



September 9, 2024

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

RE: Draft Biological Opinions for Methomyl from The Fish and Wildlife Service; Docket ID: EPA-HQ-OPP-2024-0290

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to comment on the Fish and Wildlife Service’s draft biological opinions (BiOp) for methomyl.

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 rangeland from invasive species; and provide services to agencies and homeowner groups for the control of mosquitoes and other health-threatening pests.

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 productivity, accuracy, speed, and is unobtrusive to the crop compared to ground application¹. 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

¹ Kováčik, L., and A. Novák, 2020. “Comparison of Aerial Application vs. Ground Application.” *Transportation Research Procedia* 44 (2020) 264–270.

standing crop results in a significant yield loss. Research from Purdue University² 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 study³ and the 2019 NAAA industry survey⁴ 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 soybeans, 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 billion⁵.

Research summarized by the University of Minnesota⁶ 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 applications⁷ 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&M⁴ 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 million acres, an area roughly the size of Tennessee. Aerial applicators seed 3.8 million acres of cover crops annually⁵. 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

² 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>

³ 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>

⁴ National Agricultural Aviation Association. May 2019. "2019 NAAA Aerial Application Industry Survey: Operators." <https://www.agaviation.org/Files/Comments/NAAA%202019%20Operator%20Survey.pdf>

⁵ 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>

⁶ University of Minnesota. "Soil Compaction." Accessed April 29, 2021. <https://extension.umn.edu/soil-management-and-health/soil-compaction>

⁷ Thomas, D. 2009. Unpublished research results submitted to EPA.

<https://www.agaviation.org/Files/Comments/Fungicide%20efficacy%20results.pdf>

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 to mitigate the risk of drift from agricultural aircraft have originated from ideas first tested at Operation S.A.F.E. fly-ins.

Just last 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. C-PAASS professionals are also required to take and be tested on additional aviation safety and environmental stewardship curriculum offered on-line through a 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.

Comments

NAAA would like to point out the drift estimates for aerial applications used for the methomyl BiOp were all conducted using the Tier 1 model in AgDRIFT and are artificially inflated because of the inaccuracy of the Tier 1 AgDRIFT model. NAAA encourages EPA to use the Tier 3 model in AgDRIFT instead of the Tier 1 for all risk assessments. EPA OCSPP leadership has publicly stated they intend to update their atmospheric modeling, referencing NAAA's suggested use of Tier 3 of the AgDRIFT model. This was also confirmed in the Herbicide Strategy update. 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 2020⁸. 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 study⁹.

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 encourages EPA and FWS to use wind-directional buffers to protect listed species and critical habitat from potential drift. 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 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.

Aerial applicators are already experienced with using wind-directional buffers and are equipped with the technology needed to implement them to protect endangered species and other sensitive areas. Agricultural aircraft have smokers, an Aircraft Integrated Meteorological Measurement System (AIMMS), or both. These devices provide immediate and onsite wind direction measurement, so if wind speed or direction does change during the application, they can respond immediately. 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

⁸ 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>

⁹ 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>

¹⁰ 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.

¹¹ 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>

¹² 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>

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.

Regarding the potential prohibition of aerial application of methomyl in Hawaii, NAAA does not dispute that aerial applications of any kind are currently very uncommon in Hawaii. NAAA helped provide USDA OPMP with information on current aerial applications in Hawaii to assist with EPA's endangered species work specific to Hawaii. However, last week NAAA became aware of aerial applications being used on Kauai, and soon to be on Maui, to control mosquitos that are spreading avian malaria¹³. These applications have been occurring since last fall, but NAAA was unaware of them at the time information on aerial applications in Hawaii was being compiled. A naturally occurring bacterium is being applied by helicopter to protect near-extinct bird species.

Prior to these mosquito control applications, the most recent use of aerial applications in Hawaii that NAAA was able to determine was also to protect birds, specifically marine species whose nesting areas had been overrun with rats. NAAA would like to point out the irony of the EPA suggesting aerial application should be banned in Hawaii to protect endangered species when the only recent uses of aerial application in Hawaii are to protect endangered species.

NAAA cautions against a complete ban of aerial applications of methomyl or any other pesticide in a location or for a certain crop or use site solely because aerial application is not currently being used. The spread of exotic pests and the growing problem of pesticide resistance means that a future need for aerial applications may arise in areas it's not currently being used. Global warming will continue to have tremendous impacts on the spread of exotic pests, both those that impact agriculture and those that impact our natural resources.

NAAA generally opposes reducing application rates as this can result in less effective applications and hasten pesticide resistance. Specific reductions would need to be considered on an individual crop basis to ensure the applications can remain effective for controlling targeted pests. NAAA supports the use of temporal application restrictions provided they are clearly explained on EPA's endangered species bulletins and have been determined to not interfere with agricultural production.

For additional measures that can further minimize drift from aerial applications, NAAA suggests EPA and FWS consider boom length and droplet size. Decreasing boom length and increasing droplet size to reduce the risk of drift from aerial applications was documented in NAAA's June 2023 letter to EPA¹⁴. When the Tier 3 AgDRIFT model is run with NAAA's parameter settings (as described earlier) using a very coarse droplet size and a 65% boom length, the fraction of applied materials estimated at 200 feet downwind is 0.0049. This is an 89% reduction in drift compared to the inaccurate Tier 1 AgDRIFT model. The additional mitigations of an increased droplet size and reduced boom length, along with wind directional buffer zones, will be sufficient for protecting sensitive areas.

¹³ The Maui News. September 5, 2024. "Aerial war against bird-killing mosquitoes on Maui and Kaua'i". <https://www.mauinews.com/news/local-news/2024/09/aerial-war-against-bird-killing-mosquitoes-on-maui-and-kauai/>

¹⁴ NAAA letter to EPA, June 29, 2020. <https://www.agaviation.org/20230627-letter-to-epa-drift-mitigations/>

Conclusion

NAAA supports the use of wind-directional buffers to protect endangered species and critical habitat from potential drift of methomyl. NAAA encourages EPA to continue their efforts to move from the Tier 1 to the Tier 3 AgDRIFT model.

Thank you for this opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew D. Moore". The signature is written in a cursive style with a large initial "A" and "M".

Andrew D. Moore
Chief Executive Officer