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

DEC 13 1993

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Fenbuconazole on Stone Fruit, Pecans, Almonds, Bananas, Apples, and Wheat. New Chemical Registration. Issues to be Presented at the 12/15/93 Meeting of the HED Metabolism Committee.

FROM: Nancy Dodd and William D. Wassell, Chemists Nancy Dodd
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THROUGH: Debra Edwards, Ph.D., Chief
Chemistry Branch I- Tolerance Support Debra Edwards 12/10/93
Health Effects Division (7509C)

TO: Members of the HED Metabolism Committee

Fenbuconazole (RH-7592, fenethanil, Indar®, α-(2-[4-chlorophenyl]ethyl)-α-phenyl-3-(1H-1,2,4-triazole)-1-propanenitrile) is a new fungicide for which a temporary tolerance is established on the stone fruit crop group (except dried plums) at 1.0 ppm. The temporary tolerance is established for parent *per se*.

No permanent tolerances have been established. There are no Codex, Canadian, or Mexican tolerances.

Permanent tolerances have been proposed for stone fruit, pecans, almonds, bananas, apples, wheat, and animal commodities as follows:

stone fruit crop group and dried prunes at 2 ppm for residues of fenbuconazole and RH-9129 and RH-9130, the diastereomeric lactone metabolites [5-(4-chlorophenyl)-dihydro-3-phenyl-3-(methyl-1H-1,2,4-triazole-1-yl)-2-3H-furanone]

pecans at 0.1 ppm for fenbuconazole, RH-9129, RH-9130, and RH-6467 [4-(4-chlorophenyl)-2-(methyl-1H-1,2,4-triazole)-4-oxo-2-phenyl butanenitrile]

almond nuts at 0.05 ppm and almond hulls at 3.0 ppm for fenbuconazole, RH-9129, RH-9130, and RH-6468 (the diastereomeric iminolactone metabolites, 5-(4-chlorophenyl)-dihydro-3-phenyl-3-(methyl-1H-1,2,4-triazole-1-yl)-2-3H-iminolactone)

banana pulp at 0.05 ppm and banana peel at 0.30 ppm for fenbuconazole, RH-9129, and RH-9130

apples at 0.4 ppm, apple juice and wet pomace at 0.8 ppm and dry pomace at 3.0 ppm for fenbuconazole, RH-9129, RH-9130, RH-6468 and RH-6467.

wheat grain at 0.05 ppm and wheat straw at 10.0 ppm for fenbuconazole, RH-9129, RH-9130, RH-6468 and RH-6467.

Animal commodity tolerances are proposed in conjunction with the proposed use on wheat, but animal metabolism is not to be discussed at this time since the nature of the residue in livestock has not been adequately defined.

Structures and names of metabolites are given in Attachment 1. The plants and animals (including the rat) in which each metabolite was found are shown in Attachment 2.

The proposed uses are as follows:

stone fruit crop group and dried prunes:

Spray apricots, cherries, nectarines, peaches, plums, and prunes at rates up to 0.1 lb ai/A. Do not exceed 0.75 lb ai/A/season.

Spray peaches at rates up to 0.125 lb ai/A. Do not exceed 1.0 lb ai/A.

Applications can be made up to the day of harvest. Postharvest applications were proposed but not supported by residue data.

pecans:

Spray at rates up to 0.125 lb ai/A. Do not exceed 1.0 lb ai/A/season.

Do not apply within 28 days of harvest.

almonds:

Apply at rates up to 0.1 lb ai/A. Do not exceed 0.28 lb ai/A/season.

Do not apply within 160 days of harvest.

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bananas:

Applications at the rate of 0.094 lbs ai/A beginning when leaves first appear and repeated every 14 to 21 days up to the day of harvest. A maximum of 8 applications per growing season (0.75 lbs ai/A/season) are specified.

apples:

Applications are to be made at a rate of 0.047 to 0.125 oz ai/A on a 10 to 14 day spray schedule. Do not apply more than 1 lb ai/A/season.

Do not apply within 14 days of harvest.

wheat:

Applications at the rate of 1 to 3 oz ai/A are to be applied as a single application in the spring when wheat is tillered, but before elongation has occurred. If disease persists at heading, a second application should be made to partial to completely emerged heads. Do not apply more than 3 ounces ai per acre per season. A seed treatment for wheat has been proposed, but this use is not supported by residue data.

Do not apply within 35 days of harvest.

Plant metabolism studies have been conducted for fenbuconazole on peaches, peanuts, and wheat. The metabolism differs in each plant.

The nature of the residue in animals has not been adequately defined.

