Agricultural Aviation

Official Publication of the National Agricultural Aviation Association
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September/October 2013
Vol.40, No.5

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Agricultural Aviation (ISSN 0745-4864) is published bimonthly by the National Agricultural Aviation Association. © 2013. **Editorial and circulation office:** 1440 Duke Street, Alexandria, VA 22314. **Change of address:** Please send notices to the circulation department and include your old mailing label with your new address, including zip and postal codes. Please also include your new phone and fax numbers. Allow two months for the change. **POSTMASTER: Send address changes to *Agricultural Aviation*, 1440 Duke Street, Alexandria, VA 22314.** Periodicals Postage Paid at Alexandria, VA, and at additional mailing offices. Printed in York, PA. Distribution coverage: Distribution includes NAAA members and those in related industries, educators, libraries, government officials and the news media.

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Background photo courtesy of Brad Howell, Mad Mantis Studio. UAV photo by Robert Mandel/Shutterstock.com

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Agricultural Aviation is the Official Publication of The National Agricultural Aviation Association

President's Message

Dana Ness

Flying at 35,000 Feet for Low-Level Aviation

One of the most important aspects about NAAA is its long-term vision to ensure a healthy and productive agricultural aviation industry. This foresight goes back to the Association's founding fathers. Oftentimes I think how fortunate we are to be standing on the shoulders of the giants who created NAAA. Where would we be today if it wasn't for the big-picture thinking of Dick Reade and other industry leaders nearly a half century ago to found the National Agricultural Aviation Association? Where would we be without the generous resources that Leland Snow and other allied industry leaders provided the Association so that it had the wherewithal to meet its objectives as set out in the NAAA Constitution?

One of the most important objectives, in my opinion, within the NAAA Constitution is Article II (D), which states that "NAAA will work toward gaining greater recognition and respect for the agricultural aviation industry and its contribution to agriculture by promoting strict ethical standards." NAAA Board members have taken this objective to heart and it has led to some of our most important programs, such as the establishment of our sister organization the National Agricultural Aviation Research and Education Foundation (NAAREF) and programs produced from her such as Operation S.A.F.E., PAASS, and the Fly Safe messages. Sometimes the programs and messages that have been developed to promote these strict ethical standards are interpreted by some in the industry as overreaching, meddling and Big Brother-esque. I truly believe without us promoting strict ethical standards within our own industry, and the industry abiding by those standards, there would be strong efforts outside of our industry to push stricter and stricter regulations that could handcuff us if not eliminate our existence. NAAA is a professional trade organization and as such must set the bar high as to the conditions we set for ourselves.

NAAA's current Board strives to follow the extraordinary lead set by our industry's founding fathers. Just this year we revised our strategic plan, which can be found at www.agviation.org and in the 2013 NAAA Membership Directory. One of the guiding principles of the strategic plan is "determining the future, external trends, challenges and issues that are impacting, or will impact, the agricultural aviation industry." By reading technological developments and industry trends, two issues NAAA has identified as potential challenges and is addressing are Unmanned Aircraft Systems (UAS) and maintaining a sustainable supply of ag pilots. UAS, the subject of this issue's cover story beginning on pg. 14, do not presently have an established regulatory structure in which to work under in the U.S., but that is only temporary. It is inevitable that they will be present in our airspace someday and may even be actively used by our industry. NAAA is working hard to educate federal policymakers to ensure manned ag aircraft are protected from UAS so these unmanned machines don't become another perilous obstacle sharing the air with us.

The 2012 Aerial Application Industry Survey NAAA conducted to glean demographic information about the aerial application industry identified the average age as 53.6 years for an operator and 49.9 years for a non-operator pilot. Approximately 94 percent of operators are ag pilots. Because we are a mature industry, a continued transfusion of young pilots must enter the bloodstream of our industry to sustain the vital service we provide agriculture. On pg. 30 you will read about a terrific concurrent session we are providing at our annual convention in Reno this December tentatively titled "Ask the Expert: Speed Mentoring." This session will enable young, new and prospective ag pilots to visit personally with experts familiar with insurance, regulations, flight schools and operating and flying in the ag aviation industry.

We on the NAAA Board have big shoes to fill when you consider the achievements and foresight of our predecessors. But I can promise you that we are committed to maintaining this industry's professionalism and this industry's service to agricultural production for many years to come by strictly adhering to our strategic plan and the constitutional objectives our industry's founding fathers set for us. ■

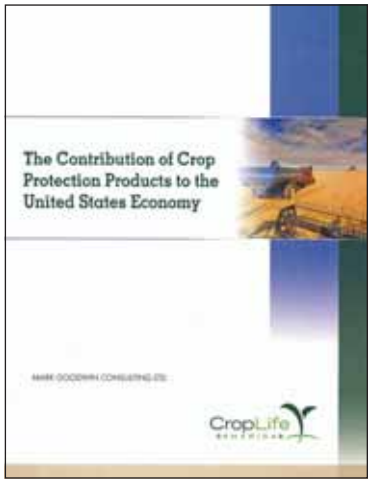
Executive Director's Message

Andrew Moore

The Impressive Economic and Environmental Benefits of Modern Agricultural Production

In 2012 the U.S. ran an impressive agricultural trade surplus of $38,470,893,005.[1] Agriculture is one of the only industry sectors in the U.S. where we are actually generating a trade surplus—exporting far more than we are importing. If it weren't for crop protection products and the applicators that ensure targeted placement of these products it is quite likely we wouldn't be able to generate the trade surplus printed above.

CropLife America, the trade association that represents the manufacturers of crop protection products, recently compiled the economic report "The Contribution of Crop Protection Products to the Economy," which details the favorable impacts of the crop protection industry to the U.S. economy as well as environmental gains in the U.S. from their use. Here is a taste of the positive results identified from the study:



Crop protection products added increased yield and quality of field crops, fruit and nut crops and vegetable crops to the extent that they add approximately $51.4 billion, $18.9 billion and $11.5 billion, respectively, in crop value annually. *(See Table 1 for crops included in this analysis.)*

1 Source: Compiled by ERS using data from U.S. Department of Commerce, Census Bureau.

Table 1: About CLA's Crop Value/Crop Protection Contribution Analysis

Study Category	Field Crops	Fruits and Nuts	Vegetables
			
Crops in Study	corn, sorghum, oats, barley, wheat, rice, soybeans, peanuts, flaxseed, sunflower, potatoes, canola, upland cotton, hay, dry edible beans, chickpeas, dry edible peas, Austrian winter peas, and lentils	**Fruit family:** grapefruit, lemons, oranges, tangelos, tangerines and mandarins, apples, apricots, avocados, bananas, blackberries, blueberries (cultivated, wild), boysenberries, cherries (sweet), cherries (tart), cranberries, dates, figs, grapes, guavas, kiwifruit, loganberries, nectarines, olives, papayas, peaches, pears, plums, prunes (dried), prunes and plums, raspberries (black, red, all), and strawberries **Nut family:** almonds (shelled), hazelnuts (in-shell), macadamia (in-shell), pecans (in-shell), pistachios (in-shell), and walnuts (in-shell)	artichokes (California), asparagus, beans (snap), broccoli, cabbage, cantaloupes, carrots, cauliflower, celery, corn (sweet), cucumbers, garlic, honeydew melon, lettuce (head), lettuce (leaf), lettuce (romaine), onions, peppers (bell), peppers (chili), pumpkins, spinach, squash, tomatoes, watermelons, beans (lima), and green peas

Left to right: Jim Barber/Shutterstock.com, paulista/Shutterstock.com, and TrotzOlga/Shutterstock.com

The additional crop value created because of the use of crop protection products led to 1.04 million jobs generating a payroll of $33.9 billion for U.S. workers annually.

Crop protection products also contribute to positive outcomes with regard to environmental benefits, allowing U.S. farmers to produce four times as much corn and wheat as they did in the early 1900s without clearing additional forests or wetlands.[2]

Use of crop protection products in support of conservation tillage[3] saves 558 million gallons of fuel per year.

Affordable food is also a benefit that accrues from crop protection. Proxies used to estimate savings for key grains, vegetables and fruits were 47.9 percent for an average family of four in one study. A second study puts the savings for the same average family of four at 35 percent on fresh fruit, 45.5 percent on fresh vegetables, and 40.7 percent on fruit and vegetables overall.

It's not just the crop protection manufacturers that have contributed to this economic activity, job creation and environmental stewardship. Applicators of these products also are a vital component. According to the National Stakeholder Team for Pesticide Safety Education Program Funding (PSEP) there were approximately 912,000 certified applicators in 2012 (549,000 ag-related and 363,000 non-ag). The 912,000 applicators are broken down into commercial (for hire) and private applicators (mostly growers and their employees), which comprised 438,000 and 474,000 of the total, respectively.

In addition to useful P.R. tools such as NAAA's Media Relations Kit[4] and our new Aerial Application 101 PowerPoint[5] presentation, these are great statistics for us to use when speaking to our local communities, policymakers, students and educators or the media. The multitude of benefits the judicious use of crop protection products provides us societally, economically and environmentally is a story that needs to be told at every opportunity. ■

2 In the first half of the 20th century, overtly toxic compounds such as sodium arsenate and sulfuric acid were used at rates of several pounds per acre. As the century moved forward, safer and more selective herbicides were developed and introduced for specific crops and use patterns. Today, we see the registration of low use rate herbicides (applied at a few ounces per acre) that interact with specific biochemical sites to produce selective and environmentally safer weed control. The real expansion in the discovery and registration of insecticides occurred during and after the Second World War. This period represented a pivotal point in the overall history of pesticides. The latter half of the 20th century has produced more selective insecticides with reduced impact on the environment, applicators and beneficial insects.

3 Conservation tillage systems are methods of soil tillage which leave a minimum of 30 percent of crop residue on the soil surface. This slows water movement, which reduces the amount of soil erosion. Conservation tillage reduces fuel consumption and soil compaction by reducing the number of times the farmer travels over the field by minimizing plowing.

4 www.agaviation.org/content/naaa-media-relations-kit

5 www.agaviation.org/content/aerial-application-101-presentation-0

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WNAAA President's Message

Dona Jorden

Customer Satisfaction Guaranteed?

Unfortunately, at some time in the ag aviation business, as in any business, we will encounter an unsatisfied customer. How we handle the situation will determine whether the customer tells friends, family and business associates how awful he was treated, or instead lets them know what great service he receives from your company. How we respond to the unhappy customer is critical to the success of a business.

Thinking about this, I decided to ask a few people from different areas of the ag aviation business for their thoughts on the subject and did a little research on the topic. In my research I read an article by Richard Proffer, a business development specialist, who listed five A's in customer service. I took Proffer's list and elaborated on it using advice I received from my earlier discussions.

Here are the five A's. Ace them and you'll be well on your way to becoming a customer service superstar.

Acknowledge the Problem

Once you're aware the customer is unhappy your first priority is to the customer. Put yourself in the customer's shoes. Set aside any feelings you might have, particularly that the situation isn't your fault. All that matters is your customer is upset and you are the "go-to person" to resolve the issue.

Nobody makes mistakes on purpose, but they happen. Regardless of the circumstances, acknowledge the problem and that the customer has the privilege to be upset. Listen carefully. Give the customer 100 percent of your focus.

Make sure you are addressing all the customer's concerns. After you have listened to the customer, reiterate what you believe you heard from the customer's view. Confirm with the customer this is correct and write the concerns down. This lets the customer know you are listening, concerned and you are focused on the issue at hand.

Apologize Even if You Think You're Right

When a customer is at the peak of expressing anger, distress or agitation, be patient and listen. Never interrupt, or greet agitation with agitation. This only adds fuel to the fire. Once the customer has finished verbalizing his frustrations, take the opportunity to sincerely empathize with him. Apologize and let the customer know you are sorry for any inconvenience this situation may have caused. Make sure your body language is communicating the same message.

Accept Responsibility

It doesn't matter who created the circumstance or what transpired before the customer came to you. Tell the customer you will personally handle the situation and will make every effort to resolve the issue. This doesn't mean that the customer is always right, however. Make sure you have the necessary documentation that presents the facts. This will prove essential when negotiating a solution when the customer is wrong.

Adjust the Situation With a Negotiation to Fix the Problem

Next, try to make amends with unhappy customers by giving them your solution for correcting the problem. Let them know if they don't agree with your solution you are open to any suggestions that they feel will better correct the problem. Let them know that if it's in your power you will get it done; if not, you will work together on another solution.

Always do your best to help them when you can, even if you really *aren't* at fault, but never make promises unless you can keep them.

> "Speak when you are angry and you'll give the best speech that you will ever regret."
>
> —*Lawrence J. Peter*

Assure the Customer You Will Follow Through

Let your customers know their satisfaction is important, and they are appreciated. Let them know immediate action will be taken to resolve the issue, and you will take steps to reduce the risk of the situation happening again. Whenever possible, go beyond customers' expectations to rectify the situation. Once the situation has been resolved, follow up to make sure they are satisfied with the resolution. Make sure you have made the appropriate adjustment to lower the risk of the situation happening again.

Dealing with difficult customers can be challenging. If we handle the situation well, we may create future business opportunities. Keep in mind that a satisfied customer means better business. ■

Washington Report

By John Thorne

Identifying Waters Protected by the Clean Water Act: The Impact on Aerial Application

Despite decades of trying, lawmakers continue to struggle to identify which waterbodies are subject to Clean Water Act (CWA) regulations. All agree that rivers, lakes, wetlands and other "waters of the U.S." (WOTUS) supply critical drinking water, irrigation, recreation, storm water control and industrial uses to society, while also providing critical aquatic ecosystems to wildlife. Yet, in the 40 years since CWA enactment, government agencies, Congress and stakeholders still disagree over how best to balance the competing needs of society and nature with regard to regulations implementing the CWA.

Overall, the guidance will likely harm the aerial application business, as federal and state agencies, county and city governments, mosquito control and irrigation districts, natural resource managers and private entities work to sort out the changes to the definition of "waters of the U.S."

