

Turf Wars Part 1

Examining the Debate Surrounding Non-Paved Runways and Cirrus Aircraft

by Matthew McDaniel

A Cirrus SR22-G2 pointed down Runway 02 at Viroqua, Wis. (Y51).

It was a typical, blustery, Midwestern autumn day. It had been a pleasant flight and the pilot began his descent into the destination airport. He tuned in AWOS to check weather and his ears perked when he heard the wind report, “Wind 190 at 15, gusting 20.” He knew that the airport’s only paved runway was 9/27. It would be a near-direct crosswind approaching the maximum demonstrated crosswind component of his SR22. He thought of his transition training a year earlier. His CSIP had made him land in crosswinds, of course, but he didn’t recall any landings with *this much* crosswind. His palms began to sweat and he told his three passengers that it might be a bumpy approach and landing, but that everything was fine.

He entered downwind, Runway 27, but failing to anticipate the tailwind on the base leg, he overshot final. He managed to crank it around and get lined up, albeit in an unstabilized fashion. Hearing his instructor’s voice in his head, he went around. On the second approach, he was ready for the base-leg tailwind and rolled out right on final. He was high, a little fast, and the indicated airspeed jumped and bobbed in the gusty winds. After flaring, he floated and was eating up runway at an alarming rate. Again, he did a go-around. On downwind to Runway 27 for the third time, he briefly noticed the grass runway below him; Runway 18/36. It was green and pristine, but he recalled his instructor’s warning to avoid non-paved runways in the Cirrus. “The wheel pants are too tight and the prop clearance is too close,” he had said. Putting Runway 18 out of his mind, he focused on the task at

hand. He reassured his wife, who was no longer hiding her concern. He ignored his grown children in back. They’d been flying with him since childhood and knew he was just being cautious. Established on a stabilized final this time (as stabilized as he could achieve with the gusty crosswind, his lack of recent crosswind practice, and his still relatively low time in his Cirrus), he aimed for the numbers. He flared high and began to drift sideways. He kicked in rudder to straighten out his crab angle and then pushed the stick forward to get the thing on the ground before the wind pushed him beyond the runway’s edge. Both mains touched simultaneously and the plane bounced high; the machine was not yet ready to stop flying. A strong gust weathervaned the nose left and initiated a left roll. He jammed the throttle to the stop just as the wingtip contacted the ground. The drag instantly pulled the nose into the ground and the airplane cartwheeled into the grass adjacent to the runway. Flames erupted and the pilot and all his passengers, likely knocked unconscious by the impact, all died in the ensuing inferno. Witnesses to the carnage were helpless to assist and watched in horror as the pilot, known to several of them for years, perished.

While the story above is fictional and dramatized, I did not just pull it from thin air. Instead, I massaged a real Cirrus fatal accident to protect those involved. Common elements of the fiction above, and the real fatal accident includes multiple go-arounds in a strong crosswind, ending in a fatal crash, and all while a perfectly useable grass runway, pointed almost directly into the wind,



Freehold, N.Y. airport (115) is a perfect example of one where the grass runway (which lies parallel to and right of the paved runway) is far smoother and far safer to land on. The pavement is rough, cracked, and varies from 16 to 22 feet in width. The grass, on the other hand, is quite smooth, well-maintained, almost 400 feet longer and 80 feet wider!

remained unused. Of course, why the pilot chose not to utilize the grass runway, or divert to another airport, and find crosswinds within his personal limits, will forever remain a mystery.

The Great Debate

It's hard to believe that I did my first Cirrus flight a decade ago. In that time, the debate about landing Cirrus aircraft on non-paved runways has raged unabated. Some, like me, do it fairly routinely. Others actually base their Cirrus at non-paved airports. Yet, countless others have told me they will *never* land their Cirrus on unpaved runways. What does each side of the debate tout as the reasons for their stance?

Grass is for Goats:

- Wheel pants are too tight and too low.
- Prop/ground clearance is insufficient.
- Additional landing vibration forces damage aircraft components.
- Surface conditions can be unpredictable and difficult to judge.
- Performance can be unpredictable.
- Non-paved operations are prohibited by insurance policy.
- No experience/training in non-paved operations.

Takin' it to the Turf:

- Makes literally thousands of additional airports and runways available.
- Greater wind and flight planning flexibility.
- Such airports often offer cheap fuel, unique attractions, and interesting destinations.
- Emergencies happen: Incorporating non-paved airports can greatly increase the options.
- Improves pilot skills and versatility.
- IT IS FUN!

