Wheat and Meat: The Rockefeller Foundation and the Chilean Agricultural Program

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Abstract

This paper offers a preliminary examination of the Rockefeller Foundation’s agricultural improvement work in Chile, as I read through the Rockefeller Foundation’s own archival collections at the Rockefeller Archive Center. Following the model set by earlier agricultural development projects in Mexico and Colombia, the foundation’s Chilean Agricultural Program (ChAP) sought to improve methods for agrarian production in the South American country, starting in the mid-1950s and continuing through the mid-1960s. The program’s ultimate goal, I argue, was to help make Chile more food secure, and to do so, foundation experts worked closely with Chilean agricultural scientists employed by Chile’s growing agricultural state. Early collaboration centered around how to improve common varieties of spring and winter wheat—the raw input for widely-consumed bread products. However, over time, the Rockefeller Foundation’s focus turned increasingly toward forage crops, with the hope that more nutrient-rich grasslands would form the foundation of a more modern and productive domestic beef economy. I suggest that an examination of this important example of inter-American agricultural cooperation raises important questions about both the social motivations and environmental consequences of mid-twentieth century agricultural modernization efforts.
In early May 1955, US plant pathologist Joseph A. Rupert touched down in Santiago de Chile, ready to begin what would become a thirteen-year stint as director of the Rockefeller Foundation’s Chilean Agricultural Program (ChAP). A cereal breeder by vocation, Rupert had spent much of the previous decade moving between the foundation’s signature agricultural program in Mexico and Colombia, where a project of similar design had been established in 1950. Now in Chile, Rupert’s main task seemed straightforward enough: use new knowledge about agricultural production from Mesoamerica and the northern Andes to boost food production and improve domestic food security on South America’s Pacific Coast. As an early foundation memo about the ChAP explained, “The results obtained in Mexico and Colombia provide sound evidence that Rockefeller Foundation participation in agricultural research on basic food crops in Chile can bring about reasonably rapid economic benefits to the people of Chile.”

Although the agreement governing the Rockefeller Foundation’s agricultural work lingered in Chile’s national congress for more than a year, administrative delays did not stop Rupert and his team from hitting the ground running. Just days after departing Colombia, the ChAP director was engaged in meetings with Chile’s Ministry of Agriculture, hoping to enlist key members of the ministry’s skilled but underpaid research staff in the foundation’s proposed work. From Santiago, he accompanied Chilean agronomists to observe research at several of the country’s nineteen agricultural experiment stations. And most significantly, Rupert established a command center for the ChAP—a special research office housed within the Ministry of Agriculture that, like its counterpart in Mexico, became known as the Office of Special Studies (OEE). Operational until Chile created (with Rupert’s assistance) its own autonomous institute for agricultural research in the mid-1960s, the OEE propelled work with new crop seed varieties, fertilizers, pesticides, herbicides, and a host of other farming technologies. Its staff also processed dozens of funding applications from
Chilean students in the agricultural sciences, most of whom pursued graduate training at North American institutions. As policies of import substitution industrialization (ISI) faltered because of rising inflation and a foreign exchange crunch, the OEE situated agricultural science at the center of a revitalized project of national economic development.

Yet despite these developments, historical research on the ChAP remains limited, particularly when compared to many of the Rockefeller Foundation’s other agricultural initiatives. Thanks to the innovative work of agricultural historians of Latin America, in particular, the scholarship on the Green Revolution (and the Rockefeller Foundation’s role in promoting it) has moved steadily away from an understanding of scientific agriculture as a largely a top-down and outside imposition by institutions of the Global North on the countries of the Global South. Instead, newer work has emphasized the multi-directional and often reciprocal flows of agrarian knowledge that moved both between the Global South and Global North and within the Global South itself. Implicit in this scholarship is the observation that the rural countryside of the “developing world” was not an empty or undifferentiated geographic space, endowed with little more than valuable natural resources that needed to be ordered and controlled. Rather, from Mesoamerica to the Andes to South Asia and beyond, an active cast of local agricultural experts had long experimented with new techniques and technologies to make agricultural production more effective, amidst tremendous ecological diversity.

