



Proposed Designation of Imidacloprid, Clothianidin, and Thiamethoxam as “Surface Water Pesticides of Concern”

Response to Public Comments

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Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division

Minnesota Department of Agriculture

625 Robert St N

St. Paul, MN

55155

Please direct inquiries about this document to:

Rajinder (Raj) Mann

Rajinder.Mann@state.mn.us

651-201-6208

or

Kathleen (Kate) Hall

Kathleen.Hall@state.mn.us

651-201-6267

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The Minnesota Department of Agriculture (MDA) proposed to designate clothianidin, imidacloprid, and thiamethoxam as “surface water pesticides of concern” in February 2020 based on water quality data collected from 2010 through 2018. Since the initial proposal of these neonicotinoid insecticides as “surface water pesticides of concern”, the MDA has also reviewed and summarized the 2019 data.

Designation as a “surface water pesticide of concern” is a proactive step that results in the development and promotion of voluntary Best Management Practices (BMPs) to reduce the potential impacts to aquatic life while the pesticide(s) continues to be used. The state Pesticide Management Plan (PMP) states that the MDA should consider designating a pesticide as a “surface water pesticide of concern” if the pesticide exceeds 10-50% of a state standard or other appropriate reference value with consideration for trends, use and other relevant factors. The MDA also considers comments from members of the Pesticide Management Plan Committee (PMPC) which meets annually to review water quality monitoring data. Designation as a “surface water pesticide of concern” does not require the exceedance of a standard or reference value since the goal is to develop and promote protective BMPs to minimize or prevent exceedances of standards or reference values.

Proposing to designate imidacloprid, clothianidin and thiamethoxam as “surface water pesticides of concern” was in large part the result of lowered ALBs (Aquatic Life Benchmarks) for these insecticides published by the EPA in 2017. In response, the MDA collected additional samples in 2018 and 2019 and conducted additional assessments of the available data. Thiamethoxam is an active ingredient that partially degrades to clothianidin.

A notice was published in the Minnesota State Register on February 10, 2020 about the Commissioner’s preliminary decision to designate three neonicotinoid insecticides, clothianidin, imidacloprid, and thiamethoxam, as “surface water pesticides of concern” (44 SR 879). A total of 16 public comments were received. All comments were carefully reviewed and considered by the Commissioner of Agriculture in his final decision. The MDA has responded to relevant comments below. Comments with a common theme have been combined.

Comment #1

Commenter: Roots Return Heritage Farm

Comment Summary:

The commenter requested that the MDA not only designate the pesticides as “surface water pesticides of concern” but take it to the next level as we are in danger of losing our water for decades and generations to come. In addition, the commenter specifically stated that any use of these chemicals in karst regions should be prohibited.

MDA Response:

The MDA follows the [Minnesota Pesticide Management Plan \(PMP\)](#) to prevent contamination in groundwaters and surface waters of the state by pesticides or pesticide breakdown products. The PMP considers economic factors, availability, technical feasibility, implementability, effectiveness, and environmental effects, as well as the beneficial uses of pesticides in its

prevention efforts. Designation as a “surface water pesticide of concern” is a key aspect of the PMP which triggers preventative actions for specific pesticides but does not regulate their use.

The preliminary decision announced in the State Register on February 10, 2020 focused only on the designation of clothianidin, imidacloprid, and thiamethoxam as “surface water pesticides of concern,” not on the development of regulations; therefore, additional restrictions such as prohibiting use in karst regions are not being considered at this time. Furthermore, surface water detections of neonicotinoid insecticides are widespread throughout the state and not limited to karst regions.

Comment #2

Commenter: Roots Return Heritage Farm

Comment Summary:

The commenter stated that the MDA does not follow up on the state requirement to renew pesticide applicator licenses. The commenter suggested that the number of producers who apply neonicotinoid insecticides in the state should match the number of licenses applied for and tracked, but there are fewer licenses than producers.

