

Bee Kill Compensation Legislation – Discussion Meeting

August 14, 2014

Attendees:

Dr. Marla Spivak (UMN Bee Lab); Dr. Dennis vanEngelsdorp (University of Maryland Bee Lab); Kristy Allen (Beez Kneez); Dan Whitney (President of MN Honey Producers); Gary Reuter (UMN Bee Lab Scientist); and Jamison Scholer, John Peckham, Gregg Regimbal, Dr. Joe Zachmann, Doug Spanier (all MDA).

Meeting was facilitated by Joe Zachmann (see attached agenda)

Joe Zachmann opened with a welcome and meeting objectives (understanding written statute, defining “acute pesticide poisoning,” defining “fair market value,” and discussion of any additional information to be collected during investigations that could aid in a decision).

1. Doug Spanier (10:10 – 10:50)

Went line-by-line through the 2014 amendments to Minn. Stat. chapter 18B (attached) and pointed out the meaning of specific terms, the flow and logic of specific sections, potential inconsistencies, undefined terms, and specific actions/procedures that must be followed in implementing the law. Subsequent discussion on intent vs. written meaning followed and Doug explained how to proceed with statutory clauses that could be considered conflicting or inconsistent with other clauses.

2. Discussion of “acute pesticide poisoning” (10:50 – 12:00)

Issue document (attached) was briefly explained and then discussion over how to incorporate “pollinator deaths or illnesses” and “death of bees or loss of bee colonies” into a logical interpretation of “acute pesticide poisoning” ensued. The main discussion points were as follows:

- The Pollinator Protection: A Bee and Pesticide Handbook describes a pesticide bee kill as having >1,000 dead and/or twitching bees (e.g., those showing signs of neurotoxin exposure) in front of a hive in a single day. It was suggested that this description could be the foundation for defining an “acute pesticide poisoning” eligible for beekeeper compensation under the law.
- Experts suggested if no bees are dead outside the hive entrance there may still be an acute pesticide bee kill if the foraging force dies away from the hive. In these cases where a large numbers of bees cannot be quantified outside the hive entrance it would be necessary to revisit/check up on hives 30-45 days after the incident and reevaluate colony health. (If a hive loses its work force away from the hive, it may not appear to be an acute pesticide poisoning but could be considered a delayed acute pesticide poisoning. In this situation, younger bees will attempt to replace forager bees but, depending on the portion of foraging work force lost, could throw off hive dynamics enough that the hive is unable to recover. By waiting 30-45 days, the hive will have replaced much of its work force and a clearer determination of damage to the hive could be observed.)

- After considerable discussion it was determined that bee kills associated with the conditions described in bullet point 2 would not be eligible for compensation due to: the difficulty in establishing the number of bee deaths as a percentage of the hive/apiary population; the difficulty of attributing specific pesticide application events to bee deaths that can't be verified at the apiary; and the need to conduct a second hive assessment. There is also the possibility that between the first and second assessment, the bee keeper could engage in varying management styles to either mitigate the loss of bees, or even exaggerate the loss if compensation was a potential outcome, and these practices could not be accounted for and could affect interpretation of the first assessment collection of evidence. Therefore it was suggested that we still conduct hive assessments under bee kills associated with the conditions described in bullet point 2, but only for documentation and the potential for future procedural resolution via expert consultation.

Lunch (12:00 – 12:30)

3. Discussion of “fair market value” (12:30 – 1:50)

Issue document (attached) was briefly explained and then discussion was opened. The main discussion points were as follows:

