Manulife Investment Management

Sustainable investing

Agriculture 2022

A *message* from Oliver S. Williams IV, CFA

In a world that seems increasingly fragmented and divided, there may appear to be few things that unite us. Food is one of them. As the pandemic wore on in 2021 and geopolitical tensions moved toward a flash point, the agriculture sector wasn't immune to global supply chain upheavals.

The United Nations and World Bank project that the world population will reach 9 billion to 10 billion people by 2050, and there's now general consensus that the only way to feed a population of that size is to grow more sustainably. We have to grow, transport, and deliver food to people in ways that preserve, rather than undermine, our ability to continue growing, transporting, and delivering that food.

What does that look like in practice? Certainly, it'll vary by crop type, geography, market, and many other factors. But there are some common themes, and we're pursuing as many of them as we can. It means:

- Being responsible stewards of water. That's why we've grown our global water team from two to five professionals spanning the full range of operations, policy, and strategy expertise.
- Understanding the likely effects of climate change, and that's why we conducted climate change scenario analysis workshops with operations in our three major growing regions.
- Deliberately considering which markets to enter, or not, using a sustainability lens. We've built a market sustainability assessment tool to evaluate just that.
- Understanding the growing market for soil carbon sequestration, which is why we've investigated 15 such programs and continue to diligently review the rapidly developing space.
- Using regenerative farming techniques where they make sense environmentally and economically, which is why nearly two-thirds of our permanent crop and one-half of our row crop farms do so—and why we're seeking to do more.
- Incorporating sustainability considerations into our valuations, so we're now using factors to flex hurdle rates up or down based on a farm's anticipated sustainability performance.
- Recognizing the pivotal role sustainability plays in our strategic direction, which is why we've established the agriculture stewardship committee to make such decisions.

And last, but certainly not least, it's why our entire U.S. agriculture platform, including nearly 70,000 acres of permanent crop and over 200,000 acres of row crop farmland, have been certified to the Leading Harvest Farmland Management Standard. Leading Harvest demonstrates our commitment to sustainability, assuring our key stakeholders of sustainable practices, robust management, and continuous improvement. We manage our farmland according to the standard at all our operations globally and are participating in a pilot to formally launch it in Australia.

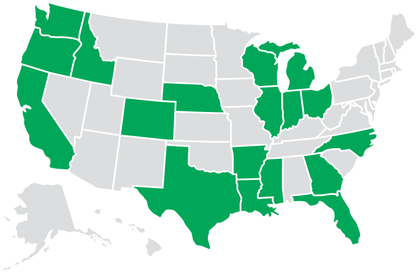
We cannot singlehandedly feed the world, but we can contribute positively toward that goal by growing more with fewer inputs and less impact. That's good stewardship, which is good for the world, and as we've said for over three decades: good stewardship is good business.

Oliver S. Williams IV, CFA
Global Head of Agriculture Investments, CIO

Where we invest

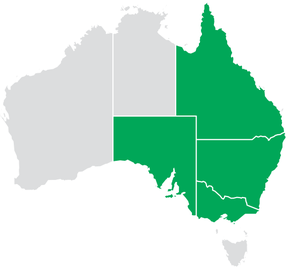
We manage farms around the globe in key institutional agriculture investment regions

United States



Canada

Australia



Chile

Our managed farms | Maps shown not to scale.

Category	USA	Canada	Australia	Chile
Assets under management (USD million)	$3,156	$167	$546	$131
Gross acres	302,247	21,013	119,451	2,570
Asset type per region	Pistachios, almonds, corn, grapes, soy beans, apples, rice, potato, vegetables, cotton, cranberries, walnuts, alfalfa, wheat, canola, peanuts, citrus, olives, barley, cherries. Processing.		Almonds, cotton, grapes	Cherries, apples, pears, nectarines, kiwi, and blueberries. Processing.

Source: Manulife Investment Management, 2021.

How we invest

Agriculture is foundational for human life and well-being. While historically some types of agriculture have contributed to climate change and biodiversity loss, agriculture also holds great promise for mitigating climate change and restoring biodiversity.

The climate impact of an investment should be a core consideration. As the table below showing our 2021 agriculture greenhouse gas (GHG) inventory illustrates, agriculture investments are capable of sequestering more CO_2 than the emissions they generate.

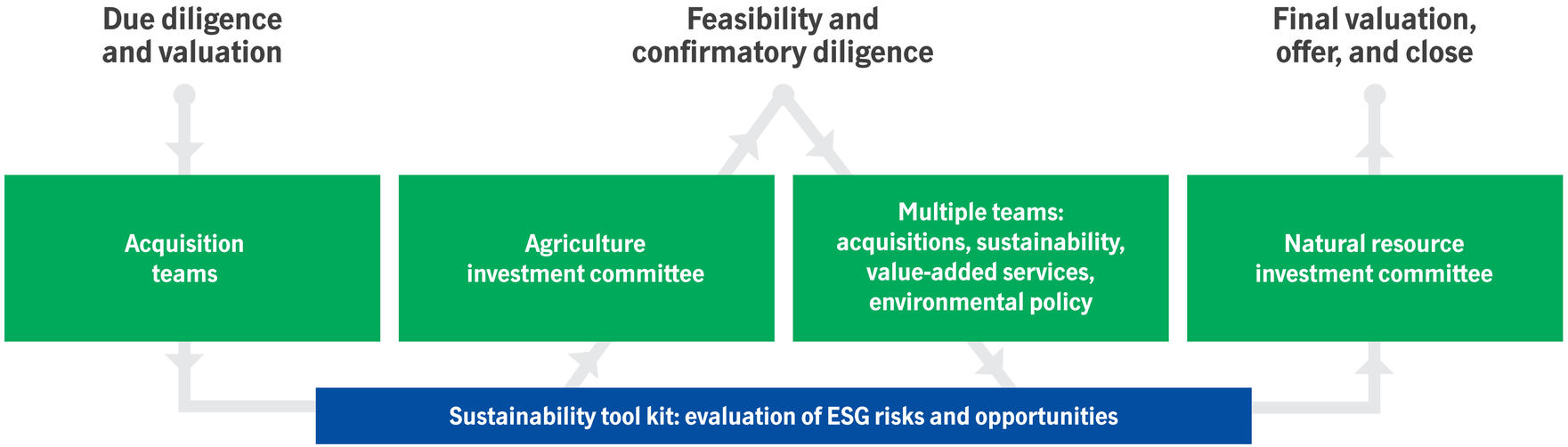
2021 agriculture certification and GHG inventory statistics

