# Agricultural Aviation

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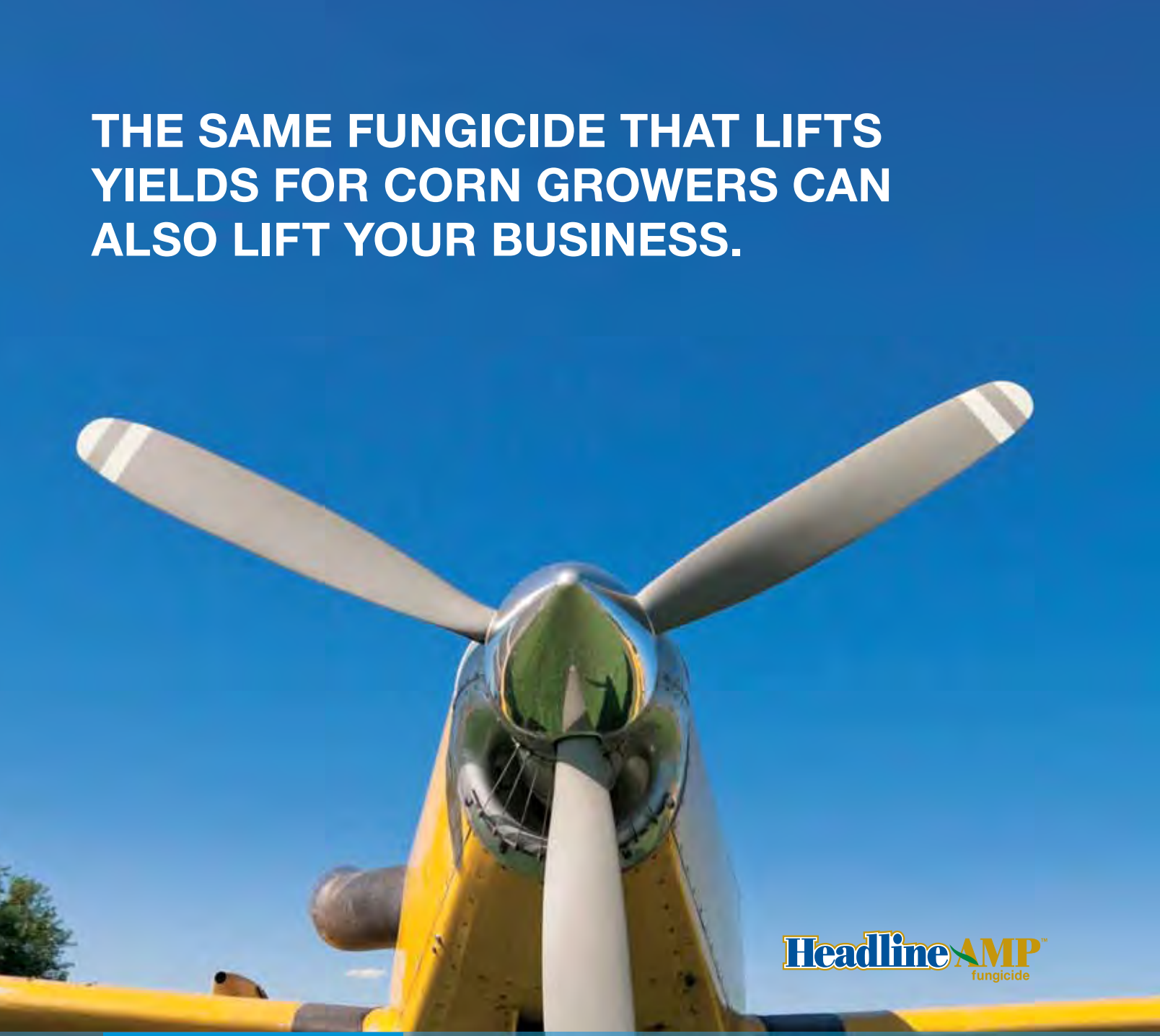


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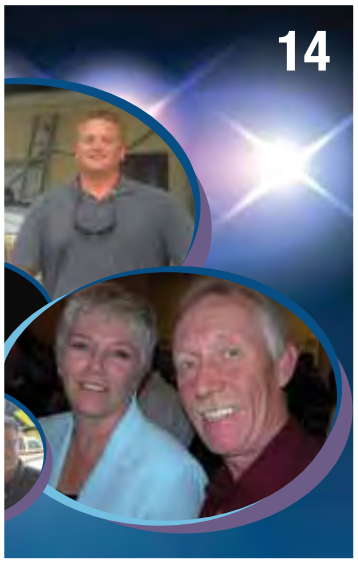
# Contents




## ON THE COVER

*It takes more than airplanes to make an agricultural aviation business go. To see the big picture you need to look at it from the ground up*

## ALSO INSIDE:

*Wheat conjures up several paradoxes for aerial applicators*


## COVER STORY



## FEATURES



## NOTES



## DEPARTMENTS



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# President's Message

Rick Richter

## Skilled Employees Are Worth Their Weight in Gold

This issue's cover story focuses on the ground support that is so important to getting our job done correctly and on time. Statistics tell us the average aerial application business has two aircraft and employs four people: two pilots, a mixer/loader and an administrative staffer. If just one of these key employees drops the ball it could jeopardize the successful outcome of the entire operation.

Teamwork is tantamount to a business running smoothly and productively. Communication also plays a large role in the successful outcome of all applications. In my opinion, each person's role is just as important as the other. Granted, only the pilot can fly the aircraft, but he still depends on the mixer/loader to keep him flying and not on the ground any longer than necessary.

I often think back to when we were dependent on human flaggers. According to our recent industry survey, 93 percent of the current ag aircraft fleet in this country is equipped with GPS for swath guidance, and 19 percent use automatic flaggers. Just 1 percent uses human flaggers today. Let me say this loud and clear, THANK GOD FOR GPS. We have just about eliminated both the extra staff required for flagging and the huge liability. I've flown with flagmen for a good part of my 30-plus-year career and it still amazes me every time I power up my GPS and—within minutes—I am ready to go to work. If I had to name one thing that revolutionized our industry, it would be, unequivocally, the advent of the GPS. (*For more on GPS and the interference debate raging in Washington, see pg. 10.*)

Aerial application is highly dependent on skilled employees. Understanding and accepting this simple fact will go a long way toward ensuring that your business is surrounded by qualified and confident people.

We might have taken two people from the equation, but that doesn't mean we're off the hook. We're still dependent on highly trained mixer/loaders, and computer-literate staff and office personnel. As an employer you need to recognize and reward them for a job well done. Sometimes just a few words of praise are all that is necessary to maintain that level of trust that is such a big part of keeping our employees happy and motivated.

Employees like the following pair are worth their weight in gold, and I'm sure many of you have experienced employees like this in your operations. Our small company has two employees who fit this bill: my son Nick, and our full-time man, Troy, who's been with us for six years. I'm proud of the job they do, day in and day out. Nick has grown up in the business, and it is second nature to him. He's in his second year of flying, and is doing quite well. Troy is a local and has a background in farming, which makes him a natural fit for our crop-dusting and farming ventures. As good as they are, though, they can't do it alone. Since much of our work is seasonal, many of our employees are only temporary. Luckily, some of these employees return year after year. This is a big advantage because they know their respective jobs and what is expected of them. They then can pass on their knowledge to new employees to facilitate the "learn by doing" process.

There's really no escaping it, this business of aerial application is highly dependent on skilled employees. Understanding and accepting this simple fact will go a long way toward ensuring that your business is surrounded by qualified and confident people.

Don't forget NAAA is and always has been a great resource for the industry. If you're a member, use NAAA to enhance your business in many ways. If you're not a member, please join us and find out how we can help!

I hope to see you all at an upcoming regional convention or the 2011 Convention & Exposition in Las Vegas in December. Take care and fly safe! ■

# Executive Director's Message

Andrew Moore

## Making Agriculture's Boom Our Down Payment to Future Prosperity

The boom in American agriculture is a hot topic as of late. A number of commodity prices are at record highs. Growth prospects look exceptional as output must double by 2050 to meet the demand of a global population expected to grow by over two billion. This bodes well for aerial applicators that provide a vital service to farmers in helping them protect their crop until market. If farmers are making money on their crop they will spend money on application services to protect that investment.

Prices and overall demand are projected to remain strong in the long-term because the days of farm surpluses appear to be over. For nearly all commodities in the U.S. the harvest will exceed that of 2010—from grain to oilseeds—but demand is outpacing crop production. Stocks of nearly all field crops, except sunflower seeds and cotton, will slip in 2012 despite big harvests. This includes corn, wheat, soybeans and rice. The population growth isn't the only thing driving demand—it's also diets. As the middle class grows in the two most densely populated countries—China and India—they are eating more, particularly meat. Americans eat two and a half times more meat than the average Chinese person and 25 times more than the average person from India. This gap will tighten and conversely the grain market will widen because it takes 7 pounds of corn to produce 1 pound of beef, 6.5 pounds of corn to produce 1 pound of pork, and 2.6 pounds of corn to produce 1 pound of chicken. Currently half of U.S. corn production goes to feed cattle, pigs and poultry. This drives up demand for grain. China and India are likely to turn to America and other ag-exporting nations to obtain a great portion of their agricultural products due to both countries' poor infrastructure issues into their rural, growing regions. George Washington's wish is being granted when he wrote to the Marquis de Lafayette in 1788: "I hope, some day or another, we shall become a storehouse and granary for the world."

With all of these economic variables pointing toward long-term agricultural prosperity coupled with a growing federal debt, it is inevitable we will see marked changes in federal agricultural policy. Long gone are the days of federal farm policy of the early to mid 20th Century that enforced acreage controls and slaughtered animals to control the livestock herd to help dwindling farm income and depressed rural communities. Next year the Farm Bill must be reauthorized and agriculture's economic well-being may result in significant cuts from the 2008 Farm Bill which features $19 billion in subsidies for farmers, including $8 billion in direct payments. Reports came out during debt limit talks between the White House and Congress this

summer that cuts in farm program funding were already among the agreed upon spending reductions. Furthermore, the Senate this summer passed an amendment to immediately eliminate the 45 cents-per-gallon Volumetric Ethanol Excise Tax Credit (VEETC) which would save federal coffers $2.5 billion.

Where do we go with all of this? For one we should bask in it a little bit. Similar to when Barbara Mandrell sang, "I was country when country wasn't cool," we chose careers in agriculture when a career in agriculture wasn't cool. Now it is. *Time* magazine recently wrote an article on this subject titled, "Want to Make More than a Banker? Become a Farmer!" In the article, American investor and author Jim Rogers, co-founder of the Quantum Fund with George Soros, advised, "Become a farmer … farming incomes will rise dramatically in the next few decades, faster than those in most other industries—even Wall Street."

When you're done basking, do what the gray squirrels that live in my yard do every fall— hoard your nuts. My flower beds look like a moonscape when the leaves start to fall because the squirrels have buried their winter food supply there to get through the cold season. Economic predictors aren't always accurate, weather is unpredictable (just ask folks suffering from drought in the Southern Plains or flooding in the Midwest and Southeast this season) and the government won't provide as sturdy of a crutch for agriculture, let alone what type of regulations they might have in store for us. All of this will affect our bottom line. Retain windfall profits for a rainy day; invest in new technologies that, although not commonplace now, will likely be in the future. Precision agriculture and the Aircraft Integrated Meteorological Measurement System (AIMMS) look to be the technologies of the future for aerial application that will result in more precise targeting, fuel savings and efficient applications. Also, consider diversifying and retailing chemicals if you aren't already.

It is nice to finally begin to receive the public recognition Thomas Jefferson bestowed on farmers when he said over two centuries ago, "Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bands." Our wise investment in prosperous times can keep Mr. Jefferson's quote alive in perpetuity. ■

# WNAAA President's Message

Julie Broussard

## Good Things Happen with Sacrifice and Teamwork

I remember like it was yesterday when my husband told me he always had a dream of becoming an ag pilot and owning his own business one day. Never did I realize I would be involved as much as I am today. I was one of those spouses who didn't know much about the aerial application business.

We opened up our business and I was put into the position of being scheduler and quite a few other things. It wasn't easy raising a family and working long hours at the flying service, but this is something we chose to do. It was a great feeling knowing we have done our part to help grow food for the world and we still feel that way.

Being an owner/operator, we know from experience how important having a good crew is. Lewis started as a loader driver, chemical mixer, mechanic and pilot. He really did work his way up. It takes a good crew to make everything work out, from the ground crew, loader drivers and bookkeeping department to the mechanic, well-qualified pilots, me and most of all, the owner/operator who oversees it all. After all, you cannot seed, put out fertilizer or spray with the pilot only. Lewis is always out on the chemical rack every morning to oversee the crew mixing chemicals. One little screw-up can be very costly to the farmer and us.

The better the crew the more work we can produce in a day. The pilot can create business for us if he does good work. Then, the customer will come back. Bad work, the customer leaves. In this business it is not just the owner who keeps customers, it takes everyone involved to get the job done.

Every day is so repetitive: spray, convert the planes to dry work, at the end of the day convert back to wet, then either spray again or wash up and get ready for another day starting again at 5 a.m. We run three Air Tractor 502s and are very busy during the summer months. I am thankful every day for working indoors. It has been so hot lately with little rain. Sometimes I don't know how the crew can keep up in all the heat, but they do.

We have witnessed many air services close due to the owner passing during our 41 years in the agricultural industry as well as many closing due to a lack of work or poor management. The farmers are the reason for our business surviving. If you run your business with the farmer in mind and treat him fairly, the rest will fall in place for the crew, the pilots and hopefully for us.

In this business it is not just the owner who keeps customers, it takes everyone involved to get the job done.

In this business one has to accept that sacrifices have to be made. For this reason, I think spouses need to be involved in every phase of what their husbands do for a living. They need to take part in the business at some level to keep our industry alive and contribute to our nation's food security. Husbands need the support of their spouses and family as well as the understanding they have chosen to work long hours and make sacrifices to do this kind of work.

When I first started going to the conventions I was one of the spouses who had no idea about what was going on. Luckily, a friend took me under her wing and encouraged me to get involved. Just sitting in meetings and listening to the process, I got hooked.

The wives of aerial applicators would benefit greatly by getting involved with their state associations. We also would love to have them come to our national convention and participate in the activities we have planned. I hope to see many new faces at the upcoming convention.

May all of you have a safe year. ■

# NAAREF President's Message

Rod Thomas

## Bug Run Mentality

As I pen these thoughts we are just putting the finishing touches on treatments to an unprecedented outbreak of stripe rust on wheat here in the Pacific Northwest. Fortunately for the growers this unexpected application came during a period of high commodity prices so it was less of a financial burden overall. It was good work for aerial applicators and I believe most did our industry proud. But, as Paul Harvey used to say, here is the rest of the story.

Most of the application work we do in my little part of the farming world is very predictable. It is unusual to have a "bug run" so most operators gear up for an average year. To give you some background I can tell you that in a career of over 35 years we have only sprayed for rust in grain two other times and the flying then was very spotty. Every seven to 10 years we will have a grasshopper infestation and we have been battling voles for several of the past years, but they seem to have run their course for now. So, for the most part, we have adequate aerial application capacity with a reasonable amount of work for all. When a new operator comes into the picture without buying an existing operation, they have to "steal" customers to have work. All of that changed this spring.

A lot of the pressure we feel to bend the rules and get more done than we should comes from the growers, but my observation this year convinces me the *most* pressure comes from ourselves.

Most operations were begging for help from friends in the industry. I too, needed some help and in turn helped another close operation as well. Word spread and I took several calls from operators in other parts of the country eager to have a few weeks extra work. A couple did come out and I believe most of the needed spraying was accomplished. In our operation we pushed crews, weather and equipment to the limits, but we didn't do anything illegal or unethical. I can't say that is what I observed in all other operations—maybe they were napping during the ethics portion of the PAASS Program last year. It was interesting to observe firsthand how pilots and farmers deal with this kind of problem. A lot of the pressure we feel to bend the rules and get more done than we should comes from the growers, but my observation this year convinces me the *most* pressure comes from ourselves.

When these problems arise for farmers that translate directly into opportunities for our industry, let's ensure we do work worthy of the extra income. If time or weather doesn't allow you to treat every acre either get some help or just say no. I was pleased to note when I needed help I had friends who were willing to show up without even asking about the pay. When your "bug run" happens will you have friends to help, equipment ready for extra work, staff to accomplish the task and, most importantly, the mindset to showcase the ability of our industry and do the right thing? As a matter of good safety and stewardship we need to plan for this. Not only does it enhance our professionalism, but it also helps our fellow operators and pilots experiencing a down year. ■

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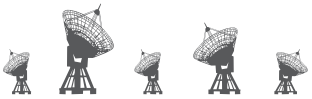
# Washington Report

## NPDES Pesticide General Permit Update

While NAAA continues to actively work with a coalition of agricultural groups to gain support for legislation that would exempt the application of pesticides made over or near waters of the U.S. from Clean Water Act NPDES pesticide general permit requirements, time is running out. Unless EPA asks for and receives another extension from the U.S. Court of Appeals, 6th Circuit, or legislation is passed through the Senate and signed into law, the Oct. 31 deadline remains in effect for NPDES pesticide general permit implementation. Please visit the *NPDES Permits* section of the NAAA website at www.agaviation.org/content/clean-water-acts-effects-aerial-application for the most up-to-date and accurate information on the issue.

## The Battle Over GPS: Can Technology Guide Us Into the Future?



When the Department of Defense developed the Global Positioning System (GPS) over 30 years ago, it's safe to say they envisioned it expanding beyond mere military use. Undoubtedly they saw untapped potential for future use, but just how they envisioned it being used is something we can't be sure of. It is reminiscent of an adage about technology called Amara's Law: We tend to overestimate the effect of technology in the short run and underestimate the effect in the long run. This rings especially true in the case of GPS and the current controversy with the Virginia-based company LightSquared.

LightSquared was established in mid-2010 with the historic goal of building a nationwide 4G-LTE wireless broadband network capable of providing coverage of the entire United States—something entirely new and on the surface revolutionary. However, as with many innovations, technology often comes with a catch. The terrestrial-based stations of the LightSquared network will operate in the spectrum immediately adjacent to GPS. The legitimate fear by military, industry and many others is that because of the proximity of LightSquared's network to GPS, widespread jamming and interference will occur. What may have begun for LightSquared as a pioneering project designed to help bring wireless Internet access to virtually all Americans has turned into a "no holds barred" battle with concerned GPS users across the nation. As an industry that depends heavily on GPS, ag aviation finds itself right in the middle of this fight.

As with most everything in business, it all boils down to the almighty dollar. Both sides have substantial financial commitments to safeguard, yet LightSquared's perceived "fast tracking" of the project and alleged lack of extensive industry testing, make it ripe for circumspection among the GPS industry as a whole. In a LightSquared-sponsored economic impact study by the Brattle Group, the wholesale provider claims the commercial GPS industry has received an estimated $18 billion in implicit subsidies from the U.S. government and is basically using the GPS satellite network free of charge. In addition, LightSquared itself has shelled out $7 billion in private funds to get the project off the ground. On the flip side, in a report funded by the Coalition to Save Our GPS, the numbers point to direct economic benefits of GPS technology on commercial users estimated at more than $67.6 billion per year, and with more than 3.3 million jobs relying on GPS technology. Thus, it's safe to say that

By Danna Kelemen, NAAA Coordinator of Government & Public Relations

with billions of dollars on the line, the discussion over where LightSquared's network should reside is merely beginning.

