Agricultural Aviation

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Bugging Out!

Will this year's warm, mild winter lead to big bug runs this summer?

ALSO INSIDE:

- The Pitfalls of Flying Fatigued
- Disaster Mitigation Steps
- NPDES Compliance Complications Continue

Scott Goetz, Grand Prairie Dusters Inc.

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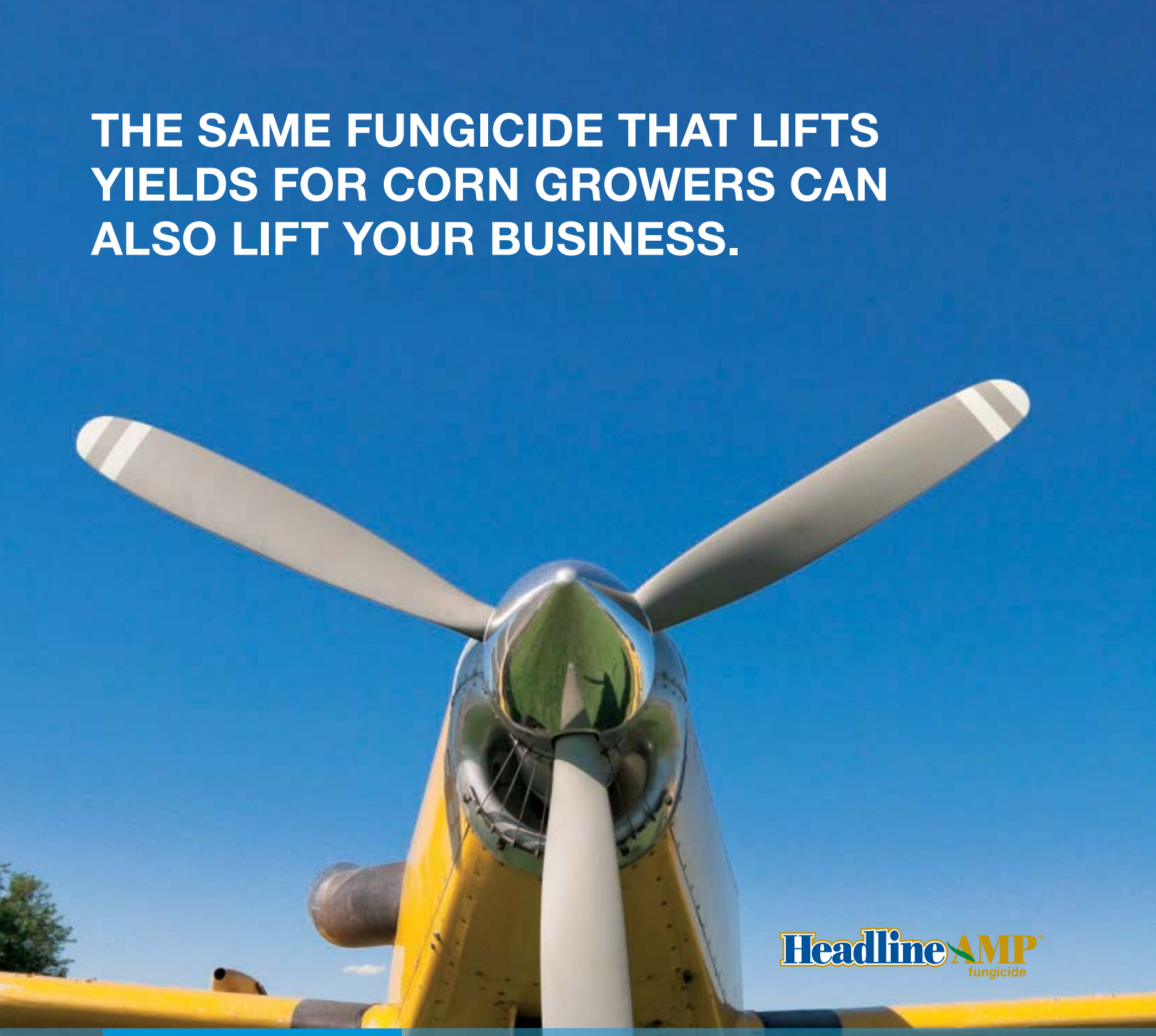

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Cover photo courtesy of Bill Bracewell, ARCO Sign & Decal, Stuttgart, Ark.

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President's Message

Mark Hartz

A Culture of Safety and Stewardship

This is my first column since attending many of the state conventions earlier this year, including the Canadian AAA's convention in Montreal. My take from all those conventions, which had record attendances I might add, is a considerable amount of enthusiasm about the coming season but tempered with concerns about regulatory issues such as the NPDES Pesticide General Permit.

While the PGP remains a concern for all of us, NAAA is continually looking for opportunities to have this flawed and cumbersome regulation rescinded. I would urge all of you to stay in contact with your senators to reinforce the fact that this permit does nothing to increase the safety of water or the environment. But it does put us all in legal jeopardy from lawsuits from environmental groups who would use this permit as a mechanism to further their particular agendas. Let your elected representatives know that as a constituent of theirs, you oppose the PGP and wish for them to work towards eliminating this convoluted and redundant regulation by enacting H.R. 872.

Another meeting of importance during this time period was NAAA's Spring Board Meeting. It was an exciting meeting, where many issues were addressed. Perhaps just as exciting were the meetings that occurred prior to the board meeting with the FAA, the Senate subcommittee on aviation and the USDA Agricultural Research Service (ARS). In the FAA meeting, NAAA discussed further revising the AC circular regarding marking MET towers to include all towers (free-standing and guy-wired) less than 200 feet AGL. Implementing a web-based volunteer database of all towers also was discussed. NAAA was successful in getting a provision into the FAA Reauthorization Bill which requires the FAA to conduct a study to assess the feasibility of such a site.

With the Senate Aviation Subcommittee, user fees on general aviation (of which agricultural aviation would be included) were discussed. In that meeting we were told that user fees on general aviation would be unlikely to be considered until the next FAA Reauthorization in four years. In addition, because of NAAA's success four years ago in obtaining an ag exemption for user fees, should another exemption be necessary it "shouldn't be a heavy lift," according to subcommittee staffers.

In the meeting with USDA-ARS, NAAA communicated the value we place in the research they do for aerial application, and they in turn communicated their commitment to continue to do research that is important to our industry with no reduction in spending planned. This is quite a success considering the USDA-ARS has cut spending by $80 million in the past two years and shut down 10 research facilities across the country.

With meetings like these, relationships are built and maintained with those who govern us, which is of great value to our industry. While similar meetings are attended throughout the year by NAAA staff, being a party to them reinforced for me how important it is to have an association that brings credibility and gives voice to our concerns at all the tables where ag aviation needs to be represented.

Putting PAASS into Practice

Since I traveled to many of the state conventions I probably hold the distinction of having attended more PAASS presentations than even the PAASS presenters themselves. Each time the presentations were interesting, informative and compelling. But as was soon demonstrated to me, just attending a PAASS presentation, or in my case numerous presentations, does not a safer ag pilot make.

During the months of January and February I spent fewer than 10 nights in my own bed while attending numerous functions on behalf of NAAA. I arrived home from my last convention late on a Thursday afternoon with a completely full flying schedule for the next day. It was particularly blustery the next morning, my first day back in the saddle. With my responsibilities as NAAA President and my travel

schedule, my mind was on many things. One thing that had not been on my mind was the fact I was about to start my flying season and that I had spent little time preparing myself mentally for the transition I was about to make.

I spent the day applying dry fertilizer. Things were going okay until the middle of the afternoon. While working very close to our airport and with several other aircraft working in the same area, I made an abbreviated approach to land so as not to lose my place in the parade of airplanes coming and going from the runway I was using. While trying to slow down before the end of the runway approached, a gust of wind hit me and before you know it I was taking a trip through the daisies. Yes, I had run off the runway, narrowly missing several of the new runway lights freshly installed at our airport. I will never forget how big the eyes of my loader driver got when he saw me coming at him from a very unconventional direction!

This was an approach and landing I had done thousands of times before. What was the difference here? First, it was my first day back flying. Second, flying conditions were very poor that day. But all of us in this business have a "get 'er done" mentality, and that's what I was trying to do. Having been away from the business so much I was really trying to once again pull my weight. Lastly, I didn't make a conscious effort to think about making safety a priority.

Too often in the heat of battle and trying to accomplish too many things at once, all considerations of safety fly out of the window with our "get 'er done" mindset. Even after seeing as many PAASS presentations as I had over the winter, I walked right out to my plane that morning and never once said to myself, "Let's make it a safe day." I realized I need to make a positive effort to bring a mindset of safety into my awareness.

It will take far less time to make up the time you spend thinking about safety than it will for you to recover from an incident or accident that results from not giving any thought to operating in a safe manner. Accidents often are personal blows to your business, family and to our industry. So I have made a pledge to myself and hope you will make the same pledge: Let's make safety a priority in our thought process each and every time we climb into our aircraft. But don't stop there, make safety an integral part of your whole operation. The dividends for being safe far outweigh the tragic consequences of allowing a preventable accident to happen.

Stewardship

Another issue that needs some time at the forefront of our consciousness is stewardship. A major consideration to remaining a viable industry is our ability to place crop protection products on target. A misapplication that results in damage to adjacent crops can be financially devastating to you as the applicator, the customer you are applying for and of course whoever is harmed by the misapplication. But another casualty from a misapplication is the agricultural aviation industry as a whole.

While we as an industry have made great strides in reducing misapplications through education and adopting new technologies where spray applications are concerned, there is a perception that applying crop protection products, especially herbicides, by air is less precise than applying them by ground rigs. While totally unfounded and the facts bear this out, the perception exists nonetheless. How does that affect our industry?

Several chemical companies that are producing new herbicides are going through the registration process without pursuing an aerial label. One can only conclude that these chemical companies, in trying to successfully launch new herbicides for corn and soybeans, perceive the risk as too great to allow these products to be applied with an aircraft. This mindset, while inaccurate, has led these chemical companies to seek to reduce their liability, reduce developmental costs and perhaps bring these new herbicides to market faster. What this does for our industry is deny the tools we need to service our grower's needs. If this precedent is allowed to continue, more and more tools in our arsenal will be denied to us. That inhibits our ability to be a full-service applicator of crop protection products.

As an industry, we need to greatly reduce the incidences of misapplications and adjacent crop injuries so that when new products come down the pike, we won't be denied the opportunity to apply them by agricultural aircraft. It seems only appropriate to recite the mantra from the PAASS Program: "Upon the performance of each rests the fate of all." Truer words have never been spoken. ■

P.S. No runway lights were harmed during the events described in this column.

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Executive Director's Message

Andrew Moore

A Frugal Farm Bill?

In case you haven't heard, gridlock has become the new norm in Washington, D.C. Lawmakers seem unwilling to come to agreement on any major legislative initiatives until after the Nov. 6 national elections when the people decide who they want running the show in the White House and Congress. But once the election results are determined a number of key national policy issues will still need to be addressed due to the fact that they have expired or will expire shortly. Agricultural policy is included in this mix given the unlikelihood that any pre-election agreement will occur.

One of the key issues involving agriculture is, of course, the 2008 Farm Bill which includes supporting farm commodity prices and income. The current Farm Bill program expires in September. Many in Congress have historically defended farm support programs as a means to ensure the U.S. has continued access to the safest, most abundant and most affordable food supplies in the world. The Farm Bill is important for commercial applicators because of the assurances it provides that farmers will be paid for their crops and in turn will be likely to pay for services provided to their crops. Plus, the research title of the Farm Bill provides authorization for research dollars to the ARS that trickle down to research on aerial application technologies aiding the industry's efficiency.

Times have changed, however, since the $283.9 billion 2008 Farm Bill was written, which was basically a budget-neutral statute, and have changed significantly from the well-heeled 2002 Farm Bill which was written during a brief period of budget surplus at the turn of the millennium. Today congressional economists say the government will run a $1.2 trillion deficit for the budget year that ends a few weeks before Election Day—making this the fourth straight year of trillion-dollar-plus deficits.

To address out-of-control federal debt, broad deficit reduction proposals include agricultural spending. For example, the joint deficit reduction panel that dissolved in a stalemate last fall was provided a proposal by Senate Ag Committee Chairwoman Debbie Stabenow (D-Mich.) and House Ag Committee Chairman Frank Lucas (R-Okla.) that would cut $23 billion in farm and nutrition programs over a decade. The two chairs were taking a proactive approach to spending cuts. President Obama's 10-year deficit proposal would cut about $32 billion over that same amount of time. In March, House Budget Committee Chairman Rep. Paul Ryan (R-Wis.) released his proposal for the FY2013 Budget. On the agriculture side, the proposal would reduce spending by $30 billion over 10 years by reducing direct payments and reforming crop insurance so that agriculture producers take on more responsibilities related to managing risk.

The bottom line is there are very likely going to be significant cuts in the farm commodity price and income support framework, if not an elimination of these programs to be replaced by perhaps buttressing crop revenue insurance. "The country simply cannot afford to pay subsidies to farmers who are already doing well, or to pay farmers for crops they are not even growing," Chairwoman Stabenow said. "It's time for real reform. That's why the era of Direct Payment subsidies is over."

Adding to this likelihood are the farm sector's recent rosy statistics. Net farm income was $81.6 billion in 2010, up from 31% from 2009, and $98 billion in 2011 with projections of $95 billion in 2012, according to the Food and Agricultural Policy Research Institute.

A one-year extension to the Farm Bill as a means to punt the issue until after the election is highly unlikely due to the fact that it would perpetuate what many in Congress—particularly new House members—believe is an already expensive federal program. A one or two-month extension might be likely. But shortly after the second week in November in a lame duck session or at the beginning of the

new Congress in January, a new, more frugal Farm Bill will very likely be decided upon.

Eliminating subsidies by buttressing crop insurance as the new protection measure for farmers is not a given, however. The Obama Administration has proposed to save more than $7.6 billion over the next 10 years by reducing crop insurance subsidies. Some environmental activists propose the federal government provide all farmers with free insurance to cover yield losses of more than 30%, but premium aid for revenue-protection plans and other crop insurance products would be eliminated, although farmers could buy such policies on their own.

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The government-backed insurance, according to the activists' plans, would also require farmers to meet certain conservation practices in order to qualify for the insurance. Congress required so-called conservation compliance as a condition for crop insurance from 1985 to 1996. Opponents of the requirement argue it would drive some farmers away from federal insurance because of regulatory costs or fear that they might lose coverage because floods or other weather-caused events temporarily undo soil conservation protections. An argument could be made that using aerial application might be considered a conservation measure due to the fact that it doesn't disrupt the topsoil as other forms may.

At any rate, crop insurance is not necessarily a magic elixir because strong market prices raised the value of insured crops affected by natural disasters. With 81% of the finalized claims tallied for 2011, crop insurance companies had already paid $9.1 billion in indemnity payments to U.S. farmers. That's a new record and actually the largest loss claims in the history of the program, according to USDA's Risk Management Agency.

Adding to this pressure of determining U.S. farm policy is the BCA or Budget Control Act that passed last summer raising the federal debt ceiling and pledging to cut budget deficits by at least $2.1 trillion by 2021. If the joint deficit reduction panel and Congress could not achieve the deficit reduction through more spending cuts or tax increases, which they have not, then sequestration or automatic cuts in defense and non-defense spending are to take place in 2013. Many entitlements (Social Security, Medicaid) were excluded from cuts, which mean sequestration will take back large shares of the budgets of the remaining programs to achieve the total cutbacks required. This will severely affect the activities of the un-exempted programs, which includes defense, agriculture and other discretionary spending programs.

The Farm Bill and budget sequestration aren't the only key policy initiatives requiring action at the end of 2012 and beginning of 2013. When the clock strikes midnight on New Year's Day 2013 the Bush tax cuts will expire if no agreement is reached. The Bush cuts reduced the lowest income tax rate from 15% to 10%, the 27% rate went to 25%, the 30% rate went to 28%, the 35% rate went to 33%, and the top marginal tax rate went from 39.6% to 35%. In addition, the child tax credit went from $500 to $1,000.

All of this is leading to what will be a pretty darn active and eventful lame duck session of Congress after the people have spoken on Nov. 6—one that is very likely to have long-term national implications on agricultural policy, tax policy and the services of the federal government for years to come. ■

NAAREF President's Message

Rod Thomas

Daily Summer Checklist for Safety & Productivity

I would hope by the time you receive this magazine that your aircraft and ground equipment have had a thorough annual inspection and you are settling in for another safe and productive season. While that preseason ritual of equipment maintenance most likely followed some form of a checklist, my intent is to offer some suggestions to cover a few of those items that pop up in our day-to-day operations. Not only are some of the following items necessary prior to the start of the season, most need to be covered every day. With that said, let's look at some safety and productivity suggestions in the form of a checklist.

