Health Canada / Santé Canada

Pest Management Regulatory Agency / Agence de réglementation de la lutte antiparasitaire

December 21, 2021

Michelle Dickie
RM of Estevan No. 5
#1-322- 4th Street
Estevan, SK
S4A 0T8

Dear Michelle Dickie:

Re: Notice of Objection to Re-evaluation Decision RVD2020-06: Strychnine and Its Associated End-Use Products (Richardson's Ground Squirrels)
Submission Number: 2020-5575

Your notice of objection, filed under subsection 35(1) of the *Pest Control Products Act* (PCPA), regarding the re-evaluation decision for Strychnine and Its Associated End-Use Products (Richardson's Ground Squirrels) has now been reviewed and assessed in accordance with the PCPA and *Review Panel Regulations*.

Health Canada's Pest Management Regulatory Agency (PMRA) has taken all reasonable measures to ensure impartiality in assessing this Notice of Objection. The information submitted to support the objection was reviewed by the PMRA scientists, who were not involved in the re-evaluation of Strychnine. The issues raised in the notices of objection followed by the PMRA responses are in Attachment 1.

The information submitted in support of your objection does not raise scientifically-founded doubt as to the validity of the evaluations on which the decision was based nor would the advice of expert scientists assist in addressing the subject matter of the objection. Therefore, PMRA will not be establishing a review panel in respect to the objection that was submitted (see Attachment 1).

However, in evaluating one of the objections against cancellation that stated there was no species at risk killed in Proulx (2010) study, the PMRA determined there was evidence of risk to birds that are species at risk. As a result, scientifically-founded doubt has been raised regarding the current three-year phase out cancellation timeline and PMRA would benefit from the advice of an external expert panel. Therefore, the PMRA's decision is to establish a Science Review Panel to provide advice on the risk to the chestnut-collared longspurs, from the use of strychnine to control RGS. The re-evaluation decision to cancel the registration of strychnine to control

Richardson's Ground Squirrels will not be suspended while the Review Panel is established and conducting the review. A notice of the establishment of a review panel will be released to the public registry. The notice will be found in the *Pesticide Product Information Database* under Application Number 2021-6314.

Should you have any questions regarding this letter, please submit them to the Notice of Objection e-mail account (pmra.noo-ado.arla@hc-sc.gc.ca) and we will respond as soon as possible. Please quote your Submission Number in any correspondence regarding the Notice of Objection to the re-evaluation of Strychnine and Its Associated End-Use Products (Richardson's Ground Squirrels).

Sincerely,

Digitally signed by Bissonnette, Frederic
Date: 2021.12.21 09:35:42-05'00'

Frédéric Bissonnette
Chief Registrar
Pest Management Regulatory Agency

Attachment 1

Comment 1:
There is no harmful effect to the environment when applying strychnine in accordance to the label for the control of Richardson ground squirrel.

PMRA response:

The PMRA re-evaluated the use of strychnine to control Richardson's ground squirrels in PACR2005-08/REV2007-03 and PRVD2018-13/RVD2020-06. The risk assessment considered multiple lines of evidence, including:

- Available toxicity data;
- The results of field studies conducted over almost 20 years to study the effects of strychnine on non-target organisms;
- Canadian and American incident reports; and,
- Evidence showing a lack of uptake of integrated pest management (IPM) measures among farmers.

The risk assessment determined that the use of strychnine poses an unacceptable risk to the environment. No measures have been identified to mitigate the risks to non-target organisms, including species at risk. Scientific evidence to the contrary has not been provided in this Notice of Objection.

Comment 2:
The Saskatchewan Ministry of Agriculture, in collaboration with Alberta Ministry of Agriculture and Forestry personnel, in consultation with the Saskatchewan Ministry of Environment and the PMRA, developed a research study to evaluate the effects of strychnine use on RGS populations and non-target species. This study was cited in PMRA's recent decision document, although the conclusions reached by PMRA suggest a misinterpretation of the actual conclusions determined in the study.