- Because it was suggested that an “acute pesticide poisoning” eligible for beekeeper compensation only includes having >1,000 dead and/or twitching bees in front of a hive’s entrance and would be considered “a loss of bee hive,” the fair market value for individual bees was not evaluated.
- All discussions focused on a hive’s potential to vary in value and were based on the following four issues: colonies used in pollination services; colonies with queens used for breeding / queens obtained from special breeder lines; colonies currently in honey production; and colonies with reduced value based on disease, parasites, or hive size.
- Dennis vanEngelsdorp suggested that his research shows beekeepers agreed on three distinct hive values: post-harvest (fall), February (pre-pollination), and May (pre-build up/nectar collection).
- Marla Spivak suggested two time periods where hive values would be different: post-honey harvest colonies from fall through sometime in May would be considered “of less value,” while summer colonies would be considered “of more value.”
- There was considerable discussion on how one would be compensated for loss of honey produced.
 - Various reference values were mentioned (USDA Honey Report and National Honey Board)
 - Would hobby beekeepers be compensated more than commercial beekeepers due to selling their honey at retail vs. whole sale value?
- USDA Emergency Livestock Assistance Program (ELAP) provides beekeepers compensation for hives lost due to colony collapse disorder (CCD) or other natural disasters. USDA ELAP values are updated annually and the group agreed that the 2013 value of \$230 was, for 2013, a fair summer value.