Category	USA	Canada	Australia	Chile
Certification	100% (Leading Harvest)	N/A	Leading Harvest pilot	N/A
Scope 1 emissions	23	0	24	N/A
Scope 2 emissions	13	0	5	N/A
Scope 3 emissions	190	4	1	N/A
Carbon sequestered	247	8	38	N/A
Net carbon sequestration	21	4	8	N/A

Source: Manulife Investment Management, 2021. All figures shown in thousand tCO_2e; scope 1 and 2 emissions are calculated based on activity data provided by managers directly operating our farms. Scope 3 emissions are those from leased farms outside our operational control and are estimated using crop-specific emissions intensity data from publicly available research. Carbon sequestration is also estimated using crop-specific sequestration data. GHG profile for Chile will be available in 2023 after a full year of data is available. Leading Harvest certification as of May 17, 2021. Manulife Investment Management is a founding member of Leading Harvest. In addition, Oliver Williams, global head of agriculture, is current chair of the Board of Directors for Leading Harvest.

The investment process: using our sustainability tool kit

In our investment process, we use a proprietary question-based tool co-developed in house by our sustainability, acquisitions, and operations teams to identify, assess, and score environmental, social, and governance (ESG) components of every deal we consider. The tool kit considers a wide range of factors, including anticipated climate risks, adherence to our zero-deforestation policy, water availability, biodiversity, working conditions, renewable energy opportunities, and ability to positively affect surrounding communities.



SRI theme	Climate stability	Ecosystem resiliency	Watershed protection	People empowerment	Community prosperity
Risks and opportunities	• Climate change impacts • Emissions • Deforestation • CO_2 sequestration	• Sensitive lands • Protected areas • Biodiversity • T&E species • Mitigation banking	• Water quantity/quality • Flood, drought risk • Groundwater depletion • Water banking	• Health and safety • Training and development • Labor practices • Human rights	• Community relations • Indigenous peoples • Job creation • Research, internships

For illustrative purposes only. Source: Manulife Investment Management.
SRI refers to sustainable and responsible investing. T&E refers to threatened and endangered.

Asset management: leveraging third-party certification

Last year, we built a similar tool to evaluate the sustainability of particular markets—to evaluate not only the "how" but also the "what." This market sustainability tool has quickly become an important component of our agriculture investment strategy committee's market suitability assessment. We ask approximately 30 questions covering the full breadth of social and environmental factors, both on the farm and within the value chain, to develop an overall aggregate score. This is paired with, and may even help to inform, our view of the market's profitability.

"Last year, our agriculture business became the first to have our entire U.S. agriculture platform certified under the Leading Harvest Farmland Management Standard."

Once we purchase an agriculture asset, we consistently manage it to credible third-party sustainability standards. Last year, our agriculture business became the first to have our entire U.S. agriculture platform certified under the Leading Harvest Farmland Management Standard. As Leading Harvest expands to other countries where we operate, we intend to seek certification in Australia, Canada, and Chile as well, addressing considerations from biodiversity to water, soil health to conservation value, and indigenous peoples' rights to training and education.

Why Leading Harvest?

We were an early mover in third-party forest certification and have managed third-party certified timberland investments for over two decades. Yet until recently, the agriculture sector lacked a sustainability standard that could work across different crop types, production systems, scales, and geographies. In 2017, we began collaborating with leading environmental organizations and farmland owners and managers to build such a standard. Five years later, the Leading Harvest Farmland Management Standard is growing rapidly.

The Leading Harvest principles begin by identifying the need to meaningfully assess the positive or negative impact farmland assets have on their local environments and communities, aiming to:

- Define materiality on a sector-specific basis
- Set out clear principles and objectives for operating in a sustainable manner that are relevant to that sector
- Identify a range of practices that could be employed to achieve those principles and objectives
- Evaluate the extent to which those practices are being followed
- Require an external auditing process that ensures rigor and verifiability of the sustainability claims being made

Learn more about our work with Leading Harvest.

LEADING HARVEST

Climate

Climate stability

We seek to limit the impacts of climate change by responsibly using and managing land, creating carbon sequestration opportunities with our farms, and mitigating climate change through investing in renewables and energy efficiency.

Climate change presents both risks and opportunities for agriculture investing. As a signatory to the Task Force on Climate-related Financial Disclosures (TCFD), we believe it's essential to drive financial markets toward investments, activities, and products that help mitigate and adapt to climate change. We issued our inaugural climate disclosure in 2020, detailing our governance, strategy, risk management, and metrics and targets when addressing climate change. Since then, our foundational approach hasn't changed, but our depth of understanding and level of commitment have—beginning with Manulife's 2021 announcement of Our Journey to Net Zero.

