UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

JUN 03 1993

Roussel Bio Corporation
170 Beaver Brook Road
Lincoln Park, NJ 07035

Attention: Ms. Christina Lawes:

Subject: Nusyn-Noxfish Fish Toxicant
EPA Registration No. 432-550
Your resubmission of May 24, 1993

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, is acceptable provided that you do the following:

1. On the Front Panel after "DANGER", add the following:

   a. "POISONOUS" in red on contrasting background

   b. Skull and Crossbones in red

   See 40 CFR 156.10(i) for more information.

2. On Page 3, revise end of first sentence to read:

   ... from lakes, ponds, reservoirs, and streams.

3. On Page 3, split the third paragraph into two smaller paragraphs as follows:

   a. Properly dispose ... or feed.

   b. Do not use ... or reservoir.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product bearing the amended labeling constitutes acceptance of these conditions.

CONCURRENCES								
SYMBOL								
SURNAME								
DATE								

*U.S. Government Printing Office: 1992 — 630-808/40872

A stamped copy of the labeling is enclosed for your records.

Sincerely yours,

mam/fw

Robert A. Forrest
Product Manager (14)
Insecticide-Rodenticide Branch
Registration Division (H7504C)

Enclosures: 1. Stamped Label
2. A-79 Enclosure

Peacock WP#2:A:\432A.550:305-5407,305-6600:6/3/93

RESTRICTED USE PESTICIDE
Due to Aquatic Toxicity and Acute Inhalation

For retail sale to, and use only by, Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

NUSYN-NOXFISH
Fish Toxicant
Synergized Rotenone
Liquid-Emulsifiable

* For Control of Fish in Lakes, Ponds, Reservoirs and Streams

ACTIVE INGREDIENTS:

Rotenone	2.5% w/w
Other Associated Resins	5.0%
Piperonyl Butoxide, Technical*	2.5%
INERT INGREDIENTS:+	90.0%
	100.0%

* equivalent to 2.0% [Butylcarbityl] [6-propylpiperonyl] ether and 0.5% related compounds

+ This product contains aromatic petroleum solvent.

Roussel Uclaf Registered Trademark

ACCEPTED
with COMMENTS
In EPA Letter Dated:
JUN 03 1993

EPA Reg. No. 432-550 EPA Est. No.

Under the Federal Insecticide, Fungicide, and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 432-550

KEEP OUT OF REACH OF CHILDREN

DANGER

STATEMENT OF PRACTICAL TREATMENT

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention.

If in eyes: Hold eye lids open and flush with a steady, gentle stream of water for 15 minutes.

If swallowed: Drink promptly a large quantity of milk, egg white, gelatin solution, or if these are not available, large quantities of water. Avoid alcohol. Do not induce vomiting.

If no skin: Wash with plenty of soap and water. Get medical attention.

See below for additional precautionary statements.

Net Contents

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

DANGER
Fatal if inhaled. May be fatal if swallowed. Harmful if absorbed through skin. Causes substantial but temporary eye injury. Do not breath spray mist. Do not get in eyes or on clothing. Avoid contact with skin. When spraying undiluted material wear a mask or respirator jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health for use with pesticides. Wear protective goggles, face shield, or safety glasses. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.

Environmental Hazards

This pesticide is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

Chemical and Physical Hazards

Combustible mixture. Flash point of this formulation is 115° F. DO NOT USE OR STORE NEAR HEAT OR OPEN FLAME.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.
Storage: Store only in original containers, in a dry place inaccessible to children and pets. Nusyn-Noxfish will not solidify nor show any separation at temperatures down to 40°F and is stable for a minimum of one year when stored in sealed drums at 70°F.
Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions contact your state pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.
Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

General Information

Nusyn-Noxfish is a specially formulated product containing synergized rotenone, to be used in fisheries management for the eradication of fish from lakes, streams and reservoirs.

Since such factors as pH, temperature, depth and turbidity will change effectiveness, use this product only at locations, rates, and times authorized and approved by appropriate state and federal fish and wildlife agencies. Rates must be within the range specified on the label.

