Inset: Aerial applicators Brian and John Townsend (right) of Townsend Aviation, Monticello, Ind. Below: Townsend Aviation’s customized nurse truck has everything a helicopter applicator needs for the job, including fuel, chemicals, supplies and a landing pad on top.
Exploring Rotorcraft’s Versatile Role in Aerial Application

Helicopter applicators sure know how to put a unique spin on things. Consider the paradox they have a tendency to use to describe the parallels between helicopter and fixed-wing applications: It’s the same but different.

Helicopters are an important subset of aerial application that provides the same precision application services as their fixed-wing counterparts, just in a different way. Airplane or helicopter, the application customer expects the same results. But the methods a helicopter applicator uses to deliver those results are going to differ from an ag plane.

“I don’t really feel that there’s a quality difference,” says Ron Cline, owner/operator of Central Valley Helicopters in Ellensburg, Wash. “It’s just a different machine. The techniques are completely different for taking off of a truck versus taking off of a runway heavily loaded. Either way, you have to have smooth adjustments so that you’re not losing lift with radical movements.”

Although Cline has done aerial application work with fixed-wing aircraft in his career too, he formed Central Valley Helicopters in 1997 as a helicopter-only operation in large part because of the environment where he works, Ellensburg, Wash., is in a fairly populated area with lots of ranching and horses. Helicopters are more elusive and take up less airspace on turns; as such, they may not have as much of a psychological hold on residents as an ag plane.

Helicopters excel at working in small, congested areas that may be more challenging or simply too small a job for an ag plane. “Big fields, big running, the airplane excels. Small fields, a lot of obstacles and congested areas, the helicopter excels,” says Brian Townsend who flies a Bell 206B3 Jet Ranger and an Air Tractor AT-602 for Townsend Aviation in Monticello, Ind.

According to NAAA’s 2012 Aerial Application Industry Survey, fixed-wing aircraft account for 87% of the industry’s fleet, with rotorcraft/helicopters making up the other 13%. Unofficially, that figure may be even higher, as helicopter use appears to be on the rise in recent years. Several factors may account for the increased interest. For example, the corn fungicide run in the Corn Belt increased the demand for aerial application beyond what local operators could supply. Some ground spraying companies added a helicopter to their fleet since they could operate it from their facility without the use of an airstrip. With the booming demand for green energy and more wind generation sites being erected, more operators began to consider the merits of using a helicopter to spray among the wind turbines as well.

About seven years ago, a large wind farm went up a few miles to the west of Townsend Aviation’s airstrip, extending another 50 miles beyond that. In 2009, John Townsend, Brian’s dad, bought a Bell 206B3, figuring the fields around the turbines would be easier to access.
in fact, Cline was stationed in the mountains of Montana on initial attack status. Central Valley Helicopters has a firefighting contract with the U.S. Forest Service for its Bell UH-1H helicopter. Cline uses an Enstrom F-28F as his main application aircraft. An Enstrom 480 turbine helicopter handles forestry work and some herbicide applications. Wildlife surveys and Part 135 charter operations are done in a Robinson R44 Raven II.

“The helicopter platform really diversifies our operations. It keeps us busy either working on them or flying them year-round,” Cline says.

With its fleet of Bell helicopters, including Jet Ranger IIIs, a Bell 206 L4, Bell UH1 204 and 205 and four OH 58s, Gettysburg, Pa.-based Helicopter Applicators Inc. (HAI) has 12 helicopters that perform multiple tasks across an expansive coverage area. With bases in Pennsylvania and Florida, operator Glenn Martin says HAI’s trade area includes almost anything east of the Mississippi River.

Now in its 40th year of business, Helicopter Applicators is a longtime client of Clay Hoxton, an aviation insurance broker with the Hoxton Agency in Shepherdstown, W.Va. He says HAI will sometimes bring down extra helicopters for work in the Everglades of South Florida. “If they have a large body of water to spray they’ll do it in a long line of helicopters and do a huge swath,” Hoxton says. “These guys, they’re masters at their trade.”