The naysayers certainly have some valid points. Cirrus aircraft do have relatively small wheels/tires, combined

with tight wheel pants and small prop-to-ground clearances. Many owners also wish for "beefier" brakes with a bit more stopping power. As a low-wing aircraft, a non-paved airport exposes the underside of the flaps to a higher possibility of minor damage due to debris thrown up by the main tires. Of course, any aircraft is subject to possible performance degradations associated with non-paved runway operations. In nearly every category above, there is a valid argument for and against, but, the biggest reasons I see Cirrus pilots avoiding these airports is the uncertainty of landing surface conditions, insurance prohibitions, or the lack of training and experience.

Airframe Considerations

Wheel Pants: I think this concern is a bit overblown. If the runway is known to be smooth and well-maintained, grass length is generally no taller than the ground clearance of the wheel pants. Even if it is slightly taller, the worst thing that will happen is leaving a little grass stain on the bottom lips of each fairing, which can be quickly and easily removed with a variety of aircraft-specific cleaning products, especially immediately after the event. If there is still concern, removal of the wheel pants is a simple and quick task. It can be done with basic tools and does not affect airworthiness. Do remember to recalculate your weight and balance after removal, which can be done by referencing the arms and moments in the POH's Equipment List. One weak area in Cirrus wheel pants are the inboard attach brackets, which I've found broken on many Cirrus aircraft during pre-flight inspections. I find them broken on Cirrus aircraft that strictly operate from paved runways/taxiways, which negates any argument that rough surface conditions alone are to blame.

Prop Clearance: This is a real concern and varies across the model line. Cirrus SR20 G1 and G2s with a two-bladed prop have only seven inches of prop-to-ground clearance. That is minimal for even smooth strips. I recommend avoiding operating these airplanes into

unknown grass strips and any gravel/dirt runways. These same planes with three-blade props have a nine-inch clearance. While this is still smaller than some aircraft in its category, it is on par with many others. That extra two inches goes a long way in helping prevent prop tip rash. All G3 models have greater than nine-inch prop clearances, thanks to their taller landing gear. Composite versus metal props offer no distinct differences, each having advantages and disadvantages.

Surface-Induced Vibration: There seems to be a fallacy that non-paved equates “unimproved.” Not so. Most non-paved runways are purpose built for aircraft operations and “improved” accordingly. In fact, I have operated out of plenty of paved runways that were far rougher than a well-maintained turf runway. Certainly, rough runways, turf or pavement, can induce additional vibration stresses on aircraft components, but probably no more so than a poor landing technique. Many of us old-school-pilots can recall warnings about rough runways causing radios and landing light damage due to vibration-induced radio tube and bulb filament failure. Today’s solid state avionics and gas-filament or LED bulbs greatly diminished such concerns.

Runway Conditions

In my mind, this is the greatest concern of non-paved runway operations. Various turf surfaces can be difficult to judge and predict. I deal with this through a variety of methods. I check NOTAMs and verify runway conditions by

calling the airport management. Low approaches to view runway conditions prior to landing are also helpful. Of course, using commonsense applies too; if recent weather would make surface conditions in your backyard undesirable, nearby turf runways conditions could be similar, especially if they don’t incorporate crowns, clay or gravel bases, or other drainage systems/features. A little homework can almost completely mitigate these concerns, allowing you to avoid runways that are not up to snuff on a given day.