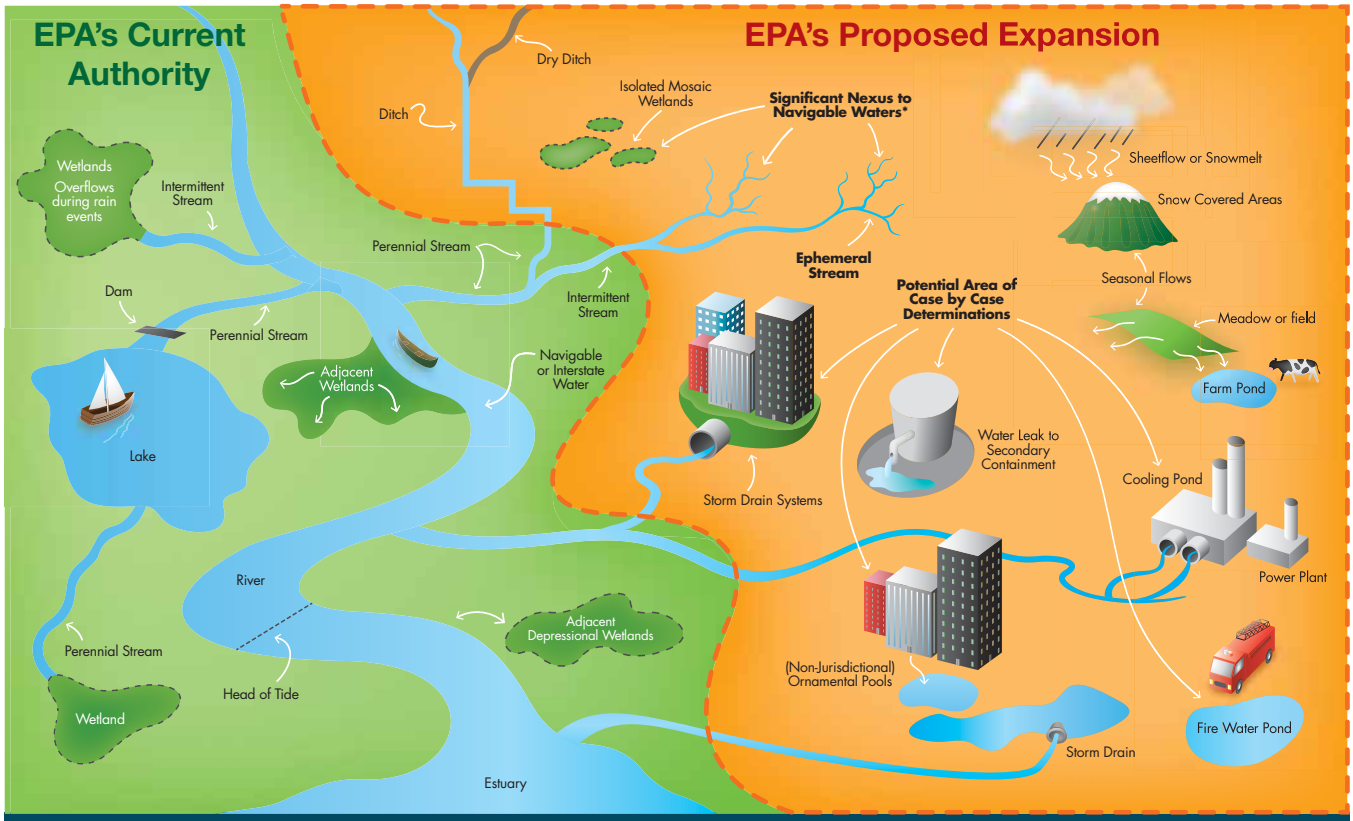
In recent years rather than adopt policy changes through formal rulemaking, the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) have repeatedly issued informal "guidance" documents to change the definition of WOTUS and the scope of critical CWA programs. The newest draft guidance would expand the WOTUS definition to include many waters never intended by Congress or the courts to be regulated, including small tributaries and man-made conveyances. It also would expand the WOTUS definition to all CWA programs, including wetlands delineation and wastewater treatment requirements, as well as water quality standards and scope of the new NPDES pesticide general permits. The illustration found on the adjacent page highlights some of the principal ways the guidance would affect CWA policies. Agricultural stakeholders and many in Congress are concerned the agencies are attempting to greatly expand the scope of the CWA by modifying existing guidance with still more guidance, without pursuing rulemaking under the Administrative Procedures Act (APA).

The First 40 Years

Congress originally identified waterbodies subject to the then-new CWA as "navigable waters"—meaning those forming interconnected highways (e.g., large rivers and lakes) for waterborne travel, recreation and transport of interstate and foreign commercial goods. Today, in addition to the traditionally navigable waters identified by Congress in the enactment of the CWA in 1972, CWA regulations (and guidance) also covers a very long list of regulated waterbodies, yet there are still many other situations and thousands of waterbodies where the agencies, the courts and Congress cannot agree. Despite 40 years of policy tinkering and lawsuits, there is still major disagreement over the scope of CWA jurisdiction today. A series of conflicting lower court decisions led the Supreme Court to twice address the definition of WOTUS with respect to wetlands policy. In 2011 the EPA and Corps decided to incorporate all of the Justices' opinions in sweeping, new draft guidance[1] that would greatly increase the number and type of waters regulated by the CWA. Such changes would likely effect state water policies, since about half of state water laws are written to protect "waters of the U.S." instead of "waters of the state." Of key importance to NAAA members, they would expand the waters regulated by NPDES pesticide

1 http://water.epa.gov/lawsregs/guidance/wetlands/upload/wous_guidance_4-2011.pdf

The EPA's Proposed Guidance Would Expand the Definition of Navigable Waters of the U.S.



The Environmental Protection Agency's (EPA) most recent proposed guidance expands the definition of the "waters of the United States," and by extension the EPA's and the Army Corps of Engineers' jurisdiction over these bodies of water. Under the new guidance, the EPA would be able to regulate things such as fire ponds, ornamental pools, dry ditches, ephemeral or seasonal streams, cooling ponds, isolated mosaic wetlands, snow melt and storm drainage ponds. In essence, the EPA would have the subjective authority to define, on a case by case basis, any and all waters as "navigable" to deviate from the spirit of current law which applies specifically to "navigable waters." The result would be increased uncertainty and greater incentive for groups to seek court intervention. Because the EPA is pursuing this approach as a guidance, it need not follow public notice and comment rulemaking safeguards before the Agency and 10 regions apply it.

*The EPA interprets the Clean Water Act to apply to non-navigable tributaries and their adjacent wetlands that have a "significant nexus" to navigable waters. The EPA defines significant nexus as waterways that "either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable or interstate waters."

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general permits, Total Maximum Daily Loads (TMDLs) and other CWA requirements.

2011 Proposed Guidance

Despite the agencies' repeated assertions that the draft guidance lacks the force of law, it supersedes existing law and will have substantial, binding impact on the agencies and public. The proposed draft guidance would not only change federal policies for wetlands delineation under CWA but also for the NPDES permitting programs. For all of the various CWA programs, the proposed guidance would expand the scope of CWA regulations by defining WOTUS to include many previously unregulated headwaters, tributaries and conveyances. It would reinterpret Congressional intent and court decisions, and apply broad jurisdictional principles such as the aggregation of all waters in a watershed and the regulation of agricultural, irrigation and roadside ditches to the entire CWA structure (water

quality standards, TMDLs, etc.). It would do more than fill in the details of pre-existing regulations, as the agencies state. It would essentially reinterpret court opinions, apply specific tests for establishing jurisdiction and effectively revise those CWA regulations. This represents much more than simply "guidance."

Potential Impact on Aerial Application

The guidance would greatly increase the number and types of waters subject to the CWA's requirements, as well as enforcement and potential citizen suit risks. Government agencies and states will struggle to apply water quality standards, TMDLs, permitting and many other CWA programs to thousands of newly jurisdictional "waters." These waters could include seasonally dry swales, roadside and irrigation ditches, culverts, wetlands or minor tributaries. The complexity of the guidance will cause delays, increase water program costs and reduce pest-control budgets, as funds are directed to other programmatic areas. Such clients may want to share some of the added risks and legal liability with contracting pest-control applicators. Overall, the guidance will likely harm the aerial application business, as federal and state agencies, county and city governments, mosquito control and irrigation districts, natural resource managers and private entities work to sort out the changes.

Policy Status

Despite industry calls for EPA and the Corps to pursue formal rulemaking, EPA and the Corps continue to pursue finalization of the guidance before undertaking what they expect would be a protracted rulemaking and multiple legal challenges. But the widespread controversy generated by the draft guidance has stalled its approval by the White House Office of Management and Budget (OMB) since February 2012. As is a common practice when such controversy exists, OMB may require changes to the draft guidance before approving it.

Despite Republican efforts, however, it is unlikely legislative efforts to block the WOTUS guidance will be successful. The end result being that if OMB approves the draft guidance, we will likely have to live with it until EPA and the Corps undertake formal rulemaking.

WOTUS Guidance and NPDES Permits

The requirements for NPDES general permits for pesticide applications into, over or near jurisdictional waters are

the result of a 2009 Sixth Circuit decision in the case of National Cotton Council et al, vs. EPA. While many in Congress have tried unsuccessfully to overturn this decision and the subsequent EPA rule to require NPDES permits of pesticide applicators and others, efforts thus far have been unsuccessful. In the most recent attempt, the House of Representatives approved July 11 a 2013 farm bill that included language that would overturn the Sixth Circuit decision. However, the provision to remove the need for NPDES general permits could be lost when the Senate and House work to reconcile their much different versions of the farm bill. Regardless of WOTUS guidance and/or potential NPDES exemption legislation, NAAA will continue to work with our ag/pesticide user stakeholder coalition to ensure the regulatory guidelines governing waters of the U.S. impact the aerial application industry in a manner least disruptive to performing the essential application of crop protection products critical to high-yield agriculture. ■

John Thorne, Ph.D., serves as Senior Government Affairs Counsel at Bergeson & Campbell, PC.

Aerial applicators affected by the NPDES Pesticide General Permit requirements could be impacted even further by the EPA's proposal to expand the definition of "waters of the U.S." The number and types of waters subject to Clean Water Act requirements would increase greatly under the proposed changes.

The Future of Unmanned Aircraft Systems:

Is There a Niche in Aerial Application?

By Danna Kelemen

Ever since the Wright Brothers first achieved flight a century ago, humans have been fascinated with aviation. Hundreds of years earlier the visionary Leonardo da Vinci attributed flying to an experience unlike any other: "Once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return." As we progress into the 21st century and the amount of general aviation aircraft worldwide numbers upward of 350,000, it's not surprising the airspace continues to become more and more congested. By 2015, the U.S. airspace is projected to become even more crowded as the marvels of unmanned aircraft transform from fantasy into reality. As commandeers of the original "low and fast" flight, ag aviators have reason to be wary about what this new type of revolutionary aircraft will mean for the aerial application industry in terms of safety and vying for low-level airspace.

Ivan Cholakov/Shutterstock.com

Up until recently the guidelines for flying anything unmanned were pretty simple: adhere to the FAA's advisory circular (AC) for model aircraft operating standards and above all else stay out of the way of full-scale aircraft in flight. When the FAA issued AC 91-57 some 32 years ago it was in an effort to create safety standards for model aircraft operators and reduce the potential for accidents with manned aircraft. Back then, unmanned aircraft were certainly being discussed, but more in terms of drone use for the military. In fact, an unclassified digest report from the Comptroller General's Office in 1982 stated, "The Army's remotely piloted vehicle shows good potential but faces a lengthy development program." Little did the U.S. government know just how quickly this development would take place, and as a result the regulatory and accountability issues we are now facing today. With the passage of the 2012 FAA Reauthorization Bill, unmanned aircraft systems (UAS) are coming, and they're coming quickly. As an industry we must determine the best practices for sharing the national airspace while proactively safeguarding low-level aviation.

A 2007 FAA Notice defines unmanned aircraft as a device that is used, or intended to be used, for flight in the air with no onboard pilot. Their complexity, size, method of control and intended use may vary greatly, but the FAA currently classifies unmanned aircraft into three distinct categories: public aircraft, civil aircraft and model aircraft. According to a July 2011 FAA UAS Fact Sheet, there are approximately 50 companies, universities and government organizations currently developing and producing more than 155 unmanned aircraft designs. Beyond use as recreational vehicles by model airplane users, the only two acceptable (and legal) means of operating UAS in the National Airspace System (NAS) outside of "restricted" airspace are through Special Airworthiness Certificates in the Experimental Category (SAC-EC) or Certificates of Waiver or Authorization (COA). Experimental aircraft are certifiable via SAC-EC only and while precluded from carrying persons or property for payment or hire, experimental aircraft are approved for research and development, market survey and crew training. However, in late July the FAA issued its first restricted category type certificates and opened the door for unmanned aircraft being able to be used for surveillance. The Agency stated the approval is "a milestone that will lead to the first approved commercial UAS operations later this summer." On the other hand, public aircraft must go through the COA process should they wish to be flown in civil airspace. This includes aircraft used by law enforcement, military and other governmental agencies. Generally speaking, the FAA issues COAs based on the following premises: authorization for an operator to use defined airspace, and includes provisions unique to each individual operation; coordination with the appropriate air traffic control facility and may also require a transponder to operate in certain airspace; and in the absence of sufficient "see and avoid" provisions the requirement for operators to have a visual observer or "chase" aircraft maintaining visual contact with the UAS.

Potential Economic Impact of UAS

If one watches the nightly news or picks up the latest newsmagazine, the topic du jour is UAS and the many potential commercial uses they will likely have in the future. In an NBC *Today* show segment aired on July 8, the news program documented a visit to the Holloman Air Force Base (New Mexico) UAS training Unit and provided a closer look at the Remotely

AT LEFT: Background photo courtesy of Brad Howell, Mad Mantis Studio. UAV photo by Robert Mandel/Shutterstock.com

Piloted Aircraft (RPA) training program. The Air Force predicts the growth for RPA pilots to be exponential and estimates graduating 700 UAS pilots in 2013 alone—many of whom are not traditional military pilots and have never piloted a manned aircraft.

Beyond the military the potential for commercial use has been fueled in aviation circles by a March 2013 Association of Unmanned Vehicles Systems International (AUVSI) report that stated, "While there are multiple uses for UAS in the NAS, this research concludes that precision agriculture and public safety are the most promising commercial and civil markets." The report further evaluates the economic impact of integration of UAS at $13.6 billion in the first three years alone and estimates it will create more than 70,000 jobs as well in the same amount of time. These sorts of figures, if accurate, certainly make one stand up and take note of just how influential unmanned aircraft will be in our nation's airspace in the years to come.

While UAS are currently the up and coming instruments of flight here in the U.S., they have been used in precision agriculture in Japan for the last 25 years. Since 1987 variations of the original Yamaha R-50 industrial-use unmanned helicopter have been used primarily for seeding and spraying rice, but also in remote sensing, precision agriculture, frost mitigation and variable rate dispersal. Today, there are about 2,400 RMax helicopters in use in Japan, which represents a 77 percent market share, according to Yamaha. The manufacturer equates the total number of people capable of operating them to about 7,500 nationwide in Japan. The difference in these types of UAS being used in Japan is the small hoppers that simply would be incapable of spraying the larger amounts of cropland present in the U.S., as it has two tanks, capable of holding only a little more than two gallons of liquid product per tank or three gallons of granular product per tank respectively. Similarly, Yamaha predicts opportunities for unmanned use in Australia and New Zealand. In separate, but related research, Denmark is working on a precision herbicide project much like that being studied by universities in the U.S.

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The University of California-Davis is researching the viability of using unmanned helicopters for agricultural purposes. UC Davis is making test applications on a research vineyard in Oakville, Calif.

Even though the evolvement of UAS in the United States, particularly in agriculture, has not been quite as rapid as in Japan, the integration is a fundamental tenet of the planning and implementation of the Next Generation Air Transportation System (NextGen). As such, Congress established the Joint Planning and Development Office (JPDO) under the Vision 100 – Century of Aviation Reauthorization Act in 2003. This represented a multi-agency approach and means to involve the public and private sector in the overhaul of air transportation as a whole.

In order to ensure a viable public-private partnership, the JPDO established the NextGen Institute in 2005 as a clearinghouse of sorts for researching and moderating discussion and information from experts across the industry pertaining to NextGen. In 2009 the FAA teamed with its government counterparts, NASA and the Departments of Defense and Homeland Security, to form a UAS Executive Committee (or "ExComm") to address UAS integration issues. In addition, the FAA also enlisted the assistance of industry and academia stakeholders through the UAS Aviation Rulemaking Committee and RTCA SC-203. The latter, serving as a federal advisory committee, was formed in 2004 to develop "standards, certification criteria, and procedures for sense and avoid systems as well as protocols to be used for the certification of command, control and communication systems in the defined flight environment." Within the FAA, the UAS Integration Office was created in January 2013 to focus integration efforts within the agency under one executive; however, integration operations have been in progress for some time prior to its formal creation.

Unmanned aircraft systems (UAS) are coming, and they're coming quickly. As an industry we must determine the best practices for sharing the national airspace while **proactively safeguarding low-level aviation**.