## Background

To fully understand the wireless broadband issue and LightSquared's stake in it, one must first go back to early 2011 when the company was granted seemingly lightning-quick approval by the Federal Communications Commission (FCC). At the end of January LightSquared was granted a conditional waiver by the FCC to establish a network of 40,000 broadband transmission towers throughout the United States. While seemingly cutting-edge, the proposed LightSquared broadband network illuminated the very real potential for interference with GPS users from all walks of life. LightSquared's ground-based radio signals are roughly one billion or more times more powerful as received on earth than GPS's low-powered satellite-based signals. *The Washington Times* provided a fitting example in explaining the issue by stating it could not simply be boiled down to making sure families didn't miss their exit to Disney World—it's much more encompassing and the fate of public safety, aviation, agriculture, and commercial and consumer industry is at risk.

As the potential problems regarding LightSquared's network began to build, NAAA joined the Coalition to Save Our GPS in April. More than 100,000 companies and millions of employees are represented in the Coalition, either independently or through their trade associations. Along with many others, NAAA submitted comments to the FCC outlining agricultural aviation's concerns with LightSquared's network and encouraged NAAA members to do the same. Many experts have predicted LightSquared will affect high-precision GPS users, such as those used in mapping, GIS and navigation, even more than consumer-type GPS receivers. This is as a result of the wider radio frequency band used in high-precision GPS receivers which allows for more jamming susceptibility. Because the aerial application industry is indeed a prescribed high-precision user NAAA is extremely concerned about the very real possibility of GPS interference. As a result, the Association urged members to contact their respective Members of Congress in support of a bipartisan letter that circulated in Congress regarding the issue. Along with 31 other Senators, Sen. Pat Roberts (R-KS) and Sen. Ben Nelson (D-NE) asked the FCC to ensure LightSquared's proposed network would not interfere with GPS. The letter asked "LightSquared to demonstrate non-interference of GPS as a condition prior to any operation of its proposed service." Additionally, the Senators requested the Commission rescind LightSquared's waiver until proof that interference was not an issue.

As anticipated by the GPS community, testing in New Mexico in mid-April and again in May in Nevada substantiated industry concern for interference. New Mexico first responders who were asked to partake by the FAA saw some disruption of services when participating in the tests and not only experienced inaccuracies and GPS failure in proximity to the LightSquared towers, the problems continued even after LightSquared's 4G signal was turned off. Additionally, LightSquared stated the broadband power spectrum used in the Las Vegas, Nev., testing was significantly lower than what is planned for initial deployment. Thus the test results were not only overly optimistic in terms of severity of interference, but also only emitted at half the power.

Following the LightSquared flawed field tests the Radio Technical Commission for Aeronautics (RTCA) issued a report validating the concerns being echoed throughout the GPS community. In an executive summary issued by RTCA, the committee stated, "The impact of a LightSquared … deployment is expected to be complete loss of GPS receiver

What may have begun as a pioneering project designed to help bring wireless Internet access to virtually all Americans has turned into a "no holds barred" battle with concerned GPS users across the nation.

function." RTCA is a not-for-profit organization that serves as a federal advisory panel on navigation and air-traffic management policy. In reaction to the escalating concern, the House of Representatives approved an amendment to the 2012 Defense Authorization bill at the end of May that would require the FCC to withhold full approval of the LightSquared system until interference issues with military receivers are resolved, making for a much more stringent version of the bill that would also mandate the final report on the LightSquared/GPS testing be available to Congress and open to comments from interested parties. This action aimed to slow the LightSquared project down as the legislation goes to committee in the House and the Senate decides whether to take up its version of the bill. The amendment follows a letter by U.S. Representatives, similar to that sent by one-third of the nation's Senators, requesting final approval only be granted if "non-interference" with GPS can be demonstrated by LightSquared.

In response to the rising uproar surrounding the issue, the chairman of the FCC responded to concerns voiced by Sen. Chuck Grassley (R-IA). In a letter addressed to Sen. Grassley, FCC Chairman Julius Genachowski stated "under no circumstances would I put at risk our nation's national defense or public safety." Chairman Genachowski scoffed at the notion that the decision to grant a conditional waiver was made hastily, and assured Sen. Grassley that LightSquared would not be able to provide commercial services until all GPS interference issues had been resolved. However, Genachowski made it clear he would like to see LightSquared and GPS be able to coexist, as it "would result in billions of dollars of new private investment and the creation of tens of thousands of jobs."

Agricultural aviation took center stage on the issue when NAAA President Rick Richter was interviewed by National Public Radio (NPR) about the controversy with LightSquared. Listeners of the popular NPR news show "All Things Considered" gained insight into the high-tech world of ag aviation when Richter explained how essential GPS technology has become for the industry. Richter stated more than nine out of 10 aerial application operators and pilots use GPS equipment, and it provides swath guidance to within one meter accuracy of where ag pilots want to place chemicals, crop protection products, seeds or fertilizers.

## New Developments

In late June the House Appropriations Committee threw up another roadblock for LightSquared with the passage of the FY 2012 Financial Services Appropriations Bill. The Committee report contained an amendment prohibiting FCC funding for removing conditions on or permitting commercial broadband operations until concerns related to harmful interference with GPS have been resolved. The House passage of the spending bill, which still requires approval from the Senate and signature by the President before it would become law, followed on the heels of LightSquared's request and approval for a two-week extension of their final testing report. The final report was released July 1 and, as predicted from the onset, stated the original plan to deploy 40,000 ground-based transmitters is "incompatible with aviation GPS operations," and "would


*LightSquared's lobbying efforts aren't restricted to the halls of Congress. With signs extolling the virtues of high-speed wireless Internet access for all dotted throughout Washington D.C.'s L'Enfant Plaza Metro Station, the full-court press begins before Congressional staffers even make it through the front doors.*

NAAA supports the conclusion drawn by most others that the most feasible solution is to relocate the LightSquared service to a spectrum not adjacent to GPS.

result in a complete loss of GPS operations below 2,000 ft. above ground level over a large radius."

While the negative findings in the FCC-mandated LightSquared report served to bolster concerns vocalized by the GPS industry, it did little to deter the company's plans to move forward, albeit now in a slightly different direction aimed at ostensibly appeasing interference concerns. Unfortunately the new proposed plan centers on an untested solution—utilizing a different part of the radio spectrum affecting roughly 1 percent of GPS users. While this number may be trivial to LightSquared, it is nothing short of ruinous for many of the high-precision users who would potentially be affected. In the aforementioned economic report it states high precision receivers used in construction, agriculture and survey and mapping accounted for $10 billion in private investment in GPS equipment over the last five years, and produced $30 billion in economic benefits per year. Additionally, LightSquared presumes filters can solve the problem of interference and furthermore the GPS industry should be responsible for shielding its devices from any interference encountered by LightSquared's signals. There is one massive problem with this fallible deduction—no suitable filters exist and even if they were available, it would be virtually impossible to block out a signal literally *billions* of times more powerful than satellite GPS signals.

In spite of continued opposition, LightSquared remains on the offensive and in early July secured an additional $265 million in funding and also created the Empower Rural America Initiative. The group is led by an advisory board that includes former Members of Congress Sen. Byron Dorgan (ND), Rep. George Nethercutt (WA) and Rep. Charlie Stenholm (TX). LightSquared states the group will partner with it to ensure, among other things, that "device filters and other approaches are developed that will resolve GPS issues related to precision agriculture and other areas."

A public comment period on LightSquared's latest plan remained open until the end of July and NAAA again submitted comments outlining our grave concerns with the company's plan to move forward despite not alleviating interference concerns among the GPS community. The Association reminded the FCC that small businesses, such as aerial application, should not be expected to bear the brunt of costs associated with fixing a problem created by the FCC in the first place. NAAA supports the conclusion drawn by most others that the most feasible solution is to relocate the LightSquared service to a spectrum not adjacent to GPS. Additional pressure from LightSquared came with the announcement of a network-sharing agreement with Sprint Nextel in late July. The partnership will allow Sprint to expand its service to the LTE broadband, and in exchange LightSquared will have the use of Sprint's 40,000 cell towers for an estimated $2 billion annually in rental fees.

Beyond the already copious national attention LightSquared has received, the European Commission also jumped into the fray to voice strong concern over LightSquared's broadband signals potentially destroying signals from its Galileo satellite-based navigation system, which is scheduled to deploy in three years. The European Commission is worried the signals may have an even larger impact on the Galileo equipment than what is projected for GPS.

The LightSquared vs. GPS conflict is far from being resolved, and remains an issue that will significantly impact commercial and private GPS users alike. A solution must be found that will allow for expanded wireless Internet capability for the future, yet in doing so will not pit one industry against another or compromise the millions of Americans who depend on GPS on a daily basis. NAAA will continue to work on behalf of the aerial application industry to ensure no disruption to its precision GPS systems. ■

# Let's Hear It for the Ground Gang!

*It takes more than airplanes to make an agricultural aviation business go. To see the big picture you need to look at it from the ground up*

*By Jay Calleja*
*Manager of Communications*

Ag pilots are used to flying solo. With some exceptions, aerial applications applied for agricultural purposes are almost always administered from single-seat cockpits. However, it would be a mistake to assume because ag pilots fly alone that they do it all on their own.

Ag pilots get the glory because they're the ones in the spotlight. What people don't often see or realize is all the preparation that takes place on the ground before the pilot steps into the cockpit. They aren't aware of the supporting characters and their contributions to the job. When it's go-time, they don't see the pilot's ground crew busting their tails to get the pilot loaded, refueled and back in the air as quickly as possible. In reality, it takes a total team effort to operate a safe and efficient aerial application business on the part of everyone involved.

Let's take the "aerial" out of aerial application for a moment to gain a better understanding of what goes on behind the scenes and outside of the aircraft to keep an ag aviation operation running smoothly. In addition to what the operator and pilots do outside the aircraft, let's consider and appreciate the important roles everyone from the mixer/loader to the office support staff to the drivers and mechanics play in the company's success. Now it's their time to shine.

Joe and Harley Curless

# Surviving the Corn Run

***Starring Joe Curless and the support staff of Curless Flying Service***

It has been a busy summer for Astoria, Ill.-based Curless Flying Service, with seven airplanes working out of its headquarters and satellite locations in Fairfield and McLean, Ill. Joe Curless is not a pilot, but the work he and his ground crew do are just as essential to Curless Flying Service's success as the pilots who fly the airplanes.

Joe grew up around the business and started loading airplanes for his father Harley Curless when he was 10 years old. Harley is the owner and operator, but most of his time these days is devoted to Farm Air Inc., the Midwest Air Tractor dealership he purchased from Bill Taylor in 2009. He relocated the dealership from Fairfield to Astoria into a newly built facility adjacent to Curless Flying Service. Harley assumed full ownership of Farm Air at the beginning of 2010.

Harley depends on Joe to keep the aerial application business he founded in 1977 running on all cylinders. Joe isn't big on titles, but in essence he's the COO of Curless Flying Service.

Joe has been working at Curless Flying Service full time for nearly five years. In his previous job, he worked for the Illinois office of the USDA's Farm Service Agency (FSA) and led a team responsible for producing all of the geographic information system (GIS) maps for the state of Illinois. The job entailed collecting, organizing and mapping all of the aerial imagery and field boundaries (common land units, or CLUs) for the state and getting them approved by Illinois producers.

Although he has always been involved in the flying business in some shape or form, Joe's role has changed quite a bit since he assumed day-to-day control of the business. "I used to be out there loading a lot and involved in all the specifics. Now I've become more of an overseer …" he said. "Because of the fluid changes [that can occur] here with weather, with an equipment breakdown, with a farmer, with a customer's product change or recommendation, I find myself just jumping from one project to the next and not being really focused on one specific thing."

Some seasons are more challenging than others when it comes to unplanned roadblocks. The upheaval factor was particularly high in 2010. In the face of unrelenting rain, the company often found itself scrambling to reposition its equipment and keep everyone out of harm's way.

"We had to basically stay ahead of the storm or run from the storm to make sure the equipment and the people were safe, and also make sure the product was on the customer's field for a reasonable amount of time if it was going to get rained on," Joe said. "Trying to anticipate those showers was very challenging—it seemed like the popup showers were everywhere."

Seasons like that reveal Curless Flying Service has grown too big for one person to manage. A lot of things Harley and Joe used to manage by themselves, such as making alternate arrangements when weather or an equipment breakdown upends the original plans, fall on operations manager Bobby Blickenstaff's shoulders now. Jack Holland, Mark Vaughn and Nick Chenowth are three more key contributors. They run Curless Flying Service's satellite locations in Fairfield and McLean, Ill.

Operations and logistics planning are important parts of Joe and Bobby's job, but so is managing people. The staff at Curless Flying Service swells from 15 full-time employees to as many as 25 employees during the summer flying season. On hot, humid and hectic days when the fungicide run on corn is at its peak, like it was on July 22, paying attention to the temperature in the atmosphere isn't the only reading Joe keeps a close eye on.

"We're going to be 111 or 113 degrees heat index today, and attitudes tend to go south when it's this hot," Joe said. "You're hot, you're frustrated and you're dealing with lots of noise from the airplanes and the wind. You have to scream [to be heard] when the airplanes are sitting there getting loaded."

On high-traffic days, the activity is nearly constant. Curless Flying Service's ground crew knows their job and they do it well. They work with pit-crew precision to get the airplanes loaded as quickly as possible and out the gate for another run.

"The pilots have a very challenging job, but the ground folks are a true anchor to our system," Joe said. "To see the hoops these ground folks have to go through to get a job done is sometimes quite amazing. Dealing with equipment and vehicles and getting them to and from the various airports, working with the airport managers and the associated array of chemicals that they work with are just a few of the obstacles. There's a lot of physical aspects to it as well. They're constantly moving around and doing things and sitting out on the hot tarmacs. Our ground men are certainly not flying 150 mph like the pilots are but they each are a vital piece to the operation."

Curless Flying Service's three-person office support staff plays an important role too, often serving as a primary point of contact for customers. Cheri does most of the billing and often is expected to balance inventory in a matter of a few days for a customer's end-of-year statements.

Beckey does most of the mapping. "She sits back there in the corner of the office and diligently makes maps and organizes and then sometimes reorganizes maps when a customer makes a last-minute change," Joe said.


*"The pilots have a very challenging job, but the ground folks are a true anchor," Joe Curless said of Curless Flying Service's ground unit. Billing, mapping and customer support are handled by Beckey Ogden, Cheri Koster and Carrie Capers (L–R, top photo). Front row, L–R, members of the ground crew include Mason Blickenstaff, Operations Manager Bobby Blickenstaff, Matt Orwig, Darrin Yazvec, Colton Doerr, John Koster and Danny Holmes. Shawn Chaffin is seated in back.*

Newlywed Carrie, who married JT Capers, Curless Flying Service's 602 pilot, creates walk-in customer maps and makes phone calls to growers and members of the community when needed. Together they make the hectic information flow go much smoother. "Cheri, Beckey and Carrie are topnotch. They each take great pride in their jobs," Joe said. "We are very blessed to have these patient and skilled ladies in our office."

It really takes a total team effort, Joe said. "We have a staff that is excellent in many aspects, with personalities, with work ethic, with devotion and care or concern for doing a good job. All those attributes are some of the things that make our operation work the way it does."

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# It Takes Two

***Starring Elly Rau as the do-it-all sidekick***

Brian and Elly Rau

Medina Flying Service in Medina, N.D., doesn't have any employees outside of the husband-and-wife team of Brian and Elly Rau. Brian, who served as NAAA's president in 2010, is fond of telling anyone who will listen that he flies the airplane and Elly takes care of everything else. That includes mixing chemicals, bookkeeping and scheduling orders. It's been that way ever since Brian expanded beyond the flying he did for him and his brothers' farm and started accepting aerial application orders from other growers.

The Raus have been married for 26 years and operating Medina Flying Service together for the past 15 years, but Brian must have known even earlier that Elly was capable of shouldering many of the ground duties associated with an aerial application business.

They met when Brian was flying for Schroeder Aviation in Davenport, N.D., where Elly worked part-time as a bookkeeper and kept track of the company's chemical inventory. Before that, Elly spent 12 years with the North Dakota Air National Guard working as a weapons loader for the F-101 fighter jet. "I had loaded airplanes before in my life, but they were fighter bombers, and it was missiles and bombs," she said. "Now I'm just loading something different."

There are a lot of advantages to their arrangement. Elly enjoys being outdoors and working side by side with Brian. They split the mixing and loading duties. She gets the next load ready while he's out flying. She refuels the plane as Brian is putting the next load in. "If I could just get a little bit faster he wouldn't even have to stop!" Elly said.

One reason she doesn't mind the physical aspects of the job is the fact that their season is fairly short. "I don't know if I would want to do this all year long," Elly admitted. "We do it for four months and then we're done, and then we have the winters off, and we're off at the same time. … That's a good thing about working together this way."

### *Avoiding Mixing Mix-Ups*

Although she is conscientious in her handling of chemicals and the loads she mixes, there are times when Elly starts to second-guess herself. "When we're doing this all day long, then I start wondering, did I do that on that load? Did I [mix] that one correctly? … I do worry about that—that the customer is getting what they're supposed to be getting."

That doesn't mean a mistake *has* occurred, it's more a matter of being prudent. Usually she can verify that the load was mixed at the proper rates by double-checking the work order or the products that have already been used. "If you mix up a load incorrectly, you're kind of—yeah," Elly said. "That's why we make sure we go over them in the morning and we know what we're doing and in which order we're doing them, and if Brian switches [the] order [of things] he makes sure he lets me know."

Ultimately, the pilot is responsible for what goes into the aircraft. Brian always does a final check before loading the plane himself. That final check—taking the time to physically inspect the load—is an important safeguard. Oftentimes he can tell by looking at it or the smell of it whether it's the correct load or not.

Every year it seems like they cover more acres, but wet weather in Medina and other parts of the state kept the team of Rau & Rau especially busy this summer. It's the nature of the business: you take the work when you can get. "It's nice when we can have just a nice flow, but either we're really swamped or else we're sitting," Elly said.

If, for some reason, she wasn't available to fulfill her ground duties, it's hard to imagine Medina Flying Service functioning nearly as efficiently as it does now. "I don't know who else he would get to do my job!" Elly said. Before she could elaborate further, another call came in.

"Brian is calling my other phone right now for me to go load up another load, so I better go do one more."

# Learning From the Ground Up!

***Starring Reed Keahey as the Mixer/Loader***

Drew, Reed and Zack Keahey

Family is the common thread that runs throughout this tapestry of stories about the industry. Quite often agricultural aviation is a family affair that continues from one generation to the next.

Reed Keahey is another son of a crop duster who grew up around farming and agricultural aviation. His father, Drew Keahey, owns and operates Keahey Flying Service in Columbia, La., a business he took over from his father, Jack Keahey. He also grows cotton, corn and soybeans on 1,600 acres of farmland.

Besides good bloodlines, one of the advantages of growing up around an ag aviation operation is the opportunity to learn the business from the ground up. Reed was 14 when he started working for his dad in the summer. He always knew he wanted to be a pilot, he just didn't know what kind. When he was 18, he decided to follow in his father's and his grandfather's footsteps.

"When he told me what he wanted to do I told him that it would take a commitment from both of us and he assured me he would do his part," Drew said. "My only wish was that my father was still alive to help me train Reed. He was a great teacher and I am trying to be as good as he was."

That conversation happened almost four years ago. Now 22, Reed has been working full-time at Keahey Flying Service for a little over a year. He earned his private pilot's license in January and is building up hours in Drew's Cessna 180. When Drew is flying his Air Tractor 402, however, Reed stays planted firmly on the ground.

His understanding of the business seems to grow with each new task his dad delegates to him. "Reed has gained a wealth of knowledge not only from me but from customers, chemical salesmen, farmers and other pilots," Drew said.

Today Reed handles everything from taking inventory and ordering chemicals to processing customers' orders to mixing loads, washing the plane and taking care of minor maintenance matters, such as greasing the tailwheel and checking the tire pressure. For an ag pilot in training these foundational experiences are important rites of passage.

