



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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

January 29, 2009

MEMORANDUM

SUBJECT: Response to Comments on the Reregistration Eligibility Decision (RED) for Rotenone and Amended Label Table (EPA 738-R-07-005)

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TO: Public Docket EPA-HQ-OPP-2005-0494

This document presents the Environmental Protection Agency's (EPA or "the Agency") formal response to the comments received on the 2007 Reregistration Eligibility Decision (RED) for Rotenone. These comments were received during the 60-day public comment period that ended on July 23, 2007.

During the comment period EPA received responses from various stakeholders including technical registrants, state fish management agencies, interest groups, members of the public, and the user community. EPA's response to these comments is presented in this document and three attachments according to division within the Office of Pesticide Programs that prepared the response: Environmental Fate and Effects Division (Attachment 1), Health Effects Division (Attachment 2), and Biological and Economic Analysis Division (Attachment 3). In addition, this document presents the Special Review and Reregistration Division's (SRRD) responses. Comments are presented in bold font and SRRD's responses are presented below each comment.

Comment: EPA should allow the use of a 48-hour bioassay test to determine whether or not rotenone levels are below the maximum allowable concentration in drinking water. If EPA's level of concern is 40 ppb, for example, the bioassay would use a species susceptible to rotenone at less than 40 ppb. EPA should require this test only for water intakes for domestic use that do not use oxidative treatments.

EPA response: Based on the chronic toxicity endpoint, EPA estimated the chronic drinking water level of concern (cDWLOC) to be 40 ppb for the most sensitive population subgroups (infants and children). There is evidence that rotenone is readily deactivated through the use of oxidizing agents, such as potassium permanganate and treatment through chlorination, ozonation or charcoal filtering. But, the Agency believes that under certain limited circumstances – e.g., drinking water intakes near lentic (standing) cold water treatment areas with no oxidative raw or finished water treatment – residues of rotenone in drinking water could exceed the cDWLOC (40 ppb) for up to several weeks. The labels will need to describe all the steps certified applicators must follow and the various methods, including analytical chemistry, bioassay, dilution to ensure that chronic or sub-chronic exposures above 40 ppb through drinking water will not occur.

Comment: It is not always practical or desirable to restrict rotenone applications of rotenone to below the water surface (e.g., drip can, tank mix spray).

EPA response: The label table will be revised to allow drip can, backpack sprayer, hand-held sprayers and aerial applications to be made above the water surface.

Comment: Collection and disposal of dead fish should not be required.

EPA response: The labeling requirements clearly state that, users should collect and bury dead fish where practical. It is not a requirement.

Comment: Deactivation with potassium permanganate should not be required because potassium permanganate use may not always be necessary or desirable depending on the results of the pre-treatment environmental analysis.

EPA response: The persistence of rotenone can vary depending on environmental conditions. Because of uncertainties associated with the potential effects on humans and because of the known effects of rotenone on nontarget animals such as aquatic invertebrates, the Agency is attempting to limit nontarget exposure by requiring rotenone deactivation with potassium permanganate. Therefore, flow in a stream and outflow from a treated lake beyond the treatment area must be deactivated with potassium permanganate to prevent exposure beyond the treatment area. Depending on flow rates, environmental conditions and treatment rates, rotenone can potentially move beyond targeted treatment areas and expand the affected area. The extent to which this would occur could be highly variable and uncertain. Exposure of nontarget organisms outside the treatment area is intended to be limited through rigorous application standard operating procedures used by trained fishery professionals and deactivating rotenone with potassium permanganate. The Agency agree there are some situations where deactivation is not possible or unnecessary, e.g. in a steep canyons and those situations will be outlined in the SOP.

Comment: Rinsate from cleaning activities should be disposed of in the treatment area.

EPA response: We agree that rinsate from cleaning activities should be disposed of in the treatment area. The label table will be revised to make this clarification.

Comment: There is no guidance to differentiate between partial and complete kills (except in the concentrations and durations used and the sensitivities of the target species) and label language required by the RED that refers to partial kills should be removed.