A preliminary review of the Rockefeller Foundation’s archives at the Rockefeller Archive Center reveals that the foundation’s agricultural work in Chile shares a great deal with this more recent literature. For one, the history of the ChAP makes clear that the international agricultural improvement efforts of the foundation were predicated upon an institutional and epistemological foundation that more than a generation of Chilean scientists helped construct, while working for and with an incipient agricultural state. In Chile, state-led efforts to improve crop seeds, irrigate arable lands, and improve soil fertility all predated the arrival of foundation officials, sometimes by more than a decade. And a close examination of such initiatives suggests that modernization consistently occurred through collaboration between national and international agricultural advisers, both private and public. What’s more, the direction that scientific
agriculture in Chile took after World War II hinged on both the successes and failures of these earlier projects.

**Before the ChAP**

About ten months before Joseph Rupert arrived in Chile, another renowned North American plant breeder had also traveled to Chile for a tour of the country’s rural countryside. Having spent much of the last decade perfecting high-yield, rust-resistant wheat varieties in Mexico, Norman Borlaug was sent by his patrons at the Rockefeller Foundation to take stock of Chile’s agricultural landscape, while its leadership in New York debated whether to make a major financial commitment to the country. Over two-and-a-half weeks, the man some would later refer to as the “Father of the Green Revolution” trekked around the Chilean countryside, beginning in the Central Valley, the country’s agricultural heartland, and then moving south to the important winter wheat-growing province of Llanquihue. In a 60-page report that he submitted to the foundation after he departed, Borlaug painted a striking portrait of Chile’s agricultural accomplishments, challenges, and potential. The existence of three distinct agricultural zones in the country—one in the south, a second in the Central Valley, and a third in the arid lands north of Santiago, would make the creation of a single agricultural policy difficult, he noted. Climatic conditions, like temperature and rainfall, distinguished one region from the next but so, too, did distinct soil characteristics, a variety of historical land use practices, and differing techniques of agricultural production. But ultimately, the country held great promise, particularly if the Rockefeller Foundation centered its work around two crop categories: wheat and forage crops. As had occurred in Mexico a decade earlier, Borlaug believed that foundation experts could assist Chilean wheat breeders in the production of multiple generations of plant breeding material each year. Running parallel to wheat work, Chile needed to also “determine the most economical sources of hay and silage for use as supplementary [animal] feed” during harsh winters and summer droughts. As time progressed, Borlaug was hopeful that both wheat and forage improvement could jumpstart a series of generative collaborations—between plant experts and animal nutrition experts, between seed makers and fertility experts, and even between industrialists and farmers.
The Rockefeller Foundation’s decision to move forward with the ChAP in much the way Borlaug envisioned suggests his report was well-received by the foundation’s leadership. But digging below the surface, it is clear that the US plant breeder’s observations about Chilean agriculture, present and future, were deeply indebted to the work that his Chilean counterparts had been conducting for well over a decade. With the future of Chile’s export-dependent mining sector in question after the global economic collapse of the late 1920s and early 1930s, Chilean officials fixed their eyes on their agricultural countryside for economic revitalization. To that end, the government reorganized its agricultural ministry in 1930, separating out a focus on agricultural production from other economic matters like industrial development and land colonization. Two years later, Chile’s rechristened Ministry of Agriculture launched a campaign to boost wheat production, coupling generous outlays of public credit for wheat planters with a pledge that the state would purchase their excess production. For a short period, the government even prohibited the export of wheat until it became clear that there was sufficient production for the domestic market.13

The formation of the Corporación de Fomento de la Producción (CORFO), one of Latin America’s first permanent state development agencies, advanced further the project of agricultural modernization. Created by the Popular Front government of Pedro Aguirre Cerda after a powerful 1939 earthquake devastated the agricultural economy around the Chilean city of Chillán, CORFO provided public credit to both heavy industry and agriculture. In its first “Plan of Immediate Action,” released in September 1939, CORFO planners stated that Chile’s countryside needed to finally provide the Chilean nation with “what it expected from her.”14 And in ten programmatic objectives, the new development corporation sketched a detailed agricultural program that included bringing foreign experts to Chile, sending Chilean agrarian experts abroad for training, and promoting a combination of seed improvement, farm mechanization, fertilizer usage, and irrigation projects.15 By the early 1950s, the agrarian sector would become CORFO’s “new priority,” experiencing what Chilean economic historian Luis Martínez Ortega and his co-authors describe as “an undeniable process of growing state intervention.”16

The existence of a new Ministry of Agriculture and committed state development cooperation made Chile an attractive place for postwar international development
In the late 1940s and the early 1950s the Food and Agriculture Organization (FAO), the International Bank for Reconstruction and Development, and the US government each provided Chile with important technical assistance and financial support to modernize its agricultural sector. After a 1951 FAO mission estimated that agricultural production in Chile would have to grow by over three percent annually just to eliminate its dependence on foreign agricultural imports and meet the consumer demands, the United States’ “Point IV” development program (channeled through an international development clearinghouse known as DTICA) set in motion plans to meet that goal. Plan Chillán, DTICA’s ambitious effort to build new rural infrastructure and expand agricultural extension efforts in a single rural province became an important symbol of this commitment.