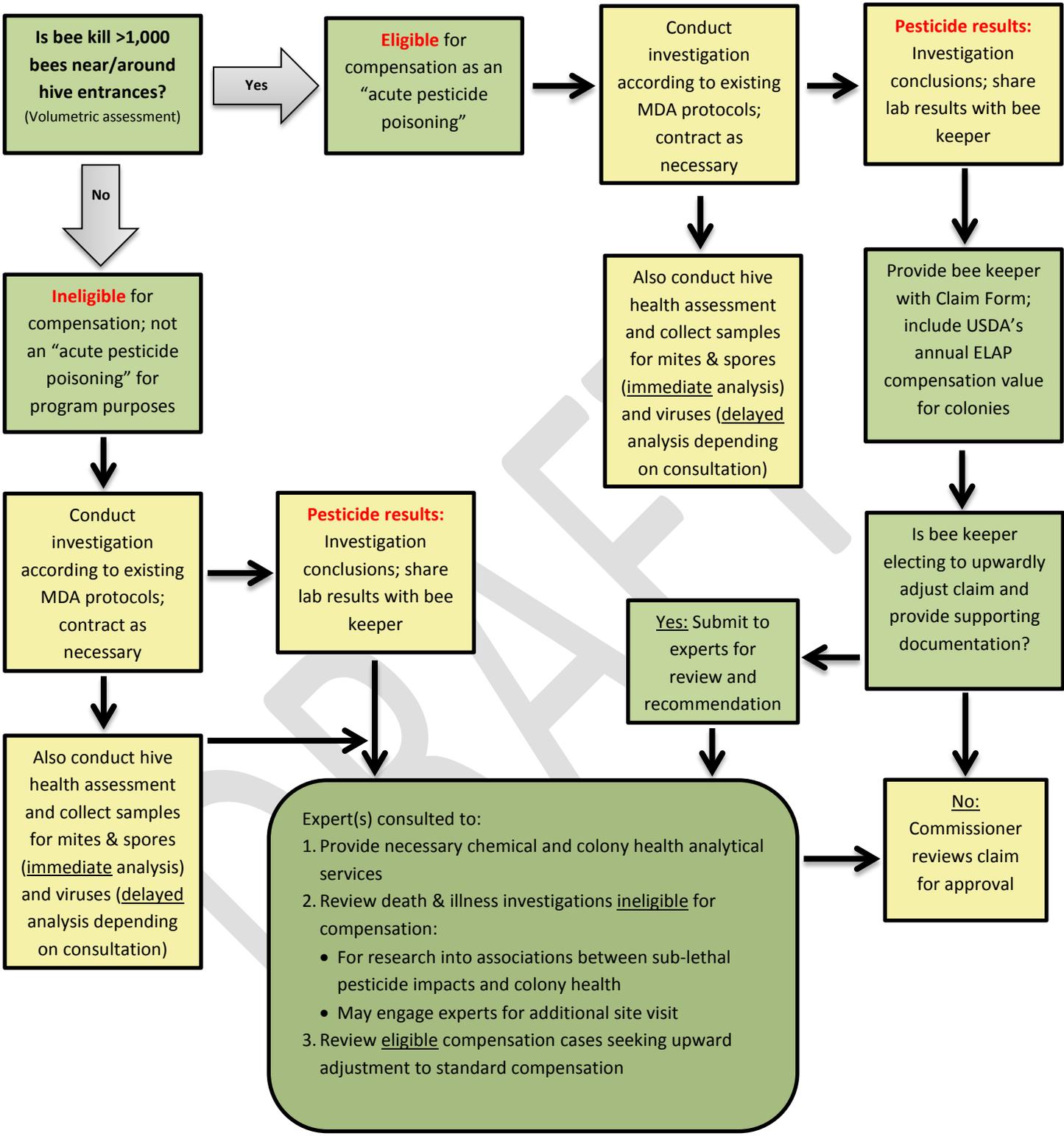
- It was suggested that USDA ELAP be called to clarify what criteria are taken into account when establishing the annual ELAP compensation payment. Based on the criteria taken into account to develop the ELAP payment, it may be possible to break down the ELAP payment on a frame-by-frame basis (brood and honey frames). This method would allow MDA to extrapolate to hives that are larger or smaller than the hives (and number of frames) considered by the USDA in establishing its payment.
 - Because in a limited number of cases \$230 may not be considered “fair market value” compensation – e.g., if a hive has a special breeder queen for which the beekeeper is paid more than is typical for a queen – the affected party will have the option to submit information to support their contention that they should be compensated for more than the ELAP payment based on the hive’s higher value. Such information would be reviewed on a case by case basis by experts and beekeepers.
 - The group also explored the idea that if the concentration of pesticide active ingredient in dead bees is quantified and compared to its respective acute contact or oral dose- response LD50 probit analysis, could the analysis be used to compensate a beekeeper based on a percentage of the USDA ELAP’s value? For example, using the working definition of an “acute pesticide poisoning” with >1,000 dead bees associated with a bee kill investigation, and assuming that 15.3 ppb clothianidin was found in a sample of dead bees, the probit of the acute dose-response curve suggests that such a concentration is associated with the death of 10% of the population. Could compensation then be based on only 10% of the USDA ELAP full hive compensation value? [This approach was ultimately discarded, as it was too complicated]
- At the end of these discussions the overall consensus was that an annual recommendation would be established by academic experts and beekeepers based on a review of the USDA ELAP value. This value would be the “baseline” value and form the foundation of the compensation program, and the annual recommendation would meet the intent of the statute for input from academic experts and beekeepers. For individual compensation claims that include information requesting an upward compensation adjustment from the baseline, the claim form and adjustment request can be evaluated on a case-by-case basis by the same academic experts and beekeepers that participate in establishing the annual recommendation. The annual ELAP hive compensation value will likely form the baseline for replacement cost, no downward adjustments will be considered.
 - It was discussed that a claim form for compensation could be filled out at the time of investigation/complaint, and that the beekeeper would be informed of the “baseline” compensation value per hive, and informed of the opportunity for upward adjustment based on unique circumstances. Should the claim form include a finite or example list of “eligible” adjustments, e.g., special breeder queens, larger-than-typical number of boxes/supers per hive, other? If so, which finite or example adjustments would the group suggest are eligible?
- 4. Discussion of additional information that might be collected during investigations (1:50 – 2:20)**
Issue document (attached) was distributed along with a datasheet outlining current information being collected at bee kills. The main discussion points were as follows:

- It was suggested that asking for an outline of the previous year's management plan (something most experienced beekeepers will be able to provide either in writing or verbally) would be helpful in teasing out management shifts that could have led to current hive issues.
- It was suggested that we incorporate the Bee Informed Partnership's management questions into our inspection/investigation interview. Including the question: When were colonies re-queened?
- It was suggested that, if possible, in cases of partially affected apiaries an affected and control sample be collected (as MDA has done in the past). In addition to these samples a separate control hive from a separate apiary should also be collected.
- It was also noted by the group that MDA pesticide bee kill investigation staff currently follow investigation protocols in a timely and professional manner, collecting bee samples and, as necessary, samples from hives, boxes, frames and the surrounding environment.
- It was noted that the MDA investigation staff are now accompanied by MDA graduate-level entomologists familiar with bees and bee keeping. Nevertheless, additional experience and training for both MDA investigation and entomology personnel would benefit the investigation of alleged pesticide bee kills. The group noted that MDA is appropriately seeking such training through the USDA-sponsored Bee Informed Partnership "Remote Tech Team" training classes.