According to the latest Government Accountability Office (GAO) report issued in February 2013, the FAA authorizes all UAS activity, judging each on a case-by-case review for safety. This includes "all domestic military; public (academic institutions, federal, state and local governments including law enforcement organizations); and civil (private sector entities) UAS operations." Under the requirements of the FAA's Modernization and Reform Act of 2012, the agency has faced difficulty in reaching many of the deadlines—with only two of the seven having been completed as of January 2013. The most recent deadline to be missed is establishing a program to integrate UAS at six test ranges; however, due primarily to privacy concerns this selection has been delayed as well. The "no later than date" of Sept. 30, 2015, for the safe integration of civil unmanned aircraft systems into NAS remains the ultimate goal, but much will need to be accomplished in terms of alleviating safety and privacy fears should this deadline remain realistic.

Safe Integration Challenges

The General Aircraft Manufacturers Association (GAMA) estimates there are approximately 223,000 general aviation aircraft in the U.S, therefore it is critical UAS do not endanger NAS users. In fact, the FAA has long stated its primary goal with the integration of UAS into the NAS is safety. In remarks at the AUVSI conference in 2012 FAA Administrator Michael Huerta stated the FAA's mandate is to ensure that the largest and safest aviation system in the world continues to become even safer with the introduction of UAS. However, Administrator Huerta pointed to two challenges that must be addressed to maintain this record: operational issues like pilot training and "see and avoid" technology that allows aircraft to continue operating safely even if they lose their link to their pilot. NAAA wholeheartedly agrees that resolving these two fundamental safety issues is paramount before UAS can begin to be safely integrated into the NAS.

The aforementioned GAO report highlighted several key regulatory and safety issues that require tackling before the safe integration of UAS into the national airspace. In addition to the research and development of the necessary capability to "sense and avoid" other aircraft and airborne objects, other significant concerns include improvements in "lost link" technology and a dedicated radio-frequency spectrum so that communications between UAS and operators functioning in a ground control station can rely on a dependable and dedicated spectrum without the fear of losing command and control of a UAS. Additional uncertainties include GPS jamming and spoofing as well as multiple human factor issues, similar to those encountered by pilots of traditional aircraft, but potentially magnified in an unmanned aircraft environment.

According to the FAA UAS integration office, the Agency expects to formulate a standard by 2016 that will permit UAS to inter-operate with manned aircraft using "electronic means" to see and avoid potential collisions. Jim Williams, manager of the UAS integration office, stated that the FAA is looking to amend the federal aviation regulation to allow for an electronic sensing system.

NAAA has been active in the discussion surrounding UAS, as the ability of pilots to see and avoid other aircraft and hazardous obstructions is paramount to ensuring the safety of low-level aircraft pilots. Each year pilots flying at the bottom of the NAS are exposed to a greater number of in-flight hazards, such as wires, and a multitude of towers. Next on the horizon is the imminent likelihood of UAS. As such, NAAA has met multiple times with both the FAA Obstruction Evaluation Group (OEG) as well as the UAS Integration Office. The Association has submitted correspondence to the OEG documenting low-level concerns as well as comments to the FAA regarding UAS test sites and privacy concerns. Additionally, NAAA was contacted by the NextGen Institute and participated in an interview regarding UAS and its impacts on agricultural aviation. Most recently, NAAA submitted a letter to FAA Administrator Huerta urging the implementation of low-level marking, lighting and database development solutions for locating ground affixed and UAS obstacles. In addition, NAAA requested the FAA require strobe lighting for UAS and standout painting for pilots of manned aircraft to easily see. NAAA has also been in contact with a number of congressional offices about its UAS concerns as well as the UAS trade association AUVSI. NAAA is aware of

the important functions which can be accomplished by UAS, including those to agriculture, but protecting the safety of current and future users of the NAS is mandatory and top of mind for the agricultural aviation industry.

Assessing UAS' Agricultural Capabilities & Limitations

The agricultural angle of unmanned aircraft is being liberally touted by the media, and currently at least five U.S. universities are researching the feasibility of unmanned helicopter use for agricultural purposes. The University of California-Davis's (UC Davis) research vineyard in Oakville, Calif., recently used a 200-pound RMax helicopter with a slightly more than four-gallon hopper capacity in an experimental scenario as researchers gathered data on the likelihood of potential agricultural pesticide application use. According to UC Davis Professor of Agricultural Engineering Ken Giles, the entry point for the helicopters would be to use them on hillside farms where the terrain is hazardous and time-consuming for tractors to navigate. Giles stated, "The unmanned helicopter technology allows precision positioning. In the U.S. right now there is no commercial use of this technology—it's strictly a research and development effort."

Within the aerial crop imagery industry, UAS development has begun to move at a quicker pace and in some instances is already beginning to prosper. A North Dakota-based company, Field of View, aims to bridge the gap between unmanned aircraft and precision agriculture. The company's flagship product, GeoSnap, is an add-on device for multispectral cameras mounted on aircraft (manned or unmanned) that takes the images captured and maps them with real-world coordinates—or "georeferences" them. Field of View hopes to market such revolutionary products as a time-saving measure to farmers who already scout their fields anyway. CEO David Dvorak cautions that aerial crop imagery is not "a cure-all." He sees it as an additional tool in a farmer's toolbox to help them manage their farm. Field of View recently began selling the add-on devices at $5,000 per unit with the cameras costing an additional $4,000 each. To date, Field of View has sold about half a dozen, but Dvorak states, "I'm quietly confident there's this perfect storm brewing where the precision agriculture market really takes off and the civil UAS market takes off."

NAAA interviewed representatives from the two leading manufacturers of ag airplanes used in the industry today, Air Tractor and Thrush, to inquire about how current manufacturers view the potential uses of UAS in the agricultural industry. Air Tractor President Jim Hirsch responded that he has been involved in discussions of making the company's aircraft into unmanned aircraft for uses other than the application of agricultural chemicals. Hirsch felt one of the most difficult problems to overcome is the lack of situational awareness when the pilot or UAS controller is not sitting in the cockpit. A human pilot can sense situations where his input may be needed. "Controlling an aircraft remotely is somewhat similar to viewing the surroundings looking through a soda straw," commented Hirsch. This is essentially the same as administrator Huerta's "see and avoid" operational issue.

Proponents of using UAS for spraying say the technology exists to control the aircraft's location and movement both horizontally and vertically using electronic control within a more exact tolerance than a human can control the aircraft. Only a few years ago, swath guidance was done by human flagman: then automatic flagman or no flagger; and then the miracle of GPS. As we believe no one can argue against the accuracy of GPS marking, perhaps the next sequential step is to incorporate the guidance system of the UAS into the manned

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Under current U.S. law, the only difference between a UAS and model aircraft is user intent. Per a 2007 FAA policy, aircraft without an on-board pilot intended for commercial purposes are considered unmanned aircraft and cannot be used without special authorization from the agency. UAS intended for recreational use are considered model aircraft and can be used as long as they do not compromise the safety of manned air traffic.

> "I'm quietly confident there's this **perfect storm brewing** where the precision agriculture market really takes off and the civil UAS market takes off."
>
> —*Field of View CEO David Dvorak*

ag aircraft and use it similarly to an autopilot in a passenger aircraft. This step may improve the accuracy of the application while still being monitored and reprogramed as necessary for existing conditions, such as people or animals moving adjacent to the target area. One hurdle to overcome will be whether the industry will be able and willing to afford what is sure to be markedly increased costs in these additional avionics.

Jody Bays, Vice President of Product Support and Development for Thrush Aircraft, shares many of the same feelings as Hirsch at Air Tractor. He believes the technology may be available but it may take many years to work out all the problems with safety. Even if the technology is possible, it may not be economically viable. Bays feels another obstacle is being able to safely terminate the flight in the case of loss of control signal. For this reason, helicopter type equipment may be easier to certify because they can be pre-programmed to land immediately upon loss of guidance signal in the field where they are operating.

Hirsch thinks one of the more daunting tasks would be to gain certification of the UAS control system by the FAA. Currently, certification of a particular aircraft depends on demonstrating safety if there is a catastrophic failure of one or more of the aircraft's systems. The FAA maintains that they and the public will accept only certain risks when evaluating safety. For example, for aircraft in the airline fleet, they must prove a safety rate due to a catastrophic failure at one in a billion throughout the life cycle of the aircraft model. This rate decreases with the use of the aircraft. VFR restricted category aircraft have a lesser safety requirement. Even restricted aircraft which are prohibited by FAR §91.313(e) from flying in certain areas, like over densely populated locations, are required to prove they are able to minimize the hazard to persons on the surface. The bar is likely to be

raised even higher for an unmanned restricted category aircraft.

Amidst all the potential and unknowns alike for UAS, the U.S. House of Representatives has weighed in on the technology as well and formed an Unmanned Systems Caucus under the leadership of Co-Chairmen Buck McKeon (R-CA) and Henry Cuellar (D-TX). The Caucus aims to educate members of Congress and the general public on the value of unmanned systems, to support the development of more systems, and to engage the civilian aviation community on unmanned system use and safety. In a UAS flight demonstration in Kansas over the summer, U.S. Senator Jerry Moran (R-KS) applauded the potential for agricultural uses of unmanned systems in Kansas. He stated, "The number of ways farmers and ranchers can utilize UAS are endless—from mapping the spread of disease or insects within a field to applying fertilizer to a specific area of crops—and I look forward to continued progress in this field."

NAAA Executive Director Andrew Moore stated there may be a place for UAS within agriculture in the future. "I foresee a big part of the technology being beneficial for checking crops and determining when and where in the field the most efficacious applications should be made. In regard to applications, however, current UAS are too small to be efficient for agriculture in the U.S. where fields are much larger than in Japan. The ability to make timely applications as well as fuel and labor costs associated with multiple reloadings will put a 20-gallon UAS at a marked disadvantage compared to today's significantly larger manned ag aircraft."

Among those anxious to see UAS in action for precision agriculture and beyond, there are other groups with mounting fears over privacy concerns motivating them to take unorthodox actions. Take for example the small town of Deer Trail, Colo. The town board will be voting on an ordinance that would create drone hunting licenses and offer bounties for unmanned aerial vehicles. Essentially the ordinance would reward $100 to any shooter who presents a valid hunting license and certain identifiable parts of an unmanned aerial vehicle. While many in Deer Trail see the idea as a novelty and a way to make money for the town, others take it very seriously. One resident stated, "This is a very symbolic ordinance. Basically, I do not believe in the idea of a surveillance society, and I believe we are heading that way." In response to the proposed ordinance, the FAA released a statement warning that people who fire guns at UAS are endangering the public and property and could be prosecuted or fined. The administration reminded the public that it regulates the nation's airspace—including that over cities and towns. Some states are opting for widespread privacy control, and the National Conference of State Legislatures recently reported that eight states have enacted legislation to control the use of drones, and 35 others have considered it or now are considering it.

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Approximately 50 companies, universities and government organizations are currently developing and producing more than 155 unmanned aircraft designs.

Sky's the Limit?

Good or bad, the possibilities appear limitless, yet the UAS technology is still proceeding cautiously as companies wait and see how the FAA regulates the unmanned aircraft industry. In the meantime, training individuals to pilot UAS is already occurring at more than 30 training schools across the country. Beyond training programs, the University of North Dakota and the University of Kansas both offer four-year degrees in UAV pilot training and Unmanned Aircraft Systems, while Embry-Riddle Aeronautical University offers a graduate degree in Unmanned Autonomous Systems Engineering. In a less traditional campus setting, the Unmanned Vehicle University in Arizona is the only school of its type to grant Doctorate and Masters degrees in Unmanned (Air, Ground, Sea)

> "**Controlling an aircraft remotely** is somewhat similar to viewing the surroundings **looking through a soda straw**."
>
> *—Air Tractor President Jim Hirsch, expressing reservations about the situational awareness of UAS*

Systems Engineering and a certificate in UAS Project Management as a totally online curriculum.

External to agriculture, entrepreneurs are jumping on the UAS bandwagon and visualizing the unmanned aircraft phenomena as a potential solution to global poverty problems. A Palo Alto, Calif.-based startup, Matternet, is already developing a courier network of small drones that could potentially be used to transport small, lightweight goods, like medicine or other essentials, in rural and poor areas of the world where access to traversable roads can be unpredictable. While the idea of unmanned aircraft delivery may seem *Jetsons*-like, even the Marines are already using unmanned remote-controlled helicopters as a safer means of delivering supplies to troops at Afghan outposts.

In other related unmanned aircraft developments, the venture capitalist firms of Google Ventures and Andreessen Horowitz announced in June a $10.7 million investment in a company, Airware, creating a common platform for drones that would allow developers to create industry-specific applications. Andreessen Horowitz believes the potential of Airware is similar to that encountered in the early PC industry. It would ultimately allow for specific applications, like that of precision farming, to be created without worrying about the specific underlying hardware and instead build on Airware's platform—much like Adobe Systems Inc. built Photoshop on Windows.

Notwithstanding the positive hype and publicity surrounding UAS and its multitude of potential uses, the technology must still jump through several privacy and safety hurdles at the FAA and now possibly within Congress before full integration is possible. While the House version of the 2014 Transportation, Housing and Urban Development (THUD) Appropriations Bill recognizes the importance of the UAS innovation, it calls for progress in developing a regulatory framework and instructs the FAA to develop a "lessons learned" report as well as a plan to resolve issues arising as a result of integrating UAS into the NAS. The Senate version of the transportation appropriations legislation goes a step further and prohibits the FAA from issuing final regulations on the integration of UAS into the national airspace until collaboration with other federal agencies has occurred that evaluates the impact that broader use of UAS in the national airspace could have on individual privacy and must be completed within one year's time. Unfortunately, because the House pulled its THUD bill before the August Congressional recess, it may be some time before Senate and House conferees are able to decide the best course of action for UAS, which will likely determine just exactly how soon we can expect to see unmanned aircraft in the skies near us.

Safely incorporating unmanned aircraft systems into the national airspace is undoubtedly of utmost importance for manned aerial applicators since we will likely be working at similar altitudes. As aforementioned, NAAA has made our concerns known to FAA Administrator Huerta and requested that to ensure safe coexistence, UAS will need to be well lit, marked and have their operational activities made known to manned pilots of low-level aircraft via a similar database system as would be ideal for obstacles 50 feet or more in height. Preferably, to avoid collision, if UAS worked at a higher level of airspace, perhaps 1,000 feet or higher, it would add an additional level of safety to our low-level aerial applicator pilots. In addition, the training and licensing of UAS operators should be equally as stringent as that for aerial application pilots both in terms of obtaining commercial pilots' licenses and commercial pesticide licenses, as well as frequent upkeep of equipment.

As an industry, agricultural aviation prides itself on its professionalism and efficacious and judicious application of crop protection products; therefore, we must ensure we play an integral role in the implementation of NextGen, specifically as it relates to the safe integration of unmanned aircraft into low-level airspace.

Aerial applicators are highly trained professionals who have made a very large investment in their business, and like all Americans, are concerned with human health, the environment, security and performing their job in a responsible and safe manner. NAAA is committed to working in tandem with the UAS industry to ensure ag aviators are able to continue performing their jobs without the additional concerns of unidentified aircraft occupying the same airspace and potentially and unnecessarily endangering the safety of low-level ag pilots. ■

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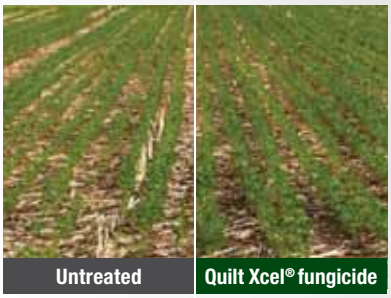

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Remote Sensing & Aerial Application

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By Chenghai Yang, Clint Hoffmann and Bradley Fritz
USDA-ARS Aerial Application Technology Group

Bill Gates once said, "Information technology and business are becoming inextricably interwoven. I don't think anybody can talk meaningfully about one without talking about the other." That is especially true about agriculture. With the increasing need for global food production in the presence of dwindling productive acres, the business of modern agriculture is the one of using all possible information available to maximize production.

