October 16, 2024

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

RE: EPA's Proposed Interim Registration Review Decision for Mancozeb; Docket ID: EPA-HQ-OPP-2015-0291

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to comment on EPA's proposed interim registration review decision for mancozeb.

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.

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 application[1]. 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 University[2] 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[3] and the 2019 NAAA industry survey[4] 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 billion[5].

Research summarized by the University of Minnesota[6] 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[7] 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 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

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[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 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 fully supports the concept of using wind-directional buffers zones to protect aquatic habitat and conservation areas from spray drift. NAAA strongly urges EPA to make the spray drift buffer zone to protect residential areas wind directional as well. Wind directional buffers have also been proposed in the ESA workplan update, vulnerable species pilot project, the herbicide strategy, and the proposed revisions to the Methomyl PID. NAAA is unclear why wind-directional buffers would be acceptable for protecting conservation areas and aquatic habitats but not bystanders on this PID. 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[8,9,10]. 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 sensitive 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 sensitive areas.

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 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.

NAAA would like to point out the drift estimates for aerial applications used to determine the buffer zone distances for mancozeb 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. 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[11]. 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[12].

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[8] 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.
[9] 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
[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] 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
[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

NAAA strongly supports that the Ecological Mitigation Support Document to Support Endangered Species Strategies, recently released with EPA's Draft Insecticide Strategy, used Tier 3 of AgDRIFT to estimate the amount of drift from aerial applications. While EPA did not utilize all of NAAA's suggestions, the modernized assumptions EPA did use in the Tier 3 AgDRIFT model for the Insecticide Strategy are far more accurate than the Tier 1 model. NAAA will continue to work with EPA to provide data regarding updating the assumptions about surface roughness and boom drop. NAAA encourages EPA to reevaluate the required buffer distances for mancozeb using the Tier 3 AgDRIFT model with the same assumptions they used for the Insecticide Strategy.

NAAA supports the 10-foot release height for aerial applications, requiring a medium or coarser droplet spectrum, prohibition of spraying during an inversion, the boom length restrictions, and the upwind swath displacement. NAAA objects to the 10-mph wind speed limit for aerial applications of mancozeb. In some parts of the country, wind speeds can commonly exceed 10 mph during critical portions of the application season. Limiting application to wind speeds below 10 mph would have a negative impact on the ability to make timely applications. There are existing labels that allow application in wind speeds up to 15 mph. The list of these products includes but is not limited to Headline AMP, Baythroid XL, Folicur 3.6F, Graslan L, Warrior 2, Hero Insecticide, Belt SC, Belay Insecticide, Besiege Insecticide, and Flexstar GT.

Numerous recent registration review proposed interim decisions from the EPA have included proposed label statements that allow for aerial applications in wind speeds up to 15 mph. The proposed label requirement for working in wind speeds from 11 to 15 mph has been a boom length restriction of 65% of wingspan for fixed wing aircraft and 75% of rotor diameter for helicopters, as well as an increase to ¾ swath displacement when winds are 11 to 15 mph. These proposed interim decisions included those for clomazone, diflufenzopyr, prometryn, pyriproxyfen, emamectin benzoate, trifloxystrobin, pyroxsulam, thiencarbazone-methyl, acetamiprid, clothianidin, dinotefuran, imidacloprid, thiamethoxam, atrazine, propazine, 23 pyrethroids, and 9 ALS herbicides.

NAAA recommends the maximum allowed wind speed for aerial applications of mancozeb be 15 mph with the requirement that in wind speeds from 11 to 15 mph there is a boom length restriction of 65% of wingspan for fixed wing aircraft and 75% of rotor diameter for helicopters, as well as an increase to ¾ swath displacement for both application platforms.

When combined with the medium droplet size required for aerial applications, the potential for drift with these restrictions is less with a 15-mph wind than what EPA models using the tier 1 model in AgDRIFT. For example, when running the Tier 1 AgDRIFT model with the default fine to medium droplet size, wind speed of 10 mph, boom length set at 75% of wingspan, the standard 0.375 swath displacement, and using the terrestrial assessment, the fraction of applied materials at 200 feet is 0.0456. If the droplet size is increased to medium, wind speed is increased to 15, boom length is reduced to 65% of wingspan, and swath displacement is increased to 0.75, the fraction of applied materials at 200 feet is 0.0319, a 30% reduction in drift. It is important to note for this example 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.