EPA response: The label table has been modified to provide instructions and rates for a variety of fish species, obviating any confusion with the term "partial kills". Detailed guidance for conducting bioassays and designing treatment will be presented in the Rotenone SOP Manual.

Comment: The Certified Applicator should only be required to be in contact with the treatment operation and not onsite.

EPA response: Because piscicidal applications are so complex and because circumstances vary significantly, a Certified Applicator must remain onsite for the duration of the treatment.

Comment: Placarding instructions in the RED are excessive (e.g., postings every 250 feet).

EPA response: The label table will be revised to account for placarding requirements for large or inaccessible treatment areas (see enclosed Table 2).

Comment: The aerial application height restrictions required by the RED are unsafe.

EPA response: The label table will be revised to allow the aerial applicator to determine the appropriate application height consistent with pest control and flight safety.

Comment: The term "helicopter application" should be replaced with the term "aerial application" because fixed-wing aircraft are occasionally used to apply rotenone.

EPA response: The label table does not differentiate between helicopter or other aerial applicators/applications.

Comment: All enforceable label language should appear on the product label and the Rotenone Standard Operating Procedures (SOP) manual should contain only advisory/informational statements. Because piscicidal applications are so complex and because circumstances vary significantly, it is impossible to craft mandatory detailed instructions that will apply in every situation.

EPA response: The Agency believes rotenone applications are often quite complex requiring many factors be considered by the certified applicators. The Agency agrees that labels should include enforceable language and may need to incorporate by reference more detailed, instructions in an SOP manual.

Comment: The prohibition of use in estuarine/marine environments should be removed because uses and risks are similar for these environments.

EPA response: EPA understands that rotenone is not generally used in estuarine/marine environments and no data have been submitted on the fate and/or toxicity of estuarine/marine environments/organisms. EPA will consider removing this restriction upon submission of updated labels with instructions for use in estuarine/marine environments as well as data that demonstrate estuarine/marine fate and toxicity.

Comment: Recreational access should be allowed in flowing waters after the chemical has moved beyond the access point.

EPA response: Most treatment areas, including flowing water bodies, have stagnant areas that receive little to no stream circulation (e.g., those areas treated with handheld sprayers); therefore, recreational access must be prohibited for at least 72 hours after treatment to flowing waters to ensure degradation of rotenone.

Comment: Chest waders may not be appropriate in all instances (depending on water depth, etc.) and should be changed to “waders.”

EPA response: The label table will be revised to specify “waders” instead of “chest waders.”

Comment: EPA’s rationale for limiting rotenone applications to 50 ppb in flowing water is unclear and will result in failed treatments. EPA should allow treatment concentrations up to 200 ppb in all settings or when results of a bioassay indicate the need.

EPA response: The Agency is establishing the maximum application rate of 200 ppb in both lotic (flowing water) and lentic (still water) environments. For still water applications, the existing labels allow treatment rates as high as 250 ppb; however, this treatment rate exceeds the solubility limit (200 ppb at 20°C) for rotenone and thus, the maximum treatment rate will be reduced to 200 ppb. For moving water applications, the application rate will be increased to 200 ppb. Since moving water treatments have the highest potential for off-site movement, EPA is requiring the deactivation with potassium permanganate to prevent exposure beyond the treatment area. Exposure outside the treatment area is intended to be limited through rigorous application standard operating procedures used by trained fishery professionals and deactivating rotenone with potassium permanganate.

Comment: Should the rotenone/sand/gel formulation be included in the registrant developed SOP manual?

EPA response: The Agency has determined that the rotenone/sand/gel formulation is eligible for reregistration as long as the mitigation measures required in the RED and in the enclosed Amended Label Table are adhered to. In addition, the SOP will provide useful instructions and guidance to enhance protection to workers and the environment when certified applicators mix and apply the rotenone/sand/gel formulation.