While our agriculture investments sequester carbon in soils and can be part of the climate solution, they also currently represent one of the largest sources of Manulife's global operational emissions footprint. Our climate ambitions include playing our part to reduce Manulife's scope 1 and 2 emissions by 35% by 2035, and we're developing a decarbonization strategy that will help to get us there.

A key component of our efforts will be working with our tenants and value chain partners to reduce emissions and increase soil carbon sequestration.

What's in a climate disclosure?

Governance—The organization's governance around climate-related risks and opportunities. Read more on page 8.

Strategy—The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning. An example can be found on page 10.

Risk management—The processes used by the organization to identify, assess, and manage climate-related risks. For more information, see our 2020 climate disclosure.

Metrics and targets—The metrics and targets used to assess and manage relevant climate-related risks and opportunities. Read more on page 13.

Source: TCFD for real assets investors, PRI, April 27, 2021.

Governance: our organizational approach to sustainability

Alongside the rebranding of Hancock Natural Resource Group to Manulife Investment Management, we've strengthened our governance of climate change risks and opportunities through new linkages across the Manulife and Manulife Investment Management sustainability ecosystem.

Our commitment to sustainability involves leaders in all asset classes, as well as representatives from functional areas such as operations, legal, compliance, risk, and technology. As a result, governance bodies across Manulife Investment Management ensure that sustainability issues are embedded within our long-term business strategies and day-to-day work activities.

The graphic at right illustrates sustainability governance at Manulife, from the board of directors and CEO all the way through each business unit. In the case of agriculture investing, key sustainability decisions related to business-wide policy and commitments are taken by the private markets sustainable investing committee, with direction from the private markets chief sustainability officer and support from the timberland and agriculture sustainability team. Sustainability decisions affecting particular areas of the business are taken collaboratively through the participation of sustainability team members in decision-making bodies (for example, through investment committees or strategy working groups).

Sustainability governance at Manulife

* Executive Sustainability Council includes Manulife chief executive officer, analytics officer, marketing officer, HR officer, sustainability officer, financial officer, operations officer, investment officer, and risk officer.

COE refers to Center of Expertise. SFDR refers to Sustainable Finance Disclosure Regulation.

Strategy: three pillars of our global Journey to Net Zero

Our vast natural resource holdings have enabled us to realize net-zero emissions in our operations, and we're uniquely positioned in our sector to accelerate the use of nature-based solutions in the fight against climate change.

Operations

Substantially reducing emissions to lessen our footprint

- We're proud to share we're net zero in our operations, uniquely positioned due to the carbon removal from our substantial owned and operated forests and farmland outweighing our scope 1 and 2 emissions.
- Manulife is committing to reduce absolute scope 1 and scope 2 emissions by 35% by 2035. We'll take steps such as enhanced efficiency measures, fuel switching, and use of on-site renewables in our buildings to achieve this target.

Investments

Actively investing for a sustainable future

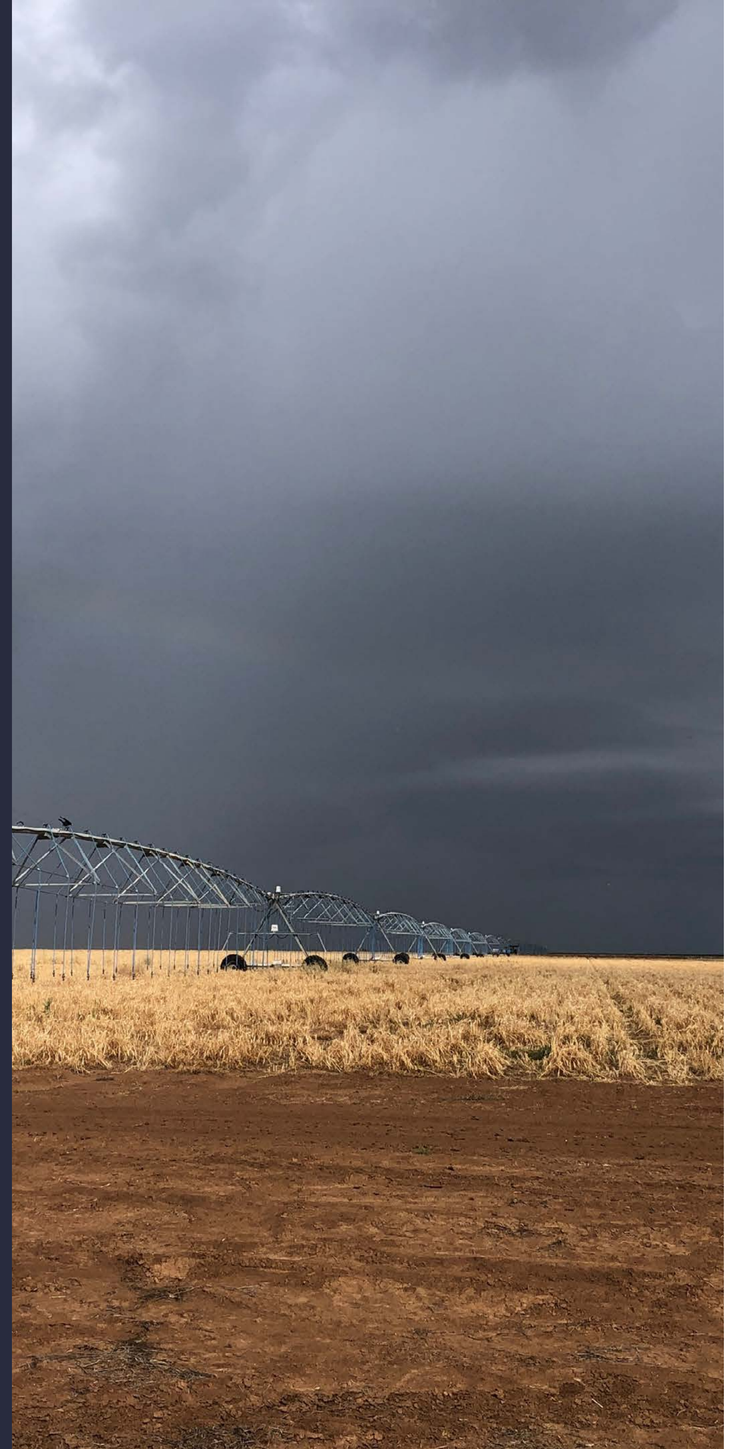
- We're committed to steering our investment portfolio to be net zero by 2050.
- We'll continue to grow our CAD$39.8 billion in green investments, such as renewable energy, energy-efficient real estate, timberland, and agriculture.
- Manulife has committed to the Science Based Targets initiative (SBTi), which will guide target setting, measurement, and progress reporting.