**Improving Wheat**

In the late 1940s and early 1950s, CORFO’s early agricultural work was largely the domain of state planners and agricultural engineers, many of whom subscribed to a belief that pumping money into large-scale infrastructure, like dams, along with heavy industry, such as tractor manufacturing, was all that was needed to spur robust economic growth. What made the Rockefeller Foundation’s work distinct was its commitment to agricultural experimentation at the more granular level of soil and seeds. In this respect, the foundation found its closest allies and collaborators in the skilled but often underpaid network of crop researchers employed by the Ministry of Agriculture’s Department of Agricultural Research. One man, in particular, immediately seems to have caught the eye of Rockefeller Foundation: plant breeder René Cortázar Sagarminaga.

René Cortázar was to Chile what Norman Borlaug was to the US. Born in 1917, he had studied agronomy at the University of Chile in the late 1930s, just as the reorganization of Chile’s Ministry of Agriculture and the establishment of CORFO was occurring. He graduated with the title of “ingeniero agrónomo” in 1940 and soon joined Chile’s young agricultural state as an employee of the new ministry. But as World War II raged in Europe, a Rockefeller fellowship, arguably the first ever to be granted to a Chilean agricultural scientist, allowed Cortázar to complete graduate work in plant genetics at
the University of Minnesota. For much of 1942 and 1943, Cortázar lived and studied in the Twin Cities. Carrying out laboratory work in the university’s greenhouses—and drawing on extensive visits he made to study the breeding of spring and winter wheat varieties in Iowa, Nebraska, Kansas, and North Dakota, Indiana, and Pennsylvania—it was there, in the upper Midwest, where Cortázar made some of the first crosses that eventually produced one of Chile’s first hardy, rust-resistant wheat varieties. Upon his return to Chile in late 1943, he was immediately appointed to lead cereal improvement work in Chile’s Ministry of Agriculture. In that post, Cortázar published important scientific articles that became the basis for all future wheat improvement work in the country.

Borlaug, a graduate of the same University of Minnesota program that produced Cortázar, would declare his admiration for Chile’s most important plant breeder, after the two men traveled together through the Chilean countryside in mid-1954. Cortázar was, in Borlaug’s view, “probably the best informed man on agriculture in the [Chilean] government services,” and “by far the best agricultural scientist” in all of Chile. What made him stand out was his unique ability to not just “organize” research but also “carry out the details” of those research programs. Cortázar was both a thinker and a doer, and he possessed, in Borlaug’s estimation, a “good understanding of all of the major agricultural crops and their problems, throughout the different agricultural zones.”

The only problem was that the Chilean plant breeder and his Ministry of Agriculture colleagues were spread too thin. Cortázar himself worked not only as the director of cereal crop research at the Ministry of Agriculture but also taught at two different Chilean universities, conducted part-time wheat-related research at one of Chile’s largest pasta manufacturing company, and still ran “at least one large farm,” all apparently to make ends meet. Borlaug believed that the Rockefeller Foundation could help change that if it conscripted Cortázar in its own research and then compensated him with a decent salary.