1. **Is your body—and those of your crew—up to the task today?** Did you get enough sleep? Are you sick? Do you have family or personal issues that could distract your work today? Do you have an injury that will impair your ability to fly? Remember, it is up to us as pilots to certify that we are fit to fly every day.

   How about your crew? Are they in the physical and mental shape to mix and manifest loads properly? Are they rested, sober and alert enough to judge your flying performance and inform you when they see your skills degrading?

2. **Equipment:** Even though your aircraft was signed off with a fresh annual inspection prior to the start of the season, it needs to be approved for service every day. Like your flight surgeon, the IA who said your aircraft was good to go can only speak to its condition on the day it rolled out of the shop. It is up to you to make sure it is airworthy today. In addition to the aircraft there is a lot more equipment that needs to be ready for the day.

   How many of you have been idled during a busy day because something as simple and cheap as a sparkplug in a mixing pump stopped the entire operation? Sitting at ground-idle on the pad in a half million dollar airplane because you can't get a load on board is embarrassing to say the least. It becomes frustrating and costly if the time it takes to remedy the situation delays the job long enough for the wind or weather to prevent completion.

   In looking at all of the equipment it takes to make an application, I decided long ago the entire operation hinged on the success of the weakest link. Because I am a belt and suspenders kind of guy, you would be hard-pressed to find equipment for which I don't have spares. When working away from my home base I carry items most likely to fail. I have put a lot of road miles on spare pumps, hoses, clamps, motors, etc., but seldom am I completely shut down for a minor repair.

In looking at all of the equipment it takes to make an application, I decided long ago the entire operation hinged on the success of the weakest link.

3. **Procedures:** I am very fortunate in that I have a full-time crew that has been with me for many years. My shortest-serving ground employee has been with me 14 years, and my ground foreman has been doing that job for 27 years. We fly all year long, but the type of work varies dramatically. The aircraft setup and even the type vary from summer to winter, and my crew knows at certain times of the year how we need to be configured and have the airplanes and helicopters ready when that season hits. Some of that is written down, some isn't. For those of you who employ seasonal workers it might be a great idea to have a written procedure. That gives you a syllabus, which makes your job of training much easier and more complete.

   How do you fuel your aircraft and are they all fueled the same? Do you have bottom fuel or do you service your airplane from the top? Do you fuel from the front or the back of the wing? Which side do you put fuel in and do

you fuel hot? Do you bond before fueling and where do you hook that ground? For every aircraft I operate my people know how much they burn per hour and how much fuel each pilot likes to tank in reserve. Knowing that, and given that we date and timestamp each load (and its contents), it never comes as a surprise when the pilot orders fuel, nor what that amount might be.

Do you have an established mixing process that reduces the chance of mixing errors? Do you keep the full and empty containers in a spot where you could reconstruct the mixing process to prove the right chemical was put in every load? We write enough information down during our seeding and spraying operations that a pilot or ground crewman can be substituted at any time without sacrificing the quality of the job.

Space constraints prohibit me from going into more detail, but you can see from just three points the list could be much longer. Last winter in the PAASS Program we talked about an SMS (Safety Management System) for ag, and whether we ever implement that system or not, it shows the merit in crew meetings and written procedures in our business. Safety doesn't just happen, we must plan for it.

Checklists have long been the standard in other segments of commercial aviation and a few ag pilots use at least some form of one on every takeoff.

Consider the subjects I have touched on to be a primer to create your own written checklist. In this article I ask many more questions than I gave answers for a reason. Each of our operations is different enough that I don't know what your answers might be. They are enough alike, however, that I can comfortably say the questions need to be asked.

Have a safe summer. ■

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Washington Report

By John Thorne & Danna Kelemen

New Guidelines Further Complicate NPDES Permit Compliance

As the application season shifts into high gear, NAAA urges aerial applicators to steer clear of compliance problems with the newly enacted and enforceable NPDES permits by understanding the latest nuances related to the permit. This task is becoming increasingly difficult to accomplish, as the NPDES permits—both at the state and federal level—continue to become muddied with additional guidelines and regulations. However, we have tried to condense the most pertinent information you need to comply at www.agaviation.org and in this column over the past several issues. Of primary concern, the permits are challenging to understand and implement—especially when your business takes you across several state lines with different requirements. Furthermore, seven states don't yet even offer an NPDES permit (PGP), so applicators working in those states risk Clean Water Act (CWA) violations and citizen suits if they spray into, over or near jurisdiction waterbodies. Finally, the White House is now finalizing EPA and Corps of Engineers guidelines to greatly expand the scope of what constitutes jurisdictional "waters of the U.S."—e.g., the types of rivers, lakes, wetlands, creeks and ditches that are subject to CWA enforcement and citizen suits. So, if you thought the EPA and state pesticide PGPs were complicated already, they're about to take on a whole new dimension of difficulty and legal risk. The following information is designed to give you a "heads up" on these changes so you can be fully prepared for this busy time of year.

Status of State NPDES Permits

EPA finalized its court-ordered PGP on Oct. 31, 2011, but gave permittees until March 1 to get into compliance, shifting its role from stakeholder PGP education to compliance enforcement on that date. EPA's PGP (*http://cfpub2.epa.gov/npdes/home.cfm?program_id=410*) serves as the national model and applies to Idaho, Alaska, New Mexico, New Hampshire, Massachusetts, Oklahoma and Indian lands, many federal lands, military and government areas in other states, most U.S. territories, and Washington D.C. Of the 44 states mandated to design their own state permits, almost 20% had not yet finished their permits at the date of publication and indicated they may not do so before the end of 2012. The seven states which currently do not have NPDES permits are: Hawaii, Maine, Connecticut, Rhode Island, Wyoming, Kentucky and Tennessee. Delaware and Arkansas very recently implemented permits. A chart comparing EPA's PGP to that of the other states' PGPs is available on NAAA's website at *www.agaviation.org/content/state-pesticide-npdes-general-permits*.

Some states' permits (e.g., Washington, Oregon, New York, California) have been in place prior to the 6th Circuit decision requiring NPDES permits for aquatic pesticide applications and were updated to include all of EPA's considerations; however, most states developed new PGPs. In some cases, the state legislature had to establish rules authorizing such permits, which accounts for some of the delays observed in state permit completion. About half of the states' PGPs are pegged to discharges to "waters of the U.S." (like EPA's PGP), but the remainder are pegged to "waters of the state"—which include a lot of minor waters and private waters that would not qualify as waters of the U.S. Most state PGPs cover the four use categories that EPA's PGP covers, but some state PGPs cover other use categories too (e.g., TX: "area wide pest control" category; NC and SC: "intrusive vegetation" pest control category; NJ: "aquaculture," "utility transmission" and "Pinelands" pest control category; MN: "other flying insect" pest control category; and MT: "other" pest control category).

Significant differences exist between the state permits, with some essentially replicating EPA's federal permit and others going beyond the federal permit and providing even more stringent guidelines. Examples of some of the wide-ranging differences between states include coverage not being granted for aerial discharges of aquatic pesticides in Maine to Nebraska defining "near" as pesticide migration to waters by gravity within 24 hours and requiring proof of citizenship

when submitting an NOI. Other emerging issues include Kentucky only allowing for liquid product discharges but granting automatic coverage to everyone without submission of an NOI, New Jersey planning to revoke and reissue its permit, and Louisiana covering not only aquatic applications but terrestrial treatments of fire ants, fleas and other insects where granules or powder may be washed into water by rainfall. In early April, California modified its vector control PGP to eliminate the restriction against using a pesticide if it was in the "same chemical family" involved in the impaired water listing. Furthermore, several other states don't even have their PGPs finished yet. Therefore, to ensure compliance it is essential aerial applicators thoroughly understand the PGPs for the states in which they operate, as the guidelines can be vastly different from one state line to the next and are likely to continue to be modified as states fully digest the implications of the PGP.

Status on Changes to Definition of "Waters of the U.S."

Further adding to the complexity of the PGPs themselves, EPA is expected to soon release guidelines that will change how "waters of the U.S." are defined and regulated. Determination of jurisdictional waters provide the basis for direct federal regulation under the CWA and directly affect all CWA programs, including whether an NPDES permit is needed for pesticide applications. Conservative estimates indicate the guidance will increase the scope of federal regulation of creeks, tributaries, ditches and other "waters" by a minimum of 15%.

The new guidance is being issued as a result of continuing confusion with respect to the interpretation of two U.S. Supreme Court decisions (*Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC)* [2001] and *Rapanos v. United States* [2006]) over what legally constitutes "waters of the U.S." subject to CWA enforcement. The most significant changes that will affect NAAA members will be the inclusion of millions of miles of ditches, culverts, creeks and other conveyances that currently aren't regulated. A draft of the new guidance is available at *http://op.bna.com/env.nsf/r?Open=jsun-8s629h*. NAAA will update you on the implications of the final guidance once the White House approves it.

Recently the differing definitions of waters caused a conundrum for one of NAAA's members in a Western state who does aerial application work for the U.S. Bureau of Land Management (BLM) on federal land to control certain weeds and grasses for fire suppression purposes.

Jan Zoetekouw/www.shutterstock.com

Pesticide general permit guidelines can vary greatly from one state line to the next and are likely to continue to be modified as states fully digest the implications of the PGP.

Since it was BLM, or federal government land, where EPA's PGP is enforced (as opposed to the other 44 states that have their own versions of the PGP), the BLM was wondering whether to submit to EPA a Notice of Intent (NOI) as part of their plans to apply glyphosate near waterways. The problem: glyphosate is not labeled for applications to water.

Thus, the BLM wanted clarification from EPA to determine if a PGP was needed for applications where the applied materials may reach waterways but were *not approved* under FIFRA to water. The intended glyphosate application was to be to weeds and grasses growing in dried-up creek beds that are considered "waters of the U.S." under the CWA because they at *some time* of the year provide hydrological connections to rivers and other "navigable" waters. Violating both the CWA and FIFRA at once would be a nasty "business-risk" lesson and take a chunk out of the checkbook. The NAAA member received the following explanation of the situation, which was confirmed by NAAA, from EPA Headquarters:

> EPA determined that because the CWA's definition of "waters of the U.S." and FIFRA label language for use around "water" can represent very different situations, EPA's CWA permit compliance and the FIFRA label compliance can both be met by an applicator spraying a pesticide not labeled for aquatic applications into a dry stream bed, dry ditch, or dry ditch bank as long as (1) FIFRA label rates are not exceeded, (2) there is not "wet or actual" water present, and (3) coverage under a pesticide NPDES general permit has been obtained. [Translation: yes, the BLM must submit an NOI to EPA for these glyphosate applications to dry creeks.]

This recent real-life situation makes the point that although EPA's PGP is designed for aquatic pesticide applications "into, over or near waters of the U.S.," the permit also will allow non-aquatic pesticide applications into dry creeks and other "waters of the U.S. *as long as no actual water is present*. However, if an applicator exceeds the FIFRA-labeled use rate, or sprays a non-aquatic pesticide into liquid (wet) "water," he/she would likely be violating *both* FIFRA and the CWA.

What does this mean for NAAA members? Only "decision-makers" like the BLM must submit an NOI in order to gain coverage under EPA's PGP. Applicators who are for-hire contractors are generally automatically covered and their PGP compliance requirements are primarily limited to following the FIFRA label, keeping spray logs and other records, and properly maintaining their spray equipment to ensure it is calibrated and in good working order.

The permits of the 44 states that have or are developing their own PGPs can vary significantly from EPA's PGP, and from each other. If you are spraying pesticides for different customers in various states, you must be fully compliant with each state's PGP requirements.

Legal Jeopardy

With EPA and most states now enforcing their PGPs, and the impending issuance of the final joint EPA-Corps of Engineers' "waters of the U.S." guidance, it is obvious that increased legal jeopardy may follow. Along with the significant compliance requirements, as outlined in previous articles and in NAAA's checklist available at *www.agaviation.org/content/naaachecklist*, aerial applicators will have legal jeopardy if they fail to perform these PGP requirements in the correct manner or by the deadlines indicated in the PGP. A brief overview and reminder of the potential sources of legal jeopardy that you should be on the lookout for are as follows:

Failure to realize you may be a decision-maker: It will be wise to carefully evaluate each of your contracts going forward to determine if you are an applicator or, in fact, also a decision-maker. The added responsibilities and potential jeopardy of also being a decision-maker could affect some applicators' willingness to accept some contracts. As you negotiate contracts with your customers, it would be wise to review the model contract language (*www.agaviation.org/content/naaacontractlanguage*) NAAA has developed as an example of the types of considerations necessary for applicators to segregate their PGP requirements from those of their decision-making customers.

Failure to be covered by the PGP: There are some exceptions to automatic PGP coverage for applicators (e.g., to water quality impaired waters, Tier 3 waters, or discharges that are likely to adversely affect species that are federally listed as endangered or threatened, or habitat that is federally listed as critical). It will be wise to carefully evaluate each of your contracts going forward to determine if your intended treatment area(s) include the possibility of any such disqualifying treatments.

Failure to recognize a "water of the U.S." or "water of the state": Permit coverage is not needed if no discharge occurs to jurisdictional waters. However, not all jurisdictional "waters" are easily recognized because they are not wet when pesticides are applied—and a discharge to such unrecognized jurisdictional water without PGP coverage could trigger legal jeopardy. The EPA-Corps of Engineers' new guidelines for "waters of the U.S." will complicate this. Although coverage under the EPA PGP is automatic for non-decision making applicators, there may be a risk of violation if you spray a pesticide not labeled for aquatic applications on ditches or other areas that become newly defined as a "water of the U.S."

Failure to be fully aware of each state's PGP requirements: The permits of the 44 states that have or are developing their own PGPs can vary significantly from EPA's PGP, and from each other. If you are spraying pesticides for different customers in various states, you must be fully compliant with each state's PGP requirements. It will be wise to fully evaluate (or have your attorney evaluate) the various compliance requirements of each state you operate in, create compliance check-lists, train your other pilots and staff, and keep compliance records separately for each state.

Citizen suits: The CWA authorizes citizens and activist groups to sue pesticide applicators and decision-makers for apparent violations. Even if you are in full compliance you may be sued, and defending against citizen suits is time consuming, disruptive to your business, emotionally upsetting and costly. The more carefully you use best professional practices, document your PGP compliance and maintain accurate and timely records, the better off you will likely be. It will also be wise to evaluate your insurance policies in light of the many new requirements and potential legal liability. NAAA's website (*www.agaviation.org/*

content/state-pesticide-npdes-general-permits) provides an excellent overview of the differences between states' PGPs, including contact information for each state. It would behoove applicators to contact individual state contacts and/or the state agencies tasked with regulatory jurisdiction with specific questions pertaining to state PGP compliance and explicitly document this correspondence in an effort to protect oneself in the event a claim is made.

Joint and several liability: EPA's PGP declares applicators and decision-makers will be jointly and severally liable for any permit violation that may occur, but will take into account in its enforcement actions any differentiation of responsibilities incorporated into executed performance contracts. This essentially constitutes liability for all applicators working under a decision-maker, not solely the applicator who violates the CWA. It will be wise to carefully evaluate each of your contracts going forward to delineate who is the decision-maker and applicator, and their respective responsibilities.

Certification of "no adverse effects" on listed species or habitat: Decision-makers submitting NOIs for intended discharges to critical habitat or waters that contain listed endangered or threatened species must certify in Appendix D of the NPDES permit (*www.epa.gov/npdes/pubs/pgp_appd.pdf*) that their proposed treatments will not have such adverse effects and document that through selection of one of six options. This certification is under penalty of the law, and adverse effects on such species or habitat can be a violation of not only the PGP and CWA, but potentially also of the Endangered Species Act.