"An ag pilot is only as good as his ground crew and I am proud to say that we have always had a great crew even when I was loading," Drew said. "We have had pilots work for us in the past that had never loaded or flagged before. I feel to understand what a loader goes through you have to walk in his shoes."

"My dad taught me that doing what I'm doing now, it may be hard work, but it will pay off in the end, and also it will make you appreciate your ground crew whenever it's time for you to step up and get one," Reed said. "I just enjoy it. I'll do whatever has to be done, and I think it will all work out in the end."

Reed Keahey has a long road ahead of him, but he is excited about the journey. Quite possibly, Drew may be even more excited for him. "It is a father's joy to come in for a load and see your son standing there sweating and smiling at the same time with the loader hose in his hand."

Jayne and Cary Rucker

# Answering the Call, Finding a Calling

***Starring Jayne Rucker as the Office Manager***

Rucker Flying Service in Burdett, Kan., is similar to a lot of other agricultural aviation small businesses. On average, each aerial application business has 2.2 aircraft; Rucker Flying Service has three, an AT-502A, AT-402B and a 188 Cessna Husky. Like most owner/operators, Cary Rucker is also the company's chief pilot. Jayne Rucker, his wife, serves as the office manager.

There's no hard data on the percentage of spouses who work with their husbands in an aerial application business, but it's certainly not uncommon. If you consider there are approximately 1,600 aerial application businesses nationwide, it would seem reasonable to conclude that spouses work together in at least several hundred of them.

At Rucker Flying Service, Cary handles the physical operations. There's no ground crew, so the pilots mix and load the planes themselves.

Jayne handles the administrative side as the sole office worker. She takes growers' orders, outputs the aerial maps, orders the chemicals needed for the application and handles the billing and tax paperwork. Such a cursory overview doesn't do justice to her level of involvement in the business. It runs deeper than that.

It wasn't always that way. Rucker Flying Service was founded by Cary's father and uncle, and has been in business for more than 60 years. Cary and Jayne lived in Wichita, Kan. from the late '70s to the mid '80s. He earned his A&P mechanic's license and they started their family there. When

Cary's father decided to retire, they moved back to Burdett with their kids.

"I had nothing to do with the business," Jayne said. "My kids were little and I was a homemaker." For extra income, she substitute taught and worked at the post office on Saturdays.

One day in 1989 Cary called Jayne in a sweat. They were swamped and he needed a hand. It was almost harvest time for wheat when heavy rainfall and fast-growing weeds created a major pre-harvest wheat run. Jayne got a babysitter for the kids and came straight over.

"I walked into the office and Cary said, 'Go into the office and fill out the work orders,' which I'd never seen before in my life!" A farmer named Henry Winters was waiting inside. After exchanging introductions, "I said, 'O.K., Henry, you've got to show me how to fill this out,' and he did. I had farmers lined up out the door. I had absolutely no knowledge of the business, nor did I have any inkling that I'd be here 20 years later," Jayne said.

She got up to speed quickly, however, and they have worked together ever since. Decisions about the business get made together. Jayne and Cary both like to plan, but projecting how things will go from season to season is difficult. "You have no idea how the year is going [to go], so it's really hard to do a plan," Jayne said. "We kind of have a five-year plan where he's thinking about new equipment … but it takes us a long time to decide those kinds of issues."

Unlike some of the fungicide work applied in Illinois, hardly any of their work is prescheduled. They are able to treat a diverse mix of crops, but the fields tend to be smaller. Depending on the elements, Rucker Flying Service's season can start as early as the end of March and continue into the fall, winding down in October or November.

After the season ends, they'll sit down to assess how it went. "Every year we look at how we've done and what didn't work so well as far as products that we were pleased with and products that we weren't. If we're not happy with a product, we don't use it again."

Their team approach is one of the secrets to Rucker Flying Service's success. That philosophy has also paid dividends in their personal and family life.

"I'm really blessed to have a husband who trusts me to work beside him in a business that can be quite difficult," Jayne said. "Since this is a family business, it has always been understood that when help is needed you pitch in and get things done. I truly believe that has carried over into our family life, with our children and with each other."

Tommy Summersill and Talmedge Ballew

# 'Take your time as quickly as you can'

***Starring Tommy Summersill as the detail-oriented Operator***

The adage "Measure twice, cut once" is a good rule of thumb if you are cutting wood, but when you apply pesticides for a living you can never be too careful. The consequences of a misapplication of chemicals are just too great.

At Thomas R. Summersill Inc. in Belle Glade, Fla., they don't just check and double-check work orders, there are at least four layers of checks and balances before the product goes into the aircraft. That culture of safety and stewardship permeates throughout an operation that flies year-round. Hours of preparatory work go in to each job to ensure that it goes off without a hitch.

"The application is just the final part of the puzzle. All of the things that take place before that make that application possible," said owner/operator Thomas J. "Tommy" Summersill. "And that's the whole key."

The system of checks and balances Summersill and his staff employ is an important part of that preparation. Being careful isn't complicated, but it takes a commitment from everybody to ensure that mistakes don't slip through. Their checkpoint system is designed to do just that.

To hear Summersill and Talmedge Ballew, who oversees the ground-rig side of TR Summersill, tell it, their multi-point check process has been a lifesaver for them and their customers on numerous occasions. Here's the way it works.

**Check No. 1:** It's no big mystery. The first check begins when the grower or crop consultant sends instructions for a job. Did the grower get everything right?

"The grower may or may not be fully educated on the materials that he needs to use to do what he's going to do," Summersill said. "And it happens more often than you think. The chemical house, well meaning as they are, they'll provide some sort of a recommendation to a grower. The grower will just say, 'Okay, send me some of that, I'm going to get these guys to do it,' and he'll hand us a slip of paper asking us to go do it. We'll look at it, and we have to correct things on it and melt that down to something that we can work with. …

" 'Are you sure this is what you want to do?' 'If you do this, you need to do that.' Or 'this chemical is not cleared for that, or this chemical, the rate is wrong. You need change this.' All those questions need to be answered up front."

**Check No. 2:** Next, an in-house work order gets created based on the customer's instructions and other pertinent information the company has on file. Someone else examines the work order after it gets written up. Then the pilots, Tommy and his son Jeff, review it.

"The application is just the final part of the puzzle. All of the things that take place before that make that application possible."

—Tommy Summersill, Thomas R. Summersill Inc., Belle Glade, Fla.

"Before we talk with the mixing/loading crew, we look at it, and when we're satisfied that it's correct, then we can give it to the mixing/loading crew," Summersill said.

**Check No. 3:** The customer supplies TR Summersill with the chemicals intended for the job. The next check is to double-check whatever comes in from the chemical supply house. If a pallet gets delivered with 32 boxes of what is supposedly one product they make sure by physically checking all 32 boxes. Sometimes a different box with a different product may be there by mistake. If they have a copy of the grower's original order, they'll cross-check against it.

"[If a question arises] I contact the farmer: 'Hey, this is what they are delivering.' 'No, it's the wrong chemical.' Double-checking on it," Ballew said. "All of these things are because we're all imperfect. We're all going to make mistakes. We're all going to have an oversight, even to the point where [a mistake] will go through us, and our ground guys will catch it."

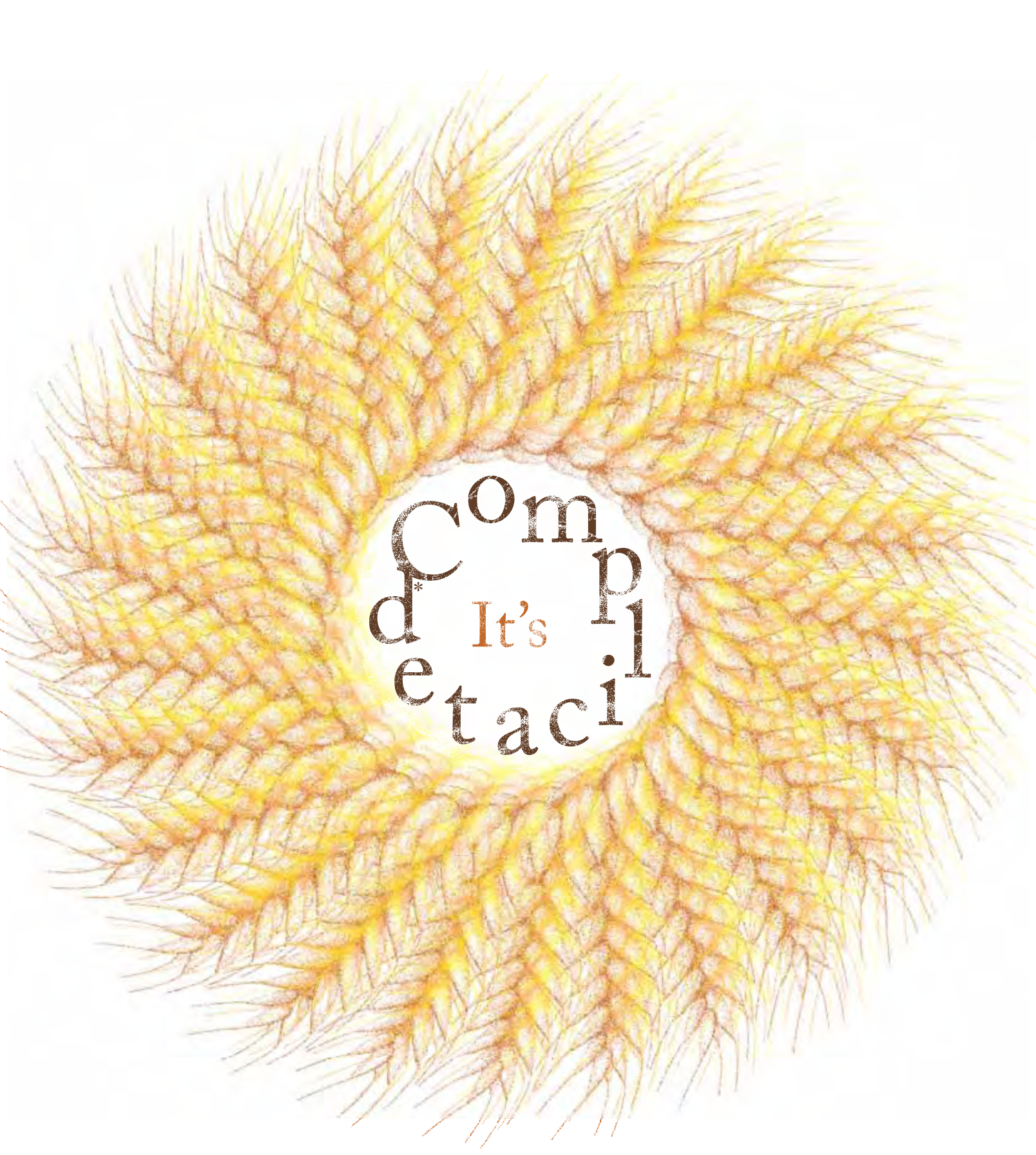
**Check No. 4:** The last line of resort falls to the pilot or the ground-rig operator. "Before it gets loaded into the airplane or the ground machine that we're using, we physically look to make sure [the right products] went in there before that machine leaves the spot it was sitting," Summersill said.

It's all part of the crucial groundwork before an application ever gets applied.

"There's a quote that somebody mentioned years ago that impressed me," Summersill said. "It has to do with our business. The quote was, 'Take your time as quickly as you can.' And I thought that was very appropriate because you need to be efficient. These are very expensive machines. The workforce is expensive. You're trying to be as efficient as you can. However, there's so much room for error that you have to take your time. It was Wyatt Earp that said that: *'Take your time as quickly as you can.'* But it makes its point."

## Closing Credits

Like those that work inside the cockpit, those that work outside of the cockpit of an aerial application business are integral to its functionality. Regardless of whether they are tied by marriage or blood to the operator they are vital to the business's operation and are part of the operation's family. ■




# Wheat Conjures Up Several Paradoxes for Aerial Applicators

*By Jay Calleja*
*Manager of Communications*

The relationship between aerial application and wheat is almost as varied as wheat is itself. Several hundred varieties of wheat in the U.S. fall into six classes: hard red winter, hard red spring, soft red winter, durum, hard white wheat and soft white wheat. Depending on the climate and weather conditions, and disease or pest pressures that may or may not be present, aerial applicators can play a major role in wheat's development or they could have a modest one. But modest these days isn't as modest as it used to be.

Aerial applicators' role in treating wheat is on the rise even as wheat cedes acres to corn and soybeans. It's an interesting paradox: aerial applicators may be treating fewer wheat acres overall than they used to, but the workload for the wheat they do support has increased, in many cases, as preventative applications have become more accepted by growers.

The paradoxes don't end there. The amount of wheat spraying fluctuates from year to year, yet wheat is a more consistent source of work for aerial applicators. It fluctuates for obvious reasons: the weather—the overriding factor in wheat disease development—and insect pressures are unpredictable. It's more consistent because growers have gotten into the habit of doing more preventative fungicide and herbicide treatments.

Historically, wheat was sprayed by air only for weed control in the spring, especially if fields were too wet to get into them with ground rigs. "Two developments in the last 10 years have changed that," said Brian Rau, owner/operator of Medina (N.D.) Flying Service and NAAA's president in 2010. The first is the application of fungicides to control Fusarium head blight, or scab, and the second is the use of glyphosate as a preharvest aid. "These two reasons make wheat a more consistent source of work."

*Brian Rau's Thrush nestles in a North Dakota wheat field. North Dakota is the second-leading wheat producer in the U.S. behind Kansas.*

Record wheat prices this year haven't hurt either, but Nick Fassler, Technical Market Manager for Fungicides at BASF, points out the market for early application of wheat came about as far back as 2003 when wheat prices were much lower. He has seen the market for fungicide applications and herbicide timing grow over the years and he expects it to continue to expand. "They are definitely excellent areas for aerial applicators to make a home for themselves, and I think those acres will be consistent too," Fassler said. "It won't be the emergency type scenarios of having to run over here and treat a couple of thousand acres and be the end of it, but more something that's consistent year after year, like what we've seen in the development of corn and soybean acres over the last couple of years."

Which brings us back to the first paradox. "In my community [where hard red winter and hard red spring wheat are grown] we've seen a decrease in wheat acres with the movement toward more corn and soybeans," Perry Hofer of Doland (S.D.) Aerial Spraying said. Wheat acres range from one-third to half of the total acres he sprays now, compared to three out of every four acres in the past. The shift to corn and soybeans began five or six years ago, Hofer estimates, and gradually got more pronounced.

Even though wheat has lost ground to corn and soybeans, lessons learned from the corn run have had a positive carryover effect that benefits aerial applicators. Farmers satisfied with the boost in yield from corn fungicide applications have shown a willingness to the do the same with wheat. That can provide a measure of certitude for aerial applicators in hot, humid areas that even with variances in wheat spraying that occur from year to year, the floor isn't as low as it may have once been.

Hofer has a set of customers with wheat fields he knows he'll be spraying every year, which allows him to plan. "I already know when it's time to spray spring wheat or their winter wheat, they're going to be calling me to do it," he said. "I like to have that, like every aerial sprayer does, because you know you've got some work during this time of year. You get down to the bug runs and stuff, those are the emergency things that everybody wants you yesterday to do."

## Circumstantial Evidence

Aerial application plays a valuable role in protecting wheat and enhancing its

yields, but circumstances still dictate to what extent. Wheat stem sawfly, wheat midge, aphids and army worms all present problems, but insect and pest pressures are much more variable than the disease pressures wheat growers face year in and year out. Several foliar fungal diseases can and frequently do afflict wheat, including scab, tan spot, powdery mildew, stem rust, leaf rust and stripe rust. Disease development largely depends on the weather and the stage of the crop's life cycle.

North Dakota predominantly grows spring wheat and is the second largest wheat producing state behind Kansas in the United States. Anywhere from 10 to 50 percent of Rau's total spraying can be applied to wheat in a given year. "Herbicide can be almost nothing in terms of work early in the season, and it can be a great deal of work depending on the weather conditions," Rau said. He mainly sprays hard red spring wheat. Hard red winter wheat and durum wheat get treated by air to a lesser extent.

Heavy snow last winter and a wet spring delayed some of North Dakota's spring wheat planting. Chris Wharam covers North Dakota and northwest Minnesota as a technical service representative for BASF. He believes the later planting could lead to additional fungicide applications on spring wheat. Instead of occurring in early to mid July, the heading and flowering period will end up being closer to the end of July or beginning of August. "Our weather patterns at that time are typically fairly warm and fairly humid, and that's a perfect recipe for head scab to develop," Wharam said. "[That's] certainly an application that in a lot of years ends up being an aerial application."

In Kansas, over the last 10 years, wheat spraying has ranged from a quarter to a third of Chanay Aircraft Service's total annual spraying. "Last year it was up. That was probably one of the higher years that we had," operator Doug Chanay said.

This year has been one of his lowest wheat-spraying years, far below average. A long drought has ravaged wheat-growing areas in the western two-thirds of Kansas, western Texas, the panhandle and central Oklahoma, and parts of Nebraska, Wyoming and eastern Colorado. "Quite a few farmers here on dryland wheat have gotten the insurance O.K. to destroy their wheat and consider doing something different," Chanay said.

Climate varies across the country, but those differences are more constant. "Each area is a little bit different," said Rod Thomas, operator of Thomas Helicopters Inc. in Gooding, Idaho, and NAAA's president in 2007. "We raise primarily soft white in my part of the country, but our state varies vastly. Our grains for the most part are all irrigated, and in other parts of the state in northern Idaho it's all dryland grain."

The humidity is so low in Idaho that they seldom get funguses in grain. "In areas where it's humid and hot and wet all the time, if it stays nice and moist, they get lots of flying. We don't get that," Thomas said. "I've put a fungicide on a wheat crop, or any grain crop for that matter, once in the last 12 or 13 years."

## A Time to Spray

In general, the growth stages and application timings for wheat hold constant across all varieties. What changes are the dates on the calendar when they occur. Not all applications are performed by air, but when the conditions are right, an aerial applicator has the potential to apply the following treatments at critical points in wheat's growth cycle, and that doesn't take insect pressures into account.

**1. Early Application:** This typically occurs whenever a herbicide application is going on spring wheat or winter wheat is coming out of dormancy. A half-rate of fungicide may also be recommended at this stage, typically in early to mid April for winter wheat, to target early season diseases. In some winter wheat regions, including Kansas and Missouri, aerial applicators are sometimes called upon to apply a spring fertilizer application.

**2. Flag Leaf Application:** This is a significant stage in the growth cycle because the flag leaf makes up about 75 percent of the effective leaf area that contributes to grain fill. This is an especially critical application time in the Great Plains where they typically battle stripe rust. As with other wheat applications, aerial applicators and farmers are working within a narrow timeframe, a window of no more than seven to 10 days.

**3. Flowering Application:** Also known as head scab application, wheat is most susceptible to Fusarium head blight, or scab, during the flowering growth stages right before the grain ripens and the kernels harden in preparation for harvest. Protecting the head from scab is important because of the potential grain risks. In severe cases of head scab, the farmer could be docked significantly for each bushel of wheat he sells or the grain could be rejected outright. Aerial applicators are frequently called upon to treat head scab for those reasons.

That's not necessarily the case for herbicide applications on wheat. Several operators noted herbicide applications are often applied using ground rigs when the fields are dry. Another contributing factor is the presence of adjacent crops that are susceptible to glyphosate.

"Anything you spray with a broadleaf [herbicide] to control the broadleaf weeds in the wheat is not going to be good for soybeans. And anything that

goes after the grasses in the wheat is not going to be good for corn, so you've got to pay attention to what's bordering the wheat field that you're spraying," Hofer said.