MDA Response:

A person applying a restricted use pesticide (RUP), applying a pesticide on a commercial basis, or applying to a golf course must have a license to perform such activity. Because clothianidin, imidacloprid, and thiamethoxam are not RUPs, those who apply neonicotinoid insecticides in Minnesota are not necessarily required to have an applicator license. Therefore, the MDA would not expect the number of producers or users to match the number of applicator licenses. Furthermore, a license is not required to plant neonicotinoid treated seeds (pre-treated offsite). Additional information about pesticide applicator licensing can be found on the MDA’s website: <https://www.mda.state.mn.us/pesticide-fertilizer/pesticide-applicator-licensing>.

Comment #3

Commenter: Xerces Society for Invertebrate Conservation

Comment Summary:

The commenter stated that once clothianidin, imidacloprid, and thiamethoxam are designated, the MDA should design and implement strong best management practices to reduce surface water contamination. The commenter urged the MDA to address neonicotinoid contamination through strong best management practices and/or changes to product registrations to reduce the use of neonicotinoids throughout the state.

MDA Response:

The MDA follows the Minnesota PMP to prevent contamination in groundwaters and surface waters of the state by pesticides or pesticide breakdown products. Prevention activities include the development and implementation of best management practices (BMPs). The PMP states:

“A determination that a pesticide is a “surface water pesticide of concern” will initiate the development of preventative actions including voluntary pesticide-specific BMPs to protect surface waters from further contamination.” (p 65)

The MDA previously developed [BMPs for neonicotinoids](#) to protect pollinators as an outcome of the [Special Registration Review on Neonicotinoids](#). These BMPs address the use of all approved neonicotinoid chemicals including clothianidin, imidacloprid, and thiamethoxam. While directed towards pollinator protection, many of the promoted practices also serve to protect water quality (e.g., incorporate granular products in soil to minimize runoff). As stated in the announcement, these preexisting BMPs may be reformatted to directly address water quality.

Changes to product registrations are not being considered by the MDA in response to the consideration of these products as “surface water pesticides of concern”.

Comment #4

Commenters: Syngenta; Minnesota Crop Production Retailers; [Minnesota Farm Bureau Federation, Minnesota Soybean Growers Association, Minnesota AgriGrowth Council, Northern Plains Potato Growers Association, Minnesota Association of Wheat Growers, Red River Valley Sugarbeet Growers Association] - joint comment; Bayer; Minnesota Corn Growers Association

Comment Summary:

Commenters expressed concern regarding the MDA’s use of chronic versus acute aquatic life benchmarks (ALBs) in their review of the monitoring data. It is suggested that the MDA erred in its comparison of sample results to chronic standards without consideration of duration, and the MDA’s dismissal of the duration component of the ALBs resulted in conclusions that are not supported by sound science or good public policy.

While individual comments varied in their level of detail, the primary argument was that the MDA incorrectly compared single detections (maximum duration of 96 hours) to chronic ALBs which are based on longer exposure durations (~21 days). One commenter explained that, “A single surface water detection provides only a snapshot in time of the possible exposure level; it does not provide information on the chronic exposure concentrations and should therefore be compared to the acute aquatic life benchmarks and not to the chronic aquatic life benchmarks.”

MDA Response:

The MDA acknowledges that duration is an important component of ALBs and their use in evaluating monitoring data. To evaluate the water quality data relative to the ALBs, the MDA took a conservative approach towards protecting aquatic life. In its initial evaluation, the MDA compared measured concentrations of clothianidin, imidacloprid, and thiamethoxam to their

chronic invertebrate ALBs with the conservative assumption that concentrations may remain elevated and result in a chronic exposure to aquatic life. Focusing on acute exposures as suggested by the commenter likely under-estimates the risks to aquatic life because it does not include long-term (chronic) exposure that also occurs in the waterbody.

