

# GAI GAZETTE



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THE FUTURE IS  
REPLETE WITH AG  
INNOVATIONS THAT  
ARE DRIVING SECTOR  
INVESTMENTS

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# IN MEMORIAM

## Gregory J. Duerksen

Chairman of Kincannon & Reed



All of us at Global AgInvesting would like to pay our respects and honor the memory of Gregory J. Duerksen, Chairman of Kincannon & Reed, following his passing in January.

Greg believed that those working in food and agriculture serve a noble purpose, and we were fortunate to benefit from his passionate support and participation. Greg added color and context to more than two dozen HighQuest events as a cherished member of our speaking faculty. He generously shared his expertise, anecdotes, and deep sector knowledge both on and off the stage, and he will leave an indelible mark on our programming for years to come.

We are grateful to have had the opportunity to know him as an industry advocate and dear friend. His influence on Global AgInvesting will be ever-present as we continue our shared goal to cultivate the community of investors, operators, and innovators who feed the world and keep it healthy.

# GAI GAZETTE

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# AG SECTORS TO WATCH IN 2019

BY PHILIPPE DE LAPÉROUSE AND MARK ZAVODNYIK, HIGHQUEST CONSULTING



While the consensus is that agriculture has emerged as a distinct asset class, it nevertheless continues to be viewed as a challenging allocation for institutional investors. Lower crop prices following three successive bumper crops of soybeans and corn in the Western Hemisphere and the impact of the current trade war with China - which resulted in an erosion of farm income and a softening of land prices in the U.S. Corn Belt - may dissuade investors from committing capital to agriculture. Yet, like most things in life, timing is everything.

While returns on portfolios invested in row cropland prior to, or during the peak in farmland prices four to five years ago are likely to be down, due to lower commodity prices and cash rents, the current weakness in U.S. farmland values represents an attractive opportunity to acquire farmland at reasonable values. This would be done in anticipation of a rebound in commodity prices, which will be driven by the strong secular trend in global agriculture (rising GDP and populations in developing economies leading to growing demand for food during a period of increasing resource constraints).

Despite the headwinds noted above, farmland, along with other sectors across the agricultural value chain such as:

- crop inputs and services;
- robotics in the field;
- aquaculture; and
- indoor agriculture

represent attractive investment opportunities to pursue over the next 12 to 18 months for both strategic and financial investors seeking attractive returns and exposure in the agricultural asset class.

Institutional investment in farmland ranges between US\$28-35 billion.<sup>1</sup> Given that the estimated size of the “investable” universe of farmland globally is US\$1 trillion,<sup>2</sup> less than 3.5 percent of the investable universe is owned by financial investors. We are clearly still in the early stages of the financialization of the farmland asset class.

While average farmland values in the U.S. Corn Belt have fallen 20 to 25 percent from peak levels realized in the 2012-14 period, farmland values in the region have stabilized within the past 12 months. Media coverage of the U.S. farm economy paints a bleak view based on a misleading comparison of current financial performance with that of the “golden age” of 2012-2014, when in fact current financial returns have reverted to the historical mean. Total U.S. farmland generated a return of 6.74 percent in 2018 with annual cropland in the Central Corn Belt generating a return of 2.64 percent, which approximates the rate for the 10-year U.S. Treasury note.<sup>3</sup> The financial performance of the asset class is not as dire as depicted in the press.

Productive annual cropland in the U.S. continues to remain in short supply and is increasingly subject to water constraints. In addition, there is increased competition for leases driven

by younger growers seeking to expand the acreage they operate in order to maximize their productivity. In many cases these growers, who are strapped for capital, depend on “non-operators,” including individual investors, family offices, and large institutions, to provide the necessary liquidity in the farmland market which enables them to access this acreage.

Therefore, despite a number of challenges (eroding farm incomes, an increase in farm debt, questions regarding future demand for renewable fuels, and the ongoing trade war), U.S. farmland continues to offer investors an attractive investment option that:

1. Protects against inflation;
2. Is negatively correlated with other financial assets;
3. Reduces the volatility of returns in a diversified portfolio; and,
4. Provides wealth preservation in a flat yield curve environment with expectations of long-term growth in global demand for food.

Farmland prices and returns vary across regions and different crop systems within the U.S. For example, farmland in the Pacific Northwest region, where a highly diversified range of crops are grown, generated an average return of 8.86 percent in 2018.<sup>4</sup> Thus, as we have pointed out over the past two years, institutional investors are shifting the weight of their farmland portfolios away from annual row cropland in favor of specialty and permanent crops. In January 2019, the Alaska Permanent Fund Corporation announced its intention to reconfigure the target allocation for its \$852 million farmland portfolio from 80 percent/20 percent row crops/permanent crops to 60 percent/40 percent due to the expected higher returns for permanent crops. Similarly, the Teachers’ Retirement System of Louisiana recently announced that it has established a \$100 million separate account to be managed by Boston-based AgIS Capital for investment in permanent crops and related infrastructure.<sup>5</sup>

Disruptions in trade flows caused by tariff wars are likely to create opportunities for farmland investment outside the U.S. in countries located closer to major destination markets that are not embroiled in trade disputes. As countries dependent on food imports seek to diversify their sourcing of ag commodities, we expect that new players are likely to emerge, creating opportunities for farmland investing in non-traditional regions.

**The financial performance of the [agriculture] asset class is not as dire as depicted in the press.**

## Crop Inputs and Services

Consumer concerns over food provenance and safety – where food comes from and how its produced (i.e. organic, non-GMO, sustainable production methods, etc.) – has emerged as a major trend in developed markets. As a consequence, consumers are playing an increasingly influential role in how food is handled and processed across the supply chain (production, processing, packaging, and distribution, etc.).

To stay ahead of this trend, retailers and distributors are requiring their suppliers to meet strict protocols that are radically upending established practices throughout the supply chain, and changing the range of crop inputs and services deemed acceptable for use in the field. This trend has opened the door for new players to develop and offer novel products, services, and technologies requiring a high level of sophistication to sell and support. This is disrupting the legacy ag retail and wholesale distribution sector in the U.S., with 100 of the largest ag retailers generating US\$30.5 billion in revenue in 2019, according to *CropLife* magazine.<sup>6</sup>

The rapid adoption of new products and technologies (biologicals used for pesticides, fungicides and root development, and other precision ag technologies) has increased the options available to growers, which many legacy ag retailers find difficult to sell and support due to a lack of technological sophistication amongst their salesforce. There is clearly a shortage of skilled crop management advisors with the requisite technical expertise to advise growers responding to the changing requirements of the marketplace. Furthermore, with increased interest in “locally grown” agriculture and the growth of indoor agriculture, certain regions of the U.S. such as the Northeast, where agricultural production has largely been absent since the end of the 19th century, are experiencing an acute shortage of crop management advisors with the requisite technological skills.