With that being said, he would still bank on the skill and professionalism of an aerial applicator. "My personal opinion is the airplane is the best way to handle your herbicide and fungicide applications in wheat even if it isn't wet and you cannot go with a ground rig, because of the fact you're not trampling down that crop."

Readers can take that with a grain of salt if they wish, but let's not forget that with a thousand acres of wheat of his own, Hofer is a fairly significant grain farmer in his own right. ■

# Let's Hear It For the Red, White and … Durum?

Both of my sisters were allergic to wheat when we were kids, which was a problem since wheat ingredients are in every kind of food imaginable. Several hundred varieties are produced in the United States, but they fall into six basic classes of wheat that are planted in either the fall (winter wheat) or the spring (spring wheat). Winter wheat, which typically accounts for 70–80 percent of U.S. production, gets planted in the fall and harvested in the spring or summer. Spring wheat is harvested in late summer or early fall.

Fortunately, my sisters grew out of their allergy. Suddenly, a whole new world of foods derived from the six classes of wheat was open to them. Here's a primer on everything they were able to enjoy once those amber waves of grain were no longer off limits. —*J.C.*

### Hard Red Winter (HRW) Wheat

***Uses:*** Excellent milling and baking characteristics for pan bread. Also used for Asian noodles, hard rolls, flat breads, all-purpose flour and as an improver for blending.

***Produced in:*** Great Plains states

***Did you know?*** HRW is the largest class of wheat produced each year.

### Hard Red Spring (HRS) Wheat

***Uses:*** "Designer" wheat foods like hearth bread, rolls, croissants, bagels and pizza crust.

***Produced in:*** Minnesota, Montana, North Dakota, South Dakota

***Did you know?*** HRS wheat contains the highest percentage of protein of any wheat class.

### Soft Red Winter (SRW) Wheat

***Uses:*** Flat breads, crackers, cookies, cakes, and other pastries.

***Produced in:*** Areas primarily east of Mississippi River

***Did you know?*** SRW wheat produces high yields but relatively low proteins.

### Hard White Wheat

***Uses:*** Pan breads and flat breads, hard rolls, tortillas, Asian noodles and whole wheat or high extraction applications.

***Produced in:*** California, Oregon, Washington, Idaho, Montana

***Did you know?*** Hard white is the newest class of U.S. wheat.

### Soft White Wheat

***Uses:*** Produces flour for baking cakes, crackers, cookies, pastries, quick breads, muffins and snack foods.

***Produced in:*** Pacific Northwest and to lesser extent in California, Michigan, Wisconsin, New York.

***Did you know?*** Low-protein soft white wheat provides a whiter product good for Asian-style noodles and Middle Eastern flat breads.

### Durum Wheat

***Uses:*** Durum has a high gluten content. Used for premium pasta products, couscous and some Mediterranean breads.

***Produced in:*** Minnesota, Montana, North Dakota, South Dakota

***Did you know?*** 70–80 percent of U.S. durum is grown in North Dakota.

*Sources: Minnesota Association of Wheat Growers, U.S. Wheat Associates*

# A Winning hand

## Attending NAAA's 2011 Convention is a Smart Bet

*By Jay Calleja*
*Manager of Communications*

Don't miss NAAA's 45th Annual Convention & Exhibition Dec. 5–8. This year the world's largest agricultural aviation convention and trade show returns to Las Vegas for a dose of bright lights and city nights. We hope you'll join in on our celebration of "Ag Aviation: America's Winning Hand."

Things are shaping up for what's sure to be another terrific convention. NAAA has lined up an impressive roster of speakers, including Brian Shul, NAAA's Kickoff Speaker, one of the few pilots to fly the famed SR-71 "Blackbird" spy plane, and Air Medical Examiner Dr. Mark Ivey, who will cover a range of pilot health issues during NAAA's General Session.

For a truly all-inclusive experience, stay at the **Las Vegas Hilton**. The Hilton is NAAA's headquarters hotel and the site of all 2011 convention activities. Everything—and we mean everything—takes place within the confines of the spacious **Las Vegas Hilton**, including meetings, social engagements and the trade show itself. With 200,000 square feet of meeting space, the resort has more than enough room to accommodate NAAA's meetings and exhibitors. And with the Kickoff Breakfast, Welcome Reception, Live Auction, Farewell Banquet and informal get-togethers happening in and around the hotel, there will be no shortage of opportunities to visit with old friends and make new acquaintances. You won't be able to get this type of face time with a large majority of the conventioneers if you don't stay at the Hilton!

### Strengthen Your Hand

*Ag Aviation: America's Winning Hand*. NAAA took its cues for this year's convention theme from its Las Vegas setting. One of the first things that comes to mind when you think of Las Vegas is the gaming industry. Now imagine NAAA's convention as one big poker table. Players at the table are having the night of their lives. Everybody is up. Stacks of chips are piled high all around. One person leaves, another takes his place and the hot streak continues. To what do they owe this good fortune? The truth is it's almost impossible to lose. With NAAA as the card dealer the deck is heavily stacked in their favor. Their hands get stronger and stronger with each new card NAAA deals out.

The only thing stopping you from raking in the winnings is getting a seat

at the table. Fortunately, the barrier to entry is low. Admission to the 2011 Convention & Exposition is the ante. Once you buy in you will find multiple ways to assemble a winning hand. It's all in the cards. Here are some ways to strengthen your hand and improve your prowess at the tables:


*Brian Shul*

**An Ace (Pilot).** Brian Shul, NAAA's Kickoff Speaker, has captivated audiences nationwide with his story of perseverance and triumph over tragedy. He emerged from the wreckage of a near fatal plane crash deep in the jungles of Vietnam to scale some of the highest heights ever in the SR-71, the world's fastest, highest-flying jet. When he retired from the Air Force in 1990, Shul published a book about what it was like to fly the SR-71 called "Sled Driver," which contained rare photos and became the most popular book on the plane ever written. In the years since he has become a highly sought after speaker on the aviation circuit and by business, medical and church groups.

Shul has plenty of stories about the SR-71 but that's not the sole focus of his talk. His broader point is much more transcendent. It's an inspirational message about living fearlessly, making the most of each day and following your passions in life. You won't want to miss it.

**A Pair of Kings.** NAAA's General Session is actually two programs rolled into one. Topics of interest we'll be exploring this year include pilot health and trends for the future.

**Dr. Mark Ivey**, a pulmonologist from Spring Lake, Mich., will cover a range of pilot health issues, including fatigue and the importance of proper sleep.

**Futurist Bob Treadway** will lead a fascinating discussion on the future of agriculture. He preaches that organizations and industries can't just "invent the future," they need to anticipate, prepare, strategize and act on factors beyond their control. Think government regulation, population growth and increasingly erratic weather patterns, for starters. Treadway also will help audience


*Make yourself at home at the Las Vegas Hilton, NAAA's headquarters hotel for the 2011 Convention.*

## Las Vegas Hilton Offers It All

If you're looking for the best place to stay in Las Vegas for convenience to the NAAA Convention & Exposition, great shopping and fine dining, as well as proximity to the Strip, look no further than the **Las Vegas Hilton** Hotel. What exactly does this mean to NAAA members? All NAAA meetings and convention events will be held inside one building!

Not only does the **Las Vegas Hilton** offer everything you expect in a Las Vegas vacation, including gaming and world class entertainment, fine dining and spots for that early morning coffee, snack or beverage of your choice, your use of the NAAA headquarters hotel helps NAAA meet its obligations. NAAA asked for a large block of rooms to be held out of the hotel's sales book during the dates of our convention specifically for use by our attendees. Using rooms from the NAAA room block helps us pay for all the meeting and trade show space our convention requires. If we don't meet our contracted room obligations it costs NAAA money—money that could go to government representation, educational programs, public relations and other substantive association programs.

The **Las Vegas Hilton** is the NAAA headquarters hotel and the best place for all NAAA convention attendees. It's where hundreds of aerial applicators will be. Meet your friends, relax and enjoy the convention. Join us at the **Las Vegas Hilton,** Dec. 4–8.

Want to go to the strip without waiting for a cab? Try the Las Vegas Monorail—it's quick, easy, above ground and reasonably priced.

For more information, visit *www.agaviation.org/content/naaa-hotel-registration-0.* From there, you can book online by linking to the **Las Vegas Hilton's** secure website. You can also call 800-635-7711. Rates are $105 per night, plus tax. Ask for the "National Agricultural Aviation Association" room block.

**Reasons to Stay at the Las Vegas Hilton Dec. 4–8:**

- NAAA Headquarters Hotel
- Meetings & Tradeshow in one facility
- Network with Hundreds of Aerial Applicators
- Great Services and Facilities (Spa, Fitness Center, Pool, Shopping)
- 12 Food Outlets—Fine Dining, Buffet to Casual
- Nightlife and Entertainment
- It's where NAAA will be!

# NAAA Hotel Registration Information

The **Las Vegas Hilton** is NAAA's headquarters hotel and the site of all 2011 convention activities. Besides NAAA's Convention, the week of Dec. 5 also coincides with the National Finals Rodeo in Las Vegas, so we strongly encourage you to make your room reservations early. The cutoff date to receive NAAA's group rate of $105 per night is Nov. 14.

**Las Vegas Hilton**
300 Paradise Road
Las Vegas, NV 89109

**Rates:** $105/night plus tax—single or double

**Reservation cutoff for NAAA block rate:** Nov. 14, 2011

**Contact:** 800-635-7711; between 6 a.m. and 11 p.m. daily (PDT)

**Online reservations:** *https://resweb.passkey.com/Reswebdo?mode=welcome_ei_new&eventID=3324157*

*Reference National Ag Aviation Convention

members learn *how* to think about their future using anticipatory habits and implication thinking.

**Multiple Wild Cards.**

Concurrent Sessions allow you to drill deeper to focus on specific topics of interest to you. Several are spread throughout the 2011 NAAA Convention Schedule, including two brand new sessions.. Choose among the following sessions and attend as many as you like.

**New Session – NPDES Permit Requirements**
Don't miss this opportunity to hear the latest about the NPDES permit and how the Clean Water Act affects aerial application now and in the future. What do you need to do to keep your business on the "right" side of this important industry change? Come and find out!

**New Session – Fuels – Avgas**
The Allied Support Division will host a concurrent session on fuels, specifically the availability of avgas or a marketable replacement. Find out how this will affect your business.

- Air Tractor Inc. Session
- Application Technology Session
- Chemical Session
- Com*paass* Rose Session–new pilot mentoring session
- FAA/Security Session
- GE Turboprop Engines
- Helicopter Roundtable
- Honeywell TPE-331 Engine Session

- Pratt & Whitney Canada–Piston Engine Session
- Pratt & Whitney Canada–Turbine Engine Session
- Thrush Aircraft Session

Several Company Sessions will also be added to the agenda over the next few months. Those sessions are put on by individual companies to showcase their particular products and services.

**A Full House.** When it comes to agricultural aviation trade shows, it doesn't get any bigger than NAAA's Annual Exposition. NAAA has established record highs for the number of exhibitors at each of our last two conventions. Whether you plan on upgrading your GPS and GIS hardware and software, are in the market for a new aircraft or simply want to investigate new crop protection products available from different chemical companies, you'll find what you're after at NAAA's 2011 Trade Show. And because it's at the **Las Vegas Hilton,** you won't have to go far at all. Less walking means more time for talking with the companies that support our industry. You must stay at the Hilton to get the maximum worth out of the show!

**Study the Trends.** The best way to ensure the on-target delivery of pesticide products is through the development of cutting-edge drift reduction technologies and techniques and by continually educating aerial applicators about these technologies and techniques. Much of the credit for these advances goes to members of the American Society of Agricultural and Biological Engineers (ASABE). On Dec. 5, ASABE's Aerial Application Committee will report on their ongoing research at the NAAA/ASABE Technical Session. Come hear top industry researchers as they share

Your use of the NAAA headquarters hotel helps NAAA pay for all the meeting space our convention requires. If we don't meet our contracted room obligations it costs NAAA money—money that could go to government representation, educational programs, public relations and other substantive association programs.

key findings and discuss a number of new aerial application technologies and techniques that help mitigate drift and ensure proper crop coverage. In this day and age, within this regulatory environment, maintaining the status quo isn't enough. Increase your odds of success by staying on top of the latest research. (*Some states allow CEUs for this session.*)

**Watch and Learn.** Looking for direction and guidance? Then Com*paass* Rose is for you! This is your opportunity to talk to a real pro. To hear from older, more experienced operators and ag pilots and make an impression on them. NAAA's Com*paass* Rose Program is designed to provide professional support and direction to prospective agricultural aviation pilots. The goal is for the participants to enhance their own knowledge, continue to gain agricultural aviation experience, and improve their individual professionalism. Agricultural aviation pilots will have an opportunity to discuss ideas and philosophies about the business, make informed decisions about their future, and interact with some of the industry's top operators.

*Back at the table again you're smiling inside but trying not to show it. You are holding an unbelievable hand. There's only one thing left to do. It's time to go all in!*

***Register for NAAA's 2011 Convention & Exposition and go all in!*** ■

# 2011 NAAA Convention Exhibitors as of 08/18/2011

Talk about "Get 'em while they're hot!" A virtual stampede commenced when NAAA's exhibit registration website opened at 12 p.m. July 20. Eighty-one companies registered for booth space, NAAA's largest first-day response ever. Within a matter of days, two-thirds of the exhibit space had been snapped up. As of August 18, 116 companies have signed on to exhibit at the largest agricultural aviation trade show in the world (see list below). Prime booth space is moving fast! To secure space for your company's exhibit or learn more about exhibiting at NAAA's trade show, visit *http://s3.goeshow.com/ygs/annual/2011/* or call Marshall Boomer at 717-505-9701, Ext. 123.

| EXHIBITOR NAME |
|---|
| ACES Systems |
| Acorn Welding Ltd. |
| Aero-Engines, Inc. |
| AeroFlow Systems |
| Ag Air Turbines Inc. |
| Ag Container Recycling Council (ACRC) |
| Ag-Nav Inc. |
| AgAir Update |
| AgLasers LLC |
| AgriData Inc. |
| Agrinautics |
| AgriSmart Information Systems LLC |
| AgSync |
| Air Repair Inc. |
| Air Tractor Inc. |
| Aircraft Accessories of Oklahoma |
| AmSafe |
| ApplicationMGMT.com |
| Av-DEC |
| Aventech Research Inc. |
| Aviation Products Systems APS Inc. |
| BASF Corporation |
| Bayer CropScience |
| Bell Helicopter |
| Capman Inc. |
| Cascade Aircraft Conversions LLC |
| CD Aviation Services |
| Central Florida Ag Aero LLC |
| Chartis Aerospace Insurance Services Inc. |
| Compton's Flying Service |
| Covington Aircraft |
| CP Products Co. Inc. |
| Curtis Agri-Line ASC |
| Dallas Airmotive |
| Davidon Inc. |
| Davidson Solid Rock Insurance |
| Desser Tire & Rubber Co. Inc. |
| Dromader USA LLC |
| DTC DUAT Service |
| DuPont Crop Protection |
| DynaNav Systems Inc. |
| Executive Aircraft Maintenance |
| Falcon Insurance Agency Inc. |
| Farm Air Inc. |
| First Pryority Bank |
| FMC Corporation |
| Frost Flying Inc. |
| Garrco Products |
| GE Aviation |
| Hardy Aviation Insurance Inc. |
| Hatfield/Turbine Conversions |
| Hemisphere GPS, Air Business Unit |
| Huffy's Airport Windsocks Inc. |
| Hunter Agri-Sales Inc. |
| Isolair Helicopter Systems |
| Johnston Aircraft Service Inc. |
| Kansas Aviation of Independence LLC |
| Kawak Aviation Technologies |
| Kugler Company |
| Lane Aviation Inc. |
| Leading Edge Associates LLC |
| Machida Inc. |
| Makhteshim Agan of North America Inc. |
| Micronair Sales & Service Inc. |
| Mid-Continent Aircraft Corp. |
| Mint Turbines LLC |
| Monty's Plant Food Co. Inc. |
| NAAA Museum Booth |
| Nation Air Aviation Insurance |
| National Flight Services Inc. |
| OctaFlex Environmental Systems, Inc. |
| PARMA |
| Perkins Technologies P/L |
| Pickett Equip. Co. Inc. |
| PIM Aviation Insurance |
| Pratt & Whitney Canada |
| Precision Aviation Group |
| Precision Laboratories |
| Premier Turbines |
| Prime Turbines |
| Proair |
| ProAir RRG |
| Queen Bee Air Specialties |
| Reabe Spraying Service Inc. |
| Red River Specialties Inc. |
| Rocky Mountain Propellers |
| Rosen's Inc. |
| RT Turbines |
| S & T Aircraft Accessories Inc. |
| Serv-Aero Engineering Inc. |
| Simplex Manufacturing Company |
| Sky-Tractor Supply |
| Southeastern Aircraft Sales & Service |
| Southwest Turbine Inc. |
| Spectrum Electrostatic Sprayers Inc. |
| StandardAero |
| Starr Aviation |
| StollerUSA |
| Sutton James Inc. |
| Syngenta Corporation |
| Teledyne Battery Product |
| Tennessee Aircraft Co. Inc. |
| Thrush Aircraft |
| Timken Aftermarket Solutions |
| TRACE Engines L.P. |
| Transland LLC |
| Turbine Engine Consultants Inc. |
| Turbines Inc. |
| United Turbine Corp. |
| Valley Air Crafts |
| Weber Aviation Insurance |
| Western Skyways Inc. |
| WinField Solutions |
| Wings Insurance |
| WNAAA |
| World Fuel Services Inc. |

# "The Surprise has Arrived!"

By Jayne Rucker
WNAAA Convention Co-Chair

*Fashion, fellowship and fun.* Ladies, if I had to sum up in four words or less what lies ahead at the 2011 WNAAA Convention "fashion, fellowship and fun" would be three of them. Keep reading to see if you can figure out the fourth word.

We hope you'll join us in Las Vegas Dec. 5–8 for an array of wonderful activities. The WNAAA Convention is open to all women, including spouses and employees who work in the agricultural aviation industry. We have some terrific events planned, including a surprise activity hinted at in the last issue of *Agricultural Aviation*. What's the big surprise? Before we get to that, let's preview the full slate of events.

## Monday, Dec. 5

8 a.m.–9:45 a.m. NAAA Kickoff Breakfast

10 a.m.–12 p.m. Seminar on Holiday Fashion (*RSVP required*)

12 p.m.–1:30 p.m. Light Bites

1:30 p.m.–2 p.m. Shop your Shape

Our **Saks Fifth Avenue Seminar on Holiday Fashion,** replete with complimentary "light bites," champagne mimosas, and "Shop your Shape" session, already looks like something everyone wants to attend! To add to the fun, each participant will receive a $20 Saks Fifth Avenue gift card to spend during convention week. Because of limited seating, you must **RSVP by Nov. 30.** Please e-mail or call Kayla Caillouet at KPC57@hotmail.com or 337-432-5558 to sign up for this fashion extravaganza.

## Tuesday, Dec. 6

9 a.m.–11 a.m.

The **Athena Presentation** is always informative. Athena provides strategies and ideas we can use in our everyday lives. This presentation helps us learn from each other about living the ag aviation lifestyle.

1 p.m.–3 p.m.

Join us for more fun and fellowship at the **Cajun Country Come Along/President's Open House,** hosted by WNAAA President Julie Broussard. We'll have Cajun snacks, wine and conversation. The setting is casual, so come as you are.

## Wednesday, Dec. 7

9 a.m.–10:30 a.m.

Join us for breakfast on the bayou at the **President's Breakfast.** Mimosas, Bloody Mary's and Cajun treats are on the menu and it's all on the WNAAA. Afterward, Julie Broussard presents her President's Awards for 2011.

