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## New Technology Targets Weedy Patches Before They Emerge

Grain farmers have historically managed weeds by spraying entire fields with herbicides, hoping to limit or eliminate weed pressure and impact. But with constantly rising costs and growing environmental concerns, greater efficiency and cost discipline are demanded.

Geco, a weed management company, believes weed control should start before weeds appear, not after they've already reduced yield and forced expensive in-season decisions.

The company's Strategic Weed Management program recognizes that in-field weed patches leave patterns. By analyzing roughly 5 years of satellite imagery from a field, often more than 100 images in Canada, Geco says it can identify where unwanted plants have consistently emerged, distinguish weed behavior from crop behavior over time, and estimate where the underground seedbank is most likely to compete in the next season. The result is a prescription that farmers can load directly into their existing equipment.

"Our predictive map allows grain farmers to focus extra attention on weedy patches," says Geco CEO Greg Stewart. "Resulting actions can be more focused herbicide application, variable-rate seeding, and in-season sprays on the worst parts of a field rather than treating every acre the same."

Geco is also working to identify weed types, but currently they're reliably distinguishing between crop and weed pressure and highlighting the worst-performing portions of a field, which is often the key information a grower needs to create an action plan.

Geco's most popular service option is a 3-year subscription.

"When dealing with an underground seedbank, it's best to enact sustained action to deal with it, as seedbanks don't disappear after a single herbicide pass," Stewart explains.

The 3-year subscription currently starts at about \$2.50 per acre per year, with maps refreshed over time so farmers can respond across a crop rotation rather than in isolated seasons. The map becomes a crucial long-term strategy for sustained pressure on persistent weed patches.

Just as important, the service doesn't require a major operational overhaul. Prescriptions can be integrated into existing platforms and equipment, and Stewart says their predictive maps can be delivered in less than a day.

"We don't make recommendations of what and when to spray, as generally this is a decision the farmer and the agronomist make together relative to existing control programs with an existing crop and herbicide rotation plan," he states.

Stewart says Geco has no direct competitors and outperforms other service providers in the weed-control sector.

"Optical spot sprayers and targeted control typically work alongside sprayer boom cameras, applying herbicides as weeds are seen," he says. "We make predictions about where they'll come up before they get out of the ground. I'd say our biggest competitor is the status quo, where people spray by broadcast or by memory. That strategy still owns much more market share than anything else."

Geco is expanding and currently works with about 180 farms, primarily in the Prairie Provinces. They've also begun expanding into the U.S. Midwest.

Geco has entered into partnerships, including one with the Canadian herbicide company Gowan. Arrangements with Gowan provide cost-saving incentives and bonus product deliveries when purchasing new weed control equipment.

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Bucket's low profile improves visibility of the cutting edge, which is crucial for precision grading and back dragging.



## Mini Skid Attachment Is A Groundwork Game-Changer

CMP Attachment's patented Mini Hydra Bucket 36 (MHB36) is a versatile bucket that provides a multi-purpose solution for completing lawn and landscaping tasks, shaping driveways and roads, and building tracks and trails with smaller skid steers.

"The ultra-heavy-duty Mini Hydra combines standard functionality with the improved capability to grind, shred and pulverize, thanks to a carbide-toothed hydraulic drum built into the bucket heel," says company spokesperson Olaf the Welder.

The MHB36 features a 36 in. width, 7.25 cu ft of volume, and is engineered for low-flow performance, making it suitable for even the smallest machines (max 20 gpm). A high-torque, direct-drive hydraulic motor drives the drum and is located on the rear underside of the bucket. It's housed within the drum, protruding only 2.5 in. beyond the side plate for improved durability and safety. Crossover relief valves dampen hydraulic shock, while the drum's bidirectional capabilities let operators clear jams quickly.

An anthracite gray powder coat with black trim provides long-term rust protection and a professional appearance. The AR 400 wear strip and welded cutting edge add durability and toughness, while the left-side motor mount aligns with hydraulic systems and booms for ease of operation.

Unlike traditional power rakes, the Mini Hydra's drum features extra-hard, spiraled carbide mining teeth that aggressively pulverize hard-packed soil, moving material to the center before redistributing it. This unique design not only simplifies grading, leveling

and site preparation but also reduces the need for additional attachments and hand labor, making jobs faster and more efficient.

