

# SUSTAINABILITY ENSURING A DAIRY FUTURE

## From Waste to Wow! Transforming discarded materials into compostable bioplastics

Kate Ayers, B.Sc. Agr.

Generally, plastics are cheap, convenient and effective materials used across a wide range of applications, especially in agriculture. Its versatility makes it ubiquitous, and its components make it harmful to the environment. Fortunately, Canadian scientists and experts are discovering new ways to produce plastic alternatives that have a smaller carbon footprint.

With offices in Toronto and Denmark, Launch Bioindustries is developing fully compostable bioplastics through fermentation using waste streams from dairy processing, food production and pharmaceutical manufacturing. Indeed, discarded byproducts from dairy processing is a top candidate for bioplastic production.

### One Man's Waste is...

"Dairy waste is a great feedstock for this type of application primarily because it's quite consistent around the world. Dairy waste exists in almost every jurisdiction that you look at," says Launch Bioindustries founder and CEO Andrew Chiappetta. "The second thing is it is carbon rich, especially lactose, it is something that we can readily digest with our bacterial platform."

Right now, Chiappetta and his team are taking a closer look at dairy waste, including acid whey and lactose-rich

permeate because these components can easily be converted into high carbon feedstocks and then bioplastics.

The company's bioplastic production line involves a three-step process. The first step is to pre-treat the waste. "We try and filter out unnecessary components, concentrate certain things, but essentially get it to a point where it's very consistent for fermentation," Chiappetta says.



Andrew Chiappetta shows his bioreactors which are the key to the microbial magic giving dairy waste a new functional life.



Dairy processing waste by-products can be transformed into environmentally safe biodegradable plastics making a win for the environment and dairy sustainability.

The second step is fermentation, in which bacteria create polyhydroxyalkanoates (PHAs) in a bioreactor under optimized conditions. PHAs are biodegradable polymers that fit into a circular economy. "In nature, bacteria can use PHA to store energy. And we've kind of supercharged this through our strains," Chiappetta says.

The final step is to extract and purify the PHAs. "Once we have the bioplastic produced, we use our innovative purification process to really efficiently get the bioplastic out into a very high level of purity, over 99 per cent, so that we can use it in a variety of applications. From there, we compound it and make it into final products," Chiappetta explains.

Through this process, Launch Bioindustries looks to achieve full

circularity by helping industry offset disposal costs and providing stakeholders with a sustainable product they can integrate into their value chains.

"Lactose and dairy waste in general, it's producing some burden on wastewater treatment plants, and on farmers, because it is a cost to get rid of. Our process eliminates that cost by taking it in for free," Chiappetta says. "Then there's the other side of things, providing sustainable products."

### Sustainable Bioplastics

Complete biodegradation depends on the product type and bioplastic thickness, but can take anywhere

Continued on next page ▶



## Fraser Valley and Okanagan

# BREW TO YOU!



**J. Wolzen Trucking** Email: [jwt@dccnet.com](mailto:jwt@dccnet.com)

Seasonal culled potatoes also available for delivery.

### Excellent Nutrition ...Excellent Value!

- **Brewers Grain** is excellent nutrition in lactating cow TMR's while reducing grain costs
- **Spent Brewers Yeast** available for regular delivery, yeast tanks will be installed

### RELIABLE DELIVERIES

**Fraser Valley: Call Mike**  
604-771-4378

**Okanagan: Call Tony**  
250-309-2360

# FOOKS PUMPING LTD

Serving the Fraser Valley

- Optimize field work time - pumping 2000+ gallons per minute!
- Minimize field passes with 60' spread!

SERVICES: • Draglining • Agitation • Silage Pushing



Reliable Service and Competitive Rates!