Because his father was a Marine Corps helicopter pilot, Hoxton has a special affinity for rotary-wing aircraft. “I like helicopters a lot. I like fixed wing a lot,” he says. “But it’s amazing how efficient helicopters are at getting into areas—corners and pieces of property—that a fixed wing can’t effectively get in with a swath. A helicopter can go in and get the job done. They can really do a good job.”

‘Apples and Oranges’
Triple F Flying Inc. in Benton, Pa., is just a couple of hours north of Helicopter Applicators in Gettysburg. The F stands for “Farwell,” but the family business could easily be called Quadruple or Quintuple F Flying these days. Parents Rick and Pam Farwell are part owners along with sons, Joseph, Ted and Will Farwell. Rick and Pam’s youngest son also flies part time for the business, working from Triple F’s satellite location in New York state.

Almost 100% of Triple F Flying’s work involves agriculture. They mainly treat wheat, corn and soybeans, but they also spray some smaller vegetable crops. The company’s fleet of rotary- and fixed-wing aircraft includes four Bell 47 helicopters and two Ag Cats, but they fill different needs at different locations.

“Because of the terrain the airplanes are in New York, and the helicopters are in Pennsylvania,” Will Farwell says.

Between the Appalachian Mountains and the surrounding hills, the terrain in western Pennsylvania is rugged and extremely hilly. Rectangular fields are rare. Small, odd-shaped fields planted on undulating farmland are the norm, conditions for which a helicopter is better suited than an airplane.

“Sometimes we’re only talking about 80- or 120-foot strips all the way down hillsides,” Will says.

Fields with 200 acres of continuous corn are few and far between in Farwell’s area. He might spray a field that size once a year. “More of our average falls between 10-20 acres per field,” he says. Some fields can be as small as two acres, though.

This is Will’s third full-time year flying for the family business. When he first
started helicopter spraying, he did so for Glenn Martin and Helicopter Applicators, an indication of just how friendly the competition can be in the tight-knit aerial application industry.

Sometimes Will or one of his brothers will go to New York to help their youngest brother and get in some fixed-wing spraying. So how do rotorcraft compare to fixed-wing applications?

“It’s really apples and oranges,” Will says. “The helicopters are mostly suited for what I do right here in Pennsylvania, and you handle the aircraft, the topography, the field size and everything else differently than when I am in the airplane up in New York state. It’s just a very different animal.”

**Keep on Trucking**

Helicopters are more expensive to operate and maintain, carry smaller payloads and fly at slower airspeeds than an ag plane. To maximize efficiency, helicopter operators can’t afford to prolong non-revenue flight time by ferrying back to their main airstrip. Instead, they bring the air strip to the helicopter by working off of a nurse truck.

A nurse truck is a customized flat-bed truck that has all of the central items a helicopter applicator needs for the job, including fuel, tools, a chemical storage box, a water tank, and a landing pad on top. The truck driver sticks with the helicopter throughout the day and doubles as the pilot’s ground support. Depending on the job, two or three crew members could be supporting the helicopter to limit its time on the loading pad. Liquid operations may only require the truck driver, but seeding, fertilizer and other kinds of bucket work require additional support.

To be efficient, the nurse truck has to remain close by at all times. Townsend prefers to have his driver within a mile’s range. “If you have to ferry the helicopter over a mile to get to the semi, you start to really lose efficiency,” he says. “Efficiency and the amount of acres that you are able to do per hour are key.”

“If you don’t have a truck driver that’s got a good head on his shoulders, you will not excel or get anything done with a helicopter. With an airplane, theoretically, the pilot can do everything [from loading to flying],” Townsend says. “Obviously, you like to have good support with the airplane, but the helicopter definitely requires it.”

**Helicopter Expenses**

From time to time, Martin will converse with fixed-wing operators who are thinking about adding a helicopter to their fleet. “What they don’t expect is how much maintenance is involved in maintaining a helicopter,” he says. “There’s a lot of time-component items on those aircraft that have to be tracked—they have to be changed whenever, and when that occurs, it’s pretty expensive.”

