July 16, 2016

Environmental Protection Agency, 28221 T
1200 Pennsylvania Ave, NW
Washington, DC 20460.

RE:  Docket ID No. EPA-HQ-OPP-2013-0266 Preliminary Ecological Risk Assessment of Atrazine

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to provide comments to the Environmental Protection Agency (EPA) on the draft ecological risk assessment of atrazine.

Our comments provide observations about how the U.S. agricultural aviation industry uses atrazine and highlight concerns we have with the ecological risk assessment for atrazine. In these comments we cite technical studies documenting the drift-reduction opportunities for aerial applicators provided by certain aircraft setup conditions, technologies and in-flight practices. We also characterize the adoption by our pilot members of spray-drift reduction planning, aircraft set-up methods and in-flight aircraft management best practices. We provide this information because we believe the EPA-enforced 66 and 200 foot buffers for atrazine will lead to more applications of herbicides to crops as this basically establishes a nursery serving as a source for subsequent infestations. We also highlight the importance of atrazine in modern agricultural crop production in our comments.

COMMENTS

Aerial application helps align spray-drift reduction and pest-control needs:  Aerial application is an important method for applying crop protection products, for it permits large areas to be covered rapidly when it matters most. It makes the most of often too-brief periods of acceptable weather for spraying and allows timely treatment of sensitive pests while crops are in critical developmental stages, often when fields are too wet or otherwise inaccessible for ground applications. The rapidity of aerial pest control helps producers and applicators become more selective among days for when pesticides can be applied, for they can choose periods of acceptable meteorological conditions (clement weather, nonturbulent winds) and thereby help limit spray drift while still obtaining the pest control needed for the developing crop. The result is effective pest control treatment by aircraft of millions of crop acres during critical developmental stages of crops and/or pests. As such it is an essential integrated pest management tool.

Data released by the USDA National Agricultural Statistics Service’s Census on Agriculture indicates that aerial applicators treat nearly a million farms and 71 million acres of cropland in the U.S. each year. NAAA estimates that approximately 18.75% of all crop protection product
applications made to U.S. commercial farms are made by air. If the average number of annual pesticide applications per farm is assumed to be six, we estimate that aerial applicators throughout the country make roughly 1.6 million farm applications per year, primarily on corn, wheat/barley, soybeans, pastures/rangelands, and alfalfa, but also on a number of other crops. The timeliness and efficiency of aerial application reduces pest control costs, fuel use, and total volume of pesticides needed. When evaluated over an entire season of pest control on U.S. farms, the enhanced alignment of these factors with favorable meteorological conditions likely contributes to the precision of these 1.6 million farm applications.

Aerial application is a mature, expert industry. The average pilot is over 50 years old, with nearly 25 years and 10,000 hours of agricultural aerial application experience, according to a 2012 industry survey conducted by SRA International. Mistakes are rare, as are spray-drift incidents. Their success is a combination of gained experience, proper planning and execution, modern equipment, and dogged pursuit of best management practices (BMP) and safety within the industry.

These BMPs include aircraft set-up to minimize drift, careful pre-flight planning, on-board technologies with demonstrated drift-reduction effectiveness, and in-flight decision-making in response to encountered conditions. NAAA believes the following industry practices should be part of EPA’s evaluation of spray-drift risk and calculation of buffer sizes.

Aerial applicators typically:

- Utilize large droplet size spectrums whenever possible through the careful selection of nozzles, deflection angle, boom pressure, planned airspeed, and other factors that are well known to determine droplet size. EPA’s default assumption in the proposed guidance is that applicators routinely use equipment that produces fine-medium spray patterns. This incorrect assumption is discussed further in Section 4 of these comments.
- Check weather conditions expected to be encountered at the job site to better anticipate temperature, relative humidity, wind speed and direction conditions, identify the possibility of a temperature inversion, and evaluate evaporative conditions likely to be encountered.
- Consider the volatility of the pesticide formulation to be used, and whether adjuvants and surfactants are included, which can affect droplet size and rate of evaporation. Prefight planning includes discussions with farmer-customers about the job-site characteristics, proximity to any sensitive areas and safety considerations, field boundaries and buffers, crop growth stage and canopy characteristics, and product use.
- Check nozzle alignment on the spray boom as part of preflight aircraft setup. An air strip with obstacles such as tall grass or even accidental movement by ground support crewmembers may potentially knock nozzles out of horizontal alignment, which changes nozzle performance. Tested across a range of airspeeds in fixed wing aircraft, a 15-degree nozzle misalignment was shown to reduce droplet size by 15% and significantly increases small, driftable droplets. This is caused by increased air shear on one side of