“To succeed in the future, ag retailers will need to be generalists and broaden the depth of their expertise and technological knowledge as newer products such as advanced crop protection and agricultural bio-inputs come into the market,” said Chris Grallert, an industry expert and HighQuest Consulting affiliate.

New independent retailers (often not brick-and-mortar) have entered the market offering product knowledge and expertise, as well as a wave of new services such as product bundling,

**...despite a number of challenges (eroding farm incomes, an increase in farm debt, questions regarding future demand for renewable fuels, and the ongoing trade war), U.S. farmland continues to offer investors an attractive investment option...**

customized growing services, equipment, and data analytics. This is a sector where nimble new players and legacy crop input suppliers will have opportunities to acquire new capabilities and expand geographically by targeted acquisitions. For example, in January 2019, Wilbur-Ellis invested in Crop Enhancement Inc., a California-based producer of sustainable crop protection and agrochemical products for enhancing yields.<sup>7</sup> The rationale given for the investment was “the powerful market force of hundreds of millions of consumers who demand sustainably produced foods.”<sup>8</sup>

## Robotics in the field

In response to a shrinking and more expensive labor force, the adoption of robotics in agriculture is increasing. The global market for ag robotics has been estimated by various industry analysts to be ~ US\$3 billion and is expected to increase to US\$12 to US\$13 billion over the next seven years.

Increasingly stringent U.S. immigration laws are complicating the ability to hire competent and qualified labor in agriculture. While the national median annual cost of a U.S. farm worker in 2017 was \$23,730 (or \$11.41 per hour)<sup>9</sup>, the median cost for farm labor in California, where adoption of robots is the fastest in the U.S., is \$20 per hour.<sup>10</sup> According to a California Farm Bureau Federation survey conducted in 2017, 55 percent of responding growers have experienced labor shortages in recent years. Given that a majority are growing high-value crops, such as berries and grapes which have proven difficult to harvest mechanically, the labor shortage is particularly challenging.<sup>11</sup>

Adoption of robots as an integral part of farm production provides labor cost savings and generates increased operating efficiencies. For example, the Harvest CROO Computerized Robotic Optimized Obtainer can pick a single strawberry plant in 8 seconds and cover 8 acres of strawberry fields in a single day, replacing the labor of 30 human pickers.<sup>12</sup>

The following are examples of recent investments in ag robotics:

- Blue River Technology's (acquired in 2017 by John Deere for US\$305 million) *See & Spray* devices combine machine learning with robots to identify exactly where the use of herbicides is required, thereby enabling them to significantly reduce overall usage.<sup>13</sup>



- Yamaha Motor Co. of Japan announced in 2018 that it had invested US\$8 million in Robotics Plus, a New Zealand-based producer of robotics technologies used to grow and harvest fruits such as apples and kiwifruit.<sup>14</sup> Yamaha's interest in ag robotic technology is driven by persistent labor shortages in Japan.

With growing global demand for high-value specialty crops, the adoption of robots across the agricultural supply chain is expected to continue increasing, providing attractive investment opportunities.

### Aquaculture

Global demand for seafood has increased 3.2 percent annually since 1960, outpacing the growth in the world's population, with per capita consumption during the period increasing from 10 kg to more than 20 kg.<sup>15</sup> Demand for seafood is driven by developing markets in Asia where fish has historically been a traditional source of protein, and by the trend toward healthy diets in developed markets. Given the growing demand and restrictions on wild catch fisheries, seafood production in farmed systems has increased dramatically over the past decade, growing at 8 percent annually since 2010.

While investment in integrated aquaculture production continues to attract capital, most investments in aquaculture have focused on developing alternative proteins (derived from insects, algae, and single cell proteins) to produce less expensive analogues for fish meal protein and fish oil (DHA) traditionally fed to carnivorous species such as salmon. This is due to the perception that investing in nutrition is a less risky proposition than investing in other sectors that support the aquaculture industry.

New gene editing techniques such as TALENs and CRISPR/Cas9, which act as "molecular scissors" to precisely cut into DNA to remove genes which are replaced with optimal genes from the same species, offer the opportunity to boost productivity of aquaculture production by reducing stress, and increasing disease tolerance while avoiding concerns over the use of gene transfer between organisms.

Finally, given estimates that 90 percent of seafood consumed in the U.S. is imported and 50 percent of that is farm-raised, guaranteeing the origin and the way a fish was raised is likely to become the accepted standard for the industry. Novel

technologies, including digital infrastructure, that support traceability in the seafood supply chain will offer attractive opportunities for investors willing to spend time analyzing the sector.

### Indoor Ag

Indoor agriculture has been one of the fastest growing agricultural sectors in the U.S. This method of "farming" can be undertaken in both urban and rural areas, reduces the water and carbon footprint of crops grown, and provides an opportunity to grow high-value crops year-round in inhospitable climates. It also reduces the distance required to ship products to urban areas with high population densities.

In 2017, the industry was comprised of 40,000 farms, operating more than 1 billion square feet of surface area, and produced crops with an approximate market value of US\$15 billion.<sup>16</sup>

Labor costs, which are estimated to account for 49 percent of production costs for hydroponic farms and as much as 79 percent for aquaponic farms, are the primary factor limiting the industry's ability to continue growing and attract capital.<sup>17</sup> To reduce labor costs while increasing operating efficiencies, operators are seeking to integrate new automation technologies. Given that vertical farms require more labor than greenhouses (which typically operate at ground level), automation will be the critical factor determining the ability of vertical farms to achieve optimal scale.

Recent investments in indoor agriculture have focused on increasing automation. In January 2019, 80 Acres Farms, an indoor vertical farming startup based in Ohio, announced that it had raised US\$40 million from Virgo Investment Group to build the first fully automated indoor farm.<sup>18</sup> "The advantages of integrating a higher level of automation in indoor agricultural operations are too numerous to ignore: 24/7 availability, harvesting multiple crops with minimal change-over, germ-free, and one worker per machine vs. multiple pickers," said Graham Mitchell, industry expert and HighQuest Consulting affiliate. "The indoor growing and vertical farm sector is going to be a first mover in adopting labor-saving automation and robotics technologies because the environments are controlled and predictable."

Industry experts expect operators and investors to focus on the adoption of increased automation not only to decrease labor costs, but also to enable them to diversify the number of crops grown. This provides an opportunity to upgrade existing farms as well as build greenfield projects.