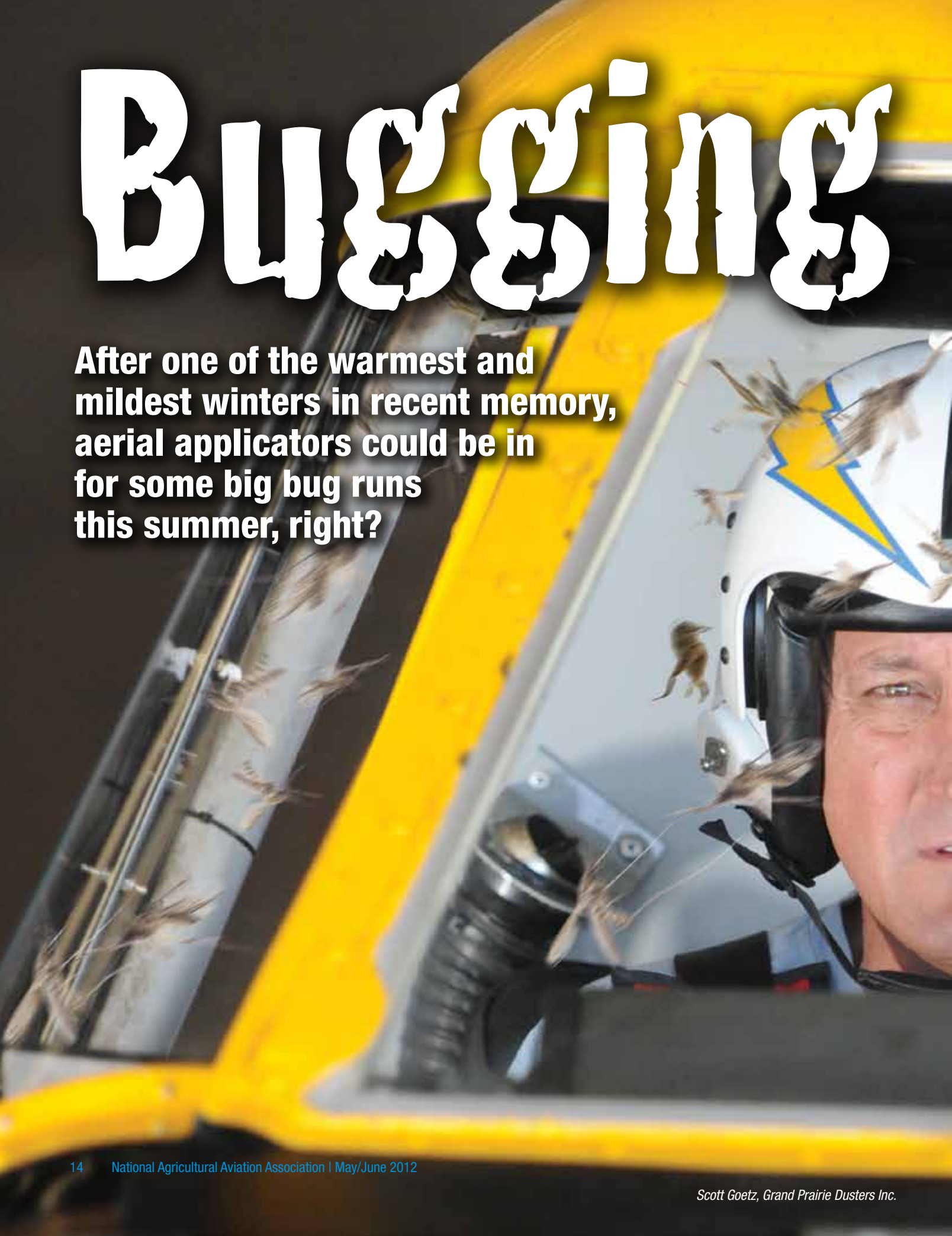
Future of NPDES Permits

As has been reported in past issues of the magazine and other NAAA publications, legislative action continues in the hopes of negating the effects of the PGPs on the ag aviation industry. The latest Congressional action includes attaching exemption language that passed the House (H.R. 872) to the Farm Bill and other relevant bills the House and Senate are slated to consider this year *(see Executive Director's Message, pg. 6, for more on the Farm Bill)*.

A wealth of information regarding the overall NPDES permits, including compliance guidance, can be found at www.agaviation.org. The Association encourages members to utilize the many resources available to them. ■

Bugging

After one of the warmest and mildest winters in recent memory, aerial applicators could be in for some big bug runs this summer, right?



Scott Goetz, Grand Prairie Dusters Inc.

Out!

By Jay Calleja
Manager of Communications

Pilot photo courtesy of Bill Bracewell

The season formerly known as winter has a new moniker: *whimper*. It's an apt description for this year at least, given that there was very little bark and almost no bite during the winter of 2011–2012. In March, the National Oceanic Atmospheric Administration (NOAA) confirmed what even the most non-fervent weather watchers already understood—that there really wasn't much of a winter to speak of. Officially, NOAA has classified the 90-day period between Dec. 1 and Feb. 29 as the fourth warmest meteorological winter on record across the contiguous United States and the warmest since 1999–2000.

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"It's been an unusual winter. It's been unusually warm across most of the U.S. [with] very little snow cover," said Jason Nicholls, a senior meteorologist with AccuWeather.com.

The most out-of-norm warmth occurred across the northern Plains and the upper Midwest where temperatures were 4 to 10 degrees above normal during the 90-day meteorological winter. In the East average temperatures were as high as 7 degrees above normal. "Usually, in a 90-day period if you get temperature departures of 2 to 4 [degrees] above normal, that's very significant over a 90-day period, but to see double-digit departures for that 90-day period is very impressive," Nicholls said. "It shows you how long the warmth was going."

How hot was it? So hot that as of mid-month Nicholls had already seen 5,000 records set for high temperatures for the month of March, compared to approximately 2,500 records for the entire month in 2011.

Courtesy of AccuWeather.com

The warm and mild weather will continue to be the prevailing weather pattern in most parts of the country this spring. The exception is the Pacific Northwest, where AccuWeather.com's forecasters expect temperatures to be below normal.

Eric Isselée/www.shutterstock.com

"In our region, this winter was definitely much warmer and milder than the last one. And the snowpack is not as considerable compared to previous years," said Alex Latchininsky, an associate professor and extension entomologist at the University of Wyoming.

A combination of rain and melting snow typically leads to flooding in the spring, which happened in 2011 along the Red River in North Dakota. Flooding along the Mississippi River had a devastating effect on some areas of the Midwest as well. Due to the lack of substantial snow cover, flooding is not a concern for rivers in the northern Plains this year.

The warm and mild weather was expected to continue this spring for most of the country. "At least two-thirds of the nation could wind up with above-normal temperatures," said Paul Pastelok, lead meteorologist for AccuWeather.com's Long-Range Forecasting Team. The exception will be the Pacific Northwest, where temperatures will be below normal.

Going forward, "it looks like the core of the heat might be more toward the Plains and into the Rockies and interior Southwest as we go into the summer," Nicholls said. "If it sets up like that, it would allow for at least normal, if not slightly above normal, precipitation in the late spring going into the summer across the Midwest, but there would be dryness concerns

as you get into the Plains later on in the spring and going into the summer."

Place Your Bets

With the warmer-than-usual winter segueing into a warm and mild spring the question is, what does this mean for farmers and aerial applicators? One thing is certain: it has meant an early start. From earlier vegetation to earlier weeds to earlier insect sightings, the signs are everywhere. As an aerial applicator, it's likely your season kicked off earlier too.

"Insect activity has really picked up early, and we've seen some unusual things," Oklahoma State University extension entomologist Tom Royer said. "We saw grasshoppers emerging in January, which is just surprising, so that rang some alarm bells for me."

Another anomaly Royer observed in March is an explosion of bird cherry-oat aphids in some Oklahoma wheat fields. Bird cherry-oat aphids, or BCOAs, attack small grains including wheat, barley, oats, rye and triticale and can transmit barley yellow dwarf virus. They can also be found on sorghum and corn.

Do warmer winters lead to an increase in insects? It's an easy assumption, but far from absolute. Although the warmer winter has had an effect on insects, the lack of cold temperatures alone doesn't tell the whole story. In nature, where everything is interconnected, the lines are never as clearly drawn as that.

To find out if the unseasonably warm winter is having an appreciable impact on insect pressures this spring and what that could mean for agricultural pilots this summer, *Agricultural Aviation* contacted entomologists from across the United States in five different agricultural regions: the South, Midwest, Great Plains, Pacific Northwest and California.

In terms of pest control, the "whimper" of '11–12 could mean aerial applicators will be busier than usual. Or maybe it doesn't mean much at all. Given the adaptability of insects and unpredictability of future weather occurrences, the entomologists said it's difficult to look too far into the future.

"It really depends, and it's highly variable," said Robert Peterson, an insect ecologist and professor of entomology at Montana State University.

Just because there have been earlier observances of pests this winter doesn't mean it will always be the case in a warm winter. Conversely, an extremely cold winter doesn't necessarily translate to fewer insects come spring and summer.

"If it's extremely cold people make the assumption that insect pressures will be down because a lot of insects froze to death," Peterson said. "You can actually have better survival if it's very, very cold than if it's a relatively mild winter that warms up, cools down, warms up cools down."

Eric Isselée/www.shutterstock.com

A mild winter could have the opposite effect, leading to a higher mortality of insects. "They can come out and then get hammered by an inclement period of weather." Other beneficial insects also could emerge early and keep the bothersome bugs in check naturally.

Then again, if the weather remains mild, Peterson said early-emerging insects can build their population up "earlier and more quickly in the spring, and that can have effects into where those populations would need to be managed earlier than they would normally."

Before joining Pioneer Hi-Bred International as a senior research scientist three years ago, Dr. Marlin Rice spent 20 years as a professor of entomology at Iowa State University. Although it may make for interesting coffee shop fodder, in his opinion, trying to predetermine insect outcomes based on any particular incident or factor is a losing proposition.

"Las Vegas never gives odds on insects," Rice said. "The reason is that in spite of what little we know, there is a tremendous amount that we don't know about insects

> "Las Vegas never gives odds on insects. The reason is that in spite of what little we know, there is a tremendous amount that we don't know about insects with respect to all the factors, whether it's the environment—abiotic things like rain, light, temperature, soil—or biotic factors like diseases, predators or parasites."
>
> *—Marlin Rice, entomologist and senior research scientist at Pioneer Hi-Bred International*

with respect to all the factors, whether it's the environment—abiotic things like rain, light, temperature, soil—or biotic factors like diseases, predators or parasites. There's a whole bunch of things that influence insect populations."

Taking a wait-and-see approach may be the most appropriate advice, but where's the fun in that? Based on the evidence at hand, it seems reasonable to have certain expectations. Just don't be blinded by them.

Expecting an Active Summer in the South

Barring a late freeze, in Arkansas, entomologists are bracing for a wave of insects this summer. Stink bugs had already begun to accumulate on certain weeds as of late March. University of Arkansas extension entomologist Glenn Studebaker has been warning farmers to be prepared because it could be a bad bug year across the board if the warm, mild weather persists.

This spring, for the first time in several years, Grand Prairie Dusters Inc., Almyra, Ark., did a significant amount of insecticide work on wheat, applying for insects and especially worms. "We have sprayed every acre of wheat we have in our customer base and might spray some twice," said NAAA President Mark Hartz, co-owner of Grand Prairie Dusters. "That indicates to us that we might even spray for insects during the summer growing season when normally that wouldn't occur until much later."

"I can't think of any insect right now that's not going to be higher than normal," Studebaker said. "They're already reproducing on these weeds, and they're going to build up to higher populations than they usually do by the time the crops come along."

Insects that don't overwinter and typically arrive later in the season, such as the fall armyworm and some of the looper species that attack soybeans and cotton, are expected to migrate north earlier.

Plant bugs are one of the prime pests for Arkansas' cotton. Studebaker anticipates higher-than-normal populations of them this year. Spider mites and cotton bollworms can also cause damage to cotton. Rice water weevils and stink bugs are the two predominant insects for rice. Soybeans may be susceptible to the cotton bollworm, spider mites and armyworms. Southwestern corn borer and corn earworm are commonly found on corn in Arkansas. Cinch bugs will sometimes move out of the grasses in wheat and seep into corn, Studebaker said.

Despite having plenty of plant material to feed on, there's no guarantee any of these particular insects will be problematic. "I've already seen good numbers of predators in wheat feeding on these aphids that were building up earlier, and they've actually knocked some of them back a little bit and not caused us as much trouble as we thought they would," Studebaker said.

The point of preparation, though, is to be ready in case they become a problem. "With our growers we always recommend that they scout their fields, treat only if they're at an economic threshold, and not to assume that just because it might be a bad year that it's gonna be," Studebaker said. "Sometimes we kind of get in these modes where everybody is expecting a bad year, and they start automatically spraying their fields just in case. That's never a good practice. It actually can cause some outbreaks of other insects because we take out all the good ones."

Insects Arrive Sooners in Oklahoma

OSU's Royer estimates wheat is about two weeks ahead of schedule in

Pan Xunbin/www.shutterstock.com

In March, Tom Royer observed an "explosion" of bird cherry-oat aphids in some Oklahoma wheat fields, which is hardly typical. "We've seen some unusual things," the OSU extension entomologist said.

Courtesy of Alex Latchininsky, University of Wyoming

Wyoming's extremely mild weather last fall likely led to a lot more grasshopper eggs being laid. That factor more so than a mild winter has set the stage for a large grasshopper infestation this summer.

Oklahoma. He saw a few fields where winter grain mites were injuring the wheat, which is also unusual. "Their numbers were high enough that they were injurious, and we don't typically see them cause severe injury. I can always find them in wheat fields, but it's rare to see them injure a wheat crop like this," Royer said.

He surmises the warm weather "probably helped them go through their generations quicker and maybe increase their survival a bit."

In the case of the early bird cherry-oat aphids identified in Oklahoma, Royer gives more credence to last year's record drought. "The bird cherry-oat aphid probably was enhanced by the drought knocking back some of its traditional natural enemies. We have a parasitic wasp that oftentimes takes care of them. The drought might have eliminated that."

His advice to growers? Scout early. "If a producer is relying on their own field history or their own experience, with this mild a winter … they may be out there too late to see something happening because it's not the typical time that they'd normally see that particular insect."

Here Come the Grasshoppers

In the Pacific Northwest, Latchininsky expects grasshoppers to be a problem. "Because of insufficient snow cover I think we will be facing a drier than usual summer, which usually increases the grasshopper pressure on the rangeland."

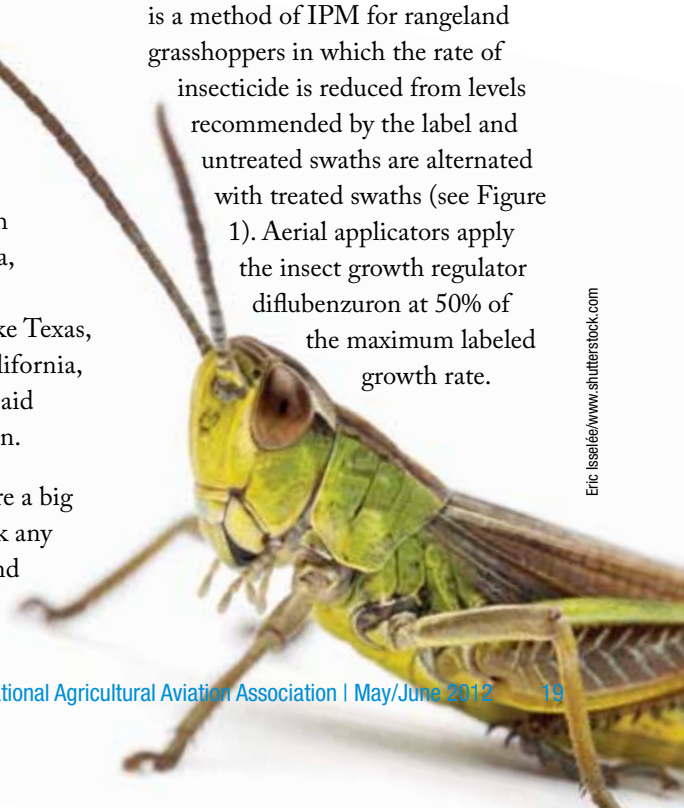
Grasshoppers are present in the 17 states west of the Mississippi, but the pressure varies from state to state. "Nebraska, both Dakotas, Wyoming, Montana, Utah, Idaho suffer a lot from grasshoppers. Other states like Texas, Oklahoma, New Mexico, California, they have spotty problems," said Latchininsky, a native Russian.

Spotty or not, grasshoppers are a big issue out west. They can attack any crop, including cereal crops and alfalfa, but the main problem is that they compete with livestock for rangeland vegetation. Every year, even if there isn't an outbreak, grasshoppers remove about 25% of rangeland vegetation to the tune of about $1 billion in damages. In an outbreak situation, which typically occurs when it is very dry, grasshoppers can remove up to 100% of rangeland vegetation.

"I am afraid we can have something like that this coming year," Latchininsky said.

The last major outbreak happened in 2010. Six million acres of Wyoming were treated for grasshoppers that year, mostly by aerial applicators. Grasshoppers were less of a problem for the state in 2011 because it was a relatively wet summer. As a result, there was more vegetation and more variety for the green critters to feed on.

Latchininsky and his team recently received the International Integrated Pest Management (IPM) Award for Excellence from the IPM Symposium. They were recognized for developing the Reduced Agent and Area Treatments (RAATs) grasshopper control strategy, which saves landowners money. RAATs is a method of IPM for rangeland grasshoppers in which the rate of insecticide is reduced from levels recommended by the label and untreated swaths are alternated with treated swaths (see Figure 1). Aerial applicators apply the insect growth regulator diflubenzuron at 50% of the maximum labeled growth rate.



Eric Isselée/www.shutterstock.com

"It means that we are not blanketing the infestation of grasshoppers with broad spectrum insecticides," Latchininsky said. "Using aerial applicators we are applying insecticide in parallel strips like a zebra—one is treated, one untreated. So we leave 50% of untreated forage, but we still get 80, 85, up to 95% of reduction of grasshopper numbers."

