agroideal

TERRITORIAL INTELLIGENCE

SMART PLANNING MEANS BUSINESS

How Agroideal is helping take food production in Brazil to a higher level of sustainability and profitability

Why Agroideal?

The vast, mostly flat landscapes of the Cerrado, Brazil's second largest biome only behind the Amazon, could hardly be excluded from any serious review of the country's recent history, given the political and economic importance they have acquired over the past six decades. The region covers almost 24% of the territory of South America's powerhouse and harbors thousands of native species of plants and animals, many of which cannot be found anywhere else. It was here that the federal government inaugurated the new capital, Brasilia, in 1960. Vast groups of construction workers, government officials, and migrants seeking a place to start anew moved to the bold, modernist-looking city and began a fresh cycle of human occupation of these lands.

It was one of the first times that Brazil significantly invested in attracting large numbers of people to places as far as 650 miles from its coast. As the political center moved away from the bustling streets and beaches of Rio de Janeiro to the fairly-wild savannas in the heart of the country, economic growth increased quickly in the region. In the 1980s, scientific research coordinated by government agency Embrapa allowed farmers to successfully introduce new types of soy seeds adapted to the soil and climate of the Cerrado, and agribusiness flourished, bringing another boost to the countryside. Cattle ranching expansion also grew quickly, so that by the 2000s, soy and beef were already the significant forces of transformation in these region, a movement that continues to-date. The Center-Western region of the nation, which is mostly covered by the biome, more than doubled its population to 16 million in 2018 up from 7 million in 1980. Suitable natural conditions and substantial investments in technology has made this Brazilian region one of the leading sources of food globally. From 2008 to 2018, production of soy in Brazil grew by about 98% (from 60 million tons to 119 million tons), with the Center-Western region being responsible for around 45%. The country now vies with the United States for the position of the world's largest soy producer.

This impressive economic phenomenon came at a high environmental cost. The Cerrado has already lost more than half of its natural areas. From 2000 to 2015, approximately 91,000 square miles were deforested, an area a little smaller than the United Kingdom (around 93,000 square miles), most of it due to the conversion of the savannas to pasture for cattle and soy crops. This process results in an inestimable loss of species and changes in rain patterns to the whole country, affecting agriculture itself and water availability in some of the largest metropolises of the continent. Deforestation also hinders Brazil's efforts to reach its carbon emissions reduction goals; not only does carbon absorption cease, but also the carbon dioxide that trees store is released into the atmosphere when they are cut. Scientists estimate that the Cerrado stocks about 13.7 billion metric tons of carbon dioxide, which is equivalent to the total emissions of the United States for 2.5 years. Also, the biome is home to a wide range of indigenous communities spread throughout 109 Indigenous Lands. They rely on a healthy climate, fauna, and flora to live and preserve their cultures. Agribusinesses, investors and financial institutions have an exceptional opportunity to lead a positive change in the soy and beef supply chains so that growth goes hand in hand with conser- vation. By better plan- ning their purchases and investments, they can bring perpetual sustainability into the core of farming and ranching activities. Helping to save the Cerrado is one of the most relevant things we can all do to allow businesses, communities, and nature in Brazil to thrive.

Origins of Agroideal

Agroideal was created under the premise that technology and smart planning are key answers to one of the most pressing challenges in South America: to continue creating jobs and income through agricultural and ranching activities while conserving its extremely biodiverse natural areas.

The origins of this innovative tool go back to 2012, when The Nature Conservancy (TNC), a leading environmental organization, and Bunge, a leader company in the sectors of agribusiness, food, and ingredients, decided to work together to assess how much private land was available and suitable for agricultural activities, considering Brazil's then-new environmental legislation.

The idea came from the realization by both sides that land clearing starting in the 1960s led to inefficient growth in the cattle industry, with a low number of heads per hectare. That meant lots of cleared pasture could be used for crop expansion. Besides making sense from the business perspective, driving food production growth to low-density or degraded pasture lands would also alleviate the pressure on areas covered by native vegetation.

As part of this collaboration, TNC, Bunge and the University of São Paulo developed a Go/No-Go tool, which indicated different scenarios for intensification of farming in areas that were deforested long ago. This experience showed how useful territorial intelligence could be to the strategic planning of agribusiness companies. That prototype had the potential to become a game changer if it could evolve into a tool that the entire sector could use to make better decisions on sourcing, investment, and expansion. Inspired by this perspective, the two organizations partnered once again in 2016 to take the project to the next level.

