December 26, 2023

Office of Pesticide Programs
Environmental Protection Agency Docket Center (EPA/DC), (28221T)
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

RE: Registration Review Draft Biological Evaluation for Acetamiprid; Docket ID: EPA-HQ-OPP-2023-0513

The National Agricultural Aviation Association appreciates the opportunity to comment on EPA's registration review draft Endangered Species Act Biological Evaluation for acetamiprid. Docket ID: EPA-HQ-OPP-2023-0513

U.S. Aerial Application Industry Background: NAAA represents the interests of the 1,560 aerial application industry owner/operators and 2,028 non-operator agricultural pilots throughout the United States licensed as commercial applicators that use aircraft to enhance the production of food, fiber and bio-energy; protect forestry; protect waterways and ranchland from invasive species; and provide services to agencies and homeowner groups for the control of mosquitoes and other health-threatening pests. NAAA represents both crewed and uncrewed aircraft, however, the following comments dealing with the movement of applied products by air refers to manned aerial applications. Unmanned aircraft (UA) have not yet been sufficiently evaluated for efficacy and drift potential they may pose to the environment and people, including both bystanders and pesticide handlers. Field research comparable to the Spray Drift Task Force has not been conducted on UA, nor have UA been added to the AgDRIFT model EPA uses to assess the risk of drift from terrestrial, airblast and manned aerial applications. A detailed explanation of NAAA's position can be found in our letter sent to the EPA on the issue in January of 2020[1].

Within agriculture and other pest control situations, manned aerial application is an important method for applying pesticides, for it permits large areas to be covered rapidly—by far the fastest application method of crop inputs—when it matters most. It takes advantage, more than any other form of application, of the often too-brief periods of acceptable weather for spraying and allows timely treatment of pests while they are in critical developmental stages, often over terrain that is too wet or otherwise inaccessible for terrestrial applications. It also treats above the crop canopy, thereby not disrupting the crop and damaging it. Aerial application has greater

[1] NAAA letter to EPA, January 16, 2020.
https://www.agaviation.org//Files/Comments/UAS%20Letter%20to%20EPA%20re%20testing%20drones%20for%20efficacy%20and%20env%20safety%2020200117.pdf

productivity, accuracy, speed, and lack of damage to the crop compared to ground application[2]. Although the average aerial application company is comprised of but six employees and two aircraft, as an industry these small businesses treat nearly 127 million acres of U.S. cropland each season, which is about 28% of all cropland used for crop production in the U.S. In addition to the cropland acres, aerial applicators annually apply to 5.1 million acres of forest land, 7.9 million acres of pasture and rangeland, and 4.8 million acres for mosquito control and other public health concerns.

While there are alternatives to making aerial applications of pesticides, aerial application has several advantages. In addition to the speed and timeliness advantage aerial application has over other forms of application, there is also a yield difference. Driving a ground sprayer through a standing crop results in a significant yield loss. Research from Purdue University[3] found that yield loss from ground sprayer wheel tracks varied from 1.3% to 4.9% depending on boom width. While this study was conducted in soybeans, similar results could be expected in other crops as well. Data from a Texas A&M University economics study[4] and the 2019 NAAA industry survey[5] were used to calculate that the aerial application industry is directly responsible for the production of 1.69 billion bushels of corn, 199 million bushels of wheat, 548 million pounds of cotton, 295 million bushels of soybean, and 3.33 billion pounds of rice annually that would be lost every year without the aerial application of pesticides. The value in additional crop yield that the aerial application industry brings to farmers, input suppliers, processors, and agricultural transportation and storage industries for corn, wheat, cotton, soybean, and rice production in the U.S. is estimated to be about $37 billion[6].

Research summarized by the University of Minnesota[7] describes how soil compaction from ground rigs can negatively affect crop yields due to nitrogen loss, reduced potassium availability, inhibition of root respiration due to reduced soil aeration, decreased water infiltration and storage, and decreased root growth. Aerial application offers the only means of applying a crop protection product when the ground is wet and when time is crucial during a pest outbreak. A study on the application efficacy of fungicides on corn applied by ground, aerial, and chemigation applications[8] further demonstrates that aerial application exceeds ground and chemigation application methods in terms of yield response. The aerial application of crop protection products results in greater harvest yields of crops. This in turn results in less land being used for agricultural production, preserving more wetlands for natural water filtration, forest ecosystems for carbon sequestration and habitat for threatened and endangered species.