1 http://www.agaviation.org/content/naaa-releases-2012-aerial-application-survey
Participate in Operation S.A.F.E. (Self-Regulating Application and Flight Efficiency) fly-in clinics to evaluate their aircraft set-up, nozzle selection and calibration, boom adjustment, and application efficiency. Clinic analysts verify spray pattern, droplet size, and calibrate the aircraft performance. Many pilots are experienced in the use of USDA-ARS spray-nozzle models and AgDISP to assist in routine adjustments of their aircraft as part of pre-flight planning to minimize drift. USDA-ARS scientists and university extension specialists are readily available to assist in pilot efforts to determine effects on drift and deposition efficiency of potential aircraft setup changes. These models allow assessment of many variables that can affect drift, such as nozzle selection, spray pressure, nozzle angle, boom length versus wingspan, swath adjustment, adjuvants and tank mix variables, ground speed, release height, and other factors.

Participate in spray-drift reduction training. Each year nearly 100% of NAAA’s member pilots participate in the National Agricultural Aviation Research and Education Foundation’s Professional Aerial Applicators’ Support System (PAASS) program to improve their understanding of human factors and learn positive steps to limit spray drift and increase pilot safety. PAASS is offered in nearly every state where active aerial application activities are conducted. In addition, NAAA’s annual meeting agenda routinely includes technical sessions by academics, government experts, and consultants on drift-reduction planning and best practices.

Utilize new technologies as they are commercialized.

- On-board computerized meteorological technology: For example, there is growing interest among aerial applicators of on-board meteorological measurement technology. This technology generates a serial output stream of meteorological data, including wind speed and wind direction, aircraft motion, aircraft velocity and orientation. This information can be integrated with a variety of existing in-cockpit spray navigation systems to provide real time

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meteorological data. New developments in this market include integration of drift model calculations to add actual drift estimates and optimized swath offsets to the cockpit navigation display. As the cost of this technology comes down interest within the industry is growing.

- **Lowered spray boom and nozzles relative to trailing edge of wing:** Another example is the adoption within the industry of lowered boom and nozzle height relative to the trailing edge of the wing to reduce spray drift. This is a widely adopted aircraft set up, and in fact this configuration has been standard equipment on the Air Tractor 402, 502, 602 and 802 models for the past two decades.

Avoiding turbulence below the trailing edge of the wing reduces fine droplets and spray drift due to: (a) reduction in the wind shear droplets are exposed to; and (b) reduction in the fraction of fine droplets that become trapped in the wingtip vortices and the turbulent wake. Aircraft with lowered booms and nozzles produce less off-target deposition because released droplets have less interaction with aircraft turbulence, lower relative droplet span ratio \( \frac{(DV0.9 - DV 0.1)}{DV 0.5} \), and are less subject to production of fine particles and off-target drift.

Studies by Hoffman and Tom\(^3\) demonstrated that lowering the spray boom 1.5 feet relative to the trailing edge of the wing reduced off-target deposition by 25.9% and 55.9% at 10 m and 310 m, respectively.

Unfortunately, AgDRIFT —EPA’s model used to determine off-target aerial drift— was developed using older aircraft (Air Tractor 401) not equipped with a dropped boom and nozzles, and the Tier I default conditions proposed in EPA’s guidance do not incorporate considerations of this well-established aerial application set up. AgDRIFT defaults to a relative span of 1.374 in the fine to

medium droplet spectrum, resulting in the prediction that 16.37% of the fraction applied is off target at 50 feet downwind from the application edge.