At the same time, the Gordon and Betty Moore Foundation launched its Forests and Agriculture Markets Initiative (FAMI) and the Collaboration for Forests and Agriculture (CFA), seeking to shift market stakeholders towards sourcing deforestation-free beef and soy from the Brazilian Cerrado and Amazon biomes, as well as in the Argentinean and Paraguayan Chaco. The perfect match between the two initiatives led the Moore Foundation to support a multi-year development program for Agroideal. It was then that TNC and Bunge began developing the system.

26%
CERRADO

62%
MATOPIBA

Between 2007 and 2014, 26% of crop expansion in the Cerrado took place in areas that were covered by native vegetation. In the Matopiba[1] region, this number jumped to 62%.

2000   **2016**

From 2000 to 2016, 49% of the cattle ranching expansion in the Matopiba region occurred in newly deforested lands.

154,000 square miles

Brazil has more than 154,000 square miles (an area larger than Germany) of cleared lands suitable for soy expansion, most of them occupied by low-productivity pastures that could be replaced by crop agriculture if modest efficiency gains in cattle ranching were obtained.

1 Brazilian states of Maranhão, Tocantins, Piauí and Bahia

How Agroideal was developed

When TNC and Bunge began developing **Agroideal**, they knew that they needed to come up with a tool that would be useful to all stakeholders in the soy and beef value chains to unleash the full transformative potential of territorial intelligence applied to agribusiness planning.

They had one classic trap to avoid: building a system that would end up being ignored by the companies of those sectors because it did not answer their needs. There was a long history of science-heavy NGOs putting together apps for the private sector without working with substantial and continuous input from the business community throughout the process. So, the organizations took a different approach with **Agroideal**. They began by forming a consortium of potential end-users, mostly representatives of the soy and beef industries in Brazil and having that working group set the parameters with which the developers would work.

It was through this user-driven process that the concept of **Agroideal** took shape.
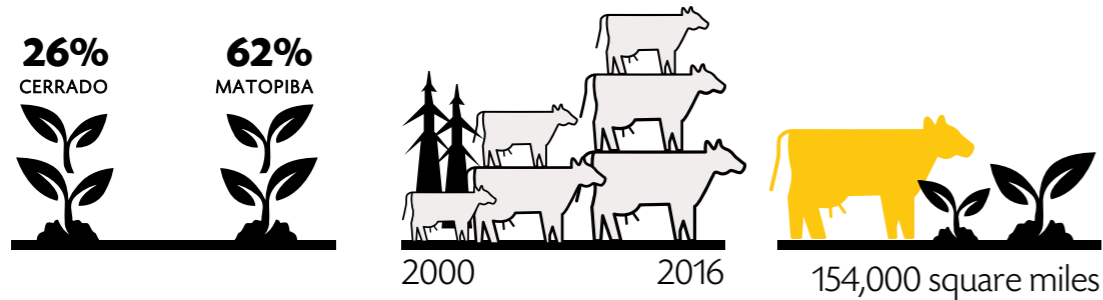
Agroideal is a free, online tool that layers social, economic, and environmental datasets, and allows users to identify where they can expand soy and beef sourcing in a way that minimizes environmental impact and maximizes return on investment.

To flesh out the tool, consortium members participated in bi-monthly meetings, in which they offered guidance to a technical group composed of TNC's conservation and geospatial technology experts, as well as systems specialists from Agrosatélite, a Brazilian agribusiness software design company.

The inputs from the working group shaped the tool entirely, from the data layers that were included in the system to the user-friendly design that characterizes it. In some cases, there was not enough information available in official sources and research centers to address the consortium's interests. The soy sector companies, for example, revealed that two of the most useful maps for their planning would be that of degraded pasture areas in the Cerrado and that of lands suitable for soy crop intensification, but these maps had just never been created. To meet those needs, the **Agroideal** team partnered with renowned universities in Brazil, such as the Universidade Federal de Goiás, to gather data and define analysis methods that, after two years of work, resulted in unprecedented mapping.