The analytical methods are as follows:

stone fruit crop group and dried prunes- Fenbuconazole, RH-9129, and RH-9130 are determined by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. Sensitivity is 0.01 ppm for all analytes. (Rohm and Haas Technical Report #34-90-47)

pecans- Fenbuconazole, RH-9129, RH-9130, and RH-6467 are determined by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. The claimed sensitivity is 0.01 ppm for all analytes. (Rohm and Haas Technical Report #34-91-14)

almonds- Fenbuconazole, RH-9129 and RH-9130 are determined by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. The sensitivity is 0.01 ppm for all analytes. (Rohm and Haas Technical Report #34-89-34). See the comment below under apples concerning measurement of RH-

6468.

bananas- Fenbuconazole, RH-9129 and RH-9130 are determined by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. The limit of quantification for all analytes is 0.01 ppm. (Rohm and Haas Technical Report #34-90-47)

apples- Fenbuconazole, RH-9129 and RH-9130 are determined directly by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. The registrant indicates that during the sample workup procedure, residues of RH-6468 are converted to a mixture of the lactone metabolites, RH-9129 and RH-9130 and determined as such. Additional data concerning the determination of residues of RH-6468 have been requested from the petitioner. The limit of quantification for all analytes in apples is 0.02 ppm. (Rohm and Haas Technical Report #34-92-44)

wheat- Fenbuconazole, RH-9129, RH-9130 and RH-6467 are determined directly by gas liquid chromatography with a thermionic specific detector with nitrogen selectivity. The registrant indicates that during the sample workup procedure, residues of RH-6468 are converted to a mixture of the lactone metabolites, RH-9129 and RH-9130 and determined as such. Additional data concerning the determination of residues of RH-6468 have been requested from the petitioner. The limit of quantification for all analytes in wheat grain is 0.01 ppm and 0.05 ppm in wheat straw. (Rohm and Haas Technical Report No. 34-92-45)

Final conclusions concerning the adequacy of the proposed tolerances for the stone fruit crop group and dried prunes, pecans, almonds, bananas, apple commodities and wheat commodities cannot be made because of various deficiencies in the petitions. However, for the purposes of the discussion of the metabolism committee only, the maximum expected residue levels (for combined residues of parent and metabolites) in the crops should be considered to be as follows:

stone fruit crop group- 2 ppm
dried prunes- 7 ppm (ie. 3.4 X)
pecans- 0.1 ppm
almond nuts- 0.05 ppm
almond hulls- 3.0 ppm
banana pulp- 0.10 ppm
banana peel- 0.30 ppm
apple- 0.20 ppm
apple juice- 0.40 ppm (2x concentration)
apple pomace, wet- 0.40 ppm (2x concentration)
apple pomace, dry- 2.0 ppm (10x concentration)
wheat grain- 0.05 ppm
wheat straw- 10.0 ppm

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Question #1: Metabolism studies have been conducted on peaches, peanuts, and wheat. CBTS would like the HED Metabolism Committee to determine the following: Which residues in peaches, pecans, almonds, bananas, apples, and wheat should be included in the tolerance(s)?

Question #2: Which residues in these same crops should be included in the dietary risk assessment?

Question #3: Does the Committee concur that triazolealanine (RH-3968) is not a residue of concern at the levels observed in the metabolism studies (ie. 0.062 ppm in peaches, 3.5 ppm in peanuts, and 0.25 ppm in wheat grain)?

Question #4: Since metabolism differs in different crops, will metabolism studies on almonds, apples, or future crops be needed before residues of concern in these crops can be determined?

Note: The nature of the residue in animals has not been adequately defined. Therefore, discussion at the 12/15/93 meeting of the HED Metabolism Committee will be limited to plant metabolism.

Peach Metabolism

One peach tree was treated with fenbuconazole radiolabeled with ^{14}C in the phenyl ring. Another peach tree was treated with fenbuconazole radiolabeled with ^{14}C in the triazole ring. The test substance was applied as a 6.8% EC formulation. The application rates averaged 0.2 lb ai/A. Five applications were made to each tree, starting before blossom and continuing up to 22 days before harvest. Residues were extracted with methanol and partitioned into several fractions by liquid-liquid extractions. Total radioactive residues (TRR) were determined in leaves and fruit by combustion. Residues in mature fruit (depitted) were identified by column chromatography, TLC, and GC/MS.

Table 1. Identification of Radioactive Residues from Mature Peach Fruit in the Methanol Extract

Compound	^{14}C-TRI-RH-7592 % TRR (ppm*)	^{14}C-PHE-RH-7592 % TRR (ppm*)
RH-7592	15.5 (0.020)	45.0 (0.036)
RH-9129***	4.3 (0.006)	14.2 (0.011)
RH-3968	47.5 (0.062)	----
RH-4098	6.7 (0.009)	----
	74.0 (0.097)	59.2 (0.047)
unidentified residues**	12.6	12.3
unextracted residues	4.6	6.4
total	91.2	77.9

* ppm in RH-7592 equivalents

** Each component of the unidentified residues was <10% of the TRR and ≤10 ppb.

*** RH-9129 and RH-9130 are diastereomeric lactones which do not coelute in the enforcement method. Although RH-9130 was not found in the metabolism study, the petitioner includes RH-9130 in tolerance proposals since it is a diastereomer which could be expeced to be found in small amounts when RH-9129 is present.

Summary of Fenbuconazole Metabolism in Peaches

The major residues in stone fruit are fenbuconazole (RH-7592), RH-9129 and its isomer RH-9130, triazolealanine (RH-3968), and triazoleacetic acid (RH-4098).

TOX has indicated that triazolealanine (RH-3968) is not a residue of toxicological concern (Elizabeth Doyle, Toxicology Branch II, in a conversation with Nancy Dodd on 12/7/92).

