



Harvest Weed Seed Control Factsheet Series

Seed Impact Mills



A seed impact mill called the Seed Terminator at work in a wheat field in Washington state. (Photo credit: Claudio Rubione, GROW)

Seed impact mills are a harvest weed seed control device designed to crush crop residues and chaff material leaving the combine, including weed seeds. There are three major brands in use in North America:

- The Integrated Harrington Seed Destructor (iHSD): <https://ihsd.com>
- The Redekop Seed Control Unit: <https://redkopmfg.com/>
- The Seed Terminator: <https://www.seedterminator.com.au>

University testing shows very high weed seed kill rates from seed impact mills, but harvest conditions, crop type, and climate can significantly impact how well they work. Each section on the following pages answers key questions about mill technology in the U.S. and Canada.



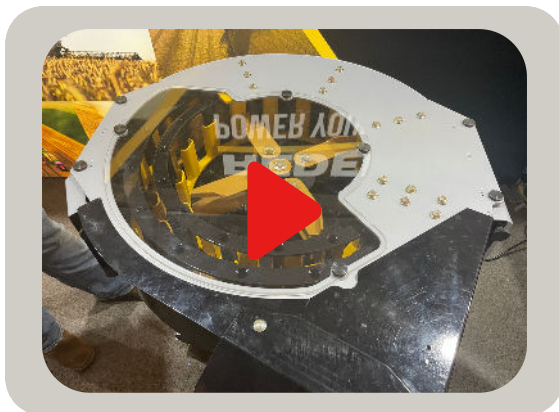
1. How do seed impact mills work?

Mills process only the chaff portion of harvested material, which is what comes off the sieves (also known as the shoe). The straw fraction is not processed. This design is effective because research shows that weed seeds are found predominantly in the chaff. For example, GROW network testing shows less than 5% of weed seeds escape control by exiting the combine in the straw material (see Section 2. How well do seed impact mills kill weed seeds?).

During harvest, chaff material and weed seeds enter the center of the seed impact mill and pass through rings of spring bars or screens (rotors) and stationary bars or screens (stators) to exit the mill. The rotors spin at about 3,000 rotations per minute. Weed seeds must hit the steel four times or more before exiting. Most seeds are shattered into multiple, non-viable fragments. Sometimes whole seeds pass through with fatal damage to internal organs, leaving them non-viable. In other cases, seed coats are cracked, exposing seeds to elements and pathogens, which significantly lowers germination potential.



The finely ground remains of chaff residue after it has been run through a seed impact mill. (Photo credit: Michael Flessner, Virginia Tech)



Another seed impact mill currently under development is the WeedHog from Tecfarm Engineering in Australia (<https://www.tecfarm.com.au/tfwp/>). It works differently than other options on the market but has not yet been tested in the United States.



See a short video demonstrating how seed impact mills work with a Redekop model.
<https://www.youtube.com/watch?v=EfZc87SONN4&t=2s>



2. How well do seed impact mills kill weed seeds?

Seed impact mills have a very high kill rate, typically greater than 98% for most weed species evaluated. One exception is Italian ryegrass, which showed kill rates of 85–95% in university testing (Figure 2). Research shows that seeds not completely killed by seed impact mills will likely not survive the winter (<https://doi.org/10.1017/wsc.2019.66>). Crop seed is also controlled by the mills, leading to reduced issues with volunteers.

Various factors can influence seed kill rate including the crop harvested, chaff flow rate into the mill, and the chaff material's moisture level. However, the impact of these factors is minor—typically, seed kill rates change by less than 1% under varying conditions.