Products and services

Contributing to climate change mitigation and resilience

Through our capabilities in timberland and agriculture, we'll accelerate the development of investment strategies for investors interested in nature-based solutions that capture even more carbon per dollar invested.

The commitments and figures stated above are those of Manulife Financial Corporation, inclusive of Manulife Investment Management.



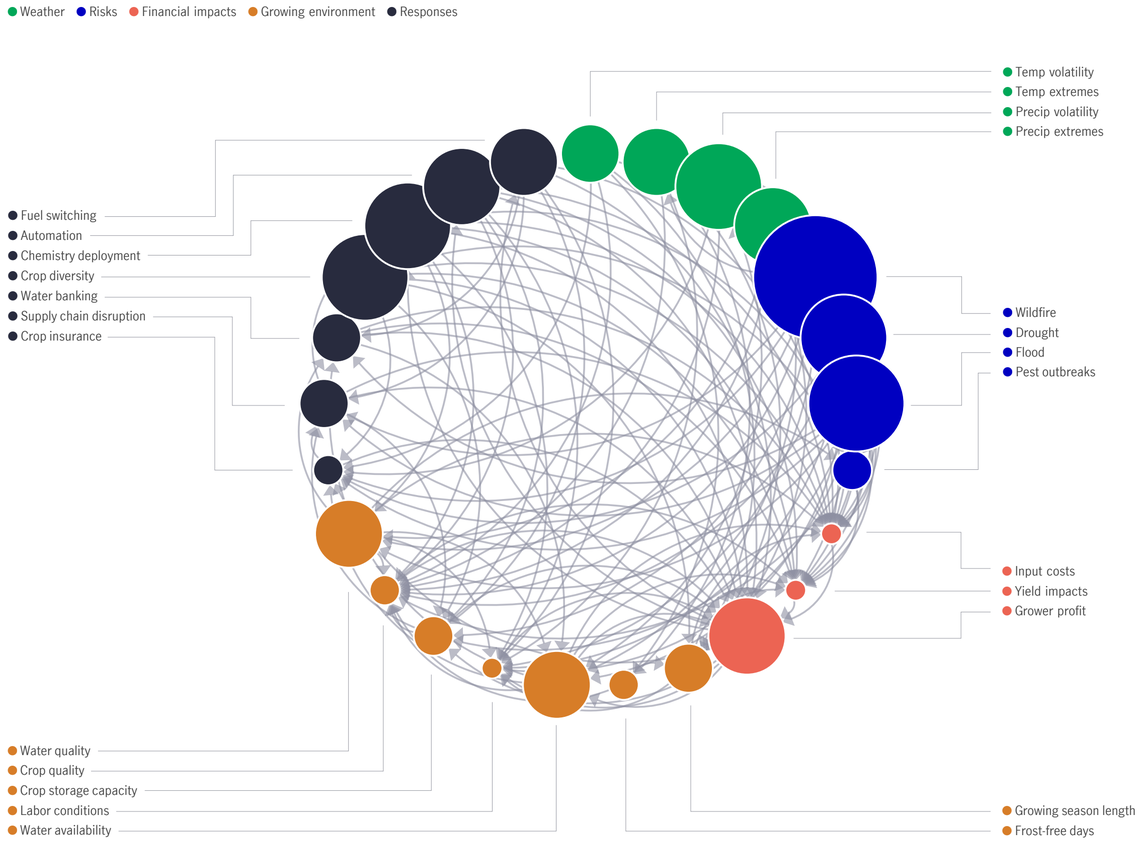
Strategy: scenario analysis

While we're developing plans to reduce our emissions, we're also keeping an eye on how a changing climate may affect agriculture going forward. Climate change itself is certain, but its effects on agriculture are less certain and will likely vary significantly across space and time. This is why—in keeping with the strategy recommendations of the TCFD—we conduct scenario analyses to help ensure that our climate strategy remains resilient amid various potential climate outcomes. These analyses can be challenging for any asset class, but especially for agriculture, given significant uncertainties around the ability of different crop types or varietals to adapt to changing climate conditions.

In 2020, we conducted a pilot climate scenario analysis for our California farmland and last year built on it to extend the analysis across our global platform. Through a series of workshops engaging our agriculture operations professionals from North America, Australia, and Chile, we're now better equipped to gauge our ability to prepare for the realities of climate change.