Single detections were compared to chronic ALBs to guide voluntary preventative actions and future monitoring efforts (via “surface water pesticide of concern” designation and related guidance in the PMP). Comparisons were not used to quantitatively evaluate the risk to aquatic life at specific sites nor to impose regulations. Furthermore, the screening of the monitoring data complied with the guidance provided in the Minnesota PMP. Designation as a “surface water pesticide of concern” is a proactive step to develop and promote voluntary BMPs to ensure the impact to aquatic life is reduced while the pesticide(s) continues to be used. Designation as a “surface water pesticide of concern” does not require the MDA to document specific exceedances of ALBs. The MDA also consulted the Minnesota Pollution Control (MPCA) and the EPA on use of chronic ALBs. The MPCA concurred with the MDA’s interim use of EPA ALBs to assess monitoring data.

In response to the comments received and to further inform the Commissioner’s decision, the MDA has since conducted additional analyses of the monitoring data with a greater emphasis on exposure duration. Since the initial proposal of these neonicotinoid insecticides as “surface water pesticides of concern”, the MDA has also assessed and summarized the 2019 data. The analysis indicated that numerous detections exceeded 10% or more of the ALB, which is the threshold for considering a pesticide as a “surface water pesticide of concern” in the PMP.

Detections of imidacloprid were found to be greater than the acute invertebrate ALB (385 ng/L) in two samples collected at two different locations and greater than 10% of the acute ALB in 14 additional samples collected from 11 different locations from 2010 to 2018 (1,975 total samples). The MDA estimated 53 imidacloprid 21-day average concentrations above the chronic ALB (10 ng/L) from 20 locations from 2010 to 2018. Measured concentrations for imidacloprid were found to be above the chronic ALB in 58 samples from 23 of the 30 monitored locations in 2019.

The MDA calculated that 44 clothianidin 21-day average concentrations exceeded the chronic ALB (50 ng/L) from 15 locations from 2010 to 2018. In addition, measured concentrations for clothianidin were found to be above the chronic ALB in 62 samples from 15 locations in 2019.

The MDA has not reported detections of thiamethoxam above 10% of its acute ALB (17,500 ng/L) or the chronic ALB (740 ng/L) in 1,974 samples from 266 locations collected from 2010 to 2018. The maximum estimated 21-day average thiamethoxam concentration from 2010 to 2018 was 26% of the chronic ALB.

Factoring in these additional analyses, the MDA concluded that the monitoring data continue to support the designation of both imidacloprid and clothianidin as “surface water pesticides of concern” but not the designation of thiamethoxam. See comment # 11 for additional information on thiamethoxam. Refer to [summary of MDA imidacloprid, clothianidin, and thiamethoxam water quality data collected from rivers and streams](#) for a detailed analysis of the data.

Comment #5

Commenter: Syngenta

Comment Summary:

The commenter compared the available monitoring data to ALBs for clothianidin and thiamethoxam and identified only one detection above 10% of the acute ALB for thiamethoxam and none for clothianidin. Based on these findings, the commenter concluded that there is no need or justification to designate clothianidin or thiamethoxam as “surface water pesticides of concern.”

MDA Response:

The Minnesota PMP defines a “surface water pesticide of concern” as a pesticide detected at concentrations of concern relative to a reference value; however, it is important to note that there is no single value or percentage of a reference value that results in the designation. Instead, preventative actions are considered at concentrations above 10-50% of a reference value. As noted in the response to Comment #4, concentrations were evaluated using both acute and chronic ALBs. The MDA agrees that comparisons to the acute ALBs alone do not justify designation; however, the MDA concluded that comparisons to chronic ALBs support the designation of clothianidin (see Comment #4 response). In addition, the MDA considered several additional factors including pesticide use patterns, sales trends, and spatial and temporal detection patterns to help guide the final decision. The pesticide use patterns and the sales data suggest that neonicotinoids continue to be used significantly in the state as seed treatments and foliar applications. The spatial and temporal detection patterns indicate continuous detections over the large areas of the state.

Comment #6

Commenters: Minnesota Crop Production Retailers; [Minnesota Farm Bureau Federation, Minnesota Soybean Growers Association, Minnesota AgriGrowth Council, Northern Plains Potato Growers Association, Minnesota Association of Wheat Growers, Red River Valley Sugarbeet Growers Association] - joint comment

Comment Summary:

Commenters found the following statement from the State Register announcement to be misleading:

“The Pesticide Management Planning Committee members provided comments to the Commissioner to designate these three neonicotinoids as “surface water pesticides of concern”.”

