Innolytics, LLC
The Humane Hatch Control Company

The Effects of OvoControl® P (nicarbazin) on Non-target Birds and Other Wildlife

The lowest acute toxicity reference value in the roughly 1,000 active ingredients approved as pesticides cited by Mineau, et.al (2001) is alpha-cypermethrin with a value of 9,654 mg/kg body weight ("bw")[1]. In comparison, the active ingredient in OvoControl, nicarbazin, has an acute toxicity reference value of >10,000 mg/kg bw and if included on the list would be the very last entry. Put in perspective, nicarbazin has an acute toxicity value equivalent to table sugar.

Requirements for a Contraceptive Effect in Birds

The essential and intended purpose of OvoControl is a contraceptive effect on targeted birds. It is important to understand that the effect can only be attained if, and only if,

a) the bait is consumed regularly and in a large enough quantity to achieve blood levels sufficient to accomplish contraception in any particular bird species[2], and,

b) the bait is consumed during the nesting season of the species in question.

While non-target contraceptive effects are possible, the design of the baiting system together with the requirements for delivery of the bait makes the likelihood of non-target effects remote.

Furthermore, there is no secondary toxicity resulting from the active ingredient, nicarbazin, since its two components, DNC and HDP, must be bound in order to have the contraceptive effect (see "*The Secondary Toxicity of Nicarbazin in Birds*"). Non-target effects can only result from direct ingestion of OvoControl. While it may be possible, for example, for a predator such as a falcon to consume undigested OvoControl in a dosed bird, it is very unlikely. And, when this requirement is combined with the other features described below, any effect from secondary toxicity is exceedingly remote.

To summarize, in addition to actually consuming the bait, a non-target bird must ingest the bait in an adequate quantity to achieve blood levels of the active ingredient for at least five consecutive days. Additionally, the non-target bird must consume the bait during its own nesting season. The combination of these requirements along with the design of the bait makes it extremely unlikely that non-target effects will occur, particularly since the bait will be fed on roof tops, a location where non-targets are typically not found.

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[1] Mineau, P., A. Baril, B.T. Collins , J. Duffe, G. Joerman, R. Luttik. 2001. *Reference values for comparing the acute toxicity of pesticides to birds.* Reviews of Environmental Contamination and Toxicology 170:13-74.)

[2] Avery, M., K. Keacher, and E. Tillman. *Nicarbazin bait reduces reproduction by pigeons* (*Columba livia*). 2008. Wildlife Research 35(1) 80-85.

OvoControl P Bait and Baiting System Design

OvoControl P and the prescribed baiting system have been designed to limit non-target exposure through the following means,

1. The bait is relatively large, suitable for a pigeon but not the average songbird. The bait has low oil content which is typically not attractive to songbirds which seek out higher energy dietary grains[3]. Smaller birds also prefer higher calorie and protein grains and insects, especially during their breeding season[4].

2. The bait is fed sparingly – 5gm/bird/day, or roughly 15% of the pigeon's daily dry matter intake – at the crack of dawn, in the general vicinity of the roosting birds (i.e., rooftops). Experience shows that once the pigeons are habituated to the bait, it is consumed in 3 to 5 minutes, leaving little opportunity or time for non-target feeding. See the following link for a video illustration – http://www.youtube.com/watch?v=FkDXDQuaETI

3. Pigeons are flocking birds and feed as a group. Feeders are placed on rooftops where the risk of non-target exposure is already limited. Typically, only other exotic birds are found on urban rooftops, i.e., starlings and English house sparrows[5]. Passerine activity occurs primarily at or below the tree canopy level.

4. Raptors will not consume bread based bait and there is no risk of secondary toxicity[6].

5. OvoControl has no effect on mammals, reptiles, insects or anything else that might consume some of the bait[7].

It is conceivable that a non-target bird or other animal receives a dose from time-to-time, although periodic observation by the applicator ensures that OvoControl is reaching the target instead of the non-target population. Furthermore, one dose does not constitute a contraceptive effect.

In summary, when used according to label directions, the risk to non-target birds and other animals is minimal. Even when used inappropriately, the contraceptive effect is completely reversible, and the bird returns to normal reproduction within 5 days after the bait is withdrawn.

Nicarbazin does not bio-accumulate in the animal or the environment[8]. Once in the environment, the compound binds to soil particles and does not translocate. Nicarbazin breaks down over time and does not accumulate[9].

For further information and details, please see the OvoControl website at www.ovocontrol.com.

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[3] Geis, Aelred D. "*Relative Attractiveness of Different Foods at Wild Bird Feeders*." Special Scientific Report No. 233, U.S. Dept. of Interior, Fish and Wildlife Service. 1980.
[4] Martin, Alexander C., Zim, Herbert S., and Nelson, Arnold L. 1951. ***American Wildlife & Plants: A Guide To Wildlife Food Habits*.** Dover Publications, Inc. New York. 500pp.
[5] Fenwick, G. American Bird Conservancy (ABC). Personal correspondence.
[6] ***"The Secondary Toxicity of Nicarbazin in Birds"***, Innolytics, LLC White Paper, 2006.
[7] EPA Fact Sheet, "Conditional Registration of Nicarbazin, 2005.
[8] "***The Absorption, Excretion and Environmental Fate of Nicarbazin,*** Innolytics, LLC White Paper. 2007.
[9] ***A greenhouse study to determine the rate of decline of soil incorporated narasin and ^{14}C nicarbazin singly and in combination***, Lilly Research Laboratories, 1984