### Other Opportunities Abound

Attractive investment opportunities are not limited to the sectors highlighted above. Another area to monitor is the market for products and technologies addressing animal health. Merck's recently announced acquisition of Antellic – a digital livestock tech company focused on digital animal identification, traceability, and monitoring solutions – from BC Partners for US\$2.37 billion, marks the largest investment in ag technology to date.<sup>19</sup> This sector will undoubtedly provide further investment opportunities as advances in IoT converge with big data and new technology solutions to redefine animal health and management in order to meet growing global demand for animal protein, and address consumer and regulatory concerns regarding traceability and food safety. 🌍

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# COMPARING OPERATING STRATEGIES TO MAXIMIZE FARMLAND RETURNS

BY JACKSON TAKACH, FARMER MAC



**U.S. farmland owners – both agricultural producers and land investors alike – have dozens of decisions to make, but one of the most fundamental is how best to put their land assets to use. For some, renting the land to other producers provides adequate cash flow to meet financial needs and required returns. For others, agricultural production and operational expertise can provide the cash flow and returns to land holdings (not to mention the lifestyle and tradition that many operators in agriculture desire). While the decision to operate or rent depends on many land-and-owner-specific factors, geographic location and historical returns are two important factors with enough data to evaluate on a macro level.**

## HISTORICAL OPERATING RETURNS BY REGION

Different regions of the U.S. offer vastly different soil types, climates, and available technology that lead to different blends of agricultural production. For example, the silty clay loam soil covering Iowa combined with advanced seed technology make corn and soybeans the logical choice for nearly 90 percent of farmland in the state. Conversely, the varied soil types, micro-climates, and long growing season give California growers the ability to produce more than 200 different crops. Regardless of the crop grown, all production experiences market price volatility and changing cost of production, giving rise to net income volatility.

Using state-level USDA cash receipt, expense, and acreage data, Figure 1 highlights the historical trends in regional inflation-adjusted net operating income (NOI) per acre. Each region's NOI tended to increase in the two major farm profitability expansions in the 1970s and 2010s, but the timing and magnitude of changes vary by region. Average profitability in the Corn Belt swelled in 2012 due to widespread drought and the high grain prices and crop insurance payments that followed. Since 2012, average NOI in the Corn Belt has fallen by more than \$100 per acre, predominantly in grain-intensive states like Iowa and Illinois. The inflation-adjusted NOI in Illinois peaked in 2012 at over \$440 per acre (6.6 percent of average land values in the state) but registered just \$223 in 2017 (3.0 percent of average land values).

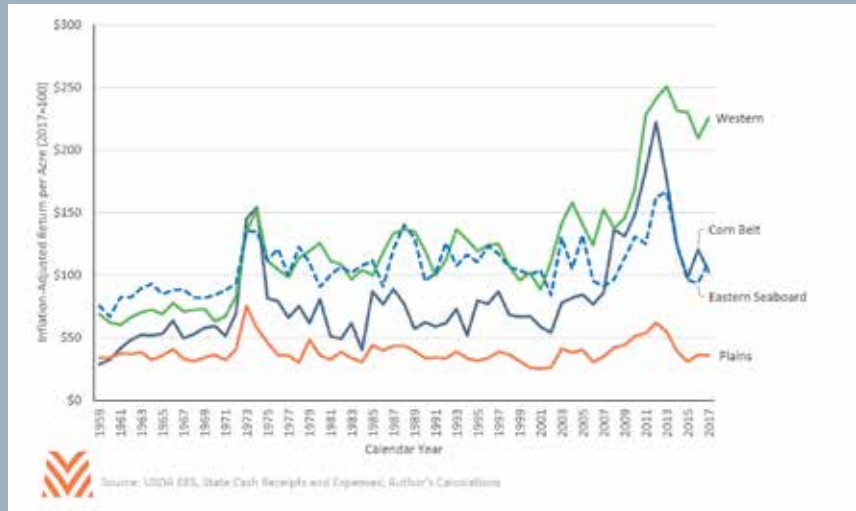
NOI for Western agriculture has increased significantly since 2007 due to an increase in consumer preference for fruits, vegetables, and particularly nuts. In California, inflation-adjusted NOI peaked in 2013 at \$723 per acre (9.9 percent of average land values) and had only fallen to \$622 per acre in 2017 (71 percent of average land values). Overall, NOI in the Plains region has been lower than other areas primarily due to lower yields and greater land use for pasture. Finally, farmland in Eastern states has experienced very stable NOI returns for operators, increasing at the pace of inflation.

### RENTAL RETURNS COMPARED

In addition to revenues and expenses, the USDA surveys thousands of farmers per year to estimate average cash rental rates at the state and county level. Naturally, operating returns tend to be higher than rental returns as operators would not rent land for more than they expect to earn farming it. However, there are periods and states where rental returns are more consistent and even higher than operating profits. For example, the real operator returns in Corn Belt states averaged more than 2.5 percent higher than average real after-tax rental returns from 2008 to 2013. Since 2013, cash rental rents in the Corn Belt increased, and the gap narrowed, inverting for some states in 2016 and 2017.

For most states, returns from rental income are lower than operating returns, but they also exhibit lower volatility from year-to-year. Cash rents tend to be sticky as many operators will enter into multi-year contracts at fixed and semi-fixed prices.

**Figure 1: Inflation-Adjusted Farmland Net Operating Income per Acre by U.S. Region**



**Figure 2: Average State-level Operating Returns vs. Rental Returns (1994-2017)**



Figure 2 plots each state's average real operating profit against its average after-tax cash rental return from 1994 to 2017. The size of each bubble is related to the total value of agricultural real estate in the state. Most states fall near the identity line where operating returns are near or slightly higher than rental returns. Southeastern states like Florida, Georgia, and North Carolina tend to have lower rental rates, but Mountain and Plains states like Idaho, Colorado, and Arizona tend to have higher rental rates (likely due to the higher rents associated with irrigated cropland, a quirk of the survey data reported by the USDA). Average operating returns to California farmland has far outpaced rental returns due to the large returns on nut crops and other orchard crops. States with a higher percentage of their cash receipts to permanent crops tended to have higher returns, a result of the higher margins achieved by fruits, nuts, and vegetables and the additional investments required in the trees and vines to produce the crops.

### THE FINAL WORD

For most regions, average NOI per acre followed the expansions and contractions of the commodity price booms in the 1970s and 2010s. Corn Belt per acre returns have lowered from the most recent agricultural expansion, but the current profitability is at a higher level than the prior 25 years.