Peanut Metabolism

Peanut plants were sprayed with fenbuconazole (a 6% EC formulation) at the rate of 0.5 lb ai/A. The radiolabel was either in the unsubstituted phenyl ring or in the triazole ring. Four applications were made at one month intervals beginning when the plants were about 6 inches tall. The preharvest interval was 28 days. Total radioactivity was determined by combustion and liquid scintillation counting. Most of the residues were extracted with methanol-water (95:5). Additional residues were extracted with 2% KOH in methanol-water (3:1). In some cases, further extraction was also attempted with HCl in methanol-water (25% 1N HCl and 75% methanol). "Bound" material was not released by acid hydrolysis. Residues were analyzed by column chromatography, TLC and HPLC. Sugar conjugates were subjected to enzyme hydrolysis, acid hydrolysis, and acetylation reactions.

Table 2. Total Radioactive Residues (ppm) in Peanuts

	Radioactivity (ppm)	
	phenyl label	triazole label
vines	13.679	13.485
shells	1.044	1.296
nuts	0.064	3.977

Table 3. Characterization/Identification of Residues in Peanut Vines

Vines

Extraction	^{14}C-TRI-RH-7592 % TRR (ppm*)	^{14}C-PHE-RH-7592 % TRR (ppm*)
MeOH/water	83.1 (11.209)	82.64 (11.304)
KOH/MeOH	8.8 (1.187)	9.04 (1.236)
bound	8.1 (1.089)	8.32 (1.138)

Component	^{14}C-TRI-RH-7592 % TRR (ppm*)	Component	^{14}C-PHE-RH-7592 % TRR (ppm*)
RH-9129	5.07 (0.683)	RH-9129	4.13 (0.565)
RH-7592	45.37 (6.118)	RH-7592	53.63 (7.336)
RH-6467	10.35 (1.395)	RH-6467	7.75 (1.060)
conjugate-1**	17.55 (2.366)	conjugate-1**	19.01 (2.601)
conjugate-2***	6.90 (0.930)	conjugate-2***	5.35 (0.731)
RH-3968	6.78 (0.914)	origin	1.90 (0.260)
Total identified	92.02		89.87

* ppm in RH-7592 equivalents
** glucoside conjugate of RH-6648
*** glucoside-malonate conjugate of RH-6648

Table 4. Characterization/Identification of Residues in Peanut Shells

Shells

Extraction	^{14}C-TRI-RH-7592 % TRR (ppm*)	^{14}C-PHE-RH-7592 % TRR (ppm*)
MeOH/water	85.32 (1.106)	80.51 (0.840)
KOH/MeOH	4.09 (0.053)	7.14 (0.075)
bound	10.59 (0.137)	12.36 (0.129)

Component	^{14}C-TRI-RH-7592 % TRR (ppm*)	Component	^{14}C-PHE-RH-7592 % TRR (ppm*)
RH-9129	0.24 (0.003)	RH-9129	2.22 (0.023)
RH-7592	22.74 (0.295)	RH-7592	58.10 (0.607)
RH-6467	8.47 (0.110)	RH-6467	8.80 (0.092)
RH-6468	3.35 (0.043)	RH-6468	2.22 (0.023)
conjugates 1 & 2**	23.45 (0.304)	conjugates (1 & 2)**	15.16 (0.158)
RH-3968	22.99 (0.298)		
RH-4098	4.47 (0.057)	origin	1.23 (0.013)
unknowns	3.32 (0.043)		
Total identified	85.71		86.50

* ppm in RH-7592 equivalents
** glucoside conjugate of RH-6648 (Conjugate 1) and glucoside-malonate conjugate of RH-6648 (Conjugate 2)

Table 5. Characterization/Identification of Residues in Peanut Nuts

Extraction	^{14}C-TRI-RH-7592 % TRR (ppm*)	^{14}C-PHE-RH-7592 % TRR (ppm*)
MeOH/water	83.32 (3.314)	39.64 (0.025)
HCl/MeOH	9.14 (0.363)	3.88 (0.002)
KOH/MeOH		0
bound	7.54 (0.300)	56.48 (0.036)

Component	^{14}C-TRI-RH-7592 % TRR (ppm*)	Component	^{14}C-PHE-RH-7592 % TRR (ppm*)
RH-9129	nd (<0.002)	RH-9129	nd (<0.002)
RH-7592	nd (<0.002)	RH-7592	nd (<0.002)
RH-6467	nd (<0.002)	RH-6467	nd (<0.002)
RH-6468	nd (<0.002)	RH-6468	nd (<0.002)
conjugates (1 & 2)**	<1	conjugates (1 & 2)**	29.39 (0.019)
RH-3968	88.11 (3.504)	unknown	14.13 (0.009)
RH-4098	1.85 (0.074)		
unknowns	2.59 (0.103)		
Total identified	89.96 (3.576)		29.39 (0.019)

* ppm in RH-7592 equivalents

** The sugar conjugates in phenyl-labeled nuts were tentatively identified by comparison of tlc with the sugar conjugates in peanut vines. Conjugate 1 is a glucoside conjugate of RH-6648. Conjugate 2 is a glucoside-malonate conjugate of RH-6648.