When the boom height is lowered and all other factors held constant, the nozzle relative span drops to 0.8713. When this is used as an input to AgDRIFT, the model predicts that only 1.53% of the fraction applied is off target at 50 feet.\(^4\)

NAAA urges EPA to modify its guidance for risk assessment methods to consider the best management practices (BMPs), aforementioned, commonly used by this industry.

NAAA and consulting scientists are convinced that, were EPA to instead predicate its risk assessment and buffer determinations on the use of more appropriate and effective practices (Tier II and Tier III parameters of AgDRIFT), the resulting spray-drift reduction would warrant much smaller buffer sizes, including no buffers in many circumstances. NAAA urges EPA and registrants to incorporate in product labels the flexibility to use the following drift-reducing parameters depending on specific conditions on a particular day at a particular site so as to minimize required edge of field buffers:

- **Apply large spray droplets:** The Tier I assumption of *fine to medium droplet size*, while correct for some applications and some pesticide products, is generally incorrect. Aerial applicators routinely set up and manage their aircraft in-flight to produce larger droplet spectrums. This is accomplished via nozzle and orifice selection, orientation of nozzles on the boom, nozzle angle relative to air shear, sprayer pressure, airspeed, and surface tension of the spray solution combinations.

  Many new nozzles have been developed to produce larger droplet size distributions and smaller relative span. Their performance is well characterized in empirical data and models, and numerous nozzle options are available as Tier III inputs in AgDRIFT. NAAA urges EPA and registrants to permit aerial applicators to incorporate in product labels the drift reduction opportunities provided by aircraft setup and management that results in coarse spray droplets.

- **Using GPS technology to accurately map aerial applications:** On-board GPS equipment precisely locates the aircraft relative to field boundaries and potential adjacent sensitive areas. It also records the exact coordinates of each application pass so pilots may spray a field in sections if they choose to avoid changes in wind conditions. Pilots may return to the field at different times during the day to cover the site completely under desirable wind conditions, relying on the aircraft’s GPS to precisely locate the previous passes. A 2012 industry survey determined that GPS was employed by 99% of respondents.

- **Determination of wind effects on aerial applications:** Pilots use “smoker” technology to very accurately determine current wind-direction, wind speed, atmospheric stability, and swath displacement. Pilots quickly gauge meteorological conditions and the risk of drift at any

\(^4\) Reabe, D. 2014. AgDRIFT Tier III calculations using actual data as Tier III inputs: Air Tractor 502B with lowered boom, VMD of 342, relative span of 0.8713 from 2012 WRK patter testing, 65% effective boom length, 72 foot swath, and 16 flight lines.
time during the application by creating highly visible indicator smoke trails, produced from liquid paraffin wax dispelled onto the plane’s hot exhaust manifold. As the wax burns off it creates white streams that clearly indicate current wind direction, speed, vertical mixing and swath displacement at the application site. Smoker technology is an invaluable aid to aerial application, and contributes to effective reduction of spray drift. A 2012 industry survey determined that “smoker” technology is used by 85% of respondents.

Pilots can leave a highly-visible smoke trail on alternating passes across the field, near a field border, or whenever they wish to gauge wind direction, wind speed and turbulence, and swath displacement.

- **Shorten boom length near field borders:** Tier I assumes a boom length of 76.3% of the wing length, although studies have shown that effective boom lengths can vary from 80% down to 50% of wingspan. In practice, installation of shut off valves to selectively cut off specific groups of nozzles and shorten the boom is an effective tool for maneuverability and spray-drift reduction.

  There are several ways that a shortened spray boom can dramatically reduce drift, including cutting off the boom nozzles on each boom end to reduce the amount of fines trapped in the wing tip vortices.

  Another technique is to shut off the nozzles on the right boom (from the pilot’s perspective) enabling the prop wash’s air movement to create a “fence” at the point of shutoff to prevent droplets from moving to the right of the shutoff point. Applications with half of the boom shut off may take longer, but are especially effective near field edges when a sharp edge to the application is needed to limit off-target deposition, as seen in the photograph below. Actual deposition data using this technique can be seen in the next two graphs.