One key takeaway from these workshops was that while the magnitude of climate effects may vary significantly across space and time, the types of climate impacts are fairly constant, and this enables nimbler strategic responses to them. As with timberland, although different in degree, the number of key risks is small. Yet they interact and influence each other in ways that simple linear cause-effect relationships don't convey accurately (see page 11). Climate change is a systems problem, and we've adapted our thinking about it to reflect that reality.

Strategy: scenario analysis



Source: Manulife Investment Management, March 31, 2022. For illustrative purposes only.

Climate and agriculture

Understanding climate impacts and dependencies

Climate change is complicated. As we seek to understand ways in which our agriculture business will be affected by climate change, it's helpful to consider the relationship between climate and agriculture as a system in which different factors interact with one another. For example, precipitation extremes could result in flooding or drought and destroy crops. If these events increase in frequency, some growers may rely on crop insurance to protect against loss, but insurance would likely become more expensive for the same reasons. While changing climate patterns may make agriculture more challenging in some areas, it could create possibilities in others; for example, as the number of frost-free days might increase in higher latitudes or as crop researchers develop plant varieties more adaptive to changing climatic conditions.

The important point is that these relationships are not linear but interacting. Through our scenario analysis workshops, we identified variables relating climate change to our business and then developed a way to illustrate the relationships between them. The graphic at left shows the different types of factors (color coded) as well as the extent to which they may influence other factors. The larger the circle, the more factors are influenced by it (illustrated by the arrows between factors).

As we progressively deepen our climate scenario analysis, it helps to have a framework that can account for the complexity of the interaction between agriculture and climate change.

Case study

Climate risks: regenerative and organic almonds in California

Regenerative agriculture shows great promise for climate change mitigation and adaptation. Many of our farms use regenerative practices, but few of them have undertaken systematic studies to help determine and quantify the benefits of such practices in contrast to other farming regimes. That's what we're doing at Madera 7.

We've managed the almond orchard at our Madera 7 ranch in California for nearly 30 years. When we were replanting the orchard in 2019, we took advantage of the opportunity to conduct a large-scale experiment into the benefits of different types of farming systems. The practices we're currently testing include:

- **Orchard reincorporation—**grinding the old trees and reincorporating the wood chips/organic material back into the ground
- **Organic production—**no synthetic fertilizers or pesticides applied
- **Regenerative practices—**cover crops, reduced tillage, reduced usage of herbicides and pesticides, blending fertilizer with compost and green waste
- **Irrigation practices—**Different irrigation systems and wetting patterns

Over the next five years, we'll be closely tracking crop quality, yields, costs, water consumption, and pests, as well as all the materials used while cultivating each of the trial sites. We won't have definitive results for some time but similar previous exercises have already enabled us to reduce our pesticide and herbicide application by 20% to 30%, while reducing the number of passes required by mowers (therefore reducing GHG emissions).

Metrics

We aim for continuous improvement both in environmental performance and in data quality. We made multiple improvements to our data collection process in 2021 that resulted in capturing more emissions than we had in 2020. We anticipate reporting in alignment with the GHG Protocol's land sector guidance once it's complete, as well as recalculating our base year (2020) emissions to account for such methodological improvements and to enable a truer year-over-year emissions comparison.

Metrics can never tell the whole story, but they can certainly show part of it. Here's how we're tracking on climate.

Metric	2021	2020	GIIN
Properties managed	269	270	OI1674
Scope 1 GHG emissions (tCO_2e)[1]	47,072	36,634	OI4112
of which: fertilizer (N_2O) emissions (tCO_2e)	18,474	11,233	OI4112
of which: fuel combustion emissions	26,999	22,221	OI4112
Scope 2 GHG emissions (tCO_2e)	17,922	10,177	OI9604
Scope 3 GHG emissions (tCO_2e)	195,684	199,569	PD9427
Biogenic removals (tCO2)	293,046	330,288	PI9878
Net sequestration (tCO2; + sequestration, - emission)	32,368	83,908	PI9878
Number of crop types grown[2]	25	23	N/A
Percent net productive area	88%	87%	N/A

Source: Manulife Investment Management, 2021. GIIN refers to Global Impact Investing Network IRIS+ metric codes. **1** Scope 1 emissions include some small immaterial sources in addition to fertilizer and fuel. **2** Crop types include infrastructure and solar farms; new crops in 2021 include cherries and citrus.

Targets

Similar to our timberland business, we see three main avenues for increasing the contribution our agriculture platform can make to mitigating and adapting to climate change. We can 1) reduce emissions, 2) increase removals, and 3) partner with others to develop innovative ways of doing any of those within our value chain.

First, we need high-quality data that enables an accurate quantification of our existing emissions and removals since decarbonization plans and progress monitoring require measurement against a reliable baseline. Straightforward and scalable methods for calculating emissions—and especially soil carbon sequestration—have historically been lacking, so we've spent the past three years progressively improving our capabilities in this area, and it's an essential supporting element of our decarbonization plan.

Source: wbcsd.org, November 6, 2021. Whereas scope 1 and 2 emissions are calculated based on activity data provided by operations managers, scope 3 emissions are estimated. Effective monitoring of decarbonization progress relies on improved GHG quantification methods to establish a baseline.

Our climate targets

1 **Improve GHG quantification methods—**Working in tandem with the ongoing developments in the GHG Protocol and SBTi, we're building and applying a scalable method for accurately quantifying our GHG emissions and removals—based on field data—for our entire global agriculture platform.