Tables 1 and 2 update and supersede Tables 15 and 16, respectively, in the March 2007 RED (EPA 738-R-07-005).

Table 1. Label Changes Summary Table for Rotenone Manufacturing-Use Products

Description	Amended Labeling Language for Manufacturing Use Products	Placement on Label
For Liquid Manufacturing Use Products	<p>“Only for formulation into a piscicide (fish kill) for the following use(s) [MUP registrant, insert those uses that are being supported by the RED].”</p> <p>“End use product containers that are larger than 5 gallons must be packaged in a manner compatible with a closed mixing/loading system. End use product containers that are 5 gallons and smaller are not required to be packaged in a manner compatible with a closed mixing/loading system.”</p> <p>“Only for formulation into products that are classified as Restricted Use.”</p>	Directions for Use
For Wettable Powder Manufacturing Use Products	<p>“Only for formulation into a piscicide (fish kill) for the following use(s) [MUP registrant, insert those uses that are being supported by the RED].”</p> <p>“End use product containers must be packaged in a manner compatible with a closed mixing/loading system.”</p> <p>“Only for formulation into products that prohibit aerial, drip can and backpack sprayer application.”</p> <p>“Only for formulation into products that are classified as Restricted Use.”</p>	Directions for Use
Environmental Hazards Statements Required by the RED and Agency Label Policies	<p>“This product is extremely toxic to fish and other aquatic organisms.”</p> <p>“Do not contaminate water, food, or feed by storage or disposal.”</p> <p>“Do not discharge effluent containing this pesticide into sewage systems without notifying the sewage treatment plant authority (POTW).”</p>	Precautionary Statements

Table 2. Label Changes Summary Table for Rotenone End-Use Products Intended for Occupational and Residential Use

