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Redwoods, Agriculture and Climate Change

We are often asked about the origins of the name “Redwood Grove.” There were several reasons for the name. First, the firm was founded at the foot of a redwood (*sempervirens*) grove. Another redwood (*sequoias*) grove, the Mariposa Grove, was the site of a camping trip that changed conservation in the United States. And maybe most significantly redwood trees store more carbon per acre than any other tree.¹ General Sherman, perhaps the most famous redwood in the world, stores 392 metric tons of carbon alone.² Sequoias are among the longest living, and therefore not surprisingly, most adaptive species on earth. These majestic trees are capable of surviving extended droughts, cold and heat. They have lived through low intensity wildfires. However, they are not immune to the current high intensity wildfires, which have increased due to climate change. The National Park Service recently reported that twenty percent of large sequoias, the best storers of carbon on the planet, have burned in wildfires in just the past two years.³

Redwoods, which have been around 240 million years⁴ and can live over 1000 years, are dying at an unprecedented rate due to human caused climate change. This loss highlights that even our most resilient plant species are strained. Our less resilient food production system is under tremendous stress to feed the planet’s population before accounting for the impacts of climate change. The combination of changing diets and a growing population has stretched our ability to generate food to the limit. The result has been an optimization of crop productivity and a loss of biodiversity as forests are being felled to make arable land.

In addition, the United States uses about nineteen percent of its fossil fuel consumption just to produce food.⁵ That is because on average the food system takes between seven and ten units of energy to produce and serve one unit of food energy. Feeding 332 million people in the United

¹https://e360.yale.edu/digest/california_redwoods_co2_storage#:~:text=Redwoods%20store%20%2C600%20metric%20tons,t heir%20longevity%2C%20the%20scientists%20said.

² <https://onelifeonetree.com/giant-sequoia-carbon-capture>

³ https://www.nytimes.com/2022/07/10/us/washburn-fire-yosemite.html?campaign_id=54&emc=edit_clim_20220712&instance_id=66437&nl=climate-forward

⁴ <https://sempervirens.org/learn/redwood-facts/>

⁵ <https://sustainability.emory.edu/wp-content/uploads/2018/02/InfoSheet-Energy26FoodProduction.pdf>

States becomes a highly energy intensive proposition.⁶ Reducing our fossil fuel consumption will require us to turn energy into food more efficiently.

Of course, that ratio varies significantly depending on the type of food that is produced. Today about 50% of the globe's vegetated land is used for agriculture. Of the land used for agriculture about 30% of it is used to produce grains for livestock. This is one of the least efficient uses of limited land and energy, because it takes thirty-five calories of grain to produce one calorie of meat.⁷ Increased meat consumption is the leading cause of deforestation. Deforestation, in turn, creates about 10% of global warming pollution annually.⁸

Fortunately, land productivity has gone up over the past few decades, but it is largely due to increased nitrogen use which has its own environmental problems. Despite this increased productivity the World Resources Institute released a report in 2019 that concluded if current dietary patterns continued an additional 1.465 billion acres of land – twice the size of India - would be needed to feed the world's projected population by 2050.⁹ Here is where things get really hairy. Not only is increasing our agricultural footprint adding to global warming, but global warming is destabilizing the productivity of much of the existing agricultural lands. Certain crops are becoming less productive, often experiencing mass failure events due to extreme weather events, such as droughts and heat waves. This leads to the need for more deforestation to create farmland, which creates more global warming. A vicious cycle, one that will likely need to slow, stop and eventually reverse if we are to avoid the worst effects of climate change.

Finally, if you haven't left us yet in a depressed funk, the food we are producing, particularly in the United States, is increasingly unhealthy. To paraphrase one of our favorite thought leaders in the space Spencer Glendon: our food production is a grand experiment where we are its subjects. We eat an unhealthy meat and carbohydrate heavy diet, made worse by food science that tricks us into eating non-foods. The result is increased incidence of diabetes, certain kinds of cancer and autoimmune diseases.¹⁰ This experiment is hurting us and our planet.

Redwood Grove has been looking for undervalued food production companies that can generate nutrition more efficiently, are highly resilient to the changing climate and have a lower CO2 impact. Over time these companies will fare better due to more stable supply chains, long term secular demand growth and greater protection from potential rising costs of future CO2 emissions.

