

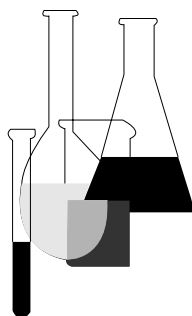


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# Product Performance Test Guidelines

## OPPTS 810.3400

### Mosquito, Black Fly, and Biting Midge (Sand Fly) Treatments



## INTRODUCTION

This guideline is one of a series of test guidelines that have been developed by the Office of Prevention, Pesticides and Toxic Substances, United States Environmental Protection Agency for use in the testing of pesticides and toxic substances, and the development of test data that must be submitted to the Agency for review under Federal regulations.

The Office of Prevention, Pesticides and Toxic Substances (OPPTS) has developed this guideline through a process of harmonization that blended the testing guidance and requirements that existed in the Office of Pollution Prevention and Toxics (OPPT) and appeared in Title 40, Chapter I, Subchapter R of the Code of Federal Regulations (CFR), the Office of Pesticide Programs (OPP) which appeared in publications of the National Technical Information Service (NTIS) and the guidelines published by the Organization for Economic Cooperation and Development (OECD).

The purpose of harmonizing these guidelines into a single set of OPPTS guidelines is to minimize variations among the testing procedures that must be performed to meet the data requirements of the U. S. Environmental Protection Agency under the Toxic Substances Control Act (15 U.S.C. 2601) and the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136, *et seq.*).

**Final Guideline Release:** This guideline is available from the U.S. Government Printing Office, Washington, DC 20402 on *The Federal Bulletin Board*. By modem dial 202-512-1387, telnet and ftp: fedbbs.access.gpo.gov (IP 162.140.64.19), or call 202-512-0132 for disks or paper copies. This guideline is also available electronically in ASCII and PDF (portable document format) from EPA's World Wide Web site (<http://www.epa.gov/epahome/research.htm>) under the heading "Researchers and Scientists/Test Methods and Guidelines/OPPTS Harmonized Test Guidelines."

**OPPTS 810.3400 Mosquito, black fly, and biting midge (sand fly) treatments.**

(a) **Scope**—(1) **Applicability** This guideline is intended to meet testing requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136, et seq.)

(2) **Background.** The source material used in developing this harmonized OPPTS test guideline is OPP guideline 95–10 Mosquito, black fly, nonbiting midge, and biting midge (sand fly) treatments (Pesticide Assessment Guidelines, Subdivision G: Product Performance, EPA report 540/9–82–026, October 1982).

(b) **Overview.** (1) This section is concerned with efficacy data requirements for evaluation of invertebrate control pesticides as outdoor and breeding ground treatments against several groups of important insect pests which pose economic and public health threats to man in urban, rural, agricultural, and wilderness habitats. The insects for which data considerations are outlined here belong to five families: *Culicidae* (mosquitoes), *Simuliidae* (black flies), *Ceratopogonidae* (biting midges), and nonbiting midges in the families *Chironomidae* (midges) and *Chaoboridae* (phantom midges).

(2) These insects inhabit a variety of ecological niches and show diverse biological, physiological, and behavioral patterns. In the evaluation of biologically active compounds, the unique features of each pest species must be taken into consideration. Members of the 5 families for which these guidelines are developed are mostly aquatic or semi-aquatic in their immature stages. The mature stages are terrestrial, dispersing beyond the immediate vicinity of breeding sources.

(c) **General considerations**—(1) **Species, stage, age, and sex.** The test insect should be identified as to genus and species. Additional information as to subspecies or strains should be recorded. Methods and procedures utilized for assessment are dictated by the stage and habitat of the insect. Pesticides are generally evaluated against the larval and/or adult stages. In certain situations, however, registrants may have to gather data on the egg and pupal stages. In larval evaluation, the instar should be standardized and specified. The age or age range (if precise age is not known) of the adult test insects should be reported. Reporting of the calendar age of larvae is not essential if the larval instars are specified. The sex of the adult test insects should be specified. Determination of the sex of the immature stages is difficult, and generally this information is not necessary.

(2) **Plot size.** Plots which are suitable in size for commercial applications should be used. Plots size can vary from a few square feet to hundreds of acres (hectares), depending on the objectives of the test, species,

and type of control desired. Test plot dimensions should be large enough to avoid drift onto sampling areas of untreated control plots.

(3) **Number of trials.** A minimum of 5 large-scale geographically separated trials are generally necessary, but the number of trials can vary somewhat due to the accessibility of infestations, fluctuations in pest population pressures, behavior, and other important considerations in the biology of the target pest.

(4) **Application techniques and equipments.** Aerial or ultra-low volume applications should be evaluated if these methods are specified on the label.

(5) **Evaluation and reporting procedures.** The evaluation procedures should be specified in the presentation of the data. Reports should include larval counts, bite counts, percent mortality, knock-down time or other appropriate measures of determining the effectiveness of the test product. Results should include the infestation or nuisance reduction, or preferably both, compared with the control plots or areas. Raw data on pest counts or other measures of control should be summarized. Insect resistance can be a major problem when testing a product for mosquito control, and any evidence of such should be reported when tests are run in areas where resistance is a known problem. Other factors of special concern in determining a product's usefulness are wildlife and fish hazards (see OPPTS Test Guideline Series 850, Ecological Effects), possible water or air pollution, effects on house paints, and spotting of automobiles. Any adverse effects should be reported. Repellency from mosquito coils, candles, and torches is dependent upon the concentrations and duration of smoke or fumes which permeate a limited area. These types of products should demonstrate repellency of mosquitoes and other small flying insects on patios, torches, or other confined outdoor areas where there is little or no breeze.

(6) **Sampling techniques.** Various species and the different stages of the same species require specific sampling techniques. Applicable techniques for assessment of populations of test species or groups should be employed.

(d) **Suggested performance standards.** Unless otherwise specified, these standards are presented on the basis of pre- and post-treatment pest population counts (including landing, bite, and trap counts) from treated as well as the untreated pest plots and standard comparative treatments. All percentages of control refer to the performance of the test product [as determined by pest insect counts (landing and bite) and other measures correlated to insect population pressures] against the vulnerable stage(s) of the target pest, when evaluated according to a recognized aerial or ground application treatment program under actual field conditions.

(1) **Culicidae (mosquitoes)**—(i) **Larvae.** A minimum of 95% population reduction, based on pre- and post-treatment infestation counts from tests conducted under actual field conditions.

(ii) **Adults.** A minimum of 95% population reduction, based on pre- and post-treatment infestation counts. When appropriate, laboratory colony or caged wild mosquitoes can be used. The tests should be conducted under actual field conditions.

(2) **Simuliidae (black flies)**—(i) **Larvae.** A minimum of 80% population reduction, based on laboratory evaluation techniques (jar, cloth trap, flushing and draining, and trough) and the single stream technique to determine effectiveness by comparing larval populations above and below the stream treatment point, not more than one day before and one day after treatment.

(ii) **Adults.** Large scale control operations are evaluated by pre- and post-treatment population estimates. Landing rate counts (a one-minute count beginning after a 5-minute waiting period is satisfactory) and standardized sweeps about the head of observer inside and outside the treated areas provide a useful index to the annoyance rate.

(3) **Ceratoponidae (biting midges)**—(i) **Larvae.** A minimum of 95% population reduction, based on pre- and post-treatment counts. Populations of larvae can be sampled by laboratory inspection of suspected breeding media collected in the field or by an emergence trapping method to determine the level of control.

(ii) **Adults.** A minimum of 95% population reduction, based on pre- and post-treatment population estimates determined by landing counts or light trap collections.