Description	Amended Labeling Language for End-Use Products	Placement on Label
RUP	<p>“Restricted Use Pesticide”</p> <p>“Due to acute inhalation and acute oral toxicity and due to toxicity to fish and other aquatic organisms.”</p> <p>“For retail sale to and use by only Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator’s certification.”</p>	<p>This statement must appear at the very top of the label's front panel [see 40 CFR 156.10(j)(2)(i) for more information]. No other wording or symbols may appear above the RUP statement.</p>
SOP Manual	<p>“THE APPLICATOR IS RESPONSIBLE FOR CONFORMING TO THE LABEL. IMPORTANT GUIDANCE ON THE SAFE AND EFFECTIVE USE OF THIS PRODUCT AND CONFORMING TO THE LABEL IS PROVIDED IN THE ROTENONE STANDARD OPERATING PROCEDURES (SOP) MANUAL, AVAILABLE FROM THE REGISTRANT OR AMERICAN FISHERIES SOCIETY AT www.fisheries.org/units/rotenone/.”</p>	<p>Immediately below the RUP statement on the label and on the cover page of the Rotenone SOP Manual.</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
<p>PPE Requirements Established by the RED¹ for Liquid Formulations</p>	<p>“Personal Protective Equipment (PPE)”</p> <p>“Some materials that are chemical-resistant to this product are” [<i>EUP registrant, insert correct chemical-resistant material</i>]. “If you want more options, follow the instructions for category” [<i>EUP registrant, insert A, B, C, D, E, F, G, or H</i>] “on an EPA chemical-resistance category selection chart.”</p> <p>“All mixers, loaders, applicators, and other handlers (except pilots) must wear, at a minimum, the following PPE:</p> <ul style="list-style-type: none"> * coveralls over long-sleeved shirt and long pants, * chemical-resistant gloves, * chemical-resistant footwear plus socks, * protective eyewear, and * a dust mist respirator.” <p>“In addition, mixers, loaders, and others exposed to the concentrate, through cleaning equipment or spills must wear:</p> <ul style="list-style-type: none"> * chemical-resistant apron.” <p>“Exception: waterproof waders may be worn in place of coveralls, chemical-resistant apron and chemical-resistant footwear”</p> <p>“See Engineering Controls for additional requirements and exceptions.”</p>	<p>Precautionary Statements under the heading “Hazards to Humans and Domestic Animals”</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
<p>PPE Requirements Established by the RED¹ for Wettable Powder Formulations</p>	<p>“Personal Protective Equipment (PPE)”</p> <p>“Some materials that are chemical-resistant to this product are” [<i>EUP registrant, insert correct chemical-resistant material</i>]. “If you want more options, follow the instructions for category” [<i>EUP registrant, insert A, B, C, D, E, F, G, or H</i>] “on an EPA chemical-resistance category selection chart.”</p> <p>“All mixers, loaders, applicators, and other handlers must wear, at a minimum, the following PPE:</p> <ul style="list-style-type: none"> * coveralls over long-sleeved shirt and long pants, * chemical-resistant gloves, * chemical-resistant footwear plus socks, * protective eyewear, and * a NIOSH-approved tight-fitting full-face cartridge or canister respirator with any N, R, P, or HE filter; or a NIOSH-approved helmet or hood-style respirator with a dust/mist filter with MSHA/NIOSH approval number prefix TC-21C; or a NIOSH-approved N95 filtering face piece or half-face negative pressure air purifying respirator with P100 HEPA filter cartridges; or a powered air purifying respirator (PAPR) with P100 HEPA filter cartridges.” <p>“In addition, mixers, loaders, and others exposed to the concentrate, through cleaning equipment or spills must wear:</p> <ul style="list-style-type: none"> * chemical-resistant apron.” <p>“Exception: waterproof waders may be worn in place of coveralls, chemical-resistant apron and chemical-resistant footwear”</p> <p>“See Engineering Controls for additional requirements and exceptions.”</p> <p>[* <i>EUP registrant, drop the “N” type prefilter from the respirator statement if the pesticide product contains or is used with oil.</i>]</p> 	<p>Precautionary Statements under the heading “Hazards to Humans and Domestic Animals”</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
User Safety Requirements	<p>“Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.”</p> <p>“Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them.”</p>	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the PPE requirements
Engineering Controls for Mixing/Loading Liquid Formulations Packaged in Containers Larger Than 5 Gallons In Volume	<p>“Engineering Controls for Mixing and Loading Liquid Formulations Packaged in Containers Larger Than 5 Gallons In Volume”</p> <p>“Mixers and loaders must either:</p> <p>(1) Use a closed system that meets the requirements listed in Worker Protection Standard (WPS) for dermal protection of agricultural pesticides [40 CFR 170.240(d)(4)], or</p> <p>(2) Use the Semi-Closed Probe Mixing/Loading System described below.</p> <p>Remove plug from bung of drum containing this product only when drum is sitting on the ground or on a secure level platform, with the bung end of the drum pointed up. Do not pour this product from its drum. Transfer</p>	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.

Description	Amended Labeling Language for End-Use Products	Placement on Label
	<p>product from the drum to the mixing tank by use of a suction hose connected to one end of the suction pump on the mixing tank and connected at the other end to a probe/dip tube. Remove the plug from bung of drum and insert the probe/dip tube into the bung of drum until the foam ring/gasket fits snugly around the bung opening to minimize leakage of liquid rotenone. The probe/dip tube should be specifically sized to insure a snug fit into the bung which incorporates an anti-drip flange to remove excess liquid rotenone when the probe/dip tube is removed. In addition, the foam ring/gasket on the probe/dip tube insures a snug fit to minimize leakage of liquid rotenone. Do not handle the probe/dip tube in a manner that allows dripping or splattering of the product onto yourself or any other person. Do not touch the portion of the probe/dip tube that has been in contact with this product until the probe has been triple rinsed with water. See Rotenone SOP Manual for further information on the operation of the Semi-Closed Probe System.</p> <p>If the entire product is removed from the drum, then triple rinse the probe while it remains inside the drum if possible. In not, remove the aspirator probe and triple rinse it and all parts of the aspirator in site water. If an unrinsed probe must be removed from the drum, triple rinse it and all parts of the aspirator in treated site water. The anti-drip flange must be designed to remove excess rotenone product from the probe as it is extracted from the drum. Take the following steps if the probe must be disconnected from the suction hose before both the probe and the hose have been triple-rinsed: (1) equip the probe end of the hose with a shutoff valve; (2) install a dry break coupling between the valve and the probe, and close the shutoff valve before disconnecting the probe. See Rotenone SOP Manual for further information on unrinsed probes.</p> <p>Mixers and loaders using all systems must wear PPE as required in the PPE section of this labeling for mixers and loaders. All systems must be capable of removing the pesticide from the shipping container and transferring it into mixing tanks and/or application equipment. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shutoff device to minimize drippage.</p>	