11 a.m.–1:30 p.m.

Enough with the hinting, here's our **SURPRISE!** We'll be touring the **Bellagio Conservatory and Botanical Gardens,** and the **Bellagio Gallery of Fine Art.** Transportation and admission fees will be provided by the WNAAA. In addition, we will view the **Fiori di Como,** an extraordinary glass sculpture chandelier by glass sculptor Dale Chihuly. We can't wait to have you join us on this cultural excursion.

So the surprise is a secret no more. Have you figured out the fourth word yet? No, it's not food. *Fashion, fellowship, fun and … art!* Those four elements combined add up to a convention you won't want to miss. See you in Las Vegas!

# CONVENTION SCHEDULE

## Join NAAA for the 45th Annual Convention & Exposition!


| Sunday, Dec. 4 | |
|---|---|
| 9 a.m.–4 p.m. | Pratt & Whitney Canada PT6 Seminar |
| 8 a.m.–4 p.m. | CD Aviation-TPE331 FAA Approved IA Refresher Course |
| 12 p.m.–6 p.m. | Registration Open–Convention Center |
| 4:30 p.m.–6 p.m. | NAAA Board Meeting |
| 4 p.m.–6 p.m. | **WNAAA Board Meeting** |
| 4 p.m.–6 p.m. | Com*paass* Rose Concurrent Session |
| **Monday, Dec. 5** | |
| 7:30 a.m.–6:30 p.m. | Registration Open–Convention Center |
| 8 a.m.–8 p.m. | Exhibitor Setup |
| 8 a.m.–9:45 p.m. | Kick-Off Breakfast–Brian Shul |
| 10 a.m.–2 p.m. | **WNAAA/Saks Fifth Avenue Event – Fashion Seminar/ Light Bites/Shop Your Shape (RSVP required)** |
| 10 a.m.–2:30 p.m. | ASABE Sessions |
| 10 a.m.–5 p.m. | Canadian AAA Board Meeting (tentative) |
| 2:45 p.m.–6 p.m. | Concurrent Sessions |
| 6:30 p.m.–7:30 p.m. | Welcome Reception |
| **Tuesday, Dec. 6** | |
| 7 a.m.–8:30 a.m. | CP Products Breakfast |
| 7:30 a.m.–5:30 p.m. | Registration Open |
| 8 a.m.–11:30 a.m. | Exhibitor Setup |
| 8:45 a.m.–9:45 a.m. | NAAA Business Meeting |
| 9 a.m.–11 a.m. | **WNAAA Athena Program** |
| 10 a.m.–12 p.m. | NAAA General Session |
| 12 p.m.–6 p.m. | NAAA Trade Show Hours |
| 1 p.m.–3 p.m. | **WNAAA President's Open House** |
| 5:30 p.m.–7 p.m. | Live Auction & Reception |
| 7:30 p.m. | Pratt & Whitney Canada Reception |
| **Wednesday, Dec. 7** | |
| 7:30 a.m.–4 p.m. | Registration Open |
| 8 a.m.–9:30 a.m. | Concurrent Sessions |
| 9 a.m.–10:30 a.m. | **WNAAA President's Awards Breakfast** |
| 10 a.m.–4 p.m. | NAAA Trade Show |
| 11 a.m.–1:30 p.m. | **WNAAA Program – Art Tour (offsite event)** |
| 3 p.m. | Silent Auction Closes |
| 4 p.m.–5:30 p.m. | Concurrent Sessions |
| **Thursday, Dec. 8** | |
| 8 a.m.–6 p.m. | Registration Open |
| 8 a.m.–3 p.m. | Concurrent Sessions |
| 5:30 p.m.–6:30 p.m. | Farewell Reception |
| 6:30 p.m. | Farewell/Awards Banquet |

*Events subject to change. Updates are posted regularly at www.agaviation.org. WNAAA events appear in bold green.*

| CONVENTION SPONSOR | COMMITMENT |
|---|---|
| **DIAMOND SPONSORS ($20,000 OR GREATER)** | |
| BASF | Kickoff Breakfast, Program Guide (Inside Ad), Convention Passport and Embroidered Patches |
| syngenta | Auction Reception, General Session–Futurist |
| **PLATINUM SPONSORS ($12,000–$19,999)** | |
| Bayer CropScience | Internet Café and WiFi Sponsor, This One's On Us Beer Station, Hotel Key Cards |
| Dow AgroSciences | Welcome Reception |
| **GOLD SPONSORS ($7,500–$11,999)** | |
| | Conference Registration Bags, Program Guide (Back Cover) |
| Hemisphere GPS | Window Clings, Program Guide (Inside Front Cover), Convention Passport |
| **SILVER SPONSORS ($3,000–$7,499)** | |
| AgriSmart | Convention Lanyards, Program Guide (Inside Ad) |
| Covington Aircraft | Aisle Signs (Exclusive), Bag Inserts, Convention Passport |
| DuPont | Farewell Awards Banquet |
| FMC | Convention Pins |
| Southwest Turbine, Inc. | Coffee Breaks (Exclusive) |
| **BRONZE SPONSORS ($1,200–$2,999)** | |
| GPS AG-NAV | Floor Graphics (Exclusive) |
| CHARTIS | General Session–Air Medical Issues |
| Farm Air Inc. | Convention Notebooks and Pens |
| Kimmel Aviation Insurance Agency | Live Auction Catalog |
| Queen Bee Air Specialties Inc. | Program Guide (Inside Ad), Convention Passport |
| | Window Clings |
| **EMERALD SPONSORS ($500–$1,199)** | |
| Simplex Manufacturing Co. | Registration Bag Inserts |
| Star-Flex | Window Cling |
| Sutton James Inc. | Helicopter Concurrent Session |
| Texas AAA | Com*paass* Rose Concurrent Sessions |
| Transland LLC | Firefighters Concurrent Session |

*Additional sponsorship opportunities are available.*
*For more information, see pg. 39.*

# 2011 Live and Silent Auctions Revving Up!

When it comes to high-stakes entertainment, the intrigue, drama and excitement of NAAA's Live Auction is hard to beat, which is why it has become one of the signature events at each convention. The Live Auction on "Convention Tuesday" is very important to NAAA and WNAAA from a fundraising standpoint, so enjoy the reception food and beverages and bring your checkbooks.

We're looking for items to include in our Live and Silent Auctions. Last year, the combined auctions raised a record $460,000 for NAAA and WNAAA. $350,000 came from the sale of a new PT6A-34AG turbine engine contributed by Pratt & Whitney Canada, but it was a banner auction all the way around. We challenge our Allied Industry, State Associations and individual aerial applicators to beat last year's historic auction. Auction items provide income for association projects and programs.

In exchange for contributing to the NAAA/WNAAA auctions, we will showcase your company's contribution to the aerial application community on site and leading up to the convention. Companies that contribute early will benefit from increased exposure as we tout the auctions on our website and in NAAA's publications.

To donate an auction item, complete the Auction Donation Form at *www.agaviation.org/content/2011-auction-donation-form*. Big-ticket items are usually reserved for the Live Auction, with smaller items allocated for the Silent Auction, but final determinations are made on site once all the offerings have been inventoried. ■


***VROOM, VROOM!*** *NAAA's annual auction is off to a fast start. This DuPont Motorsports car hood autographed by Jeff Gordon is one of our newest auction items, courtesy of DuPont Crop Protection.*

**SAMPLING OF AVAILABLE AUCTION ITEMS**

| COMPANY | AUCTION ITEM |
|---|---|
| Ag Air Update LLC | 1 Lifetime Subscription to AgAir Update;<br>2 pen & ink Drawings by Richard DeSpain |
| Ag-Nav Inc. | 3 $500 gift certificates good toward Ag-Nav products;<br>2 TrackerNav Systems |
| Bayer CropScience | To-Scale Model AT-502 with NAAA Logo |
| Covington Aircraft Engines | $15,000 Certificate toward PT6-A, R-985 or R1340 Engine Overhaul, Maintenance or Repair preformed by Covington Aircraft Engines |
| DuPont Crop Protection | #24 DuPont Motorsports car hood, autographed by driver Jeff Gordon |
| Kansas Aviation of Independence LLC | 2 KAI-logoed Nylon Camping Chairs;<br>1 Flight Jacket with KAI Logo |
| Lane Aviation Inc | Ground adjustable balance pump fan & electric brake |
| Tim McPherson, Tall Towers Aviation | P-51 Mustang ride |
| NAAA/Wayne Handley Aerosports | Harold Miller helmet trophy & aerobatics course |
| Prime Turbines Inc. | Fuel nozzles for small or mid-size PT6 engine |
| Tulsa Aircraft Engines Inc. | P&W 985 Piston Engine (1,000-hour warranty) |

**Thank you to our contributors!** If your company has something of value to add by all means consider contributing it to the NAAA/WNAAA auctions. For additional information, contact NAAA at 202-546-5722. To donate an auction item, complete the Auction Donation Form at *www.agaviation.org/content/2011-auction-donation-form* and e-mail it to Lori.Racey@theYGSgroup.com or fax it to 717-825-2171 or 888-608-0288.

LAS VEGAS

**SAVE THE DATE!**

**DECEMBER 5–8, 2011**


# NAAA 45TH

## ANNUAL CONVENTION & EXPOSITION

Ag Aviation, America's Winning Hand
National Agricultural Aviation Association
Las Vegas 2011

Exhibitor and sponsorship opportunities are now open. Visit http://tinyurl.com/NAAABooths to reserve your booth today!

**Marshall Boomer**
Sponsor/Exhibitor Sales Consultant
717-505-9701 x123
Marshall.Boomer@theYGSgroup.com
The YGS Group is a proud partner of NAAA.

Prospects and clients abound for you and your company at the world's largest trade show for ag aviation!

Unlimited networking opportunities and a great lineup of speakers and events makes NAAA's 45th Annual Convention & Expo an experience you won't want to miss.


# 45th Annual NAAA Convention & Expo

*Las Vegas ◊ Dec. 5–8, 2011*

**Pre-registration must be received by Thursday, Nov. 23, 2011. Use this form and register today!**

**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 an NAAA member to qualify for member rates.

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

| NAAA Members | Registration With Banquets | Registration Without Banquets |
|---|---|---|
| Member | $320 | $220 |
| Spouse | $265 | $165 |
| Child (under 12) | $110 | Free |

| Non-NAAA Member | Registration With Banquets | Registration Without Banquets |
|---|---|---|
| Non-member | $440 | $340 |
| Spouse | $380 | $280 |
| Child (under 12) | $110 | Free |

**Banquets: Kickoff Breakfast and Farewell/Awards Banquet**

## EXTRA BANQUET/RECEPTION TICKET FEES:

***NOTE:*** 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 a "without banquets" package. Purchase extra Welcome Reception and Farewell Reception tickets only for guests with no registration package.

| | | | |
|---|---|---|---|
| Monday, Dec. 5 | Kickoff Breakfast | $40/each | # needed ___ |
| Monday, Dec. 5 | Welcome Reception | $40/each | # needed ___ |
| Thursday, Dec. 8 | Farewell Reception | $30/each | # needed ___ |
| Thursday, Dec. 8 | Farewell Banquet/Awards | $75/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:** _____

*(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 _____

**PAYMENT:**

Registrant Fee $_____ Credit Card _____ or Check # _____

Spouse Fee $_____ Card# _____

Add'l Registrants $_____ Exp Date: _____ Phone _____

NAAA Dues $_____ Address _____

Banquet Tickets $_____ City _____ State _____ Zip _____

**TOTAL DUE** $_____ _____

*(U.S. funds only, must accompany registration)* *"Signature is permission to bill Credit Card."*

**Mail payment and registration form to: NAAA – 1005 E Street SE – Washington, DC 20003**
**Print registration form at www.agaviation.org – Fax 202-546-5726 – Questions? Call 202-546-5722**
**E-mail information@agaviation.org. Online registration is now open at www.agaviation.org.**

# NAAA Convention Sponsorship Opportunities

There are a variety of ways for companies to showcase themselves at NAAA's 2011 Convention & Exhibition. This year, NAAA is pleased to present a wide range of sponsorship opportunities, including several intriguing new offerings. This is a great way to get your company's message across and garner the support of NAAA members and attendees. According to an NAAA Industry Survey 69.9 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 or contributes to the association in another supportive capacity. To learn more about becoming a sponsor, please contact Marshall Boomer, NAAA's sponsor/exhibitor sales consultant, at 717-505-9701, Ext. 123.


## RECEPTIONS and FOOD & BEVERAGE SPONSORSHIPS

### Welcome Reception — SOLD

Dow AgroSciences

### Auction Reception — SOLD

syngenta

### Kickoff Breakfast — SOLD

BASF

### Continental Breakfasts — OPEN

Sponsor the daily non-ticket continenal breakfasts on either Monday, Tuesday, Wednesday and/or Thursday.

### Farewell Awards Banquet — SOLD

DUPONT

- Farewell Reception — OPEN

  Reserve a front-row table for eight at the farewell banquet. Includes corporate recognition signage.

  **Thursday evening** **8 guests: $750**

- NEW! Floral Arrangements at the Farewell Banquet — OPEN

### Coffee Breaks — SOLD

**S, M, T, W and Th (exclusive)**

Southwest Turbine, Inc.

### General Session — SOLD

- Futurist Bob Treadway, sponsored by syngenta
- Jump Ahead on Air Medical Issues, sponsored by CHARTIS

### Private Roundtable Breakfast/Luncheon — OPEN

Meet and network with the attendees. Three opportunities: Tuesday, Wednesday or Thursday. (Includes boardroom, continental breakfast and signage)

**Breakfast**
**Luncheon 12–18 Guests**

### This One's On Us! — OPEN

Sponsor a cold one in one of the lounges. (Covers one keg and Server; Held on exhibit floor)

*Sponsors include* Bayer CropScience

## SPECIAL BOOTH and LOUNGE SPONSORSHIPS

### Museum Booth — OPEN

A must-see booth for all attendees, the museum booth sponsorship offers front and center name recognition and association with learning and celebrating our industry. (Includes furnished booth, beverage, snack, with sofa setting)

### Attendee Lounge — OPEN

Sponsor a 10' x 10' or 10' x 20' attendee lounge. A great opportunity to provide a networking area with beverage and snacks. (Includes water station. F&B upgrades available.)

### NEW! For Sale By Owner Area — OPEN

Sponsor this high-traffic For Sale By Owner area that will include bulletin boards and information about job fairs, postings by pilots, equipment for sale and more! Includes furnishings, signage and water station.

### NEW! After-Hours Lounge (in the Vegas Hilton) — OPEN

The Space Quest Casino and Lounge is available during non-show hours. Hold an after-hours networking or showcasing event. All attendees must be welcome.

## SIGNAGE and DISPLAY SPONSORSHIPS

### Convention Signage — OPEN

**Assorted openings. Call Marshall for pricing on the signage style of your choice.**

*Sign sponsors include Ag-Nav Inc. and Covington Aircraft*

### Window Clings — OPEN

Twenty-two 55" x 55" window cling opportunities in the lobby of the registration area leading into the convention center.

*Sponsors include Hemisphere GPS, Southeastern Aircraft Sales & Service and Star-Flex*

NEW! **Publication Refillable Display** (non-exhibitors only) OPEN

Sponsor graphic shown on header and convention logo on footer of this literature display. Use publication displays when your information and brochures absolutely have to be at the show, but your staff cannot.

NEW! **Hotel TV Channel** OPEN

CCTV is a dedicated television channel that will be viewable in all attendee rooms. This sponsorship includes tent cards that include the sponsor's channel and company logo. These will be placed in all rooms so the attendees know to check it out!

**sponsor must provide video roll to NAAA 3 days prior to event start*

## SHOW and AUCTION PROGRAM SPONSORSHIPS

**Program Guide** OPEN

Advertise your products and services, and direct attendees to your booth with an ad in the Program Guide.

**Cover 3, Inside Pages available**

*Sponsors include AgriSmart Information Systems, Air Tractor, Hemisphere GPS*

NEW! **Live Auction Catalog** SOLD

*Sponsored by Kimmel Aviation Insurance Agency*

## AND MORE!

**Registration Bags** SOLD

**Registration Bag Item** OPEN

Place your promotional material and gift into each attendee's registration bag. Provide a great gift that will have the attendee thanking you! And thinking of you!

*Sponsors include Simplex Manufacturing Co. and Covington Aircraft*

**Hotel Key Cards** OPEN

Sponsor logo on convention hotel key cards puts your company logo in attendees' hands multiple times throughout the event. (Includes key card for host hotel and hotel coordination)

*Sponsors include* Bayer CropScience

**Room Drop to Host Hotel** OPEN

Reach the attendee with a promotional give away or driver to your booth with a nightly room drop. Room drop targeted for attendees only. Room drop nights: Sun., Mon., Tue., and Wed.

**Hotel Door Hangers** OPEN

A special room drop idea. Door hangers for all attendees staying in host hotel.

**Hotel Newspaper Sticker** OPEN

Be at the attendee's door every morning by providing a branded newspaper for them. Your logo sticker, directing the attendee to your booth for "valuable news on products and services" will be dropped at their door

**Notebook and Pen** SOLD

FARM AIR INC.

**Convention Lanyards** SOLD

AgriSmart INFORMATION SYSTEMS LLC

**Internet Cafe & WiFi Sponsor** SOLD

Bayer CropScience

NEW! **Convention Passport** OPEN

What better way to increase traffic to your booth? All attendees receive a Convention Passport at registration. Attendees are to visit each sponsor's booth and receive a stamp. They must collect all participating booth stamps to be included in the drawing for the Passport Prize. *(16 stamps available)*

*Sponsors include BASF, Covington Aircraft, Hemisphere GPS and Queen Bee Air Specialties Inc.*

NEW! **The MingleStick Networking Sponsorship** OPEN

Be the faciliating company for great convention networking experiences! Akin to an electronic business card, the MingleStick enables attendees to exchange business contact information, social media profiles, profile pictures, and more. The MingleStick serves as a great social ice breaker and conversation starter and its "click to connect" technology is a great business utility tool for collecting business card information. All attendees receive a MingleStick to network with each other. The MingleStick can be labeled with the sponsor's logo and message.

**Benches on the Tradeshow Floor** OPEN

Sponsor a place to rest and network. Each Marketplace bench comes with sponsor recognition signage.