One tool that is being used to obtain this information is remote sensing. Any crop disease or insect pest that causes significant plant stress or damage may be detected by remote sensing. Remote sensing has evolved from rudimentary film-based cameras to sophisticated digital imaging systems that can provide data on everything from soil type and moisture to plant health down to sub-foot accuracy.

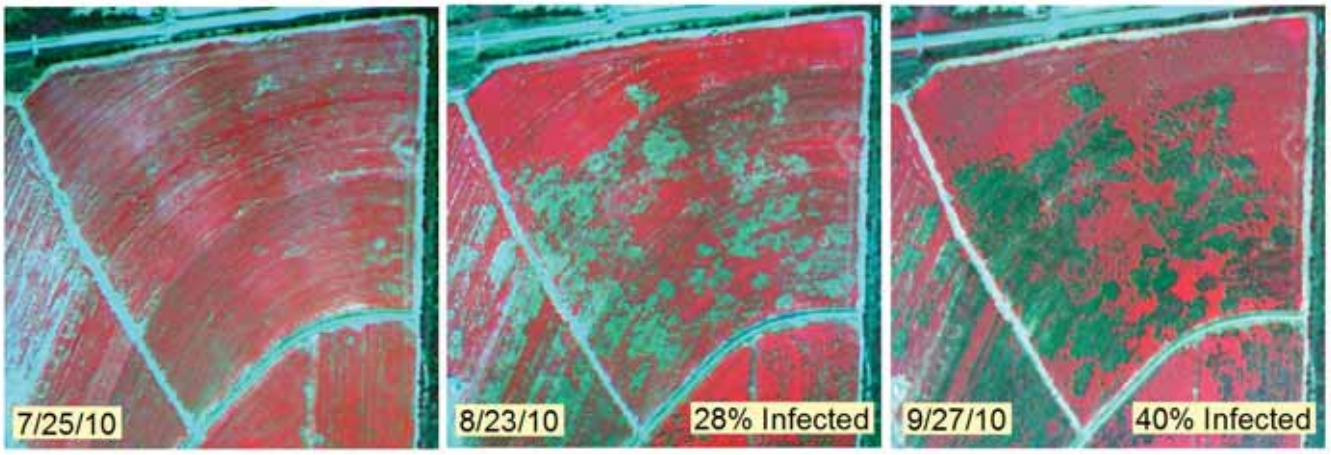


Fig. 1. *Color-infrared images for a root rot-infected cotton field on three dates in 2011 near San Angelo, Texas In these images, healthy plants are colored as red while the infected plants were green in color.*

This technology has great potential for aerial applications given that most applicators use GPS guidance and many have variable rate systems. These, coupled with data from remote sensing, can be used to precisely identify crop pests and treatment areas to optimize efficiency, minimize environmental impact and reduce the risk of pest resistance. The USDA-ARS Aerial Application Technology (AAT) group at College Station, Texas, has successfully used a number of remote sensing technologies for mapping crop growth and yield variability for precision agriculture, assessing crop conditions, detecting crop diseases and mapping a number of invasive weeds in rangelands and waterways.

One practical application example of these systems is for the detection of cotton root rot, which has plagued the cotton industry for more than 100 years and caused significant economic losses to cotton growers. A fungicide, flutriafol, has been found that can control the soil borne fungus that causes cotton root rot. This fungicide may need to be applied yearly to effectively suppress the disease. However, rather than broadcast treating an entire field, by identifying and treating only those locations within the field that are contaminated, the expense of these applications can be greatly reduced. Due to the large number of infected fields and the irregularly shaped infected areas within these fields, remote sensing offers a very efficient and effective means of mapping the locations and progression of the disease.

Over the past several years, the AAT group, in cooperation with Texas AgriLife and Cotton Incorporated, has used multispectral remote imaging systems to monitor the initiation and progression of the disease both within a growing season and across different growing seasons. This data can be used to formulate the site-specific application maps to control the disease.

Figure 1 is a series of color-infrared images taken of a root rot-infected cotton field on three dates approximately one month apart.

In these images, healthy plants are colored as a red while the infected plants were green in color. These very different colors allowed for easy separation between infected and non-infected areas, particularly when aided by image processing software. As this series of images shows, the root rot started to appear on July 25 and quickly expanded over much of the field. By Aug. 23, the fungus had infected 28 percent of the field and continued to spread to cover about 40 percent of the field shortly before harvest on Sept. 27.

Aerial images taken in the last three years have shown that this disease tends to occur in similar areas in recurring years. Once plants are infected, the fungicide will not save the plants. One practical method for treating root rot is to use previous year's aerial imagery and identify at-risk areas to be treated at the time of planting. It is obviously not as simple as "tracing" out the green areas on a single image from the previous year as areas to be treated. Data similar to that shown in Figure 1 are being analyzed to determine things like rate of spread, probability of reinfection and to develop guidance on buffer zones around infected areas to ensure complete treatment of infected plants and to accommodate potential expansion. As an example of the reduced application input, for the last picture in Figure 1, and figuring about a three-foot buffer zone around infected areas, about 45 percent of the field would need treatment. This potentially reduces the volume of fungicide required by 55 percent, as compared to treatment across the whole field.

While the example here focused solely on root rot, this technology can be used to support variable rate application of a variety of crop protection and production products, including plant growth regulators, defoliants, fertilizers and herbicides. Timely detection of crop health and pest damage, as well as weeds, is a critical first step for effective aerial variable rate or precision application. On an aerial platform, such as an ag plane, these remote imaging systems offer a quick and efficient way of obtaining high quality crop data to guide and maximize effectiveness of applications. One of the AAT group's research objectives is to develop the image systems and processing routines so that these remote sensing services could be one of the options that an applicator could offer to their customers. ■

For more information about the remote sensing research at the USDA-ARS Research Center in College Station, Texas, please contact Dr. Chenghai Yang at (979) 260-9530 or chenghai.yang@ars.usda.gov.

Change is in the Air

History teaches us that unimaginable possibilities often serve as a prelude to revolutionary advances in aviation

By Jim Anderson
NAAA Insurance Committee

Some of my relatives have been a long lived group (hopefully I will enjoy the same). My great aunt Helen lived to be 103 and was born in 1899, just before the Wright Brothers tackled powered flight. She would tell the children in my family stories of how she remembered the "big news" of the Wright Brothers when she was a little girl and how amazing they all thought it was!

My grandmother who recently passed after achieving a respectable age of 95 was born in 1917, just before the start of World War I in 1918, when aviation would play a major role in the outcome of major battles for the first time in history. I remember as a young boy talking with her about the barnstormers who would visit their small eastern Kansas town and take people for an airplane ride for what was a small fortune back then, about one to two dollars. Maybe two dollars included a loop or roll and the one dollar ride was just around the field. Later on in her life my grandmother would see her husband train in the US Army Air Corps as a radio operator and gunner for the B-24 Liberator, then travel to England in early 1944 to watch history repeat itself in World War II.

It's hard to believe in just over a century and generations later we conquered supersonic flight, landed a man on the moon, and today our aerospace industry is sending unmanned vehicles up into space on a regular basis, while other companies are working on commercializing space travel to the general public at a slightly higher price than the barnstormers of the early 20th century charged. Unlike the barnstormers of yesterday today's aviation industry works in large part from the ability of manufacturers, service providers and aircraft operators to transfer risk. Without a risk transfer mechanism technology advances, well, simply don't advance.

Looking forward, unmanned aerial vehicles, or UAVs, represent a significant spoke in the aviation technology wheel and will have an impact on all of our lives. There are some forecasts today that suggest UAVs will account for more than $89 billion in expenditures over the next 10 years, but as with most forecasts there are no guarantees. Today UAVs are predominantly used in the military for a variety of roles, but the civilian applications are beginning to take shape, such as use in law enforcement and for long aerial survey or surveillance missions. In my home state of Arizona UAVs are routinely used for border enforcement, which then makes aerial photography and filming a simple transition. I have a friend who works for a major cargo operator and they are thinking (not committing) about pilotless aircraft hauling boxes from point to point.

And did someone say aerial application work administered by UAVs? In Japan there are some 2,400 small UAV helicopters (Yamaha RMax) being used mainly for spraying and seeding, but also for remote sensing, precision agriculture and frost mitigation! If it is happening abroad and working well, then I think it is safe to say the technology will be used here in the United States in the future.

The relatively young aviation insurance industry has been through many market changes over a very short period of time. For some underwriters change represents

Right now there really is no civilian/commercial application of the UAV, thus very little risk, but with a small amount of imagination you can see the future taking shape and the risks developing and being brought to the market.

opportunity. Some underwriters will take a wait and see approach, while others will be aggressive. Regardless of the insurance market appetite, there will always be a need for operators to transfer risk, provide lenders with security for their financial interest and operators of the potential UAVs with liability protection for the bodily injury or property damage their vehicles may cause. The big problem the insurance industry will face in the wake of change is what will the future hold from a loss experience standpoint? How can underwriters, brokers and hopeful UAV operators work together to make educated decisions about pricing, limits of liability or values to insure? Underwriters live by the concept that the past will predict the future, but what if there is no past?

Just over 20 years ago I wrote my first turbine powered agricultural aircraft. This was a big deal for the company I worked for at the time so all eyes were on this transaction. The policy covered a Thrush which had been converted to handle a Garrett/Honeywell 331. I had the operator mail some pictures to me (yes, back before you could use your smartphone to take a picture and email it). I recall how strange the Thrush looked, but we were excited to get away from the somewhat unpredictable results of an airframe powered by a round engine being worked hard day in and day out. The future looked bright and seemed like hull losses would really start going down due to the reliability of a turboprop power plant and we all thought, "What an improvement for the agricultural aviation industry!" I also remember the first claim I had on the turbine powered Thrush (yes, same operator/policy). About a month after the policy was put in force the aircraft ran right into an irrigation standpipe in the field. My point is sometimes in the insurance business the results can be difficult to predict with changes in technology, even if the change would suggest an improved result.

Currently most of the underwriting my company does for UAVs are for operators who are developing this technology or "proof of concept vehicles" for what they speculate will be the demand for the civilian world and coverage for some educational institutions providing courses and degree programs for students hoping to make the UAV industry their career. Right now there really is no civilian/commercial application of the UAV, thus very little risk, but with a small amount of imagination you can see the future taking shape and the risks developing and being brought to the market. The next industry steps will be to find out the answers to a series

Sunny studio-Igor Yaruta/Shutterstock.com

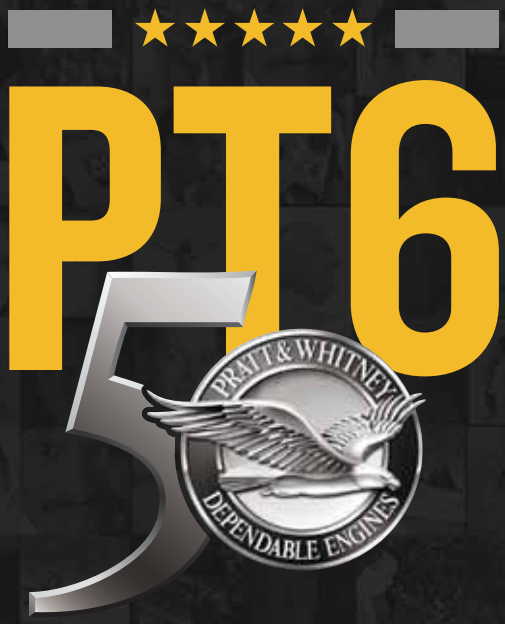
of questions. Can these vehicles be *successfully* used commercially? How will they be regulated, and how will these vehicles interact with other aircraft in the National Airspace System? What types of new exposures can we anticipate, or will they be the same? How will the courts assess liability on an aircraft that caused property damage or bodily injury to a pilotless aircraft? It almost seems like we have more questions now than answers, but, as with all things, this will come to pass.

I can almost see insurance professionals and operators of yesteryear contemplating similar types of questions as commerce progressed over the oceans carrying property or persons for hire and had great risks associated with their voyages. The railroad system was able to cross the country in a matter of weeks rather than months and had unknown perils and risk. Then aviation was born and through the years, milestones and regulation of air travel and commerce, the insurance industry has been able to devise ways to cover the companies that lead our future. I can say with a high degree of certainly not all of these early ventures were successful, nor were the insurance offerings which provided risk transfer to these new segments of industry successful. But if there is market demand there is opportunity, and the financial sector will respond with capital. Correspondingly, the insurance industry will provide the mechanisms to protect the business and property the capital creates.

Who knows? Maybe when I am of the ripe age of 100+ (wishful thinking) I can mesmerize my great grandchildren with brilliant tales of aircraft powered by fossil fuels that were flown by aviators who put themselves in harm's way in battle, or flying through weather to deliver a package, survey a power line or pipeline for miles on end, or provide aerial application to a crop in need of pest eradication. It may seem as foreign to them as my great aunt thinking a man could land on the moon in her lifetime, which they did six times over! ■

Is there an insurance matter you would like to learn more about or think would be of interest to Agricultural Aviation's readers? The NAAA Insurance Committee welcomes your suggestions. Please send insurance article ideas to information@agaviation.org.

CLASSIFIEDS



What makes a **LEGEND**? It starts with an idea, it grows with the **PURPOSE** to delight **CUSTOMERS**, and it's born from **VICTORY**. But the only legends that are truly worth celebrating are those that carry on long after the first victory lap, where **VISION**, purpose and success are ongoing. This is the legend of the PT6 engine, and now it's time for us to **CELEBRATE 50** inspiring years of turboprop **INNOVATION**.

The celebration starts at **PT6Nation.com**

Pratt & Whitney Canada
A United Technologies Company

47th ANNUAL NAAA CONVENTION & EXPOSITION

December 9–12, 2013 ♦ Reno, Nev.

Deal Me In!

The Road to Agricultural Aviation Enlightenment Runs Through Reno

By Lindsay Barber
Manager of Meetings, Marketing & Special Projects

Ante up early to get the best deal on airfare, lodging and registration at the 2013 Convention

Get ready for a high-stakes adventure in Reno, Nev., at NAAA's 47th Annual Convention & Exposition Dec. 9–12. Agricultural aviation's highest-yielding convention offers countless opportunities to conduct business for your company, visit with old and new friends and learn about cutting-edge technologies and products. NAAA's Convention & Exposition is the best place to network, socialize and hear from industry experts. And this year we've upped the ante by adding two new marquee programs to the convention slate.

You asked and we listened! NAAA is returning to lively Reno. Reno has always been a great location for pilots and exhibitors attending the NAAA Convention & Exposition because of the ample show space and numerous aircraft that pepper the trade show floor due to the large trade show doors and close access to the Reno airport.

Here's more on what's in store for you at the Biggest Little Convention in the Biggest Little City in the World.

2013 Kickoff Breakfast: The Miracle on the Hudson

Don't miss this year's 2013 Kickoff Breakfast as you'll hear the harrowing "Miracle on the Hudson" story from First Officer Jeff Skiles, co-pilot of the Jan. 15, 2009, "Miracle on the Hudson" U.S. Airways flight.

NAAA Kickoff Speaker Jeff Skiles

After taking off from La Guardia, both engines on U.S. Airways Flight 1549 failed after geese were sucked into the engines and Skiles' instrument panel malfunctioned. Captain Chesley Sullenberger took over flying the plane and tipped the nose down to retain airspeed. Within 60 seconds the two pilots concluded that returning to La Guardia or diverting to Teterboro or Newark Airports was too risky since they'd have to fly over densely populated areas and there was no guarantee that they'd make it. Surrounded by nothing but skyscrapers and neighborhoods they decided to head to the only open, flat space available—the Hudson River.