That's 5 to 15% lower mortality than with a standard high-rate, blanket-coverage treatment, but enough to get the job done. Eighty percent is considered sufficient control, Latchininsky pointed out, "and we usually get 85–95, so we still get really good control."

The economic incentives also play in aerial applicators' favor. In 2010, RAATs saved Wyoming's ranchers more than $11 million. Had they treated grasshoppers using conventional application techniques, they would have spent more than $20 million. With RAATs, they spent about $9 million.

RAATs is widely used in all 17 western states by both private applicators and the USDA-APHIS-PPQ (Animal and Plant Health Inspection Service-Plant Protection and Quarantine).

"The program really works and it does not harm the environment," Latchininsky said.

California Insect Outlook

With its diverse ecosystem, California is an agricultural powerhouse and a region all to itself. Unlike other areas, the winter was somewhat cooler than normal, but below-normal

Figure 1: Grasshopper Treatment Tactics Recommended by the National Grasshopper Management Board—Schematic of a RAATs application with 50% coverage

rainfall for the state was similar to the lack of snow elsewhere. Virtually all of the West received less than its average precipitation.

Frank Zalom, a professor of entomology at the University of California-Davis, said the lack of precipitation had a lot of farmers in the Central Valley concerned about not having enough water to produce annual crops. California typically gets very little rain from April to October, so a wet March was a welcome relief.

"This year we didn't have much rainfall in the winter time, so we didn't have a lot of the storm events that might cause a lot of the mortality in the winter," Zalom said. "I can't project what it's going to be like the next couple of months, but if it's similar to the last couple of years where we've had rain lasting longer than normal, then that will slow everything down."

Zalom expects it to be a good year for farmers in terms of less insect pressure than usual. Exceptions could include crops like walnuts and olives where pests overwinter in old fruit.

The University of Wyoming's Latchininsky and his team recently received the International Integrated Pest Management Award for Excellence from the IPM Symposium for developing the Reduced Agent and Area Treatments (RAATs) grasshopper control strategy. The innovative approach relies heavily on aerial application.

"We may see a little bit more navel orange worm pressure on almonds and walnuts, because we didn't have the winter storms that would knock down a lot of the old nuts where they were overwintering," Zalom said.

The same thing could happen with olive fruit flies. "When the new olive flies emerge this spring there's going to be a few more olives than normal left on the trees that they can infest."

For Midwest Pests, Time Will Tell

Corn and beans are the two primary crops grown in the Midwest. Both are susceptible to an array of insects that remain largely unaffected by whatever the winter conditions are in a given year. There are two reasons for that said Rice, the former Iowa State University entomologist. "Winter has little effect on our insects here because a) half of them are down in Texas and b) the other half of them are usually pretty protected in the soil."

"Snowbird" insects that migrate to Iowa and other Midwestern states in the spring and summer include black cutworms, corn earworms and fall armyworms in corn and potato leafhoppers in alfalfa. They spend their winters in Texas, Louisiana and Mexico.

A mild or severe winter could have a bigger impact on insects such as the European corn borer, western bean cutworm, western corn rootworm and northern corn rootworm that reside in Iowa year-round, but even so, the temperature on the thermometer still isn't much of a threat, Rice said. The real danger is the climatic shock effect that could occur when the eggs hatch and the larvae are small. That holds true whether it is extremely hot and dry or very wet, which is more often the case in the Midwest.

For example, western corn rootworm eggs normally start to hatch around Memorial Day, but could begin a week or two earlier this year. "We could have had a perfect winter, but if we get a lot of rainfall the last week of May, first couple weeks of June, and the soils are saturated and water is standing in

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The corn earworm, like other varieties of yield-robbing worms that plague corn growers, remains largely unaffected by winter, regardless of its severity or lack thereof.

As it turns out, the temperature on the thermometer isn't much of a threat for fledgling insects. The real danger is the **climatic shock effect** that could occur when the eggs hatch and the larvae are small.

the field—those conditions will drown many of the larvae," Rice said. "The population will shrink down to a very small population size."

An earlier start is as far out on a limb as the entomology expert would go when queried about the warm and mild winter's effect on Midwest insect conditions. Like any good scientist, there was just one thing Rice would say unequivocally: "A hard winter doesn't make insects go away. A mild winter doesn't necessarily make them worse."

Montana State's Peterson offered a similar takeaway. "You can't read too much into the mild winter other than things could start a little earlier, for sure, and there could be a little bit more activity in terms of aerial application a little bit earlier than normal. But you still have to wait and see what happens as you go into the growing season."

Even bullish entomologists become more circumspect when they consider the big picture. "Nature doesn't always act like it's supposed to," Studebaker said. "Sometimes we have these kinds of winters and we expect big things to blow up, and sometimes they just don't for whatever reason." ■

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Each of the entomologists interviewed for this article are members of the Entomological Society of America. Marlin Rice is a past president of ESA and Frank Zalom is the organization's vice president-elect.

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The Pitfalls of Flying While Fatigued

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An expert in sleep medicine offers his prescription for fighting fatigue during the busy flying season

By Jay Calleja
Manager of Communications

As the summer flying season approaches, the majority of aerial applicators are heading into their busiest stretch of the year. The workload is intense, the hours are long and consecutive days off are few and far between. The pace can be frenetic, but it's a tradeoff ag pilots willingly accept because summer also means it's show time, offering innumerable opportunities to support their farming customers by doing what they love to do the most.

It's not all sun and games, however. The rate of accidents rises in the summer along with the number of hours cumulatively flown. Oftentimes the cause is determined to be the result of human factors, or pilot error. In the 10-year span from 2001–2010, 58% of the combined ag aviation accidents and fatalities were attributed to human factors. Arguably, that means they could have been avoided. Fatigue and flying are a dangerous mix that undoubtedly factored into many of those incidents.

To give readers a better understanding of how fatigue can affect their job performance as pilots, *Agricultural Aviation* contacted Senior Air Medical Examiner (AME) Dr. Mark Ivey. Dr. Ivey is Chief of Flight Medicine with the 110th AirWing of the Michigan Air National Guard, a helicopter pilot and an expert in sleep medicine. When he was with the Army National Guard he was instrumental in reshaping its crew rest policy to mitigate the impact of sleep problems on military operations. As a speaker at NAAA's 2011 Convention & Exposition, he addressed the importance of maintaining healthy habits. In the interview that follows Dr. Ivey weighs in on the need for a full night's rest, sleep apnea, sleep aids, energy drinks and more.

AIR MEDICAL Credentials

Mark J. Ivey, MD FCCP FACP FAASM

- Board Certified: Internal Medicine, Pulmonary Diseases, Critical Care and Sleep Medicine
- Chief of Flight Medicine, 110th AirWing of the Michigan Air National Guard
- Consultant to Federal Air Surgeon
- Senior AME
- Commercial, Instrument Pilot, CFI Rotorcraft Helicopter

What is the average number of hours worked per day during the entire application seasons?

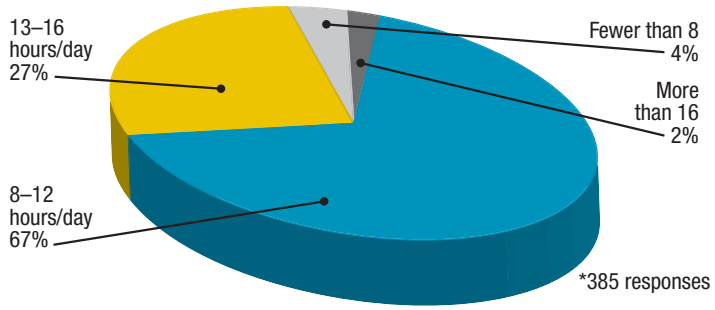

Figure 1: Hours worked by operators in season

*** Operator Results from 2012 NAAA Aerial Application Industry Survey*

Agricultural Aviation: **It goes with the territory that ag pilots work long hours in season and may work for long stretches without a day off. In a recent survey we conducted, 80% of agricultural aviation operators admitted that they sometimes feel tired during the application season even with adequate sleep. Are there any strategies you can offer pilots to combat on-the-job and in-the-cockpit fatigue?**

Dr. Ivey: Naps. They're not just for kids. Humans have two periods during the 24 hours where they are sleepiest: 0300 and 1500. These are also the times when fatal motor vehicle accidents occur the most. Most ag operators are not flying at 0300, and 1500 is usually the heat of the day. So take a nap for 20–40 minutes around 1500 and then take one or two cups of brewed coffee.

AA: **Almost two-thirds of the operators in our survey (64%) reported that they get an average of 7–8 hours of sleep per day during the application season. Almost one-third (32%) said they get 4–6 hours of sleep. For the segment getting less sleep, don't some people simply require less sleep than others to function normally?**

Dr. I: Very rarely is an individual born with the ability to obtain all the benefit of eight hours of sleep in 4–5 hours. Such "Congenital Short Sleepers" are exceedingly rare. Almost all humans require eight hours a night, 56 hours a week. Dr. Terri Weaver, of the University of Pennsylvania, has found that in regards to human performance the "knee of the curve" is six hours. At six hours or less performance and productivity drop sharply. The best productivity, especially with complex tasks, is found in those groups that get eight hours of sleep per day. We fool ourselves when we steal extra hours for a project from our sleep time.

AA: **Then again, there could be more serious reasons for why some ag pilots sleep less, be it sleep apnea or insomnia. Is it okay for pilots to take a sleeping pill to help them get a full night of sleep?**

Dr. I: There is really no such thing as a "sleeping pill." Almost all OTC sleep aids use the side affect of a common antihistamine to induce sleepiness. These medications very often cause a hangover effect the next day and are not allowed for aeromedical purposes. Almost all prescription soporifics use a class of drugs known as benzodiazepines. These drugs work just the same as a barbiturate or alcohol. Obviously, the residual effects of these medications the following day are simply not compatible with flying. In addition, these drugs will ruin the normal "architecture" of sleep making it non-restorative. There are no medications that I am aware of that can induce normal sleep.

AA: **Is sleep apnea more common among pilots than people think?**

Dr. I: We suspect that it is the same as in the general population. Pilots mirror the demographics of the general population, such as obesity and body mass index, or BMI. There is no reason to suspect they have a greater or lesser degree of sleep apnea. You can assume the incidence, or rate, of sleep apnea in men in general is at least 10%, but probably closer to 24% in all cases. We diagnose it in pilots at less than 0.5%. Obesity is found in 15–24% of civil

What is the average number of hours of sleep per day during the entire application seasons?

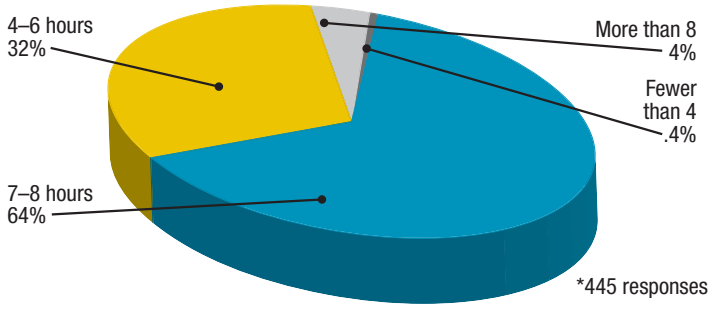

Figure 2: Average amount of sleep in season

*** Operator Results from 2012 NAAA Aerial Application Industry Survey*

Too Much BMI?

Body mass index (BMI) is a measure of body fat based on height and weight that applies to adult men and women.

BMI Categories:

- Underweight = <18.5
- Normal weight = 18.5–24.9
- Overweight = 25–29.9
- Obesity = BMI of 30 or greater

Source: National Heart, Lung, and Blood Institute, National Institutes of Health

What is the average number of days worked per month during the entire application season?

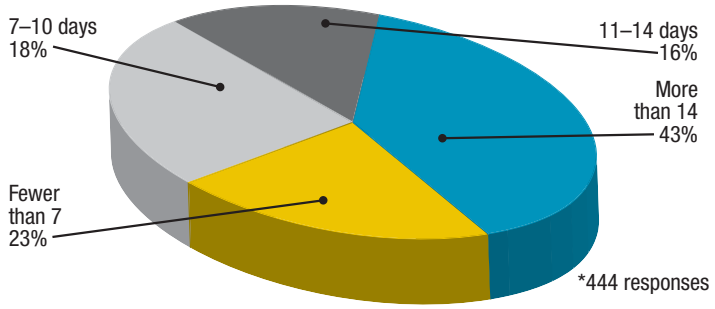

Figure 3: Consecutive days worked per month in season

*** Operator Results from 2012 NAAA Aerial Application Industry Survey*

pilots, with a BMI of 30 or greater (see box). We find that 60–90% of people with a BMI greater than 28 have OSA [obstructive sleep apnea]. Therefore, we are missing it in pilots. The Federal Air Surgeon is requiring AME's to be more vigilant, especially in those pilots with a BMI greater than 28.

AA: **What are the signs of sleep apnea?**

Dr. I: Fatigue, snoring, excessive daytime sleepiness, BMI greater than 28 to name a few.

AA: **What should ag pilots do if they suspect they have sleep apnea?**

Dr. I: Discuss it with their family physicians during the offseason. It can take more than six weeks to complete a comprehensive workup[1] for sleep apnea. Once you are aware you may have it, or you are being worked up for it, you really can't act as PIC [pilot in command].

AA: **Some pilots may be afraid to talk about sleep apnea with their primary care physician or AME. Are those fears unfounded?**

Dr. I: No. Once the skunk is up on the table it has to be dealt with and a temporary period of grounding during the evaluation is likely. On the bright side, it is very easy to get a special issuance for it. I much prefer to see pilots get this worked up before they see me. If the workup is complete I can in many cases get a phone authorization to issue the medical locally with an eligibility letter to follow in the mail.

AA: **Sleep deprivation is a common ingredient in work-related accidents. Flying while fatigued potentially could be as impairing as flying drunk, right?**

Dr. I: Back in the 1990s a model for measuring performance with fatigue was developed. Alcohol was used. These studies were conducted by independent investigators, almost simultaneously in several countries with shockingly consistent results. Being tired measures out about the same as being intoxicated. After 15 hours of continuous wake a human functions at about the same level as when they are legally drunk. This is why trying to work through fatigue is very counterproductive. These days very few pilots would climb in the cockpit and attempt to fly after knocking back a few drinks. Yet just about all of us would find a way to justify flying tired.

AA: **What do you think about ultra-caffeinated beverages like 5-Hour Energy, Red Bull and Rockstar Energy Drink—are they okay for a short-term boost?**

Dr. I: I don't use them and I don't recommend them. Taking excessive amounts of caffeine, more than 200

During the spraying season, how often do you feel tired at work even with adequate sleep?

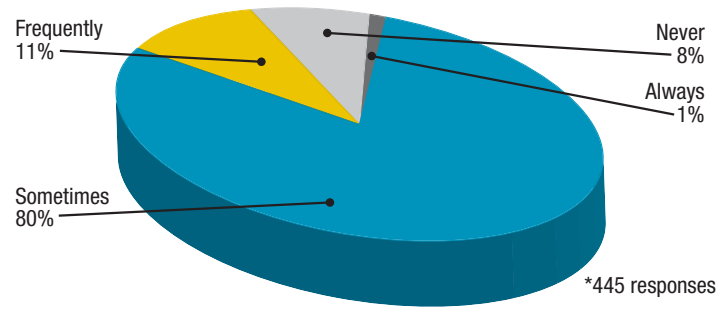

Figure 4: Feel tired

*** Operator Results from 2012 NAAA Aerial Application Industry Survey*

[1] Completing an evaluation for possible sleep apnea would require one or two office appointments with your doctor and one to two overnight studies followed by an adjustment period of the equipment and a review of the download from the CPAP machine for compliance.

> "If you have been up for more than 14 hours or the flight will take you past that point ask yourself as I do, How important is this flight?"
>
> —*Senior AME Dr. Mark Ivey*

mg, is associated with a much higher incidence of cardiac arrhythmias. Besides, they are expensive. A lump of sugar in a cup of coffee works well enough, is reasonably safe and a lot cheaper.

AA: **You have a demanding work schedule. You're also a helicopter pilot. How good are you at recognizing when it's time to pull back instead of forging ahead? Do you listen to your body and your own advice?**

Dr. I: Because we become "inebriated" as we get tired no one is very good at self-assessment. Forging ahead can be a bad idea for reasons we have already mentioned. I guess you could think of it like a checklist. When doing preflight planning we should all consider the human factor. How fit is your engine? How fit are you? If you have been up for more than 14 hours or the flight will take you past that point ask yourself as I do, How important is this flight? Bill Hatfield [of Hatfield Spraying Service Inc., Nunica, Mich.] once told me 15–20 years ago when he goes out to fly if he finds three things wrong he goes away and comes back later. Your fitness is certainly one of those "things."