Cortázar started collaborating with the Rockefeller Foundation almost as soon as Joseph Rupert arrived in Chile. Given both his own expertise with wheat and the foundation’s own commitments to the crop in Mexico, Colombia, and later India, it was little surprise that the grain became the initial subject of the ChAP’s agricultural research agenda. According to a foundation assessment of Chile’s agricultural needs
that was produced on the eve of the OEE’s creation, the importation of more than 24 million US dollars’ worth of wheat each year represented the country’s greatest agricultural challenge. Moreover, most estimates suggested that figure was only going to rise in future years, as domestic supply remained unstable and demand continued to rise. In 1954, for example, experts predicted that problems with stem rust threatened to reduce that year’s wheat harvest by as much as 25 percent. All the while, the Chilean government’s subsidization of bread meant that per capita consumption of the wheat was among the highest anywhere in the world, at roughly 1.14 pounds daily per person. Citing Chile’s own Ministry of Agriculture, Rupert estimated that a ten percent increase in wheat acreage and 25 percent increase in yields were necessary to bring domestic supply and demand more in balance. The Rockefeller Foundation’s success crossbreeding wheat in Mexico and Colombia made Rupert and his team confident that they could meet the challenge that Chile presented. In fact, the OEE predicted that it would take just five to seven years before it “reverse[d] the trend in local wheat production” and “essentially wipe[d] out the growing deficit in national wheat production.” That clock started ticking in early June 1955, when the first seed samples followed Rupert from Colombia to Chile, where the ChAP director and Cortázar soon planted them in test plots at Chile’s Paine agricultural experiment station, just outside of Santiago.

Rupert and his team identified the slow speed at which Chile’s Ministry of Agriculture created new wheat varieties as one of Chile’s greatest problems. In the Central Valley where most of Cortázar’s wheat breeding work had occurred, only one generation of wheat was being planted each year. “Wheat planted in May or June grows slowly during the following three months because of the low winter temperatures and begins to head out in October,” Rupert’s OEE noted in one of its first progress reports. This meant that for at least four months, “little, if any, productive wheat improvement research is carried on.” Then, when the harvest was completed in January, Chile’s Ministry of Agriculture typically waited another four months before starting its next planting. But the example of Mexico showed that there was a solution to this problem, but it would require the Chilean state to start seeing its disparate rural economies as parts of one larger whole. Specifically, if a second wheat planting could be carried out in the warmer, northern reaches of Chile’s wheat-producing territory, that later planting would reach
maturity soon enough to be replanted in June, around the time that most wheat was planted further south.\textsuperscript{28}

A model for accelerating plant breeding was not the only innovation that the ChAP adapted from its sister programs in Latin America. During its first year, the ChAP also screened approximately 17,000 different wheat varieties from Mexico, Colombia, and the US, seeking to find genetic material that might produce higher yields while also remaining resistant to rust.\textsuperscript{29} By the middle of 1957, the office’s work with Mexican and Colombian wheat varieties, in particular, suggested that several rust-resistant varieties would be “available for large-scale increase” by 1958.\textsuperscript{30} Even greater changes were on the horizon as higher yielding wheat varieties took hold. The two most promising synthetic varieties were Orofén, a spring hybrid that had been developed from lines shared by the Rockefeller Foundation’s Mexico program, and Rulofén, another spring hybrid that had been selected from Colombian seed material and was more favorably adapted to dry-land production. Orofén seeds produced wheat yields that were on par with Menflo, the regional spring wheat that Cortázar had developed a few years earlier, but its straw appeared both stronger and more resistant to stem rust. By 1961, the state agency in charge of seed certification and distribution was expected to provide enough certified Orofén and Rulofén seed to plant roughly 150,000 acres—the equivalent of 50 percent of all total spring wheat acreage in the country.\textsuperscript{31} Working closely with another OEE program focused on wheat milling and bread baking, the Rockefeller Foundation sought to ensure their new wheat varieties received the acclaim of wheat producers and bread consumers alike.

**From Wheat to Meat**

Orofén, Rulofén, and a handful of later wheat crosses represented relatively quick breakthroughs for the Rockefeller Foundation and its Chilean counterparts. But not everything related to the foundation’s wheat improvement work proceeded so smoothly. Winter wheat improvement in southern Chile, where two French varieties had long predominated, proved to be slow going.\textsuperscript{32} In colder climates, infrastructural inadequacies—particularly a lack of greenhouse space—delayed the speed of breeding. Additionally, experimental work with wheat in several different environments also
revealed that there was a general lack of attention being paid to matters of soil (in)fertility. While Chile’s fledgling nitrate industry pushed for more nitrogen consumption among wheat planters, the limited soil studies being conducted in southern Chile revealed that it was actually a deficit of phosphorous, not nitrogen, that was negatively impacting production on the region’s most important crop fields.\(^{33}\)