Summary of Fenbuconazole Metabolism in Peanuts

The metabolism of fenbuconazole in peanuts differs from that in peaches. Significant residues in peaches include fenbuconazole (RH-7592), RH-9129 and its isomer RH-9130. Significant residues in peanut vines include RH-7592, RH-6467, and a conjugate (1) of RH-6648. Significant residues in peanut shells include RH-7592 and conjugates (1 and 2) of RH-6648. Sugar conjugates (1 and 2) of RH-6648 were **tentatively** identified as part of the phenyl-labelled radioactivity of peanut meats.

Triazolealanine (RH-3968) was found in peanut vines, shells, and meats. Triazolealanine comprised 88% of the total residue in peanut meats treated with the triazole-labeled fenbuconazole. However, TOX has indicated that triazolealanine is not a residue of toxicological concern.

Wheat Metabolism

Winter wheat plants were sprayed twice with a 7% EC formulation of fenbuconazole at a nominal rate of 0.36 lbs ai/A with 8 days between the applications. The total rate was 0.72 lbs ai/A (3.8x the proposed seasonal application). The active ingredient was uniformly labeled with ^{14}C in the unsubstituted phenyl ring or in the triazole ring. Mature wheat plants were harvested 39 days after the last treatment. The timing of the applications and the PHI closely approximate the proposed use pattern for the product on wheat. The heads and stalks (straw) were separated and the heads were threshed to isolate the grain from the chaff.

Total radioactivity was determined by combustion and liquid scintillation counting. Residues were initially extracted from all samples by soxhlet extraction with methanol. Additional residues were extracted from samples of wheat straw and chaff by treatment with basic solvents (i.e. aqueous NH_4OH, aqueous NaOH or methanolic KOH). Samples of wheat grain were subjected to blender extraction with aqueous or acidic methanol in order to extract a greater portion of the radioactive residue. Residues were analyzed by column chromatography, TLC and HPLC.

Table 6. Total Radioactive Residue Levels in Winter Wheat.

	Radioactivity (ppm)	
Commodity	Phenyl label	Triazole label
Straw	18.3	13.54
Chaff	7.6	6.4
Grain	0.048	0.53

Table 7. Characterization/Identification of Residues in Wheat Straw.

Extraction	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
Soxhlet	11.98 (88.5%)	16.07 (88.1%)
Base	2.00 (14.8%)	2.20 (12.1%)
Bound	0.38 (2.8%)	0.00 (0%)

Component	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
RH-7592	8.81 (65.1%)	11.84 (64.9%)
RH-9129	1.10 (8.1%)	1.40 (7.7%)
RH-6467[2]	0.62 (4.6%)	0.59 (3.2%)
Unknowns	3.45 (25.5%)	4.44 (24.3%)
Bound	0.38 (2.8%)	0.0 (0%)
Total	14.36 (106.1%)	18.27 (100.1%)

[1] Residue levels expressed in RH-7592 equivalents.
[2] Identification of RH-6467 is tentative.

Table 8. Characterization/Identification of Residues in Wheat Chaff.

Extraction	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
Soxhlet	5.15 (81.0%)	5.83 (76.4%)
Base	0.80 (12.6%)	0.89 (11.7%)
Bound	0.46 (7.2%)	0.92 (12.1%)

Component	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
RH-7592	3.67 (57.7%)	4.49 (58.8%)
RH-9129	0.45 (7.1%)	0.49 (6.4%)
RH-6467[2]	0.19 (3.0%)	0.16 (2.1%)
Unknowns	1.64 (25.8%)	1.58 (20.7%)
Bound	0.46 (7.2%)	0.92 (12.1%)
Total	6.41 (100.8%)	7.64 (100.2%)

[1] Residue levels expressed in RH-7592 equivalents.
[2] Identification of RH-6467 is tentative.

Table 9. Characterization/Identification of Residues in Wheat Grain.

Extraction	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
Soxhlet	0.238 (45.1%)	0.021 (43.8%)
Blender	0.255 (48.3%)	0.007 (14.6%)
Bound	0.036 (6.8%)	0.020 (41.7%)

Component	^{14}C-TRI-RH-7592 ppm[1] (%TRR)	^{14}C-PHE-RH-7592 ppm[1] (%TRR)
RH-7592	0.007 (1.3%)	0.006 (12.5%)
RH-9129	0.0 (0%)	0.001 (2.1%)
RH-3968	0.253 (47.9%)	0.0 (0%)
RH-4098	0.106 (20.1%)	0.0 (0%)
Unknowns	0.127 (24.1%)	0.021 (43.8%)
Bound	0.036 (6.8%)	0.020 (41.7%)
Total	0.529 (100.2%)	0.048 (100.0%)

[1] Residue levels expressed in RH-7592 equivalents.