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Some aircraft engines turn to the left instead of right (e.g., a few Honeywell engines). For such aircraft, the pilot would shut off the left boom to achieve the same result.
Aircraft operating with half-boom nozzles shut off
Actual field data: Deposition pattern made by aircraft flying away from viewer, center of aircraft at center of chart (75 on x axis), right boom off, wind direction from right of chart to left at 3-6 mph. Note that there is no deposition outside the boom shut-off point created in one pass with half boom spray. Water and dye deposition determined with WRK String Analysis at NAAA fly-in clinic, June 3, 2011, Astoria, IL.
Actual field data: Deposition patterns created by two adjacent passes in 9 mph cross wind, blowing from the right of chart to the left. The right half of the deposition pattern was created as the aircraft flew away from viewer with only right half of boom spraying (left boom shut off). Center of aircraft was at chart location 75 on the x axis. The left half of the deposition pattern was created from the next pass of the aircraft that occurred toward viewer with only the left half of the boom spraying (right boom half shut off). Center of aircraft was at chart location 39 on the x axis. Note that there is minimal deposition outside the effective swath created by two adjacent passes with half boom sprays. Water and dye deposition determined with WRK String Analysis at WAAA fly-in clinic, April 29, 2013, Baraboo, WI.

- Reduce airspeed near field borders: The guidance is silent on airspeed in the Tier I assessments, although studies have demonstrated the role of airspeed in fine particle production and spray drift. These have concluded that reducing airspeed lowers the risk of off-target spray drift.

Empirical research has shown that two or three lower-speed passes near the edge of the spray field result in from a 6% reduction to over 10% reduction in off-target movement.  


Calculations with USDA-ARS Aerial Spray Nozzle Model clearly demonstrate the effect of airspeed on droplet size distribution.

**Impact of Airspeed on Droplet Size Distribution**

40-Degree Flat Fan 4020 Nozzle, All at 8° Nozzle Angle, 40 psi, Fixed-wing Aircraft

<table>
<thead>
<tr>
<th>Airspeed (mph)</th>
<th>% Spray Volume &lt;100 µm</th>
<th>% Spray Volume &lt;200 µm</th>
<th>Dv0.1 Droplet Size</th>
<th>DSCv0.1 Droplet Spectra Classification</th>
<th>ASABE DSC Droplet Spectra Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 mph</td>
<td>0.01%</td>
<td>0.42%</td>
<td>291 µm</td>
<td>Very Coarse</td>
<td>Coarse</td>
</tr>
<tr>
<td>110 mph</td>
<td>0.01%</td>
<td>0.87%</td>
<td>273 µm</td>
<td>Very Coarse</td>
<td>Coarse</td>
</tr>
<tr>
<td>120 mph</td>
<td>0.01%</td>
<td>2.00%</td>
<td>256 µm</td>
<td>Very Coarse</td>
<td>Medium</td>
</tr>
<tr>
<td>130 mph</td>
<td>0.01%</td>
<td>3.81%</td>
<td>239 µm</td>
<td>Coarse</td>
<td>Medium</td>
</tr>
<tr>
<td>140 mph</td>
<td>0.01%</td>
<td>6.29%</td>
<td>222 µm</td>
<td>Coarse</td>
<td>Medium</td>
</tr>
<tr>
<td>150 mph</td>
<td>0.45%</td>
<td>9.44%</td>
<td>205 µm</td>
<td>Coarse</td>
<td>Medium</td>
</tr>
<tr>
<td>160 mph</td>
<td>1.20%</td>
<td>13.27%</td>
<td>188 µm</td>
<td>Coarse</td>
<td>Fine</td>
</tr>
</tbody>
</table>

- Select low nozzle deflection angle: Shear and droplet size is influenced significantly by the nozzle orientation angle on the boom -- nozzles set at 0°, 45°, or 90°, or any angle in between, relative to aircraft flight direction. Remarkably, Tier I conditions are silent on this important factor. Greatest shear typically occurs when nozzles are oriented at 90° (straight down), perpendicular to aircraft flight direction. This typically reduces droplet size and increases risk of spray drift. Lowest shear typically occurs when nozzles are oriented at 0° (straight back), fully aligned with the aircraft flight direction.