NAAA CONVENTION: YOUR BEST DEAL

Theme..... "Ag Aviation: Agriculture's Best Deal"

2013 NAAA Convention..... Dec. 9–12

Attendee Registration..... Open Now. Deadline Nov. 20. Visit www.agaviation.org or Page 38

Exhibit Booth Sales..... Open Now. Visit www.agaviation.org

Cutoff for NAAA Room Block at the Silver Legacy..... Nov. 6

Battlefords Airspray flight instructor Fran de Kock offers words of wisdoms to new and prospective ag pilots during a Compaass Rose Session at NAAA's 2012 Convention. That's Compaass Rose in a nutshell: a forum for veteran operators to impart advice and knowledge to rookie and low-time ag pilots.

Enjoy the breakfast buffet and hear the stories, lessons and scenarios from Skiles' experiences in the cockpit. His presentation will have you on the edge of your seat. Tickets for the Kickoff Breakfast and Farewell Banquet are included in the "with banquets" registration package. Anyone with a "without banquets" package can

2013 CONVENTION SCHEDULE

Updates online at www.agaviation.org

Sunday, Dec. 8

TBD	Aircraft Move
8 a.m.–4:30 p.m.	CD Aviation Session
9 a.m.–4 p.m.	Pratt & Whitney PT6 Session
12 p.m.–6 p.m.	Registration
12 p.m.–4 p.m.	PAASS PDC Meeting
4 p.m.–6 p.m.	Com*paass* Rose
4:30 p.m.–6 p.m.	NAAA/WNAAA Board Meetings
6 p.m.–7 p.m.	Operation S.A.F.E. Analysts

Monday, Dec. 9

7:30 a.m.–6:30 p.m.	Registration
8 a.m.–8 p.m.	Exhibitor Setup
8 a.m.–9:45 a.m.	Kickoff Breakfast
10 a.m.–12 p.m.	ASABE Technical Session
10 a.m.–5 p.m.	Canadian AAA Board Meeting
1 p.m.–6 p.m.	Concurrent/Company Sessions
6:30 p.m.–7:30 pm	Welcome Reception

Tuesday, Dec. 10

7 a.m.–8:30 a.m.	CP Products Breakfast
7:30 a.m.–5:30 p.m.	Registration at hotel
8 a.m.–11:30 a.m.	Exhibitor Setup
8:45 a.m.–9:30 a.m.	NAAA Business Meeting

Tuesday, Dec. 10 (cont.)

9:45 a.m.–11:30 a.m.	NAAA General Session
11:30 a.m.–6 p.m.	Registration at Conv. Center
12 p.m.–5:30 p.m.	NAAA Trade Show
5:30 p.m.–7 p.m.	Live Auction & Reception
7:30 p.m.	Pratt & Whitney Canada Reception

Wednesday, Dec. 11

7:30 a.m.–4 p.m.	Registration
8 a.m.–9:30 a.m.	Concurrent/Company Sessions
10 a.m.–4 p.m.	NAAA Trade Show
3 p.m.	Silent Auction Closes
4 p.m.–5:30 p.m.	Concurrent/Company Sessions

Thursday, Dec. 12

8 a.m.–6 p.m.	Registration
8 a.m.–11:15 a.m.	Concurrent/Company Sessions
1 p.m.–2 p.m.	NAAREF Safety Session
2:15 p.m. –3:15 p.m.	Com*paass* Rose Session
2:15 p.m. – 3:45 p.m.	Concurrent/Company Sessions
3:30 p.m.–4:45 p.m.	Ask the Expert Speed Mentoring
5:30 p.m.–6:30 p.m.	Farewell Reception
6:30 p.m.	Farewell/Awards Banquet

purchase tickets for the 2013 Kickoff Breakfast à la carte. *Sponsored by BASF.*

NEW THIS YEAR!

Safety & Speed Mentoring Sessions

Don't leave this year's convention too early! You have the opportunity to attend professional growth sessions on Thursday afternoon. We are proud to introduce two new sessions that are a must-see for experienced operators and pilots new to the industry.

For the first time ever, NAAREF is presenting the hour-long NAAREF Safety Session that will provide an overview on understanding human factors and how to eliminate stall/spin accidents. This is a must-attend session for all attendees, regardless of experience level. You can never learn enough about safety as an operator and pilot in the aerial application industry. *Sponsored by Bayer CropScience.*

If you've been in the industry less than five years, don't miss "Ask the Expert Speed Mentoring Session," which will be a series of 10-minute speed mentoring sessions with experienced operators and pilots, insurance and regulatory representatives and ag schools. This is your chance to pose questions to industry experts in a much smaller group setting than the Com*paass* Rose sessions and builds on that popular program. Attend this session immediately following Com*paass* Rose to get your questions answered and make connections with industry experts. Additional details are available at www.agaviation.org and onsite at the NAAA Convention.

Additional Sessions & Events of Interest

ASABE Technical Session: NAAA's educational programming leads off with the ASABE Technical Session,

BOOK YOUR ROOM AT THE BEAUTIFUL SILVER LEGACY RESORT CASINO

Join us in Reno at the beautiful Silver Legacy Resort Casino this December. The Silver Legacy has been completely updated since NAAA's last stay at the hotel in 2009. When staying at the Silver Legacy, you will be provided with complimentary transportation between the hotel and the Reno-Sparks Convention Center for the trade show.

The room rate is $75/night + taxes for a single or double. Book your room online at www.agaviation.org or call 1-800-687-8733 and give the reservation code NAAA13. The deadline to book your room is Nov. 6.

NAAA TRADE SHOW EXHIBITORS EXCITED TO SEE YOU

What companies will you meet with on the NAAA Trade Show floor? This is an opportunity to conduct business with 120+ companies and view seven different types of aircraft! Take a peek at who has already purchased booth space at www.agaviation.org/content/trade-show.

NAAA Trade Show Hours

Tuesday, Dec. 10: 12 p.m.–5:30 p.m. Wednesday, Dec. 11: 10 a.m.–4 p.m.

Potential exhibitors can contact Lindsay Barber at lbarber@agaviation.org or (202) 546-5722 with questions.

The NAAA Trade Show is a bustling two-day affair that attracts well over 120 exhibitors each year and countless more attendees eager to engage with them.

led by members of the American Society of Agricultural and Biological Engineers (ASABE). As always, you can expect a science-based overview of the latest state-of-the-art aerial application research, but in an effort to make the session more useful for aerial applicators, ASABE's presenters will focus more on practical uses for the information presented. *(Some states allow CEUs for this session.)*

General Session—Earning a Skeptical Public's Trust: How to Make a Compelling Case for Agricultural Aviation and the Work You Do: According to the National Institute of Food and Agriculture, fewer than 2 percent of Americans farm for a living today, and only 17 percent of the U.S. population lives in rural areas. Realistically, the farm is a long way off from the fork for 49 out of 50 Americans. Agriculture is *good* for America—and not just the 2 percent of Americans who work in it, but for all Americans. The other 98 percent don't always grasp that, however, which is why NAAA has made advocacy and public relations training the focus of the 2013 General Session.

To prepare you for answering questions and educating individuals and the media about our industry, you'll hear from Leonard Gianessi, Director of the Crop Protection Research Institute at the CropLife Foundation, about the value of modern crop protection technology in meeting global food production needs. Then you'll hear from Steve Powell of Solum Consulting about the need and importance of building an advocacy story. Powell will explain how to advocate on consumers' "turf" and provide tips for telling ag aviation's story during a news interview. All attendees, including spouses, employees of operations and allied companies, will leave this session armed with tips and resources to educate and advocate more effectively for their businesses and on behalf of the agricultural aviation industry. *Co-Sponsored by Syngenta and AIG.*

Concurrent & Company Sessions: Several education sessions will be on the docket throughout the week, including programming focused on application technology, chemicals, engine performance and maintenance, security and FAA regulations, helicopters and airframe sessions. Stay at the convention on Thursday to attend the new NAAREF Safety

SUPPORT THE INDUSTRY WITH A SPONSORSHIP

According to an NAAA Industry Survey, 73 percent of aerial applicators surveyed would be "very likely" to use the products and services of a company that sponsors an event at the NAAA Convention. Thank you to the following companies that have already committed to supporting the industry through a sponsorship.

DIAMOND SPONSORS ($20,000 or greater)

Bayer CropScience	Internet Café, Hotel Key Cards, North Entrance Vertical Sign, Window Cling, Industry Safety Session, Convention Passport
syngenta	Live Auction Reception, NAAA General Session

PLATINUM SPONSORS ($12,000–$19,999)

Dow AgroSciences	Convention Transportation, Convention Passport
BASF The Chemical Company	Kickoff Breakfast, Program Guide Ad (inside page)
SATLOC	Trade Show Bar Sponsor, North Entrance Horizontal Banner, Window Clings, Cell Phone Charging Stations, Benches, Aisle Decals, Convention Passport

GOLD SPONSORS ($5,000–$11,999)

AG NAV	Registration Signs - Conv. Center, Floor Decals, Program Guide Ad (inside page), Convention Passport, Registration Bag Item
AIR TRACTOR	Conference Registration Bags, Program Guide (Back Cover)
DUPONT The miracles of science	Farewell/Awards Banquet Co-Sponsor
AgriSmart INFORMATION SYSTEMS LLC	Convention Lanyards, Convention Passport, Program Guide Ad (inside page), Convention Benches

SILVER SPONSORS ($1,000–$4,999)

COVINGTON AIRCRAFT	Aisle Signs (Exclusive), Convention Passport
FMC	Convention Keepsake Pins
SOUTHEASTERN AERIAL CROP SERVICE	Farewell/Awards Banquet Co-Sponsor, Window Cling
AIG	General Session Co-Sponsor
Kimmel Aviation Insurance Agency, Inc.	Auction Paddles
PHOENIX AVIATION MANAGERS, INC.	Thursday Continental Breakfast
Turbine Conversions, Ltd	Cell Phone Charging Stations, Convention Passport
Aero Flow Systems	Tuesday Continental Breakfast
Star-Flex	Program Guide Ad (Inside Page)
Transland	Program Guide Ad (Inside Page)
Tulsa Aircraft Engines	Museum Booth

BRONZE SPONSORS (Up to $999)

Texas Agricultural Aviation Association	Com*paass* Rose Thursday Concurrent Session
Torell Aviation Insurance Agency	Com*paass* Rose Sunday Concurrent Session

Don't miss out on an opportunity to get your name in front of 1,200+ attendees! The earlier you sponsor, the more advertising you'll receive! Your sponsorship will be visible to attendees via convention signage and banners, in the convention program and throughout various other NAAA publications. Learn more at *www.agaviation.org/content/2013-convention-sponsorships* or contact Lindsay Barber at (202) 546-5722 or lbarber@agaviation.org.

Session, as well as the "Ask the Expert Speed Mentoring" Session. The PAASS presenters will moderate Com*paass* Rose Sessions, an information-sharing session geared toward low-time and prospective ag pilots, on Sunday and Thursday.

Trade Show & Live Auction: In NAAA's 2012 post-convention survey, 71 percent of respondents identified the NAAA Trade Show as their favorite program. There's a reason it's the convention's premier event. This year, the world's largest agricultural aviation trade show will feature 120+ exhibitors from all facets of the agricultural aviation sector and seven different aircraft. Talk to the company representatives you work with on a daily basis and learn about other allied companies that support our industry.

On Tuesday evening, join us for the Live Auction on the Trade Show Floor. This annual auction has become a highlight of the NAAA Convention with top-notch industry items to bid on and an engaging auctioneer, Kevin Palmer from Illinois. To commemorate the 50th anniversary of the PT6 engine, Pratt & Whitney Canada is contributing a brand new PT6A-34AG turbine engine. To make a donation to the Live or Silent Auction, see pg. 36. *Auction reception sponsored by Syngenta.*

Networking: The 2012 post-convention survey reveals another truism: The No. 1 reason people attend is for the networking, which practically goes on 24/7 at the NAAA Convention. Between the Kickoff Breakfast, Welcome Reception, Live Auction, Pratt & Whitney Canada Reception, Farewell Banquet, private functions and informal get-togethers, there are no shortage of opportunities for socializing and networking with friends and business acquaintances.

WNAAA Convention: Ladies, this year's WNAAA Convention offers a lot of business and a lot of pleasure with education and fun-filled activities. Learn more on pg. 39.

Check out everything that is being offered at this year's convention online at www.agaviation.org. ■

DONATE AN AUCTION ITEM TO SUPPORT THE INDUSTRY

Support the aerial application industry and get your company name in front of NAAA Convention attendees by donating an auction item to NAAA, WNAAA or both organizations. The earlier you come forward, the more exposure you'll get. In exchange for contributing to the NAAA/WNAAA auctions, we will showcase your company's contribution to the aerial application community in Reno and in the period leading up to the convention on the website and in future NAAA publications.

Donated auction items provide income for association projects and programs. To donate an auction item, fill out a form online at www.agaviation.org, contact NAAA at (202) 546-5722 or email information@agaviation.org. Big-ticket items are usually reserved for the Live Auction, with smaller items allocated for the Silent Auction, but final determinations are made onsite once all the offerings have been inventoried. ■

SAMPLING OF AUCTION ITEMS

COMPANY	ITEM
Pratt & Whitney Canada	To commemorate the 50th anniversary of the PT6 engine, Pratt & Whitney Canada is contributing a brand new PT6A-34AG engine. (See accompanying article for more details.)
AgAir Update	Lifetime Subscription to AgAir Update Two pen and ink drawings by Richard DeSpain
Air Plains Services	For Cessna 188 Operators Only: McCauley 3-Blade Propeller STC Paperwork Authorization (paperwork only, doesn't include propeller)
Phoenix Aviation Managers and John "JT" Helms	Matted print of "Leland's Legacy"
S&T Aircraft Accessories Inc.	Certificate for a Starter Generator Overhaul
Turbine Conversions	$2,000 gift certificate/card to use towards any Turbine Conversions products

The Live Auction is an important fundraiser for NAAA and great fun for everyone involved.

Pratt & Whitney Canada

Pledges Its Popular PT6A-34AG to NAAA's Live Auction

Pratt & Whitney Canada (P&WC), a regular contributor to NAAA's annual Live Auction, has made a notable donation to this year's auction: a PT6A-34AG engine. The gift coincides with the 50th anniversary celebrations of the iconic PT6 engine family.

"We are very proud that the PT6 engine has helped change the face of modern aviation," said Denis Parisien, Vice President, General Aviation, P&WC. "Its simplicity of design, versatility and dependability have made it one of the most enduring engines in aviation history. And thanks to the unmatched reliability and durability of the PT6A engine family, P&WC has gained an increasing presence in the agricultural aviation segment. As part of our 50th anniversary celebrations, it was important to us to make this contribution to NAAA's Live Auction."

"The Live Auction is a key fundraising initiative for NAAA," NAAA Executive Director Andrew Moore said. "Pratt & Whitney Canada's commitment to the ag industry and NAAA's initiatives has enabled us to raise record dollar amounts, which provide income for NAAA projects and programs. We can't thank them enough for their support."

Pratt & Whitney Canada's Denis Parisien addresses attendees at the 2012 Live Auction and shares the news that the company would be providing NAAA with a new PT6 engine for this year's Live Auction.

P&WC has a history of generous contributions to the Live Auction. In 2011 and 2012, the company donated two Hot Section Inspection certificates. P&WC also provided a new PT6A-34AG engine in 2010. "We hope this year's pledge of a PT6A-34AG will contribute to establishing a new bidding record!" Parisien said.