In addition to offering long-sought-after information for its users, **Agroideal** also gathered data that was spread across multiple sources, including public and private databases, and organized it into a coherent, easy to customize format. As a result, users are now able to create and compare scenarios that previously would have been nearly impossible to analyze, leading to more sophisticated and efficient decision-making.

Agroideal 1.0 was launched in September 2017 at an event in São Paulo open to the agribusiness and environmental sectors. The first version of the system contained information related to the soy chain in the Cerrado. Seven months later, TNC, Bunge, and the Moore Foundation launched an expanded version at an Innovation Forum event at TNC headquarters in Arlington, VA. The system's newest version included data relevant for the soy sector in the Amazon and the beef sector in both the Cerrado and the Amazon biomes.

How Agroideal works

Agroideal helps maximize investment and purchase opportunities and reduce social and environmental risks by allowing users to create maps that combine information about both needs and generate reports that indicate the level of "opportunities versus risks" of the area undergoing analysis. But who is using Agroideal, and how?

a) Users

Agroideal is useful to:
- Target users: Soy trading companies' staff working in planning, purchasing, investment, expansion, and sustainability activities
- Government representatives seeking to coordinate land-use planning policies
- Researchers working on territorial analysis and land-use planning
- Non-profit organizations supporting conservation and social development efforts

Agroideal is <u>not</u> designed for:
- Monitoring property-level compliance or commitments
- Replacing CAR or other monitoring systems
- Helping farmers and ranchers plan their land use

b) Data Security

Agroideal does not share user data, search history, strategies or any information with other users. The only way someone can view a map or report created by someone else is if the owner creates a link and shares it with others.

c) Exploratory inquiries

Step 1:
Users define a question related to their business strategy, such as, which areas in northern Mato Grosso state have the highest potential for the expansion of soy crops onto cleared lands? Which zones have the highest number of properties already included in the government monitoring system, as well as the lowest level of illegal deforestation?

Step 2:
Based on these questions, users select the most relevant economic and socio-environmental indicators. The menu includes the following types of data layers:
- Protected lands (Environmental Protection Areas, Indigenous Lands)
- Special areas (military zones, "priority conservation zones" as defined by the government)
- Political or managerial limits (the Amazon or Cerrado biomes, states, municipalities, micro-regions)
- Agricultural areas (soy crop areas in different years, pasture lands in areas suitable for soy crops)
- Infrastructure (warehouses, silos, roads, ports)
- Monitored areas (properties monitored by the public government system, rural settlements, areas under environmental embargo)

Step 3:
Users select parameters related to their business strategy, which modify the map and the information contained in the report generated by the system. These parameters are:
- The region of interest (Cerrado biome, Amazon biome or both)
- Area of study (either the name of a municipality or a specific region that users select on the map)
- Economic opportunity (area covered by soy crops, pasture lands suitable for soy crops)
- Socio-environmental risk (deforestation, level of conflict for land tenure)

Step 4:
The system generates a tailored map, combining all the choices made by the user. It also displays an evaluation of the economic opportunities and socio-environmental risks that the selected region offers, according to the strategy that the user indicated.

Step 5:
Users can then explore the map created for them, visualize the information that will help them make decisions, download raw data into excel, and generate pdf reports with graphics and accurate numbers that can be shared or taken to a meeting, for example.

Unique features of Agroideal

1 All indicators were suggested by experienced representatives of the agribusiness, research, and conservation sectors.

2 It is a market-approved tool, continually updated and improved by experience-based feedback from major companies and NGOs.

3 The system integrates business-related data and conservation-sensitive information in a unique platform, leading to a more comprehensive and more in-depth perspective of land use planning.

4 As a free, online, open tool, Agroideal does not charge users access or license fees, offering unrestricted access to an unlimited number of visitors from the same organization without impacting their budgets.

5 It is the first tool explicitly designed to help companies assess socio-environmental risks while still planning their sourcing and investment expansion, connecting processes that were previously isolated and bringing sustainability to the heart of business planning.

6 **Agroideal** offers data that cannot be found anywhere else, such as maps for degraded pasture areas in the Cerrado and lands suitable for soy-crop intensification. It also as allows users the possibility of checking the potential for expansion into areas with no deforestation in any given region within the two main Brazilian biomes.