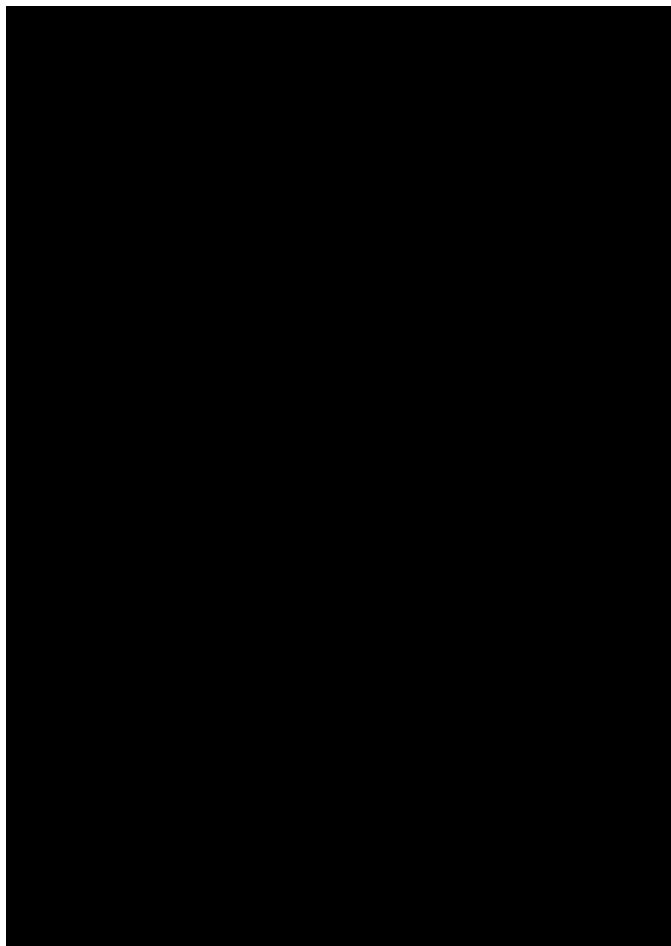
Performance

Unpaved runways can negatively affect takeoff and landing distance. Such affects vary widely depending on the exact type of surface and its condition. Generally, POHs only address grass runways in takeoff/landing distance performance charts, sometimes denoting dry versus wet grass. In Cirrus aircraft, those performance effects vary by model and vintage and you should check your aircraft’s up-to-date POH for specifics. For some idea of what to expect, consider these numbers and thoughts:

Takeoff: Ground roll can increase by 10%-20% on dry grass and 30%-plus on wet grass.

Landing: Ground roll can increase 15%-40% on dry grass and 60%-plus on wet grass.

Tires and Brakes: Tire friction (rolling resistance) is greatly increased on grass – the longer the grass, the greater the effect. This is a negative on takeoff, but can be a positive



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Departing Okiwi Station Aerodrome (NZOX) on the Northeast coast of Great Barrier Island, New Zealand (runway is above and behind wingtip).

on landings. Brake effectiveness is greatly reduced due to the ease with which the brakes can be locked and cause skidding, so, brakes must be used gingerly on grass. With proper training and practice, this skill can be quickly mastered by a proficient pilot. Brake effectiveness should be considered in terms of aborted takeoffs on grass runways as well. In spite of all the above, in my experience, operating from well-maintained, dry, grass runways is rarely a problem if length is within POH performance parameters. Wet grass, on the other hand, is very unpredictable as it can greatly increase rolling resistance on takeoff and can reduce braking action to almost nothing.

Other Surfaces: Unpaved runways come in many varieties other than grass. I've landed Cirrus aircraft on dirt, cinder, gravel, and various combinations, in both compressed and loose conditions. Since the POH does not specifically address those surface types, taking a very conservative approach to performance considerations is in order. I generally use a combination of short and soft-field techniques, regardless of runway length. The importance

of preparing yourself with knowledge of the surface before attempting to operate from it cannot be understated.

Insurance and Training

Insurance Requirements: Before operating from non-paved runways, check your insurance policy to ensure there are no prohibitions against such operations. If there are, this can be negotiated with your insurance company and, often eliminated via training and experience.

Training and Experience: Operating a Cirrus from non-paved runways opens a whole new world of possibilities to pilots. It is not dangerous, per say, but appropriate precautions must be observed. That begins with seeking professional training with a CSIP who has experience in such operations. Practice to improve and maintain proficiency in such operations is equally important. The end result can make you a better pilot and greatly increase your mission flexibility. Best of all, it is a lot of fun!

In the next issue of *Cirrus Pilot*, part two of this article will discuss practical applications of non-paved runway operations. I will talk more specifically about operating from various non-paved surfaces, and precautions and techniques appropriate to each. Specific pre- and post-flight items to consider will also be reviewed. Finally, I will introduce you to a number of unpaved airports in the United States and internationally and the Cirrus pilots that operate from them regularly. [GOPA](#)

About the Author: *Matthew McDaniel is a 20-year professional pilot with a background in airline, corporate, and charter operations. He's owned and operated Progressive Aviation Services, LLC (www.progaviation.com) since 2002, specializing in Cirrus, TAA, and Glass Cockpit training. He's been actively instructing for 19 years, has logged over 11,000 hours in 70-plus aircraft types, and holds five turbine aircraft type-ratings. He is one of only 53 instructors in the world to have earned the "Master Certified Flight Instructor" recognition four consecutive times. Mr. McDaniel can be contacted at (414) 339-4990 or matt@progaviation.com.*

Lined up for departure on Runway 34 at Thames Aerodrome (NZTH) in Kauaeranga, New Zealand.