The commenters explain that, as written, the statement suggests the committee voted or reached consensus on the recommendation; however, the issue was only raised in comments from a few individual committee members.

MDA Response:

The statement is incorrectly quoted by the commenters and reads as follows in the State Register announcement:

*“The Pesticide Management Planning Committee members provided comments to the Commissioner to **consider** clothianidin, imidacloprid, and thiamethoxam, as “surface water pesticides of concern”.*

Further, the PMP indicates that comments from all members of the PMP will be considered individually by the Commissioner. There is no requirement for a vote or consensus of opinion from members of the PMP.

Comment #7

Commenters: Minnesota Crop Production Retailers; [Minnesota Farm Bureau Federation, Minnesota Soybean Growers Association, Minnesota AgriGrowth Council, Northern Plains Potato Growers Association, Minnesota Association of Wheat Growers, Red River Valley Sugarbeet Growers Association] - joint comment

Comment Summary:

The commenters expressed concern regarding the apparent rush to add pesticides to the “surface water pesticides of concern” designation when a process for removal from the designation has not yet been finalized or opened to public comment.

MDA Response:

The MDA does not currently have a formal process for removing a pesticide from the “surface water pesticide of concern” designation; however, this is not relevant to a discussion about adding new pesticides to the list of “surface water pesticides of concern”.

Comment #8

Commenter: Bayer

Comment Summary:

The commenter does not support the designation of imidacloprid as a “surface water pesticide of concern” stating that preliminary decision was lacking scientific validity with regard to the reference values used and the surface water monitoring data do not warrant concern for aquatic life.

With respect to reference values, the commenter proposed the use of an alternative ALB value of 1.01 µg ai/L for imidacloprid based on the results of a mesocosm study. The commenter argued that it is more representative of the risk to aquatic life and better suited to interpret the data than the EPA’s laboratory-based ALB which are not intended to indicate a level above which harm will occur. The commenter also suggested that the MDA should not compare the EPA’s chronic invertebrate ALB to the detection data, stating that all surface water detections from the USGS Water Quality portal clearly

demonstrate the pulsed nature of imidacloprid detections with exceedance of any reference value being short term, or acute, in nature. The commenter concluded that, “Surface water exceedances of the aquatic life benchmark alone should not cause concern and any potential for concern should further be diminished considering the studies that are the basis for the aquatic life benchmarks and inappropriate manner in which surface water detects are compared to these values.”

The commenter’s critique of the imidacloprid surface water monitoring data noted that the data lacked the spatial scale, frequency, duration, and magnitude of detections that warrant concern for aquatic invertebrate communities. In addition, the commenter suggested that imidacloprid detections were generally low with sporadic peaks followed by rapid dissipation and notes that the data showed no trends of increasing detection frequency or a higher percentage of reference values.

MDA Response:

The Minnesota PMP states that in the absence of surface water quality reference values from the Minnesota Pollution Control Agency (MPCA), reference values from the U.S. Environmental Protection Agency (EPA) will be considered. For imidacloprid, the MDA used the lowest published EPA chronic ALBs for aquatic invertebrates as a reference value in accordance with the guidance in the PMP.

According to the EPA’s Aquatic Life Benchmark website,

“Aquatic life benchmarks are estimates of the concentrations below which pesticides are not expected to represent a risk of concern for aquatic life” and “comparing a measured concentration of a pesticide in water with an aquatic life benchmark can be helpful in interpreting monitoring data.”

Based on the above description, exceedances of ALBs are a useful measure of when pesticide concentrations may be at or nearing concentrations of concern in surface waters. Therefore, EPA’s ALBs are considered suitable for screening monitoring data for potential designation as a “surface water pesticide of concern,”. The MDA does not develop standards or reference values, but only applies the values developed by the MPCA or MDH, or the US EPA.