The study's results indicate that the risks associated with label-approved use to non-target species were low. Despite large numbers of hawks, antelope, geese, badgers, coyotes and foxes in close proximity to the 12 study sites, only four deer mice were killed; these were found only on non-label-use experimental sites. Half of these mortalities were in the process of being buried by carrion beetles when found (sites were monitored daily) and would be unavailable to scavengers. Few of the RGS that died from strychnine were available on the soil surface. These results are consistent with those of two reports produced by the Government of Alberta that were provided to PMRA as part of the Saskatchewan Ministry of Agriculture's response. For RGS found on the soil surface, the bitterness of the compound apparently dissuaded scavenger feeding. Strychnine is very distasteful and because it kills quickly, is generally localized in the gut. Related published research indicated that predators and scavengers like raptors will eviscerate dead rodents and leave their digestive tract on the ground. This was also found in the submitted study. PMRA also expressed concerns about bait ejection. The majority of these events were found on the same

non-label-use experimental sites. We feel this is a mischaracterization of the results of this work.

PMRA response:

The study by the Saskatchewan Ministry of Agriculture (Tansey, 2019) was conducted over a four-day period at the end of April 2019. Tansey (2019) baited 225 burrows on nine 0.16 ha sites (1.44 ha total) in a region of Saskatchewan characterized by high Richardson's ground squirrel (RGS) populations in grassland and pasture systems; an additional three sites (0.48 ha total) were used as controls. Three 0.4% strychnine bait treatments were used (applied in the burrow at 30 cm depth and covered, applied in the burrow at 30 cm depth and uncovered, and applied 1 m deep in an uncovered burrow) as well as control sites without bait. Three replicates per treatment were used. Baits were applied to 25 burrows per site. Each site was equipped with camera traps. Visual counts of RGS, as well as non-target organisms, were conducted daily for a total of 40 minutes at each site. Searches for carcasses were conducted daily in the plots, a 10-metre perimeter around the plots as well as a line of sight search with binoculars.

Over the four test days, Tansey (2019) reports that there were 23 bait ejection events from the 225 treated burrows and 11 strychnine-poisoned RGS carcasses found above ground; an additional three RGS carcasses from treated sites were too damaged by predators/scavengers or degraded to determine the cause of death. There were no statistically significant differences between treatments for the number of RGS carcasses above ground or the number of bait ejections. While the only non-target organisms found dead were four deer mice, previous studies reviewed in PACR2005-08 (i.e., McKinnon *et al*., 2002; McKinnon and Mineau, 2004) have shown that the number of strychnine-poisoned carcasses is likely underestimated due to poor search efficiency and high scavenging rates. Two RGS carcasses in the Tansey study were too degraded/desiccated for necropsy, despite daily searches, indicating that low search efficiency may also have been a factor in this study. Tansey observed predation and scavenging of RGS carcasses on the treated sites; two carcasses from the treated sites were partially consumed and too damaged for necropsy. While poisoning of predators was not observed in the study, it was not properly designed to determine if adverse effects to these organisms occurred. Carcass searches were confined to the plots, 10 m around the plots, and a line-of-vision search with binoculars. Any organisms that did not die within the plots, or 10 m around them, would be very difficult to identify, particularly if they were small.

While the study author determined that the study showed low risk to non-target organisms, the objectors conclusion that this means that the use of strychnine to control RGS presents a low risk to non-target organisms is incorrect. The re-evaluation of strychnine was conducted using multiple lines of evidence and considered other Canadian field studies reviewed in PACR2008-08 and PRVD2018-13, including those carried out by the Governments of Alberta and Saskatchewan (Bourne *et al.*, 2001/2002; McKinnon *et al.*, 2001 and 2002; McKinnon and Mineau, 2004 and Proulx, 2010). Taken as a whole, these studies found that:

- Ejection of strychnine baits from ground squirrel burrows resulted in concentrated areas of strychnine on the surface, presenting a risk of non-target poisonings;
- Strychnine treatment resulted in ground squirrel carcasses on the surface available to scavengers; and,
- Treatment with strychnine baits led to direct and secondary poisoning of non-target organisms.

These studies were much larger than the Tansey (2019) study, in several cases baiting thousands of burrows.