Summary of Fenbuconazole Metabolism in Wheat

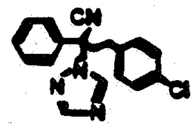
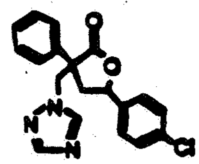
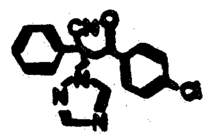
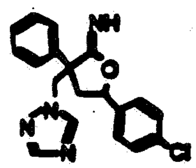
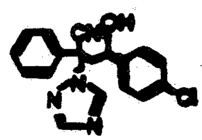
The metabolism of fenbuconazole in wheat appears to proceed in a manner slightly different than peanuts and peaches. Significant residues identified in wheat chaff and straw include fenbuconazole (RH-7592), RH-9129 and RH-6467. Note: The identification of residues of RH-6467 is tentative and this compound was not identified as a rat metabolite of fenbuconazole. For wheat grain, the significant residues identified in plants treated with both labeled compounds included RH-7592 and RH-9129. Residues of triazolealanine (RH-3968) and triazoleacetic acid (RH-4098) were identified in samples of wheat grain from plants treated with the triazole ring labeled compound. While we have indicated above that residues of RH-9130 were not identified in any of the wheat fractions of the metabolism study, this is due to the fact that the analytical techniques of this study could not distinguish between residues of RH-9129 and its isomer RH-9130. Residues of RH-9130 can be distinguished from that of RH-9129 by the proposed enforcement methodology. Analysis of wheat straw samples from the metabolism study by the proposed enforcement methodology indicated quantifiable residues of RH-9130 and RH-9129 at approximately 0.36 ppm (~4.7% of the TRR) and 0.75 ppm (~9.9% of the TRR) for samples treated with the phenyl labeled compound. Similar results were noted for the samples treated with the triazole labeled compound.

Attachment 1: Molecular structures of fenbuconazole and metabolites
Attachment 2: Overall Metabolic Profile of RH-7592 in Plants and Animals
Attachment 3: Metabolism of fenbuconazole in peaches
Attachment 4: Metabolism of fenbuconazole in peanuts
Attachment 5: Metabolism of fenbuconazole in wheat
Attachment 6: Summary table

cc: RF, SF, Circu., N. Dodd (CBTS), E. Haeberer (CBTS), W. Wassell (CBTS), PM#22, A. Kocialski (CCB), PP#1F3995, PP#1F3989, PP#3F4194, PP#2F4154, PP#2F4127, PP#2F4135

RDI:R. Quick:12/9/93:M. Flood:12/9/93:R. Loranger:12/9/93
7509C:CM#2:Rm804F:305-5681:N. Dodd:nd:12/10/93
7509C:CM#2:Rm804U:305-6135:W.D. Wassell:wdw:12/10/93

Chemical Names and Structures of Fenbuconazole and Metabolites

Chemical Names	Chemical Structures
fenbuconazole RH-7592 α-(2-[4-chlorophenyl]ethyl)-α-phenyl-3-(1H-1,2,4-triazole)-1-propanenitrile)	
RH-9129/RH-9130 (diastereomers) 5-(4-chlorophenyl)-dihydro-3-phenyl-3- (methyl-1H-1,2,4-triazole-1-yl)-2-3H-furanone	
RH-6467 4-(4-chlorophenyl)-2-(methyl-1H-1,2,4-triazole)-4-oxo-2-phenyl butanenitrile	
RH-6468 5-(4-chlorophenyl)-dihydro-3-phenyl-3-(methyl-1H-1,2,4-triazole-1-yl)-2-3H-iminolactone	
RH-6648 benzylic alcohol metabolite	
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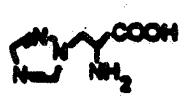
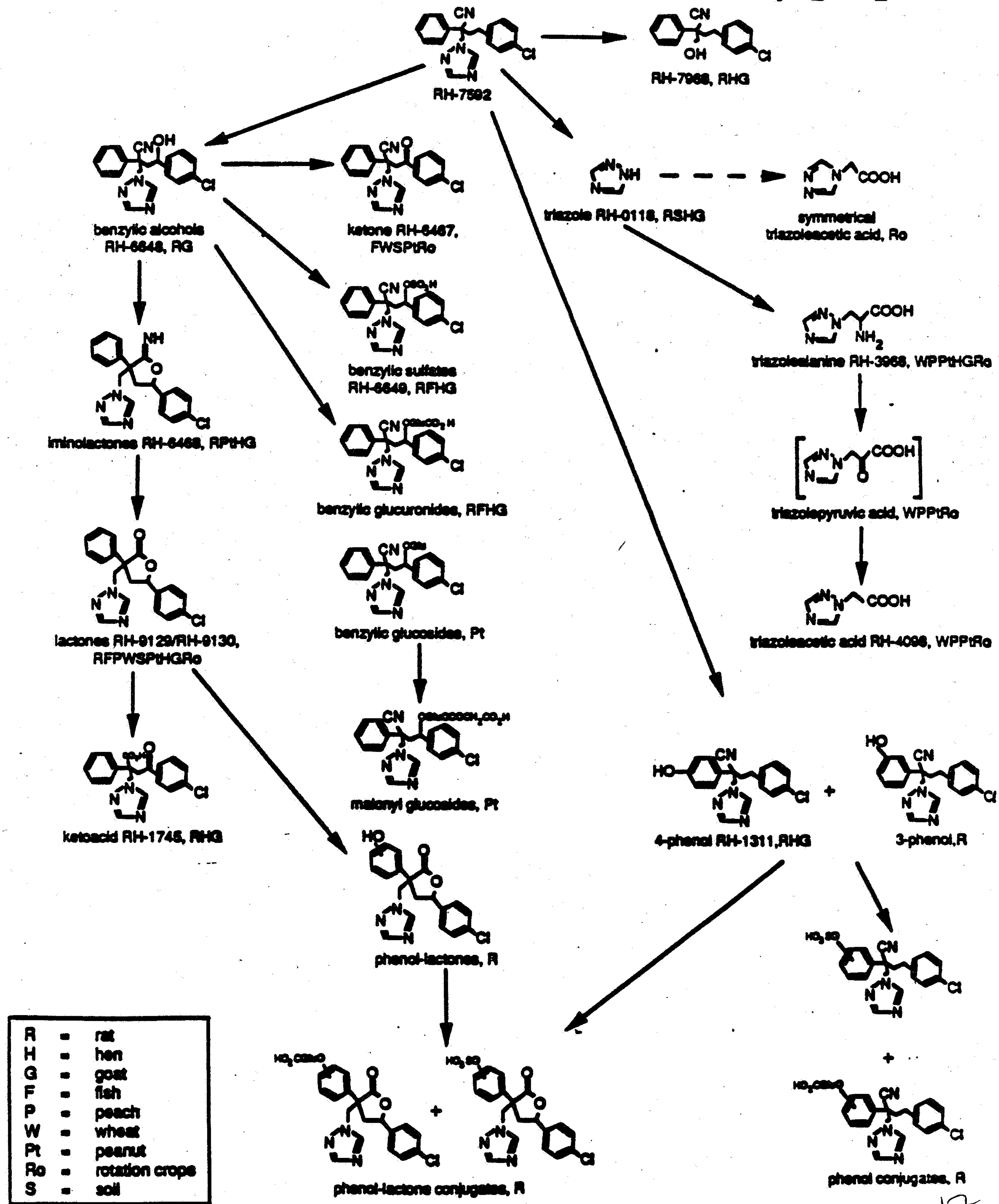
RH-3968 triazolealanine	