Description	Amended Labeling Language for End-Use Products	Placement on Label
Liquid Formulations For Containers of 5 Gallons or Less Liquid Volume	<p>“Mixing and Loading Liquid Formulations For Containers of 5 Gallons or Less Liquid Volume”</p> <p>“Mixers and loaders must transfer product from container to mixing tank by pouring appropriate amount into measuring device (i.e., measuring cup) and then transferring to mixing tank inside of a plastic-lined bermed area capable of recovering spilled product. Wash plastic liner and measuring device and dispose into treated site water. Do not handle this product in a manner that drips or splatters the product onto yourself or any other person.”</p>	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.
Engineering Controls for Applying Liquid Formulations	<p>“Applications using a boom or other mechanized equipment must release this product below the water’s surface. Applications made with aircraft, backpack sprayer, drip can, or hand-held or hand-directed nozzle may release this product above the water’s surface.”</p>	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.

Description	Amended Labeling Language for End-Use Products	Placement on Label
<p>Engineering Controls for Mixing/Loading Wettable Powder Formulations</p>	<p>“Engineering Controls for Mixing and Loading Systems for Wettable Powder Formulations”</p> <p>“Mixers and loaders must either:</p> <ol style="list-style-type: none"> 1. Use a closed system that meets the requirements listed in Worker Protection Standard (WPS) for dermal protection of agricultural pesticides [40 CFR 170.240(d)(4)], or 2. Use the Semi-Closed Aspirator Mixing/Loading System described as below. <p>“Before applying this product, roll the sealed drum on the ground to loosen the rotenone powder that may have settled during shipping and storage. Remove top of the drum containing this product and insert the aspirator probe into the bung opening in the plastic liner until the foam ring/gasket on the aspirator probe fits snugly around the bung opening in the plastic liner to minimize rotenone powder dispersing into the air. The bung opening is specifically designed for a snug fit around the aspirator probe and incorporates a soft plastic flange to remove excess powder rotenone when the aspirator probe is removed. In addition, the foam ring/gasket on the aspirator probe insures a snug fit to reduce rotenone powder dispersing into the air. Do not pour this product from its drum. Transfer product from the plastic lined drum to the mixing tank by use of a suction hose connected to one end of the suction pump (aspirator) on the mixing tank and connected at the other end to the aspirator probe that is inserted into the bung opening in the plastic liner. Handle the aspirator probe in a manner that minimizes the dispersing of rotenone powder onto you, any other person or into the air. Once the application is complete, remove the aspirator probe and triple rinse it and all parts of the aspirator in treated site water. See Rotenone SOP Manual for further information on the operation of the Semi-Closed Aspirator System.”</p> <p>“After the application is complete and the aspirator probe is removed from the drum, shake residual powder into the bottom of the plastic liner, fold the plastic liner into the drum, and reseal the drum. The liners are triple-rinsed by removing from the drum, submerging the liner before cutting open, and wetting the liner underwater. See Rotenone SOP Manual for further information on cleaning aspirator and rinsing liners.”</p> <p>“Mixers and loaders using all systems must wear PPE as required in the PPE section of this labeling for mixers and loaders. All systems must be capable of removing the pesticide from the shipping container and transferring it into mixing tanks and/or application equipment.”</p>	<p>Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
Engineering Controls for Applying Wettable Powder Formulations	“Applications using a boom or other mechanized equipment must release this product below the water’s surface. Applications made with hand-held or hand-directed nozzle may release this product above the water’s surface. Applications with an aircraft, backpack sprayer and drip can are prohibited.”	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.
Engineering Controls for Aerial Applicators	<p>“Engineering Controls for Aerial Applications”</p> <p>“Open cockpits are prohibited. Pilots must use a cockpit that has a nonporous barrier that totally surrounds the cockpit occupants and prevents contact with pesticides outside the enclosed area. Pilots in enclosed cockpits may wear a long-sleeve shirt, long pants, shoes, and socks, instead of the PPE required for applicators in the PPE section of this labeling.”</p>	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.
Engineering Controls Exception for Boat Applications	<p>“Engineering Controls for Boat Applications”</p> <p>“When boat pilots or others on the application boat are located within an enclosed area that has a nonporous barrier that totally surrounds the occupants and prevents contact with pesticides outside the enclosed area, they:</p> <ul style="list-style-type: none"> * may wear a long-sleeve shirt, long pants, shoes, and socks, instead of the PPE required for applicators in the PPE section of this labeling. * must be provided and have immediately available for use in an emergency when they must exit the enclosed area while application is taking place, the PPE required for applicators in the PPE section of this labeling; * must take off any PPE that was worn while outside the enclosed area before reentering the enclosed area, and * store all such used PPE in a chemical-resistant container, such as a plastic bag, to prevent contamination of the inside of the enclosed area.” 	Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the User Safety Requirements.