**Convention Keepsake Pins** SOLD

FMC

**Embroidered Patches** SOLD

BASF

NEW! **Embroidered Hats** OPEN

Collectable embroidered baseball cap depicting the 2011 Convention logo. Attach a sponsor card or brochure to the hat for maximum exposure. (Includes cost of 1,600 hats)


NAAA NATIONAL AGRICULTURAL AVIATION ASSOCIATION

Hemisphere GPS

# Satloc Bantam

## Experience state-of-the-art GPS guidance

SATLOC BANTAM

Customizable touch screen with real-time, moving map

2 USB ports. Log to hard drive or USB stick.

Create and convert Google Earth KML files or shape files for viewing on the Satloc Bantam

Remote switches with various programmable functions

New A21 antenna with superior noise rejection

7″ Display Screen (shown left): 12.9 cm H x 20 cm W x 8.6 cm D

CPU: 8 cm H x 24.25 cm W x 13.71 cm D

Total weight with optional lightweight lightbar: 15 lbs

**The Satloc Bantam, along with all Hemisphere GPS products, feature optional real-time tracking through HQ!**

**Featuring the new SX-2E Crescent board, which enhances functionality to handle G Force**

## Talk To Your Local Dealer About Further Details

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frost Flying Services | AR | (870) 295-6213 | Landry Aero | LA | (800) 280-2884 | M&M Air Service | TX | (409) 656-9044 |
| HeynSight, Inc. | AZ | (480) 377-6463 | Mid-Continent | MO | (573) 359-0500 | Lane Aviation | TX | (281) 342-5451 |
| Jones Flying Service | CA | (530) 868-1222 | Earl's Flying Service | MO | (573) 695-3842 | Aero Clinic | TX | (432) 758-6455 |
| Jensen Aircraft Service | CA | (559) 582-5000 | Air Repair | MS | (662) 846-0228 | Yorkton Aircraft (Canada) | | (306) 786-7007 |
| Johnston Aircraft | CA | (559) 686-1794 | Donald's Air Park Inc. | NC | (252) 935-5000 | Brandon Flying Club (Canada) | | (204) 728-7691 |
| The Flight Doctor | ID | (208) 678-0372 | Sky Tractor Supply | ND | (800) 437-5319 | APG (Australia) | | + 61 2 6581-4250 |
| R&S Aviation | ID | (208) 743-1554 | Compton Flying Service | OK | (888) 336-3924 | Trisponder Inc (Australia) | | + 61 2 9597-1247 |
| Tyree Ag | KS | (620) 723-3108 | Vaughn Flying Service | TX | (806) 684-2732 | | | |

www.hemispheregps.com • air@hemispheregps.com

# NAA Golf Tournament Extends an Olive Branch Invitation

*Golf Tournament Benefiting Agricultural Aviation Museum and NAA Hall of Fame Tees Off Oct. 14–16*

The 30th Annual National Agricultural Aviation (NAA) Museum & Hall of Fame Golf Tournament tees off Oct. 14–16 at the Cherokee Valley Golf Club in Olive Branch, Miss. The tournament has raised more than $230,000 over the years, which is quite a purse! Proceeds benefit the National Agricultural Aviation Museum, a museum dedicated to preserving the history of the aerial application industry. The museum is affiliated with the Agriculture & Forestry Museum in Jackson, Miss.

Besides golf, a number of non-golf activities are happening at the Whispering Woods Conference Center, the tournament's host hotel. The festivities kick off Friday, Oct. 14, with an Italian dinner, followed by a pig roast on the 15th. A silent auction runs from Saturday to Sunday. To donate an item, call Lou Stokes at 870-792-7474.

Even if you've never picked up a club, you're assured of having a blast at the NAA Hall of Fame weekend. After all, a bad day of golf (or golf watching) beats a good day at the office any day!

## National Agricultural Aviation Museum & Hall of Fame Golf Tournament Schedule and Registration Form

Golfer's name:_____

Address:_____

E-mail address or Fax #: _____

Golfer's name:_____

Address:_____

E-mail address or Fax #: _____

Social only: _____

Address:_____

E-mail address or Fax #: _____

Golf Fee $185_____ (Includes golf & meals)  Social only Fee $90_____ (meals only)  Donation_____

Call Lou Stokes at 870-792-7474 to make your hotel reservations and request a tee time for Saturday. Hotel reservation cutoff date is Sept. 12, 2011, then the room rate goes up. Hotel rate is $92 per night, continental breakfast included. When you call to reserve your room, a credit card will be needed.

Send entry form & check to:
NAA Golf Tournament • c/o Lou Stokes • 1373 Hwy 149 S • Earle, AR 72331

### NAAA Golf Tournament Schedule:

Friday, Oct. 14
- 5 p.m. – Registration
- 5:30 p.m. – Cocktail Party (front bldg)
- 6:30 p.m. – Italian Dinner (bldg)

Saturday, Oct. 15
- 9:30 a.m. – Qualifying Rounds Start
- 5 p.m. – Happy Hour
- 6 p.m. – Pig Roast
  Putting Contest and Calcutta

Sunday, Oct. 16
- 9 a.m. – Shotgun start Scramble
  Awards luncheon after golf at Cherokee Village

All evening events will be in the front building at Whispering Woods Conference Center.

# Test Your Knowledge

*Agricultural Aviation* continues its series of questions to quiz you on your knowledge of aerial application topics. Thanks to the National Association of State Departments of Agriculture Research Foundation (NASDARF) for permission to use selected questions from their chapter review questions from the Aerial Applicator's Manual: A National Pesticide Application Certification Study Guide.

See pg. 57 for an explanation of the answers and the page or pages in the manual where the topic is discussed. Hopefully this will introduce those taking the quiz to the contents of the manual, which we encourage everyone to study in the quest for industry knowledge.
*—Ken Degg, NAAA Director of Safety & Education*

## How well will you fare? Let's find out!

**1. During an application operation, pilots must wear the label-required personal protective equipment for pesticide handlers:**

A. Only while making an aerial application.
B. Anytime they are in the aircraft cockpit.
C. While making nozzle adjustments.
D. Only when mixing and loading.

**2. At a minimum, the training that ground crews must receive as pesticide handlers is required to be performed:**

A. At the beginning of each operation.
B. Annually, before performing handling activities.
C. Every two years, before performing handling activities.
D. Every five years, before performing handling activities.

**3. Aside from external factors, the most important factors affecting off-target drift are:**

A. Physical properties of the spray mixture.
B. Extremely high or low temperatures.
C. The size of the spray droplets and the percentage of droplets within a certain size range.
D. Conditions leading to a temperature inversion layer.

**4. Driftable fines are droplets in the size range of:**

A. Larger than 500 microns.
B. 300 to 500 microns.
C. 200 to 300 microns.
D. 50 to 200 microns.

**5. A properly functioning positive cutoff valve with a suck-back feature will supply _____ pressure to the boom and nozzles when the spray flow is stopped.**

A. High negative.
B. Low negative.
C. High positive.
D. Low positive.

**6. Increasing airspeed without changing the spray output will result in:**

A. More pesticide active ingredient applied per acre.
B. Less pesticide active ingredient applied per acre.
C. An increase in the pesticide flow volume.
D. A decrease in the pesticide flow volume.

**7. How many acres are in a rectangular field that measures 620 feet by 1,280 feet?**

A. 16.1
B. 18.2
C. 22.8
D. 28.8

**8. Ferrying flights that pass over areas where people live or work should:**

A. Follow the same route in each direction for all trips.
B. Be varied by 1/8 to 1/4 mile for each trip.
C. Follow the same route each time to the field, but vary the route when returning to base.
D. Follow a different route each time to the field, but use the same route for each return to base.

**The next two questions are aviation trivia. Can you come up with the answers?**

**9. Wiley Post became the first pilot to fly solo around the world in July 1933 in his Lockheed Vega 5-B. What was the name given to that aircraft?**

**10. What was the first U.S. bomber aircraft to bomb Japan after Pearl Harbor?**

*See answers on pg. 57*

# BUYING A USED PT6A ENGINE?

## Here are Some Things to Consider

*By Fletcher Sharp, Covington Aircraft Product Support*

***Editor's Note:*** *Although this article was written specifically referring to buying a used PT6, similar care and research should go into the purchase of any turbine engine.*

Due to the growing numbers of PT6A series turboprops in the agricultural aviation industry, large number of ag operators wish they could own a new aircraft with a new PT6A engine installed, but the reality of today's economics may not allow that to happen.

One could shop for a used engine in numerous ways: through ads in trade journals and magazines, by word of mouth and more. This article will provide some information to help the non-turbine operator make an informed decision when buying a used PT6A series engine.

Currently, and going back at least 15 to 20 years ago, a LOT of faith was placed on ensuring an engine had a "fresh" HSI (Hot Section Inspection) and, this was about all folks were looking at when they were thinking of buying a used engine. While the HSI area is undoubtedly one of the hardest working areas of a PT6 engine, it's not the only area that gets a lot of wear and tear. The RGB (Reduction Gear Box) on the front of the engine takes all the high rotational speed from the power turbine, spinning at up to 33,000 RPM at takeoff power, and converts it through two separate stages of gear reduction down to either 2,200 Propeller RPM (small PT6s) or to 1,700 Propeller RPM (large PT6s).

If you think about all the takeoffs per day you can make, then multiply that by all the days you're putting out product, that's a large amount of power applications and subsequent power reductions. This use causes wear and tear in the RGB area.


Some of the newer chemicals are extremely corrosive; and unfortunately, when putting out the chemicals, especially if the wind is extremely low or nonexistent, some of that corrosive product can find ways to enter the air box, bypassing all the filters installed. At working power, a large PT6 engine sucks the equivalent of a 12-room house full of air every second! Occasionally, small pieces of dirt, grass or pebbles can also be ingested by the engine, even with a filter system installed. That causes FOD (Foreign Object Damage) and it can cause major damage to the compressor blades, rendering them less efficient.

So, when looking at a used PT6A engine, while it's important to ensure a fresh HSI (hot section) has been complied with, it's just as important to note how many hours since the RGB or the compressor were last looked at by a shop that has the equipment and expertise to disassemble both of those major engine components. If it's been four or more years, or more than 4,000 hours since those areas were inspected, that should be a potential red flag.

Another very important area is the engine logbook, specifically the area in the logbook that shows how many hours and cycles have been accrued on the rotating parts inside the engine that have an established cycle life or limit. Ag operators fly under Federal Aviation Regulations (FARs) and they are very clear about the rotating parts, which are called Life Limited Parts, and the requirement to track the cycles of each part. Those parts are primarily all of the hubs/disks that make up the compressor stack, the compressor turbine disk and the power turbine disk. In the larger PT6As, from the PT6A-41 and up, there are two power turbine disks.

There is a wide range of part numbers for each of these rotating components, and depending upon the part number, the cycle limit may be different. Each engine series of the PT6A has its own separate service bulletin number

sequence. For example, the PT6A-20, -21, -27 and -28 all relate to service bulletins (S/B's) that start with the 1,000 series. The PT6A-41, -42 and -45 all have S/B's starting with 3,000 series. PT6A-60 through and including -65 series all have a 13,000 series of service bulletins. PT6A-67 series are the 14,000 series, and the PT6A-11AG and -15AG all have the 12,000 series of S/B's.

There is some commonality across ALL of these series; S/B's that end in 002, as in 1002, 12002, 13002 and 14002 all relate to Rotor Component Service Life. THESE ARE THE S/B'S FOR THE ENGINE MODEL YOU MIGHT BE CONTEMPLATING PURCHASING THAT NEED TO BE COMPARED AGAINST THE DATA IN THE ENGINE LOGBOOK.

S/B's that end with 003 relate to TBO and Hot Section Inspection intervals. Most, but not all S/B's ending in 044, such as 1044, 3044, 12044, 13044 relate to the various types of fuel approved for that series of PT6 engines.

Let's get back to the paragraph that has all the capitol letters in it. If you are purchasing a used engine, this can easily be the most important single item you check and confirm. At EACH annual, the IA or shop performing an annual inspection "should" be reviewing all the documents the flight crews have generated during the season that relate to the number of starts and the number of takeoffs/flights. That is critical data each turbine operator should ensure is being captured. Your mechanic can use that data with a formula in the applicable S/B that addresses Rotor Component Service Life to help calculate the correct cycles accumulated. At each annual inspection there should be a document produced that shows the cycles accumulated for all the rotating disks/hubs, as well as cycles remaining.

Engines that have cycle-limited components reaching their service life must have those parts removed from service when they reach their maximum life limit. **This is NOT an optional issue; to continue parts past their cycle limit/life is breaking the law!** An older engine that has several disks/hubs close to being cycled out should not be considered for purchase. That is, unless the engine's price is so low that the cost you will incur buying serviceable rotating parts and having them installed after purchasing it is still within your ballpark from a financial perspective.

If you have any questions regarding the statements made in this article, please call your engine maintenance facility or contact the author at 214-766-1212 for assistance. The important thing is to have a clear understanding of all the possibilities before committing your funds to purchase a used PT6A engine. ■

## Savvy Shopper Tips: When looking at a used PT6A engine…

* While it's important to ensure a fresh HSI (hot section) has been complied with, it's just as important to note how many hours since the RGB or the compressor were last inspected by a shop with the equipment and expertise to disassemble both of those major engine components. Four years or more than 4,000 hours since those areas were inspected should be a potential red flag.

* In the engine logbook, pay particular attention to the Life Limited Parts to see how many hours and cycles have been accrued on the rotating parts inside the engine that have an established cycle life or limit.


# Changing the Way We Look at Liability Limits

*By Barry Dowlen*
*on behalf of the NAAA Insurance Committee*

Insurance companies have historically adopted slogans that make us feel safe. "Like a Good Neighbor…"; "You're in Good Hands"; "The power to help you succeed." Insurance is a product that should help you sleep at night. Just buy our insurance and everything will be OK. We will take care of you. Most of the time that ends up being true and the carriers in our industry do an excellent job at handling the claims we present to them. But the reality is insurance policies are issued with limits of liability and those limits are being reached or exceeded with more frequency than ever before. And when the claim amount exceeds the amount of the coverage on the policy, we all get nervous—no one more so than the operator who stands to pay the difference out of their pocket.

The scenario starts out harmlessly enough, you put out an application that seems routine and a few days later you get a call that a neighboring farmer or homeowner is complaining about drift. No problem, right? Just get that reported to your insurance agent and underwriter and they will take it from there. Most of the time, your insurance carrier can help you resolve the situation, but in the reality of today's economics, there is a growing chance that your policy might run out of limits before the claim gets settled. When that happens, the insurance company, the operator and the claimant try to work out a settlement, and many times the operator is required to pay a significant portion of the claim.

## Is 100/300/100 Obsolete?

For many years, the "standard" limit of liability for aerial applicators has been referred to as "100/300/100" which means $100,000 Bodily Injury Per Person/$300,000 Per Occurrence/Aggregate and $100,000 Property Damage. In fact, many operators still purchase that limit today. Basically, what this limit gives the insured is coverage for $100,000 per person for Bodily Injury (up to $300,000 per occurrence). It also covers up to $100,000 for property damage for chemical and non chemical losses. Normally the bodily injury and property damage limits are aggregated (capped) at $300,000 and $100,000 respectively for the policy year.

The $100,000 limit for damage to property/crops has until recent years, been enough coverage to satisfy most claimants. But due to several factors including inflation, rising commodity prices and the expensive nature of genetically enhanced crops, the operators who have that coverage are now running the risk that they could have a claim that exceeds the protection they have purchased. And what if an operator has two property damage losses in one season? If the property damage coverage has an aggregate of $100,000 and the first claim is settled for $80,000, then there is only $20,000 left to handle any other claims that might occur in that policy period. Add to that the increased amounts being sought by some attorneys for bodily injury claims, and the bodily injury limit of $100,000 per person could also come up short.

A USDA report from June 2011 states that commodity prices have spiked in the last year due to global population growth, increased consumption of animal products, rising energy prices, depreciation of the U.S. dollar and slower growth in agricultural productivity. In some cases, prices have increased by 60 percent. And while the increased worldwide demand for agricultural products certainly has its benefits to the aerial application industry, it also has the unfortunate side effect of driving up the cost of crops when they are damaged and has hastened the need for us to revisit what limits aerial applicators should carry in order to be adequately protected.

## So How Much is Enough?

If we take the worst case scenario, you probably cannot afford to carry enough protection. Consider the case of an applicator who was applying herbicide for a ranch in Texas. The application drifted on to a neighboring cotton crop. In the resulting lawsuit, the claimant was awarded a judgment over $2,000,000 for the damages to the crop and loss of use of the field for the following year. The operator was insured for $100,000 and was left personally liable for the difference. Bankruptcy was the only alternative.

Scary stuff, but thankfully the majority of claims will not approach that amount of damage. The good news is that most carriers are prepared to offer the higher limits that will help aerial applicators deal with these issues. For operators who meet the underwriting guidelines, most companies will readily offer $300,000 or $500,000 CSL (combined single limit) which do not contain a sublimit for Bodily Injury or Property Damage. And in some cases, $1,000,000 CSL is available. Another option that can help is to purchase an additional $1,000,000 for non-chemical losses that might occur.

So, whether you think you are at risk for a big claim or not, ask your agent to obtain quotes for a higher limit of liability and consider carefully what protection you need. No one knows better than you the economics of your community, and whether there are any lawsuit happy persons around. Instead of some feel-good words, put some real teeth into your insurance so that if the big claim does come along, you along with your carrier will have the financial means to deal with the problem. ■

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*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.

# A Reverse Venturi Atomization Chamber

*By Russell Stocker,*
*Arena Pesticide Management, Woodland, Calif.*

**Editor's Note:** *This paper was originally presented at the ASABE Technical Session at NAAA's 2010 Convention. The following abridged article was adapted from the full report. The complete report is available at the USDA Aerial Application Technology Group's website, http://apmru.usda.gov/aerial/. Click on the button for "ASABE/NAAA Technical Sessions" and select the year 2010.*

## Introduction

Spray drift is one of the most significant issues facing aerial applicators. Material not applied to the target crop or pest is a financial loss for the farmer and a potential liability for the applicator. Off-site drift also represents an environmental liability, particularly as habitat and water-quality concerns demand greater attention with larger buffer and/or no-spray zones.

Current practice delivers liquid material through a nozzle, under pressure, and utilizes air shear for at least a portion of the atomization, creating a range of droplets with those less than 200 microns, known as fines, particularly susceptible to off-site drift. As airspeed increases, so does the effect of air shear on the spray leaving the nozzle, resulting in further shatter/fracture of droplets which produces even more fines and leads to more off-site drift.

This article introduces a new technology that controls the environment at the nozzle where atomization occurs, reducing driftable fine production and reducing off-site movement of spray material. Control of nozzle environment is accomplished using a chamber having three sections, called a Reverse Venturi Atomization Chamber (RVA), as seen in Figure 1. Air enters the first section (diffuser), with a restricted opening, and flows into a larger section (settling chamber or calming section) where air velocities are reduced, the nozzle is located and atomization occurs. The atomized spray and air then travel together through the third section (constrictor) where they are accelerated to match the aircraft's air speed. By reducing the air speed where atomization occurs, there is less air shear on the atomized spray droplets resulting in an atomization profile with fewer fines and, ultimately, less potential for off-site movement.

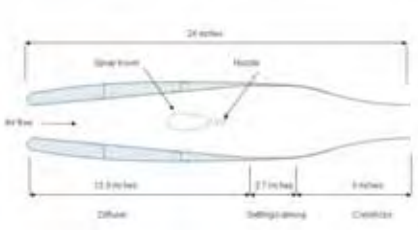

*Figure 1. RVA Chamber*

## Development and Testing

**Air velocity testing:** Internal and external air velocities were measured in Arena Pesticide Management's wind tunnel. This wind tunnel has a working section two feet by two feet and six feet long, and generates air velocities up to 160 mph. An eight-inch section of chamber and boom was constructed and mounted in the wind tunnel. At 148 mph, the velocity in the settling/calming section was 49.5 mph and the exit velocity was 141 mph.

To compare wind tunnel measurements of the RVA to actual conditions when the chamber is mounted on an aircraft, the eight-inch section of chamber used in the wind tunnel was mounted 18 inches below the left wing of the AT-301. Agreement between flight and wind tunnel tests further substantiated use of wind tunnel data to evaluate potential improvements to the RVA chamber internal aerodynamics.

**Atomization test:** The RVA Chamber was fitted with a spray boom and nozzle that could be located independent of each other inside the chamber. This design allowed us to determine the optimal location of the spray boom and nozzle in relation to one another. SYMPTEC's HELOS-VARIO/KF laser diffraction sensor and computer software for particle size analysis were used to determine atomization profiles for both free air stream (nozzle not in chamber) and with a nozzle in the chamber. We were able to reduce the driftable fine fraction by 93 percent at 100 mph using a spray pressure of 20 psi, and 78 percent at 150 mph with spray pressure of 50 psi, when the spray boom was 12.75 inches from the exit and the nozzle was 10 inches from the exit (see Table 1). It is important to

understand that as air speed increases, increasing spray pressure can help reduce the driftable fine fraction, up to a point, because the spray is released into the air stream at a speed closer to that of the air stream. Excessive pressure, however, can be detrimental.