Overall Metabolic Profile of RH-7592



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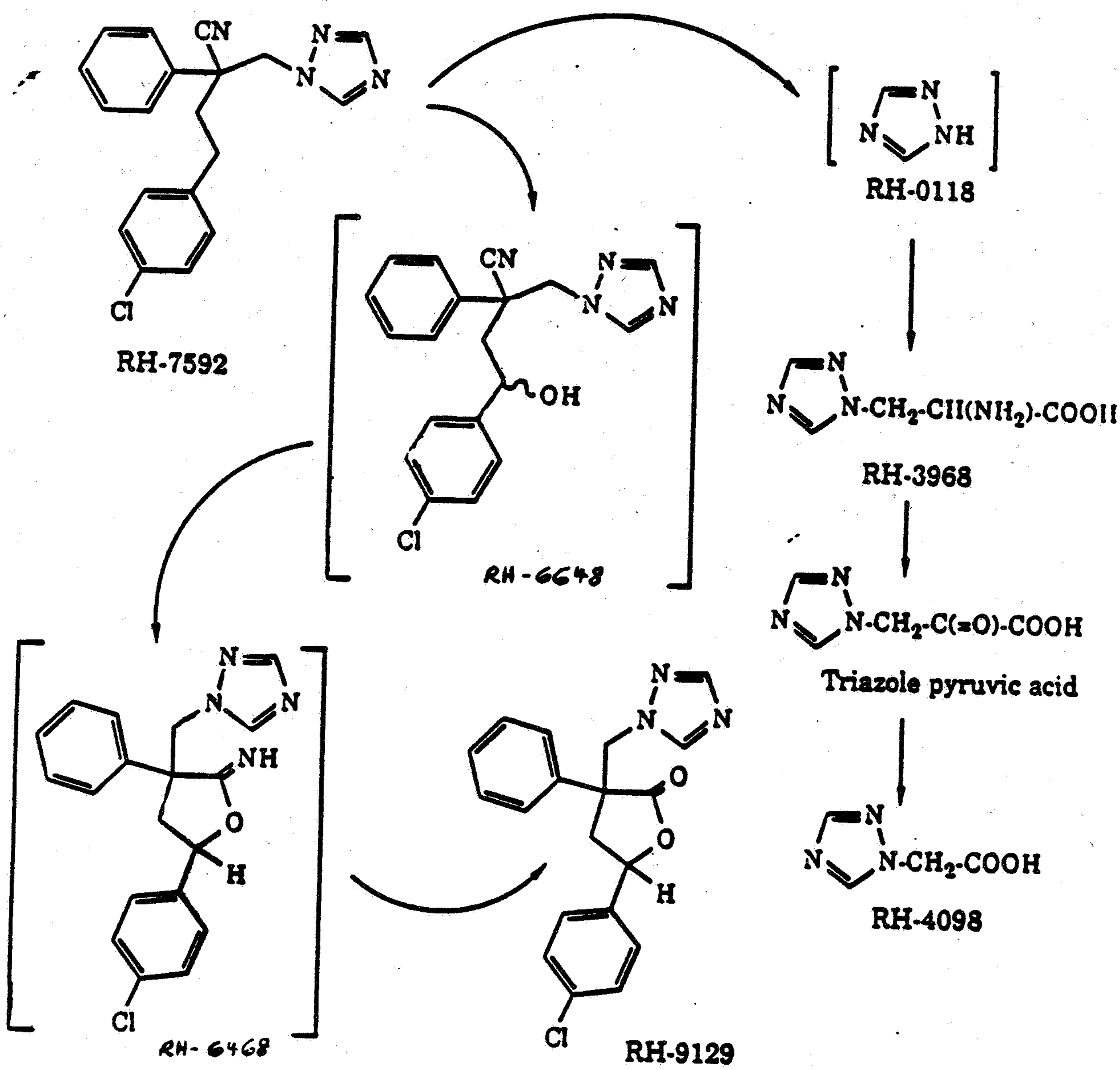