Western agriculture is currently producing significantly higher average profitability from both an average NOI per acre as well as a percentage of average land values. The disparity is likely because Western agricultural production is focused on farm products closer to the consumer (i.e., fruits, nuts, and vegetables), and those states tend to show higher profitability than those in grain-intensive states. However, higher risks tend to follow higher returns, and Western growers certainly have several unique risks to manage including water access, lack

of generic commodity markets (i.e., you can't buy apple futures on the CME), and a labor-intensive process that is highly reliant on the U.S. immigration system to manage workflow.

In general, average returns for cash rent at the state and regional level tend to normalize with the returns to operators as landlords increase rents to share in the increased profitability. Declines in state average NOI for operators also leads to declines in average cash rents, but rents tend to be sticky and take time to show up in the data. Average rental returns offer lower volatility compared to operating returns, but that also limits upside potential from year-to-year as increases in NOI are absorbed into rental rates over several future periods. 🌍

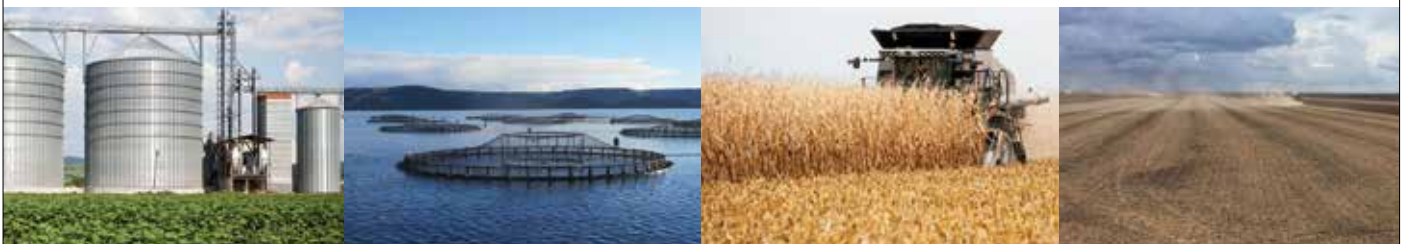
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# REGENERATIVE AGRICULTURE: Investing in a Brave New World

By Lynda Kiernan, GAI Media

American scientists and policy makers alike are calling for more attention to be paid to the environmental challenges attributed to global climate change, and as outlined in the dire climate report issued by 13 U.S. federal agencies last November. The report, the second volume of the National Climate Assessment required by law every four years, suggests that climate change could eliminate up to one-tenth of U.S. gross domestic product by 2100, with agricultural yields potentially down to 1980s levels by as soon as 2050.<sup>1</sup> In the early days of February 2019, Democratic U.S. Congressional members introduced the *Green New Deal* - a massive legislation package setting aggressive goals to revolutionize the U.S. economy, create jobs, and fight climate change through eliminating U.S. carbon emissions across the transportation, agriculture, and energy industries.<sup>2</sup>

The introduction of such aspirational legislation may have little chance of passing into law, but it does spur conversation and debate, which might have the potential to result in bipartisan solutions and plans for the future. It is indeed easy for agricultural producers, investors, scientists, and policy makers alike to be overwhelmed by the scale of change required in order to hasten a shift toward production systems that align with ambitious environmental goals. However, farmers aren't without weapons in their arsenal.

"Regenerative Agriculture" refers to a holistic method of production that rebuilds soil health and organic matter, restores biodiversity, improves the nutritional profile and resilience of crops, improves the water-holding capacity of soil, and sequesters carbon to draw down atmospheric CO<sub>2</sub> levels.

*The Carbon Underground and Regenerative Agriculture Initiative* defines Regenerative Agriculture practices as:

• *Practices that (i) contribute to generating/building soils and soil fertility and health; (ii) increase water percolation, water retention, and clean and safe water runoff; (iii) increase biodiversity and ecosystem health and resiliency; and (iv) invert the carbon emissions of our current agriculture to one of remarkably significant carbon sequestration thereby cleansing the atmosphere of legacy levels of CO<sub>2</sub>.*<sup>3</sup>

I'm sure we can agree that these goals sound not only worthy, but necessary. However, I can also hear the sighs of lingering doubt that whisper back that farming is not purely a philanthropic activity - but a for-profit business. And indeed, regenerative agriculture and profit *are not mutually exclusive*.

## BY THE NUMBERS

It is understood that agriculture, like mining, is a primary sector of the economy, meaning that the growth and development of other economically important sectors depend upon it. And like mining, since the 1800s, it has been widely accepted that farming, by its very nature, is an extractive industry. But whereas mining is obviously so, the extractive nature of farming is much less so - embodied in water pollution, soil degradation, erosion, and loss of fertility.

Along with this, we have done a poor job in modernizing how we look at the profit and loss associated with farming. Higher crop yields and more animals, partnered with low cost of inputs, have traditionally meant higher profit. For centuries, the unaccounted losses tied to traditional extractive farming have been viewed as unavoidable, and inherent - but it need not be this way, according to the Union of Concerned Scientists, who state that a shift from extractive to regenerative agriculture is not only possible, but profitable, when taking a more modern, learned, and complete approach to the costs and output of agricultural production.<sup>4</sup>

As proof, The Delta Institute and Earth Economics, with funding from the Department of Agriculture's (USDA's) Natural Resource Conservation Service (NRCS), has worked with Farmland LP, an agricultural investment firm that has been using regenerative farming practices for almost a decade on more than 6,000 acres of farmland in its portfolio.

"With the current system that focuses on growing more cheap food, we face a dire situation that intensifies the degradation of critical farmland," David LeZaks, Ph.D. in Environmental Resources, and leader of the regenerative food systems project for the Delta Institute, told Forbes.<sup>5</sup> "Recent evidence demonstrates that by re-orienting capital and the institutions and people that move capital, we can reverse farmland degradation and build regenerative food systems that undo much of the damage that has been done over the past century."

Through its funds, Farmland LP purchases conventionally-farmed operations, and integrates sustainable production methods and management systems with the multi-faceted goal of generating competitive return on investment, while also realizing positive environmental and social effect. However, the ability to quantify these "tangible but hidden" metrics, which are not included in financial statements, are only now being developed.



Working with its partners, Farmland employed Ecosystem Service Valuation (ESV) and Greenhouse Gas (GHG) accounting models on a field-by-field basis to quantify biophysical. And on a deeper level, ecosystem service valuation metrics that reflect the environmental, social, and economic value that Farmland's managed farms generate through clean water, biodiversity, healthy pollinator habitats, and improved soil.