P&WC is in the midst of celebrations marking the 50th anniversary of its innovative turboprop's first delivery. The engine's dedicated website, www.PT6Nation.com, plays a major part in those efforts. It features a series of articles on the PT6 engine focusing on its remarkable pedigree and the people behind its success. There is also a brand-new eStore and a number of interactive initiatives, including a new mobile application designed to give P&WC's 10,000 engine operators instant access to a host of services on wireless handheld, tablet and laptop devices of all makes and models. ■

47th Annual NAAA Convention & Expo

Reno, Nev. ◊ Dec. 9-12, 2013

Pre-Registration must be received in the NAAA Office by Wednesday, Nov. 20, 2013. Use this form and register today! Registration is also available online at www.agaviation.org.

MEMBER REGISTRATION: You must be the designated member of an Operator or Allied Industry Company, State Association Executive, or have a Pilot, Affiliated Operator, Affiliated Allied, Associate, International or WNAAA membership in your name, or be the spouse of a NAAA member to qualify for member rates.

Registration at the convention site will cost $50 more per person!

EXTRA BANQUET/RECEPTION TICKET FEES: Attendance at the Welcome Reception, Auction Reception and Farewell Reception are included in your registration fee. Purchase Kickoff Breakfast or Farewell Awards/Banquet tickets only if you purchased "without banquets" package. Purchase extra Welcome Reception and Farewell Reception tickets only for guests with no registration package.

NAAA Members	Registration With Banquets	Registration Without Banquets
Member	$335	$230
Spouse	$280	$170
Child (under 12)	$115	Free

Non-NAAA Member	Registration With Banquets	Registration Without Banquets
Non-member	$460	$355
Spouse	$400	$295
Child (under 12)	$115	Free

Monday, Kickoff Breakfast	$45/each	# needed ___
Monday, Welcome Reception	$45/each	# needed ___
Thursday, Farewell Reception	$30/each	# needed ___
Thursday, Farewell Banquet/Awards	$80/each	# needed ___

REGISTRANT: First Name _____ MI _____ Last Name _____

(Please print your name as you would like it to appear on your convention badge.)

Company _____ Phone _____

Address _____ City _____ State _____ Zip _____

Country _____ Fax _____ Email _____

SPOUSE REGISTRANT: First Name _____ MI _____ Last Name _____

(Please print name as you would like it to appear on convention badge.)

ADDITIONAL REGISTRANTS:

First _____ MI ___ Last _____
First _____ MI ___ Last _____
First _____ MI ___ Last _____
First _____ MI ___ Last _____

NAAA MEMBERSHIP DUES: *(Check appropriate boxes)*

Note: Participating Operator or Pilot does not belong to a State/Regional Association. See www.agaviation.org or call (202) 546-5722 for further membership information.

- ❑ Operator: $500, plus $100/ aircraft over one
  - ❑ Extra Aircraft: $100/ aircraft over one _____
- ❑ Affiliated Operator: $200
- ❑ Participating Operator: $1,000, plus $100/ aircraft over one
  - ❑ Extra Aircraft: $100/ aircraft over one _____
- ❑ Pilot: $200
- ❑ Participating Pilot: $380
- ❑ Allied (1–10 employees): $500
  - ❑ (11–50 employees): $750
  - ❑ (51–100 employees): $950
  - ❑ (101–500 employees): $1,100
  - ❑ (500+ employees): $1,900
- ❑ Affiliated Allied: $200
- ❑ Associate: $95
- ❑ International: $250
- ❑ State/Regional Association: $750
- ❑ WNAAA: $200

PAYMENT:

Registrant Fee $_____
Spouse Fee $_____
Add'l Registrants $_____
Banquet Tickets $_____
NAAA Member Dues $_____
TOTAL DUE $_____
(*U.S. funds only, must accompany registration*)

❑ Credit Card ❑ Check # _____

Card# _____

Exp Date: _____ Phone _____

Address _____

City _____ State _____ Zip _____

_____

"Signature is permission to bill Credit Card."

Mail payment and registration form to: NAAA, 1440 Duke Street, Alexandria, VA 22314 Fax 202-546-5726
Register online at www.agaviation.org Questions? Call 202-546-5722 or email information@agaviation.org.

Saddle Up for the WNAAA Convention!

By Leslie Craft
WNAAA Convention Committee Chair

Saddle up and hitch those wagons! We are gearing up for "Ag Aviation's Best Deal" in the biggest little city, Reno, Nev.! When I think of Reno, I always remember the David Spade advertisement "Going to Reno, to play some Keno, in the Casino." Well, despite the catchy phrase, Reno is much more than just gambling. The 2013 NAAA Convention & Exposition should have plenty to offer for everyone, including several great programs geared toward the ladies.

The first NAAA Convention I ever attended was in Reno. I really didn't know what to expect. I kind of figured it would be vendors making deals, fundraising by the various industry organizations and attendees loading up swag bags full of goodies that they would never use. Boy, was I surprised! The first day I was a little on the shy side, but after a night of being a wall hanger I decided to jump in. The ladies had an amazing program, the trade show blew me away and the networking was incredible. Moreover, the overflowing swag bags were filled with useful information that we used all year long.

If you are ready for the latest in technology, the education to take you to the next level or the networking that will connect you to the next business opportunity, you do not want to miss Reno this year, especially the ladies program! Have you ever heard the saying, "Behind every successful man there is a great woman"? Well, it's true, and I like to think we make up the WNAAA!

2013 WNAAA Convention

This year's WNAAA Convention features a great slate of events, starting with an opening day Casino Royale meet and greet. Later that afternoon we'll honor our president, Dona Jorden, at the President's Open House. Come for the fellowship, and bring your big hair and dazzling good looks to our photo booth, which will be making its first appearance.

Another program dear to my heart is the Athena Project. Please join us as we look at ways to put "a positive spin on ag aviation" on Day 2. The next morning we're pleased to present a special breakfast engagement led by flight instructor Catherine (Cathe') Fish. Cathe' has taught motivating and entertaining aviation safety courses in every state in the union. In nearly 40 years of flying, she has flown more than 6,000 hours. Fish spent five years as an aviation technology professor at Cochise College in Arizona and has been an AOPA Air Safety Foundation lead instructor since 1983. You don't want to miss her fun, upbeat and motivating program, "Flying Fish's Wild, Wacky and Outrageous Pilot Whoppers." Cathe's unusual and hilarious aviation stories are sure to make you laugh, and we'll even throw in breakfast on the house! You will need a ticket for this seated event, so be sure to email me for a seat or two at *Leslie@craftairservices.com*. So what are you waiting for? Book your room and flight today! See you in Reno! ■

WNAAA CONVENTION SCHEDULE

Monday, Dec. 9

10 a.m.–12 p.m.
Meet & Greet: Casino Royale
Come try your luck ~ Is it true what they say about Lady Luck?

12:30 p.m.–2 p.m.
President's Open House: Texas Grill
Giddy Up! Texas Style Lunch ~ Photo Booth Fun!

Tuesday, Dec. 10

9:30 a.m.–11:30 a.m.
Athena Program: Putting a Positive Spin on Ag Aviation

12 p.m.–5:30 p.m.
Trade Show, WNAAA Booth & Silent Auction
Who doesn't like to shop? Especially at Christmas time! You'll find great gifts and convention apparel at the WNAAA booth. Check out the silent auction too to bid on great items that benefit the WNAAA.

Wednesday, Dec. 11

9:30 a.m.–11:30 a.m.
Breakfast with Cathe' Fish
Wacky & Outrageous Whoppers
Sponsored by GarrCo Products Inc.
Space is limited, tickets are required. Email me to order your complimentary tickets! *Leslie@craftairservices.com*

10 a.m.–4 p.m.
Trade Show, WNAAA Booth & Silent Auction*
** Silent auction closes at 3 p.m.*

3,000 and Counting!

Air Tractor presents milestone ag plane to new owner at Texas-sized celebration

Air Tractor #3,000, an AT-502B, was sold to Agropecuaria Maggi Ltda., Brazil. (Inset) U.S. Rep. Randy Neugebauer (R-TX), at right, with Air Tractor President Jim Hirsch and Director of Sales & Marketing Kristin Edwards, in front of the 3,000th Air Tractor, an AT-502B.

Air Tractor Inc. welcomed an international contingent of dignitaries to its manufacturing facilities Aug. 7 for a Texas-sized celebration that has been 40 years in the making. Air Tractor President Jim Hirsch presented the company's 3,000th airplane to its new owners from Brazil on a muggy summer day approximately 40 years after the first Air Tractor, an AT-300, was test flown. The Air Tractor AT-502B rolled off the Olney, Texas, company's production line in mid-July and had just returned from being on display at EAA AirVenture 2013 in Oshkosh, Wis.

"This is a big milestone for Air Tractor," Hirsch said. "I wish Air Tractor's founder Leland Snow could be here to enjoy this moment. The model 502B is the most popular, best flying ag plane in the world, and Leland Snow designed it himself." The 500-gallon capacity AT-502B is powered by a Pratt & Whitney PT6A-34AG turbine engine. The powerplant and the airplane's 52-foot wingspan allow the 502B to carry over two tons of liquid or dry material.

The 3,000th Air Tractor was purchased by Agropecuaria Maggi Ltda., an agribusiness subsidiary of the André Maggi Group, a Brazilian agricultural conglomerate, and the largest private producer of soybeans in the world. Itamar Locks, a partner in Agropecuaria Maggi, and Pedro Valente, Agro Division Director were on hand for the Air Tractor celebration. The company also operates three other Air Tractor AT-502B aircraft for spraying soybeans, cotton and corn.

Pratt & Whitney Canada President John Saabas traveled from Canada to be part of the festivities and to express his appreciation for Air Tractor's four-decade use of Pratt & Whitney engines. All current Air Tractor aircraft are powered by the Pratt & Whitney PT6 turbine engine series. This year marks the 50th anniversary of the iconic engine.

Randy Neugebauer, U.S. Representative, Texas District 19; Texas State Senator Craig Estes and Texas State Representative Drew Springer were also in attendance, along with Air Tractor employees and Air Tractor/AeroGlobo dealers Grant Lane and Fabiano Zaccarelli Cunha, who facilitated the 3,000th Air Tractor sale to Agropecuaria Maggi.

The Air Tractor #3000 AT-502B was on display inside Plant 2A. Given the typical 100+ degree west Texas summer temperature, most guests in attendance were inclined to remain inside for the Texas barbecue luncheon and guided tour of Air Tractor's manufacturing facilities. But those venturing outside were able to enjoy a static airplane display representing the history of Air Tractor. Air Tractor's 1000-gallon aircraft, the AT-1002, an aerial firefighting AT-802F, Walt Disney Studio's "Dusty" AT-400 and an AT-802A ag plane were parked next to Air Tractor AT-300 S/N 0002, the earliest existing Air Tractor. The R-985 radial engine-powered aircraft was purchased by the Snow family last year from Tim Steier of Blue Earth Aviation in Minnesota.

Air Tractor AT-300, serial number 0002, the earliest Air Tractor airplane still in existence, on display Aug. 7. The AT-300 was manufactured around 1973.

The "real life" version of Dusty Crophopper, an AT-400 and star of Disney's hit motion picture Planes, stopped by Olney, Texas, to participate in Air Tractor's celebration.

(Above left) On stage marking the sale of Air Tractor's 3,000th airplane were, from L–R, Grant Lane, Air Tractor dealer, Lane Aviation; Itamar Locks, Agropecuaria Maggi Ltda. partner; Pedro Valente, Agropecuaria Maggi Agro division director (with a commemorative 3,000th Air Tractor certificate); Fabiano Zaccarelli Cunha, Air Tractor Brazil representative with AeroGlobo Aeronaves, Brazil; and Air Tractor's Hirsch. (Above right) Rep. Neugebauer (R-TX) presents Hirsch with an American flag flown over the U.S. Capitol to commemorate Air Tractor's 3,000th airplane.

Air Tractor has come a long way since its early days, when in 1975 the company celebrated its annual production of 25 airplanes, Hirsch observed. Last year Air Tractor produced and sold 180 aircraft, an all-time company record. More and more of that business is going global. "Just over half of our aircraft sales are exports, which reflects the strong market presence our global dealer network has in key markets," Hirsch said. Air Tractor aircraft can be found in more than 30 countries.

NAAA congratulates Air Tractor on the delivery of its 3,000th aircraft. This remarkable accomplishment is indicative of Air Tractor's consistent and continuous excellence. ■

By Jay Calleja
Manager of Communications

If agricultural aviation is the source of your livelihood, you should be an NAAA member. If you are an existing member, thank you for your support and the opportunity to earn your business again. If you are a lapsed member, particularly in the operator or pilot categories, we encourage you to rejoin NAAA. If you have an overriding interest in agricultural aviation or would like to become an agricultural pilot, joining NAAA as an associate member is a great place to learn more about the industry.

As the voice of the aerial application industry, the National Agricultural Aviation Association supports members in many ways, acting as our voice before the media, government and public. NAAA and its foundation NAAREF also provide industry-leading education and training programs which enhance safety and professionalism, including PAASS, Operation S.A.F.E. and Com*paass* Rose for new and low-time pilots. Beyond those frontline programs, NAAA provides a wide range of exclusive member resources and services. If you became a member for the first time, NAAA wants to make sure you are aware of every avenue available to you. That's important for veteran members too. Considering NAAA's ever-expanding array of member benefits, even its most ardent supporters would be hard-pressed to remember them all.

So what can NAAA do for you, and perhaps more importantly, how can you get the most out of your NAAA membership? Here are 10 ways to maximize your NAAA membership.

1. Take advantage of the Operation S.A.F.E. Rebate Program: Thanks to the generous support of BASF, operators can subsidize their 2013 NAAA operator membership dues by earning a $225 rebate or qualify for up to $225 off the cost of purchasing new nozzles and/or tips for each eligible aircraft that they personally pattern test at an Operation S.A.F.E. Fly-In. In addition, NAAA member pilots can earn a $170 rebate, which would allow many of them to recoup nearly the full cost of their membership dues. The eligibility period for BASF's incentive program covers Operation S.A.F.E. Fly-Ins offered between Oct. 1, 2012, and Sept. 30, 2013. Rebate requests must be received by the rebate program's auditor by Oct. 15. To learn more about BASF's Aerial Application Equipment and NAAA Membership Program, refer to the official program rules at *www.agaviation.org/content/basf-and-naaa-operation-safe-incentive-program-rules-application-form*.

2. Get in the know with NAAA's publications: This includes *Agricultural Aviation,* the NAAA eNewsletter and Membership Directory and NAAREF's Fly Safe Campaign messages. The NAAA eNewsletter covers current events and is NAAA's prime means of keeping members apprised of major developments within the industry. It comes out as often as warranted *(see related story on pg. 47)*. *Agricultural Aviation* is published bimonthly and is NAAA's flagship publication. It covers industry trends, regulations and other topics of interest. Fly Safe delivers important safety reminders to operators and pilots during the spring and summer. New Fly Safe messages go out by email or fax. Previous Fly Safes are archived at *www.agaviation.org/content/fly-safe-messages*.

NAAA's Membership Directory contains a wealth of information for easy reference. Members can look up fellow members by last name or their state association affiliations; Allied members by company or category; NAAA, NAAREF and WNAAA Board members and committees; and all state and regional association contacts. There's also extensive government information, including FAA contacts and state pesticide

official listings. In short, the directory boils down everything NAAA has to offer in one handy resource.

3. Save on NAAA's Annual Convention:

You won't find a better opportunity to network with operators and pilots or stay abreast of the latest technology, products and trends impacting your business than at NAAA's Annual Convention & Exposition. As an NAAA member, you'll benefit from the reduced member rate when registering for the convention *(see form on pg. 38)*.