The results of Tansey (2019) confirm the following results of the other Canadian field studies: treatment of ground squirrel burrows with strychnine results in the availability of treated baits and poisoned RGS carcasses on the ground surface and can also lead to the death of non-target organisms. In fact, Tansey (2019) found 4.2 strychnine-poisoned RGS carcasses/ha at the label use site (30 cm-deep, covered) which is consistent with the 1.56 to 6.8 carcasses/ha found in the field studies reviewed in PACR2005-08 (Bourne *et al.,* 2001); McKinnon *et al.*, 2002; McKinnon and Mineau, 2005). Tansey (2019) did not find any statistically significant effects in the number of RGS carcasses found on the surface or rate of bait ejections between treatments.

It is important to note that Tansey (2019) is a small study. Taking the result of "low risk to non-target animals" at face value, even without further evaluating the quality of the study, does not negate the weight of evidence from the other larger field studies, and from the other lines of evidence.

In regards to the palatability of strychnine and evisceration of carcasses, Tansey (2019) observed predators/scavengers feeding on RGS in the strychnine-treated plots. While some predators may eviscerate their prey prior to consuming them, this is not universal. James *et* al. (1990) observed 14 American crows, five black-billed magpies, two Swainson's hawks, two California gulls, and a northern harrier feeding on, or attempting to feed on, dead ground squirrels poisoned by strychnine. There is no mention that theses species attempted to eviscerate the ground squirrels. McKinnon *et al*. (2002) report that 34% of coyotes, 30% of ferruginous hawk and 45% of Swainson's hawks observed in several studies did not eviscerate ground squirrels prior to eating them. Proulx (2010) found a Northern harrier that had died of secondary strychnine poisoning with a dead mouse in its stomach containing strychnine grains. Furthermore, evisceration does not eliminate the potential for exposure to strychnine, as male RGS may store treated grain in their cheek pouches (McKinnon *et al.* (2002)).

Comment 3:
There is lack of proof of harm to the environment.

PMRA response:

According to the *Pest Control Products Act*, the registrant has the burden of persuading the Minister that the health and environmental risks of a pest control product are acceptable. The

risks of a pest control product are acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from exposure to, or use of, the product, taking into account its conditions or proposed conditions of registration. The registrant has not provided reasonable certainty that there will be no harm to the environment. Following a review of the available scientific information, the PMRA has determined that the use of strychnine poses an unacceptable risk to the environment.

Comment 4:
Controlling RGS remains a priority to protect crop and livestock production that the Canadian public relies on, not only as a food source, but also as a large contributor to Canada's Gross Domestic Product. Strychnine, when used as part of an integrated pest management program, remains the most effective product for the control of RGS with limited impacts on the environment and species-at-risk. There is currently no equivalent alternative to strychnine in safety or effectiveness.

PMRA Response:

Health Canada acknowledges the value of strychnine to agricultural users because it is easy to use, cost effective and kills RGS in a single feeding. There are several registered alternatives to strychnine available to users, and it is recognized that the alternatives have their limitations. However, the primary mandate of Health Canada is to prevent unacceptable risk to individuals and the environment from the use of pest control products. The *Pest Control Products Act* requires that pesticides have acceptable risk in order to stay in the market. After a scientific review of available information, Health Canada has concluded that the environmental risks associated with the use of strychnine to control RGS were not shown to be acceptable.

Comment 5:
The use of strychnine has been effective, which has had a positive effect on agricultural economic returns. The loss of this product is seen as eliminating all of the progress that has been made in reducing RGS populations and returning agricultural producers to a previous state, where the pest has a negative economic impact. Agriculture in the prairies contributes to the GDP; the loss of strychnine to address the RGS problem will cause economic losses.

PMRA Response:

Health Canada acknowledges the economic importance of Canadian agriculture and livestock production and recognizes the need for pest control products that are effective, but do not pose unacceptable risks to human health or the environment.

Comment 6:
The Saskatchewan Association of Rural Municipalities (SARM) has worked with the Saskatchewan Ministry of Agriculture (SMA) and Health Canada to minimize the potential impact of strychnine on unintended species by promoting integrated pest management and monitoring conditions of registration including how the product is applied, who can

purchase the product, and reporting requirements through the Saskatchewan RGS Stewardship Program (SRSP).

PMRA Response:

Application of strychnine for control of RGS is a restricted use with explicit guidelines provided on product labels pertaining to its sale and use. However, these restrictions have not eliminated negative effects on non-target organisms, including species-at-risk.