

Novel approaches in monitoring effects of pesticide products

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Abstract A field experiment¹⁾ was conducted in Southwest France and Northern Italy to investigate potential impacts of azinphos-methyl (OP insecticide) applications in pome fruit orchards on the natural bird community. Methods employed included radio telemetry to track the fates of individual birds,

¹⁾ This study was performed in compliance with the current OECD Principles of Good Laboratory Practice (GLP), ENV/MC/Chem(98)17.

Introduction EU Directive 91/414/EEC requires an assessment of the effects of crop protection products on wild vertebrates. To refine the theoretical exposure of birds to azinphos-methyl in pome fruit orchards in Southern Europe, it is

Material and Methods The study was conducted in two typical pome fruit growing areas in Southern Europe, to the west of Montauban, in Southwest France and to the southeast of Verona in Northern Italy.

Radio tracking

A total of 66 birds were caught within the orchards and equipped with radio-tags. Radio-tracking made it possible to precisely monitor the fate of individual birds utilising pome fruit orchards before, during and after the application of azinphos-methyl.



Radio-tracking checks of individual birds were performed repeatedly throughout the daylight hours of days 0, 1 and once in the morning and in the evening of days -3 to -1 before treatment and days 2 to 7 after treatment.

Carcass search



Carcass searches were carried out within the orchards, including a strip of adjacent habitats of approx. 5m. These searches were performed on days 0 and 3 after treatment by a team of at least 4 staff members slowly walking between the tree lines and carefully searching for carcasses.

Results and Discussion In 69 out of 85 evaluated telemetry periods, survival of the tracked birds was proved until the end of the respective investigation period (7 days after the application). In the remaining 16 telemetry periods survival of the surveyed bird was proved at least until the bird left the area, lost its tag or died for reasons that were either obviously (two cases) or proved by later laboratory analysis (one case) not related to the test item.

None of the applied methods revealed any impacts on the survival of birds due to application of azinphos-methyl in pome fruit orchards.

visual observations of the bird community during and after the applications, carcass searches and nest monitoring. No effects were observed to result from applications of azinphos-methyl. The set of applied methods is considered a robust approach to assessing potential impacts on birds.

necessary to obtain actual figures of exposed bird species and potential impacts as ascertained by behavioural monitoring and exposure to contaminated food.

5 orchards were intensively monitored during 9 independent applications of Gusathion WP (25% w/w azinphos-methyl, 750 g a.s./ha) from three days before each application until seven days thereafter.

Bird survey



Systematic visual observations before, during and after the application aimed to detect any affected bird in and around the treated orchards and thus focused more on the entire bird community. Parameters such as ruffled plumage, abnormally low flight distance

or atypical motions of the head, wings or legs were used to estimate the health status of the observed birds. Bird surveys were conducted on days 0 (twice), 1, 4 and 7 after the application.

Nest survey

The whole orchard was searched for nests containing eggs or hatchlings some days before the application. The fate of each nest was monitored, particularly with regard to any sign of intoxication with the applied product, on days 0, 1, 3, and 7 after the application.



In view of the many seemingly unimpaired birds found over the investigation period, it is very unlikely that application of azinphos-methyl resulted in any undetected incidents.

The chosen set of methods addressed a wide range of possible impacts on the avian community in pome fruit orchards due to the application of azinphos-methyl. While systematic visual observations ('bird surveys') and carcass searches focused more on the entire bird community, telemetric studies and nest surveys monitored the fate of selected individuals or broods. This study design is therefore considered a suitable approach to assessing potential impacts of pesticides on birds.