7 Up-to-date information from the most reliable sources, including 2016/2017 soy harvest data; the most recent data that exists on the Rural Environmental Registry (CAR), shared by the SFB (Brazilian Forestry Service); and Amazon Soy Moratorium blocked/embargoed areas, updated every two months.

8 The user experience is fully customized, making the system useful in multiple ways. See case studies on pages 7 - 8 for real examples.

Agroideal Users and Uptake

A growing community of users

From its first launch in September 2017 to September 2018, the **Agroideal** website has been visited by around 2,200 users, of which more than 700 visited the page at least twice. These numbers indicate a surprisingly active group of early-adopters.
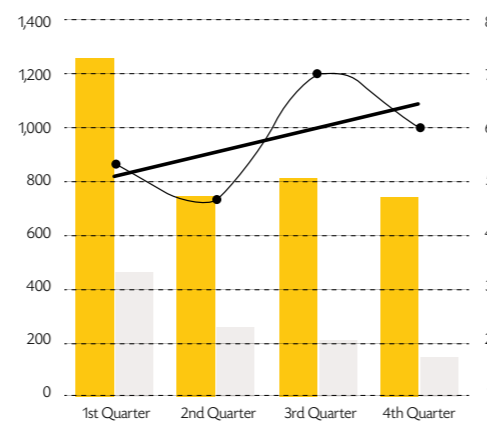
More than
4,000
visits

About
2,200
users

More than
700
visited the website at least twice
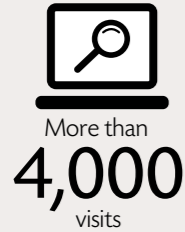
Growing relevance for business

Since **Agroideal's** first month of operation, time users spend on each visit has steadily increased, from less than five minutes to about 6.5 minutes. The number of total users in the last three-quarters of the system's first year remained stable. While the proportion of new users plunged from 35% in the second quarter to 23% in the fourth quarter, this probably means that a considerable percentage of users have been visiting **Agroideal** frequently and for more extended sessions - evidence that the system has been useful for them.

|	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter

Global attention, strong presence in Brazil

More than half (54%) of the visitors to **Agroideal's** system are in Brazil, as expected. However, the decision-making support tool did not go unnoticed in other major soy-producing countries, such as the United States (17% of visitors) and Argentina (5%). Even though in its first year of operation the system was focused on regions in Brazil only, high-level executives of leading agribusiness companies with headquarters in the US have been showing interest in understanding the potential applications of Agroideal, which may explain the country's considerable share in the global community of visitors.

72
Users from 72 countries

83%
Countries where users came from represent 83% of the demand for soy from the Amazon and the Cerrado.
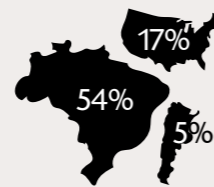
17%
54%
5%
Top three countries using **Agroideal**: Brazil (54%), USA (17%), Argentina (5%)

Case studies

COFCO

Why does territorial intelligence matter to COFCO?

COFCO announced the goal of becoming the world's leader in the grains supply chain in the next few years. Consolidating a fast-paced growth in Brazil while abiding by its own global Sustainable Sourcing Policies is a crucial part of their strategy.

How does COFCO use Agroideal?

The Chinese-capital company is relying on **Agroideal** to integrate socio-environmental risk assessments with evaluations of business opportunities in the Brazilian Amazon and the Cerrado. The processes that used to be conducted separately by different departments are now combined in a unified analysis.

Can you give me an example?

Before investing in infrastructure expansion or signing purchase commitments with a new group of farmers, COFCO evaluates if the lands already cleared in a given region fit their growth forecast. In case they do, expansion is likely to happen with no incentive to deforest. When the assessment indicates considerable risks of crops entering conservation areas, the company may either strengthen measures to track the origin of the crops to make sure they come from previously cleared lands or choose another region to evaluate.

What was Agroideal's contribution?

The system offered data that was not available anywhere else, such as updated maps of the soy crop areas across the entire Brazilian Amazon and Cerrado. It also made it possible to overlay several layers of information about supply, infrastructure, and conservation aspects, which resulted in unprecedented clarity and accelerated the planning process.

Where is it already making a difference?

In the municipality of Marcelandia, in the heart of Mato Grosso's soy exports production region, COFCO used **Agroideal** to deepen its analysis of the socio-environmental risks associated with a silo the company was planning to build. Research confirmed that there was a sufficient amount of cleared lands in the region to allow for crop expansion with no deforestation. The new silo was installed at the end of 2017 and gave a boost to the local economy.