2 **Launch our decarbonization strategy—**In 2022, we'll develop a comprehensive strategy to reduce our operational emissions. Over 75% of our agriculture emissions are scope 3 indirect emissions from our leased farmland, so our plan will need to focus heavily on working collaboratively with our tenants to help them find ways to reduce their emissions.

3 **Scale regenerative agriculture—**Building on the success of regenerative practices throughout our platform, as well as from the systematic pilot trials we're conducting at Madera 7, we're working toward being able to confidently identify the highest potential regenerative practices for our properties. For our leased farms, we aim to have discussions about regenerative practices with all of our 100+ tenants by the end of 2022.

4 **Systematically understand climate risk—**As the availability of high-quality climate projection tools increases, we plan to source climate risk data from an independent third-party provider for our entire agriculture platform, enabling us to understand the anticipated financial impacts of climate change more thoroughly.

Nature

Ecosystem resiliency

Healthy ecosystems provide immense value to the vitality of communities and economies. To ensure this for generations to come, we operate in a way that responsibly manages land and protects sensitive lands[1] and biodiversity.

Watershed protection

Protecting and improving watersheds is vital for the ecosystems and communities that depend on them. We do this by protecting sensitive lands,[1] and adhering to strict water and land management policies and best practices.

Farming requires healthy soils and good water, which is why ecosystem resiliency and watershed protection are our two key nature-related priorities. As managers of agricultural investments, the success of our clients' portfolios depends on access to reliable, affordable, and quality water resources, along with fertile soils well suited to the crops we grow. Consistent with our sustainable investment principles, we also have a responsibility to manage these resources in a way that promotes the health of the ecosystems and communities that depend on them.

Our approach to **ecosystem resiliency** begins early in the investment process. For each potential acquisition, we conduct a biodiversity risk assessment to determine the potential for threatened and endangered species to be present on each property. Using the resources provided by NatureServe, our team of biologists identifies the number of critically imperiled species (as categorized by NatureServe as G1, imperiled (G2), and ESA-listed)—species listed as endangered or threatened under the ESA—and provides this information in the due diligence package for each property. Perhaps most importantly, we don't view these species as liabilities, but rather as assets, and we take advantage of these opportunities to help protect their habitats.

1 Sensitive lands are defined as lands with critical habitat for sensitive or endangered species, or lands with high scenic, historical, cultural, or recreational value.

Our property managers recognize and appreciate natural environments, and we go out of our way to voluntarily preserve them for the species that call them home. One example is the century-year old mesquite tree at our Triangle T Ranch in California where owls nest. Instead of removing this historic tree (or planting much closer to it), we retained it, surrounding it with a generous buffer. Maintaining and creating habitats for these, and similar birds of prey, become a part of our integrated pest management since they help us keep pests in check using existing natural means; we've worked with many local school districts to construct bird and bat boxes for this very purpose.

Watershed protection (water resource management and investment) has become a key focus of our agricultural strategy and operations, enabling us to meet our fiduciary and environmental goals, values, and responsibilities. Given the key importance of water to agricultural investments, we've built a dedicated in-house global water team with expertise spanning all pillars of our agriculture business, from operations and policy to strategy and sustainability, over the last five years.

The team's goal is to manage our water resources effectively and responsibly for value protection, value generation, and risk management. This means maximizing the value per unit of water used—irrigating efficiently and precisely—while implementing state-of-the-art technologies to monitor and manage our water resources for our investments and the environment.

Case study

Monitoring evapotranspiration for precision agriculture

To grow a healthy crop and water responsibly, we need to give our crops the water they need—no more and no less. To do this, we need to know how much water a crop needs and how much water the environment is providing through precipitation by measuring evapotranspiration (ET)—how much water is transferred back into the atmosphere through evaporation from the soil and transpiration from plants. When we monitor precipitation and ET, we can then make up the difference through irrigation. Knowing how much water the plant has used as an output enables us to apply the precise amount of water needed as an input to keep the crops healthy.

Our global operations team uses satellite and fixed-wing aerial imagery, as well as ground-based calculations, to measure ET. In our California platform, we have weekly local ET updates to inform our irrigation schedules, helping to ensure our water application and use is precise and effective. In addition to demand-based irrigation, we've also invested in and installed flow meters on the majority of our water extraction points. In our Australian platform, we use weather-based irrigation scheduling, satellite imagery, and other in-field technologies (such as dendrometers) to determine the appropriate volumes of irrigation based on crop needs and prevailing climate. These technologies allow us to use water efficiently, ensure application of water is effective, and generate the highest value outcome possible for our water use.

Case study

Environmental water and waterfowl in New South Wales

The Murray-Darling Basin is one of Australia's largest and most important river basins. It covers more than 14% of Australia's land mass and provides water resources for urban and rural communities, as well as industry and agriculture. It also has significant environmental importance for a variety of ecosystems, wetlands, forests, and cultural sites. Changing land use patterns have resulted in many creeks and wetlands in the region becoming disconnected from river systems and floodplains.

In response to this issue, we make our irrigation infrastructure available to deliver water to disconnected wetlands and priority environmental sites that adjoin our farms. Since 2019, we've worked with the New South Wales state government to deliver water to Bingera Creek, which adjoins our Goodnight almond orchard, wetting approximately 6.5 kilometers of channel and 50 hectares of wetlands, and providing recorded frog and waterfowl habitat.

Metrics

Nature is challenging to measure, but the metrics below provide some insight into how much we prioritize it.