Technology exists to change nozzle angle in flight. Rotating boom assemblies allow the pilot to adjust nozzle angles from the cockpit and adjust in-flight to suit changing conditions. Pilots can manually change boom angle or program a cockpit computer for the desired droplet size and nozzle tip size and let the computer automatically select the nozzle angle for the required droplet size. To maintain the constant droplet size the nozzle angle will adjust as the aircraft changes speed.

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*Brethauer, S. 2014. Univ. IL. Calculated with USDA-ARS Aerial Spray Nozzle models.*
Impact of Nozzle Angle on Droplet Size Distribution

40-Degree Flat Fan 4020 Nozzle, 40 psi, all at 140 mph, Fixed-wing Aircraft

<table>
<thead>
<tr>
<th>Nozzle Angle Relative to Aircraft Travel</th>
<th>% Spray Volume &lt;100 µm</th>
<th>% Spray Volume &lt;200 µm</th>
<th>Dv0.1 Droplet Size</th>
<th>ASABE DSC Droplet Spectra Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0º</td>
<td>0.01%</td>
<td>5.72%</td>
<td>229 µm</td>
<td>Medium</td>
</tr>
<tr>
<td>8º</td>
<td>0.01%</td>
<td>6.29%</td>
<td>222 µm</td>
<td>Medium</td>
</tr>
<tr>
<td>23º</td>
<td>0.42%</td>
<td>8.32%</td>
<td>207 µm</td>
<td>Medium</td>
</tr>
<tr>
<td>38º</td>
<td>1.22%</td>
<td>11.62%</td>
<td>193 µm</td>
<td>Medium</td>
</tr>
<tr>
<td>53º</td>
<td>2.21%</td>
<td>16.19%</td>
<td>178 µm</td>
<td>Fine</td>
</tr>
<tr>
<td>68º</td>
<td>3.4%</td>
<td>22.02%</td>
<td>163 µm</td>
<td>Fine</td>
</tr>
<tr>
<td>83º</td>
<td>4.78%</td>
<td>29.12%</td>
<td>148 µm</td>
<td>Fine</td>
</tr>
<tr>
<td>90º</td>
<td>5.50%</td>
<td>32.86%</td>
<td>141 µm</td>
<td>Fine</td>
</tr>
</tbody>
</table>

NAAA urges EPA and registrants to incorporate low nozzle angle setup on aircraft spray booms in drift assessments and product labels.

- Consider canopy effects: EPA’s default assumption of aerial application to bare ground is incorrect for all FIFRA-labeled foliar-applied fungicides, insecticides and herbicides. If AgDRIFT inputs must be supported by enforceable label language, the Tier I default of assumed bare ground is inconsistent with the labels of hundreds of commercial products applied by air. Canopy effects are not inconsequential to estimates of spray drift and calculations of buffers. Canopies create higher humidity microclimates than open areas, which can influence droplet evaporation and deposition, and reduce relative wind speeds and alter over-canopy turbulence. The net result is that aerial applications over a dense crop canopy versus bare ground can result in larger droplets and more accurate spray deposition.

USDA field studies demonstrated that canopy density can have a dramatic effect on droplet deposition, potentially reducing spray drift across cropland. These studies of deposition used a fluorescent dye as a tracer of spray deposits. These results indicate that when crop height increases from 0.3 m to 1.3 m, the spray flux (amount of material moving downwind from an aerial application) decreases by 10-fold. Such beneficial effects of a growing crop canopy on depressing spray drift should not be overlooked by EPA simply by assuming all Tier I applications will be made to bare ground. The vast majority of aerial applications of foliar pesticides are made to crops when canopies are present.