The Texas A&M[4] study revealed that the total area of cropland needed to replace the yield lost if aerial application was not available for corn, wheat, soybean, cotton, and rice production is 27.4

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[2] Kováčik, L., and A. Novák, 2020. "Comparison of Aerial Application vs. Ground Application." *Transportation Research Procedia* 44 (2020) 264–270.
[3] Hanna, S., S. Conley, J. Santini, and G. Shaner. 2007. "Managing Fungicide Applications in Soybean." Purdue University Extension Soybean Production Systems SPS-103-W. https://www.extension.purdue.edu/extmedia/sps/sps-103-w.pdf
[4] Dharmasena, S. 2020. "How Much is the Aerial Application Industry Worth in the United States?" Research presented at the 2020 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2020aatresearchpapers
[5] National Agricultural Aviation Association. May 2019. "2019 NAAA Aerial Application Industry Survey: Operators." https://www.agaviation.org//Files/Comments/NAAA%202019%20Operator%20Survey.pdf
[6] Dharmasena, S. 2021. "Value of the Agricultural Aerial Application Industry in the United States" Research presented at the 2021 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2021aatresearchpapers
[7] University of Minnesota. "Soil Compaction." Accessed April 29, 2021. https://extension.umn.edu/soil-management-and-health/soil-compaction
[8] Thomas, D. 2009. Unpublished research results submitted to EPA. https://www.agaviation.org//Files/Comments/Fungicide%20efficacy%20results.pdf

million acres, an area roughly the size of Tennessee. Aerial applicators seed 3.8 million acres of cover crops annually[5]. This means that aerial applicators are responsible for helping to sequester 1.9 million metric tons of CO2 equivalent annually, which according to the EPA would be the equivalent of removing approximately 412,000 cars with carbon-combustion engines from the roads each year.

The aerial application industry is also actively involved in education and research efforts to improve the accuracy and safety of aerial applications. The National Agricultural Aviation Research and Education Foundation (NAAREF) is a non-profit organization dedicated to promoting research, technology transfer and advanced education among aerial applicators, allied industries, government agencies and academic institutions. NAAREF's Professional Aerial Applicators' Support System (PAASS) program is a four-hour course offered annually at all state and regional agricultural aviation association conventions. The curriculum is brand new every year and a minimum of one hour of PAASS is focused on environmental professionalism. This ensures aerial applicators are kept up to date on the latest information related to making accurate applications and drift mitigation. Nozzle selection, buffer zones, inversions, precision application technology, dissection of real-life drift incidents, and proper spray boom setup are some of the environmental professionalism topics that have been covered in PAASS.

Five years after PAASS became part of the aerial application annual curriculum in 1999, there was a 26% drop in drift incidents according to Association of American Pest Control Officials drift surveys. In addition, ag aircraft accidents have also significantly declined. From 1999 to 2010, the accident rate per 100,000 hours flown dropped by 21.6% compared to pre-PAASS accident rates. From 2011 to 2019, the accident rate dropped even more—30.8%—compared to pre-PAASS accident rates. Each year we continue to see a drop in our accident rate since pre-PAASS days, but now it declines more incrementally. While aviation safety is the domain of the FAA and not the EPA, the reduction in accidents proves PAASS has had, and continues to have, a significant positive impact on the aerial application industry.

Another NAAREF program is Operation S.A.F.E. (Self-regulating Application & Flight Efficiency). The primary component of Operation S.A.F.E. is a fly-in clinic. At a S.A.F.E. fly-in, aerial applicators can have their aircraft calibrated and application patterns (both liquid and dry) measured and evaluated for accuracy and uniformity. Spray droplet size is also measured at a fly-in to ensure the agricultural aircraft is creating the droplet size required by the labels for products to be applied by the aircraft. Many of the concepts used mitigate the risk of drift from agricultural aircraft have originated from ideas first tested at Operation S.A.F.E. fly-ins.

Just this year, NAAA created a professional certification program for the aerial application industry named C-PAASS for Certified Professional Aerial Application Safety Steward. To be certified under C-PAASS aerial applicators must take the PAASS program annually and Operation S.A.F.E. biennially, in addition to belonging as a member to their state/regional agricultural aviation association and the NAAA. Next year, C-PAASS professionals will be required to take and be tested on additional aviation safety and environmental stewardship curriculum offered on-line through learning management system software NAAA installed. The purpose of C-PAASS is to enhance professionalism in the aerial application industry as our statistics show that those that participate in our educational programs are safer from both an aviation and environmental perspective.

<u>Comments</u>

NAAA encourages EPA to use the Tier 3 model in AgDRIFT instead of the Tier 1, as EPA has proposed doing in the draft technical paper accompanying the herbicide strategy. Drift from aerial applications is more accurately estimated by using the Tier 3 model as proposed in a letter sent from NAAA to the Office of Pesticide Programs in June of 2020[9]. A recent field study conducted at the University of Arkansas concluded the drift estimates from the Tier 1 model were "greatly over-predicting" the amount of drift physically measured in the field study[10].

As an example of the difference in modeled drift between Tier 1 and Tier 3 with NAAA's parameters, the fraction of material applied 200 feet downwind from the edge of the application area to a terrestrial area is 0.0456 with the Tier 1 AgDRIFT model. When the Tier 3 model with all the assumptions described in NAAA's letter to the EPA are used, the fraction of applied material downwind from application area to a terrestrial area is 0.0261, a reduction of 43 percent.

NAAA supports EPA's analysis of the impact using a medium droplet size has on reducing drift from aerial applications, as EPA indicated they did on page 29 of the biological evaluation for acetamiprid. However, simply using a larger droplet size in the Tier 1 AgDRIFT model does not eliminate the other inaccuracies associated with the Tier 1 model. For example, as previously mentioned the Tier 1 AgDRIFT model with the default fine to medium droplet size and using the terrestrial assessment, the fraction of applied materials estimated at 200 feet is 0.0456. If the droplet size is increased to medium to coarse, but still using all of the other erroneous assumptions from Tier 1 model, the fraction of applied materials at 200 feet is reduced to 0.0245.