*Table 1. Atomization profile of Spraying Systems 2505 nozzle with spray boom 12.75 inches from exit and nozzle 10 inches from RVA chamber exit.*

| Percent fines produced in free air stream (no chamber) | | | | | |
|---|---|---|---|---|---|
| 50 mph | | 100 mph | | 150 mph | |
| 20 psi | 50 psi | 20 psi | 50 psi | 20 psi | 50 psi |
| 0.5 | 2.4 | 6.9 | 4.8 | 22.9 | 16.9 |

| Percent fines produced with nozzle in RVA chamber | | | | | |
|---|---|---|---|---|---|
| 50 mph | | 100 mph | | 150 mph | |
| 20 psi | 50 psi | 20 psi | 50 psi | 20 psi | 50 psi |
| - | - | .45 | 2.18 | 7.34 | 4.3 |

**Drag and loss of lift:** Tests were conducted and calculations were performed to evaluate the amount of drag and power loss the RVA system would create on the aircraft. In one test, we used a D-Model Turbo AgCat with a typical spreader (Stainless Steel Fabricators, Inc., Beedeville, AR). The AgCat was flown with the spreader mounted on the aircraft at a noted power setting and airspeed of 115 mph, then the aircraft was landed, the spreader was removed, and aircraft flown at 115 mph while adjusting the amount of power needed to maintain 115 mph. It took 48 horsepower (Hp) less to maintain the 115 mph airspeed without the spreader. Based on this information and data collected from the wind tunnel, we were able to develop Table 2 for evaluation of drag and horsepower needed for the RVA system compared to a conventional spreader.

The conventional spray system (spray booms) weighs 70 pounds (which is removed when using the spreader or RVA system) and the RVA system has a net additional weight of 174 pounds to the aircraft. When comparing the same airplane, with a full scale 30-foot RVA system and with the dry spreader system, the airplane with the RVA system is 44 pounds lighter and requires 36 less Hp to fly at 150 mph. This demonstrates that the RVA system can be used on an aircraft with no additional cost in fuel or loss in speed when compared to dry type applications (seed and fertilizers) and when considering weight and drag.

The drag from the conventional spray boom was negligible and was not considered in our evaluations.

*Table 2. Comparisons of weight and horsepower (Hp) needed for RVA system vs. dry spreader*

| | Weight in lbs | Drag in lbs | Loss Hp |
|---|---|---|---|
| Chamber 115 mph | 174 | 156 | 48 |
| Chamber 150 mph | 174 | 265 | 106 |
| Spreader 115 mph | 218 | 205 | 63 |
| Spreader 150 mph | 218 | 349 | 144 |

Static pressure on the bottom side of the wing was measured with and without the RVA chamber. Because of the shape of the chamber, air velocities were increased on the bottom side of the wing, resulting in a minor loss of lift. This loss of lift was measured to be 312 pounds of lost lift for a full scale 30 foot chamber or a change of angle-of-attack from -0.5 degrees to 2.0 degrees. We adjusted the orientation of the chamber to the bottom of the wing by changing the angle of the chamber in relation to the bottom of the wing to look for any changes in aircraft performance characteristics. Changing orientation of the chamber did reduce the static pressure but increased the drag; lift gained was lost by the additional drag so the chamber was left at 0 degrees to the bottom of the wing. There were no observable effects on flight characteristics when the orientation was changed.

**Install RVA Chamber on the Aircraft:** A full-scale RVA Chamber was constructed and mounted 18 inches below the wing of the AT-301 to brackets that attached to the existing spray boom hanger attachment points on the wing of the aircraft.

Test flights were conducted to evaluate if there were any adverse effects from the installation of the chamber. In all instances the aircraft performed well, safely and certainly within normal performance criteria. At all times the aircraft had very good stall recovery, which is critical for safe flight.

To better accommodate swath testing and the drift studies, the aircraft was configured with a dual spray system consisting of the conventional system and an RVA system. Both systems used the same hopper, pump and spray valve. The aircraft was equipped with two additional valves aft of the spray valve allowing activation of the desired spray system. Each system had 60 H1/8VV-2505 TeeJet nozzles spaced six inches apart.

**RVA spray system performance:** Spray pattern testing was accomplished using a Digital Field Fluorometer, and Drop Scan System, WRK. The coefficient of variation (cv) value for the conventional system was 11 for back-to-back and 19 for racetrack spray patterns, while the RVA system achieved 13 for back-to-back and 13 for racetrack, both systems demonstrating acceptable spray patterns.

Overall, the RVA system generated larger drops than the conventional system. Also note that the RVA system has a smaller percent of spray less than 200µ (which is in the driftable fraction), as seen in Table 3.

*Table 3. Comparison of drop size of RVA and conventional spray systems in swath testing*

| SYSTEM | VMD | DV 0.1 | DV 0.9 | % <200µ | # DROPS <200µ |
|---|---|---|---|---|---|
| Conventional | 406 | 238 | 553 | 5.0 | 330 |
| RVA | 456 | 287 | 647 | 3.7 | 232 |

*Perform Drift Studies:* The objective of the drift study was to evaluate the reduction in spray drift from the RVA system as compared to the conventional spray system. This test was based on the work of Clint Hoffman and his team at College Station, Texas. The test was designed so that the test aircraft (AT-301) would make a pass over the test area with a cross wind of 3–10 mph. As the spray material was released, larger droplets would fall out first in the swath and smaller droplets would fall out farther downwind past the swath area.

The collection media included monofilament line, Mylar, Water Sensitive Paper (WSP) and fluorescent

*Figure 2. Full scale RVA Chamber installed on aircraft, two views. Note the conventional spray boom was maintained for testing.*

dye as the tracer. The spray solution consisted of water, fluorescent dye (15 grams/acre), and 0.2 percent volume percent (v/v) of a non-ionic surfactant. The targeted spray rate was 3 gal/acre so the aircraft was loaded with 90 gallons of water and 450 grams of dye. This same mix was used for both treatments. There were two treatments (conventional and RVA system) with four replications each. Each replication consisted of one spray pass with the right wing on the downwind side. All passes made were flown at 10 feet above the ground, 50 psi, and at 150 mph. The AT-301 can achieve 150 mph with a light load, working power and in a dive.

### Samplers and Sampling Locations (see Figure 3):

*In-Swath Deposition:* Directly under the aircraft, samplers were located at 15, 10, 5 and 0 meters (m) upwind from the downwind edge of the spray swath (designated as -15, -10, -5 and 0 m). At each location, a Mylar card and WSP card were placed on the ARS sampling stations, which were placed on the ground. The sampling stations are just a simple card holder.

*Downwind Mylar:* At 5, 10, 20, 30, 40 and 50 m from the spray swath edge, Mylar cards were placed on the ARS sampling stations which were placed on the ground.

*Drift Towers:* Two drift towers were placed at 10 m and 50 m from the downwind edge of the spray line. At each location, two T-posts were driven in the ground so that the tops were 1.5 m above the ground. The posts were 10 m apart and oriented parallel to the flight line. Monofilament line was stretched between these posts using USDA-ARS sampling equipment. After a spray replication, the line was reeled in using ARS equipment and the string placed in labeled zip-top bags.

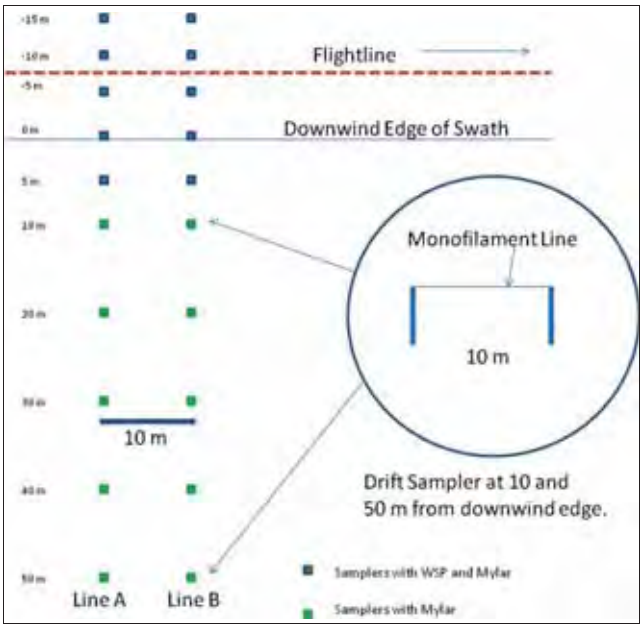


*Figure 3. Study layout*

**Figure 3.** Study layout

*Figure 4. AT-301 with RVA chamber installed flying over the test plot.*

As a spray pass was made over the test course (see Figure 4), the spray settled out and fell to the ground being collected on the Mylar and WSP samplers. The largest drops with little tendencies to drift were collected in the swath sample area and smaller droplets moved down wind with the smallest droplets moving the farthest from the swath edge. After sufficient time was allowed for spray material from a test to move down wind past the test plot and dry (approximately 5 minutes), the samples were collected, placed in labeled plastic bags, stored in ice chests out of the sun, and transported for laboratory quantification.

The WSP collectors demonstrated the RVA system produced larger drops than the conventional system which reinforces the results from the swath testing (see Table 4).

The Mylar collectors in swath (-15, -10, -5 and 0 m) had similar-looking results with the RVA chamber producing slightly more deposition, again with larger droplets. Downwind Mylar collectors (5, 10, 20, 30, 40 and 50 m) indicate the RVA chamber produced less driftable droplets because more droplets fell out closer to the 0 m location.

Both systems produced a range of droplet sizes and these droplets fell out onto the collectors. We expected to observe a greater difference between the two systems, but we did not. There was a small uptick with the conventional system at 50 m, but the significance of this difference is unclear because we have no data points past that point (see Figure 5).

*Table 4. Comparison of drop size produced by Conventional and RVA Spray Systems in swath and down wind on water sensitive cards*

| SYSTEM | VMD | DV 0.1 | DV 0.9 |
|---|---|---|---|
| Conventional | 389 | 231 | 539 |
| RVA | 441 | 300 | 591 |

As predicted, the monofilament line collectors demonstrated the most significant reduction in drift. The monofilament line is more effective at collecting very small droplets and these droplets are the ones that create the most drift because they remain suspended longer and are carried further away from the application site. The conventional treatments collected 0.073896 µg/cm$^2$ at 10 meters and 0.009984 µg/cm$^2$ at 50 meters. The RVA System treatment collected 0.043758 µg/cm$^2$ and 0.006055 µg/cm$^2$, respectively, producing a 40.8 percent reduction in drift at 10 m and a 39.4 percent reduction at the 50 m. This demonstrates that the RVA system is performing as it was intended, reducing driftable droplets, thus reducing drift or off-site movement.

### Analytical Substantiation of Structural Integrity and Stability of RVA chamber on AT-301:

The engineering report done by consultant Will Peschel on the RVA system mounted on the AT-301 included an assessment or analysis of limit and design loads, structural integrity, structural weight and reduced lift, flying quality, flight manual revision, aerodynamic control surface and component weight limit loads, chamber installation attachment, chamber scoping and aerodynamic drag calculations, beamed out limit loads at hinge arm locations, chamber attachments and limit load details, load summary computations, calculations to substantiate structural integrity of wing and fuselage attachments with chamber located 18 inches and 24 inches below the wing, and effects of chamber on c.g. (center of gravity) locations. This work determined that the aircraft, with the chamber installed under the wing, fell within all safety margins and center of gravity limitations. No negative flight characteristics were anticipated.

## Conclusion

We have designed, built and tested the concept of an RVA system to reduce

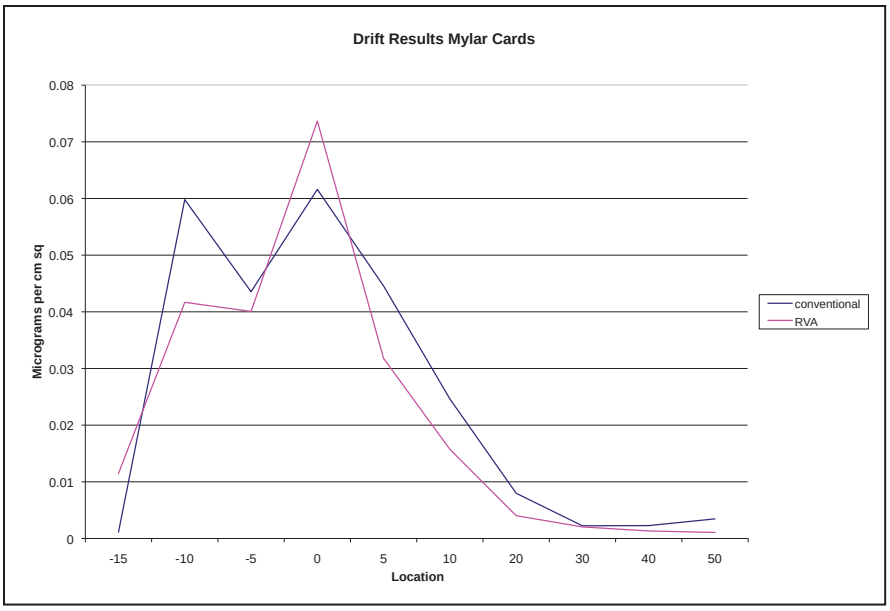


*Figure 5. Graph of amount of tracer detected on samplers*

spray drift during aerial application of pesticides. We have built and mounted a 30-foot RVA system on an aircraft and test flown it, determining it to be safe to fly with minimal costs in additional drag, loss of lift and added weight. We have demonstrated up to a 93 percent reduction in fines at 100 mph and 78 percent reduction in fines at 150 mph airspeed in wind tunnel tests. Actual drift testing in the field with the RVA on a test aircraft at 150 mph using water with dye and non-ionic surfactant (to simulate pesticides tank mix) has demonstrated a 40.8 percent reduction in drift at 10 m and a 39.4 percent reduction at 50 m compared to a conventional spray system. A complete 30-foot RVA system has been installed on the test aircraft (AT-301), test flown, and met with FAA approval allowing for commercial use of the system.

Currently the AT-301 with the RVA chamber installed is in use commercially at Bob's Flying Service, in the Sacramento Valley of California. Using the system in a commercial environment is allowing time to work out bugs and make improvements, such as modifying the delivery system (spray boom and check valves) to make it more streamlined, further reducing the driftable fines. In the process of examining the delivery system, we have discovered some additional changes that may enhance the overall system. Most of the engineering is complete for FAA certification on the AT-301. Hereafter, we will expand the scope of engineering documentation to include additional types of aircraft. Plans are to make the RVA system available commercially by the end of 2012. ■

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*Russ Stocker holds a B.S. in Environmental Toxicology from University of California, Davis, as well as an Agricultural Pest Control Advisors License, Aircraft Pilot's Pest Control Certificate, Qualified Applicator License and Qualified Applicator Certificate. Russ has 39 years' experience in the pesticide application industry, including 36 years as an ag pilot. He has logged more than 25,000 hours as an agricultural pilot in both airplanes and helicopters, has been an owner-operator of an aerial application business, and has worked in some of the most diversified cropping areas of California, regularly making herbicide applications with sensitive crops on several sides of the treatment sites. Spray management, combining climatic conditions, nozzle selection and orientation to achieve the best droplet spectrum for the job, is one of the most critical aspects of his work. His long-term goal has been to achieve better control over the percentage of driftable fines produced during aerial applications. He has developed hands-on training programs for the California Department of Pesticide Regulation and U.S. EPA Region IX and other continuing education programs. He has been involved in research projects related to pesticide applications for university, forestry and private industry including the Spray Drift Task Force.*

***Acknowledgements***

*USDA, SBIR Program, grant number 2005-33610-16463*

*NAAA provided a letter of support for RVA proposal to USDA, SBIR Program.*

*Clint Hoffmann, USDA, ARS, College Station, Texas assisted drift study design, setup, sample collection and sample analysis.*

*Richard Stoltz, Operation S.A.F.E. Analyst, California Agricultural Aircraft Association, assisted with swath testing.*

*Norm Akesson, University of California, Davis, was a major contributor in earlier studies and provided training on wind tunnel and atomization.*

*William P. Peschel, Engineering Consultant*

PROFESSIONAL AERIAL APPLICATORS' SUPPORT SYSTEM

# PAASS Preview:
## Out With the Old and In With the New

*By Ken Degg*
*NAAA Director of Education & Safety*

The 2010–2011 PAASS Programs are now in the past and we are approaching the new 2011–2012 presentation season. This marks the 14th consecutive year NAAREF has offered its signature safety education program. The primary goals of PAASS are to reduce the number of aviation accidents and drift incidents associated with the aerial application of fertilizers and crop protection products. Statistics bear this out. Since the first program began in the fall of 1998, the ag accident rate has fallen an amazing 20.7 percent. At the same time, the fatal accident rate decreased almost 11 percent. The accident and fatality rates are the rates of ag accidents occurring per 100,000 hours of flight time expressed for the purpose of factoring in the amount of exposure.

Attendee satisfaction is another barometer of success, and PAASS continues to earn high marks year after year. That's a testament to the quality of the curriculum and the individuals who present it. The continuing challenge for the PAASS Program Development Committee (PDC) is to come up with content that is compelling and current. It is a challenge they readily accept.

Programs presented through the past several seasons have had four distinct modules of information. The 2011–2012 PAASS Program will take a slightly different approach. It will tie security, human factors and drift mitigation together in one combined scenario to examine how each area can and does affect the other areas.

### 2011–2012 Preview

Programs presented through the past several seasons have had four distinct modules of information. They were Airfield Watch (security module), Human Factors in Ag Aviation (aviation decision making), Drift Mitigation (prevention of off-target chemical drift) and Hangar Flying (study of ag accidents and other late-breaking information useful to the ag aviator). The 2011–2012 PAASS Program will take a slightly different approach. It will tie security, human factors and drift mitigation together in one combined scenario to examine how each of these subject areas can and does affect the others. The dramatization will play out in a video written and produced by the PDC.

The scenario begins with a large drift claim as a result of spraying during inversion conditions. At this point, the Drift Mitigation subject of inversions will be discussed in depth with information supplied by California ag pilot and retired National Weather Service meteorologist Dan Gudgel. Dan lends his expertise in explaining the phenomenon, how to identify when it exists and its effect on spray droplet movement. His belief is that the pilot's eyes and knowledge of what to look for may be the best instrument for identifying an inversion.

The scenario continues to show the resulting pressures and stresses caused to the operator and pilot by a potential lawsuit to cover the damages. The chain of events leads to an accident which must also be dealt with by the already stressed operator at a time when he is least prepared for the additional pressure. The scenario then delves into a detailed Human Factors segment to help attendees develop a plan

for coping with tragedies before it is needed. PAASS has prepared an Emergency Preparedness and Response Plan for attendees to use in planning for such an unfortunate event. Interviews with persons in the industry who have dealt with such traumatic events reinforce the need for preparedness.

Finally, the video scenario portrays the ease at which a person can be overwhelmed by events and forget simple tasks such as maintaining security of the operator's facility. A discussion of security practices that can be employed by operators will follow.

The Hangar Flying Module will look in depth at the accidents that occurred in the ag industry during the 2011 application season. This module also provides a venue for informing the industry of late-breaking news that is vital to all operators and pilots.

## How Attendee Input Influences Future Programs

The evaluation sheets provided at every PAASS presentation are an important part of the planning process for future programs. The Program Development Committee thanks attendees for their honest assessments and suggestions for future topics of exploration. While there isn't enough time to address all important topics in each presentation, often the same ideas emerge over and over again on the evaluations.