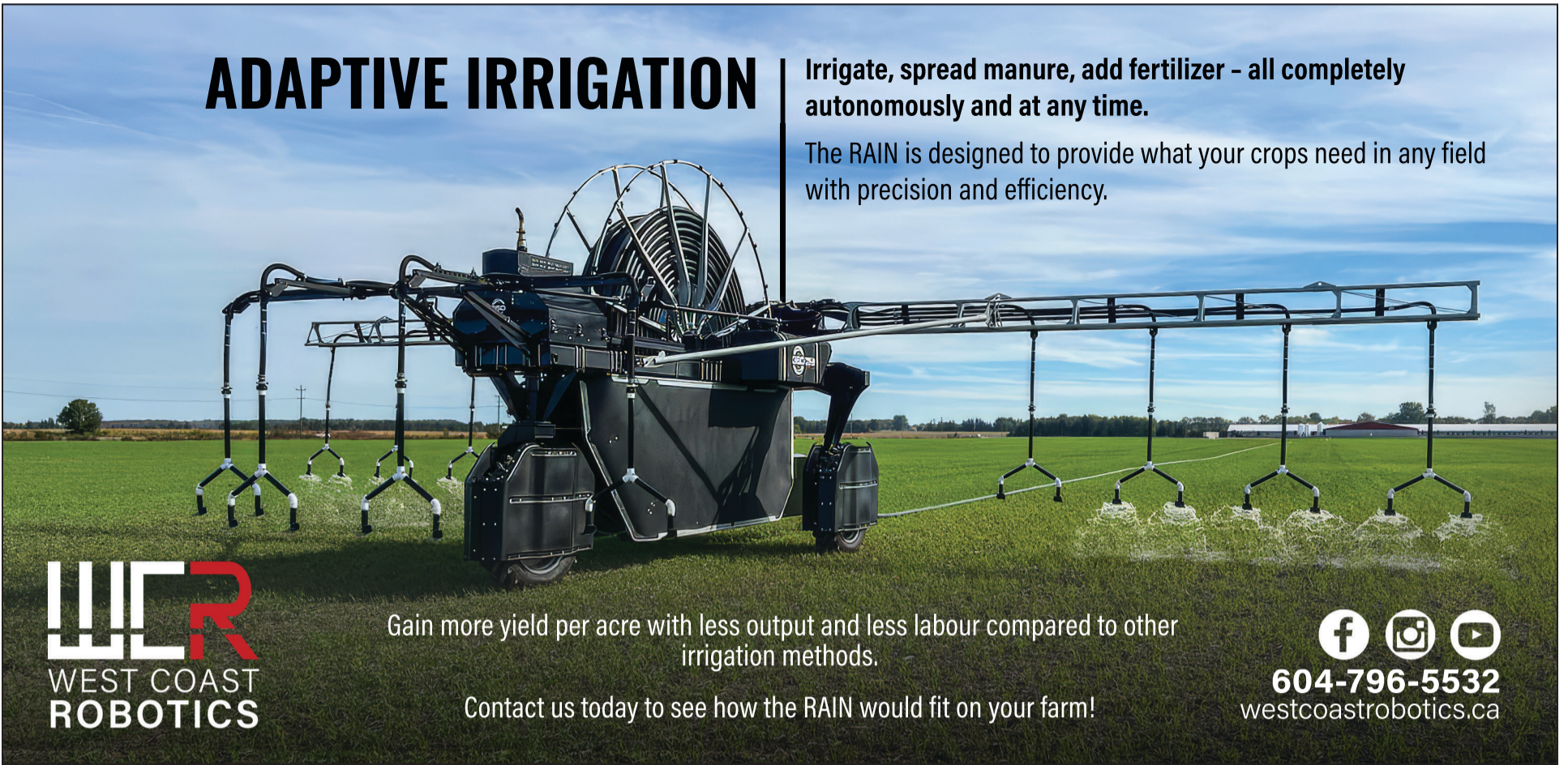
FOOKSPUMPING@GMAIL.COM

CALL FRED FOOKS: 604-302-9577

# ADAPTIVE IRRIGATION

Irrigate, spread manure, add fertilizer - all completely autonomously and at any time.

The RAIN is designed to provide what your crops need in any field with precision and efficiency.



Gain more yield per acre with less output and less labour compared to other irrigation methods.

Contact us today to see how the RAIN would fit on your farm!



604-796-5532  
westcoastrobotics.ca

between six weeks and a year without microplastics or other harmful byproducts produced as the bioplastics break down.

For a long time, cost has been a barrier to implementation of bioplastics, but as the cost of fossil fuels continues to rise, the price gap is shrinking between petroleum plastics and bioplastics.

"The fact that we upcycle waste, it significantly reduces our cost of production. [Also], these extended producer responsibility fees are starting to increase to the point where it is significantly incentivizing switching to sustainable alternatives," Chiappetta says. "In addition, the price of oil is going up significantly, which is driving up the price of petroleum plastics. As we go further into the future, it's going to be favouring sustainable plastics a lot more because our price is not dependent on geopolitics or anything like that. And as our technology improves, we're able to bring down cost of production."

### Scaling up for Economic Viability

Launch Bioindustries' next step is scaling the technology. The team just completed a 5,000-litre fermentation, which translates to about 200 kilograms of bioplastic that can move towards prototype material.

"We're looking for more partners, especially in Canada, especially in the dairy industry," Chiappetta says. "We're looking for these long-term partners that have abundant waste streams that really want to get rid of it or want to do something with it to offset the cost and are interested in implementing sustainable materials down the line in some way."



Launch Bioindustries was selected as part of the BioCreate accelerator last winter. This program is a five-year \$11.6-million project funded by Ontario Genomics and the Government of Canada to provide financial and business support to biotechnology start ups.

Material Futures is another company in the accelerator that's using dairy waste to make sustainable colourants for the food, cosmetic and textile industries.

# MORE PROTEIN MORE PROFITABILITY



Ship more **PROTEIN** by utilizing these elite sires in your matings.

	CODE	NAME	GLPI	HHP\$®	MILK kg	PRO kg
	250H018034	PROTOCOL	3968	948	1215	89
	7H017478	STURGEON	3734	1052	1551	88
	250H015217	CAPONE	3755	296	1855	87
	7H016276	SHEEPSTER	3915	1116	1300	86
	7H018108	LANECHANGE	3868	1124	1168	79
	724H02031	RIGHT STUFF-PP	3798	241	1406	76
	250H017513	TUBMAN	3828	921	1434	70
	550H014134	RENEGADE	3862	484	1175	66
	7H016295	HAS IT ALL	3843	477	2294	65



1-800-265-0043 • www.selectsirescanada.com

**YOUR SUCCESS** *Our Passion.*

\*GForce, gender SELECTED and Showcase are trademarks of Select Sires Inc. \*Milestones, ResistantPRO, RobotPRO, FeedPRO, N-GEN and Your Success Our Passion, are registered trademarks of Select Sires Inc. UltraPlus™ is a trademark of S1Gen LLC. All gender SELECTED semen is processed using UltraPlus™ technology. Evaluations for non-conformation traits are Powered by CDCB™ unless otherwise noted. 04/26 CDCB, HA and CAN data.