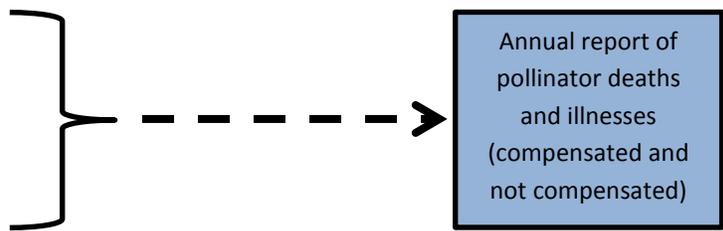
The meeting closed with a brief recap by attendees of interim messaging about program implementation. The basic interim messages are that "acute pesticide poisonings" will most likely be considered only those with large numbers of dead bees or bees exhibiting signs of neurotoxicity (typically > 1,000 in front of or surrounding an individual hive in an apiary) with associated pesticide or pesticide degradate residues known to be toxic to bees, irrespective of the acute contact or oral LD50 values associated with these pesticides. This method accounts for investigation delays, pesticide degradation or metabolism, climatic variables and other factors that may alter pesticide residue found in samples analyzed and ensures the beekeeper is not penalized for factors outside of their control. Cases of "acute pesticide poisoning" as defined above, will typically not need expert consultation other than potential chemical analytical assistance from qualified laboratories. Compensation will be aligned with the USDA's annual ELAP compensation value for colonies, with case-by-case upward adjustment in compensation considered based on information (e.g., receipts) provided by the beekeeper.

The MDA will develop a write-up of this meeting in order to communicate the outcomes to MDA management, the Commissioner's Office, and agency counsel. Attendees will receive a draft copy of the write-up to provide any edits, and subsequent interaction with attendees to further develop any necessary details will occur by email or conference call.

Alleged Pesticide Bee Kill Investigation Process as it Relates to Compensation



Legend	
	Existing MDA investigation protocols with no modification
	August 14 th Bee Kill Compensation program components established by Advisory Group of academic experts and bee keepers
	Annual report – Publicly available in late winter



MN Pollinator Law: *Expert Consultation on Pollinator Deaths/Illnesses and Bee Kill Compensation*

Date: Thursday, August 14, 2014 **Location:**
Time: 10:00 am – 2:30 pm
Facilitators: Joe Zachmann & Jamison Scholer **Address:**

- Meeting Objectives:**
- (1) Familiarize participants with the statutory language of 2014 pollinator law:
 - a. Expert consultation in the investigation of pollinator deaths or illnesses
 - b. Compensation for bees killed by pesticide
 - (2) Strive for common understanding of definitions and rational basis for statute implementation
 - (3) Outline next steps for statute implementation

- Bring To Meeting:**
- Parking map/instructions (including code for paystation)
 - Ideas, materials, references for establishing:
 - A definition of “acute pesticide poisoning” of bees and colonies
 - Guidelines for determining the “fair market value” of dead bees and colony losses
 - What kinds of colony health or other information might be collected during investigations of alleged pesticide bee kills

Topic	Presenter	Time Estimate
1. Welcome & Housekeeping	Joe Zachmann	10:00-10:05
2. Statutory Overview	Doug Spanier	10:05-10:50
3. Defining “acute pesticide poisoning” of bees and colonies	All	10:50-12:00
<i>30 minute lunch break</i>		
4. Guidelines for determining “fair market value” of bee losses	All	12:30-1:30
5. Collection of colony health and ancillary information	All	1:30-1:50
6. Attempt to summarize definitions and form a rational basis for statute implementation	All	1:50-2:10
7. Next steps for statute implementation	All	2:10-2:30