Description	Amended Labeling Language for End-Use Products	Placement on Label
User Safety Recommendations	<p>“User Safety Recommendations”</p> <p>“Certified Applicators applying or supervising any aspect of the application of this product should attend a training program for piscicide applications. Contact American Fisheries Society at: www.fisheries.org/units/rotenone/ for current schedule of training.”</p> <p>“Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.”</p> <p>“Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.”</p> <p>“Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.”</p>	<p>Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below the Engineering Controls.</p> <p>(These statements must be placed in a box.)</p>
Environmental Hazards	<p>“Environmental Hazards”</p> <p>“This product is extremely toxic to fish and other aquatic organisms.”</p> <p>“Do not contaminate water outside the treatment area by cleaning of equipment or disposal of equipment wash waters.”</p> <p>“Do not contaminate water outside the treatment area, food, or feed by storage or disposal.”</p> <p>“Do not discharge effluent containing this pesticide into sewage systems without notifying the sewage treatment plant authority (POTW).”</p>	<p>Precautionary Statements under the heading “Hazards to Humans and Domestic Animals” immediately following/below User Safety Recommendations</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
Personal Protective Equipment When Re-entering Treated Areas	<p>“Re-entering the Treatment Area”</p> <p>“For applications that result in concentrations greater than 0.09 ppm active rotenone (when applying at a rate of greater than 1.8 ppm of 5% rotenone formulation), handlers re-entering treated water, must wear, at a minimum, the following PPE:</p> <ul style="list-style-type: none"> * Coveralls over long-sleeved shirt and long pants, * Chemical-resistant gloves, * Chemical resistant footwear plus socks, and * Chemical-resistant apron. <p>Exception: waterproof waders may be worn in place of coveralls, chemical-resistant apron and chemical-resistant footwear.”</p>	Direction for Use under the heading “Re-Entering the Treatment Area”
Determining Treatment Rate	<p>“Determining Treatment Rate”</p> <p>“The actual treatment rate and rotenone concentration needed to control fish varies widely, depending on the type of water, environmental factors including pH, temperature, depth, and turbidity, and the target species. The table below is a general guide for the proper rates and concentrations for complete kills of target species. The certified applicator must conduct bioassay using site water and target species to refine the treatment rate within the maximum limit allowed. Detailed guidance for conducting bioassays and designing treatment for complete kills of target species are presented in the Rotenone SOP Manual.”</p>	Directions for Use under the heading “Determining Treatment Rate”