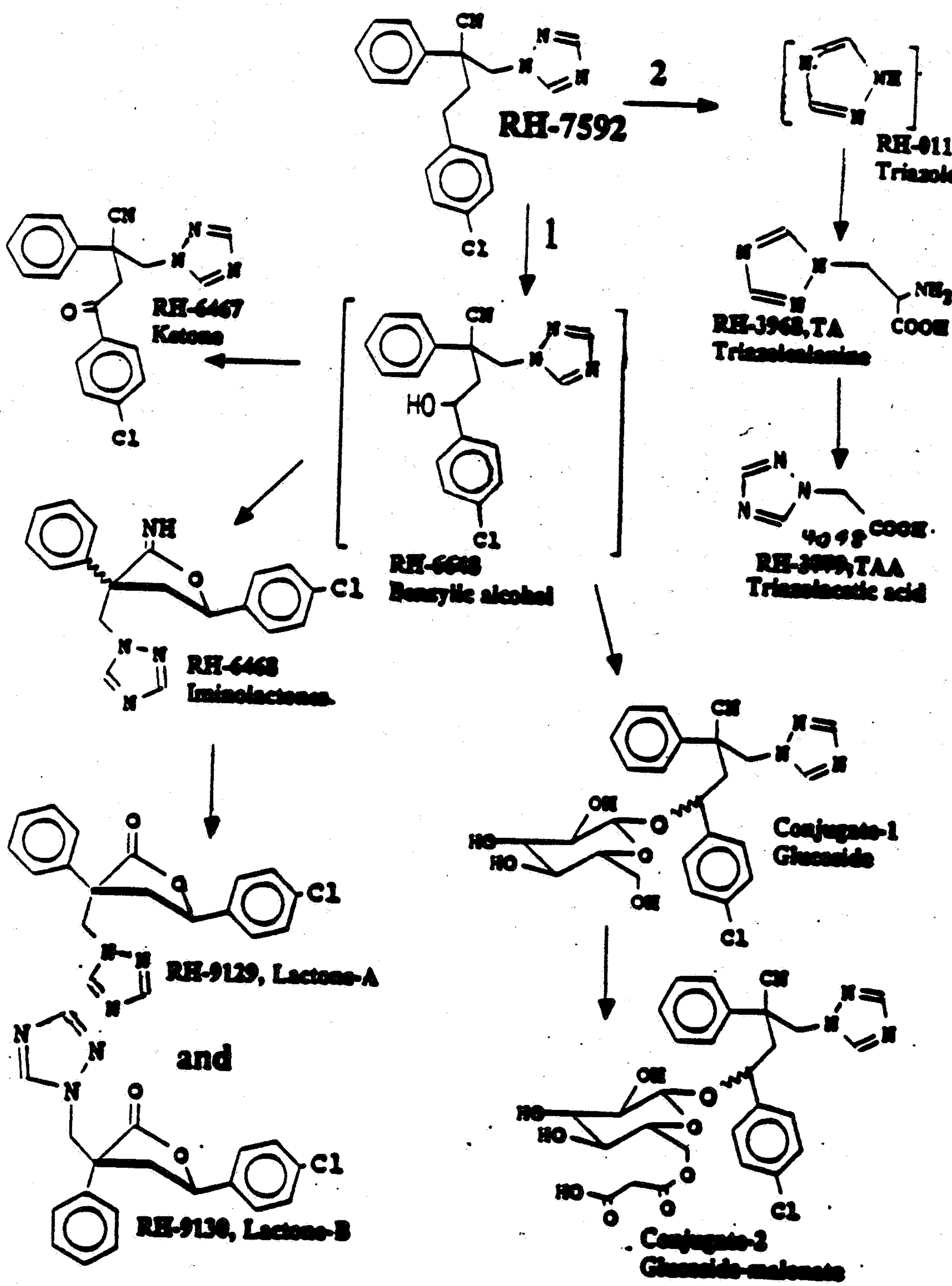
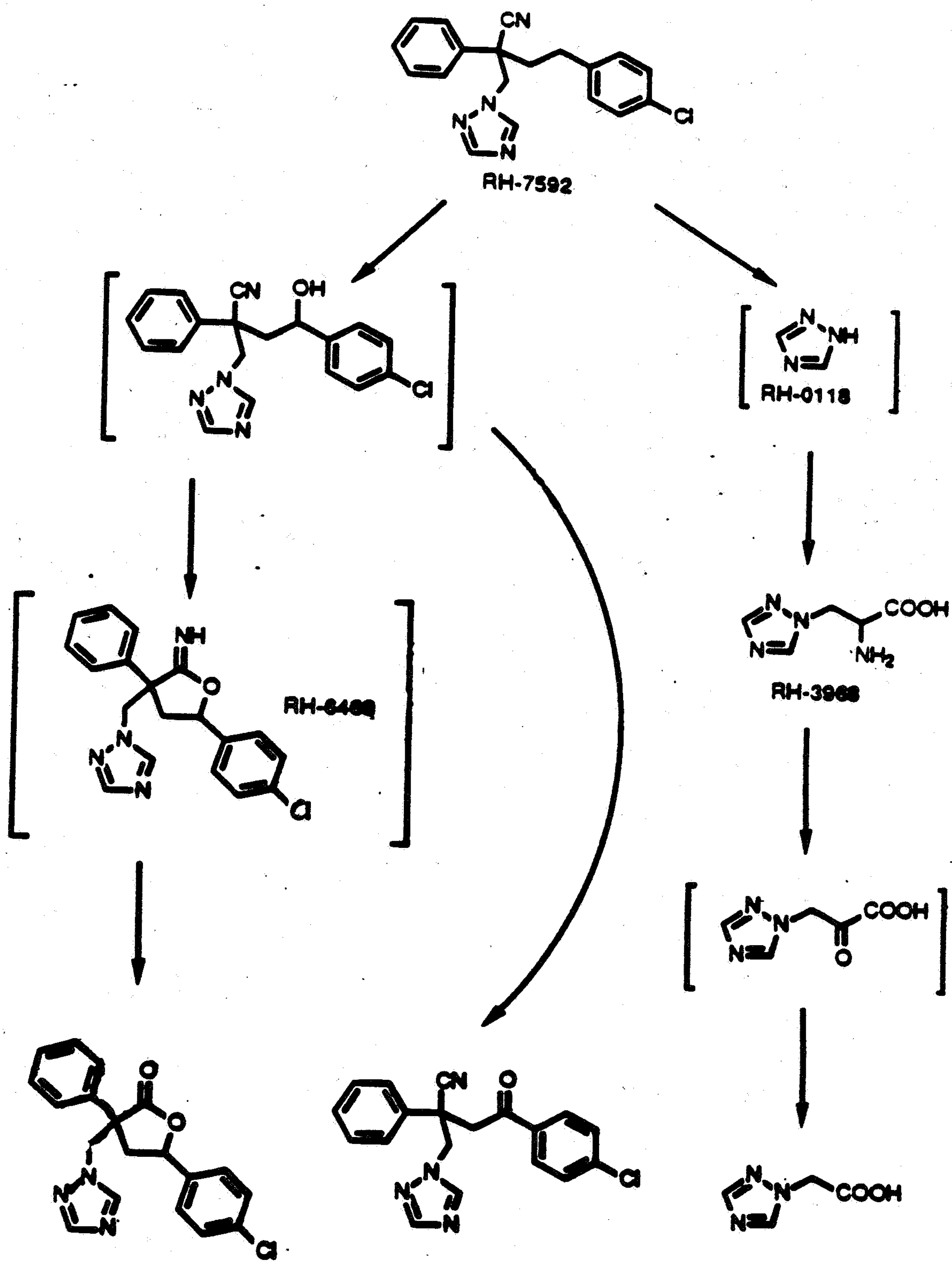
Metabolic Pathway for RH-7592 in Peaches