Although he had been a fixture of the Rockefeller Foundation’s Chile work from the very beginning, Cortázar’s own relationship with the program also seemed strained. When the foundation first sought approval of the Chile program, the wheat breeder reportedly expressed concern that Chile might follow the path of Mexico and Colombia, both of which, in Cortázar’s opinion, had seen their own ministries become too subservient to foreign experts.\(^{34}\) Later, Rupert echoed particular concern about Cortázar’s tendency to conceal his plant breeding work from foundation staff, thus hindering scientific collaboration. “Cortazar continues to amaze me with the extreme secrecy about wheat program. He resents any questions I ask about the yields of his new varieties, what crosses he is making, or what his future plans are, and manages to give evasive answers,” Rupert noted in one diary entry, adding that such a “state of affairs...cannot continue indefinitely.”\(^{35}\) From foundation documentation, it’s difficult to assess how these issues affected Cortázar. But in September 1959, Chile’s most important wheat expert temporarily decamped from the ChAP—and from his native Chile entirely.\(^{36}\) With a second Rockefeller Foundation scholarship in hand, Cortázar and his family spent the next two and a half years back in Minnesota as Cortázar completed a Ph.D. in Agronomy and Plant Genetics at the same school from which he had received his M.S. just over a decade earlier.\(^{37}\)

At least some of Cortázar’s discomfort, it seems, was born out of his concern that the attention and resources that his own wheat breeding program received would soon be surpassed by the OEE’s forage improvement program.\(^{38}\) And upon his temporary departure, his worries became a reality. Pasturelands comprised roughly 40,000,000 acres in mid-century Chile. About 90 percent of that total was classified as “natural range” land; only the remaining ten percent consisted of “seeded pastures,” dedicated to the concerted planting forage crops. But despite this fact, it was this relatively small portion of semi-“improved” land that provided nearly all the feed for Chilean livestock. What’s more, the fact that just three different forage species—alfalfa, red clover, or
orchard grass—predominated on sixty percent of that land created problems that were similar to any monoculture.39

Early OEE reports suggested that the issues most affecting Chile’s grasslands were not entirely different from those plaguing wheat. On the roughly 250,000 acres of land that was devoted to alfalfa production in the Central Valley, the growing threat of disease—specifically bacterial wilt—meant that perennial alfalfa plantings died out after just two or three years. Similar problems afflicted red clover. Representing more than three times the total acreage devoted to alfalfa, farmers were able to obtain just two cuttings of red clover each year before disease and nutrient depletion sucked life from the soil. After that, the land needed to be tilled and reseeded—and ideally fertilized. Similar problems faced Chile’s most important forage crop, orchard grass. Due to crown and root rot, growth rates and harvest size were becoming harder to predict from one year to the next—hardly an ideal situation for an agricultural subsector that was in many ways the keystone for a successful commercial meat economy.

Indeed, unlike wheat, which was produced for human consumption, forage crop production was something of a second order problem—that is to say, its importance was in its place in the larger food chain. Ruminant animals, especially beef cattle, roamed and feasted on these grasses and the growing environmental and economic uncertainty associated with their production meant that the general size and health of livestock herds around Chile, particularly during the winter months and periods of drought, were at risk.40 As evidence, Rockefeller Foundation experts pointed to the fact that meat imports constituted roughly twenty percent of its total domestic consumption in the mid-1950s.41

To begin addressing these issues, the OEE focused its early forage improvement efforts around breeding, just as it had with wheat. At research stations in Osorno, Temuco, Chillán, and Santiago, Rupert’s staff introduced new grasses and legumes into Chile “for observation and selection.” By crossing different varieties, both native and non-native, the OEE hoped to establish new grazing varieties that were more robust and prolific, and ultimately more nutrient-rich. A key component of this early work also entailed collaborating with forage experts to expand a national survey of native grasses and legumes. But much to their delight, Rockefeller Foundation experts discovered
early on that forage crop knowledge was far more advanced in Chile than in either Mexico or Colombia. “In contrast to the situation encountered in Mexican and Colombian programs,” one foundation memo noted that there were many agronomists in Chile who had been conducting their own research with forages for a long time. This was the “great advantage” of the ChAP, and foundation agronomists even wrote glowingly about how the Ministry of Agriculture’s Department of Investigations had for years been running “observation gardens” using forage grasses and legumes collected from various international sources. In fact, by the time the ChAP began its operations, the agronomists operating these gardens had already determined that the “species presently being extensively cultivated” in Chile were the best adapted to the country’s Central Valley. The Rockefeller Foundation’s main task, then, was to build upon these findings by primarily carrying out variety trials with existing species.