Properly dispose of dead fish and unused product. Do not use dead fish for food or feed. Do not use water treated with rotenone to irrigate crops or release within 1\2 mile upstream of a potable water or irrigation water intake in a standing body of water such as a lake, pond or reservoir.

For Use in Ponds, Lakes and Reservoirs

The actual application rates and concentrations of rotenone needed to control fish will vary widely, depending on the type of use (e.g., selective treatment, normal pond use, etc.) and the factors listed above. The table below is a general guide for the proper rates and concentrations.

Nusyn-Noxfish disperses readily in water both laterally and vertically, and will penetrate below the thermocline in thermally stratified bodies of water

Computation of Acre-Feet: An acre-foot is a unit of volume of a body of water having the area of one acre and the depth of one foot. To determine acre feet in a given body of water, make a series of transects across the body of water taking depths with a measured pole or weighted line. Add the soundings and divide by the number made to determine the average depth. Multiply this average depth by the total surface area in order to determine the acre feet to be treated. If number of surface acres is unknown, contact your local Soil Conservation Service, which can determine this from aerial photographs.

Amount of Nusyn-Noxfish Needed for Specific Uses: To determine the approximate number of gallons of Nusyn-Noxfish (2.5% Rotenone) needed, find your "Type of Use" in the first column of the table below and then divide the corresponding numbers in the third column, "Number of Acre-Feet Covered by One Gallon" into the number of acre-feet in your body of water.

6 8 11

General Guide to the Application Rates and Concentrations of Rotenone Needed to Control Fish in Lakes, Ponds and Reservoirs[1]

Type of Use	Parts Per Million		Number of Acre-Feet Covered by One Gallon
	Nusyn-Noxfish	Active Rotenone	
Selective Treatment	0.20 to 0.25	0.005 to 0.007	15 to 12
Normal pond use	1.0 to 2.0	0.025 to 0.050	3.0 to 1.5
Remove bullheads or carp	2.0 to 4.0	0.050 to 0.100	1.5 to 0.75
Remove bullheads or carp in rich organic ponds	4.0 to 8.0	0.100 to 0.200	0.75 to 0.38
Preimpoundment treatment above dam	6.0 to 10.0	0.150 to 0.250	0.50 to 0.30

[1]Adapted from Kinney, Edward. 1965. Rotenone in Fish Pond Management. USDI Washington, D.C. Leaflet FL-576.

Pre-Mix and Method of Application: Pre-mix with water at a rate of one gallon Nusyn-Noxfish to 10 gallons of water. Uniformly apply over water surface or bubble through underwater lines.

Detoxification: Nusyn-Noxfish treated waters detoxify under natural conditions within one week to one month depending upon temperatures, alkalinity, etc. Rapid detoxification can be accomplished by adding chlorine or potassium permanganate to the water at the same rate as Nusyn-Noxfish in parts per million, plus enough additional to meet the chlorine demand of the untreated water.

Removal of Taste and Odor: Nusyn-Noxfish treated waters do not retain a detectable taste or odor for more than a few days to a maximum of one month. Taste and odor can be removed immediately by treatment with activated charcoal at a rate of 30 ppm for each 1 ppm Nusyn-Noxfish remaining. (Note: As Nusyn-Noxfish detoxifies, less charcoal is required.)

Restocking After Treatment: Wait 2 to 4 weeks after treatment. Place a sample of fish to be stocked in wire cages in the coolest part of the treated waters. If the fish are not killed within 24 hours, the water may be restocked.

Use in Streams Immediately Above Lakes, Ponds and Reservoirs

The purpose of treating streams immediately above lakes, ponds and reservoirs is to improve the effectiveness of lake, pond and reservoir treatments by preventing target fish from moving into the stream corridors, and not to control fish in streams per se. The term "immediately" means the first available site above the lake, pond or reservoir where treatment is practical, while still creating a sufficient barrier to prevent migration of target fish into the stream corridor.

In order to completely clear a fresh water aquatic habitat of target fish, the entire system above or between fish barriers must be treated. See the use directions for streams and rivers on this label for proper application instructions.

In order to treat a stream immediately above a lake, pond or reservoir, you must: (a) select the concentration of active rotenone, (b) compute the flow rate of the stream, (c) calculate the application rate, (d) select an exposure time, (e) estimate the amount of product needed, (f) follow the method of application. To prevent movement of fish from the pond, lake or reservoir, stream treatment should begin before and continue throughout treatment of pond, lake or reservoir until mixing has occurred.