AA: **Ag pilots usually don't have somebody looking over their shoulder. If you could get them to remember one piece of advice, what would it be?**

Dr. I: You're no good to yourself, your business, your industry or the ones who love you if you are dead or disabled in a needless aircraft accident. As PIC you have the power to do the right thing. ■

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.

The Aerial Applicator's Manual is now available in electronic format on NAAA's website at www.agaviation.org/content/aerial-applicators-manual. Another way to find the manual is to scroll to the bottom of any page on NAAA's site (www.agaviation.org), click on "Links" in the footer, then scroll to the end of the Related Entities page and click on "Aerial Applicator's Manual" under "Publications." These instructions also are worth remembering to access other organizations and publications frequently needed by aerial applicators.

See pg. 55 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. **Pesticide laws and regulation help to:**

A. Encourage pesticide use.
B. Protect the environment.
C. Avoid dependence on alternative pest control methods.
D. Prevent pests from developing control resistance.

2. **One purpose of federal pesticide regulations is to:**

A. Require public notification about pesticide application.
B. Provide health benefits to agricultural workers.
C. Establish safety standards for pesticide application equipment.
D. Prevent agricultural workers from handling pesticides or working in pesticide-treated areas.

3. **If a person shows signs of pesticide poisoning, he or she should:**

A. Stop working for the day.
B. Receive immediate medical attention.
C. Be assigned to another job not involving pesticides.
D. Be scheduled for a blood test.

4. **Wider-angle spray nozzles usually produce _____ droplets than narrower spray nozzles.**

A. Coarser.
B. More uniform.
C. Less uniform.
D. Finer.

5. **Aircraft suitable for aerial application of pesticides must be:**

A. Registered with the U.S. EPA.
B. Constructed entirely of corrosion resistant materials.
C. Equipped with DGPS navigational equipment.
D. Able to lift, transport and dispense pesticides safely.

6. **Hydraulic agitation of the mixture in the aircraft spray tank requires:**

A. An external power source.
B. Sufficient pump output capacity.
C. Baffles mounted inside the tank.
D. Proper tank ventilation.

7. **The purpose of adjusting ram-air spreader vanes is to:**

A. Improve the performance of the aircraft.
B. Reduce the aerodynamic drag on the aircraft.
C. Improve the granule distribution pattern.
D. Change swath width of the granule application.

8. **The application pattern that helps to avoid flying through spray from a previous swath is the:**

A. Race track pattern.
B. Back and forth pattern.
C. Alternate swath pattern.
D. Upslope pattern.

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

9. **On April 9, 1959, the National Aeronautics and Space Administration (NASA) named seven men to be U.S. Astronauts. Can you name these seven space pioneers?**

10. **This year marks the 50th anniversary of a significant aeronautical event. What happened on February 20, 1962, that made this individual a household name?**

See answers on pg. 55

Disaster Recovery

The Road to Recovery Should Begin Long Before a Disaster Strikes

By Bob Rutledge, on behalf of the NAAA Insurance Committee

Krivosheev Vitaly/www.shutterstock.com

Disasters have no schedules or agendas. They arrive unexpectedly at the worst time. They produce fear of unwelcomed loss. From the start, disasters force us into an unexpected confrontation of being powerless.

Emotions

The first obstacle is to recognize that disasters create emotions of shock from loss, compounded by fear of what a disaster might create. From the smallest event that interferes with conducting operations to the one that causes personal grief and pain for years ahead, acting with emotions could be a costly mistake.

Recovery

The sense of being powerless is rooted in thinking you have no control over a disaster. You may not have control leading up to the event but you can take charge of a disaster. This article is about switching to recovery mode whether forced to replace a stolen aircraft or arranging the funeral of a pilot.

Recovery has two critical elements, time and readiness support. The manner in which we manage these two will decide the severity of loss. Without a timely response and a readiness support plan the event will run out of control. Take, for example, the 2012 Italian cruise ship accident. It perfectly illustrates these missing elements.

A disaster will vary from one operator to the other. Most of us label an event a disaster when that event is expected to create a loss or likely

Coming Next: NPDES-Related Insurance Concerns

The NAAA Insurance Committee will be addressing insurance concerns related to the new NPDES permit in the July/August issue of *Agricultural Aviation*. The Clean Water Act imposes steep penalties on aerial applicators for minor violations and opens applicators up to joint and several liability, which essentially constitutes liability for all applicators working under a decision-maker, not solely the applicator who violates the CWA. The article will address how applicators will be affected and possible ways to contractually handle pesticide applications.

to have a negative effect on our business. It can be from a fire, flood, earthquake, tornado, windstorm, hail, a building collapse or contamination. These events often trigger loss of critical aircraft, hangar, equipment, raw material, chemicals or utilities necessary to conduct your business. These conditions translate to delayed completion of spray jobs, inability to accept new business or sometimes threaten your survival.

If you think this is not the case, consider the study by the Institute for Business and Home Safety. It showed that 25% of all companies that close because of disasters—hurricanes, power failures, accidents, terrorism and others—never re-open.[1] Many organizations do not have prepared recovery plans when a disaster occurs. Many have no financial risk transfer in place to protect themselves. Interviews with clients on this subject can be grouped as "filed in their head."

Is that enough to protect your business? Does that handle the different exposures from disasters? We know the business failure rates, so why rely on one person's memory when you can set out a simple written plan to put yourself immediately into recovery?

Managing time and readiness support are critical. Effective use of these elements provides the best opportunity to minimize the cost and impact on your business.

Time and Readiness Support

No plan can cover every situation, but it is important to anticipate the first hour. In that hour a number of external activities may be underway before you even receive notice. Be prepared to accept the many risks in your operation, such as the accidental death of a pilot, even someone who could be a member of your family.

An aircraft accident can create a communication crisis. Notice is the first step. Set up a 24/7 contact method for incidences to be reported. If you are an operator or the next person in charge, recognize that you may not be the first person called. Time and distance will influence how long before you are notified.

Reconfirm any information that is sent from the accident site. Do not speculate. Remember, the National Transportation Safety Board (NTSB) is the only source of determining why an aircraft accident occurred. Consider that much of the early information received could be confused, incomplete and inaccurate. Nonetheless, media response will be quick both at the accident site and your hangar. To keep consistency, only trained spokespersons should relay information to the media. No statement is off the record. A news statement should be available for the press, public and families as soon as possible.

Phone calls may be overwhelming in the first hours. A central location should be established for the coordination of accident response, communications and briefings. All conversations regarding the accident should be secured. Create a list of people to handle the following activities based on pre-planned scenarios:

- Notifications
- Communications & Media
- On-scene activities
- Local authorities/Emergency services
- FAA/NTSB authorities

If representatives of the FAA, NTSB, the police or other agencies request a statement and you are not the operator or someone authorized to speak on behalf of the company, make the following declaration as diplomatically as possible: "I am instructed not to make any comment related to the incident until a designated representative arrives." Don't misconstrue this as stonewalling. The operator or some other designated representative should cooperate with investigators as much as possible.

Loss of Life

As quickly as possible following an accident, prepare a statement to reach out to affected families. Be sure to acknowledge that the company will fully cooperate with investigators, and grieve the loss of employees.

Several years ago we watched the speedy recovery by a company when their chief pilot and mechanic were killed in an aircraft accident south of Dallas. The accident created enormous shock and grief among the employees and families. In a timely manner the president of the company sent a press release and spoke a few words to reporters. His gestures and carefully phrased words began the recovery process for everyone. He was prepared and quickly took control of the disaster.

Here are some other important matters to factor into your readiness support plan. This list may seem overwhelming at first—and it can be if you aren't prepared. Planning for the unthinkable will help bring stability and a feeling of empowerment in a time of crisis.

Insurance Claim Filing and Agent Contact: Contact your insurance agent as soon as possible. They can help guide the claim handling process. Your aviation claims department should be contacted. Claims representatives provide essential assistance and expertise during the recovery process. Business records and insurance policies should be available to determine covered losses and help claims

[1] "Disaster Preparedness Planning: Maintaining Business Continuity During Crisis, Disruption and Recovery, Perspective Insights from America's Business Leaders," JPMorgan Chase & Company 2009

processing. This will help speed the claims submission and management.

Acquire Temporary Facilities: Keep track of the local hangar space in your area for temporary use. Develop an estimate of space needed. What percent of production will be needed at the temporary location? Is consolidation possible with other operations at another company location? How much of the slack can be picked up by overtime at the existing facility? Keep a list of qualified subcontractors or temporary pilots. How many jobs can be subcontracted?

Restore Damaged Hangars: After a loss has occurred, start clean up and restoration as soon as possible. Minimize additional losses by restoring sprinkler systems, inspecting fuel lines for leaks, evaluating structural damage, etc. Claims adjustors will be able to offer advice on and/or arrange for salvage contractors.

Equipment and Tool Replacement: Consider these questions when addressing equipment replacement: Can your machines or aircraft be quickly repaired or replaced? Where can you locate extra mechanics? Are spare parts available? Create a list of vendors or suppliers to contact.

Raw Material Replacement: Can materials on hand be salvaged and used? How long does it take to get replacement materials delivered? Dependency on one supplier could create delays in deliveries of materials. Keep a list of alternate suppliers on hand.

Material Storage and Handling Program: Additional material handling needs may be necessary to keep spraying operations going out of other hangars, such as moving raw materials to the new spraying location. Are additional forklifts, pallet jacks, cranes, hoists or trucks needed to move supplies? Are there special

storage needs to be addressed, such as racks, tanks, silos, etc.?

Hazardous Materials: Are hazardous contents present that require special precautions, plans and cleanup? Indicate their location on the facility blueprints and send a copy to emergency authorities. Emergency personnel will then be prepared when responding to emergencies at your facility. Some substances can result in closing or evacuating on-site or adjacent operations should an accident occur.

Records, Automation Media and Data: Should a loss occur, records such as accounts receivable, accounts payable, sales and profit and loss statements are essential to continuation of business. Backup data and media should be secured in a separate, off-site location. Make sure they are stored in a fire-rated safe or cabinet to protect it from heat generated in a fire. Run backups frequently.

Media Relations and Advertising: In 2011, the aerial application industry experienced seven fatalities. The Census Bureau reported 35,900 automobile accident fatalities in 2009[2]. Even though the number of aerial application accident fatalities are only a tiny fraction of those resulting from automobile accidents, aviation accidents are highly publicized due to press coverage. A plan should include the establishment of internal and external communications during a disaster. Designate a skilled representative to help dismiss conflicting information or erroneous rumors going to employees and the public. Set up a telephone "hotline" for employees to call for status reports. Distribute a press release or post information on your media site to keep the public, customers and employees informed.

[2] U.S. Census Bureau, Statistical Abstract of the United States: 2012

Consider setting aside funds to cover the cost of extra communications needed to maintain your marketing presence. You might need to use incentives to keep customers interested in your service or to entice them back once operations are back to normal.

Training in Temporary Operations/ Updated New Processes: There will be training needs during the restoration process, especially if you are forced to move to a temporary facility with different equipment. New procedures will need to be learned, including training in operations and safety. Maintenance personnel will need training on the new equipment. In a temporary facility, employee reorientation will be needed on fire exits, alarms, emergency procedures, directions to the plant, parking, etc.

Security of Old and New Operations: The protection of property not damaged is essential to continued operations. Precautions include hiring of temporary security personnel to protect assets from further loss. Keep access to damaged areas controlled around the clock. Any temporary facility will also need to be secured.

Long- and Short-Term Financing: A good relationship with a bank can be of great benefit through the rough times. Financial plans and strategies to get future loans are necessary.

Transportation: Plans should be prearranged for transportation of hangar equipment, stock, raw materials, tools, etc. to a temporary facility or undamaged section. Workflow and storage will be hindered due to new arrangements. Additional material handling equipment may be needed. Ideally, the plan should address these concerns to keep the flow of work as smooth as possible.

Can aircraft be leased until restoration is complete? Contact customers to see if jobs can be rescheduled. If not, the use of subcontractors or other suppliers to complete jobs may prevent loss of customers.

Salvage: The salvage plan should be activated as soon as possible after an incident. What should be scrapped and what should be cleaned or rebuilt and reused? Are there important or valuable papers that need to be saved and restored? This information should be communicated to the claims representative as soon as possible.

Other Anticipated Needs

All emergency plans should include what to do at the moment a disaster strikes. Develop employee evacuation or relocation procedures including management's duties and responsibilities to make evacuation/relocation smooth and controlled. Specialized concerns should also be addressed, such as evacuation plans for persons with disabilities, for example. Test your plan every year.

Develop an emergency directory including names and phone numbers of the emergency management members, employees responsible for specific duties and backup employees to cover their duties. Emergency services should be listed: police, fire, medical, security services, insurance agent/broker and claims adjusters. Key personnel who know the entire facility should be assigned to assist/direct arriving emergency services. A list of needed emergency equipment noting its location and quantity available should be included. This directory should also have a set of building blueprints or diagrams. A copy should be maintained off premises.

Development of a pre-loss program could reduce downtime and financial loss in a recovery period. The investment of time and effort in preparation for unforeseen situations can pay dividends for long-term profitability and continuation of operations.

Of course, prevention is always better than recovery. A self-inspection program designated to locate and correct any conditions that could lead to a catastrophic loss is very important. If such a program can prevent a loss, you will be in a far better position than if you are attempting to recover from a disaster. ■

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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.

Proactive Management & the Pilot's Personality

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By Terry Gage, President
California Agricultural Aircraft Association

As we in the industry know, pilots are a unique group of individuals. Several studies have determined that as a whole, pilots share very distinctive personality traits, and agricultural pilots even more so. This article will explore some of these unique characteristics and how they can impact the decision-making process, especially when a pilot makes the transition to management as an operator.

Would it surprise you to learn that the average pilot possesses a higher level of self confidence, assertiveness and extraversion than a non-pilot? It shouldn't; second-guessing yourself at 150 mph 10 feet off the ground is a significant cockpit distraction. Pilots constantly are looking for what can go wrong and although this characteristic can be perceived by the outsider as a negative, it is an attribute necessary to the job. Numerous studies show that it is a pilot's second nature to be highly analytical and easily able to adjust to changing circumstances, even when under pressure. It is part of a pilot's training to consider the "what ifs" in order to be prepared to avert tragedies and to quickly consider all the variables before determining an appropriate action. When you are the only one in the cockpit, you need to be confident in your actions as there is no one else to rely on.

In a paper titled "Practical Use of The Pilot Personality Profile" Robert G. Rose finds that pilots as a group tend to consistently display certain personality traits. He states that pilots "generally have good social skills and good reasoning … are able to deal with complex information, make decisions and deal with people. Thus, they tend to be bright and capable of good social interaction when called for …"

This skill set tends to serve ag pilots well, especially should they choose to move beyond the cockpit and into ownership of an aerial application business. However, while many of these skills lend themselves to business management, sometimes they can lead to a more reactive than proactive management style. Let's explore how this happens and how you can use your unique personality as a pilot to create a more dynamic business model.

Proactive vs. Reactive Management

The difference between managing your business and your business managing you

Pilots are trained to react to new information and events; however, business management requires a more proactive outlook. Certainly, there are emergency jobs that require immediate attention, but that fight-or-flight response is not necessarily the best strategy for managing a business overall. If a grower calls in with a fertilizer application in clear weather and a storm is not anticipated in the near future, should you hold your pilot and loading crew into overtime? Why should you pay overtime to the loader crew when they will be on the clock tomorrow with nothing currently scheduled? When are accidents more likely to happen, at the end of a long day or the beginning of a new day?

A situation like this is an ideal and appropriate opportunity to leverage your assertive pilot's nature and deftly schedule this application for the next day when materials are onsite and staff is refreshed. A careful review of circumstances is key to ensuring that you are managing your staff and your business efficiently.

As a business owner, your business is built or destroyed based on customer service and perception of that service. Part of this is providing customer service and another part is educating your customer about your policies. For example, examine how you determine scheduling. If your customers learn that those that make the most noise get in the schedule earlier, you have just trained your customers to make noise. To avoid this, clear scheduling parameters should be set in advance and consistently adhered to.

What happens when we continually push to finish a job, ignoring the indication that something is just not right? Why do pilots sometimes continue to fly when they should just shut it down? This can sometimes be due to overconfidence or to pressure from pest control advisors (PCAs) or growers. According to the FAA, in 2010 eight of the 16 accidents that occurred in California were due to pilot error. "Pilot error" is a general term that implies the pilot could have avoided the accident because the known cause was within his control. We have already noted that pilots tend to have greater self confidence than non-pilots. If your pilot is hesitant about an application, there is likely a

Business management is complex and begins with sourcing clients, recruiting staff and managing fiscal, equipment and human resources. Proactive management relies on all of these parts working in harmony.

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good reason. Is pushing the envelope really worth a damaged aircraft, drift claim, increased regulatory oversight or loss of life?