159.1 (d) After a fiscal year, the commissioner shall distribute the receipts credited to the
159.2 suspense account during that fiscal year as follows:

159.3 (1) the amount of the certified costs incurred by the state for forest management,
159.4 forest improvement, and road improvement during the fiscal year shall be transferred to
159.5 the forest management investment account established under section 89.039;

159.6 (2) the amount of costs incurred by the Legislative Permanent School Fund
159.7 Commission under section 127A.30, and by the school trust lands director under section
159.8 127A.353, shall be transferred to the general fund;

159.9 (3) the balance of the certified costs incurred by the state during the fiscal year
159.10 shall be transferred to the general fund; and

159.11 ~~(3)~~ (4) the balance of the receipts shall then be returned prorated to the trust funds in
159.12 proportion to their respective interests in the lands which produced the receipts.

159.13 Sec. 3. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
159.14 to read:

159.15 Subd. 1c. **Apiary.** "Apiary" means a place where a collection of one or more hives
159.16 or colonies of bees or the nuclei of bees are kept.

159.17 Sec. 4. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
159.18 to read:

159.19 Subd. 2a. **Bee.** "Bee" means any stage of the common honeybee, *Apis mellifera* (L).

159.20 Sec. 5. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
159.21 to read:

159.22 Subd. 2b. **Bee owner.** "Bee owner" means a person who owns an apiary.

159.23 Sec. 6. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
159.24 to read:

159.25 Subd. 4c. **Colony.** "Colony" means the aggregate of worker bees, drones, the queen,
159.26 and developing young bees living together as a family unit in a hive or other dwelling.

159.27 Sec. 7. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
159.28 to read:

159.29 Subd. 11a. **Hive.** "Hive" means a frame hive, box hive, box, barrel, log gum, skep,
159.30 or any other receptacle or container, natural or artificial, or any part of one, which is
159.31 used as domicile for bees.

160.1 Sec. 8. Minnesota Statutes 2012, section 18B.01, is amended by adding a subdivision
160.2 to read:

160.3 Subd. 20a. **Pollinator.** "Pollinator" means an insect that pollinates flowers.

160.4 Sec. 9. Minnesota Statutes 2012, section 18B.03, is amended by adding a subdivision
160.5 to read:

160.6 Subd. 4. **Pollinator enforcement.** The commissioner may take enforcement action
160.7 under chapter 18D for a violation of this chapter, or any rule adopted under this chapter,
160.8 that results in harm to pollinators, including but not limited to applying a pesticide in
160.9 a manner inconsistent with the pesticide product's label or labeling and resulting in
160.10 pollinator death or willfully applying pesticide in a manner inconsistent with the pesticide
160.11 product's label or labeling. The commissioner must deposit any penalty collected under
160.12 this subdivision in the pesticide regulatory account in section 18B.05.

160.13 Sec. 10. Minnesota Statutes 2012, section 18B.04, is amended to read:

160.14 **18B.04 PESTICIDE IMPACT ON ENVIRONMENT.**

160.15 (a) The commissioner shall:

160.16 (1) determine the impact of pesticides on the environment, including the impacts on
160.17 surface water and groundwater in this state;

160.18 (2) develop best management practices involving pesticide distribution, storage,
160.19 handling, use, and disposal; and

160.20 (3) cooperate with and assist other state agencies and local governments to protect
160.21 public health, pollinators, and the environment from harmful exposure to pesticides.

160.22 (b) The commissioner may assemble a group of experts under section 16C.10,
160.23 subdivision 2, to consult in the investigation of pollinator deaths or illnesses. The group
160.24 of experts may include representatives from local, state, and federal agencies; academia,
160.25 including the University of Minnesota; the state pollinator bank; or other professionals as
160.26 deemed necessary by the commissioner. The amount necessary for the purposes of this
160.27 paragraph, not to exceed \$100,000 per fiscal year, is appropriated from the pesticide
160.28 regulatory account in section 18B.05.