Metric	2021	2020	GIIN
Percent of farmland third-party certified as sustainably managed[1]	78%	74%	PI6796
Number of nonconformances[2]	0	0	OD4108
Number of opportunities for improvement[2]	1	7	OD4108
Number of exceptional practices[2]	7	10	OD4108
Percent of farms with farm management plan	100%	100%	PI6796
Percent of farms with soil health practices[3]	55%	N/A	PD8494
Percent of farms with biodiversity assessment	100%	100%	PD8494
Number of acres of pollinator habitat	295	172	PD8494
Number of stewardship projects conducted in our farms[4]	19	12	N/A
Number of stream miles protected by best management practices[5]	0.6K	0.6K	OD4108
Percent of area using integrated pest management	100%	100%	PD8494
Percent of investments accounting for water risk and opportunity	100%	100%	N/A

Source: Manulife Investment Management, 2021. GIIN refers to Global Impact Investing Network IRIS+ metric codes.

1 100% of U.S. farms are third-party certified sustainable. **2** Leading Harvest audit results. **3** Includes farms employing one or more of the following practices: conservation tillage or no till; cover vegetation/crop; crop residues; crop rotation; intercropping; nonproductive vegetation; rotational grazing; and soil amendment. **4** Includes North America only. **5** Includes North America and Australia only.

Targets

Just as in our timberland investment platform, our agriculture investments have a role to play in contributing to a nature-positive world, and we're equally committed to supporting the Finance for Biodiversity Pledge. As a global goal for nature develops, we have a responsibility to help halt and reverse nature loss. By 2030, the goal is to have regenerated and preserved nature through improvements in the health, abundance, diversity, and resilience of species, populations, and ecosystems.

As with other sectors, agriculture doesn't yet have a clear road map for this, but as a business that's ultimately reliant on "boots on the ground," we have some ideas. And we're also prominent in the discussion, contributing to the development of a nature-positive road map for the agriculture sector.

Our nature targets

1 **Comprehensively map the location of our operations relative to sensitive lands or key biodiversity areas—** Most of our farmland is in fairly well-established markets where such land isn't likely to be identified, but we believe that greater public awareness of this information is important for contributing to a nature-positive world and we want to play our part in transparently providing it.

2 **Implement a system for tracking how our agriculture operations affect biodiversity, land, and water—**We're building a system of natural capital accounts across our global operations through which we intend to capture, quantify, and potentially monetize the relationship between our operations and nature.

3 **Apply a practical menu of opportunities for following the mitigation hierarchy—**In keeping with the World Business Council for Sustainable Development's nature-positive building blocks as well as the recommendations of the Science-Based Targets for Nature, we aim to establish a straightforward method for implementing the mitigation hierarchy in our business: First avoiding harm, and then reducing and restoring whatever harm is unavoidable, establishing the ability of the ecosystem to regenerate and ultimately contribute to systems transformation.

People

People empowerment

We value our people, employees, and contractors and work to ensure that we're offering not only safe and healthy working environments but the tools, training, and support they need to thrive.

Community prosperity

We're committed to supporting and strengthening the local and indigenous communities where we operate. We provide employment opportunities, public use of our land, engage with nongovernmental organizations, and support local causes as part of our community stewardship.

Stewardship is as much about people as it is about the environment. It also applies as much to our own people—people empowerment—as it does to the communities where we operate—community prosperity.

Empowering our people means offering rewarding jobs and promoting a culture of excellence in a safe, diverse, and inclusive environment—just as in our timberland business and throughout Manulife Investment Management.

Rewarding—In addition to competitive compensation, we offer all eligible full-time and part-time employees:

- **Generous parental leave—**We offer the opportunity to take up to 12 consecutive weeks of paid time off for the birth or adoption of a child.
- **Extra personal time—**We offered five extra days of personal time in 2021 for the second straight year—in addition to existing vacation, family care, volunteer time, and personal time—in recognition of our employees' ongoing commitment despite the COVID-19 pandemic.
- **Dedicated time for learning—**Every second Friday of the month, fuel-up Fridays give employees the opportunity to learn and grow their knowledge.
- **Recognition—**Through Podium, a digital global recognition platform that enables us to express appreciation for our peers, leaders, and teams, anytime and anywhere.

Safe—Our safety record outperforms agriculture industry safety benchmarks. Yet we recognize that we still have room to improve, and that a culture of safety is always more important than safety statistics.

Diverse and inclusive—In 2021, we established a private markets diversity, equity, and inclusion (DEI) council to develop a strategy for DEI across private asset classes, including agriculture. The council includes representation from all private asset classes and geographies and has four workstreams: 1) DEI best practices and opportunities; 2) education and initiatives; 3) communications; and 4) data and metrics. Through this activity, we're seeking to create a culture that's more inclusive, better engages every employee, and provides opportunities for advancement regardless of race, ethnicity, age, gender, sexual orientation, religion, ability, economic status, and other aspects of diversity.

Community prosperity means being good neighbors and contributing to the well-being of the communities in which we operate, whether these are our tenants, contractors, or the general public.

Tenants—While we directly operate our permanent crop farms, we usually lease row crop farms to tenants. Some don't have the financial capital available to purchase significant quantities of farmland. Others may choose to use their available capital for equipment that enables them to farm larger areas rather than committing to a land purchase. In these cases, leasing farmland is mutually beneficial and provides a cost-effective method for these farmers to run their business.

Contractors—In addition to our 900+ global agriculture and timberland employees, nearly 6,000 contractors work on our worldwide properties, including almost 1,400 on our farms. In some smaller rural communities, the scale of our operations may make us a key contributor to local economic activity. We prefer to buy local, maintaining a preferred vendor list and contracts with local companies wherever possible.