1. Concentration of Active Rotenone:
Select the concentration of active rotenone based on the type of use from those listed on the table. Example: If you select "normal pond use" you could select a concentration of 0.025 part per million.

2. Computation of Flow Rate for Stream:
Select a cross section of the stream where the banks and bottom are relatively smooth and free of obstacles. Divide the surface width into 3 equal sections and determine the water depth and surface velocity at the center of each section. In slowly moving streams, determine the velocity by dropping a float attached to 5 feet of loose. monofilament fishing line. Measure the time required for the float to move 5 feet. For fast-moving streams, use a longer distance. Take at least three readings at each point. To calculate the flow rate from the information obtained above, use the following formula:

$$F = \frac{Ws \times D \times L \times C}{T}$$

where F = flow rate (cubic feet/second), Ws = surface width (feet), D = mean depth (feet), L = mean distance traveled by float (feet), C = constant (0.8 for rough bottoms and 0.9 for smooth bottoms), and T = mean time for float (sec.).

3. Calculation of Application Rate:
In order to calculate the application rate (expressed as gallons/second), you convert the rate in the table (expressed as gallons/acre-feet), to gallons per cubic feet and multiply by the flow rate (expressed as cubic feet/second). Depending on the size of the stream and the type of equipment, the rate could be expressed in other units, such as ounces/hour, or cc/minute.

The application rate for the stream is calculated as follows:

$$R_s = R_p * C * F$$

where R_s = application rate for stream (gallons/second), R_p = application rate for pond (gallons/acre-feet), C = 1 acre foot/43560 cubic feet, and F = flow rate of the stream (cubic feet/second).

4. Exposure Time:
The exposure time would be the period of time (expressed in hours or minutes) during which Nusyn-Noxfish is applied to the steam in order to prevent target fish from escaping from the pond into the stream corridor.

5. Amount of Product:
Calculate the amount of product for a stream by multiplying the application rate for streams by the exposure time.

$$A = R_s * H$$

where A = the amount of product for the stream application, R_s = application rate for stream (gallons/second), and H = the exposure time expressed in seconds.

For Use in Streams and Rivers

Only state or federal Fish & Wildlife personnel or professional fisheries biologists under the authorization of state or federal Fish & Wildlife agencies are permitted to make applications of Nusyn-Noxfish for control of fish in streams and rivers. Informal consultation with Fish & Wildlife personnel regarding the potential occurrence of endangered species in areas to be treated should take place. Applicators must reference Roussel Bio Corporations Nusyn-Noxfish Stream and River Use Monograph before making any application to streams or rivers.

Warranty Statement: Our recommendations for the use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its misuse as such, or in combination with other materials.

NUSYN-NOXFISH STREAM AND RIVER USE MONOGRAPH

USE IN STREAMS AND RIVERS

The following use directions are to provide guidance on how to make applications of Nusyn-Noxfish to streams and rivers. The unique nature of every application site could require minor adjustments to the method and rate of application. Should these unique conditions require major deviation from these use directions a Special Local Need 24(c) registration should be obtained from the state.

Before applications of Nusyn-Noxfish can be made to streams and rivers, authorization must be obtained from state or federal Fish & Wildlife agencies. Since local environmental conditions will vary, consult with the state Fish & Wildlife agency to ensure the method and rate of application are appropriate for that site.

Contact the local water department to determine if any water intakes are (within one mile) down flow of the section of stream, river or canal to be treated. If so coordinate the application with the water department to make sure the intakes are closed during treatment and detoxification.

Application Rates and Concentration of Rotenone

Slow Moving Rivers: In slow moving rivers and streams with little or no water exchange use instructions for ponds, lakes and reservoirs.