160.29 Sec. 11. **[18B.055] COMPENSATION FOR BEES KILLED BY PESTICIDE;**
160.30 **APPROPRIATION.**

160.31 Subdivision 1. **Compensation required.** (a) The commissioner of agriculture must
160.32 compensate a person for an acute pesticide poisoning resulting in the death of bees or loss
160.33 of bee colonies owned by the person, provided:

161.1 (1) the person who applied the pesticide cannot be determined;

161.2 (2) the person who applied the pesticide did so in a manner consistent with the
161.3 pesticide product's label or labeling; or

161.4 (3) the person who applied the pesticide did so in a manner inconsistent with the
161.5 pesticide product's label or labeling.

161.6 (b) Except as provided in this section, the bee owner is entitled to the fair market
161.7 value of the dead bees and bee colonies losses as determined by the commissioner upon
161.8 recommendation by academic experts and bee keepers. In any fiscal year, a bee owner
161.9 must not be compensated for a claim that is less than \$100 or compensated more than
161.10 \$20,000 for all eligible claims.

161.11 Subd. 2. **Applicator responsible.** In the event a person applies a pesticide in a
161.12 manner inconsistent with the pesticide product's label or labeling requirements as approved
161.13 by the commissioner and is determined to have caused the acute pesticide poisoning of bees,
161.14 resulting in death or loss of a bee colony kept for commercial purposes, then the person so
161.15 identified must bear the responsibility of restitution for the value of the bees to the owner.
161.16 In these cases the commissioner must not provide compensation as provided in this section.

161.17 Subd. 3. **Claim form.** The bee owner must file a claim on forms provided by the
161.18 commissioner and available on the Department of Agriculture's Web site.

161.19 Subd. 4. **Determination.** The commissioner must determine whether the death of
161.20 the bees or loss of bee colonies was caused by an acute pesticide poisoning, whether the
161.21 pesticide applicator can be determined, and whether the pesticide applicator applied the
161.22 pesticide product in a manner consistent with the pesticide product's label or labeling.

161.23 Subd. 5. **Payments; denial of compensation.** (a) If the commissioner determines
161.24 the bee death or loss of bee colony was caused by an acute pesticide poisoning and
161.25 either the pesticide applicator cannot be determined or the pesticide applicator applied
161.26 the pesticide product in a manner consistent with the pesticide product's label or labeling,
161.27 the commissioner may award compensation from the pesticide regulatory account. If the
161.28 pesticide applicator can be determined and the applicator applied the pesticide product
161.29 in a manner inconsistent with the product's label or labeling, the commissioner may
161.30 collect a penalty from the pesticide applicator sufficient to compensate the bee owner
161.31 for the fair market value of the dead bees and bee colonies losses, and must award the
161.32 money to the bee owner.

161.33 (b) If the commissioner denies compensation claimed by a bee owner under this
161.34 section, the commissioner must issue a written decision based upon the available evidence.
161.35 The decision must include specification of the facts upon which the decision is based and

162.1 the conclusions on the material issues of the claim. The commissioner must mail a copy
162.2 of the decision to the bee owner.

162.3 (c) A decision to deny compensation claimed under this section is not subject to the
162.4 contested case review procedures of chapter 14, but may be reviewed upon a trial de
162.5 novo in a court in the county where the loss occurred. The decision of the court may be
162.6 appealed as in other civil cases. Review in court may be obtained by filing a petition for
162.7 review with the administrator of the court within 60 days following receipt of a decision
162.8 under this section. Upon the filing of a petition, the administrator must mail a copy to the
162.9 commissioner and set a time for hearing within 90 days of the filing.

162.10 Subd. 6. **Deduction from payment.** The commissioner must reduce payments
162.11 made under this section by any compensation received by the bee owner for dead bees and
162.12 bee colonies losses as proceeds from an insurance policy or from another source.