METABOLISM OF FENBUCONAZOLE IN PEANUTS



Overall Metabolic Map of RH-7592 Metabolism in Wheat



RH-9129
RH-9130

RH-6467

RH-4096

SUMMARY TABLE

CROP	PROPOSED TOLERANCE EXPRESSION	RESIDUES DETERMINED BY ANALYTICAL METHOD	RESIDUES FOUND IN RADIOACTIVE STUDIES	SUGGESTED RESIDUES TO REGULATE
peaches	RH-7592 RH-9129 RH-9130	RH-7592 RH-9129 RH-9130	RH-7592 RH-9129** RH-3968	
pecans	RH-7592 RH-9129 RH-9130 **RH-6467**	RH-7592 RH-9129 RH-9130 **RH-6467**	***	
almonds	RH-7592 RH-9129 RH-9130 **RH-6468**	RH-7592 RH-9129 RH-9130	----------	
bananas	RH-7592 RH-9129 RH-9130	RH-7592 RH-9129 RH-9130	----------	
apples	RH-7592 RH-9129 RH-9130 **RH-6468** **RH-6467**	RH-7592 RH-9129 RH-9130 **RH-6468***	----------	
wheat	RH-7592 RH-9129 RH-9130 **RH-6468** **RH-6467**	RH-7592 RH-9129 RH-9130 **RH-6468***	RH-7592**** RH-3968 RH-4098	

* The petitioner indicates that RH-6468 is converted to RH-9129 and RH-9130 during the analytical procedure. It is not determined as RH-6468.

** RH-9129 and RH-9130 are isomers; <7% RH-4098

*** peanut vines: RH-7592, RH-6467, conjugates of RH-6648, <6% RH-9129, <7% RH-3968;
peanut shells: RH-7592, RH-6648 (free and conjugated), RH-3968, <10% RH-6467, <4% RH-6468, <3% RH-9129, <5% RH-4098;
peanut nuts: RH-3968, RH-4098, conjugates of RH-6648

**** in wheat, also <10% RH-9129, <5% RH-6467