

Mini Combine Makes Field Sampling Easy

Marcel Krings was familiar with the idea of mini combines for sampling grain to test for moisture in his native Germany. So when he moved to Canada, he brought the concept with him.

"I realized mini combines weren't a thing here, but the efficiencies and savings would apply just as well," Krings says. "Using fuel, time, and manpower to move a full-sized combine to remote fields just to collect a grain sample for moisture testing is inefficient."

Krings purchased the exclusive North American rights for a France-built mini combine and branded the product as the Bushel Plus Mini Combine.

The hand-held, rechargeable device works in all grains. It contains a small thrashing drum, fan, and a choice of concaves depending on the crop being sampled.

"To get the grain heads into the combine, you open the flap and dip it into the crop," he says. "The flap pushes the grain against the spinning drum which strips the kernels and forces them through the concave."

The seed sample is collected in a bottom container and the unit's fan blows the chaff out the side exit port.

Krings explains that drum speed and wind power are adjustable depending on crop density and moisture levels. He says the combine works best in standing grain, but swathed crop can also be fed into the unit through a top funnel-shaped opening.

The Mini Combine battery holds enough charge for a handful of field tests. Krings recommends completing several samples in



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each field for an accurate average with each sample taking about 5 to 15 minutes depending on conditions.

The Mini Combine retails for \$1,945 CAD plus S&H. It comes fully equipped with a charger, battery, two sample containers, and an aluminum carrying case.

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Drums were fabricated from 16-in. O.D. oil pipe found at a salvage yard. The 1/4-in. thick crimper blades extend out from the drum 4 in. Each blade was reinforced by three 3-in. by 1 1/2-in. gussets.

Field Disc Converted To Roller/Crimper

Smaller discs are a dime a dozen, so Michael Bredeson and Ryan Schmid decided to convert one to a roller/crimper for cover crops. The research scientists at Ecdysis Foundation, along with their farmer advisor group, came up with the idea. It was a natural second step for the group after building an inter-row drill for seeding cover crops into established corn.

"We had converted an IH cultivator toolbar to carry row units from an old Haybuster no-till drill," says Bredeson. "One of the farmers in the group had a couple of Gandy box seed regulators. We slapped them on and made it work. That sparked our interest in building equipment for use with cover crops."

The farmer/researcher group was interested in working with a roller/crimper for cover crop termination. They felt commercial units were too highly-priced, and no one in the area

had one for the group to experiment with.

"We figured our role was to lower the barrier of entry," says Bredeson. "Farmers in our group are welders and machinists, and they taught us how to do cutting, welding, and plasma welding."

The team applied for and received a grant from North Central Sustainable Agriculture Research and Education. The grant was for \$6,740, the estimated cost of materials.

They started with an International 490 22-ft. disc with a 10-ft. center section and two 6-ft. wings. The disc had been sitting in the wood grove of one of the farmer advisors. Bredeson and Schmid stripped away the gangs.

The first challenge was that the crimping drums were bigger than the disc gangs. The placement of the wings had to be reconfigured, so the drums didn't catch on the

Kits Turn Corn Headers Into Sorghum And Sunflower Harvesters

When Kyle Kopper, Randy Burns, and Alan VanNahmen recognized the lack of efficient and reliable harvesters for crops such as sorghum, millet, milo and sunflowers, they formed Kopper Kutter LLC and created the Alternate Rotary Rowcrop Option (ARRO), a dual disc cutter conversion kit designed for existing corn head retrofits.

"Everything we really needed was already on the corn head," says VanNahmen. "What we didn't need was the stalk rolls, trash knives, and deck plates."

The trio discovered with a few simple steps they could create a head that, even in lodged crops, would cut higher, leave stalks standing for ground shade, minimize erosion, and preserve material for livestock grazing.

To make the switch, the stalk rolls and deck plates are removed from the corn head along with the factory chain guides and gathering chains. The drives (or binoculars) are also removed from the gear cases and replaced with cover plates. After drilling 2 3/4-in. holes for the disc/sprocket assemblies, new ARRO deck plates, disc/sprocket assemblies, chain guides, chains, and tensioner assemblies are installed.

VanNahmen says it takes about 2 to 3 man-hours per row unit to complete the conversion.

The kits contain everything required including blades, sprockets, bearings, new deck plates, chain guides, and hardware.

Kopper Kutter has made numerous color-matched combine model kits available cov-



Kits contain everything required including blades, sprockets, bearings, new deck plates, chain guides, and hardware.

ering John Deere, Case IH, New Holland, Gleaner, and Claas heads which can be shipped all across North America.

Prices for the ARRO conversion kits range between \$1000 and \$1440.

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ground when the wings folded down.

"Mike did a lot of measuring," says Schmid. "We also needed the crimping drums to slightly overlap each other and for the transit wheels to fold up underneath when the wings were folded down."

"We sketched it out so many times we were sick of it," says Bredeson. "We used whiteboards and power points trying to understand it. At one point, while debating between straight blades and chevrons, we built a dummy of a roller."

They used cardboard for the roller drums and bamboo shish kebab sticks for the blades. The sticks extended out the same distance from the drums as the blades would.

"We ran it across the kitchen floor to see what the bounce would be," recalls Bredeson. "Later, we slapped the cardboard template on the end of the roller drums to see where rows of blades should go."

"We went with six sets of 23-in. long steel blades on the 11-ft. center drum," says Schmid. "Each 6-ft., 8-in. wing drum has four sets of slightly offset, 20 3/4-in. blades. Each set of 11 blades overlaps each other by an inch."

The drums were fabricated from 16-in. O.D. oil pipe found at a salvage yard. The 1/4-in. thick crimper blades extend out from the drum 4 in. Each blade was reinforced by three 3-in. by 1 1/2-in. gussets.

"We were able to use the original hydraulics," says Schmid. "We did have to replace some hoses."

The fabrication was done over the winter of 2021/2022. In the spring the roller/crimper was put to the test. It was used by three farmers, one with 10 acres of cereal rye.

"He was very happy with its crimping ability," says Schmid. "Another farmer used it on a thin stand of rye. It didn't work as well, which is standard for crimping thin stands. The last one used it on a patch of Canadian thistles at the end of June. It was heavy enough to break the stems."

No vibration problems were seen, even

at up to 9 mph. However, the field tests illustrated that more overlap of the drums was needed. They also needed a little more weight.

"We drilled holes in the drums so we can fill them with water this spring," says Bredeson.

Overall, the researchers and their farmer advisors are satisfied with the results. While it would have been easier to build a single 11-ft. roller/crimper, one of the goals was an implement that moderate-size farmers would consider.

"We liked this size because implement dealers tell us that any disc under 30 ft. is cheap to buy," says Schmid. "At the same time, a smaller farmer can look at the plans and make one with a single drum."

The project was also a success financially. Schmid estimates a commercial roller/crimper of the same size would cost from \$30,000 to \$35,000.

"Ours cost \$5,883, \$857 under our initial estimate," says Schmid. "If we can do it with next to no experience and make a functional unit, a lot of farmers could make it even better."

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