To be sure, the existence of such a talented and experienced group of Chilean forage improvement experts did present some challenges. For one, it meant that the Rockefeller Foundation’s own staff would need to adopt “more skill in working cooperatively with the Chilean agronomists who are understandably proud of their work and jealous of their positions.” In this respect, the foundation relied heavily on trusted gatekeepers, like the Chilean forage expert Hiram Grove. Grove, like Cortázar, had been awarded a Rockefeller Foundation scholarship to study forage crop improvement at the University of California, Davis in 1955. Upon his return to Chile in early 1956, his expertise landed him a position with the forage seed production section of Chile’s Point IV program. But quickly impressed with his intellectual acumen, Rupert promised Grove a transfer to the better-funded OEE when the accord governing the office’s work received official approval from Chile’s national congress. In early 1957, Grove’s transfer was finalized.

At the OEE, Grove worked closely with two North American forage specialists, James Halpin and Donald McCune, guiding early ChAP-sponsored forage research work with orchard grass, red clover, rye grass, and a handful of supplementary grasses at research stations in Temuco, Chillán, and Osorno, as well as the Santiago-based dry-land research facility. The ChAP’s forage team also fostered collaborative initiatives with university agronomy programs. Particularly notable was the expansion of the student-
led garden program with forage species, a collaboration that both decentralized and outsourced OEE plant research to a pool of future forage experts.47

By the late 1950s, progress with forage breeding enabled the OEE to expand its work into two new areas: forage management and forage utilization. The results of that shift would have a cascading effect across Chile’s national economy and would bolster the influence that Chile’s state development corporation had over national economic development, in particular. While wheat production had created some new economic opportunities for seed producers and fertilizer manufacturers, on one end of the commodity chain, and millers and bakers, on the other end, the number of economic linkages associated with forage improvement seemed vast. On the backend of the Rockefeller Foundation’s improvement work, a broad, state-led effort emerged to produce the inputs that were critical to the revitalization of Chile’s pasturelands. For instance, working hand-in-hand with CORFO, the state hastened the production, certification, and distribution of new seeds for food and forage crops.48 According to Rupert, CORFO’s plan was to use OEE’s list of “recommended varieties and mixtures” to seed roughly 10,000 acres with forage crops in 1960, anticipating “progressive increases” over the next half decade.49 Forage improvement work also spurred similar backward linkages around fertilizer and agrochemical production. Observing grassland stagnation because of pests and soil nutrient depletion, Rupert would write in an early 1959 diary entry that, if the “problems of weed control and soil fertility” were not given “adequate attention,” important progress being made in “raising pasture production will of necessity be limited.”50 In line with that observation, fertilization, in particular, became a major focus of the OEE’s work with forage crops in the early 1960s, with several new CORFO fertilizer subsidiaries committing to research and development around phosphate-, potassium-, and nitrogen-based fertilizers.51

The forward linkages that forage improvement produced were equally impressive. As Chile’s grasslands became a target of state economic intervention, CORFO promoted forage grazing trials in the early 1960s, which eventually became part of a larger National Cattle Development Plan.52 A short while later, CORFO buttressed these projects by launching a parallel effort to modernize and regionalize the country’s national network of meat processing plants over a decade. The objective of state agricultural experts was to build enough regional meatpacking capacity that it would
no longer be necessary to transport beef cattle all the way to Santiago just to be processed. Over time, then, Chile would achieve greater regional parity when it came to beef consumption. But leveling the consumer playing field would have to begin in the literal grassroots. In mid-1961, Rupert noted that when the Chilean government had asked for a US$70,000,000 loan to help finance this project, an international lender intimated that the precise terms of that loan would be at least partly determined by the results of the ChAP’s forage improvement work.53

**Tentative Conclusions, Future Paths for Inquiry**

The ChAP’s pivot away from grain and toward meat production was a curious turn of events, and one that deserves further study, not least because the consequences of this shift proved politically complicated and ecologically contradictory. On the one hand, there is the possibility that by deploying scientific agriculture to improve pasturelands, Chile may have avoided (or more likely delayed) the turn toward the sort of industrialized, grain-dependent feedlot agriculture that took hold in North America and nearby countries like Brazil. Although the impact of agriculture on climate change was not yet on the minds of the US and Chilean agricultural experts who carried out forage improvement efforts, did the ChAP’s work revitalizing Chile’s grasslands ever have the potential to act as an important carbon sink—a precursor, perhaps, to the regenerative agricultural methods that some soil scientists have promoted in recent years? This might be one point of entry into thinking about the environmental history of the Green Revolution in Chile—or at least one variant of it.

