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The Residual Efficacy of Etofenprox WP on Different Surfaces for Malaria Control in the Brazilian Legal Amazon

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Abstract : Malaria is a public health problem in the Brazilian Legal Amazon. Among the integrated approaches for anopheline control, the Indoor Residual Spraying (IRS) remains one of the main tools in the basic strategy applied in the Amazonian States, where the National Malaria Control Program currently uses one of the insecticides from the pyrethroid class, the Etofenprox WP. Understanding the residual efficacy of insecticides on different surfaces is essential to determine the spray cycles, in order to maintain a rational use and to avoid product waste. The aim of this study was to evaluate the residual efficacy of Etofenprox - VECTRON ® 20 WP on surfaces of Unplastered Cement (UC) and Unpainted Wood (UW) on panels, in field, and in semi-field evaluation of Brazil's Amapa State. The evaluation criteria used was the cone bioassay test, following the World Health Organization (WHO) recommended method, using plastic cones and female mosquitos of Anopheles sp. The tests were carried out in laboratory panels, semi-field evaluation in a "test house" built in the Macapa municipality, and in the field in 20 houses, being ten houses per surface type (UC and UW), in an endemic malaria area in Mazagão's municipality. The residual efficacy was measured from March to September 2017, starting one day after the spraying, repeated monthly for a period of six months. The UW surface presented higher residual efficacy than the UC. In fact, the UW presented a residual efficacy of the insecticide throughout the period of this study with a mortality rate above 80% in the panels (□= 95%), in the "test house" (□= 86%) and in field houses (□ = 87%). On the UC surface it was observed a mortality decreased in all the tests performed, with a mortality rate of 45, 47 and 29% on panels, semi-field and in field, respectively; however, the residual efficacy ≥ 80% only occurred in the first evaluation after the 24-hour spraying bioassay in the "test house". Thus, only the UW surface meets the specifications of the World Health Organization Pesticide Evaluation Scheme (WHOPES) regarding the duration of effective action (three to six months). To sum up, the insecticide residual efficacy presented variability on the different surfaces where it was sprayed. Although the IRS with Etofenprox WP was efficient on UW surfaces, and it can be used in spraying cycles at 4-month intervals, it is important to consider the diversity of houses in the Brazilian Legal Amazon, in order to implement alternatives for vector control, including the evaluation of new products or different formulations types for insecticides.

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