July 1, 2024

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

RE: EPA's Amended Proposed Interim Registration Review Decision for Captan; Docket ID: EPA-HQ-OPP-2013-0296

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

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 CO_2 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

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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

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 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.

<u>Comments</u>

NAAA supports proposed spray drift mitigation language for aerial applications of captan including the 10-foot release height for aerial applications, a 15-mph wind speed limit, requiring a medium or coarser droplet spectrum, prohibition of spraying during an inversion, the boom length restrictions, and the upwind swath displacements. The ability to make aerial applications in wind speeds up to 15 mph will ensure applications can get made in a timely manner, and the proposal to reduce the boom length and increase the swath displacement to mitigate drift when applying in winds between 11 and 15 mph is reasonable.

NAAA supports the new 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.

Aerial applicators are already practicing these requirements. 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 opposes the proposal to prohibit aerial applications of DF, WDG, and WP formulations of captan. While aerial applications of the liquid formulations would still be allowed, banning the dry formulations will present an unnecessary hardship to growers, as noted by University of California, Riverside in their comments on the 2022 PID. NAAA noted in comments on the 2022 PID that aerial applicators will receive dry formulations from growers if their supply of the liquid formulations has been exhausted.

EPA notes that aerial application of captan is limited, thus falsely concluding it is of limited value. While aerial application may not be the primary method growers utilize to apply captan, growers who normally use ground rigs for captan applications will not be able to get their sprayers in fields when they are wet. Nor can they spray when the winds are too high. It is under these situations that aerial application will become highly valuable to growers, who will require whatever formulation they have available to be applied quickly.

While aerial applicators are also restricted by wind speed, for any given period of time when the wind speed permits applications, aerial applicators can treat far more acres. Matthews et al.[8] notes that application timing is a key for Integrated Pest Management (IPM) and that aerial application has an advantage over ground application when and where large areas need to be treated quickly.

To compare the productivity between aerial application and ground rig application in a row crop agricultural setting, an aerial applicator and ground applicator from Mississippi were asked to

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[8] Matthews, G.A., R. Bateman, and P. Miller. 2014. *Pesticide Application Methods*. Fourth Edition. John Wiley & Sons, Ltd.

provide details about the productivity of their application equipment. The aircraft was an Air Tractor AT-502B with a 60-foot swath width and the ground rig was a John Deere R4030 with a 90-foot boom. In both cases a 12-hour day of spraying was assumed, which is appropriate for the height of the spraying season. During an average 12-hour day, the aircraft treats 1,800 acres while the ground rig treats 450 acres, meaning aerial application is roughly 4 times as productive as ground application in this region.

To highlight the timeliness of aerial application compared to an airblast sprayer, an example using a 40-acre block will be given. Assuming the 40 acres is square, it would have width and length both equal to 1,320 feet. The aircraft is assumed to make the applications at 150 mph with an effective swath width of 75 feet. It would therefore take 18 passes to treat the field. The time spraying in each pass would 6 seconds, with an estimated turning time of 45 second. This results in a total time of 51 seconds per pass, for a total time to treat the field of about 15 minutes.

For an air blast sprayer application, a speed of 2 mph is assumed based on a University of Georgia Extension Publication[9]. At this speed, a single pass down the field by the air blast sprayer will take 7.5 minutes. Row spacing is assumed to be 22 feet. This would require a total of 66 passes by the air blast sprayer to treat the 40-acre block. Not counting turning and refill time, it would take the air blast sprayer 7.5 hours or 30 times as long to treat what an aerial application could do in 15 minutes. The potential for strong variations in wind speed and the onset of stable atmospheric conditions increases dramatically with this increased application time.

This increased productivity of aerial applications also plays a key role in managing pesticide resistance. As more and more pests become resistant to existing pesticides, ensuring that applications of the remaining pesticides that still work for resistant will be crucial. All pesticides have a window when they are most effective on the targeted pest. Applications made after this window passes dramatically decreases the effectiveness of the pesticide, which can result in reduced yield and additional applications to attempt to control escaped pests. It can also speed up the development of resistance to additional types of pesticides.

Instead of banning aerial applications of the DF, WDG, and WP formulations of captan, NAAA again recommends a combination of full PPE, a PF50 respirator, and a maximum daily limit for each mixer/loader of 80 acres for supporting aerial applications of DF, WDG and WP formulations of captan. NAAA also suggests the maximum allowable rate of applying DF, WDG and WP formulations by aerial application be 2.4 lb a.i./A. In the amended PID, EPA indicates they are "now proposing limits on area treated for high benefits uses only where there is an existing mechanism in place to clearly document the amount of pesticide handled and applied." When a grower is faced with no other option to apply captan except aerial application, that should be considered a "high benefit".

In terms of a mechanism in place to document the amount of pesticide handled and applied, the vast majority of aerial application operators, both single aircraft operators and larger operations

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[9] Sumner, P. E. University of Georgia Extension Bulletin 979. Orchard Sprayers. https://extension.uga.edu/publications/detail.html?number=B979&title=Orchard%20Sprayers Accessed June 30, 2024.

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 and the acres applied for a specific product for both the applicator/pilot and mixer/loader, thus meeting EPA's requirement that a mechanism be in place.

Conclusion

NAAA supports the aerial drift mitigation label requirements in the amended PID for captan. NAAA opposes the ban on aerial applications of the DF, WDG and WP formulations of captan, and instead proposes a requirement for a PF50 respirator and a daily maximum of 80 acres for mixers/loaders supporting aerial applications.

Thank you for this opportunity to comment.

Sincerely,

Andrew D. Moore
Chief Executive Officer