Together with mapping generated by Farmland LP's Geographical Information System (GIS) and management data from its farms, Farmland LP employed a combination of three models to quantify biophysical and ecosystem service values:

- **The Ecosystem Value Toolkit (EVT)** – a primary reporting tool that uses a set of calculators to estimate the dollar value of ESV generated by each property.
- **COMET-Farm** – Developed by the USDA NRCS and Colorado State University, COMET-Farm estimates the carbon footprint of a farm or ranch based on information on management practices and spatially-specific data on climate and soil conditions.
- **Revised Universal Soil Loss Equation (RUSLE)** – Developed by the USDA and the University of Tennessee, RUSLE estimates soil loss due to sheet and till erosion.

The resulting report: *Valuing the Ecosystem Service Benefits From Regenerative Agriculture Practices* found that the 6,011 acres of farmland valued at \$85 million under Fund I generated \$12.9 million in ecosystem service value since inception.<sup>6</sup> For comparison, these same properties would have caused \$8.5 million in *ecosystem harm* over the same time period if operated conventionally – meaning, that Farmland's sustainable management has generated a total \$21.4 million in net ecosystem service value benefit, in addition to the 67 percent net financial gain in the fund - generating what Farmland LP calls, "a true double-bottom line investment return".

"It [regenerative agriculture] has so many benefits to the environment, to human society," Craig Wichner, founder and managing partner of Farmland LP, told Forbes.<sup>7</sup> "But we're also demonstrating that you can grow great, healthy, wonderful food and be more profitable than conventional agriculture systems."

## COLLABORATIVE CHANGE

As of May 2018, Food Tank listed 17 global organizations working to promote regenerative agriculture. From grassroots organizations such as Aranya Agricultural Alternatives working in rural farming communities in India; the farmer-led Soils, Food, and Healthy Communities group in Malawi; and Sustainable Harvest International working in Central America - to groups such as Terra Genesis International, a design consultancy staffed with engineers, ecologists, permaculture experts, carbon scientists, and financial analysts, that advise large-scale agricultural producers on how integrate regenerative production practices and redesign their supply chains.<sup>8</sup>

One common thread is clear - whether you are a smallholder in Peru, or one of the largest agricultural producers in California - the shift to regenerative agriculture is a collaborative effort.

Another group fostering such collaboration is the Regenerative Agriculture

Investor Network (RAIN).<sup>9</sup> With funding from the Conservation Innovation Grants program of the USDA's Natural Resources Conservation Service (NRCS), RAIN's aim, according to its website, is to use open networking and light facilitation to "increase our shared literacy, understanding of deal flow, [and] investment opportunities..." while asking, "How do we capture the carbon farming potential of restoring and enhancing ecosystem and soil health while providing food, fiber and other human material needs?"

RAIN is currently partnered with some of the top agricultural investors and proactive players in ag today, including the Delta Institute, Compeer Financial, Bickford Organics, Croatan Institute, Dirt Capital Partners, Encourage Capital, Equilibrium Capital, Farmland LP, FoodCrunch, Green America Center for Sustainability Solutions, Meadowlark Organics LLC, Nourish<sup>10</sup>, Pipeline Foods, Plovgh, Primrose Valley Farm, Rodale Institute, Sustainable Insight Capital Management, and Vilicus Capital.

"Right now, in agriculture, there are a lot of investments flowing into alternative meat protein, for example, but there are also known pathways for how to move capital into regenerative, pasture-based systems which produce high quality meat and can sequester carbon using rotational grazing approaches," said Erin Axelrod, in an interview by Slow Money NYC.<sup>10</sup> "Certain approaches are drawing investors more than others—we want to better understand why."

One large-scale company, Applegate, a provider of natural and organic meats, which was acquired by Hormel in 2015 for \$775 million, is doing just that - launching a regenerative agriculture platform that will see all of its meat come from animals that are pasture-raised.<sup>11</sup>

Using the Ecological Outcome Verification (EOV) program developed by the Savory Institute to quantify the initiative's effects, Applegate aims to improve soil health and water quality, and to increase biodiversity through its operations.<sup>12</sup> It also plans to work together with the Savory Institute to train and offer support to producers shifting into regenerative methodologies.

"We see regenerative agriculture and biodiversity as the next evolution in food and farming, and we intend to educate people about these ideas and drive demand for products produced this way," said Gina Asoudegan, vice president of mission and innovation with Applegate, when interviewed in January of this year.<sup>13</sup>

## BOTTOM LINE

Although it can be tempting for some to dismiss regenerative agriculture as the latest "feel good" ploy designed to attract capital and consumer dollars, to do so should come with the warning:

*Ignore at your own risk.* Not only the risks associated with the damage being done to our ecosystem tasked with feeding billions more people by 2050, but also the risks associated with loss of returns due to the degradation of soil, water, and biodiversity. 🌍

## ABOUT THE AUTHOR

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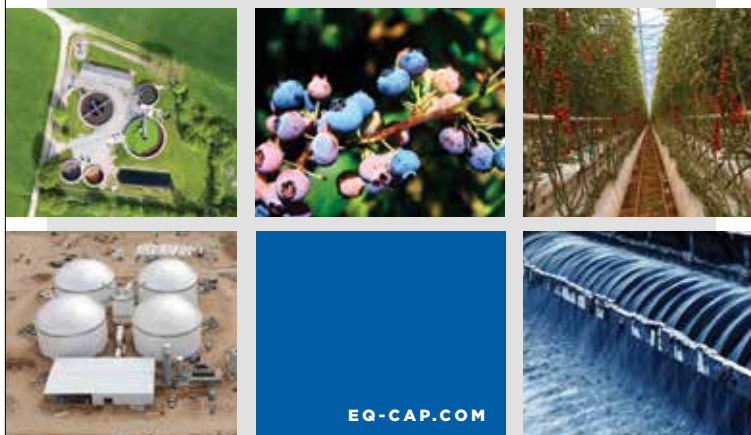
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# EXECUTIVE PROFILE:

## LUCY MACMILLAN STITZER

By Michelle Pelletier Marshall, GAI Media



What do people eat? How do we help consumers make educated decisions about what they put in their grocery cart? Where is the food grown? What is the most efficient and effective way to grow and transport food while feeding a growing population using existing land? How do we connect the farmer to the consumer? Every morning, these are the questions that the Dirt to Dinner team think about when they wake up.