If the Tier 3 model with all the assumptions described in NAAA's letter to the EPA (the exception being setting droplet size to medium to coarse for a direct comparison with the Tier 1 examples in the previous paragraph) is used, the fraction of applied materials is further reduced to 0.0186. This is a 59% reduction in possible drift compared to the Tier 1 model with fine to medium droplet size and a 24% reduction in possible drift compared to the Tier 1 model with the same medium to coarse droplet size. It is important to note when assessing the level of drift reduction achieved using the Tier 3 model, as was done for these examples, that wind speed in the Tier 3 model was set to 15 mph while the wind speed in the Tier 1 model was only at 10 mph.

Regarding the 150-foot spray drift buffer zones near aquatic areas, NAAA recommends EPA make these wind-directional. NAAA strongly feels all buffers proposed on all labels, whether they be for FIFRA or ESA obligations, be wind directional. Science has consistently indicated that drift only moves downwind[10,11,12]. NAAA has routinely recommended all buffer zones for aerial applications of all pesticides be wind directional in numerous comments submitted to the EPA throughout the years.

Wind-direction-based buffers zones will minimize impact to growers because these areas can

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[9] NAAA letter to EPA, June 29, 2020.
https://www.agaviation.org//Files/Comments/EPA%20letter%20re%20AgDRIFT%20Tier%203%20aerial%20risk%20assessment%20use%2020200629.pdf

[10] Butts, T.R., B.K. Fritz, K.B. Kouame, J.K. Norsworthy, L.T. Barber, W.J. Ross, G.M. Lorenz, B.C. Thrash, N.R. Bateman, J.J. Adamczyk. 2022. "Herbicide spray drift from ground and aerial applications: Implications for potential pollinator foraging sources." Scientific Reports (2022) 12:18017. https://doi.org/10.1038/s41598-022-22916-4

[11] Kirk, I.W., M.E. Teske, H.W. Thistle. 2002. "What About Upwind Buffer Zones for Aerial Applications?" *Journal of Agricultural Safety and Health* 8(3): 333-336.

[12] Teske, M.E., S.L. Bird, D.M. Esterly, S.L. Ray, S.G. Perry. 2003. "A User's Guide for AgDRIFT ® 2.0.07: A Tiered Approach for the Assessment of Spray Drift of Pesticides."
https://usermanual.wiki/Pdf/AgDriftusermanualpubFes2003.1946090729.pdf

still be treated by aerial applicators when the wind is blowing away from conservation areas. The buffers will also fully protect sensitive areas from spray drift because they will be implemented when the wind direction is towards the sensitive site. They provide a win-win solution that balances the needs for optimum agricultural production and protection of endangered species.

Wind directional buffers have been proposed in the ESA workplan update, vulnerable species pilot project, the herbicide strategy, and the proposed revisions to the Methomyl PID. Aerial applicators have the tools necessary to provide immediate and onsite wind direction measurement, so if wind direction does change during the application, they can respond immediately. Aerial applicators can monitor weather conditions in the cockpit and thus evaluate the need for a buffer zone in real time using a smoker or AIMMS. A smoker injects a small amount of vegetable oil into the aircraft exhaust system that creates smoke, allowing the pilot to determine, by observing smoke movement, the wind direction, and an estimate of wind speed. Inversions can also easily be detected by observing vertical smoke movement. The Aircraft Integrated Meteorological Measurement System (AIMMS) provides real-time onboard weather data, including wind speed and direction, temperature, and humidity. This enables the pilot to take into account outside wind speed and direction when making every pass.

Both smokers and AIMMS can also provide critical information on air stability and the presence of an inversion. The AIMMS probe can directly measure temperature. As an aerial applicator descends into the target field, they can determine if the temperature increases or decreases as they get closer to the ground. If the temperature cools as they descend, they know there's an inversion present. A smoker offers a visual indicator of an inversion. If the smoke rises as it spreads out, that is a sign of a normal temperature profile with the warmest air at the surface pushing the smoke upward. If the smoke hangs at the same altitude it was released, that's a sign that an inversion is present and vertical mixing of the air is minimal. Avoiding applications during an inversion is a critical drift mitigation.

At this time NAAA does not have specific data on how many acres receive aerial applications of acetamiprid, and thus cannot refute EPA's assertion that acetamiprid is not applied by air to soybeans. However, data from the 2019 NAAA industry survey[5] indicates aerial applicators treat 22.8 million acres of soybeans annually. While aerial applications of acetamiprid on soybeans might not be currently done, changing pest pressures and pesticide resistance may eventually result in a need for growers to utilize aerial application to apply acetamiprid to soybeans.

Conclusion

NAAA recommends EPA use the Tier 3 AgDRIFT model to estimate the spray drift deposition for aerial applications. NAAA also suggests all buffer zones be wind directional.

Thank you for this opportunity to comment.

Sincerely,

Andrew D. Moore
Chief Executive Officer