As much as NAAA would prefer that EPA account for canopy effects in its risk assessments and buffer calculations, it appears AgDRIFT currently is incapable of correctly incorporating such beneficial impacts of a growing crop canopy on spray drift reduction. AgDRIFT appears to inflate off-target drift when non-zero crop canopy heights are inserted in place of the Tier I bare-ground default [“If a nonzero canopy height is selected...”]

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When we entered the nonzero canopy height of 5.44 feet in AgDRIFT and maintained the same release height of 10 feet over the canopy, AgDRIFT predicted that the fraction of applied droplets deposited 50 feet away would increase from 16.37% for the default Tier I bare-ground condition to 23.13% over a 5.44 foot canopy. It would appear that AgDRIFT predicted drift over the canopy on the basis of wind speed calculated at a 30.88 foot release height (twice the boom height), rather than at 10 feet over the top of a 5.44 foot canopy (15.44 total height). NAAA urges EPA to investigate this situation and correctly account for beneficial canopy effects in its estimations of downwind drift and calculations of mitigating buffer sizes. Bare ground applications represented by Tier I parameters constitute only a small fraction of the annual aerial applications made by pesticide applicators.

- **Properly assess swath offset in risk assessments:** Tier I default conditions include a swath displacement definition of 0.3702 of the swath width for standard 10 mph crosswind conditions. NAAA is concerned that this improperly biases these risk assessments, for aerial applicators typically offset applications a full swath width under cross wind conditions. The SDTF survey of aerial applicators recognized that more than 90% of aerial operators account for swath offset during application, stating that “[w]hen wind speeds are in the 7 to 10 mph range, the majority of applicators offset the application approximately one swath upwind.” Pesticide labels often state, “When applications are made with a cross-wind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application by adjusting the path of the aircraft upwind.” We do not support EPA’s proposed use of Tier I default conditions, but to the extent they are used to assess risk from aerial applications, NAAA urges EPA to define swath displacement at 1.0 or larger instead of 0.3702.

- **Utilize AgDRIFT’s multiple application assessment tool:** AgDRIFT utilizes the Solar And Meteorological Surface Observation Network (SAMSON) to integrate the impact of wind speed across incremental wind directions from 0º to 360º on spray drift at a given location and time period. The process produces 95th percentile predictions. NAAA urges EPA to apply these 95% percentile wind estimates in its risk assessments because it will more accurately predict drift based on conservative but real-world conditions. EPA’s Tier I AgDRIFT conditions predicts a deposition of 16.37% at 50 feet downwind and assumes a constant 10 mph wind speed blowing at all borders of the field. A more realistic approach would be to use SAMSON to more narrowly define wind speed and direction. When AgDRIFT’s multiple applications tool and SAMSON are used for a single application the predicted deposition at 50 feet dropped to 14.98%. When risk assessment is conducted for products labeled for two applications, the deposition at 50 feet drops to 7.73%. We do not

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12 Reabe, D. 2014. AgDRIFT calculations of canopy effects using Tier III inputs


support EPA’s proposed use of Tier I default conditions, but, to the extent they are used to assess risk from aerial applications, NAAA urges EPA to utilize AgDRIFT’s multiple application assessment tool.

- **Drift occurs downwind:** As EPA models pesticide spray drift to estimate buffer size, the Agency should apply such considerations to downwind vectors only. Neither the scientific literature nor AgDRIFT supports the need for upwind buffer zones for typical aerial spray applications. This, plus the use of drift mitigation technologies and procedures described in these comments, should preclude the need for any buffer on the upwind side of an application area. As discussed previously in these comments, aerial applicators have the tools necessary to immediately determine on-site wind direction.