General public—While agriculture is a fairly intensive land use that doesn't always allow for recreation on farmland, we do maintain recreational opportunities where possible. In the United States, we lease more than 70,000 acres of agriculture property for recreational use and maintain more than 150 acres of farm property in Wisconsin with open, unrestricted public access.

Case study

Cranberries, river views, and bike paths in Wisconsin

We're one of the largest producers of cranberries in the United States. Wisconsin produces more than double that of any other U.S. state, nearly 60% of the crop. Our Wisconsin team is proud of its work and community, which is why the team maintains a public bike path that runs adjacent to the cranberry property.

One of our cranberry marshes in Wisconsin runs through the town of Biron next to the Wisconsin River. The land offers incredible views of the river and hosts a variety of opportunities for those in surrounding communities to enjoy nature on recreational trails. When public groups made proposals for a public bike path that would run through the town and the Biron Marsh, it was an obvious decision to accept them, since community prosperity is a key priority for us. We therefore not only supported the bike path, but since inception, we've helped to maintain it. At nearly 20 miles long, it's the longest continuous path along the Wisconsin River and allows for several wildlife viewing opportunities, including the sharp-tailed grouse—a state species of greatest conservation need.

Metrics

Contributions to people empowerment and community prosperity can be difficult to measure, but this is how we're doing it right now.

Metric	2021	2020	GIIN
Number of employees (agriculture)[1]	344	350	N/A
Number of employees (total)[2]	972	958	OI8869
Number of contractors (estimated)[3]	1,389	1,719	N/A
Percent female	20%	20%	OI2444
Percent black, indigenous, and persons of color (BIPOC)[4]	28%	29%	OI3236
Percent of executive team female	17%	33%	OI1571
Percent of executive team BIPOC	0%	0%	OI3862
Number new hires[5]	52	61	OI5479
Percent attrition[6]	12%	10%	OI1638
Total injury frequency rate[7]	25.1	6.2	OI3757
Lost time injury frequency rate[7]	20.8	4.4	OI3757
Percent employees responding to engagement survey[6]	96%	90%	N/A
Percentile employee engagement survey score[6]	57	58	N/A
Contributions to nonprofits[8]	$649K	$613K	FP3774
Lands with public access (acres)[9]	70,837	70,837	N/A

Source: Manulife Investment Management, 2021. **1** Includes 111 (2020) and 93 (2021) employees with agriculture and timberland. **2** Includes 608 (2020) and 628 (2021) timberland-only employees. **3** Agriculture contractors only; full-time equivalent, not individuals. **4** Includes North America staff only. **5** Includes 10 (2020) and 9 (2021) employees with agriculture and timberland responsibility. **6** Combined result for timberland and agriculture. **7** Incidents per 1 million hours; 2020 combines rate agriculture and timberland; 2021 is agriculture only. **8** Combined result for timberland and agriculture; does not include Australia timberland operations or South America operations. **9** Public access refers to access of any type, including by permit or unrestricted open public access.

Our people targets

1 **Employee engagement—**One mark of a great workplace is its employee engagement. Our company currently performs at the 57th percentile globally in the Gallup employee engagement survey, with 96% of employees responding. We consider this positive, but significantly below where we'd like to be. Collectively with our timberland business, we're targeting top-quartile employee engagement in the near term.

2 **Diversity—**Agriculture, forestry, and finance are industries that have historically mostly employed white men in most of the regions where we operate. The current makeup of our firm reflects that reality; however, we recognize the importance—culturally, ethically, competitively, and financially—of being a diverse and inclusive firm. That's why we're actively taking steps to become the firm we want to be by targeting the following:

- By 2025, increase black, indigenous, and persons of color (BIPOC) representation within our North America leadership by 60% relative to 2021
- Achieve a sector-specific talent pool of 20% BIPOC hiring over the next four years (U.S. agricultural and natural resources bachelor's degrees at 21% BIPOC)
- Increase the share of females in leadership to at least 20% of total by 2025

Looking ahead: a regenerative future

If there's a theme that incorporates all aspects of what the agriculture industry of the future needs to look like in order for it to contribute to meeting the sustainable development goals, it's this: regenerative agriculture. Or, put another way, farming in a way that not only produces healthy food, but also contributes meaningfully to the well-being of those producing it—and to that of natural systems such as soil and water.

To borrow language from the WBCSD's Scaling Positive Agriculture project that we co-lead, agriculture must be three things: 1) climate-positive, 2) nature-positive, and 3) farmer-positive. Agriculture must shift from a net source to a net sink of GHG emissions, from being the main driver of nature loss to a regenerator of nature. And it must ensure resilient, productive livelihoods for farming and food-producing communities. Those three themes should sound familiar because they're our top three priorities—climate, nature, and people. Investing in agriculture is fundamentally about investing in natural capital, and as stewards of natural capital our goal is to ensure that the investments we manage provide a flow of services to the climate, nature, and society that go well beyond food production.

How can we know we're making progress against these priorities? Data. Yet historically, meaningful sustainability data for agriculture has been scarce. That's why many of our sustainability targets are relatively near term (one to three years), because we're investing in the ability to systematically capture and monitor the sustainability performance of our assets, which will enable us to document how our sustainability efforts are paying off. Equipped with that information, we'll be able to develop concrete longer-term targets. There's much more to come—watch this space!

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manulifeim.com/institutional/global/en/sustainability

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August 2022

PPM556710 | 342032