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## Robotic Carrier Spreads And Sprays

OMNiPOWER 3200 is the new, improved implement carrier from Raven Industries. With 200 hp. and a hydraulic system that has been optimized for 50 percent more power, the 3200 can carry its load faster with more power to the ground. The latest version offers two operating speeds with up to 6 mph in low gear and up to 12 mph in high gear. Not only is a driver not needed, but no operator

platform even exists. It can run autonomously or remotely from an operator's tablet.

"We had two machines mainly spreading dry fertilizer this spring and will be applying herbicide in Canada this summer," says Ben Voss, director of sales, North America and Australia. "So far, most of the work has been done in the U.S."

The autonomous platform is equipped with

front, rear or 4-WD steering. It can be driven forward, backward or sideways.

The 3200 can be equipped with a New Leader NL5000 G5 applicator spreader. It has a 287-cu. ft. capacity and 16-section swath width control with independent spinner control.

Liquid applications are delivered with a Pattison Liquid Systems Connect sprayer. It has a 1,600-gal. stainless steel tank and 120-ft. booms with individual nozzle control.

Voss indicates the dry and liquid units are just the first of an array of implements to be introduced for use with the 3200 platform. Research teams at Olds College, Olds Alberta, Canada, have used the OMNiPOWER platform for three years. They have spread fertilizer and air-seeded with the SeedMaster DSR 30 ft. air seeder, as well as worked with Pattison and New Leader systems. Others are working with the platform as well.

"We'll be getting as many hours in the field this year as we can for final validation," says Voss. "Then we'll move to increase production. Of course, that will be supply-chain dependent."

Voss reports that farmer interest is not restricted to large versus small. Some see it as a way to resolve the difficulty in finding workers. Others see it as a stepping-stone to

using autonomy in other machines.

"I had one customer, not a huge farmer, who got very emotional," recalls Voss. "He was five years from wanting to retire and had been trying to get his son interested in taking over the farm. He couldn't do it until he got this machine."

While the machine is autonomously capable, putting it to work is not a turnkey operation, warns Voss. "A lot of planning is needed," he says. "You need good connectivity in the field, whether to the internet or via cellular coverage. You also need detailed mapping and RTK guidance."

Other preparation includes long-term cropping plans and the ability to integrate all aspects of precision agriculture. "Only then can you get the full benefits of autonomy," says Voss.

Unlike earlier versions, Voss expects the 3200 to be leased at a per acre rate, similar to custom farming rates. "We want to give customers an incentive to commit to the machine without being burdened financially," he says.

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These earliest steam log haulers featured a four-person crew including an engineer, fireman, steersman and striker.

Photo Credit: Herb Crosby

## Steam Powered The Earliest Tracked Log Haulers

While the Lombard Log Hauler was not the first tracked machine, it became the most prominent during the early 20th century.

The story goes that a chance meeting in 1899 between E.J. Lawrence, president of one of the largest lumber companies in Maine, and Alvin Lombard, a talented American inventor, prompted the creation of the first steam-driven, tracked log hauler.

On Thanksgiving Day in 1900, Lombard's "Logging-Engine", affectionately dubbed "Mary Anne", steamed to life.

She weighed in at 15 tons and featured a

horizontal, fire tube locomotive-style boiler with a 400-gal. water saddle tank. Two horizontal cylinders rated at 100 hp. drove connecting rods reaching back to a flywheel and crankshaft running a compensator gear acting as a differential in a car. Jack shafts on each side propelled chain drive sprockets at the rear of the crawler bed.

The track system supported nearly 14 tons of the machine's weight and extended from the lower surface of one of the driving wheels to the other. Two rows of rollers linked together to form a chain making an endless belt

around the two wheels.

Mary Anne sported a crude wooden cab at the rear and steerable skis in the front.

When running at 3 to 400 rpm's, she could produce 50 to 100 hp. The top speed was 5 mph and 15 heavy sleds carrying 300 tons of logs could be pulled.

These earliest steam log haulers featured a four-person crew including an engineer, fireman, steersman and striker.

The engineer was responsible for the speed, throttle, forward and reverse quadrants and amount of steam emitted to the cylinders.

"If they needed heavy pulling, they moved it all the way down so the steam was emitted for the full length of the piston stroke. When the lever was pulled back, it reversed the valves and ran in reverse," says Terry Harper, Maine Forest and Logging Museum volunteer and Lombard expert.

The fireman fed the wood-stoked fire and monitored the water level in the boiler.

The striker rode the logs and oversaw the hitching and unhitching of the trailing train of sleds.

The steersman had the toughest job of all as he perched near the front attempting to direct the skis by hanging onto a largely unresponsive heavy iron steering wheel. Adding intrigue, Mary Anne had no braking system although the engineer could work the reverser to some effect.

To improve braking, crews would spread straw on the hillsides to increase friction and help slow the hauler. The intent was to create enough friction to essentially pull the sleds

down the hill rather than having their weight push the hauler.

This strategy wasn't always successful and provided some wild rides and massive crashes.

"Steering was very low geared, so the steersman needed to turn the wheel a lot to get the skis to move a little," Harper says. "The popular saying was 'steer often and steer early.'"

Since the crew couldn't see or hear each other directly, they used a series of whistle signals and bell ropes to convey stop, forward or reverse commands.

Harper explains the early steam log haulers were made specifically for winter use. In Maine, the climate normally allowed a 90-day hauling season before the ice roads broke up in spring thaws, so most of the log cutting was completed during the summer. In the winter, the log haulers ran 24 hours a day moving logs down the mountains to the streams or rivers that floated them to the mills.

Approximately 82 steam log haulers were built with the last one produced in 1917.

The Maine Forest and Logging Museum is home to two of the three earliest operating Lombards known to exist and welcomes everyone to visit their exhibits.

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## Hillbilly Wheelbarrow Comes In Handy

With his "Hillbilly Wheelbarrow," landscaper Steve Stokely says he can move concrete, clay, rocks and even trees in spaces too small for other equipment.

"I needed something to haul clay out and bring rock back in a small space, and that I could get into the trailer and back out so I could load from the trailer," the Sand Springs, Okla., landscaper explains.

His ZTR mower was easy to drive up his trailer ramps so at first he used the mower's deck to haul items. Then he got the idea to take an old steel wheelbarrow off its broken frame.

"I welded a bracket on the front of the mower for the wheelbarrow to hinge off the mower. It's easy to dump by hitting reverse

really fast," Stokely says. When he needs to use it to mow, he can remove the wheelbarrow from the bracket with a single pin.

"The best thing it does is haul concrete from the cement truck all the way to where you need it," he notes.

He also uses it to haul clay, rocks and other materials - up to 500 lbs. at a time. And it works well for hauling and dumping big balled and burlapped trees into holes.

What started as kind of a strange idea has become a standard piece of equipment for the past three years for his business, Stokely says.

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