162.13 Subd. 7. **Appropriation.** The amount necessary to pay claims under this section,
162.14 not to exceed \$150,000 per fiscal year, is appropriated from the pesticide regulatory
162.15 account in section 18B.05.

162.16 **EFFECTIVE DATE.** This section is effective July 1, 2014, and applies to bee kills
162.17 and bee colony losses attributable to acute pesticide poisoning that occur on or after
162.18 that date.

162.19 Sec. 12. Minnesota Statutes 2012, section 84.788, subdivision 2, is amended to read:

162.20 Subd. 2. **Exemptions.** Registration is not required for off-highway motorcycles:

162.21 (1) owned and used by the United States, an Indian tribal government, the state,
162.22 another state, or a political subdivision;

162.23 (2) registered in another state or country that have not been within this state for
162.24 more than 30 consecutive days; ~~or~~

162.25 (3) registered under chapter 168, when operated on forest roads to gain access to a
162.26 state forest campground;

162.27 (4) used exclusively in organized track racing events;

162.28 (5) operated on state or grant-in-aid trails by a nonresident possessing a nonresident
162.29 off-highway motorcycle state trail pass; or

162.30 (6) operated by a person participating in an event for which the commissioner has
162.31 issued a special use permit.

162.32 Sec. 13. **[84.7945] NONRESIDENT OFF-HIGHWAY MOTORCYCLE STATE**
162.33 **TRAIL PASS.**

August 14, 2014

Issue Establish definition of an “acute pesticide poisoning” and enumeration strategies for compensation

Example approaches to defining an “acute pesticide poisoning” of bees and/or bee colonies:

- **Sub-colony-level poisoning; significant additional MDA information gathering:**
A draft conservative approach to the challenge of identifying an "acute" kill:
 - Dead bees or affected colonies having residues linkable to nearby, non-beekeeper pesticide applications (legal or illegal; applicator known or unknown) could qualify for compensation. EPA toxicity testing and LD50 values are developed along a dose-response curve, suggesting acute effects along a population distribution of sensitive test subjects (probit analysis).
 - Counting dead bees near and away from the apiary is not practical. Kills could be estimated by MDA comparing frame/hive occupancy (%) between affected and unaffected hives at the same location, or by consulting the Bee Informed Partnership database for a baseline reference population in the geographical area, then estimating kill by difference.
 - Approach could benefit from MDA hive assessment and sample collection (Varroa, Nosema and/or viral load; presence of foul brood; etc.) to better inform compensation experts and beekeepers about the incident context.
 - **Sub-colony-level poisoning; moderate additional MDA information gathering:**
No MDA hive assessment; focus only pesticide residue analysis and dead bee enumeration.
 - **Sub-colony-level poisoning; little additional MDA information gathering:**
No MDA hive assessment or dead bee enumeration; only pesticide residue analysis. Estimation of bee deaths or colony losses (and therefore compensation) could rely solely on review of investigation case files (redacted for data privacy concerns) by consulted experts and beekeepers.
 - **Colony-level poisoning only:**
A kill could be considered “acute” only if some percentage of the foraging population of a colony dies due to documented non-beekeeper pesticide exposures that sufficiently weaken the colony’s ability to recover. Some considerations:
 - To determine the % dead foragers, is it still helpful to estimate colony baseline population and health in “typical” BIP reference hives for the time of year?
 - Other factors (e.g., colony disease or pest pressure) may contribute to deaths and/or the population level of the colony at the time of exposure.
 - **Both sub-colony-level and colony-level approaches:**
Compensation could be provided for both types of exposure scenarios, as is apparently provided for in the law.
1. What do you think of these approaches? What other approaches might be used?
 2. The MDA Commissioner is responsible for determining that bee/colony loss is due to an “acute pesticide poisoning.” What role can expert consultation play in that determination?

