

US EPA ARCHIVE DOCUMENT

8-8-91



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

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

Subject: New Chemical Screen for RH-7592 Technical Fungicide

From: Doug Urban, *H T Craven* Acting Branch Chief *8/8/91*
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C)

To: ⁷ Dolphine Wilson
Herbicide-Fungicide Branch
Registration Division (H7505 C)

The EEB has reviewed its files on RH-7592. The Tier I nontarget wildlife studies are available and acceptable. In addition, Tier I nontarget plant study and two avian reproduction studies, fish early life-stage, and Daphnia magna life-cycle chronic toxicity test are available for review. Therefore, RH-7592 passes the Ecological Effects Branch's New Chemical Screen.

If you have any questions on the above, please feel free to contact Regina Hirsch (557-4368).



1

129011
Shaughnessey Number

Completed: 8/8/91
Revised: _____

EEB CHEMICAL PROFILE

Pesticide Name:

100 Fish and Wildlife Toxicology

100.1 Minimum Requirements

100.1.1 Avian Acute Oral LD₅₀

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
bobwhite quail	RH-7592 Technical, 96.7% a.i.	LD ₅₀ > 2150 mg a.i./kg	Core	Acc. no. 410312-31

100.1.2 Avian Dietary LC₅₀

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
mallard duck	RH-7592 technical, 96.7% a.i.	LC ₅₀ = 2013 ppm	Core	Acc. no. 410312-32
bobwhite quail	RH-7592 technical, 96.7% a.i.	LC ₅₀ = 4050 ppm	Core	Acc. no. 410312-33

100.1.3 Fish Acute LC₅₀

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
Rainbow trout	RH-7592 technical, 96.7% a.i.	LC ₅₀ = 1.5 mg a.i./L	Core	Acc. no. 410312-35
Bluegill sunfish	RH-7592 technical, 96.7% a.i.	LC ₅₀ = 0.68 mg a.i./L	Core	Acc. no. 410735-06

100.1.4 Aquatic Invertebrate LC₅₀

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
<u>Daphnia magna</u>	RH-7592 technical, 96.7% a.i.	EC ₅₀ = 2.3 mg a.i./L	Core	Acc. no. 410735-07

100.1.5 Non-target plants -- growth and reproduction of aquatic plants (required for fungicides)

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
<u>Selenastrum capricornutum</u>	RH-7592 technical, 96.7% a.i.	EC ₅₀ = 0.47 mg a.i./L*		Acc. no. 418750-09

* denotes value reported from registrant's report

100.2 Additional Terrestrial Laboratory Tests -- avian reproduction studies

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
mallard duck	RH-7592 technical, 96.7% a.i.	NOEL = 150 ppm*		Acc. no. 418750-06
bobwhite quail	RH-7592 technical, 96.7% a.i.	NOEL =150 ppm*		Acc. no. 418750-05

* denotes value reported from registrant's report

100.2 Additional Terrestrial Laboratory Tests -- beneficial insects acute oral and contact study

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
honey bees	RH-7592 technical, 96.7% a.i.	LD ₅₀ > 292.18 ug a.i./bee	Core	Acc. no. 410312-38

100.3 Additional Aquatic Laboratory Tests -- fish early life-stage toxicity (under flow through conditions).

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
fathead minnow	RH-7592 technical, 96.7% a.i.	MATC < 0.28 mg a.i./L*		Acc. no. 418750-08

* denotes value reported from registrant's report

100.3 Additional Aquatic Laboratory Tests -- Daphnia magna life-cycle (21-day renewal) chronic toxicity test

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
<u>Daphnia magna</u>	RH-7592 technical, 96.7% a.i.	MATC = 0.108 mg a.i./L*		Acc. no. 418750-07

* denotes value reported from registrant's report

100.4 Field Tests (simulated and actual field tests)

101 General Toxicology (references from Toxicology Branch)

101.1 Feeding/oncogenic -- 2 year study

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
rat	RH-7592 technical	NOEL = 80 ppm	Minimum	Acc. no. 416353-01

101.2 Oncogenic - 78 week

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
mice	RH-7592 technical	NOEL = 10 ppm	Suppl.	Acc. no. 416353-03

101.3 Developmental toxicity study

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
rat	RH-7592 technical, 96.4% a.i.	NOEL = 30 mg/kg/day	Minimum	Acc. no. 410735-05 410312-14

100.4 Feeding - 3 months

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
rat	RH-7592 technical, 96.4% a.i.	NOEL = 20 ppm	Guideline	Acc. no. 410735-02
mice	RH-7592 technical, 96.4% a.i.	NOEL = 20 ppm	Minimum	Acc. no. 410735-03
dog (beagle)	RH-7592 technical, 96.4% a.i.	NOEL = 100 ppm	Minimum	Acc. no. 410735-04

100.5 Acute oral LD₅₀

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
rat	RH 57, 592 tech., 96.7% a.i.	LD ₅₀ > 2000 mg/kg	Guideline	Acc. no. 410312-07

102 Physical and Chemical Properties

102.1 Chemical Name -- Fenbuconzole

102.2 Structural Formula -- alpha [2-(4-chlorophenyl)ethyl]-
alpha-phenyl-1H-1,2,4-triazole-1-propanenitrile

102.3 Common Name -- RH-7592 Technical

102.4 Trade Name -- Indar^R 2F Agricultural Fungicide

102.5 Molecular Weight

102.6 Physical State -- field dissipation studies suggest that fenbuconzole has a biphasic decline, a rapid early phase which may be dependent on physical conditions, i.e., temperature, and a

later phase which is probably dependent on soil type and biotic content.*

102.7 Properties

102.7.1 Solubility -- water solubility of fenbuconzole is low, 2-4 ppm

102.7.2 Octanol/Water Partition Coefficient

102.7.3 Soil Adsorption Coefficient K_d

102.7.4 Vapor Pressure

103 Behavior in the Environment -- Fenbuconzole is not expected to bioaccumulate ($K_{ow} = 1700 \pm 300$). Studies in fish indicated rapid absorption and clearance with a bioaccumulation factor of only 160.*