Description	Amended Labeling Language for End-Use Products				Placement on Label	
	Type of Use	Parts per Million (ppm) Product (5% A.I.) Active Rotenone Measured in Treated Water		Number of Acre-Feet Covered by One Gallon	Number of Acre Feet Covered by One Pound	
	Normal	0.50 to 1.0	0.025 to 0.050	6.0 to 3.0	0.74 to 0.37	
	Remove Tolerant Species	1.0 to 3.0	0.050 to 0.150	3.0 to 1.0	0.37 to 0.123	
	Remove Tolerant Species in Rich Organic Ponds	2.0 to 4.0	0.10 to 0.20	1.5 to 0.75	0.185 to 0.093	
General Application Restrictions for all Formulations	<p>“The Certified Applicator supervising the treatment must remain on-site for the duration of the application.”</p> <p>“Do not allow recreational access (e.g., wading, swimming, boating, fishing) within the treatment area while rotenone is being applied.”</p> <p>“In streams/rivers/lakes/reservoirs/ponds, do not apply this product in a way that will result in active rotenone concentrations >200 parts per billion/0.2 parts per million (> 4.0 ppm 5% rotenone formulation.)”</p> <p>“Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.”</p> <p>"This product must not be applied to estuarine or marine environments."</p> <p>“Where practical, users should collect and bury dead fish.”</p>				Directions for Use	

Description	Amended Labeling Language for End-Use Products	Placement on Label
General Application Restrictions for Liquid Formulations	“Applications using a boom or other mechanized equipment must release this product below the water’s surface. Applications made with aircraft, backpack sprayer, drip can, or hand-held or hand-directed nozzle may release this product above the water’s surface.”	Directions for Use
General Application Restrictions for Liquid Formulations For Containers of 5 Gallons or Less Liquid Volume	“Mixers and loaders of liquid containers of 5 gallons or less should not handle more than 25 gallons per day.”	Directions for Use
General Application Restrictions for Wettable Powder Formulations	“Applications using a boom or other mechanized equipment must release this product below the water’s surface. Applications made with hand-held or hand-directed nozzle may release this product above the water’s surface. Applications with an aircraft, backpack sprayer or drip can are prohibited.”	Directions for Use
Monitoring Requirements for Use in Aquaculture	<p>“For treated water bodies used for food production (aquaculture), the Certified Applicator or designee under his/her direct supervision must prohibit restocking of fish until monitoring samples confirm rotenone concentrations are below the level of detection for 3 consecutive samples taken no less than 4 hours apart.”</p> <p>“Detailed guidance for monitoring levels of rotenone in water is presented in the Rotenone SOP Manual.”</p>	Directions for Use under the heading “Monitoring Samples”
Monitoring Requirements for Drinking Water	<p>For applications > 40 ppb or 0.04 ppm active rotenone (> 0.8 ppm 5% rotenone formulation) in waters with drinking water intakes or with hydrologic connections to wells, 7-14 days prior to application, the Certified Applicator or designee under his/her direct supervision must provide notification to the party responsible for the public water supply or to individual private water users against the consumption of treated water until:</p> <p>(1) active rotenone is < 0.04 ppm as determined by analytical chemistry, or</p> <p>(2) fish of the salmonidae or centrarchidae families can survive for 24 hours, or</p> <p>(3) dilution with untreated water yields a calculation that active rotenone is < 0.04 ppm, or</p> <p>(4) distance or travel-time from the application site demonstrate that active rotenone is < 0.04 ppm. See Rotenone SOP Manual for guidance on bioassay and chemical analysis techniques and dilution, distance and travel-time criteria.</p>	Directions for Use under the heading “Drinking Water Monitoring”