One type of seed impact mill has a feature that can affect seed kill rates. The Seed Terminator offers different screen options inside the mills, allowing for varied chaff flow and power usage. Options include:

- High seed-kill-rate screen: highest kill rate, uses the most horsepower, lowest chaff capacity.
- Low (50%) seed-kill-rate screen: lowest horsepower requirement, highest chaff capacity.
- Intermediate screen options offering a balance between the two

Seed Impact Mill Weed Seed Kill Rates

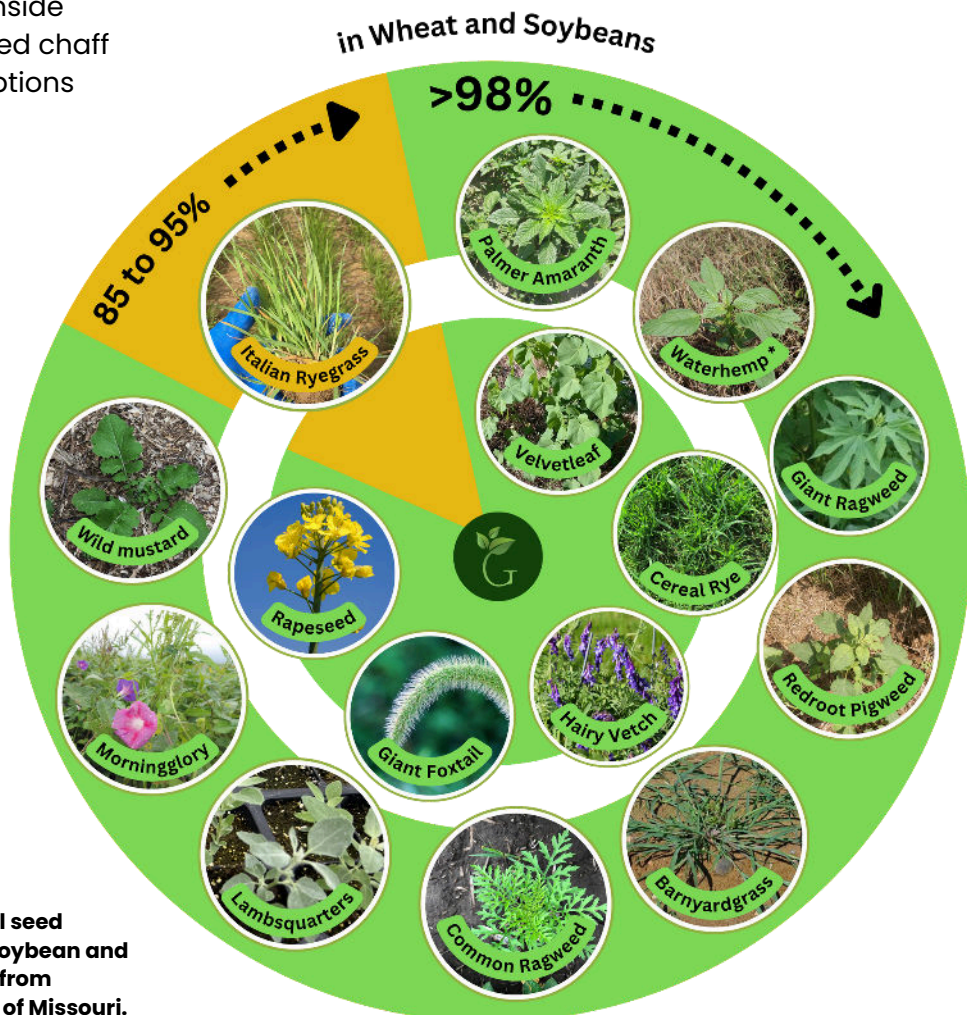


Figure 2. An overview of how well seed impact mills kill weed seeds in soybean and wheat chaff, based on research from Virginia Tech and the University of Missouri. (Chart credit: Michael Flessner, Virginia Tech, and Emily Unglesbee, GROW)

*University of Missouri reported 94% waterhemp seed kill with a Seed Terminator.
(Chart source: DOI: 10.1017/wsc.2025.14 and DOI:10.1017/wsc.2025.15)



3. How do seed impact mills affect combine performance?

Farmers generally report that **adding a seed impact mill reduces a combine's capacity by one class**. So, if you install one on a Class 8 combine, you can expect performance closer to a Class 7. As a result, Class 8 or larger combines are recommended for use with seed impact mills. Class 7 combines can be used, but operators should expect to run out of horsepower and reduce speed. Many factors influence combine performance, including crop type, yield, harvest conditions (especially moisture), and combine settings such as rotor speed and clearance.