Our search, constrained by attractive valuations, kept us from companies producing meat and dairy alternatives like Beyond Meat or Oatly. A broader sample of areas we have researched in the past year included, chicken producers, fertilizer producers, farm equipment manufacturers,

⁶ <https://www.scientificamerican.com/article/more-food-less-energy/>

⁷ <https://sustainability.emory.edu/wp-content/uploads/2018/02/InfoSheet-Energy26FoodProduction.pdf>

⁸ <https://www.ucsusa.org/resources/tropical-deforestation-and-global-warming#:~:text=When%20forests%20are%20cut%20down,percent%20of%20global%20warming%20pollution.>

⁹ <https://research.wri.org/wrr-foodexecutive-summary-synthesis>

¹⁰ <https://www.ncbi.nlm.nih.gov/books/NBK209844/>

agricultural mortgage corporations, insurance companies, and retail chains focused on plant-based diets. Each one presented a problem, either during Redwood Grove's fundamental analysis where we look at the management, business and valuation or the climate analysis. One name we looked at closely was Lamb Weston, the largest U.S. producer of Russet Burbank potatoes. This varietal of potato accounts for about 70% of processed potatoes in the United States, largely because of its ability to make long, untarnished French fries (for McDonalds).

While potatoes are found all over the world, the most prevalent one in the United States, the Russet Burbank potato, is primarily grown in the Pacific Northwest and parts of Northern Europe. By building processing facilities in these regions Lamb Weston has captured 50% market share in the United States and 20% worldwide. Lamb Weston's share price after spinning off Conagra doubled in its first few years due in part to productive crop yields. That changed on June 26th in 2021, when the Pacific Northwest experienced temperatures never previously observed.

The last days of June in 2021, parts of the Pacific Northwest and Canada saw record high temperatures breaking one hundred and twenty one degrees Fahrenheit in parts of Canada. This multi day heat wave was a 1 in 150,000 event without the warming impact of climate change. With it, it was a 1–1000-year event. When we reach two degrees Celsius of warming it will be a 1 in every 5-to-10-year event.¹¹

Potatoes are a relatively resilient food source, which is what attracted us to them, however they are predominately a cool weather crop. They thrive in temperatures between 68- and 75-degrees Fahrenheit. Any warmer and they start to have less productive yields. In addition, higher temperatures cause the Russell Burbank potato to have a lower starch content and grow in unusual shapes.¹² Both these impacts make them less suitable for use as French fries. 2021, according to Lamb Weston's management, was the worst crop yield they had ever seen. The extreme weather event exacerbated by climate change caused lower gross margins and meaningfully less free cash flow for Lamb Weston. According to FactSet, analyst estimates for Lamb Weston's free cash flow was expected to be \$450 million for their fiscal year 2022, prior to the heat wave. Due to the lower crop yield and the need to replace deformed potatoes through other channels, the analyst consensus for fiscal year 2022 plummeted to negative \$50 million. The stock price quickly reflected this, dropping from over \$80 a share to close to \$50 a share.

We reached out to the company to understand how they are preparing to manage this risk. The response was simple; they are not. This stance was echoed in the subsequent quarterly call when Tom Warner, Lamb Weston's CEO, responded to a question about future crop productivity, stating, "[Lamb Weston] looks at history, we plan at average historical levels. And in terms of the impact we had last year because of the high heat, which is abnormal.... We plan for an average yield quality crop every year."

¹¹ <https://www.worldweatherattribution.org/wp-content/uploads/NW-US-extreme-heat-2021-scientific-report-WWA.pdf>

¹² <https://spudsmart.com/revisiting-the-impact-of-heat-stress-on-potatoes/>

The problem is historical averages are changing. We don't need to wait a 1000 years. A heat wave in Europe this year is resulting in a terrible potato yield in Britain¹³ and Europe.¹⁴ The Pacific Northwest is currently experiencing temperatures 10-20 degrees above normal.¹⁵ Lamb Weston's market dominance is due to the reliability of the Russet Burbank potato crop yield in these two regions, and the location of their fixed assets to process those potatoes. As our planet's agriculture landscapes change, Redwood Grove is looking for forward-adapting management teams.

Limited agricultural land, water supplies and increasingly volatile weather patterns are driving demand for agricultural greenhouses. This is particularly true for vegetables and produce which are more sensitive to weather and water conditions than grains and potatoes. Currently only about 2 percent of US produce is grown in a greenhouse.¹⁶ While expected growth trends are compelling at high single digits, Redwood Grove believes that the forecast for worsening extreme weather will only add to the long-term demand for stable growing environments. The Dutch have already adopted this technology widely. Despite having a land mass over two hundred and thirty times smaller than the United States, the Dutch are the second largest (or third if you do not count flowers) agricultural exporter in the world.¹⁷ With limited new agricultural land left, soil erosion, excessive nitrogen use, and lower water supplies, more efficient ways to grow food is becoming increasingly essential. The long term forecast for increased extreme weather only adds to these challenging trends.