Lucy MacMillan Stitzer, a member of the Cargill-MacMillan family, former Cargill board member, and founder of the Dirt to Dinner blog, has extensive experience in agriculture, banking, investments, and corporate governance. She began her career in banking, working at Citibank, Sandler O'Neill, and AmeriBank, respectively. She also served on Cargill Inc.'s Board of Directors for 18 years, contributing to the company's future strategy and supporting efforts to advance the company's diversity and opportunities for women. Since 2011, Stitzer has been chairman of Waycrosse, Inc., the family office of the Cargill and MacMillan families, where her primary focus is to ensure a successful future for both Cargill and the family. Throughout her career she also has benefited from direct equity investments. Today, she lives in the New York metropolitan area and serves on the board of Hamlin Capital Management, as chair/owner of Rush Creek Golf Course, and as the founder of Dirt to Dinner.

Stitzer founded Dirt to Dinner in 2016. Frustrated by the disconnect between hard-working farmers, agriculture, and the dichotomy of what was being marketed in the grocery store, she created the consumer-based food blog. Under her direction, the site has emerged as a strong voice for the modern agricultural system and a primary resource for curious consumers. Dirt to Dinner connects both ends of that food chain – with a principal commitment to help consumers learn more about where their food comes from, as well as highlight the farmers who provide it.

The online publication focuses on global food, sustainable agriculture, and nutrition. The publication has a broad range of subject matter – from food trade and public policy, to genetic engineering and animal antibiotics, and everything in between. Perhaps the most distinctive accomplishment in our era of partisanship and hyperbole, is that Stitzer has made Dirt to Dinner a voice of solid, objective research, and sound, science-based reason, all to advance intelligent and informed consumer decision-making with regard to our global food system.

We got the chance to speak with Stitzer about her various roles in the sector.

### ON HER CARGILL EXPERIENCE

**1. Over 20 years ago, you were instrumental in developing the first strategies to outline the future for Cargill. Now that you can look back on them, how have they positioned the business for success?**

Our strategy has been to restructure and get closer to the consumer and the farmer and bring more added value to our end customers and ultimately the consumer. We've continued to focus on this over the last 20 years. It's been a slow process, but a great one.

The most exciting part of this launched in 2010. For years we had a competitive edge because we sold a high volume of commodities. Over a period of time though, a commodity is a commodity and we did not necessarily differentiate ourselves from our competitors. We realized in 1996 that this wasn't a long-term strategy and we needed to rethink our path.

We turned our focus to building stronger relationships with our customers. We moved from simply selling a commodity, to devising solutions. Being more relationship-oriented served the company very well delivering more success, and setting the framework for today.

## 2. During your time with Cargill and in the agribusiness sector, what have you seen as the foundation of success?

The biggest key to success is the ability to be adaptable, flexible, and open to change – whether this be as a company, senior manager, or board member. To always be prepared and solid with great earnings, great employees and culture – but always ready to accept change.

Finally, culture is the most important lasting feature. The top companies become top firms by having a distinct, powerful, and compelling culture – a set of values, beliefs, principles, and standards – not of just professional, but also personal conduct. The culture tells you how things really get done, and how decisions are made when treading on uncertain or new territory. Cargill's culture allows us to do that extremely well.

### ON AG INVESTING

## 3. Based on your experiences at Cargill and your family office, what do you see as the potential impact of the world's leading global agribusinesses working together with financial businesses in the sector?

As an agricultural community, we are only going to be effective when we work together rather than separately. That matters when your job is to feed 7.5 billion people today – and 10 billion within our children's lifetime. It matters when we have to figure out how to get the highest yield per acre but keep our water, air, and soil clean. It is about economic and social welfare. At the end of the day, it is about a healthy planet, healthy food, and healthy people. We need diversity of thought to be able to achieve it all.

Big agribusinesses don't always have the capital to finance everything their R&D organizations recommend, though we are seeing more of this. Cargill is investing in technology and innovation across the food and agricultural sectors. For example, recently Cargill invested in Cainthus, a startup providing cow facial recognition technology to monitor the animals' health and other attributes to inform feeding decisions and overall animal health and welfare. Also, many other companies are coming up with new technologies. In many cases the smaller companies can move forward with innovation more quickly. We're also seeing more partnering by big companies to collaborate and create efficiencies that benefit the larger industry.

**“Our strategy has been to restructure and get closer to the consumer and the farmer and bring more added value to our end customers and ultimately the consumer.”**

Agribusiness provides a lot of opportunity for disruption since the sector has been buying, selling, and processing food the same way for decades, opening the door to innovative solutions. This is a great time for both the consumer and the investor, with many new technologies on the horizon, a strong focus on providing transparency in the supply chain, and varying big data solutions for the farmer and others operating in food and ag. All of these pathways are transforming ag into a more efficient, more exciting place to invest.

## 4. What is the guiding vision for your family office Waycrosse?

Cargill is a great company for many reasons and one of those is that it is well-owned. We are a family business and have been for 153 years. The family provides a solid foundation, values, direction, vision, and consistent ownership, which is really important. We are very supportive and have a long-term view; we are not quarter to quarter. We have very patient capital but we also have high expectations.

Waycrosse works closely with the family members, handling all financial aspects for them. We are working with the next generation to ensure they are well educated on the business as well as connected and engaged in its operations.

Our family office goal is such that we continue our sense of ownership and pride, and are excited about Cargill, in terms of protecting it and preserving it for today and for future Cargill generations of employees, stakeholders, and customers.

### ON DIRT TO DINNER

## 5. How did your experiences influence your desire to educate consumers about food through your blog, Dirt to Dinner? What goals have you set for this media platform?

I am the mother of three children, two of whom were born with a blood disorder, inherited from my side of the family. When I asked the pediatrician the best way to keep them healthy, he said “just feed them well”. I took this to mean eat organic. So I started my own vegetable garden, made homemade baby food, and felt that I was providing my children with the healthiest foods. But as I spoke to more people from large-scale agriculture, it became clear to me that there was a huge disconnect with my approach. Sometimes organic is better and



sometimes conventional farming practices are better. Sometimes integrated pest management is best. In the big basket of agricultural chemicals, some are allocated to conventional farming and some are allocated to organic. The best food all depends on the farmer's technique and individual practices. I came to the realization that in order to feed a growing population on the same amount of land, it was a combination of different farming practices that would prove the most effective and healthy for all.

Did you know that all meat is free from antibiotics? It is against the law to process any dairy or meat where the animal has antibiotic residue. Are cage-free hens really happier? Not necessarily. Are women maturing earlier because of the hormones in milk? No, they are not. From what I see as marketing tactics in the grocery store, and what we know about food – there is a disconnect.