103.1 Soil -- binds tightly to soil ($K_{oc} = 4425$) and is not mobile. No residues were detected below 12 inches in soil dissipation studies. Fenbuconzole does not readily degrade by hydrolysis or photolysis under the physical conditions commonly found in nature, but does undergo extensive and complete metabolism by soil biota. Aerobic soils are more active in this regard than anaerobic soils.*

103.2 Water

103.3 Plant

103.4 Animal

103.5 Estimated Environmental Concentrations (includes scenario, rate, EEC source, date generated, EEC and any other pertinent information)

104 Uses and Special Concerns (major known registered uses, field kills, specific concerns)

[Sections 100, 101/102, 103 and 104 should be printed to facilitate updates]

* denotes information obtained from registrant's report

ECOLOGICAL EFFECTS BRANCH NEW CHEMICAL SCREEN

1. **Chemical:** Fenbuconzole (Indar 2F, fungicide).
2. **Test Material:** RH-7592 Technical, 96% active ingredient, off-white solid.
3. **Citation:** Rohm and Haas Company, Toxicology Department, 727 Norristown Road, Spring House, Pennsylvania 19477.

4. **Reviewed By:**

Regina Hirsch, Biologist
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C)

R. Hirsch 8/8/91

5. **Approved By:**

Les Touart, Section Head
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C)

6. **Purpose:**

- Petition for permanent tolerances of 2.0 ppm for fenbuconzole on the stonefruit crop group.
- Petition for permanent tolerances for fenbuconzole on dried prunes.
- Petition for permanent tolerances of 0.1 ppm for fenbuconzole on raw agricultural commodity pecans.
- Wish to register the manufacturing product, RH-7592 Technical Fungicide, the TGAI in Indar^R 2F Fungicide.
- Wish to register the end use product Indar^R 2F Fungicide for use on the stone fruit crop group.

7. **Pesticide Use:**

The active ingredient (fenbuconzole) controls the pathogens Mycosphaerella caryigena (downy spot), M. dendroides (leaf blotch), Septoria caryae (Septoria leaf spot), and Cladosporium carygenium in pecans.

8. **Ecological Tests Completed:**

Terrestrial Organism Toxicity

Avian acute oral toxicity
bobwhite quail LD₅₀ > 2150
mg/kg*

Avian subacute dietary toxicity
mallard duck LC₅₀ = 2013 ppm*
bobwhite quail LC₅₀ = 4050 ppm*

Avian reproduction
mallard duck NOEL ≡ 600 ppm**
bobwhite quail NOEL ≡ 600 ppm**

Acute toxicity study on rats
male LD₅₀ > 2000 mg/kg
female LD₅₀ > 2000 mg/kg

Beneficial insects acute oral and
contact toxicity
honey bees LD₅₀ > 292.2 ug/bee*

Aquatic (freshwater)

Freshwater fish acute toxicity
rainbow trout LC₅₀ = 1.5 mg/l*
bluegill sunfish LC₅₀ = 0.68 mg/l*

Freshwater invertebrate acute toxicity
Daphnia magna EC₅₀ = 2.3 mg/l*

Fish early-life stage toxicity
fathead minnow MATC < 0.28 mg
a.i./L**

Daphnia Magna life-cycle (21-day renewal) chronic
toxicity test
Daphnia magna MATC = 0.108 mg
a.i./L**

Plant Toxicity

Non-target plants: growth and reproduction of aquatic
plants
Selenastrum capricornutum EC₅₀ = 0.47 mg
a.i./L**

* Denotes values from core DER reports

** Denotes values reported from registrant reports

9. **Half-life of Fenbuconazole:**

Aerobic soil -- 285 days in Lawrenceville silty clay loam
367 days in Pasquotank sandy loam soil

Anaerobic soil -- 451 days in Lawrenceville silty clay loam

655 days in Pasquotank sandy loam soil

Fenbuconazole is only slightly mobile to immobile in soils. Adsorption appears to be associated with percent organic matter present. It is slightly mobile in soils containing a low percent organic material (1%) and relatively immobile in soils with higher levels of organic material.

Fenbuconazole residues have only a slight potential to leach in the soil environment.

Fenbuconazole will not bioaccumulate in fish and any residues that are taken up will be depurated when fish are no longer exposed to fenbuconazole residues (bioaccumulation factor = 160, per registrant's report).

10. Application rate:

For Pecans: 6 to 8 fl. oz. (0.09 to 0.125 lb a.i.). Begin applications at bud break and continue at 10-14 day intervals through pollination. Apply at 14 to 21 day intervals through cover sprays. Do not apply more than 2 quarts (1 lb a.i.) per acre per season.

For Apricots, Nectarines, Peaches, Cherries, and Plums/Prunes: 4 to 6 oz/acre (0.066 to 0.1 lb a.i.). For all crops, except peaches, do not apply more than 1.5 quarts (0.75 lbs a.i.) per season. For peaches do not apply more than 2.0 quarts (1.0 lb a.i.) per acre per season. Apply at 10-14 day intervals.