For instance, a set of rotor blades may be a hundred thousand dollars. An engine, on average, is $250,000–$350,000. That cost is similar to an airplane engine, but there are plenty of other moving parts on a helicopter. “I’d say over the last seven, eight years, a lot of those items are going up well over 50%,” Martin says.

Helicopters are also more expensive to insure, but higher premiums is just one of the added expenses that come with the territory for helicopter applicators. Nurse trucks are covered by a commercial auto risk policy, and only a handful of companies will write that type of risk. “It’s not a standard type of commercial auto coverage because they’re carrying chemical, they’re carrying fuel, they’re carrying things that make it unique,” Hoxton says.

**Risk Management Approach to Helicopter Safety**

One of the major advantages of a helicopter is its ability to navigate in tight spaces, but that can put pilots in a predicament at times if they have not game-planned accordingly. In recent years the percentage of helicopter application accidents has been trending up. From 2004–2013, helicopters accounted for 17.9% of the Part 137
accidents NAAA tracks, but the percentage has been approximately 20% or higher since 2010. (As mentioned, rotorcraft/helicopters make up 13% of the U.S. ag aircraft fleet, according to a 2012 NAAA industry survey.) In light of the uptick in accidents, the Human Factors Module for the new season of the PAASS Program will focus on helicopter safety, techniques and capabilities (see pg. 54). Meanwhile, the FAA is convening a helicopter safety forum in 2015 to discuss ways to improve helicopter safety within aerial application and other higher risk sectors (see box).

Lack of experience may be contributing to some accidents. Cline believes more people are starting out as entry-level helicopter operators instead of taking the traditional route of working as an employee pilot for another operator first. “With any aviation career you really need to have the basics down, because the aerial application industry is really about the art of applying a product and applying it correctly, evenly and within the target area. If you’re having to learn how to fly and do that at the same time, I think it’s a big challenge,” he says.

Helicopter pilots contend with a number of variables that increase their accident exposure, such as working off a nurse truck, working in remote locations and in more heavily obstructed, congested areas. “When you add everything up there’s just a higher risk to inexperience when it comes to a helicopter,” Cline says.

There are a lot of different ways to mitigate a hazard, but it starts with a risk management approach and deciding whether the job is worth taking at all.

“One of the unique characteristics about the helicopter is you can land it, Cline says. “That’s what pilots should do in the event of anything going wrong—put the thing on the ground, and get all your details worked out before you get back in the air,” he says. “It’s a little bit harder to do with an airplane, but it’s a huge advantage for the helicopter.”

Cline has always taken a keen interest in safety. He is the vice chairman of NAAA’s Safety and Federal Aviation Regulations Committee and served on the committee that developed the new NAAA Professional Operating Guidelines booklet the association released in the spring.

“There is a wealth of information, and it really has a great risk management approach to safety,” he says. “We just have to apply those tools to our trade. A lot of operators are out there doing just that, and they’re having great success. It’s not to say you do that and you can’t still have an accident. It’s just a high-risk industry where sometimes if you’re in the wrong place at the wrong time, you can have a problem.”

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**FAA Rotorcraft Directorate Seeks Members’ Input for 2015 Helicopter Forum**

The Federal Aviation Administration’s Rotorcraft Directorate is seeking comments from helicopter pilots, mechanics, flight safety officers and others associated with personal/private, instructional/training and aerial application industries about what you would like to see in a safety forum. The Rotorcraft Directorate will host a three-day safety forum April 21–23, 2015, in Hurst, Texas, a Fort Worth suburb. The forum’s purpose is to discuss ways to improve flight safety, particularly among personal/private, instructional/training and aerial application industries—three sectors with consistently high accident numbers, the FAA says.

Before the FAA’s Rotorcraft Directorate begins planning the forum, it wants to know what lectures, displays, events and programs would encourage you to attend and what topics you think would be of the most value. The FAA event planners also would like to know about other forums you have attended that you particularly liked and why that is. To share your thoughts on these matters, please contact Gene Trainor at eugene.trainor@faa.gov or at the FAA Rotorcraft Directorate, 2601 Meacham Boulevard, Fort Worth, Texas 76137.