At Dirt to Dinner, we are always searching for the facts behind our food. Lisa Hurst, Hillary Kaufman, Caroline Breed, Hayley Philip, Garland West, and I spend hours researching, discussing, and debating different topics.

Our goal is to educate the consumer on how food is farmed and processed, and also to educate the farmer on consumer trends and purchases. If you read Dirt to Dinner you will learn whether certain foods or diets are healthy, what sustainable agriculture means, and how food makes its way around the world to come to your grocery store.

Many times, food purchases are aspirational. Consumers want full transparency to know where their food originates. But at the same time, they have an idealized emotional view of where it should come from and the two don't always meet. You might have a farmer who grows both conventional and organic strawberries yet won't feed his or her family GMOs because they really don't understand what it's all about.

Every farmer and processor has their niche and everyone looks at their ag world from their own perspective. At Dirt to Dinner, our goal is to broaden that view so that everyone understands the whole picture and can make an educated decision to ensure that we don't have regulatory policies that prevent food from being grown and eaten in the most sustainable way. 🌍

**Lucy MacMillan Stitzer** will be a featured speaker at Global AgInvesting 2019 in New York City, April 1-3. Learn more at [www.globalaginvesting.com](http://www.globalaginvesting.com).







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# HEMP:

**AN INVESTMENT  
DOOR HAS OPENED**

By Bethleen McCall,  
Colorado Hemp Industries Association



Industrial hemp production has been occurring in parts of the United States since 2014 under a pilot program created by the 2014 Farm Bill. It is estimated that just over 75,000 acres were grown nationwide in 2018, with Colorado continuing to lead the industry with the most farms and processors in the nation.

After the long-awaited legitimization of the U.S. industrial hemp industry through the recently-passed 2018 Farm Bill, it is now up to regulators and industry partners to institute a framework to ensure industrial hemp grows responsibly to its full potential, bolstering the U.S. economy and opening up a new investment alternative.

## A MULTI-USE CROP

Industrial hemp is a close cousin of marijuana, and they share the name *cannabis sativa*. The difference is that hemp, by law, must have less than 0.3 percent of THC, the psychoactive ingredient in cannabis.

The sought-after ingredient in hemp is cannabidiol or CBD, and in many states, the plant can now be legally grown, processed, and shipped across state lines. Additionally, 30 countries permit farmers to grow it in some manner. Often called the plant with 25,000 uses, industrial hemp can be used as food for humans and animals, as well as in construction materials, biomass plastics, textiles, personal care items, and nutraceutical products. It is used in everything from facial creams to coffee drinks to sleep tinctures. In 2017, the sector produced at least US\$820 million in revenues, which grew to over \$1 billion in 2018 with an expected 14 percent CAGR through 2022.<sup>1</sup> The sector is projected to be worth US\$10.6 billion by 2025.<sup>2</sup>

There are three main components of the industrial hemp plant that have proven to be viable. The fiber, which has shown great promise not only as a textile but more so as a natural fiber composite. The seed, which is high in protein offering great potential in the increasingly popular plant-based protein market for human consumption, and the seed cake for livestock feeding. The seed is also sought after by the cosmetics industry for its oil content, which includes nutritionally significant ratios of amino acids. Additionally, its potential as a bio-fuel is being explored. Finally, the plant is desired for its CBD content, which may be useful in bolstering the body's endocannabinoid system. This by far is the most profitable sector in the industry. Medical research is just beginning in the promising new field of cannabinoids and the different ways supplementing the endocannabinoid system may benefit people who suffer from a wide range of illnesses such as depression, Parkinson's Disease, and epilepsy.

## WHO'S IN CHARGE?

With the removal of hemp from the Controlled Substances Act, regulatory oversight of the crop transferred from the Drug Enforcement Agency (DEA) to the U.S. Department of Agriculture (USDA). Thus hemp is now treated as a mainstream commodity crop, with the USDA having purview over agricultural production, and the establishment of standards, specifications, and rules to manage the emerging industry.<sup>3</sup> After baselines are established, states will have the option to submit their own plans to oversee production. If states choose not to submit a plan, it is anticipated that producers from those states will be able to apply directly through the USDA to grow industrial hemp.

Existing industry insiders are closely monitoring the outcome, which may result in mass exodus from states with less favorable programs. Kentucky is one state that is very enthusiastic about the opportunities – having

once earned it the moniker of "Hemp Capital of the World"<sup>4</sup> It also is where farmers are seeing hemp outperform long-standing crops like tobacco, and investments are being made, such as the US\$40 million Kentucky-based GennCanna put into a new multi-processing facility in that state in December 2018.<sup>5</sup>

The FDA also has regulatory oversight over the hemp industry. Hemp-seed derived ingredients such as protein powder and oil already have received generally-recognized-as-safe (GRAS) status, and the FDA said in December 2018 that efforts will be ongoing to ensure consumer safety in the cannabinoid market. The U.S. Hemp Authority is also working to ensure consumer safety by creating their own guidelines of best practices and standards for industrial hemp products, and have begun independently verifying hemp products.

As another check and balance, the passing of the 2018 Farm Bill means that now the Risk Management Agency will begin collecting crop history. Traditionally they require three years of cropping history for an area, prior to offering federally backed crop insurance for specialty crops. The private sector has answered the call with limited crop insurance offerings for the 2019 outdoor industrial hemp season.

## BANKING ON IT

Thanks to the full legalization of hemp, the banking, merchant services, and the lending industries are undergoing a transition. Where many banks and merchant services had avoided transactions with industrial hemp businesses due to misinformation about requirements for suspicious activity reporting and the like, and its association with the cannabis sector, they are now engaging in the sector. This previously stifled the industry by restricting access to bank accounts, limiting the ability to accept payments, and impeding operating and infrastructure improvement loans for producers, processors, and manufacturers. The majority of investment in the space to-date has been from private wealth, such as the announcement by Sanitas Peak Financial of a US\$50 million private equity fund on the same day of the signing of the Farm Bill. The fund, focused on all aspects of industrial hemp production from farming, to extraction, processing, laboratory testing, and distribution, was co-founded by Nicholas Mortimer and Charles Wellso in Colorado.<sup>6</sup>

The ability to access traditional loans, Rural Development funds, and federal grants is a huge game changer for the industry, especially in rural America. Previously shuttered tobacco farms are primed to take advantage of the emerging CBD industry due to their existing drying sheds. Soy farmers struggling with a diminished market due to tariffs and competition from the South American market also could make the conversion to industrial hemp, a higher protein crop. And indeed the numbers show that producers are now planting the crop in record numbers, where 2018 saw hemp grown across 23 U.S. states on 78,176 acres—more than triple the number of acres from the previous year, according to the 2018 U.S. Hemp Crop Report.<sup>7</sup>

## THE POWER OF CBD

The retail potential of hemp-derived CBD and cannabinoid products are just beginning to be realized. With the federal policy shift, chain retailers are testing a wide range of hemp products with their customers. Coca-Cola Co. confirmed in September that it was exploring the CBD market and "the growth of non-psychoactive CBD as an ingredient in functional wellness beverages around the world"<sup>8</sup> Also, last autumn Walmart confirmed that it

had undertaken preliminary fact finding as it considers offering cannabinoid products in its Canadian locations. In Canada – where sowing hemp has begun to replace canola acreage as experts claim farmers can earn twice as much growing hemp as they can growing canola – it is anticipated that farmers will plant over 100,000 hectares of hemp this year.<sup>9</sup>

Currently, the only retailers with significant product penetration to date are head shops and select natural food stores, though CBD products are expected to go mainstream very quickly, and are readily available online.

