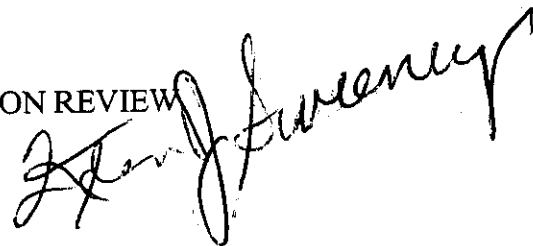


PRODUCT PERFORMANCE DATA EVALUATION REVIEW

by  
Kevin J. Sweeney, Entomologist  
Insecticides Branch



Date: March 7, 2003

Reviewer: Susan Stanton

EPA Reg. No. or File Symbol: 74843-E

Product Name: Buzz-Off Insect Shield Apparel

PM: George LaRocca, PM 13

Submission: S621759

DP: D285605

OPPTS Guideline: 810.33

Active Ingredient: 40% permethrin

Formulation: RTU permethrin treated clothing containing 0.52% permethrin (w/w), equivalent to 0.125 mg/cm<sup>2</sup>. This is the same concentration of permethrin found in U.S. Army Battle Dress Uniforms (100% cotton or 50% cotton/50% nylon).

Proposed pests: mosquitoes, ticks, ants, fleas, flies, and chiggers.

The registrant submitted one MRID and a copy of the propose product label.

**Background:** Buzz-Off Insect Shield, LLC has requested registration of permethrin treated clothing for civilian use as a repellent product. Unlike the U.S. Army, the Buzz-Off Insect Shield, LLC Company has proposed making permethrin treatments to all types of cloth. All sizes of clothing will be treated except those apparel designed for small children (child size 5 or less). The registrant included a discussion of all currently registered permethrin products used to treat clothing and note that [REDACTED] can be used to treat any type of cloth. All other clothing treatments with permethrin are restricted to 100% cotton or a 50% nylon:50% cotton blend. All efficacy data with permethrin clothing treatment has been made with 100% cotton or 50:50 cotton/nylon blend only. Permethrin binds better to natural fibers. It does not bind as well to synthetic fibers and such treatments do last as long as treatments made to natural fibers (Col Raj Gupta, pers. comm). The registrant requested that the EPA approve the claim - one treatment of permethrin provides repellency against the listed biting pests for the life of the garment. The industrial definition of garment life is 35 washes.

PRODUCT INGREDIENT SOURCE INFO NOT INCLUDED  
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Submitted studies:

**MRID 45751902 Buzz-Off Insect Shield Apparel Efficacy and Durability as a Repellent by E.A. Brown, August 28, 2002.**

The registrant included a narrative with cited public literature references. Upon my request, copies of all cited references were submitted. I reviewed the information in the MRID and all the published studies. In addition, I discussed the cited published work of Col. Raj Gupta with him to gain a better understanding of permethrin treatments and their repellent effects without discussing or mentioning the pending product. I reviewed the submitted label below based on my review of the submitted studies.

Product Label:

Page 1: OK

Page 2: The data support applications to repel mosquitoes, ticks, flies, and chiggers. Data were not provided or cited for fleas.

Page 3: OK

Page 4: Draft Labeling for garment.

Remove fleas. Add the number of washes when repellency protection expires. This number is less than 35 when weathering and wear are considered as part of durability considerations. The U.S. Army (pers. comm.) believes that 25 washes will remove most if not all the permethrin treatment. They have also stated that permethrin binds poorly to nylon and similar synthetic fibers usually require retreatment - including bednets, tents etc. The submitted data showed that permethrin was effective as a toxicant and knockdown agent to arthropods crawling or landing on treated clothing. Much less data exist for evaluation of repellent effects. Gupta, in his research found that permethrin treated clothing repelled mosquitoes at very low levels - less than  $0.01\text{mg}/\text{cm}^2$  (the level of detection). However, the weave and density of the cloth also provided protection without permethrin treatment.

Page 4 continued: the label states clothing shall not be retreated with permethrin. If the clothing is washed more than the number prescribed on the label, I see no reason why it could not be retreated with a permethrin repellent consumer clothing treatment product in order for it to be used a repellent garment.

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