A seed impact mill will result in about **2.7 gallons per hour higher fuel consumption, 9.7% increased demand on engine capacity, and a 0.2 mph reduction in travel speed**, according to GROW testing across corn, rice, soybean, and wheat under various harvest conditions, combine setups, and both Redekop SCU and iHSD seed impact mills (see Figure 3).

Seed impact mills currently on the market can be bypassed, but switching between “on” and “off” is not a simple push of a button. Operators should expect a 5–20 minute delay to reconfigure between running and bypassing modes.

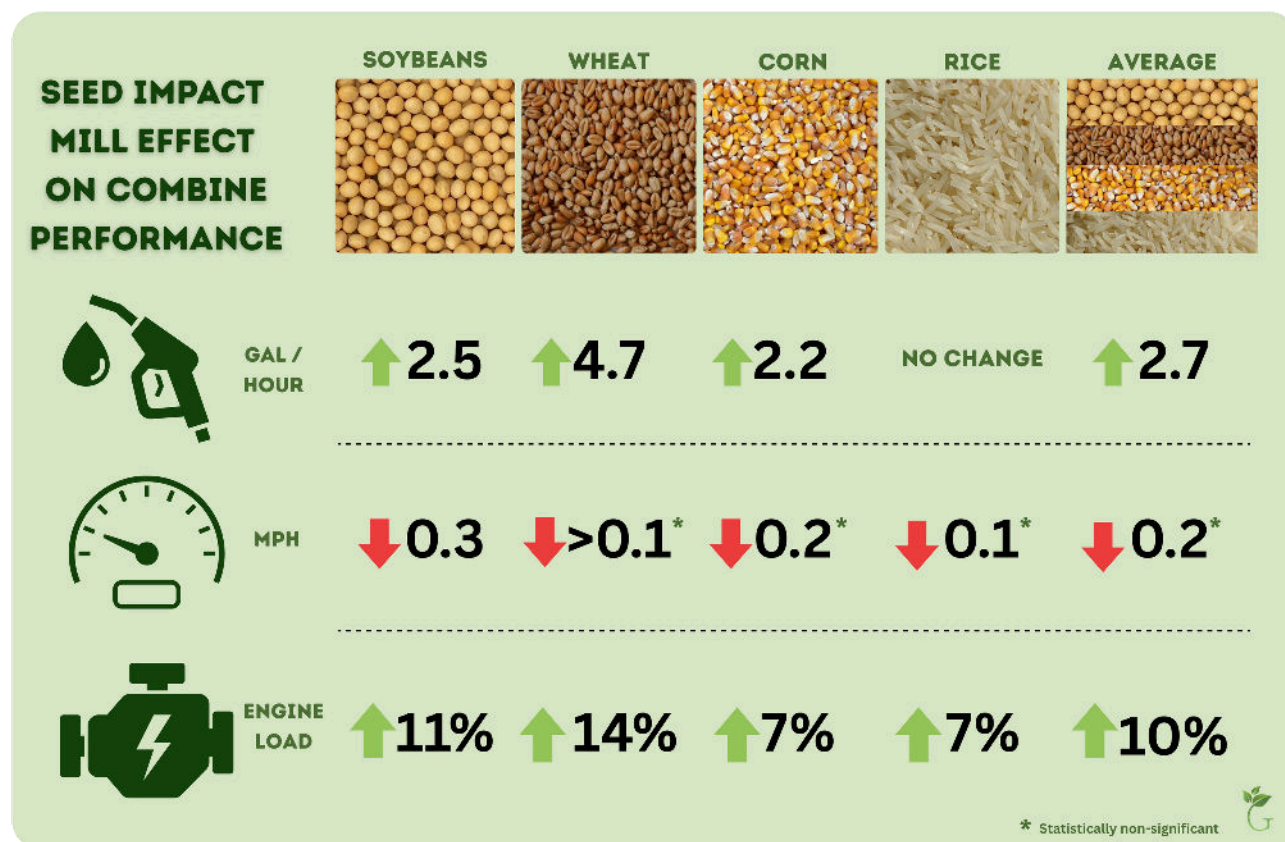


Figure 3. Change in combine performance when running a seed impact mill. Source: Flessner et al. 2025 (Chart credit: Michael Flessner, Virginia Tech & Emily Unglesbee, GROW)