An example of a subject matter that was chosen for the 2010–2011 program because of attendee suggestions was the topic of "Ethics in Ag Aviation." Ethics was one of the most requested topics on the previous year's evaluation sheets. Comments included the desire for a module to address integrity, professionalism, fair pricing, giving customers what they pay for and in turn, how the operator should be treated by the customer. One operator went as far as to write, "We are our own worst enemies—will destroy our industry from within."

In reference to the ethics module, the past season's attendee evaluations were overwhelmingly positive. Comments included numerous entries reading "thought provoking," "very important to the future of the aerial application industry" and "topic needs to be standard in PAASS." Expectedly, there were also negative comments saying "you either have ethics or not," "will not change anyone" and some who felt this type of topic should not be in PAASS at all. PDC feels "ethics" was a success if those attending at least consider making professional and thoughtful decisions that make a difference in the way our actions and the industry are perceived by customers and the public in general.

Other comments were very favorable toward the security module that dealt with the threat posed by an unknown person with questionable motives visiting ag operators in the Arkansas area. The segment highlighted the network set up by the Arkansas Agricultural Aviation Association to disseminate information to operators and work with law enforcement if a potential threat is suspected. Commenters suggested their state association or even the national association set up a communications system similar to Arkansas AAA to be available when needed.

The Drift Mitigation module presented actual cases where damage occurred from chemical drift. Each example was analyzed to demonstrate what had happened and why. A majority of commenters rated the information presented as good to excellent and asked for more technical information on chemicals that may cause damage to ultra-sensitive crops. Misconceptions about inversion conditions noted during this module prompted PDC to present this year's drift module on understanding and coping with inversions.

A change is planned in the method used for collecting program evaluations and comments on the program this year. Instead of a paper evaluation form, the evaluation may be completed online at a site called SurveyMonkey.com. Attendees will be supplied with a link and information on how to use the site. Please do not hesitate to submit your suggestions for future PAASS program content. Rest assured the suggestions are considered by PDC when deciding what topics to present in future programs. This is the best way to make your desires known and aid the committee in its endeavor to come up with even more new and exciting program content. ■

## A Word of Thanks

**NAAREF's thanks go out to the Program Development Committee (PDC) that develops the theme and content of the individual PAASS programs; the countless people who actually prepare the program; the PAASS Presenters who spend many hours of their own time learning the program and making the actual presentations; and last but not least, the sponsors of the program that lend financial support to produce a high-quality program at a price that is affordable for attendees. The sponsors include the Federal Aviation Administration (FAA) and Environmental Protection Agency (EPA); industries allied to the NAAA; individual operators and pilots; and memorial donations honoring those who have passed.**

# NTSB Accident Report

| Date | City | State | Aircraft Type | N # | Injury | Description of Accident |
|---|---|---|---|---|---|---|
| 04/13/11 | Telephone | TX | AT-503A | 503AD | Minor | Stalled and hit trees |
| 04/17/11 | Horseshoe Lake | AR | AT-802A | 42015 | Minor | Hit tower–made forced landing |
| 04/18/11 | New Madrid | MO | AT-802A | 802KC | Serious | Midair collision while spraying |
| 04/18/11 | New Madrid | MO | AT-502B | 8516K | None | Midair collision while spraying |
| 05/04/11 | Princeton | CA | G-164 | 716Y | None | Settled back onto ground after takeoff |
| 05/10/11 | Walnut Ridge | AR | G-164B | 8402K | None | Lost control on landing with tailwind |
| 05/11/11 | Garwood | TX | AT-301 | 5097S | None | Hit power line and impacted terrain |
| 05/11/11 | Pleasant Grove | CA | S2R-T34 | 510CW | None | Veered off runway on tailwind landing |
| 05/12/11 | New Athens | IL | OH-58C | 9263Y | FATAL | Hit terrain in field for unknown reason |
| 05/19/11 | Kahlotus | WA | S-2R | 4996X | None | Veered off runway on crosswind takeoff |
| 05/27/11 | Oak Ridge | LA | G-164A | 2LU | Minor | Struck trees during training flight |
| 05/28/11 | Hazelton | ID | G-164A | 9724 | None | Power loss–damaged on forced landing |
| 06/01/11 | Stockton | CA | UH-12E | 68012 | None | Hit tree while drying cherries |
| 06/02/11 | Pine Bluffs | WY | Ce A188B | 9496G | None | Power loss–damaged on forced landing |
| 06/07/11 | Odessa | WA | S-2R | 3662X | None | Aircraft collided on taxiway |
| 06/07/11 | Odessa | WA | AT-502B | 6072X | None | Aircraft collided on taxiway |
| 06/13/11 | Buttonwillow | CA | G-164A | 5286 | None | Unable to stop on landing with tailwind |
| 06/14/11 | Pullman | WA | G-164B | 8376K | Minor | Hit power line and force landed |
| 06/16/11 | Athleimer | AR | S2R-T34 | 30902 | Minor | Uncontained engine failure and fire |
| 06/17/11 | Highmore | SD | PA36-300 | 57885 | FATAL | Hit terrain for unknown reason |
| 06/19/11 | Lost Hills | CA | UH-12E | 139HA | Minor | Power loss–damaged on forced landing |
| 06/21/11 | Marysville | CA | G-164B | 3627G | None | Right main gear separated on takeoff |
| 06/21/11 | Blackfoot | ID | AT-502 | 1515P | None | Unable to remain airborne on takeoff |
| 06/21/11 | Hogeland | MT | AT-301 | 3661B | FATAL | Hit terrain for unknown reason |
| 06/23/11 | Havre | MT | PA-36-285 | 57736 | None | Settled after takeoff from road |
| 06/23/11 | Brawley | CA | S-2R | 8520V | Serious | Power loss caused forced landing–Sulfur caught fire |
| 06/24/11 | Lewistown | MT | AT-502 | 1022N | None | Power loss–damaged on forced landing |
| 06/24/11 | Circle | MT | AT-301 | 2362D | None | Failed to remain airborne on downwind takeoff |
| 06/28/11 | Estelline | SD | A188A | 1588M | Minor | Impacted terrain on takeoff and burned |
| 07/03/11 | Brentwood | CA | OH-58C | 6264D | Serious | Collided with terrain |
| 07/06/11 | Pine Bluff | AR | S2R-G6 | 3101S | Minor | Engine failed immediately after takeoff |

# Welcome to New Members

As of July 25, 2011

### OPERATOR

**Brandon Miller**
Delta Ag Specialist Inc.
Dahli, LA

### ALLIED INDUSTRY

**Matt Panfil**
Av-DEC
Fort Worth, TX

**Steve Cortum**
Loveland Products Inc
Norwalk, IA

**Victor Malone III**
Monty's Plant Food Co., Inc.
Louisville, KY

**Steve Knowle**
QBE the Americas
Kennesaw, GA

**Davis Davant**
United Turbine Corp.
Miami, FL

### ASSOCIATE

**Karen Allen**
Alexander Flying Service
Walnut Grove, CA

**Dan Benton**
Fort Worth, TX

**Jach Haskins**
Bloomville, OH

**Justin Penick**
Acorn Forestry
Lufkin, TX

**Bryan Ray**
Woodlake, CA

**Joshua Reilly**
Vero Beach, FL

### PILOT

**Casey Bessette**
AgriMax
Grafton, ND

**David Birdwell**
Katy, TX

**Jeffery Grim**
Agri-Tech Aviation Inc.
Indianola, IA

**Brandon Hanks**
Shelby, MS

**Jim Hurt**
Townsend Aviation
Walton, IN

**Tony Neal**
Shearer Sprayers
The Dalles, OR

**Hans Sellmeyer**
Knobel, AR

### PARTICIPATING PILOT

**Gregory Shears**
Western Pilot Service
Goodyear, AZ

# Test Your Knowledge Answers

Continued from pg. 39

**1. The correct answer is C.** The requirement to wear personal protective equipment (PPE) is specified on the chemical label. PPE is required when the pilot is outside the cockpit or serving as a handler. Making nozzle adjustments falls under the handler's duties. (Aerial Applicator's Manual: A National Pesticide Applicator Certification Study Guide [AA Manual], pgs. 19–22, pg. 26)

**2. The correct answer is D.** The Federal Worker Protection Standards (WPS) regulations require pesticide handlers receive training every five years at a minimum. (AA Manual, pg. 21)

**3. The correct answer is C.** The spray droplets and the percentage of droplets within a certain size range are the key factors affecting off-target drift. (AA Manual, pg. 34)

**4. The correct answer is D.** Research has shown that droplets smaller than 200 microns are very prone to drift. It is interesting to note that droplets below 50 microns in diameter remain suspended in the air indefinitely or until they evaporate. (AA Manual, pg. 35)

**5. The correct answer is B.** (*Editor's note: The manual answer guide incorrectly gives the answer as C.*) A spray valve is usually used to direct the spray pump output either to the spray booms or back to the hopper for agitation. When the spray valve is turned off, it provides a low negative pressure, or suck-back, to the boom. (AA Manual, pg. 46)

**6. The correct answer is B.** If the spray output remains constant and the airspeed is increased, less pesticide active ingredient will be applied per acre. (AA Manual, pgs. 71–75)

**7. The correct answer is B.** The area of a rectangle is calculated by multiplying the length times the width: 1,280 feet x 620 feet = 793,600 square feet. There are 43,560 square feet/acre, therefore 793,600/43,560 ≈ 18.2 acres. (AA Manual, pg. 71, Sidebar 6)

**8. The correct answer is B.** If the operation requires many trips back into an area, avoid taking the same route each time. Fly neighborly by varying the route by one-eighth to one-quarter mile to avoid repeated passes over the same surroundings to minimize the impact of the flights. (AA Manual, pg. 82)

### Trivia Answers

**9.** Wiley Post's aircraft in which he set the solo round-the-world record was named "Winnie Mae." His time for the flight was seven days, 18 hours, and 49 and one-half minutes. The aircraft is on permanent exhibit at the Smithsonian's Udvar-Hazy Center at Washington Dulles International Airport.

**10.** During April 1942, Jimmy Doolittle led a flight of 16 North American B-25 Mitchell bombers from the aircraft carrier *Hornet* to drop bombs on Japan. ■

*The USDA-ARS Aerial Application Technology Group (AAT) publishes almost 20 papers a year in peer-reviewed scientific journals. The following Applied Research Summary and others like it have been boiled down to a few quick take-away messages and will be appearing regularly in Agricultural Aviation. Full reports are available at AAT's revamped website, apmru.usda.gov/aerial.*

# Aerial Application Methods for Increasing Spray Deposition on Wheat Heads

Original Citation: Fritz, B.K., Hoffmann, W.C., Martin, D.E., and Thomson, S.J. 205. Applied Engineering in Agriculture. 23(6):709–715.

**Research Objective:** To compare multiple spray application treatments to determine which provide optimum spray deposition onto wheat heads.

**Research Methods:** Six spray treatments consisting of ASC rotary atomizers, Spectrum electrostatics spray system, and CP Products, CP-03 nozzles, were compared for product deposition on wheat heads. The rotary atomizers delivered a very fine spray at 2 gpa while the electrostatic nozzles delivered a very fine spray at 1 gpa. The CP-03 nozzles were set up to deliver four treatments: a very fine spray at 2 and 5 gpa, and a medium spray at 2 and 5 gpa. Through a combination of water sensitive cards, tracer deposition sampling and fluorescent photography, coverage and spray deposition were determined and compared. All spray applications were made with the AAT's Air Tractor 402B operating between 100 and 150 mph, depending on the spray treatment, at a 10 ft height for rotary treatments and an 8 ft for all other treatments.

**Research Results:** Water sensitive cards confirmed that spray droplet sizes delivered to the wheat heads were consistent with the treatment setups. Tracer deposition analysis demonstrated that the CP-03 at 2 gpa with a medium spray delivered the most product to the wheat head, followed closely by the electrostatics and the CP-03 at 2 gpa with a very fine spray. The fluorescent images from sprayed wheat heads confirmed previous research which noted that only the upwind side of the wheat heads have spray material deposits. Visually, the best depositing spray treatment (CP-03 2 gpa medium spray) resulted in the poorest coverage, as a result of less total spray solution delivered with larger droplets.

Research Application:

- Spray deposition from treatments delivering a very fine spray, regardless of the rate, were very similar but tended to be less than that from a medium spray delivered at a low rate. The smaller droplets from the very fine sprays were more subjective to wind speed and humidity, resulting in less on-target deposition than the larger, medium spray treatments.
- Lower spray rates, while providing somewhat less visual coverage than the higher rates, resulted in overall greater product deposition on the wheat heads as a result of the lower dilution rates.
- Overall, the lower rate (2 gpa) treatment delivered with a medium droplet sized spray delivered the most spray material to wheat heads with greater control and likely with less off-target movement. ■

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# Scott Schertz: Aerial Application Ambassador Serves on Crucial CropLife America Committee

Former NAAA president Scott Schertz and Schertz Aerial Service Inc. took on an unusual "intern" earlier this summer when Barbara Glenn, CropLife America's (CLA) VP of Science and Regulatory Affairs, shadowed the Hudson, Ill., aerial application operation. Interns usually come in the form of wide-eyed college students looking to beef up their résumé and enhance their job prospects, not high-level executives, but Glenn was just as eager to take it all in. Her visit was chronicled in CropLife America President & CEO Jay Vroom's "This Week & Next" newsletter, which goes out to CLA member companies. The visit and ensuing coverage in CLA's newsletter send an important message that crop protection producers recognize the value of aerial application.

CLA is the national trade association representing manufacturers of crop protection products. CLA is one the leading associations in Washington, D.C., pushing for sound policy affecting modern agriculture. The association has been instrumental in pushing for reasonable laws and regulations that ensure the safe use of pesticides while not being unnecessarily or overly burdensome for users. NAAA and CLA have always maintained a good working relationship, but Schertz has helped CLA gain an even deeper understanding of aerial application through his active participation on CLA's Strategic Oversight Committee (SOC), a committee he has served on for nearly a year. The SOC is a member-based committee that oversees all of CLA's issues and ensures that staff and resources are allocated appropriately. The committee is also responsible for CLA's strategic plan implementation and for making certain the plan reflects current opportunities and challenges for the industry. Schertz and other representatives from CLA member companies meet on a monthly basis to review the organization's key functions and priorities.

As NAAA's 2005 president, Schertz completed a five-year term on NAAA's Board last year when his tenure as one of the five most recent past presidents ended. Schertz's considerable service

Photo courtesy of CropLife America

*The Schertz Aerial Service team with CropLife America's Barbara Glenn, standing to Schertz's right.*

Photo courtesy of CropLife America

*Left: Brian and Scott Schertz with their dog Katie. Right: Pilot-in-chief Schertz does a flyover.*

to the aerial application industry continues, however. In addition to flying to Washington for CLA's monthly SOC meetings, he regularly travels to the nation's capital to serve on EPA's Pesticide Program Dialogue Committee (PPDC) representing NAAA. The EPA's PPDC is a federal advisory committee that seeks input from stakeholders involved with pesticides—from state regulators, activist groups, manufacturers, users and academia—on agency policies and direction. Schertz joined CLA because Schertz Aerial Service, in addition to being one of the largest aerial application crop protection product retailers in the industry, qualified for membership because it distributes chemicals and Schertz also wanted to continue to do his part in promoting the importance of modern agricultural production.

CLA sending one of its senior representatives to Schertz Aerial Service is not only an indication of the important role aerial application plays in modern agricultural production, but also indicates the important role aerial retailers' play to product manufactures by the significant quantity of product they use through direct purchases.

Schertz hosted Glenn in mid July, right when the corn was entering the tasseling stage and Illinois aerial applicators were about to embark on the busiest five weeks of their year. CLA's "This Week & Next" informed readers that aerial crop protection businesses would be "flying fungicides and insecticides over millions of acres of corn and soybeans" during this stretch. During Glenn's visit, Schertz Aerial Service had at least a dozen planes running continuously.

Proving its interest isn't short-lived, CLA has scheduled an aerial application session at its upcoming 2011 Annual Meeting. Schertz will be part of a special panel specifically addressing the aerial application industry. He will be joined by fellow panelists Mike Karasiewicz (Wilbur-Ellis), Paul Wegner (California Farm Bureau Federation) and Terry Gage (California Agricultural Aircraft Association).

The theme of CLA's Annual Meeting is "Riding the Wave of Modern Agriculture." It will take place Sept. 26–28 at the Ritz-Carlton Laguna Niguel in Dana Point, Calif. Single-day registration for the Annual Meeting general sessions is available for California-based agricultural allies. For more information, please contact Francesca Joyce at 202-872-3898. ■

# In Memoriam: Former NAAA President Richard Carroll

NAAA Past President Richard Carroll died on July 5 in Moline, Ill., following complications from surgery. He was the 1972 NAAA president and an active member of the national association and the Illinois AAA for many years.

Carroll earned his pilot's license in 1946 and was the first operator of the Mercer County Airport upon its opening in 1954. He formed Crop Care by Air in 1956 and ran the company from the Mercer County Airport for 19 years until he moved his business to Alta Vista, Kan., in 1975.

In addition to his aerial application business, he worked as a consultant to the Illinois Department of Agriculture in the 1960s and 1970s and was the head instructor and head of staff of the Agricultural School of Aviation at the University of Ohio-Columbus in 1964.

In the mid-1990s Carroll retired and he and his wife Shirley became avid collectors and restorers of Massey-Harris tractors and farm equipment. From 1977 and until Shirley's death in 2002, they divided their time between their farm in Kansas and their winter home in La Belle, Fla. Carroll later married Verna Trevor of Moline.

Carroll is survived by his wife Verna, two brothers, a son and daughter, three grandchildren and six great-grandchildren. He was 83 years old and was preceded in death by his wife Shirley, his parents and a son.

NAAA extends its sympathy to the Carroll family and is grateful for the service of Dick Carroll to the agricultural aviation industry. ■



## CLASSIFIEDS

# New-Look NAAA eNewsletter Ushers in Next Generation of Member Communications

If you're an NAAA member you probably noticed something different in your e-mail inbox recently—a revamped, sleeker, more dynamic NAAA eNewsletter. The eNewsletter is a members-only benefit and NAAA's prime means of keeping the membership apprised of major developments within the industry and inside the beltway in addition to news about the association and fellow members.

The cosmetic enhancements jump out immediately, but what's truly revolutionary about the new-look NAAA eNewsletter is the degree to which it enhances the entire reader experience. The NAAA eNewsletter is no longer a passive reading experience. Now readers can actively participate in the conversation by posting comments at the end of certain articles and voting in NAAA's new ePoll. As comfort levels increase, we expect the revamped eNewsletter to morph from a purely informational medium to a more participatory medium in which information flows in both directions—from NAAA to readers and vice versa. Over time we will introduce even more interactive elements, which should further increase the level of member engagement.

The new eNewsletter is available in multiple formats—desktop/web, mobile and print-friendly. The desktop version is the default format. If you're someone who checks e-mail on the go, the mobile-friendly version is for you. The mobile format is light on graphics and is formatted for the small screen. To convert to the mobile format, click on the mobile link above the masthead.

The previous NAAA eNewsletter featured a single-screen, scroll format that could get quite extensive. The new multi-page format allows readers to navigate quickly and seamlessly from one article to the next starting with whatever article interests them the most.

Future enhancements could include:

- Greater use of photos and pull quotes in the full versions of articles
- Social media integration
- The ability to rate articles
- And more!

If you are a member and have not been receiving the NAAA eNewsletter, please contact NAAA at 202-546-5722 to provide an e-mail address or verify that we have the correct one on file. You can also update your e-mail address yourself by clicking on "My Profile" on NAAA's website. If you are not an NAAA member, become one today. A membership application is available on pg. 58 or you can join online at www.agaviation.org. ■


*The revamped NAAA eNewsletter features a versatile design that is as functional as it is stylish.*

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