NAAA supports the label requirements for the measurement of wind speed and direction. Using the National Weather Service definition of sustained wind speed to define the maximum allowed wind speed on the label will provide clarity for aerial applicators. NAAA agrees with the requirement to check both within 12 hours before and every 15 minutes during the application using an aircraft smoker or anemometer as well as that wind speed should be measured at release height.

NAAA supports the requirement for APF10 respirators for mixers and loaders when supporting aerial applications of all formulations of mancozeb and for all crop types. NAAA also supports the requirements for closed loading systems for the crops and formulations as proposed by EPA in the PID.

NAAA strongly objects to the proposed ban on aerial applications of wettable powder formulations of mancozeb to high acreage field crops. While there are other types of formulations of mancozeb available, many growers prefer to use wettable powders for economic reasons. Additionally, an issue encountered occasionally with some of the liquid formulations utilized at aerial application operations is that they don't stay in suspension in their containers. This makes the product difficult to use, particularly in bulk containers because it becomes hard to get the active ingredient out of the container once it has settled to the bottom. Even products intended to be used soon after arrival at an operation may have been sitting for an extended period of time at a storage facility before being purchased and shipped. This issue is not encountered with wettable powders because the spray solution is agitated as the wettable powders are added, with contiguous agitation in the aircraft hopper after mixing and loading.

NAAA recommends aerial applications of wettable powder mancozeb formulations be allowed on high acreage field crops with the requirement that all mixers and loaders wear double layer PPE, gloves, and an APF50 respirator. NAAA also recommends that each mixer and loader supporting aerial applications be restricted to mixing and loading wettable powder mancozeb formulations to a maximum of 600 acres per day.

Most aerial application operators, both single aircraft operators and larger operations with multiple aircraft, use agricultural aviation operations' software to coordinate all aspects of their operation. The software tracks, among numerous other parameters, the field location (coordinates for GPS), customer, crop, pests, products, use rates, acres, applicator, mixer/loaders, application date and time, GPA, EPA registration numbers, REI, required PPE, and weather. This software can track both the volume of product used and the acres applied for a specific product for both the applicator/pilot and mixer and loader. This means there is an established mechanism in place to ensure a mixer and loader supporting aerial applications can be pulled from working with wettable powder formulations of mancozeb once they've supported 600 acres in a day.

NAAA also opposes the proposed ban on aerial applications of mancozeb on sod. Aerial application offers the same benefits to sod as it does to other crops – a timely and effective application that can occur even when the ground is wet and terrestrial application equipment cannot be used. In the case of sod, it would be expected to be especially sensitive to ground applications when the soil is extremely wet, as sprayer wheels could easily create ruts and damage young grass.

While aerial applications of mancozeb on sod might not be very common, aerial application is used to apply pesticides, including fungicides, to sod. An aerial applicator queried for these comments indicated he routinely applies strobilurin and triazole fungicides to sod, but not mancozeb. Like other diseases, those that affect grass can develop resistance to existing fungicides. Mancozeb is very resilient against the development of resistance. If the EPA bans aerial applications of mancozeb to sod, and a disease develops resistance to other types of fungicide, sod growers have effectively been denied the ability to utilize aerial applications to treat grass diseases on their farms.

Conclusion

NAAA supports the use of wind-directional buffers to protect aquatic and conservation areas and encourages EPA to make the buffers adjacent to residential areas wind directional as well. NAAA opposes the proposed EPA ban of aerial applications of mancozeb on sod as well as the ban on aerial applications of wettable powder formulations of mancozeb on high acreage field crops. Instead of these bans, NAAA recommends EPA require maximum PPE and restrict the maximum daily acreage for mixing and loading the wettable powder formulations.

Thank you for this opportunity to comment.

Sincerely,

Andrew D. Moore
Chief Executive Officer