On the other hand, however, the history of both wheat and forage improvement efforts in Chile seems to clearly suggest that a focus on food production (both for direct human consumption and as animal feed) became an important conduit for the rapid expansion of chemical agriculture. To put it simply, the ChAP’s work, which it carried out in close collaboration with the Chilean state, helped convince Chilean farmers and state agricultural officials that their success would be tied to their greater usage of fertilizers, pesticides, and other chemical inputs. In the end, this meant that an agricultural model that was driven by a humane impulse to feed the people of Chile (or at least a subset of Chilean city dwellers) too often ended up poisoning the waters and lands of the
countryside—not to mention, making the rural laborers who worked the land increasingly redundant.

1 The research for this report was made possible by a generous research stipend from the Rockefeller Archive Center. Special thanks to RAC archivist Bethany Antos for her assistance, as I located documentation related to the Chilean Agricultural Program among the Rockefeller Foundation's vast holdings.

2 For retrospectives on Rupert’s work in Chile, see “Alejamiento del Sr. Joseph Rupert, Director de la Fundación Rockefeller en Chile,” *El Campesino* (April 1968), 69-71. Also, “Rupert is Honored as He Leaves Chile,” *Staff Newsletter* (Rockefeller Foundation), April 1968. Both are located at Rockefeller Archive Center (RAC), Rockefeller Foundation (RF), Biographical File, Box 6, Folder 268.

3 The Chilean Agricultural Program’s first progress report maintained that its goal was to “work toward improved yields of basic food crops,” with wheat and forage identified as the first crops of interest “because of their critical importance in the agricultural economy of Chile.” “A Progress Report of the Chilean Agricultural Program (May-September 1955),” p. 1. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.

4 “Chilean Agricultural Program,” November 30-December 1, 1954. RAC, RF, RG 1.2 Projects, Series 309, Box 1, Folder 1. The Rockefeller Foundation seemed intrigued by the opportunity to use Chile to further internationalize its approach to rural development. Using the country as a “third training base,” the aforementioned 1954 memo went on to predict that “young Chilean scientists, as well as other Latin Americans, could gain instruction and experience which would help them significantly in their future responsibilities in their own countries.”

5 “A Progress Report of the Chilean Agricultural Program (May-September 1955),” p. 1. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.


The new historiography has opened room to think about the Green Revolution as more than simply a Cold War struggle between the capitalist and socialist world. To be sure, the Cold War struggle between the Soviet Union and the US—and what Shane Hamilton calls the “farms race”—are an undeniable part of the story of modern scientific agriculture. On the Green Revolution and the Cold War, see J.H. Perkins, *Geopolitics and the Green Revolution* (New York: Oxford University Press, 1997). Also, Shane Hamilton, *Supermarket USA: Food and Power in the Cold War Farms Race* (New Haven, CT: Yale University Press, 2018).

Norman E. Borlaug, “Chilean Agriculture,” August 1, 1954. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.

Ibid.

Ibid.

Ibid.


Cited in Mary Jane Blanton, “A Review of Chile: Its Land, People, and Agriculture,” February 1954, p. 23. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.

“Mr. Rene Cortázar Sagarminaga,” RAC, RF, RG 10, Fellowships, Fellowship Recorder Cards, Subgroup 2, Discipline 9, Box 9. Also, “Rene Cortázar Sagarminaga,” RAC, RF, RG 10.1, Fellowships, Series 309E, Box 105, Folder 1844.

Norman E. Borlaug, “Chilean Agriculture,” August 1, 1954. For effusive praise of Cortazar, see pages 1, 34, 45-46, 60. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A. Borlaug observed first-hand some of Cortazar’s work crossing Mentana wheat varieties with the Kenya 117 variety, as well his breeding of rust-resistant Capelli hybrids, used in durum wheat pastas.