As a pilot, you are used to making decisions and acting on them. This can be a valuable trait when transitioning to management; however, managers need to expand their skill set as they move from relying on just their own actions to the actions of their employees. Businesses rely on capable employees to grow and expand. If your pilot is hesitant to fly a field, it is worth finding out what it is about the job that concerns him. If you were in the seat, would you have the same concerns? Moving from relying on your own skill set to relying on those of others can be a challenging transition, but important for those willing to build a successful business.

Ours tends to be a 9-1-1 business, but this aspect can be turned into a manageable business model by setting protocols. For example, ensure that staff, loaders and pilots all have knowledge of the schedule, know where fields are located and have product onsite for maximum productivity. Pilots are known for their strong reasoning capabilities, but those who spend too much time reacting to their business cannot actively manage it.

Business management is complex and begins with sourcing clients, recruiting staff and managing fiscal, equipment and human resources. Proactive management relies on all of these parts working in harmony. Employees are more motivated when they know what is ahead, what is expected and who is responsible for various aspects. Communication needs to flow from scheduling to loading, maintenance, pilot, front office and back. One break in this chain can create chaos, confusion and frustration. The key is building a system in which communication can freely occur. Without a smooth flow, productivity can drop, which impacts the bottom line.

A proactive manager takes charge of his business like a pilot takes charge of an aircraft. Just as a successful flight begins with a pre-flight check, so should your business. Has the staff communicated clearly to each team player? Do the loaders and pilot know exactly which field and what products are being used? Is the material onsite? What is the job sequence for the day? What if the wind picks up? How should an abnormality in aircraft performance be addressed? With proper application, pilots who become operators can leverage their unique skills from the flight deck to develop a successful proactive business model. ■

This article originally appeared in On The Deck, the California Agricultural Aircraft Association's official publication, and is reprinted with CAAA's permission.

Pilots —AND— PT6's

Practical Engine Advice to Aid the Pilot

Dietmar Hoepfl/www.shutterstock.com

By Fletcher Sharp,
PT6A Customer Support,
Covington Aircraft

To help ag pilots become better operators of the PT6A series turbine engine, let's review some issues that have surfaced routinely over the years, and continue to do so. This article will cover several different areas. Should you have any questions, feel free to email me, or you can pose those same questions to your PT6 repair shop.

Starting Your Engine

All of the POH[1]/Flight Manuals basically have identical procedures for starting a PT6 engine. We'll assume that your battery/batteries are in very good condition. Routine starting procedures require switching the ignition ON, engaging the starter switch and monitoring the Ng (compressor cranking speed), looking for a *minimum* of 13% Ng before selecting "fuel on." However, cranking the engine to as high an Ng as possible before introducing fuel will almost always give a better and cooler start.

The point here is, if you initiate a start by cranking the engine, then introduce fuel *before* realizing you forgot to turn on the ignitors/glow plugs (for those with PT6A-20s), never—I repeat, never—turn the ignitors on at this time. Doing so will almost guarantee a massive hot start/overtemp condition, because all of the sprayed fuel puddled in the combustion liner will ensure a very hot temperature in the hot section area. Once you ignite this puddle of fuel, there is nothing a pilot can do to prevent the overtemp that's going to occur. Cutting the fuel off may help a little, but it's all that unburned fuel sitting in the bottom of the combustion liner that will cause the damage.

If you forgot to turn the ignitors on, abort the start, let the engine coast back to 0% Ng, crank the engine for about 15 seconds *with fuel and ignition OFF* to clear the engine of raw fuel, then go for a normal start, this time with the ignitors on *before* selecting fuel on.

For those with aircraft that have two or more batteries, there's the option of getting a quick start relay kit installed. While they have only been on the scene for four years or so, from what I've seen, the vast majority of operators who have installed these kits have seen excellent results. Apparently, on some installations, typically three battery ones, installing this kit can end up with causing fairly rapid deterioration of one of the three batteries. I've not been following this closely, but believe there's a fix for this battery problem available.

[1] Pilot's Operating Handbook

This is an example of the cockpit panel in a PT6-powered Turbo Thrush. The start switch is located in a small panel on the lower left side of the cockpit behind the throttle quadrant. It is on the aft part of the panel, next to the battery and generator switches, and the ignition switch is on the forward part of the panel.

From a Pratt & Whitney Canada (P&WC) perspective, the very best way to start any turbine engine is to get the engine lit off and spooled up to idle speed as quickly as possible. At light off, the engine is experiencing high internal temperatures without a large mass flow of air moving through the engine to help carry the high temperatures out through the exhaust stacks. Anything that can be done to improve the airflow through the engine at start is a very positive thing.

I believe these quick start kits are most beneficial to the larger PT6A-45 and PT6A-60 series engines, although I've spoken with several operators of PT6A-34 series engines that have installed the same kits, and they saw a marked decrease in starting ITT.

Keeping Track of Starts and Flights

Keeping track of starts and flights is another area a lot of pilots, especially those new to turbine operation, tend to forget or do not understand. Every turbine engine, whether it's P&WC, Garrett/Honeywell, Lycoming or Walter/GE, has certain rotating components that have a life measured in cycles or hours (it is almost always in cycles, though).

While owner/operators of FAR Part 137/91 aircraft are not required to perform overhauls at the manufacturers' recommended intervals, from an FAA perspective, the life cycle limits on those rotating components identified as such *are mandatory*. There are no options that will allow operating life cycled items past their limit. That means the owner/operator is responsible for keeping track of those life limited parts. By doing a few simple things on each flight, pilots can provide all the help a qualified A&P/IA technician will need to record and update the engine logbooks during the Annual Inspection. Should an FAA inspector ever check your records and discover you've operated a life limited component beyond its limit, the results won't be good!

P&WC identifies a cycle as a start, idle, takeoff, climb/cruise, descent and landing, followed by engine shutdown. P&WC also has something called an *abbreviated cycle* that is pretty much the same, but is used when there is a landing and takeoff with *no* engine shutdown. By tracking abbreviated cycles, the owner gets the maximum life from those parts! In the interest of safety and ease of calculation, some

There are no options that will allow operating life cycled items past their limit. That means the owner/operator is responsible for keeping track of those life limited parts.

operators simply kept track of all loads for the purpose of cycle count. A load without the shutdown does not cause the same thermal "wear" on the engine components as one with a shutdown and restart. The practice of counting loads as cycles results in a higher than necessary cycle count and premature maintenance requirement.

For any given PT6A engine series, there's a Service Bulletin that has all the information an A&P/IA will need for updating the engine logbooks, with TWO exceptions, and this is where you, the pilot, come in! When working during the season, keep a log in the aircraft that shows the number of times you start the engine each day, as well as the number of takeoffs you make; this would also be the same as the number of loads you dispersed over the fields. Those two items—number of starts and all takeoffs—if recorded conscientiously, will allow the mechanic to use the information in the engine service bulletins to extract the maximum life from those life limited rotating components.

NOTE: *Any engine starts made for the purpose of ground runs, to check rigging, engine performance, etc. are NOT counted against the life limited components.*

As a bit of added advice, operators contemplating the purchase of their first turbine engine should be aware of the importance of cycle count on all engine components. More than one new turbine owner has been surprised to learn the engine he bought at a very reasonable price may not be such a great deal after all since some of the rotating life limited parts only have a few cycles remaining before replacement is required. *These life limited parts are very expensive!* I suggest you ask one of the turbine engine shops for advice on what to look for in the maintenance records before making the purchase.

Example of an Air Tractor turbine panel showing the location of the "start" and "ignitor" switches on the left side of the engine operation panel.

During the season, keep a log in the aircraft that shows the number of times you start the engine each day, as well as the number of takeoffs you make. Those two items, if recorded conscientiously, will allow the mechanic to use the information in the engine service bulletins to extract the maximum life from life limited rotating components.

GPU's/APU's (Ground equipment to help start the engine)

The aircraft's electrical system is a 24-volt system (battery voltage) that, when the engine is running and the generator is putting out voltage, turns into a 28-volt system. For a decent engine start from a GPU/APU, one must start out with *at least* 28 volts.

I have visited many shops that have two 24-volt batteries hooked up in parallel to help with starts. That's NOT good enough! If you're going to build a GPU/APU, think about a pair of 24-volt batteries *and* a large 6-volt battery hooked up in the proper manner to provide 30 volts. By the time you've hooked up a 30-volt cart to the aircraft there's enough voltage drop across the relays, etc. so that one has 28 to 29 volts available for starting. Now you have something that will give a cooler and better start, without endangering the electrical system of the aircraft. ■

Fletcher Sharp may be reached at fletchersharp@verizon.net or fletchers@covingtonaircraft.com.

Perry Correll/www.shutterstock.com

The Importance of Aligning Your Nozzles

By Clint Hoffmann and Brad Fritz
USDA-ARS Aerial Application Technology Group

With the beginning of another application season, this is a good opportunity for aerial applicators and their ground support crew to ensure that their spray systems are properly maintained to achieve peak performance. Most applicators likely monitor nozzle flowrate and wear, but how many check to see if their nozzles are properly aligned? In addition to the vertical deflection that is typically adjusted to change droplet size, the horizontal deflection can also change the size of the droplets as well as the spray pattern out of the nozzle.

Nozzle Deflection Angles

Deflection refers to the nozzle angle relative to a horizontal flight line with a nozzle pointed straight back generally referred to as 0o deflection. The USDA Spray Atomization models (apmru.usda.gov/aerial) can be used to look at how changes in nozzle angle affect droplet size. For example, a 4008 flat fan nozzle at 40 psi flown at 140 mph will produce a volume median diameter (VMD) of 311 µm at 0o deflection; however, the VMD drops to 186 µm at 90o deflection (pointed straight down). More importantly from a drift control perspective, the percent of spray volume made up of droplets less than 100 µm increases from 5% at 0o deflection to 28% at 90o deflection.

Misaligned Nozzles

A strip with obstacles such as tall grass or even accidental movement by ground support crewmembers may potentially knock nozzles out of horizontal alignment, as shown in Figure 1, which also changes nozzle performance. Looking across a range of airspeeds (120–160 mph), a 15o nozzle misalignment reduced droplet size by about 15% and significantly increased small, driftable droplets. This is caused by increased air shear on one side of the flat fan resulting in a narrowing of the spray fan angle as well as decreased spray droplet size.

Summary

While these issues are fairly minor compared to other preparations for the coming season, one should also remember that your spray nozzles are the last piece of equipment that comes into contact with the product you are applying and, as such, has the final say in both the droplet size and uniformity of the spray being applied. A few extra minutes spent walking your boom to ensure that all spray nozzles are properly deflected and aligned could significantly reduce the chances of any off-target movement. ■

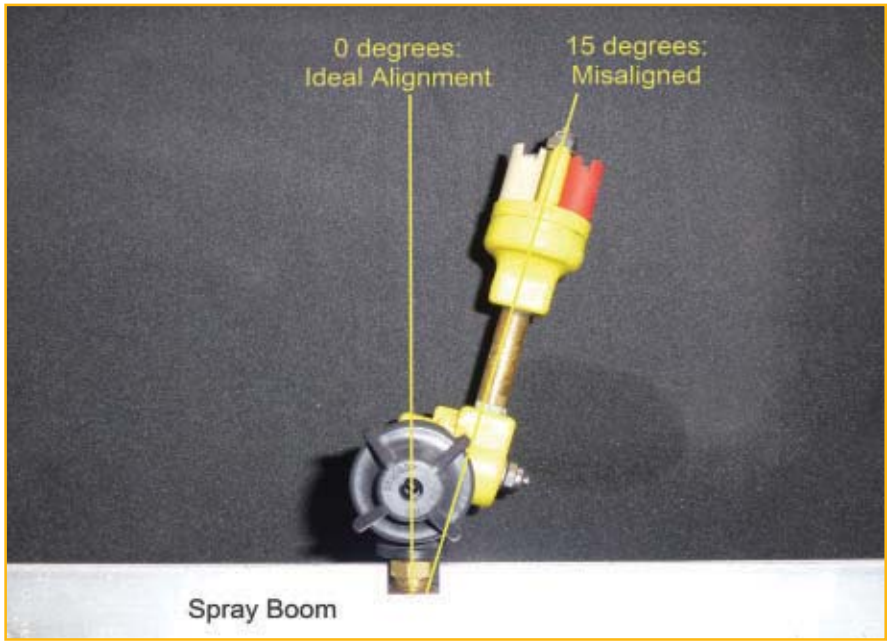

Figure 1. Top view of a misaligned nozzle, which can significantly change droplet size.

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NAAA Membership Advantages:
10 Reasons it Pays to be an NAAA Member

NAAA's new dues structure goes into effect July 1. If you have not already joined NAAA for the 2012 membership year, you can save approximately 10%—or more in some operators' cases—by joining or renewing by June 30. However, NAAA membership at any price is a worthwhile investment. The payoff far exceeds what you spend in dues in the form of effective advocacy, national representation, education and safety programs and the personal connections you make with fellow members. Here are 10 reasons why it pays to be an NAAA member!

1. Government & Public Representation:

Imagine how difficult it would be to operate if an organization like NAAA wasn't around to serve as the eyes, ears and voice of the aerial application industry in the nation's capital. Would any other organization have your back to the degree NAAA does? The Association is seeking favorable outcomes on a myriad of issues vital to the agricultural aviation industry. Top policy issues include: 1) mitigating the impact of Clean Water Act NPDES pesticide general permit requirements, which took effect Oct. 31 and are now being enforced; 2) preventing pesticide use restrictions and fewer pesticides being available to commercial applicators; 3) averting threats to GPS stability and availability; 4) properly marking guy-wire and free-standing towers and advocating for safe wind energy siting; and 5) preserving the user fee exemption for agricultural aircraft.

2. Wallet Watchmen:

Aerial applicators have saved thousands of dollars a year thanks to NAAA's federal oversight and advocacy efforts. The Association successfully lobbied Congress to enact legislation providing more than $4 million in annual federal fuel tax relief for U.S. aerial applicators and prevented costly user fees from being charged to ag aircraft by convincing lawmakers to exempt agricultural aircraft from user fees. The Obama Administration is proposing a $100 user fee for use of controlled airspace in its new budget, which NAAA is actively opposing. These savings are 10 times greater, on average, than what your annual national and state association membership dues would cost combined.

3. Exclusive Insights, Breaking News and Premium Content:

NAAA gives members a leg up on the competition by keeping them informed of breaking news, grassroots alerts and important updates. The NAAA eNewsletter is a members-only benefit and NAAA's prime means of keeping members apprised of major developments within the industry and inside the beltway. NAAA's website has a treasure trove of premium content available exclusively to members, including the very best guidance on complying and protecting yourself from $37,500-per-day penalties for NPDES pesticide general permit violations. This includes a "model contract" for reference when preparing contract negotiations with clients and is designed to help you avoid being categorized under the NPDES permit as a "decision maker" instead of an "applicator."


NAAA eNewsletter
Voice of the Aerial Application Industry
April 5, 2012
Congested Areas: Recent FAA Decision to Ag Pilot Shows Penalties Can Be Severe
An ag pilot flying in the FAA's Northwest Mountain Region was recently informed the FAA plans to issue an Order of Suspension of his certificate for 180 days. He allegedly flew at less than 1,000 feet over a congested area without complying with the requirements of §137.51 – Operation over congested areas. This portion of the regulation addresses the approval of a congested area plan by the local FSDO.
Read More
New Idaho Tower-Marking Law Initiates Pushback from Telecomm Industry, FAA Marking Guidance May Serve as Viable Substitute
With the ink still wet on Idaho's new tower-marking ordinance (signed into law March 27), the telecommunications industry has already initiated pushback with Idaho Governor "Butch" Otter. Regardless of this setback ample credit must be given to the Idaho Agricultural Aviation Association for its efforts in seeing the marking bill enacted in the Gem State. The telecommunications lobby is urging the Governor not to enforce the law citing the federal government's exclusive sovereignty of airspace of the U.S. Read More
IN THIS ISSUE
- Congested Areas: Recent FAA Decision to Ag Pilot Shows Penalties Can Be Severe
- New Idaho Tower-Marking Law Initiates Pushback from Telecomm Industry, FAA Marking Guidance May Serve as Viable Substitute
- Hog in the Spotlight: Ag Pilot and Razorback Fan Stan Ferguson Featured in Local Magazine
- $600 in Educational Funds Available from Pickett Equipment Scholarship Essay Contest
- Attention, All NAAA Exhibitors
CALENDAR OF EVENTS
April 9-13, 2012
ArAAA Operation S.A.F.E. North Region
Newport Municipal Airport, AR

NAAA delivers breaking news to members through the NAAA eNewsletter.