Prior to the recent Farm Bill, the CBD industry was on easily on track to be a billion dollar-plus sector by 2020 in the United States. With the policy change, its earning potential is greatly increased and impossible to responsibly project this early on.

### THE WALL STREET IMPACT

The Federal pivot on industrial hemp also brings new opportunities to Wall Street. U.S.-based hemp companies now have full access to the Nasdaq and NYSE, creating a global shift in cannabis investing. This is likely to lead to more activity in the technology, food, agricultural, and medical industries, as well as to give U.S.-based hemp companies an advantage over the global market.

While much remains to be seen, the 2019 growing season promises dramatic increases in hemp acreage. Limiting factors for the upcoming season, in addition to unknown regulations, include limited quantities of seed stock and clone availability, and overall unstable genetics; no herbicides labeled for industrial hemp production; and limited workforce numbers. Additionally, even with a willing consumer market, the processing side of the industry simply cannot expand quick enough to handle the overall production capacity.

Despite these obstacles, industrial hemp production and processing have already proven to be an economic win for communities. In 2017, the Kentucky Department of Agriculture reported that of the 2,300 acres harvested, licensed hemp processors paid Kentucky growers US\$75 million. Processors then leveraged that into gross product sales of US\$16.7 million for 2017. Licensed processors also reported capital investments of US\$25.6 million leading to 81 new full-time jobs in the industrial hemp industry in processing alone.

By the time the 2020 growing season approaches, it is likely that the USDA and FDA will have created the foundation of their programs, and most states will be operating an approved industrial hemp program. Knowing that much of the uncertainty will be resolved within the next 18 months, myriad investors, producers, processors, and manufacturers who have been watching the evolving industry from the sidelines are likely to make their move into the space and capitalize on the rapidly emerging industry, which is set to reach an impressive multi-billion-dollar mark by the close of 2020. 🌱

### ABOUT THE AUTHOR

A fifth generation ag producer from Northeast Colorado, **Bethleen McCall** specializes in industrial hemp, currently serving as the vice president of the Colorado Hemp Industries Association. McCall presented “Hemp: Ag’s Great Missed Opportunity” at the 2018 Women in Agribusiness Summit in Denver. Shel can be reached at [bethleen.mccall@gmail.com](mailto:bethleen.mccall@gmail.com).

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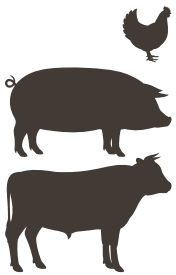
# ALTERNATIVE PROTEINS ON THE RISE



Thirty percent of the calories consumed globally by humans come from meat products.



Global protein consumption will reach 943 MMT by 2054, rising at a 1.7% CAGR.



Alternative protein sources could claim as much as 33% of total protein consumption by 2054.



The global plant protein market was valued at US\$6.41 billion in 2018, and is expected to register an estimated CAGR of 7.1%, during the forecast period, 2019-2024.



Soy – the first generation protein – is expected to account for about 80% of the alternative protein market by 2024.



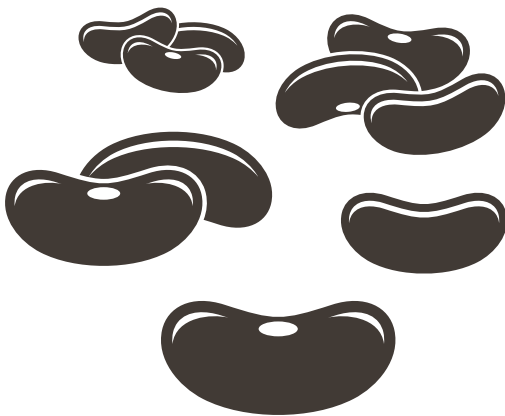
The “second generation” proteins – pea, rice, canola, etc. – and “third generation” – insects, algae, and synthetic biology – could make up as much as 50 percent of alternative protein market by 2054.







North America is the most prominent market for plant-based proteins.



Plantings of U.S. pulse crops – dry beans and peas, lentils, and chickpeas – are up 69% since 2013.



Sales of pulse-focused foods are up to \$800 million annually, up from \$10 million in the late 1990s.

A Plant-Based Products Council, that includes the likes of Cargill and ADM, was founded January 2019.



# THE DEALS

## 2015

**Impossible Foods'** second round raised \$108 million to further its plant-based burger that "bleeds its own blood".

**Beyond Meat** raised \$17 million from investors.

## 2016

**Memphis Meats** received an investment of \$17 million to put towards its lab-grown meat, where the cost of its first "meat" was \$18,000 per pound.

**Tyson Foods** became the first meat company to invest in an alternative meat company, **Beyond Meat**.

## 2017

**Maple Leaf Foods** acquired plant-based protein manufacturer **LightLife Foods** for \$140 million.

**Nestlé**, the largest food company in the world, acquired plant-based foods manufacturer **Sweet Earth**.

Hollywood director **James Cameron** and his wife, **Suzy Amis Cameron**, formed **Verdient Foods**, the largest organic pea protein facility in North America.

## 2018

**Cargill** made an undisclosed investment in **PURIS**, the largest pea protein producer in North America.

Aussie venture capital firm **Blackbird Ventures** led a US\$6.87 million Series A for **SunFed**, a New Zealand-based maker of plant-based meat alternative products made from pea protein.

**Ingredion** made \$140 million in strategic investments in pea protein opportunities.

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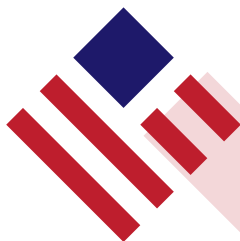
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