Rockefeller Foundation – Division of Natural Sciences and Agriculture, “Chile: Land, People, Agriculture,” Staff Information Circular No. 2, February 1954, 26. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.
24 Rockefeller Foundation – Division of Natural Sciences and Agriculture, “Chile: Land, People, Agriculture,” Staff Information Circular No. 2, February 1954, 26. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.
26 Rockefeller Foundation – Division of Natural Sciences and Agriculture, “Chile: Land, People, Agriculture,” Staff Information Circular No. 2, February 1954, 26. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A. “A Progress Report of the Chilean Agricultural Program (May-September 1955),” 1. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A.
27 Rupert Diary Entry, June 3, 1955. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1.
31 Rupert Diary Entry, February 11, 1961. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3.
32 Memoria – Oficina de Estudios Especiales, 1960, 14. RAC, RF, RG 1.1 Projects, Series 309, Box 1, Folder 2.
33 On the nitrate industry’s push for domestic nitrogen consumption, see Rupert Diary Entry, December 11, 1959. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 2. On the need for phosphates, see Rupert Diary Entry, February 11, 1957. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1.
34 W.W. Diary, February 28, 1955. RAC, RG. 1.2 Projects, Series 309, Box 6, Folder 34.
35 Rupert Diary Entry, April 20, 1956. RAC, RF Officer’s Diaries, RG 12, Box 417, Folder 1.
36 Rupert Diary Entry, September 19, 1959. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 2.
37 Rene Cortázar Sagarminaga, RAC, RF, RG 10, Fellowships, Fellowship Recorder Cards, Subgroup 2, Discipline 9, Box 9.
38 This concern is mentioned in one of Rupert’s diary entries after speaking with FAO forage expert Wayne Miles. See Rupert Diary Entry, March 30, 1956. RAC, RF Officer’s Diaries, RG 12, Box 417, Folder 1. For more on Cortázar’s disputes with Rupert about the OEE weakening the existing structures of Chile’s Ministry of Agriculture, see Rupert Diary Entry, February 1, 1956. RAC, RF Officer’s Diaries, RG 12, Box 417, Folder 1.
41 “The Chilean Agricultural Program (May-September 1955),” p. 1. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 10A. In 1960, a Rockefeller report maintained that roughly twelve percent of meat and dairy products were being imported to meet domestic demand. See Kenneth L. Turk, “Summary Report to the Rockefeller Foundation on the Needs and Opportunities of an Animal Science Research Program in Chile,” January 14, 1960, p. 2. RAC, RF, RG 1.2 Projects, Series 309, Box 2, Folder 8.
42 W.M. Myers, “Observation of Forage Crops and the Forage Research Program in Chile,” November 24 to December 15, 1958, p. 3. RAC, RF, RG 1.2 Projects, Series 309, Box 1, Folder 6.
44 W.M. Myers, “Observation of Forage Crops and the Forage Research Program in Chile,” November 24 to December 15, 1958, p. 3. RAC, RF, RG 1.2 Projects, Series 309, Box 1, Folder 6.
45 Rupert Diary Entries, March 19 and March 20, 1956. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1. Rupert Diary Entry, September 24, 1956. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1. Rupert Diary Entry, December 21, 1956. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1. Rupert Diary Entries, February 2 and February 6, 1957. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1.
46 Rupert Diary Entry, June 15, 1957. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 1.
48 Ortega Martínez, et. al., Corporación.
49 Rupert Diary Entry February 11, 1960. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3. In early 1960, CORFO also enlisted the OEE to carry out “dryland forage work” at a farm it operated near the city of Concón. See Rupert Diary, March 9, 1960. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3.
50 Rupert Diary Entry, January 27, 1959. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 2. Traveling to the south of Chile with a delegation of Chilean government officials few days later, Rupert reported that it was the Ministry of Agriculture’s belief that the high cost of chemical fertilizers was holding back forage crop production. See January 28-February 1, 1959. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 2. This concern about the need for fertilizer studies was repeated in the OEE’s 1960 annual report. See “Memoria – Oficina de Estudios Especiales,” 1960, p. 31. RAC, RF, RG 1.1 Projects, Series 309, Box 1, Folder 2.
52 On grazing trials, see Rupert Diary Entry, October 4-8, 1960. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3. Also, Rupert Diary Entry, November 11, 1960, RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3.
53 Rupert Diary Entry, June 9, 1961. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3. Rupert Diary Entry, August 4, 1961. RAC, RF, Officer’s Diaries, RG 12, Box 417, Folder 3.