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Establish guidelines for determining the “fair market value” of bee deaths and/or colony losses

Example approach to determining individual bee compensation values:

- Replacement value based off new package (colony):¹
 - 3 lbs. honey bees = \$99.50
 - 9,000 – 12,000 bees / 3 lbs. (Range may vary depending on food consumption)
 - 9,950 cents / 9,000 honey bees = 1.106 cents / honey bee

Example approaches to determining bee colony compensation values:

- Ontario, Canada: 2014 rate of \$105 per colony for “losses likely caused by pesticides as well as other causes.”²
- USDA: 2014 rate of \$230 per colony for “the loss of honey bee colonies in excess of normal mortality” as a direct result of “an eligible adverse weather or loss condition, including but not limited to, colony collapse disorder (CCD) (colony loss only), earthquake, eligible winter storm (colony loss only), excessive wind, flood, hurricane, lightning, tornado, volcanic eruption and wildfire.”³

Note: The USDA value of \$230 is in-line with the estimated cost for a first year beekeeper of \$229 for a typical complete 4 box hive + package of bees,⁴ but note that this includes materials.

1. What do you think of these approaches?
2. What other approaches might be used for either per-bee or per-colony valuation?
3. Is it reasonable for MDA to provide annual per-bee and per-colony compensation values to “academic experts” and “bee keepers” to use in completing Claim Forms?
4. The statute requires recommendations from both “academic experts” and “bee keepers.” What if they submit significantly divergent values?

¹ Mann Lake 2014, Hackensack, Minnesota 56452, catalog list prices <http://www.mannlakeltd.com/>

² <http://www.agcanada.com/daily/ontario-preparing-bee-loss-compensation>

³ http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=pfs&newstype=prfactsheet&type=detail&item=pf_20140415_distr_en_elp_hony.html

⁴ <http://www.nebees.com/tipsandtricks.php>

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Establish what kinds of additional information might be collected during investigations of alleged pesticide bee kills

A “typical” bee kill incident involves MDA collection of dead and live bees, and sometimes samples of wax, pollen, surrounding soil, etc. following certain guidelines.¹ It’s possible that additional information could be collected to better inform determinations of “acute pesticide poisoning” to distinguish poisonings from other causes, and to inform related compensation.

- **Information to aid in diagnosis:** Hive inspection reports are often helpful in establishing baseline hive health prior to or at the time of alleged pesticide exposure.
 - In the absence of a recent hive inspection report at the site of the alleged bee kill, what sorts of information could be collected by the investigator(s)?
 - i. What critical screening observations could be collected to differentiate poisoning from disease, separate from sample collection for disease?
 - U.S. EPA’s On-Site Hive Inspection guidelines note non-pesticide factors that may result in bee deaths, and suggest “colony matrix” samples for diagnosis.
 - i. Is there a short list of recommended “colony matrix” or other samples that could be collected and held in reserve pending the outcome of pesticide residue analysis and expert consultation?
 - **Information to aid in enumeration for compensation:** Some information about the health or population of affected vs. unaffected hives could help in estimating the number of dead bees (bees found dead at the apiary as well as those that couldn’t return to the hive due to exposure) or the “value” of the colony losses given a hive’s pre-exposure health status.
 - How helpful would such information be?
 - Is there a minimum set of questions to ask and observations to make that would:
 - i. Provide consulted experts with helpful information to determine the relative contribution of pesticides to the bee or colony losses in order establish the “fair market value”?
 - ii. Provide experts and beekeepers with helpful information to make compensation recommendations?
 - Can the Bee Informed Partnership database be of use in situations where an entire apiary (single hive or several colonies) is affected by a poisoning?
1. What other information (e.g., climatic, historical, management) might be collected to aid in diagnosis or enumeration of dead bees or affected colonies?
 2. Any post-inspection process for sharing of information during an ongoing investigation will require protection of data according to MDA data privacy requirements. What different types of data are needed by experts consulted as part of the investigation vs. experts and bee keepers as part of making “fair market value” recommendations?

¹ **Guidance for Inspecting Alleged Cases of Pesticide-Related Bee Incidents, U.S. EPA, 35 pp., May 2013**
<http://www.epa.gov/compliance/resources/policies/monitoring/fifra/bee-inspection-guide.pdf>