- **Aerial drift concerns are not supported by monitoring evidence or records of spray-drift incidents.** Evaluation of monitoring data fails to provide support for excessive buffers for drift mitigation. The Association of American Pesticide Control Officials (AAPCO) collected drift incident data in surveys conducted in 1999 (representing the years 1996 to 1998) and in 2005 (representing the years 2002 to 2004). The first survey determined that confirmed aerial spray-drift complaints for the years 1996, 1997 and 1998 were 342, 280 and 378, respectively. This yields an annual average nationwide of 333 complaints for the period covered by the survey. The second survey conducted six years later determined that confirmed aerial spray-drift complaints for the years 2002, 2003 and 2004 were 244, 237 and 260, respectively. This yields an annual average nationwide of 247 complaints for the period covered by this survey. This represents a 26% reduction in confirmed spray-drift complaints in the six years during which the aerial application industry applied educational programs (e.g., the PAASS program, begun after the 1998 season) and technology improvements to mitigate drift potential.

- **Consistent over-prediction of drift risks and buffer size requirements will have unintended consequences:** We recognize that finding the balance between environmental protection and effective pest control is difficult. However EPA’s drift assessment and mitigation policies should advance the use of methods and technologies that minimize potential for off-site pesticide movement while still allowing critical pest management to continue. NAAA is concerned that AgDRIFT consistently over-predicts drift potential at long distances, resulting in excessively large buffers that will have significant unintended consequences. Besides the direct reduction in economic cropping area resulting from untreated set-back areas, academic experts have voiced concerns that they will result in the remaining cropping areas receiving persistent inoculum from pathogens, insects and weeds that are harbored in untreated buffer areas; poor control and lack of isolation from the buffer areas will result in increased usage of pesticides (tighter spray intervals and higher rates) in surrounding fields within a production area to address incursions of the pests; and for many vegetable crops, untreated sections of fields will pose an extremely high level of crop disease risk (e.g., late blight on potatoes or tomatoes) and unmarketable crop harvests. To avoid the likelihood of

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16 Gevens, A. March 13, 2104. Unpublished letter to F. Khan, EPA Environmental Fate and Effects Division. University of Wisconsin Madison – Department of Plant Pathology. [Appended to these comments.]
accelerated development of resistant populations of pests emerging from low-dose exposures within buffers, producers will need to identify additional and supplemental pesticide treatments to apply to those areas.\textsuperscript{17} NAAA urges EPA to consider these issues and perhaps modify the ecological models it uses to more accurately determine the deposition required to cause harm as well as utilize AgDRIFT’s aerial application Tier III inputs without unnecessarily limiting the efficacy of crop protection products through unnecessarily large buffers.

**Importance and Safety of Atrazine:** Atrazine is used by aerial applicators to protect a variety of crops from weeds. Over half of U.S. corn and two-thirds of both sugarcane and sorghum rely on this herbicide which saves, for example, between $30 and $59 per acre. This great benefit comes with little risk as nearly 7,000 scientific studies over more than 50 years have shown atrazine to be safe for pesticide use. NAAA is worried that the ecological risk assessment seemingly ignores these studies and the great wealth of evidence that supports the use of atrazine, and would like to draw to your attention several conclusions we believe are incorrect:

- First, the assessment erroneously lowers the chronic no-effect level for birds by a factor of three without any new information or data to support this change.
- Second, the assessment relies on a study that was not conducted in accordance with required guidelines to lower the fish endpoint 12-fold, while overlooking the results of a more recent, guideline-compliant study, as well as other fish studies conducted by EPA itself.
- Third, the assessment relies on scientifically invalid aquatic plant (micro-/mesocosm) studies to define the aquatic level of concern.
- Fourth, errors in the exposure database and methodological errors lead to extraordinary overestimates of aquatic and terrestrial exposure.
- Fifth, this assessment estimates inflated hypothetical risks that have not been observed in the real world in over 50 years of closely-scrutinized product use.

NAAA appreciates being able to comment on EPA proposed registration of atrazine for aerial use on agricultural crops, ornamentals and turf.

Please don’t hesitate to contact us should you have any questions.

Sincerely,

Andrew D. Moore
Executive Director

\textsuperscript{17} Groves, R.L. March 14, 2014. Unpublished letter to J. Dawson and F. Khan, EPA Health Effects Division and Environmental Fate and Effects Division, respectively. University of Wisconsin Madison – Department of Entomology. [Appended to these comments.]