4. Wind Tower Education Materials:

To ensure that farmers are fully informed before making decisions about wind-energy development, NAAA launched a campaign to raise awareness about the worrisome effects of wind energy development on agriculture and aviation. That message is articulated in a series of wind tower education ad slicks, safety stuffers and radio

This is one of the Wind Tower Safety ad slicks available on NAAA's website. Each of the six ads comes in a variety of sizes.

scripts available free to NAAA members. Visit *www.agaviation.org/towers.htm* to learn more.

5. Public Relations Resources: Request videos, brochures and extra magazine copies for your public relations needs with the media, local governmental officials, schoolchildren and the public. Prepare beforehand by consulting the NAAA Media Relations Kit. This online members-only resource includes advice on communicating with the media and elected officials, as well as background information and talking points about the importance of aerial application and a number of other subjects of interest. Visit *www.agaviation.org/content/naaa-media-relations-kit*.

6. Membership Directory: NAAA's Annual Membership Directory is coveted by newcomers and longtime members alike. NAAA's Directory is loaded with operator and pilot contacts, as well as contact information for the premier suppliers of parts and services to the industry. This is an indispensible asset, and it's only available to NAAA members.

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

©iStockphoto.com/Jamie Farrant

8. Special Discounts: NAAA membership coupled with participation in PAASS, Operation S.A.F.E. fly-ins and the Leadership Training Program offer ag pilots several ways to improve their professionalism, earn possible CEUs and achieve discounts through their insurance providers. You also get discounted rates to NAAA's Annual Convention with your membership.

9. "Social" Networking: NAAA may be the Voice of the Aerial Application Industry, but no one embodies the face of the aerial application industry better than our members. Now members have the ability to add a picture to their online profile. We hope this dose of added personalization leads to new and renewed connections as you look people up in NAAA's Online Member Directory and are able to put a face to a name. As NAAA's picture collection proliferates, so too will the value of the Online Member Directory. To update your profile picture, login to *www.agaviation.org/user*.

10. Support: NAAA is someone to call when you have questions, need information or are having business problems. We're here to help.

The small size of NAAA's staff (six association professionals) belies the outsize results the Association delivers. That's because NAAA's for-hire employees are augmented by a supportive group of more than 1,700 aerial application supporters. We invite you to join the cause of preserving and protecting agricultural aviation and your way of life if you aren't a member already. To join, call 202-546-5722 or visit *www.agaviation.org/content/membership*. ■

There's no time like the present to protect your future.

Become an NAAA Member today!

2012 NAAA Membership Application

Please note: NAAA Membership runs from Jan. 1 to Dec. 31 regardless of the date joined.

Membership Categories: (please select one)

Dues amounts are subject to change by NAAA Board.

Operators & Pilots who do not belong to a State/Regional Aerial Application Association must pay Participating Operator or Participating Pilot dues.

$450	___ Operator
	___ $10 each aircraft over 3
$170	___ Affiliated Operator
$900	___ Participating Operator
$170	___ Pilot
$340	___ Participating Pilot
$450	___ Allied (1–10 employees)
$680	___ Allied (11–50 employees)
$850	___ Allied (51–100 employees)
$1,000	___ Allied (101–500 employees)
$1,700	___ Allied (500+ employees)
$170	___ Affiliated Allied
$85	___ Associate
$225	___ International
$680	___ State/Regional Association
$170	___ WNAAA

Effective July 1, all membership rates rise approximately 10%. Save 10% or more by joining by June 30, 2012!

Allied Industry Indicate your division:

__ Airframe __ Application Technology __ Chemical
__ Dealer/Parts __ Insurance __ Propulsion __ Support

Not sure which categories applies to you? Visit www.agaviation.org/Membership%20Classification.pdf for more information.

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Bus (_____)_____ Home (_____)_____

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Website: _____ Spouse _____

NAAA Dues $_____

NAAREF Donation $_____

Please consider a donation to support NAAREF programs.

(NAAREF depends on your donations to pay for PAASS and other programs such as Compaass Rose, Operation S.A.F.E., Fly Safe and Athena. PAASS attendance fees do not completely offset program costs. Your additional donation, made out to NAAREF, is greatly appreciated and is tax deductible.)

Total Payment $_____

Payment via: ___ Check Enclosed ___ Credit Card

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Signature _____
(signature authorizes billing credit card)

Cardholder Name _____

Cardholder Address _____

Date _____

Mail to: NAAA, 1005 E Street St., Washington, DC 20003 Ph: (202) 546-5722 Fax to: (202) 546-5726 E-mail: information@agaviation.org Join online – www.agaviation.org

Dues, contributions or gifts to the NAAA are not tax deductible as charitable contributions for income tax purposes. Dues and similar payments may be deducted as ordinary and necessary business expenses subject to restrictions imposed as a result of the NAAA's lobbying activities as defined by Section 13222 – Omnibus budget Reconciliation Act of 1993 {IRS Code 162(e)}. NAAA estimates the non-deductible portion of dues paid during calendar year 2010 as 17%. Agricultural Aviation subscription cost ($30 for domestic, $45 for international) is included in membership dues for all membership categories.

Pursuing Their Vision with Precision

Two humble outsiders stood out among a strong pool of candidates for NAAA's 2011 Agricultural Aviation Scholarship

By Jay Calleja
Manager of Communications

(Above left) Brad Taylor
(right) Jordan Loewen

Oprah Winfrey loved to talk about "aha moments," those rare occasions when the answer or solution you are looking for suddenly becomes crystal clear. But those moments don't always come with a Halleluiah chorus in the background or confetti streaming from the rafters. Usually they come in quieter moments, absent any fireworks or visible light bulbs over a person's head.

That's what it was like for the 2011 recipients of NAAA's pilot-training scholarship. Both realized being an ag pilot would be their dream job and embarked on a journey of quiet certitude to make it happen. Jordan Loewen and Brad Taylor didn't have any roots in the industry, but Loewen got hooked early, shortly after starting a part-time job as a mixer/handler at Valley Sprayers Inc. in Park River, N.D., in his junior year of high school. Taylor, who lives in Corinth, Miss., had a good job working for his family's heating and air conditioning business and had been an HVAC technician for 10 years. The job security was nice, but it wasn't everything. He was ready for a career change.

A combination of good fortune, hard work and humble but hungry attitudes led Loewen and Taylor to the operators who encouraged them to apply for the NAAA/BASF Agricultural Aviation Scholarship—Glen Wharam in Loewen's case and Dennie Stokes of Stokes Flying Service in Parkin, Ark., in Taylor's. Tasked with the difficult assignment of sifting through a strong pool of candidates, NAAA's scholarship selection committee awarded the $5,000 first-place scholarship to Loewen and a $2,500 scholarship to Taylor. The personal odysseys of both candidates struck a chord with the committee, who were impressed by the commitment and sacrifice shown by both men.

From Ground Jordan to Air Jordan

Valley Sprayers has two ag planes, two ground applicators and a maintenance facility that does 25 annuals per year along with routine maintenance and inspections. When Loewen first started working for the company, he and Wharam would talk about his plans after high school. Loewen had been working as a welder already and thought he might stick with it. As they recounted the story together, Wharman said, "About two weeks later he said—"

"I found what I want to do," Loewen interjected.

"He said, 'Where do I go to get to be an aircraft mechanic?'" Wharam continued.

"The more and more I was around it, the more and more I got interested," said Loewen. In his application essay, he described how he began working for the "chance to be the guy in the airplane instead of the guy loading the airplane."

After high school, Loewen enrolled at Lake Area Technical Institute in Watertown, S.D. Last May he graduated from the A&P school with honors. He began training at AG-Flight Inc. in Bainbridge, Ga., last October, embarking on a four-month program to earn his private and commercial pilot licenses and get some basic ag training.

Loewen was encouraged by his mentor, Glen Wharam, to apply for the NAAA/BASF Agricultural Aviation Scholarship.

> "The hard part is going to be replacing Jordan on the ground. He was really good at making three- to five-minute turnarounds on the loads."
>
> —*Valley Sprayers Operator Glen Wharam*

Wharam's son Jayse is an ag pilot in the business, and he has another son, Chris, who works for BASF as a technical service representative. To hear him talk about Loewen, it's almost as if he has a third son; the pride in his voice is unmistakable.

"We've always had high school kids, but it soon became evident that Jordan was more than just a high school, summer job guy, so we took a bigger interest in him and saw that he had some real good potential," Wharam said.

By late February Loewen had completed his program at AG-Flight. He is still working as an A&P mechanic for Wharam, but his aerial application lessons will continue—gradually—under the tutelage of Jayse and Glen. The plan was to get him up in the air as soon as North Dakota's weather improved this spring—but just to fly, not to apply products.

"We need him to get used to the airplane and take light loads. The next thing you know he'll be a year or two down the road and he'll be right there," Wharam said. "The hard part is going to be replacing Jordan on the ground. He was really good at making three- to five-minute turnarounds on the loads."

No April Fooling

A young man of few words, Loewen appears to be more content to let his work ethic speak for him. Taylor is similar in that regard. Although he may not have expressed it to anyone else, he had always been interested in flying. The revelation certainly came as a surprise to his new bride.

"At first I thought he was joking," Cassie Taylor said. "We had been married one month, and it was April Fools' Day, and he tells me he wants to be a pilot and I was just like 'ha-ha, okay.' It was the first time in six years that we had known each other [that I had heard that], so it was interesting."

Her voice trails off for a moment. "But then I quickly realized he wasn't joking, and—I don't know—he seems to really enjoy it and it really makes him happy, so that works for me."

With little money saved, Brad began working overtime and weekends to earn money for flight lessons. During his first lesson he saw Jerry Webb of Webb's Flying Service working a field in Tupelo, Miss. That cemented it for him. "I got to watching him work that field, and I said, 'That's what I want to do.'"

Brad attended the Mississippi AAA Convention in 2010 looking for an opportunity, but nothing turned up. He met Dennie Stokes and his son Tracey by way of Andy Davis, an ag pilot with Frost Flying in Marianna, Ark. As fortune would have it, Davis was getting some lessons in Tupelo from the same flight instructor Brad

trained with from his private to his commercial pilot's license.

The Stokes admired the sacrifices he was willing to make and offered him a job as mixer/loader. Brad jumped at the opportunity and began in February 2011. In his letter of recommendation to NAAA's scholarship committee, Dennie wrote, "It takes a lot of determination and faith to leave a well-established Family Heat & Air Business and move to another state and go to work on the ground at a flying service just to learn more about the business before going to ag school."

The scholarship money he received helped defray the expense of attending Eagle Ag at Eagle Vistas LLC in Port St. Lucie, Fla. He took Eagle Ag's one-week basic ag course last November. After talking to Dennie more about it, he decided to hold off on taking a turbine transition course until after he gets a couple of seasons of ag flying under his belt.

Brad continues to work for Stokes Flying Service primarily as a loader. "I've learned a lot on the ground. Just being around those guys, picking up on things they say and talk about—that's really helped a lot."

He gets up in the air when circumstances allow and has gotten in some time flying a Cub. The majority of his flying will be in a Cessna 180 and a Stearman. Brad said it's possible he could do some preliminary application work later in the season.

The progression required to become an ag pilot can be mystifying to people on the outside, but Brad understands the process and is at peace with it.

"It seems like it's just constantly been going to get more training, then more time; more training, then more time. [My friends say] 'Well, you already have your license, don't you?' I said, 'Yeah, I do, but it takes a lot more than just going and getting a license to come out here and do this kind of stuff.'"

Brad and Jordan know they still have a long way to go before they will be ready for a full-time seat, but thanks to the Agricultural Aviation Scholarship, they are a few steps closer to realizing their dream. ■

For information about the 2012 NAAA/BASF Agricultural Aviation Scholarship Program, refer to the full instructions and application starting on pg. 49.

Nurturing the Next Generation of Ag Pilots

2012 NAAA/BASF Agricultural Aviation Scholarship Offers Up to $7,500 in Training Funds to Aspiring Ag Pilots

With up to $7,500 in training money available, competition for the 2012 NAAA/BASF Agricultural Aviation Scholarship is underway. The goal of the Agricultural Aviation Scholarship is to strengthen the aerial application industry by helping NAAA Operators bring new pilots into the profession. Each applicant must be sponsored by an NAAA Operator, and scholarship recipients must use the proceeds for flight training or agricultural coursework at a university, college, community college or other institution of higher learning. A stipend for a trainee in an NAAA Operator-sponsored apprentice program is also permissible.

The 2012 Agricultural Aviation Scholarship is funded by an educational grant provided by BASF and administered by NAAA. NAAA will award one scholarship valued at $5,000 and could award a second scholarship valued at $2,500 depending on the pool of applicants. NAAA presented Jordan Loewen and Brad Taylor with scholarships in the amounts of $5,000 and $2,500, respectively, at the 2011 Convention in Las Vegas. This year's winner, or winners, will be recognized in December at NAAA's 46th Annual Convention & Exposition in Savannah, Ga.

To be considered for the 2012 scholarship, every applicant must submit:

- **A letter of recommendation** from the NAAA Operator sponsoring the applicant.
- **An essay of 250 words or less** written by the applicant explaining why he or she is deserving of an NAAA/BASF Agricultural Aviation Scholarship.
- **A one-page résumé or list of activities** detailing all agricultural and aviation experiences, education and training.

To learn more about the 2012 NAAA/BASF Agricultural Aviation Scholarship, review the application instructions on the adjacent page. The application is also available on NAAA's website at *www.agaviation.org/content/agricultural-aviation-scholarship-news*.

Please call NAAA at (202) 546-5722 if you need clarification about any of the application requirements. **The deadline to apply is Aug. 31.**

2012 NAAA/BASF AGRICULTURAL AVIATION SCHOLARSHIP APPLICATION INSTRUCTIONS

This scholarship program is made possible through an educational grant from BASF Corp.
The scholarship program is administered by the National Agricultural Aviation Association.

BASIC INFORMATION:

Purpose: To bring new pilots into Agricultural Aviation and help fund their training. Scholarship is to be used for flight training or ag-related coursework at a university, college, community college or other institution of higher learning.

Amount: The **NAAA Agricultural Aviation Scholarship Program** will award up to two (2) one-year scholarships to a deserving, qualified student(s) participating in one or more of the following programs:

1. **a certified flight training program**
2. **an NAAA Operator-sponsored flight-training apprentice program**
3. **an agriculture, agribusiness or ag vocation program** for a second-year or later student(s) enrolled at a U.S. 2-year or 4-year program of study at an accredited junior college, college or university.

The number of scholarships may vary from year to year. NAAA will award one $5,000 scholarship annually for the life of the program, and may award a second $2,500 scholarship. One award per applicant.

Eligibility: Paid employees of NAAA or BASF and immediate members of their families are not eligible. Entrant must be sponsored by an NAAA Operator.
Prior NAAA Agricultural Aviation Scholarship winners are not eligible.

Sponsor: Each applicant must be sponsored by an NAAA Member Operator.
An Operator may sponsor only one applicant per year.

Application Process: Applicant should fill out ALL "applicant information," sign the form and give the application to the NAAA Operator Sponsor. The Sponsor will complete the sponsor form, add a letter of recommendation, and forward all required information via U.S. Mail, Fax or Email to:

NAAA Agricultural Aviation Scholarship
1005 E Street, SE, Washington, DC 20003
Fax to (202) 546-5726 • Email to information@agaviation.org

Application Checklist: By August 31, 2012, please submit the following materials:

- Completed application
- One (1) letter of recommendation from the NAAA Operator sponsoring the applicant. *(Letter of recommendation may be submitted in a sealed envelope.)*
- Essay of 250 words or less explaining how you would use the NAAA/BASF Agricultural Aviation Scholarship to further your education and training.
- Current one-page résumé or list of activities detailing all agricultural and aviation experiences, education and training.
- Plus:

If scholarship proceeds are for flight training:

- Provide proof you are enrolled or have been accepted for enrollment in a certified flight training program (ag or otherwise).

If scholarship proceeds are for an Operator-sponsored apprentice program:

- Provide a brief but detailed explanation of the apprentice program.

If scholarship proceeds are for ag-related coursework at a college or university:

- Submit an official transcript from applicant's college, junior college or university. The Registrar's Office can mail your official transcript to NAAA or place it in a sealed envelope for you to mail with your application form. (GPA must be 2.5 or better on a 4.0 scale at the time of application to be eligible for NAAA scholarship).
- Provide proof that you are seeking an undergraduate or graduate degree in an agricultural, agribusiness or an ag vocation field (transcript may suffice; consult your registrar or department office for more information).

All applications must be received or postmarked by **August 31** to be eligible for scholarship funds available for the following calendar year (January–December).

Selection Process: All applicants will be evaluated based on the following criteria: need, prior experience, likelihood of retention in the aerial application industry, strength of operator's recommendation letter, and strength of applicant/candidate's essay.

Applications will be reviewed and winners chosen during the Fall NAAA Board Meeting by the NAAA Membership Committee.

Winners will be notified by November 1. Winners will be publicly announced at the NAAA Annual Convention in December.

The decision of the NAAA Membership Committee is final.

