A monitoring study confirming the safe use of DuPont Steward insecticide (a.s. indoxacarb) for natural bumblebee populations in flowering apple orchards and recommendations for the use of commercial bumble bee hives in flowering apple and pear orchards treated with Steward

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Abstract

In spring 2006 a monitoring field study was conducted to assess naturally occurring bumble bees in flowering apple orchards. Spread over the Netherlands, Belgium and Germany, 19 orchard sites were selected. The occurring pollinators (i.e. honey bees and bumble bee species) were determined during visual observations of 30 flowering trees per orchard, once before and after commercial treatment with Steward and in insecticide untreated orchards. Generally bumble bees were much less abundant than honey bees (about 1:10). No indications for decrease or disappearance of natural bumble bee populations due to Steward application in flowering orchards were found.

Commercial bumble bee hives (Biobest multi-hives) were set up in 20 apple and pear orchards in the Netherlands, Belgium and Germany in spring 2006. During the flowering period the bumble bee were exposed to commercial Steward applications in 18 orchards, while two were insecticide untreated. Three bumble bee hives per orchard were kept continuously open over the whole observation period or only for 4-day exposure/foraging period with exposure during the Steward application or with exposure starting 1, 2 or 3 days after the Steward application. Steward application caused on average 25% and 22% mortality of worker bumble bees in the colonies that were actively foraging during spraying and in the colonies that started foraging one day after Steward application, respectively. Mortality of worker bumble bees in the colonies opened two and three days after Steward application was statistically significantly lower. Colonies of all treatments developed from 50 to over 150-300 bumble bee workers during the study period and no effects on brood or the survival of queens were observed in any of the treatments.

Based on good agricultural practices, it is recommended to close commercial bumble bee hives during the day of Steward application and to keep the hives also closed the day after application to minimize acute worker bumble bee mortality.

Evaluation of side effects of commercial biological pesticides on the beneficial insect, *Bombus terrestris*

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Abstract

Nowadays cultivators are facing the problem that a percentage of their harvest is lost due to damage of pest insects or infections of plant pathogens. Meanwhile the use of pesticides is being limited because of environmental and residual risks and the development of resistance. Microbiological control agents (MCAs) are now widely used in integrated pest management (IPM) programs as an alternative for the conventional pesticides. MCAs include bacteria, yeast-like fungi, yeasts and viruses. In the field MCAs are dispersed in the crops by spraying applications. It is not unlikely that pollinators like bumblebees are exposed to these