Any changes for farmers and COFCO's staff?

Several farmers expanded their production, after the grain-storage bottleneck in the region was solved. They even reported an increase in the number of agriculture-related businesses in their town, such as machinery dealers due to the growing demand. COFCO's staff say Sustainability analysis is now more integrated than ever with the company's Business Intelligence strategy.

Louis Dreyfus Company (LDC)

Why does territorial intelligence matter to LDC?

The company has continuously implemented a set of measures to strengthen the sustainability of its operations in Brazil since 2017. Territorial intelligence is a vital part of LDC's effort to ensure that as it expands its soy sourcing in the Brazilian Amazon and Cerrado, it remains compliant with its global policies.

How does LDC use Agroideal?

LDC's Business staff is using **Agroideal** to evaluate the socio-environmental risks of expanding the company's demand for soy in given areas. They also rely on the territorial intelligence system to perform science-based analyses that help them make decisions on credit policy and commercial strategy.

Can you give me an example?

In the regions where LDC plans to increase purchases of soy, Business and Sustainability teams check the availability of cleared areas available for soy crops, including pasture lands with a potential to become crop zones. They also verify whether there are public conservation areas or Indigenous Lands nearby. When the inventory of cleared lands does not meet the demand, or there is a risk factor for entering conservation zones, they evaluate what mitigation methods may be put in place. When the risk of deforestation is high, they may choose to assess other soy crop areas.

What was Agroideal's contribution?

The tool offers information that was not available through other sources, including maps of degraded pasture lands that can be converted into crop zones, and an accurate map of soy crop areas across the Brazilian Amazon and Cerrado biomes. Also, LDC staff report that **Agroideal** allows them to combine production and conservation data in a unique way, which leads to wide-ranging options for territorial planning.

Where is it already making a difference?

Sinop, a municipality in Mato Grosso, is one of the regions where LDC adopted **Agroideal** as a tool to check socio-environmental conditions in the areas in which the company plans to expand its purchasing.

Any changes for farmers and LDC's staff?

LDC's local teams are now able to verify which properties or areas offer the highest potential for sustainable crop expansion, even before visiting farms. Staff report that by using **Agroideal** they are twice as fast in identifying new farmers with whom to partner.

To learn more about these and other real examples of how leading companies are using Agroideal, please visit:
https://agroideal.org

Looking to the future

As a system entirely based on users' needs, **Agroideal** is continually evolving. Data about conservation, production, and infrastructure in the Brazilian Amazon and Cerrado biomes is regularly updated. New layers of information are frequently added, and food, retail, and financial market companies are constantly discovering innovative ways of using the tool to integrate sustainability and business objectives.

Potential applications

These are just a few ways the private and public sectors are beginning to explore **Agroideal's** many uses.

- Risk mitigation in short-term crop financing
- Special conditions for long-term financing
- Overall supplier or loan portfolio risk evaluation
- Supermarket risk-management in sourcing of beef
- Identification of regions for government producer-support programs

Pipeline for 2019-2020

Several new features and initiatives will be incorporated by 2020.

- Expansion of **Agroideal** to the Chaco biome in Argentina (2019) and selected areas in Paraguay (2020)
- Integration of **Agroideal** with the Safe Trace traceability system – allowing retail clients such as supermarkets to perform regional risk analysis in their beef tracking processes (2019)
- Collaboration with the Brazilian and Paraguayan Roundtables for Sustainable Beef initiative to include information on landscape environmental risks for the beef sectors into **Agroideal**
- New rounds of demo sessions and training with representatives from agribusiness companies, banks, and supermarkets in Argentina and Brazil to broaden Agroideal's user base
- Development of Agroideal's Financial Sustainability Plan to leverage the system's continuous improvement and expansion

agroideal
TERRITORIAL INTELLIGENCE

For more information about **Agroideal**, please contact:

Rodrigo Spuri
Soy Sector Coordinator - Brazil
rodrigo.spuri@tnc.org

David Cleary
Global Agriculture Director
dcleary@tnc.org

Visit https://agroideal.org

The Nature Conservancy

www.tnc.org.br / www.nature.org