4. Access premium content at www.agaviation.org:

NAAA's website has a treasure trove of premium content available exclusively to members, including access to eNewsletter and magazine archives, government relations briefs, PAASS Program workbooks, fuel tax exemption information, and the very best guidance on complying and protecting yourself from $37,500-per-day penalties for NPDES PGP violations (more on that in No. 5). Want to reach out to another member you met at the convention? Use the Online Member Directory to find them quickly.

One NAAA member decided the information in *Agriculutral Aviation* is so good he ought to be sharing the magazine. So he purchased gift subscriptions for key customers and crop consultants. When a new issue arrives, the mailing label has "courtesy of Tim Shamblin" printed on it along with the name and address of the recipient of the new subscriber. If you would like to give a gift subscription to someone please use the print form found on pg. 54 to ensure that the new subscription is set up correctly. Extra subscription forms are available at *www.agaviation.org/content/agricultural-aviation-subscription-form*.

Agricultural Aviation
Magazine Subscription Form

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Agricultural Aviation is the official publication of the National Agricultural Aviation Association and is published six (6) times per year on the following schedule: January/February, March/April, May/June, July/August, September/October and November/December

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1. Mail to address listed above
2. Fax to (202) 546-5726
3. Email to information@agaviation.org

Rev 07.1

5. Review NAAA's NPDES PGP compliance tools:

NAAA has developed a wealth of material to help members remain in compliance with the various state and federal NPDES pesticide general permit requirements. This includes a "model contract" for reference when preparing contract negotiations with clients and is designed to help you avoid being categorized under the NPDES permit as a "decision maker" instead of an "applicator." A link to NAAA's compliance tools page is available on the homepage of www.agaviation.org.

6. Promote tower safety with NAAA's wind tower education materials:

Join NAAA in confronting a "towering" problem! NAAA has launched a public outreach campaign to raise awareness about the worrisome effects of wind energy development on agriculture and aviation. The industry's concerns about safety and accessibility are addressed in a series of Wind Tower Education Ad Slicks and Radio Scripts, as well as our newest campaign tool, NAAA's

Consult the NAAA Media Relations Kit before your next interview or speaking engagement.

Wind Tower Statement Stuffers. Each ad ends with the tagline, "Let's Be Fair About Sharing The Air." Visit www.agaviation.org/towers.htm to learn more.

NAAA's Aerial Application 101 presentation spawned from a member request for material to share with a group. The presentation is available for members' use in the News & Publications section of NAAA's website.

7. Use NAAA's public outreach tools to educate your community: NAAA offers several tools to help members accurately and eloquently explain what we do as an industry and why it's important. Here are some of those tools of eloquence.

Aerial Application 101 PowerPoint Presentation: NAAA's newest resource is a PowerPoint presentation members can use whenever they're invited to speak to a classroom or group about the industry. If you've ever had trouble coming up with things to talk to about at an event, our new presentation serves as a helpful script. It's also a terrific visual aid, blending a mix of statistics and aerial application images. "Aerial Application 101: A Vital Component of Production Agriculture" is available for download on NAAA's website at *www.agaviation.org/content/aerial-application-101-presentation*.

NAAA Media Relations Kit: This members-only resource includes advice on communicating with the media and elected officials, as well as background information and talking points about the importance of aerial application and a number of other subjects. The media relations kit also includes industry factsheets for handouts and sample press releases. The NAAA

Who's Hiring? Who's Looking?

Visit www.agaviation.org/jobs.

Media Relations Kit is available in hardcopy form (while supplies last) and on NAAA's website at *www.agaviation.org/content/naaa-media-relations-kit*.

Aerial Application's Growing Role: This DVD educates viewers about the history, benefits and importance of aerial applicators to agricultural and forestry production. It is available for viewing on the homepage of NAAA's website and on YouTube. DVDs are $20 each and can be purchased by contacting NAAA at (202) 546-5722.

"Why? Because" Brochure: An old faithful, this brochure introduces the public to the importance and need for aerial application. It's a great P.R. piece for media, field days and congressional visits. "Why? Because" is free to members. Contact NAAA at (202) 546-5722 to request copies.

8. Try NAAA's Job Board: If you're an operator who needs a pilot or a pilot looking for work, advertise by posting a free job listing on NAAA's website. NAAA members can post, modify or remove their job listing at any point. Visit *www.agaviation.org/content/job-listings* to get started.

9. Have a Voice in Government:

AgAv PAC empowers the ag aviation industry to help shape the political environment and enhances NAAA's ability to reach national policymakers and increase their awareness of the essential role aerial applicators play in enhancing food, fiber and bio-fuel production, protecting forestry and controlling health-threatening pests. AgAv PAC raises funds to elect candidates who will seek public policies that support the aerial application industry. You can help by contributing to this cause. To donate, visit *www.agaviation.org/content/pac-donation-form*.

10. Serve on the Board of NAAA/NAAREF/WNAAA:

Being an NAAA Board Director is one of the most challenging, rewarding and impacting ways to serve our industry. NAAA's board is made up of 51 directors from the agricultural aviation industry and allied companies that support the industry, in addition to dozens of other members who are appointed to serve on various committees. The WNAAA and NAAREF boards have committees too. Serving on the board is a win-win-win situation. It's good for you, it's good for NAAA and it's good for agricultural aviation. Contact your state association or the appropriate president to learn about ways you could serve on the board.

We could continue, but you get the idea—the payoff from being a member far exceeds what you will invest in dues! Join the cause of preserving and protecting the aerial application industry and your livelihood by joining NAAA if you aren't a member already. To sign up, call (202) 546-5722 or visit *www.agaviation.org/content/membership* to apply online. ■

Why Your Membership Matters

By Mike Rivenbark, Executive Director, North Carolina Agricultural Aviation Association

A behind-the-scenes view of NAAA leads to a new appreciation for agricultural aviation associations

The first time I was given the privilege to fly in an ag seat, my operator, who had 45 years of experience at the time, asked if I knew what NAAA was. Yes, sir, I replied. I had joined the previous year while still in ag flight school, pretty much just to get the NAAA magazine and start learning about the business. He went on to tell me that he had been a member his entire ag flying career.

I knew what NAAA was, but at the time I didn't realize the significant role they play in keeping ag pilots and operators in the air.

During my first seat in North Carolina, I became an active member in our state association, the North Carolina Agricultural Aviation Association (NCAAA). The first function I attended was an Operation S.A.F.E. fly-in. My operator wanted me there—without the 602B Weatherly I had 50 hours in—to see what Operation S.A.F.E. was about. "Sure, why not?" I remember thinking. "It's a free lunch, and maybe I will learn a little more." I did. The next year I was able to take the plane down and have it pattern tested myself.

The next two seasons seemed to fly by (no pun intended). Becoming more active in my state association and picking up an additional seat for the corn run in Nebraska, NAAA was everywhere I went.

My perspective on the importance of NAAA and our state associations grew even more beginning in March 2012. North Carolina's executive director had stepped down after serving the association for 11 years, and somehow my name came up to fill the position. I accepted the challenge, thinking, "It can't be that much work, right?" Man, was I wrong! That opened my eyes about a lot of things I had taken for granted. Dealing more with NAAA as NCAAA executive director, I now realize there is a whole lot more that goes on behind the scenes at the state and national level than one may know. Last February, I had the chance to attend NAAA's spring board meeting in Washington, D.C. I had an open invitation to sit in any of the committee and open board meetings that would benefit our state. The amount of business covered in two days will make your head spin.

The point I'm trying to make is, without NAAA, agricultural aviation as we know it would not be possible. Government regulations would be more stringent, possibly even to the point of no pesticides being applied by air. The things we may take for granted and enjoy, like the annual convention, would not be possible. The guidance NAAA passes along to our state associations would not be there. Planning for all of the programs mentioned above does not happen overnight. It happens throughout the year, during summers when everyone is thinking of how to get the acres on the book caught up and throughout the winter while we are getting the planes ready for the next season.

Every operator and every pilot in the agricultural aviation industry benefits from the "behind the scenes" role NAAA plays in our career. But NAAA can't do it without the support of members and sponsors. Before you close the books on the 2013 ag spraying season, make sure your membership is renewed for your national and state association. Get involved in your state association. The contacts you make, the knowledge you gain and the work you put in is worth the reward in the end, starting with the ability to spray again next year. ■

NAAA's eNewsletter

provides news and updates when the magazine can't

As the official publication of the National Agricultural Aviation Association, *Agricultural Aviation* strives to produce interesting and relevant content that will appeal to industry professionals and educate government officials and other non-industry readers about the important role aerial applicators play in American agriculture. Meaty stories that examine aerial application industry trends, research and technology, regulations and NAAA's government relations efforts on behalf of the agricultural aviation industry are the magazine's stock in trade.

As good as *Agricultural Aviation* is, it is not a very good outlet for breaking news. A bimonthly publication published six times a year lacks the immediacy and flexibility needed to deliver timely updates and instant analysis. That's where the NAAA eNewsletter comes in. Unlike the magazine, which is circulated to members and non-members, the NAAA eNewsletter is intended for NAAA members only who get breaking news alerts and updates about NAAA activities at least three and sometimes as many as five times a month. The eNewsletter is NAAA's primary form of ongoing communication with the membership, which is why we encourage all members to read their newsletters on a regular basis. *The Washington Post* ends each of its radio ads with the slogan, "If you don't get it, you don't get it." All members with an email address on file automatically get the NAAA eNewsletter, but whether they *get* it hinges on whether they take time to read it.

Key words found in headlines of the 2013 editions of the NAAA eNewsletter.

Members who overlook the newsletter are missing out on a key element of their membership. From July 2012 to July 2013, NAAA published 45 newsletters covering hundreds of articles that had little to no crossover in the magazine. Have you ever seen an Airworthiness Directive (AD) discussed within these pages? Notices about ADs and Special Airworthiness Information Bulletins (SAIB) are issued frequently in the eNewsletter, but that's just one example of the kind of exclusive content contained in the newsletter. Grassroots alerts are another. Grassroots alerts require swift action and would be moot by the time they would appear in the magazine. In addition to timely notices, the NAAA eNewsletter covers a wide range of industry-related topics.

You can get a pretty good sense of what those topics are by examining the word cloud shown here. For this example, we plugged in the headlines of every 2013 NAAA eNewsletter

sent from January to mid-July, a sample size of 24 issues. The cloud gives greater emphasis to words that appear more frequently in the headlines, so news about pending legislation, FAA ADs, membership, the NAAA Convention and Disney's *Planes* have been popular subjects this year. (Mention of NAAA, the most commonly cited word in the headlines, was omitted for the purposes of this word cloud exercise.)

Members who overlook the newsletter are missing out on a key element of their membership. From July 2012 to July 2013, NAAA published 45 newsletters covering hundreds of articles that had little to no crossover in the magazine.

If you aren't getting the newsletter, here's what it would look like when it arrives in your email inbox. This is also referred to as the "Newsletter Home" page if you are reading it online. The front page of the newsletter begins with a series of headlines and short teasers that link to the full articles. Each article appears on a stand-alone page, but the blue sidebar remains static on every page. The sidebar repeats the headlines and allows readers to quickly navigate from one article to another. Links to popular pages on NAAA's website and back issues of the newsletter are also found in the sidebar.


Print Version | Newsletter Home | NAAA Home

National Agricultural Aviation Association

NAAA NATIONAL AGRICULTURAL AVIATION ASSOCIATION eNewsletter

Voice of the Aerial Application Industry

July 11, 2013

Second Time is a Charm: House Passes Ag Policy Portion of Farm Bill

House Republican leaders have split the farm bill and brought the legislation to the House floor for a vote this afternoon. Read More

Share this article:

Pollinator Protection Prompts Environmentalists to Recommend Suspension of Neonictinoids

With massive bee deaths of approximately 50,000 bees in Oregon in June, environmental advocacy groups in our nation's capital are urging President Obama to direct the Environmental Protection Agency (EPA) to follow suit of the European Union and suspend certain neonictinoid pesticides. Read More

Share this article:

Dry Fertilizer Work and Other Opportunities Available on NAAA Job Board

Are you a pilot looking for a seat or an operator looking for a pilot? Whether it's long-term work or a short-term assignment, such as the case of an operator in South Georgia in need of an extra pilot and aircraft to help lighten a heavy workload, NAAA's Job Board is a resource for owners and pilots to connect with each other. Read More

Share this article:

FAA Certifies Thrush 510G Dual Cockpit Aircraft

Thrush Aircraft announced yesterday that it has received FAA Type Certification for the dual cockpit version of the Thrush 510G. Read More

Share this article:

High School Correspondent Extols Virtue of Ag Aviation

An Arkansas teenager and budding writer has taken it upon herself to spread the good word about agricultural aviation by writing about its value to farming communities as a summer correspondent for her local newspaper. Read More

Share this article:

IN THIS ISSUE

- Second Time is a Charm: House Passes Ag Policy Portion of Farm Bill
- Pollinator Protection Prompts Environmentalists to Recommend Suspension of Neonictinoids
- Dry Fertilizer Work and Other Opportunities Available on NAAA Job Board
- FAA Certifies Thrush 510G Dual Cockpit Aircraft
- High School Correspondent Extols Virtue of Ag Aviation
- NAAA Convention Hotel Information: Beware of Fraudulent Company Trying to Book Hotel Rooms
- Convention Schedule Correction in July/August Agricultural Aviation Magazine
- AD Issued for Restricted Category Main Rotor Hub Strap Fittings

CALENDAR OF EVENTS

September 9-10
Kansas AAA Pattern Testing Clinic
Larned-Pawnee County Airport
Larned, KS
*Weather Date: Sept. 11
Analyst: Sam Styron
Local Contact: Steve Gross
(620) 285-5609
Add'l. Info.: **KAAA Calendar**

September 19
OAAA Operation S.A.F.E. Fly-In
Okmulgee, OK
Analyst: Dennis Gardisser
(501) 676-1762
Local Contact: Sandy Wells
(405) 341-3548
oaaa@sbcglobal.net
**Rain Date: Sept. 20

Fig. 1. *The NAAA eNewsletter's simple-yet-sleek design enables NAAA to deliver a maximum amount of news and information in a minimal amount of space.*

Social media sharing icons appear underneath the teasers in the email version and at the end of the full version of articles. These icons allow members to share newsletter articles with their friends and contacts across three social networks, Facebook, Twitter and LinkedIn.

Another advantage of the eNewsletter is its ability to feature video and audio files, and NAAA has utilized this function to share trailers for Disney's *Planes,* television news clips and renovation updates during construction phase prior to NAAA's move-in into its new Alexandria, Va., headquarters last summer. The example from the July 3, 2013 eNewsletter edition (Fig. 2) features a video marking the 50th anniversary of Pratt & Whitney Canada's PT6 turbine engine.