Flowing Streams and Rivers: Apply rotenone as a drip for 4 to 8 hours to the flowing portion of the stream. Multiple application sites are used along the length of the treated stream, spaced approximately 1/2 to 2 miles apart depending on the water flow travel time between sites. Multiple sites are used because rotenone is diluted and detoxified with distance. Application sites are spaced at no more than 2 hours or at no less than 1 hour travel time intervals; this assures that the treated stream remains lethal to fish for a minimum of 2 hours. A non-toxic dye such as Rhodamine-WT® or fluorescein can be used to determine travel times. Cages containing live fish placed immediately upstream of the downstream application sites can be used as sentinels to assure that lethal conditions exist between sites.

Apply rotenone at each application site at a concentration of 0.5 to 2.0 parts per million of Nusyn-Noxfish. The amount of Nusyn-Noxfish needed at each site is dependent on stream flow (see Computation of Flow Rate for Stream).

Application of Undiluted Material

Nusyn-Noxfish can drain directly into the center of the stream at a rate of 0.85 to 2.4 cc per minute for each cubic foot per second of stream flow. Flow of undiluted Nusyn-Noxfish into the stream should be checked at least hourly. This is equivalent to from 0.5 to 2.0 ppm Nusyn-Noxfish, or from 0.012 to 0.050 ppm rotenone. Back-water, stagnant and spring areas of streams should be sprayed by hand with a 10% v/v solution of Nusyn-Noxfish in water to assure a complete coverage.

Calculation of Application Rate:

$$X = F(1.692\ B)$$

X = cc per minute of Nusyn-Noxfish applied to the stream, F = the flow rate (cu. ft./sec.) see Computation of Flow Rate for Stream section of the label, B = parts per million desired concentration of Nusyn-Noxfish.

Total Amount of Product Needed for Treatment: Streams should be treated for between 4 to 8 hours in order to clear the treated section of stream of fish. To determine the total amount of Nusyn-Noxfish required use the following equation;

$$Y = X(0.0158\ C)$$

Y = gallons of Nusyn-Noxfish required for the stream treatment, X = cc per minute of Nusyn-Noxfish applied to the stream, C = time in hours of the stream treatment.

Application of Diluted Material

Alternatively, for stream flows up to 25 cubic feet per minute, continuous drip of diluted Nusyn-Noxfish at 80 cc per minute can be used. Flow of diluted Nusyn-Noxfish into the stream should be checked at least hourly. Use a 5 gallon reservoir over a 4 hour period, a 7.5 gallon reservoir over a 6 hour period, or a 10 gallon reservoir over an 8 hour period. The volume of the reservoir can be determined from the equation:

$$R = H * 1.25$$

where R = the volume of the reservoir in gallons, and H = the duration of the application in hours.

The volume of Nusyn-Noxfish diluted with water in the reservoir is determined from the equation:

$$X = Y(102\ F)H$$

where X = the cc of Nusyn-Noxfish diluted to 5 gallons, Y = parts per million desired concentration of Nusyn-Noxfish, F = the flow rate (cubic feet/second), H = the duration of the application (hours).

For flows over 25 cubic feet per minute, additional reservoirs can be used concurrently. Back-water, stagnant and spring areas of streams should be sprayed by hand with a 10% v/v solution of Nusyn-Noxfish in water to assure a complete coverage.

Detoxification

To limit effects downstream, detoxification with potassium permanganate can be used at the downstream limit of the treated area. Within 1/2 to 2 miles of the furthest downstream Nusyn-Noxfish application site, the rotenone can be detoxified with a potassium permanganate solution at a resultant stream concentration of 2 to 4 parts per million, depending on rotenone concentration and permanganate demand of the water. A 2.5% (10 pounds potassium permanganate to 50 gallons of water) permanganate solution is dripped in at a continuous rate using the equation:

$$X = Y(70\ F)$$

where X = cc of 2.5% permanganate solution per minute, Y = ppm of desired permanganate concentration, and F = cubic feet per second of stream flow.

Flow of permanganate should be checked at least hourly. Live fish in cages placed immediately above the permanganate application site will show signs of stress signaling the need for beginning detoxification. Detoxification can be terminated when replenished fish survive and show no signs of stress for at least four hours.

Detoxification of rotenone by permanganate requires between 15 to 30 minutes contact time (travel time). Cages containing live fish can be placed at these downstream intervals to judge the effectiveness of detoxification. Water temperature of less than 50°F detoxification may be retarded, requiring a longer contact time.