4. What are the costs of operating a seed impact mill?

Purchase price is typically around \$70,000. This cost can vary depending on seed impact mill brand, combine model, and any fitting parts required for installation.

Installation costs are also variable but typically range from \$2,000 to \$4,000. Some dealers may include installation with the purchase, while others allow farmers to perform installation themselves. A typical setup takes about one to two days.

Operating expenses include increased fuel consumption and routine maintenance. Fuel use typically increases by about 2.7 gallons per hour when the mill is running. The mill's internal parts wear down over time and will need replacement based on usage. Soil type can influence wear rates—harvesting in sandy soils, for example, can accelerate wear and reduce mill life expectancy. Farmer reports also indicate that canola is one of the toughest crops on mills, reducing component lifespan compared to other crops.

5. How do clogs and other mechanical issues affect the mills?

Seed impact mills perform best in dry harvest conditions, typically in low rainfall areas similar to Western Australia where the equipment was first developed.

Green harvest materials are the enemy of seed impact mills due to their high moisture content. Harvest residues need to be sufficiently dry to avoid plugging or damaging the mills or increasing horsepower consumption. Grain moisture is not a good indicator of chaff moisture. Problematic moisture can come from other parts of the crop, such as green stems in soybeans, or from weeds present in the field, such as purple ammannia in rice, pigweeds in soybean, or kochia in wheat.

Some farmers have experienced plugging the combine with harvest material while operating seed impact mills (see Figure 4 on page 6). In GROW testing, farmer cooperators had this problem in excessively weedy fields when the weeds were still green at harvest or early in the harvest season when moisture levels were higher. Harvesting corn with high moisture in the stems and leaves led to damaging a seed impact mill. These clogs and damaged units have led some farmers to discontinue seed impact mill use.

Potential solutions to high moisture harvest conditions include swathing, chemical desiccation, leaving weedy patches to be cleaned up at the end of harvest, or delaying harvest until drier conditions prevail.



5. How do clogs and other mechanical issues affect the mills? (cont.)



Figure 4: Clogged plant material in seed impact mills. Clockwise from top left: purple ammannia in rice harvest blocking an iHSD, a clog ejected from a Redekop SCU during soybean harvest, and a Seed Terminator clogged with wet plant material. (Photo credits: Sarah Chu, Texas A&M, Claudio Rubione, GROW, and Josh Lade, JET Farms Ltd.)

Metal parts like nuts and bolts are another common enemy of a seed impact mill. A single nut that works loose and enters the mill can result in catastrophic failure requiring replacement or major, expensive repairs. Rocks can also cause excessive wear and damage. To alleviate this issue, the Seed Terminator includes a magnetic strip, and the iHSD uses a rock trap.

Lastly, since seed impact mills kill crop seed sieve loss, physically measuring yield loss is more difficult when a seed impact mill is installed.

Check out these farmers' experiences:



HWSC in the Pacific Northwest: Greene Ridge Farms: <https://growiwm.org/hwsc-in-the-pacific-northwest-greene-ridge-farms-tackles-tough-weeds-with-seed-impact-mill/>



HWSC in the Pacific Northwest: Druffel Farms: <https://growiwm.org/hwsc-in-the-pacific-northwest-druffel-farms-seed-impact-mill-manage-weeds/>



HWSC in the Pacific Northwest: Simon Crawford: <https://growiwm.org/hwsc-in-the-pacific-northwest-simon-crawfords-first-year-with-a-seed-impact-mill/>



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