Gibraltar Industries was founded in 1972, and for much of its existence has been a residential building company with a focus on roof and ventilation products. The growth of the company was historically tied to the new residential construction and repair spend. In 2015, Gibraltar bought Rough Brother and RBI solar, a greenhouse manufacturer and solar mounting company for \$130 million. That company was subsequently split into two separate business lines, with the solar company getting a number of small add-on acquisitions. Today the two businesses combined generate \$700 million of revenue or about 50% of Gibraltar's total revenue. Both have attractive uncorrelated potential long term growth rates.

In the early 2021, the company's stock seemed to fully reflect this optimism, trading around \$100, more than 30x's forward earnings. Redwood Grove liked the fundamental business but could not justify that valuation. In the subsequent 18 months, the stock share price was cut by approximately 60% as a confluence of external problems developed; inflation, solar tariff difficulties, and rising rates lowering expected new home construction. We covered solar tariffs extensively in our last letter ([here](#)). We believe that the long-term outlook for solar remains unchanged despite short-term tariff challenges. Inflation and slower new home construction could certainly remain a problem for the company in the short-term, but at 10% expected Free Cash

¹³ <https://www.bbc.com/news/uk-england-york-north-yorkshire-62227146>

¹⁴ <https://www.france24.com/en/europe/20220721-heatflation-how-high-temperatures-drive-up-food-prices>

¹⁵ <https://www.opb.org/article/2022/07/26/portland-july-heat-wave-hottest-day/>

¹⁶ <https://www.agclimate.net/2020/03/05/greenhouse-production-of-vegetables-implications-for-the-region/>

¹⁷ <https://dutchreview.com/culture/innovation/second-largest-agriculture-exporter/>

Flow yield and at 12x's forward earnings, Redwood Grove believes the stock price reflects the downside fully. Redwood Grove also believes that growth prospects for greenhouses in agriculture should accelerate as the stability of arable land declines. For these reasons, Gibraltar was a recent addition to Redwood Grove's portfolio.

Closing thoughts

Readers of our letter know that Redwood Grove has reservations about the broader Environmental, Social and Governance (ESG) investment space. Many of the existing products rely heavily on data that we believe is not an accurate measure of, well, much of anything. In addition, many asset managers, particularly those who use an ESG "overlay" may just be greenwashing a portfolio without making any substantial changes to their investment decisions or processes. Continued examples of this are coming to the fore. Goldman Sachs,¹⁸ Deutsche Bank¹⁹ and Bank of New York Mellon²⁰ are all under investigation by the SEC for misstatements about their ESG funds. Even Blackrock, an outspoken climate manager, has come under increased scrutiny, as they have changed the name of their flagship, um "sustainable" fund twice in six years from "Impact" to "Climate" to "Sustainable" seemingly based on market trends. Same fund, yet after each switch, client money flowed in apparently attracted by the new name.²¹

At Redwood Grove, we eschew superficial labels, focusing on the underlying economics of climate change. Climate investing is a complicated, muddy space. The word integrity comes from "integer" in Latin, conveying a sense of wholeness, honesty, and consistency. We remain committed to a research and investment process that is forthright about the complexity, provides clients with the whole picture, and remains consistent in focusing on the risks and opportunities of climate change. This is challenging and does not lend itself to any simple set of metrics or scores. Additionally, it requires a forward-looking analysis. We believe climate change and its economic impacts continue to be mispriced by the market. If our thesis is correct, this will allow us to generate alpha for our investors in the future. Truth be told, we hope that markets price climate change accurately, even though it would erase the alpha opportunity. Yet, if humans' response to climate change to date is any indication, we sadly have some time.

We have a few updates on personnel at Redwood Grove. We are thrilled to welcome Yaya Zhang who joined us as an analyst. She will be focused on fundamental and market research. We continue to build a robust talent pipeline and look forward to introducing new members of the team in the coming months. We remain pleased with the quality of candidates. It reminds us that more and more people want to commit their careers to sustainable investing, an idea that seemed very unlikely even a few years ago. Finally, Tze Wee Chen left the firm this quarter for personal reasons. We were sad to see him go. He has been a valued member of the team.

With gratitude,

¹⁸ <https://www.wsj.com/articles/sec-is-investigating-goldman-sachs-over-esg-funds-sources-say-11654895917>

¹⁹ <https://www.wsj.com/articles/u-s-authorities-probing-deutsche-banks-dws-over-sustainability-claims-11629923018>

²⁰ <https://www.sec.gov/news/press-release/2022-86>

²¹ <https://www.bloomberg.com/news/articles/2022-07-25/how-blackrock-rebranded-one-sustainable-mutual-fund>

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