Social media sharing icons aren't the only interactive elements of the NAAA eNewsletter. Readers can also add and view comments by clicking on the links found at the end of many articles or respond to NAAA's ePoll questions. Poll

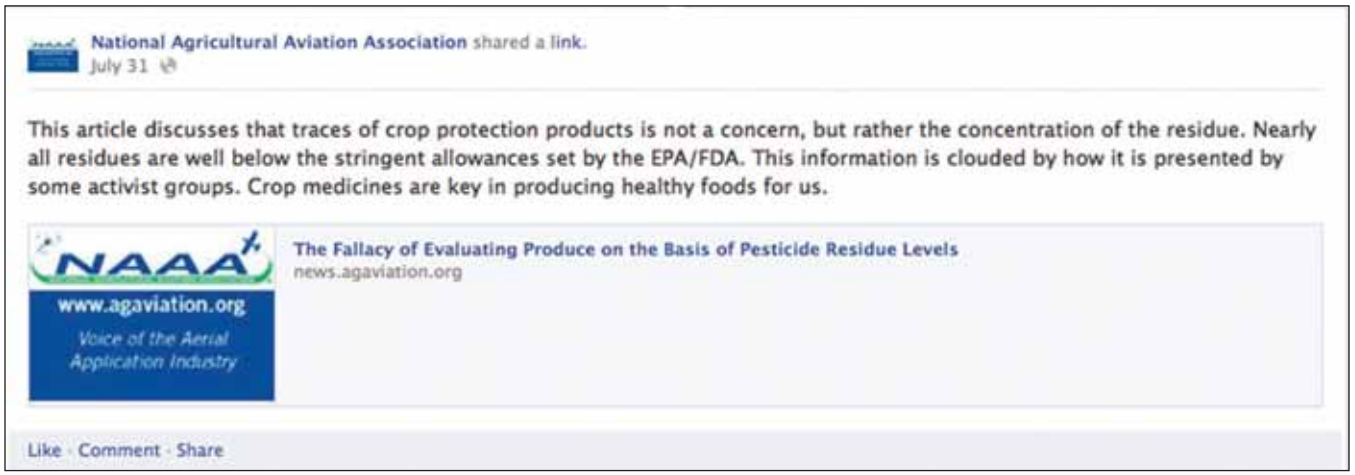
Fig. 2. One of the advantages of NAAA's eNewsletter is its versatility. The multimedia platform gives NAAA the capability to augment articles with audio and video content. Readers have the option of commenting and sharing articles with their networks on Facebook, Twitter and LinkedIn.

Fig. 3. Look for ePoll questions under the headlines in the newsletter's sidebar.

questions will appear below the headlines in the sidebar adjacent to each full article; they do not display in the email version because you have to be online to participate in the ePoll. In the event of an ePoll question, NAAA will typically draw readers' attention to the question by way of a brief story about the poll question (see Fig. 3).

Finally, if you would prefer to print out an issue, a print-friendly version of the full newsletter is accessible at the top of every page. Just click on "Print Version" in the header above the eNewsletter's masthead.

The NAAA eNewsletter is a quick, informative and lively read and an essential element of NAAA's communications portfolio. Back issues are archived in the News & Publications section of www.agaviation.org, but the best way to consume the NAAA eNewsletter is



Occasionally NAAA will post eNewsletter stories on its Facebook page, www.facebook.com/NationalAgriculturalAviationAssociation. You can follow NAAA by "liking" us on Facebook. Doing so enables content NAAA posts on its page to show up on your Facebook news feed.

in real time the same day or week a new issue comes out.

How to Get It

If you are a member and have not been receiving the NAAA eNewsletter, contact NAAA at (202) 546-5722 to provide a unique email address (one that isn't shared with another member) or verify that we have the correct one on file. If you would like to stay up to date on the latest aerial application industry news and information contained in the NAAA eNewsletter but aren't a member, there's a simple solution. Joining NAAA is fast and easy. A membership application is available on pg. 57 or you can join online at www.agaviation.org.

In addition to the NAAA eNewsletter, Fly Safe alerts from NAAA's sister organization, the National Agricultural Aviation Research & Education Foundation, are another valuable resource emailed to operators and pilots during the most active parts of the flying season. Visit *www.agaviation.org/content/fly-safe-messages* to learn more about the Fly Safe Campaign. ■

newcorner/Shutterstock.com

Past, present and future lessons abound at PAASS, which is precocious as ever entering its 16th season

By Ken Degg, Director of Education & Safety

The PAASS Program will embark on its 16th year of educating pilots on key safety, security and drift minimization issues important to flying, modern agriculture and crop protection when it kicks off the 2013–2014 PAASS presentation tour in mid-October. What can you expect to get from this year's program? The most instructive way to answer that is to look back at the lessons gleaned from this past season's installment of PAASS.

It was a banner season for PAASS, drawing a near-record number of attendees in 2012–2103. Total registered attendance numbered 1,994 participants, the second highest amount in the 15 years the program has been presented. Only 1999–2000 season had a higher attendance with 2,104 participants, and that was one of the two years it was presented to the Canadian Aerial Applicators Association.

Beginning Jan. 1, attendees had the opportunity to use electronic audience response technology to participate directly in the program. Participants applauded the addition of the tablets saying they have never felt so involved in the presentation. This interactive technology allowed them to make a response that was instantly displayed along with other opinions as the program progressed. The tablets were used on a somewhat limited basis while the presenters and attendees became familiar with them, but they will be more widely available this season.

PAASS-ing Thoughts from 2012–13 Program

Now, let's look at a few of the important take-away messages from PAASS 2012–2013. It began with the *Airfield Watch Module* and a reminder to remain vigilant to protect aircraft, equipment and chemicals from anyone wishing to use them for purposes other than intended. Tips were presented on using texting as a way for companies, groups or associations to quickly pass warning messages to individuals. This works especially well since almost everyone carries a cell phone but may not have immediate access to email.

The *Human Factors Module* took an in-depth look at stall-spin accidents, which are almost always fatal when an ag pilot ends up in one. Interviews with Wayne Handley, a renowned aerobatic pilot and former ag operator, and Dusty Dowd, a Kansas ag operator and aeronautical engineer, explored the reaction of the airplane to various control and power inputs. The module was not presented as a "how-to" recommendation on spin recovery but rather to recognize the approaching condition and take steps to avoid it. Contrary to common belief, most fatal stall-spin accidents happen when the aircraft is lightly loaded rather than when it is heavily loaded.

The primary lesson presented in the *Drift Mitigation Module* is the effect of aircraft speed on spray droplet

characteristics. Although droplet size is determined by nozzle type, orifice size, pressure, deflection angle and speed, speed is the dominant factor in droplet size in the newer aircraft capable of higher speeds. Faster application speed results in a smaller spray droplet size, but an increase in spray pressure generally increases the droplet size. More research must be done using high speed wind tunnels, but so far studies suggest higher pressure may be the answer to reducing drift at increased speeds.

The module concluded with interviews with a representative of an insurance underwriter detailing the company's experience with claims submitted to them. As could be expected, some of the claims were from spraying in adverse weather conditions such as unfavorable winds or inversion conditions. More and more claims seem to come from failure to scout the fields and identify whether or not the adjacent crops are GMO. This information needs to be ascertained before the pilot goes to the field since he is unable to determine this from the air. Properly identify the field before treating to make sure you are not applying in the wrong field. Claims are paid each year because of contaminated chemical which were not the result of improper cleaning of the hopper or mix system. Always know what products are contained in premixed loads brought to your operation by a dealer or grower for application. Underwriters suggest getting a statement from the provider of the mix that they will take responsibility for the contents of the mix. Likewise use caution when receiving opened containers of chemical. If they are to be used, take a sample of the chemical in case the load is contaminated as proof of responsibility. The insurance company recommends keeping good records to keep details of the application from being lost as well as meeting legal requirements. In summary, be professional, act professional and do the right thing.

The *Hangar Flying Module* reviewed the accidents occurring during the 2013 application season. Remaining parts of the module took a closer look at the accidents for the period of 2006–2010 with regard to pilot's age, flight experience and the probable cause of the accident; updated attendees on the EPA's NPDES pesticide general permit (PGP); and examined high-profile cases of firearms being discharged at ag aircraft.

New Season, New Lessons

The 2013–2014 PAASS Program promises to bring more high-class education to attendees. In brief, the new program modules will focus on the following topics:

The *Airfield Watch Module* once again will stress the importance of maintaining vigilance over your operational equipment and chemicals. An aircraft theft that occurred during 2013 demonstrated to NAAA the lack of coordination between government agencies which delayed actions we could have taken. Once a state organization was asked to make their members aware of the incident, the pilot and aircraft were located within hours. Working with the FBI and TSA, NAAA will attempt to implement a new notification system to make the Association aware of stolen equipment.

The *Human Factors Module* will capitalize on a unique opportunity to study an aircraft accident which occurred in 2012. With the assistance of the operator and the pilot involved, the program will analyze the entire occurrence and pinpoint how the accident chain could have been broken to prevent the accident. Some suggestions on the techniques used for dumping a load will be addressed.

For the new *Spray Drift Module*, PAASS investigated the claims paid by insurance underwriters for crop damages made on behalf of operators and sought out details of some of these claims. Many dollars were paid out for claims other than drift caused by adverse weather conditions such as wind and inversion conditions. Further investigation revealed many of the claims were the result of applying to the wrong field or using the wrong chemical. Some claims resulted from contaminated chemical being applied for various reasons. A major problem now is improper crop identification of susceptible crops adjacent to the target field. PAASS will present some thoughts to head off some of these potential problems.

Finally, the *Hangar Flying Module* will again document ag accidents that occur during the 2013 season. Information will be given on the aircraft type, location, cause of the accident when known and a comparison of accidents in prior years. We will again present "Are You Smarter than a Student Pilot?" using the audience response clickers to stimulate interest in increasing your knowledge of agricultural aviation. As usual, *Hangar Flying* will brief attendees on late-breaking happenings that influence ag pilots and operators.

The PAASS Program Development Committee is sure you will find something of interest to you or something you need to become familiar with. We look forward to seeing you at a state or regional convention PAASS Program. Consult the NAAA website calendar at *www.agaviation.org/events* for the date and location of a presentation near you. ■

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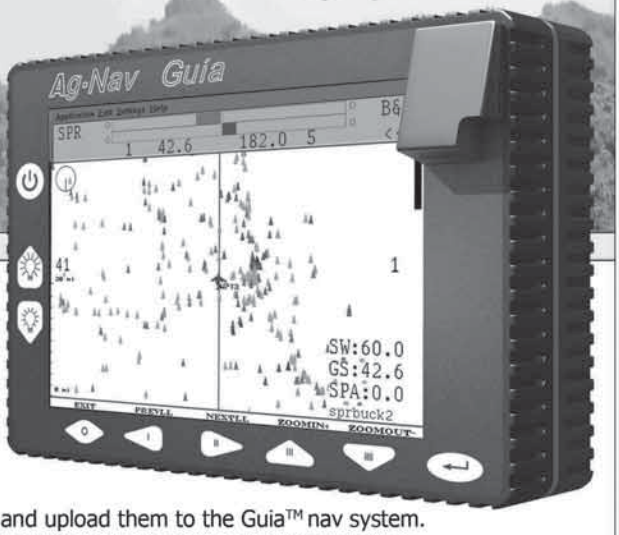

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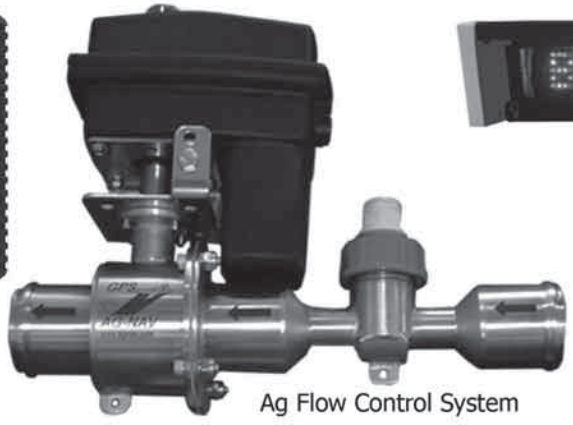

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Wilbur-Ellis Company
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Date	City	State	Aircraft Type	N #	Injury	Description of Accident
05/14/13	Galena	KS	PA-36-285	57719	Minor	Power loss–lost oil pressure and force landed
05/23/13	Longview	TX	AT-602	583LA	None	Fuel exhaustion
05/24/13	Wheatland	WY	AT-301	23647	None	Power loss–hit irrigation ditch on forced landing
06/01/13	Hamlin	TX	S-2R	4946X	Minor	Lost control–landing in 23 gusts to 28 knot quartering tailwind
06/06/13	Covington	OK	G-164B	6754Q	None	Settled to ground after takeoff
06/12/13	Boise City	OK	S-2R	2249U	None	Power loss–damaged on forced landing
06/18/13	Maplewood	MN	Bell 47G-3B	5024N	FATAL	Hit building for unknown reason
06/23/13	Campbell	NE	AT-502B	6017E	None	Settled to ground after takeoff
06/26/13	Colome	SD	AT-301	3168X	None	Power loss–damaged on forced landing
07/02/13	Ipswich	SD	AT-402B	2072D	None	Settled to ground after takeoff
07/03/13	Tillar	AR	AT-502B	5182C	None	Lost power on takeoff–throttle pin missing
07/04/13	Colfax	LA	G-164B	8187K	Minor	Hit tree during application
07/06/13	Plover	WI	Bell 47G-3B	7924S	Minor	Power loss during spray turn
07/08/13	Beaufort	NC	G-164B	6651K	None	Brake failed on landing–ran off runway

Planes Scores Well With Audiences; Sequel Slated for Summer 2014

Disney's *Planes* flew up the box office charts, grossing $22.5 million in its opening weekend, making it the biggest opener ever for an animated movie in the month of August. Overall, it finished third among movies opening Aug. 9–11.

The animated comedy adventure starring Dusty Crophopper fared well with the film-going public despite mixed reviews from critics. Movie patrons gave it a CinemaScore of "A-," which measures movie appeal by polling opening night moviegoer reactions. A movie's overall CinemaScore can range from A+ to F. Audiences for *Planes* also had a strong male contingent. According to Box Office Mojo, the opening weekend audience was 51 percent male, which it says is "unusual for an animated movie," and primarily consisted of families (85 percent).

Planes initially was conceived as a direct-to-DVD spinoff of the highly successful *Cars* films, but like Dusty, who yearns to break out of his low and slow mold to compete as a high-flying air racer, Walt Disney Studios had bigger aspirations for the film. Disney threw its considerable marketing muscles into promoting *Planes* this summer, and is clearly bullish on the franchise. In the closing credits for *Planes,* Disney revealed that Dusty and friends will be back in the summer of 2014 in *Planes: Fire & Rescue.* The release date is tentatively slated for July 18, 2014.

The voice of Dusty, comedian Dane Cook, with Elisabeth East and Brennan Edwards at the Hollywood premiere of Planes.

On Aug. 5, Disney's lovable crop duster received the full red carpet treatment at the world premiere for *Planes* at the El Capitan Theatre in Hollywood. The family of Air Tractor founder Leland Snow attended the premiere along with various Hollywood A-listers and celebrities. The Snow contingent included matriarch Nancy Snow; daughter Kara East and granddaughter Elisabeth; Kristin and Trevor Edwards, Snow's daughter and son-in-law, and their son Brennan.

Disney's Planes *had the best opening weekend ever for an animated movie released in August.*

Kristin Edwards said there's a lot to like about Dusty and the way he represents agricultural aviation in the film. "Even though the 'crop dusting' element was part of the background story, the character of Dusty is a positive role model for kids to teach them perseverance, working toward a goal, overcoming fears and being a good friend," Edwards wrote in an email. "I think this positive image association will help create more goodwill towards our industry."

NAAA Executive Director Andrew Moore saw *Planes* in 3D at an advance screening at the American Film Institute's AFI Silver Theatre in Silver Spring, Md., and was impressed by the quality of the aviation scenes. "The Disney imagineers did their research creating *Planes,*" he said. "Aviation enthusiasts, especially ag aviation enthusiasts, will be impressed by the proper use of aviation techniques and jargon used in the film. From an effects standpoint, watching it in 3D took me into the cockpit of an air racing aircraft during a competition. I felt I was actually experiencing Dusty Crophopper's barrel rolls and knife-edges."

Even before most Americans had the chance to see it, *Planes* had already been a revelation for the aerial application industry. Its significance is not lost on Moore. "I remain deeply struck by how great this film is for our industry," he said. "The company that brought to life the cultural icons of Pinocchio, Bambi and Lighting McQueen now has added a principled, hard-working and kind crop duster to its inventory of beloved animated characters. How great is that?" ■

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