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41142503. The Magnitude of Metam-Sodium Residues on Broccoli: Project ID PAL-ME-ICI-15. Prepared by PAN-AGRICULTURAL LABORATORIES, INC. 10 p.
- 92098037 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41218101. The Magnitude of Metam-Sodium Residues on Bulb Onion: Project ID PAL-ME-ICI-17. Prepared by MORSE LABORATORIES. 10 p.
- 92098038 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41218102. The Magnitude of Metam-Sodium Residues on Cabbage: Project ID PAL-ME-ICI-20. Prepared by MORSE LABORATORIES. 10 p.
- 92098039 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951608. The Magnitude of Metam-Sodium Residues on Cantaloupes: Project ID PAL-ME-ICI-08. Prepared by MORSE LABORATORIES. 10 p.
- 92098040 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951602. The Magnitude of Metam-Sodium Residues on Cucumbers: Project ID PAL-ME-ICI-02. Prepared by MORSE LABORATORIES. 10 p.
- 92098041 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41218103. The Magnitude of Metam-Sodium Residues on Garlic: Project ID PAL-ME-ICI-21. Prepared by MORSE LABORATORIES. 10 p.
- 92098042 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41218104. The Magnitude of Metam-Sodium Residues on Green Onion: Project ID PAL-ME-ICI-11. Prepared by MORSE LABORATORIES. 10 p.
- 92098043 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41142502. The Magnitude of Metam-Sodium Residues on Head Lettuce: Project ID PAL-ME-ICI-12. Prepared by MORSE LABORATORIES. 10 p.
- 92098044 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41097003. The Magnitude of Metam-Sodium Residues on Leaf Lettuce: Project ID PAL-ME-ICI-10. Prepared by MORSE LABORATORIES. 10 p.

- 92098045 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951604. The Magnitude of Metam-Sodium Residues on Mustard Greens: Project ID PAL-ME-ICI-04. Prepared by MORSE LABORATORIES. 10 p.
- 92098046 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951605. The Magnitude of Metam-Sodium Residues on Peppermint: Project ID PAL-ME-ICI-05. Prepared by MORSE LABORATORIES. 10 p.
- 92098047 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951603. The Magnitude of Metam-Sodium Residues on Potatoes: Project ID PAL-ME-ICI-03. Prepared by MORSE LABORATORIES. 10 p.
- 92098048 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951609. The Magnitude of Metam-Sodium Residues on Radish: Project ID PAL-ME-ICI-09. Prepared by MORSE LABORATORIES. 10 p.
- 92098049 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951601. The Magnitude of Metam-Sodium Residues on Snap Beans: Project ID PAL-ME-ICI-01. Prepared by MORSE LABORATORIES. 11 p.
- 92098050 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41097002. The Magnitude of Metam-Sodium Residues on Spinach: Project ID PAL-ME-ICI-13. Prepared by MORSE LABORATORIES. 10 p.
- 92098051 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41142501. The Magnitude of Metam-Sodium Residues on Strawberry: Project ID PAL-ME-ICI-18. Prepared by MORSE LABORATORIES. 10 p.
- 92098052 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41201401. The Magnitude of Metam-Sodium Residues on Sweet Corn: Project ID PAL-ME-ICI-16. Prepared by MORSE LABORATORIES. 10 p.
- 92098053 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 40951607. The Magnitude of Metam-Sodium Residues on Tobacco: Project ID PAL-ME-ICI-07. Prepared by MORSE LABORATORIES. 10 p.
- 92098054 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41142504. The Magnitude of Metam-Sodium Residues on Tomato Fruit: Project ID PAL-ME-ICI-19. Prepared by MORSE LABORATORIES. 10 p.
- 92098055 Regwest Co. (1990) ICI Americas Inc. Phase 3 Summary of MRID 41097001. The

Magnitude of Metam-Sodium Residues on Turnip: Project ID PAL-ME-ICI-14.  
Prepared by MORSE LABORATORIES. 10 p.

## 2. Agency Memoranda Citations

Table 4. Agency Memoranda Citations.

Date	DP Barcode	CB No.	From	To	MRID Nos.	Subject
Memos cited in Table 3						
5/13/91	None	None	C. Olinger & S. Funk	CRM & CBRS Branch Chief	See Table 3	Phase 4 Reviews of Residue Chemistry Data for the Reregistration of Metam-sodium.
6/26/96	D215298	15996	S. Willett	T. Myers & M. Wilhite	43632601, 43632602	Metam-sodium. Registrant's Response to Residue Chemistry Reregistration Data Deficiencies. Reregistration Case No. 2390. Chemical ID No. 039003.
Other Memos Relevant to Reregistration						
4/14/94	D200153	13352	F. Fort	T. Myers	None	Metam-sodium. Registrant's Proposal to Satisfy Reregistration Requirements. List B Case No. 2390. Chemical No. 039003.
2/24/95	D208832	14660	F. Fort	T. Myers & V. Dietrich	None	Metam-sodium. Registrant's Response to Residue Chemistry Issues. Case No. 2390. Chemical ID No. 039003.