

HELEN WOODS

Grass is a Gas!

Ensuring Safety on Sod



On a recent vacation, I found myself settling my 1965 Cessna Skyhawk down on a beautiful grassy strip at a cattle ranch in North Dakota. Blue-winged teal and monarch butterflies circled the ponds bordering the runway as lazy cumulus clouds drifted by on endless prairie horizons. What a wonderful gift my instructor gave me when he taught me how to safely land on a grass runway! It is places like this that make being a pilot so worthwhile.

It is an unfortunate fact that while all sport and private pilot applicants are taught “soft-field technique,” very few pilots these days are trained on actual grass or, for that matter, even verbally instructed in the many aspects of a grass landing, which make it different from landing on a paved runway. Insurance company requirements (and prohibitions) play a role in some cases, and it is true that accident rates are higher on unimproved runways. Even a quick review of recent accidents involving grass runways, though, suggests that ignorance of the operational nuances of this environment plays a far greater role. A bigger issue, at least in my view, is lack of experience and knowledge about operating on grass.

Nose-wheel Versus Tailwheel

One common misconception about landing on grass is that a tailwheel aircraft is required. A tailwheel aircraft certainly is preferred for two reasons: less surface drag with only two large wheels in the grass and no chance of the nose-wheel dropping into a hole and resulting in a prop strike. That being said, many tricycle-gear aircraft, especially high-wing planes like Cessnas, which allow for easy assessment of runway conditions, can be operated safely on grass with proper training and caution.

One note: It is best to remove the wheel pants on any aircraft prior to grass training. While this is not a prerequisite on a well-manicured runway, removing the wheel pants will decrease the

Photos by James Williams



ground roll somewhat and save wear and tear. It will also allow you to inspect for grass or other debris that may become entangled in the brakes.

Runway Condition

Proper assessment of the runway condition, when making a land/no-land decision, is the most critical skill for any pilot learning to land on grass. A pilot should learn to make a low pass over a grass runway to assess its condition prior to making this decision. The basics that pilots already learn about assessing runway length, density altitude, and aircraft performance still apply, of course, but many other factors apply to operations on grass. For instance, the length of the grass runway plays a critical role in takeoff decisions. A typical Cessna pilot's operating handbook suggests adding 10 percent to the takeoff roll when calculating takeoff distance, but does not specify how tall the grass is for this performance figure. Tall grass will likely require a much longer takeoff roll. Regardless of grass height, the pilot must understand that operating on grass will require more takeoff distance than for a paved runway.

Another advantage of the low pass is it allows a pilot to assess the runway for smoothness. Many parts of the country are populated by gophers or prairie dogs, both of which create holes in runways large enough to catch a nose-wheel. The low pass also allows a pilot to check for ruts in the runway, such as those created by aircraft or mowing equipment operating on the runway when it was wet. Such ruts can be as dangerous as critter holes to the propeller of a tricycle-gear airplane.

Additionally, the low pass will often allow the pilot to inspect for soggy areas where a plane might become mired in the mud. Soggy areas may appear as standing water, but more commonly they can be detected as an area with a different color turf.

Also, look for unmowed patches of turf. These may indicate areas that were too soggy for mowers to cut.

Weather Considerations

Weather plays a major role in determining the conditions of a grass runway. Dew and frost negate the braking authority you might have while operating on a dry grass runway, and braking in wet conditions risks loss of directional control. Pilots thus need to learn not only how to recognize conditions of dew and frost, but how to perform a short-field landing without the use of brakes.

As a newly minted pilot, a good friend of mine learned this lesson the hard way. Landing on a dew-covered field, he quickly discovered that he had no braking ability. Too late, he went around, plowing through soybeans at the end of the field before finally becoming airborne. He was lucky. Aside from having to remove large bunches of soybean plants from his landing gear and mending his bruised ego, he emerged from the experience unscathed. Many others do not.

Also remember that when assessing runway conditions, pilots should be taught to consider weather conditions in the recent past. Rains in the past few days can make a runway soggy, allowing an aircraft to sink in the sod and dramatically increasing the takeoff roll.

Private Strips

The majority of the grass runways in the United States are privately owned and operated. To operate on such runways, the pilot must obtain permission from both the field owner and the aircraft owner prior to landing. Phone numbers for

Few pilots are trained on actual grass or even verbally instructed in the many aspects of safe operation on grass.



Private grass field runways offer an ideal supervised flight-training environment. However, many private fields do not meet FAA construction standards, so beware of potential hazards like hills, dog-legged fields, trees near the runway, nearby power lines, or nearby streams or creeks that can make the areas of the runway soggy or wet after other areas are dry. Also, be aware of people, animals, and agricultural equipment that might be operating near or on the runway.

many private field owners can be found at www.airnav.com. During the initial phone call, obtain as much information about the runway conditions as possible. Remember that privately-owned fields do not need to meet FAA and state requirements for runway construction. It's a good practice to plan your arrival while you have plenty of daylight remaining, so you can perform a high pass before a

Privately-owned fields do not need to meet FAA requirements for runway construction, so it's a good idea to perform a high pass before a secondary low pass to inspect runway conditions.

secondary low pass to inspect runway conditions. A high pass will allow the pilot to inspect the strip for unmarked power lines, encroaching trees, large hills or slopes, and parts of the runway that might be unusable for various other reasons. If you don't like what you see, the daylight conditions make it easier to proceed to your alternate airport.

Trees aren't just a hazard when they are at the end of a runway: They can also create unfavorable windshear when growing adjacent to the runway. Many private strips are narrow, with trees lining the edges. In such a situation, a crosswind can create windshear conditions over the runway. Such

Being trained to land at grass fields can take pilots to some of the most fun and beautiful parts of the country.

conditions can blow a pilot into the trees or, if the pilot compensates with increased power, can cause a pilot to land long and overshoot the runway. Teach pilots to always consider the location of trees and other obstacles relative to wind direction before performing the low pass.

Personal Minimums


Any discussion of grass-runway operations requires a discussion about personal minimums. Every condition outlined is one for which pilots need to set personal minimums. Common sense and good judgment dictate that pilots should receive dual instruction in grass operations prior to attempting it alone. Only in a dual-instruction environment can

the pilot safely experience a grass runway for the first time and begin to set personal minimums for operating on these fields.

Why Bother?

With so many things to consider, why bother to learn proper grass techniques? There are many good reasons. Even if you live and train in a major city with plenty of paved runways, the rest of the country is different. You fly in order to go places and more of the country is open to a pilot with grass-runway operating skills—especially in the plains states, where the wind is always strong and most airports have a turf-crosswind runway. Very often it is considerably safer to land on the turf-crosswind runway than the paved runway. Do you really want to limit your choice to landing on the paved runway with a strong unfavorable wind or trying grass for the first time without proper training?

Another reason is that learning proper grass techniques provides pilots with good training for an emergency situation. Whether it's mechanical problems or bad weather closing in, there are many instances when a precautionary landing is wise. In such instances, a good grass strip may be a much closer choice than a paved airport. Proper grass-field training dramatically increases your landing options.

Finally, being trained to land at grass fields can take pilots to some of the most fun and beautiful parts of the world. Whether it is an antique fly-in at a historic grass field or a spectacular ranch vacation out on the plains, grass fields are often where you will find the most fun! 

Helen Woods is manager and head flight instructor of Chesapeake Sport Pilot, LLC, the nation's largest light-sport flight school, located at the Bay Bridge Airport in Stevensville, Maryland.

© 2009 Helen Woods

Written permission from the author is required to reprint this copyrighted article.