Additionally, the new bucket's low profile improves visibility of the cutting edge, which is crucial for precision grading and back dragging.

"From lawn prep and gravel conditioning to foundation work and trail maintenance, the MHB36 is the 'Swiss Army knife' for delivering versatility and efficiency that customers rave about," Olaf says. "Our clients swear by it, and many even keep the Mini Hydra on their skid steer as their general-purpose bucket."

The CMP Mini Hydra Bucket MHB36 retails for about \$5,500. Interested parties are encouraged to request an exact price quote on the CMP website.

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## Seaweed Research Reduces Methane Emissions In Cattle

Efforts to reduce greenhouse gases have highlighted cattle because rumen microbes produce methane by fermenting feed. This process produces byproducts such as carbon dioxide and hydrogen, which methanogens convert into methane that cows expel.

Recently, Natalie Atherton, a master's student at Thompson Rivers University in British Columbia, conducted chemical analyses of three seaweed species abundant in British Columbia: *Macrocystis pyrifera* (giant kelp), *Saccharina latissima* (sugar kelp) and *Mazzaella japonica*.

"The overall goal of my research was to evaluate the potential of these three seaweed species as methane-suppressing additives in cattle feed through assessing their abundance of omega-6 and omega-3 fatty acids, phlorotannins and trace elements, including heavy metals," Atherton explains.

She conducted her analysis in three main parts.

First, she analyzed the omega-6 to omega-3 fatty acid ratio using low-solvent, rapid proton nuclear magnetic resonance (1H NMR) spectroscopy. The analysis showed that both sugar and giant kelp have favorable omega-6/

omega-3 ratios, supporting their nutritional value and methane-reducing potential. Dehydration was identified as the preferred method for seaweed sample preparation.

Phlorotannins (polyphenolic compounds abundant in brown seaweed species) were quantified using the Folin-Ciocalteu (F-C) assay, identified by 1H NMR, and trialed by capillary electrophoresis (CE). She identified the highest phlorotannin concentrations in sugar kelp; however, method variability limited the reliability of the results.

Finally, she examined trace-element concentrations, including heavy metals, in the seaweed species to assess potential toxicity risks when using the material as a livestock feed additive. Using inductively coupled plasma mass spectrometry (ICP-MS), concentrations of key elements of interest, including aluminum, arsenic, cadmium, lead and mercury, were determined and compared with Action Level (as defined by the Government of Canada) thresholds for livestock feed. All species had concentrations well below the threshold levels.

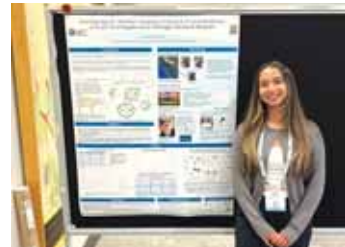
"I found that giant kelp and sugar kelp could be promising cattle feed additives for

improved ruminant nutrition and potential methane reduction, as they offer good fatty acid ratios, high phlorotannin content, and low levels of trace elements, including heavy metals," Atherton says. "These findings underscore that monitoring by site and species remains essential."

Although limited to lab analysis, Atherton's work contributed to the growing body of research on using seaweed in sustainable livestock feed. Her use of rapid 1H NMR analysis suggests efficient, eco-friendly methods. Further in vitro and in vivo studies are needed to confirm benefits for methane reduction and cattle health.

"Brown seaweed species (like giant kelp and sugar kelp) are locally abundant and may provide other benefits as cattle feed additives that have the potential to decrease enteric methane, as they produce bioactive secondary metabolites, including phlorotannins, that possess antioxidant, antimicrobial and anti-inflammatory properties," Atherton says.

She believes this has led to growing interest in phlorotannins' potential to mitigate enteric methane through alternative biochemical pathways and improved ruminant nutrition.



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Similarly, fatty acids (particularly long-chain polyunsaturated fatty acids) have shown potential to suppress methane emissions when added to cattle feed. These fatty acids are abundant in brown seaweed species, including sugar kelp and giant kelp.

Atherton hopes to return to this research in some capacity in the future.

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