The MDA considered spatial scale, frequency, duration, and magnitude of detections in its evaluation of imidacloprid surface water monitoring data and concluded that the data support the designation of imidacloprid as a “surface water pesticide of concern” based on the criteria listed in the PMP. The multiple detections above EPA ALBs are not consistent with the commenter’s claim that detections are generally low, nor does the monitoring data support the notion of sporadic peaks followed by rapid dissipation (addressed in previous paragraph).

The MDA would emphasize that goal of the “surface water pesticide of concern” designation in the PMP is to develop and promote voluntary BMPs to take action when 10 – 50% of a reference value is exceeded to minimize any potential future impacts before a standard is exceeded. The goal is to work voluntarily to prevent future exceedances of a standard or reference value from occurring.

Comment #9

Commenter: Bayer

Comment Summary:

The commenter found the following statement from the State Register announcement to be inaccurate and misleading:

““Every imidacloprid detection across Minnesota rivers and streams has been above the updated ALB [aquatic life benchmark] since 2010.”

The commenter argues that the statement is inaccurate for the following reasons:

1. Comparison of a chronic ALB to a single surface water detection concentration is not appropriate.
2. Only 7 samples (0.3%) exceeded the EPA acute ALB of 0.385 µg ai/L.
3. Only 1.6% of samples exceed 10% of the EPA acute ALB.
4. Only 5% of all surface water samples exceeded EPA chronic imidacloprid ALB (0.01 µg ai/L). It should also be mentioned that the reporting limits were above 0.01 µg ai/L for all but 2 samples, and therefore all detections would by default be above the new ALB, but it does not indicate a widespread occurrence that is implied by the statement.

MDA Response:

The MDA does not agree that the statement is inaccurate and misleading.

The announcement indicates that the ALB of 10 ng/L was used in the evaluation of imidacloprid detection data. All imidacloprid detections in Minnesota rivers and streams measured by the MDA from 2010 to 2018 were above 10 ng/L. Reasons cited by the commenter are addressed in comment # 4 and are not relevant to the accuracy of the original statement.

Comment #10

Commenter: Pesticide Action Network, North America

Comment Summary:

The commenter stated that the EPA's ALBs are likely still higher than they should be and do not account for the synergistic qualities of many pesticide chemistries.

MDA Response:

The PMP states that the source of surface water quality reference values in Minnesota is the MPCA. If a pesticide does not have an MPCA reference value, then reference values from the EPA will be considered. In accordance with the PMP, the MDA used EPA ALBs as reference values. As mentioned in comment # 8, the MDA does not develop standards or calculate risk values, including evaluating potential for synergistic effects, but only applies the values

developed by the MPCA or MDH, or the US EPA. The MDA seeks guidance from these agencies for potential risks for elevated concentrations including risks from synergistic effects.

Comment #11

Commenter: Roots Return Heritage Farm; Xerces Society for Invertebrate Conservation; Minnesota Pollution Control Agency; Pollinator Friendly Alliance; Kay Erickson; Amelia Kroeger; Margot Monson; Humming for Bees; Pesticide Action Network North America; Sandy and Tom Ahlstrom

Comment Summary:

Commenters supported the Commissioner's preliminary decision to designate clothianidin, imidacloprid, and thiamethoxam as "surface water pesticides of concern."

MDA Response:

The Commissioner, considering all submitted comments, has determined clothianidin and imidacloprid to be "surface water pesticides of concern"; however, thiamethoxam will not be designated at this time. Upon further review of the monitoring data, the MDA concluded that the limited thiamethoxam detections do not warrant designation as a "surface water pesticide of concern," particularly considering exposure duration. The preliminary decision noted that thiamethoxam can breakdown to form clothianidin. However, upon further review it was found that clothianidin is a minor degradate (<10% of applied dose) in the majority of available fate studies and has minimal impact on thiamethoxam concentrations. Therefore, breakdown of thiamethoxam to clothianidin is not considered to be adequate justification for "surface water pesticide of concern," designation for thiamethoxam. Monitoring of thiamethoxam will continue and the MDA will continue to review all pesticides detections each year to determine if designation as a "surface water pesticide of concern" may be warranted in future.