Description	Amended Labeling Language for End-Use Products	Placement on Label
Drinking Water Notification Requirements	<p data-bbox="512 191 877 224">“Drinking Water Notification”</p> <p data-bbox="512 261 1415 423">If drinking water intakes are present within the treatment area, or a hydrologic connection to wells exist, 7-14 days prior to application, the Certified Applicator or designee under his/her direct supervision must provide notification to the party responsible for the public water supply or to individual private water users.</p> <p data-bbox="512 461 1325 519">“Detailed guidance for notification is presented in the Rotenone SOP Manual.”</p>	Directions for Use under the heading “Drinking Water Notification”

Description	Amended Labeling Language for End-Use Products	Placement on Label
<p>Notification Requirements for all applications</p>	<p>“Placarding of Treatment Areas”</p> <p>“The Certified Applicator in charge of the application (or someone under his/her supervision) must placard all access areas to the treatment area. Placards must be placed every 250 feet along the shoreline of the treated area, OR, at public access points (e.g., trailheads and roads and trails). Placards must contain the information below:”</p> <ul style="list-style-type: none"> * “DANGER/PELIGRO” * “DO NOT ENTER WATER/NO ENTRE AGUA: Pesticide Application” * The name of the product applied * The purpose of the application * The start date and time of application * The end date and time of application * “Recreational access (e.g., wading, swimming, boating, fishing, etc.) within the treatment area is prohibited while rotenone is being applied.” * “Do not swim or wade in treated water while placard is displayed.” * “Do not consume dead fish from treated water.” * The name, address, and telephone number of the responsible agency or entity performing the application. <p>“Signs must remain legible during the entire posting period.”</p> <p>“For lotic (flowing water) and lentic (standing water) applications of \leq 0.09 ppm active rotenone ($<$ 1.8 ppm 5% rotenone formulation), signs can be removed once application is complete. For lotic (flowing water) applications $>$ 0.09 ppm active rotenone ($>$ 1.8 ppm 5% rotenone formulation), signs can be removed 72 hours after the application is complete. For lentic (standing water) applications $>$ 0.09 ppm active rotenone ($>$ 1.8 ppm 5% rotenone formulation), signs can be removed following a 24-hour bioassay demonstrating survival of bioassay sentinel fish or 14 days, which ever is less.”</p>	<p>Directions for Use under the heading “Placarding of Treatment Areas”</p>

Description	Amended Labeling Language for End-Use Products	Placement on Label
Deactivation with Potassium Permanganate	<p>“Deactivation with Potassium Permanganate”</p> <p>“Flow in a stream and outflow from a treated lake beyond the treatment area must be deactivated with potassium permanganate to minimize exposure beyond the treatment area unless unnecessary. (See the Rotenone SOP Manual for the definition of treatment area, examples when treatment with potassium permanganate is unnecessary and detailed guidance for deactivating rotenone with potassium permanganate.)”</p>	Directions for Use under the heading “Deactivation with Potassium Permanganate (KMnO ₄)”
Spray Drift Label Language for Products Applied as an Aerial Spray	<p>RELEASE HEIGHT: “Spray must be released at the lowest height consistent with pest control and flight safety.”</p> <p>BOOM LENGTH: “The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter. Orient nozzles backward with minimal downward angle into slip stream.”</p> <p>SWATH ADJUSTMENT: “When applications are made with a cross-wind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind. Leave at least one swath unsprayed at the downwind edge of the treated area.”</p> <p>DROPLET SIZE: “Use low drift nozzles designed to produce larger spray droplets with fewer driftable fines. Apply as a medium or coarser spray (ASAE standard 572).”</p> <p>WIND SPEED: “Do not apply when wind speeds are greater than 12 miles per hour.”</p>	Directions for Use under the heading “General Precautions and Restrictions”

¹ PPE that is established on the basis of Acute Toxicity of the end-use product must be compared to the active ingredient PPE in this document. The more protective PPE must be placed in the product labeling. For guidance on which PPE is considered more protective, see PR Notice 93-7.