Payment: A tuition bill must be presented verifying enrollment of the applicant. If tuition has been paid in full, upon proof of such payment, NAAA will remit payment to the scholarship recipient. Otherwise, the scholarship will be paid directly to the appropriate school before the recipient's training/coursework begins or resumes. Any funds paid directly to the applicant as part of this award not used for approved higher education or apprenticeship expenses must be returned to NAAA. Paid receipts for tuition or higher education expenses must be provided. A signed statement from the Operator providing the apprenticeship will serve to verify those expenses. Scholarship recipients must provide proof of expenses to NAAA by June 1 of the year following the award. Apprenticeship payments used for living expenses may be taxable.

Duration: BASF and NAAA have agreed to continue this scholarship program for a minimum of three years, 2010, 2011 and 2012.

Revisions: NAAA reserves the right to review the conditions and procedures of this scholarship program and to make changes at any time.

2012 NAAA/BASF AGRICULTURAL AVIATION SCHOLARSHIP APPLICATION

PART 1
APPLICANT INFORMATION:

Name:_____

Address:_____

City, State, ZIP:_____

Phone: _____ Email: _____

Name of University, College, Community College, Flight School or other flight training program:

_____

Address:_____

City, State, ZIP:_____

Phone: _____ Enrollment Contact: _____

Course of Study:_____

Description:_____

_____

Length of Program: _____

I am (choose one):

____ Currently enrolled_____ Enrolled beginning: (date course begins) _____

I expect to complete this course of training or study by (month/year) _____

In 250 words or less, please explain why you want to pursue a career in agricultural aviation and how you would use NAAA's Agricultural Aviation Scholarship to further your education and training:

_____

_____

_____

APPLICANT'S SIGNATURE _____ **Date:**_____

2012 NAAA/BASF AGRICULTURAL AVIATION SCHOLARSHIP APPLICATION

PART 2
SPONSOR (NAAA OPERATOR MEMBER):

Sponsor Name:_____

Company:_____

Address:_____

City, State, Zip: _____

Phone:_____ Email _____

Relationship to employee (choose as many as appropriate):

___ Family Member

___ Employee (current or past)

___ Other, please explain: _____

If not a family member, how long have you known the applicant:_____

NAAA OPERATOR/SPONSOR'S SIGNATURE _____

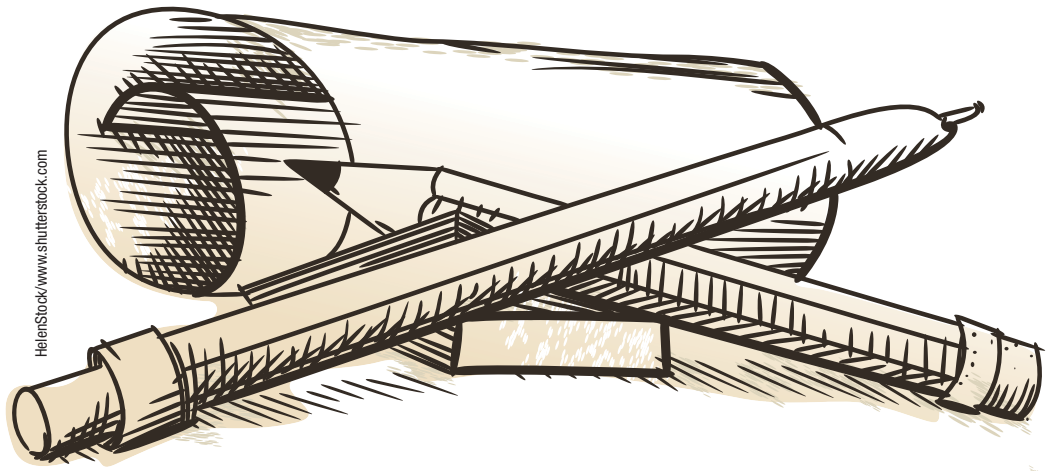
Date:_____

Please attach a letter of recommendation for the attendee. Please comment on the applicant's agricultural or flying background as well as general character, focusing on why you believe the applicant will become a good ag pilot and what the applicant has to do to further his or her training and development.

All applications must be received or postmarked by **August 31** to be eligible for scholarship funds available for the following calendar year (January–December).

2012 WNAAA Scholarship Contest Focuses on Environmental Awareness

Attention, higher-education students: Don't miss out on the opportunity to compete for a combined $3,000 in educational scholarships. The Women of the National Agricultural Aviation Association will award a $2,000 scholarship as top prize in its 30th annual essay competition, and Covington Aircraft Engines has generously agreed to sponsor a $1,000 scholarship. **The deadline for the 2012 WNAAA Scholarship Essay Contest is Aug. 15.**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Eligibility Requirements

If you are an NAAA member (or become one by June 15), the WNAAA invites you to sponsor a contestant in the 2012 WNAAA Scholarship Essay Contest. The scholarship is not restricted to pursuing a "flying career." Any educational pursuit beyond high school (at any age) is eligible. The competition is open to all NAAA members and the children, grandchildren, sons-in-law, daughters-in-law or spouse of any NAAA operator, pilot member, retired operator or pilot who maintains an active membership with NAAA. The contest is also open to allied industry members and the children, grandchildren, sons-in-law, daughters-in-law or spouse of an allied industry member. Each allied industry company is allowed only one eligible family member. To qualify, dues must be paid by the organization or individual member on or before June 15, 2012.

Entrants must have graduated from high school prior to the deadline date for entry (Aug. 15, 2012) and be enrolled in continuing education during the year of entry. Previous winners are not eligible to compete.

2012 WNAAA Scholarship Guidelines

The theme for this year's contest is "Stewards of the Sky, Stewards of the Land: Environmental Awareness in Agricultural Aviation." Essays must be 1,500 words or less. Topic deviation and/or modification will not be accepted. Papers submitted will be judged on content, theme development, clarity, originality and proper grammar. All sources used must be cited in a bibliography or works cited page. Plagiarism will result in immediate disqualification. Entries must be typewritten and double-spaced.

To ensure the judges will not know the identities of the writer, keep any reference to the author's name, sponsoring company and company location out of the essay itself. However, a title page must be attached and contain the entrant's name, address, email address, telephone number, relationship to sponsor, sponsor's company name, address and telephone number. A photograph of the entrant and short biography should also be provided.

Manuscripts may be sent electronically or mailed. Electronic submissions should be sent as an email attachment to medinaflying@aol.com. If the essay is sent by mail it must be postmarked by Aug. 15 and mailed to:

Elly Rau
WNAAA Scholarship Chair
4142 57th Avenue SE
Medina, ND 58467

Receipt of essay will be acknowledged. The winners will be notified by phone and letter and recognized at the 2012 NAAA Convention in Savannah, Ga.

Selected essays will be published on the NAAA website and may be published in Agricultural Aviation depending on space. The judges' decision is final. In the event the entries received lack outstanding merit, the WNAAA reserves the right not to award the scholarship(s). ■

$600 in Educational Funds Available from Pickett Equipment Scholarship Essay Contest

Pickett Equipment Co. has established a scholarship essay contest that will award $600 for the most compelling biographical essay about someone's life in agricultural aviation. Named the Bob Evans Memorial Scholarship, the contest is open to any children or siblings of a current NAAA Operator or Pilot member. To be eligible for the scholarship, the applicant must be enrolled, or scheduled for enrollment, in any accredited college or university undergraduate or graduate program during the 2012–2013 school year. Seniors graduating in 2012 also are eligible.

The 2012 essay topic is "The story of _____ in Agricultural Aviation." The scholarship candidate can write about a pilot, an operator, an A&P mechanic—just about anyone who is or has been involved with the agricultural aviation industry. The possibilities are limitless, considering the wide latitude Pickett Equipment is granting. As stated on its website, "The individual can still be living, or deceased. The scholarship candidate can write about him/herself. You can write about a hero, or a scoundrel! Write about whomever you find interesting."

The intent of the scholarship is to encourage contestants to research the person they are writing about to learn about their current and/or historic involvement in agricultural aviation, to develop their writing and storytelling abilities and do so in an economical fashion. Essays must be between 500 and 1,000 words. Anything above or below that threshold will be disqualified.

The deadline to apply is Aug. 31 by mail and Sept. 5 if submitting by email. Scholarship candidates applying by mail must submit their essays to:

Picket Equip. Co.
Attn: Bob Evans Memorial Scholarship
8464 Summit Cove
Olive Branch, MS 38654-4019

Emailed scholarship entries can be sent to 2010NAAAScholarship@epickett.com.

Along with the essay, applicants must submit the following information:

- Name, address, phone number, fax number and email address of applicant.
- Applicant's relationship to the NAAA member.
- College or university applicant is attending or graduating from.
- Applicant's field of study.
- Relationship, if any, to the subject of applicant's essay.

The scholarship award winner will be posted on Pickett Equipment's website by Oct. 15. For additional information, please visit www.epickett.com and click on "Scholarship Info" at the top of the left-hand menu. ■

Test Your Knowledge Answers

Continued from pg. 28

1. **The correct answer is B.** Pesticide laws and regulations address the handling and application of pesticides to help ensure their proper, safe and efficient use for the production of food and fiber and protecting public health and safety. One of the goals is to protect the environment by prohibiting, regulating or controlling certain pesticide uses. (Aerial Applicator's Manual: A National Pesticide Applicator Certification Study Guide [AA Manual], pgs. 9–10)

2. **The correct answer is D.** Federal pesticide regulations require compliance with the pesticide label and other documents that, by reference, become part of the pesticide labeling, such as the Worker Protection Standards (WPS) provisions of the Code of Federal Regulations (CFR) applicable to agricultural operations (40 CFR part 170). The answer is tricky because applicators must understand the definition of agricultural workers as defined by the WPS. Agricultural workers are the persons doing agricultural tasks, such as harvesting, weeding or watering related to the production of agricultural plants, not the person handling pesticides. The person actually handling the pesticide and performing duties such as mixing, loading, flagging, and many other defined tasks is defined as a pesticide handler. (AA Manual, "The Pesticide Label" on pgs. 12–13, and the EPA's WPS: How To Comply Manual, pgs. 10–11)

3. **The correct answer is B.** It is important for applicators and other handlers to realize that anyone displaying signs of chemical poisoning should seek immediate medical attention. Employers should have a training program for all pesticide handlers that addresses safe handling of the chemicals used. (AA Manual, pgs. 19–22)

4. **The correct answer is D.** A nozzle with a wider spray angle typically produces a finer spray. One key to producing less driftable fines is to minimize the wind shear on the droplet. (AA Manual, pg. 39)

5. **The correct answer is D.** An aircraft suitable for aerial application must be able to lift, transport and dispense pesticides safely and accurately. The remaining three choices are not correct because it is not required to register the aircraft with the U.S. EPA; it is not possible to use a construction material resistant to all types of corrosion; and GPS is not a requirement, although 99% of respondents to the 2012 NAAA Industry Survey said they have it installed. (AA Manual, pgs. 43–44)

6. **The correct answer is B.** The properties of the pesticide formulation may require agitation to prevent the material from settling out of the carrier. When spray pump output is directed back in to the spray tank to provide recirculation, it is called hydraulic agitation and requires sufficient pump capacity. (AA Manual, pg. 46)

7. **The correct answer is C.** The purpose of altering the position of adjustable vanes in a ram-air spreader is to help make the swath uniform. The variables in the remaining three answers are usually influenced by changing the spreader angle of attack as it is mounted on the aircraft. (AA Manual, pgs. 58–60)

8. **The correct answer is A.** The racetrack pattern has the advantage of allowing more time for the application to settle between adjacent passes, thereby reducing the chance of flying through it. Usually, it has an added advantage of being the most energy-efficient, which helps minimize pilot fatigue. (AA Manual, pgs. 88–89)

Trivia Answers

9. **The original Mercury Seven astronauts were M. Scott Carpenter (1925–)**, L. Gordon Cooper (1927–2004), John H. Glenn Jr. (1921–), Virgil I. "Gus" Grissom (1926–1967), Walter M. Schirra Jr. (1923–2007), Alan B. Shepard Jr. (1923–1998) and Donald K. "Deke" Slayton (1924–1993).

10. **On that date, Astronaut John Glenn made the first orbital flight by a U.S.** astronaut completing three trips around the earth. Soviet cosmonaut Yuri Gagarin made the first manned space flight, which consisted of one orbit of the earth on April 12, 1961. Between these flights, two sub-orbital flights were made by U.S. astronauts Alan Shepard and Gus Grissom.

← NAAA Membership Application located on pg. 45

Welcome to New Members

As of April 1, 2012

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Steve Archambault
CityServiceValcon
Trinidad, CO

Ward Combs
Blair, NE

Alan Corr
Corr Enterprises
Minden, NE

David Johnson
Ag Handler Exposure
Task Force
Macon, MO

Ryan Kusser
Wilbur-Ellis Air LLC
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Wendel Meier
Waianae, HI

Dan Straeter
Straeter Sod Farm
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Jeff Thue
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OPERATOR

Al Allen
Allen Aviation
Aynor, SC

Matthew AufderHeide
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Cone Ag-Aviation LLC
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Jarrod Lindemann
Lindemann Aviation, LLC
Valley City, ND

Jeffrey Muhlenkort
Sun Aviation
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Daniel Simard
Canam Aviators Inc.
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Lorrie Sparks
Low Level Dusting Co. Inc.
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Stacy Bellamy
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Jon Crain
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Ken Kiefer
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Brian Lee
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Gina Moore
Old Hickory, TN

David Norton
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Michael Satterfield
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Earle, AR

Nancy Turnquist
Whirly Birds Inc.
Lake Wales, FL

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Date	City	State	Aircraft Type	N #	Injury	Description of Accident
01/20/12	Brawley	CA	OH-58C	902SF	None	Main rotor mast fractured on takeoff
02/22/12	Farmington	CA	OH-13E/M74	43921	Serious	Impacted ground shortly after takeoff for unknown reason
04/09/12	Lakin	KS	S2R-T15	64DX	Serious	Collided with tower guy wire during turnaround

WNAAA President's Message

Kathy Diehl

How to Mitigate the Fallout if Mayhem Strikes

It seems hard to believe that spring is almost behind us and summer is on the way. In many parts of the country the weather has been unseasonably warm which has produced some severe weather disasters that many communities may not have been prepared for.

No matter where we live it is always a good idea to be prepared for disasters that could strike our business or community. A detailed disaster plan can be the first step toward protecting your business, your employees and yourself. Living in a state that ranks third in tornado activity (Kansas), I tend to be a little more anxious about severe weather emergencies than some. Because of this I wanted to share some of the information we use in my office to plan and prepare for a disaster.

> "It pays to plan ahead. It wasn't raining when Noah built the ark."
>
> —*Unknown Author*

Develop a disaster plan. Identify all disasters natural and man-made that may strike your business, even those that are not typical for your area. Include escape routes from your business and establish meeting places for your employees. Keep emergency phone numbers and evacuation routes readily available. Make sure everyone understands and is familiar with your plan before the disaster strikes. With a well-thought-out plan your employees should be prepared and able to handle any type of disaster. This will help to ensure the safety of your staff should an emergency occur. We also encourage our employees to prepare an emergency plan for themselves. Helping employees to prepare their households may increase their chances of being available to help your business during a disaster.

Make sure you have adequate insurance coverage. Review your insurance annually to make sure you have the proper amount of coverage, you understand what the fine print means and are clear on what is covered and what is not. Identify what records are required by the insurer in the event of a disaster. When you submit an insurance claim, you generally will need to provide an itemized list of damages. Having an accurate inventory prepared prior to a disaster will help determine what your needs are in order to get your business back to normal in an efficient manner.

Copy important records. It is vital to back up the information saved on computer hard drives and store that information at a secure offsite location. Create an electronic backup of your important **records**, such as bank statements, tax and accounting records, production records and customer data.

Attend emergency preparedness meetings. Most communities host these meetings in preparation for your normal severe weather season. Not only do you get to hear firsthand what your community is doing to be prepared, but you meet the emergency responders that you may need should you have any type of an emergency situation. This is an excellent opportunity to talk with them about your business and extend an invitation to come out to see your operation firsthand. While you're at it, give them a copy of NAAREF's new emergency response video or invite them for a screening. Every Part 137 operator received a free copy of "First Response: Responding to a Pesticide-Related Aircraft Accident" from NAAREF to use for that very purpose. (Contact NAAA to purchase additional copies. The single-copy price is $15, shipping included.)

According to the American Red Cross, 15–40% of businesses fail following a natural or man-made disaster, and 54% of Americans don't prepare because they believe a disaster will not affect them. We all want to believe that disasters will not affect us, but we know that natural and man-made disasters can strike anytime and anywhere. As a business owner you have invested large amounts of time, money and resources to be successful in what you do. Planning ahead for disasters and emergency situations is an important part of protecting what you have worked so hard to accomplish.

I hope you all have a safe and successful application season. ■

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