

DIY Garbage Can Lifter

Luke Kaz, of the Instagram account @lukekazmierowicz, built a garbage-can lifter that makes bringing bins to the curb easier.

"The idea came from trying to make a simple, cheap way to lift and dump a heavy garbage can without having to wrestle it by hand," says Kaz. "Around our place, I'm always looking for ways to make small chores easier using things I already have, and this seemed like a simple project that could save a lot of effort."

Kaz made the lifter from little more than pieces of wood he screwed together.

"The tools and supplies were pretty basic. I used common lumber, screws, a saw, a drill/driver, and a measuring tape. The total cost was probably around \$30, depending on what materials someone already has on hand."

He estimates the project took an hour or two to assemble.

"Overall, it works really well," Kaz says. "The biggest benefit is being able to lift and move a loaded can without having to pick it up manually. If I made it again, I might fine-tune the fit a little more for the exact garbage can and bucket setup, but the simple version worked surprisingly well."

He offers straightforward advice for readers interested in following his plans.

"Build it around the actual garbage can and bucket you plan to use. Start simple, test it slowly, and make sure everything is secure before lifting a full can. It doesn't need to be fancy to be useful."

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Cake made with rubisco.

They're Making Food From Alfalfa

New Zealand-based Leaft Foods is introducing new food ingredients made from alfalfa leaves. The company is harvesting the plant protein rubisco from the leaves and producing a protein concentrate and a protein isolate. They'll compete in the marketplace with whey and egg protein, but are produced much more efficiently on a per-acre and cost basis.

"Rubisco is a naturally occurring enzyme

that's part of the photosynthesis process," according to Dr. John Penno, Leaft co-founder. "It's found in all green leaves and often makes up a high proportion of the soluble fraction of the biomass of fresh, green leaves. It's found in particularly high concentrations in alfalfa leaves."

Other firms are developing rubisco products from a variety of non-field sources, including algae. Penno notes that Leaft extracts rubisco

from alfalfa grown in open fields by farmers.

"Our system runs on soil, sunlight and rainfall rather than controlled tanks or ponds," says Penno. "Alfalfa is also naturally regenerative, fixes nitrogen, builds soil health, and can be harvested multiple times a year without replanting."

Leaft is working with farmers to maximize harvestable biomass from broad-acre alfalfa. The objective is to enable the manufacture of a suite of products, prioritizing human nutrition, then pet nutrition, and then livestock nutrition, explains Penno.

"Leaft Foods manufactures our ingredient products using a proprietary extraction process our team developed to isolate and preserve the rubisco," says Penno. "They offer an essential amino acid composition and digestibility as good or better than egg and whey."

He adds that the Rubisco Protein Concentrate contains dietary fiber, vitamins and minerals derived from the leaves. It's light green in color and works particularly well as a protein fortification in beverages.

The Rubisco Protein Isolate is a white, mild-flavored ingredient. It can serve as a nutritional or functional protein, for example, by replacing eggs in bakery applications. The protein isolate and protein concentrate are

available to customers in chilled liquid and frozen forms.

The company also markets an Alfalfa Protein Concentrate. It's a non-rubisco protein, fatty acid and nutrient-rich ingredient. It's sold to the pet industry as a meat extender.

The remaining biomass that can't be used for human and pet nutrition is being manufactured into molasses and silage products for ruminants. Penno reports that researchers have demonstrated that the silage can improve milk and beef yields while reducing nitrogen loss from the animals.

"We've verified the research, and the products are already in demand from local dairy farmers," says Penno.

Leaft production is currently restricted to the South Island of New Zealand, but Penno expects to work with partners in the U.S. and elsewhere as the market for rubisco develops.

"We've done limited trial work with alfalfa varieties available in California, with the potential of operating from the U.S.," says Penno.

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Biomass Boilers Turn Local Wood Fuel Into Farm Heat

Hargassner wood chip, log and pellet boilers were developed to make heating with wood biomass as convenient and automated as possible.

"Generally speaking, farms heat with wood for one simple reason: it's often significantly less expensive than heating with propane," says Peter Stewart, Hargassner Director of North America Key Accounts. "Increasingly, we're also getting inquiries from farmers who want to derisk their operations from the yo-yo pricing of fossil fuels."

Primary customers for the unique boilers include farms, greenhouses, wood-processing businesses, commercial and industrial facilities, apartment buildings and district heating systems.

"For agricultural customers, biomass can provide an alternative to propane, heating oil or natural gas, particularly where farms have access to wood chips, pellets or other suitable woody biomass," Stewart says. "A cord of wood has about the same heating value as 211 gal of propane. Why waste wood and leave money on the table if you have it at your disposal?"

The Hargassner heaters combine a biomass boiler and combustion chamber with an automatic fuel-extraction and auger-feed system for efficient operation. They feature automatic ignition, a moving step-grate combustion system, and a lambda oxygen sensor with

electronic controls to optimize combustion.

Routine maintenance is minimized through automatic heat-exchanger cleaning and ash removal. Built-in safety and burn-back protection systems enhance reliability, while touchscreen controls and remote monitoring provide convenient operation. Thermal storage and hydronic components help maximize system efficiency and heat distribution.

Wood chips or pellets are automatically transported from storage to the boiler. The boiler ignites the fuel and continuously adjusts fuel and combustion air according to heat demand, cleans the heat exchanger, and removes ash. The heat is transferred to water and distributed through a conventional hydronic heating system.

Hargassner equipment is certified and tested by the EPA, ASME and UL, and is used on farms, in schools and in homes throughout the U.S.

"Our systems range from relatively small heating applications to large commercial and agricultural plants," Stewart says. "Multiple boilers can operate together in cascade, allowing installations of approximately 2 MW or 6.7 million Btu/hr. Plus, safety is integral to the design. Features include negative-pressure monitoring and physical separation between the combustion chamber and stored fuel to protect against burn-back."

Trained dealers and heating professionals

size, install and commission the equipment. Local plumbing, electrical and construction contractors may also participate. Once installed and commissioned, the system is designed to operate automatically with minimal day-to-day attention.

Hargassner is an Austrian manufacturer headquartered in Weng im Innkreis. The company has approximately 185,000 boilers in operation and exports to more than 40 countries.

In North America, the equipment is available through Hargassner North America and its network of dealers and installation partners throughout Canada and the U.S.

"Hargassner has spent decades developing equipment specifically for biomass rather than adapting conventional boilers to burn wood," Stewart says. "One biomass plant can provide heat for buildings, greenhouses, hot water and agricultural drying processes."

Stewart explains that biomass boilers are typically more expensive than natural gas or propane boilers.

"The equipment is more expensive upfront but pays for itself since the fuel is generally much cheaper than propane, for example. The meaningful comparison is therefore total installed cost versus long-term fuel cost. Biomass becomes particularly attractive where a farm has inexpensive local fuel, produces usable wood residuals, has a large annual



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heating demand, or is replacing expensive propane or heating oil."

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