



Pasto Legal



Apoio



A few lessons from recent field campaigns in Brazil

Lessons from user relationships and fieldwork in the Cerrado and the Amazon

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“I want it to tell me how my farm is doing, not what to do with it.”

The user sets the tool's boundary — and that is the first lesson from the field.





Pasto Legal is the case study; the lessons are the product

How does a tool go from curiosity to working instrument?

1

Method — why we went to the field

2

What the field teaches about the data

3

What the field teaches about the relationship

4

What the field teaches about the product

5

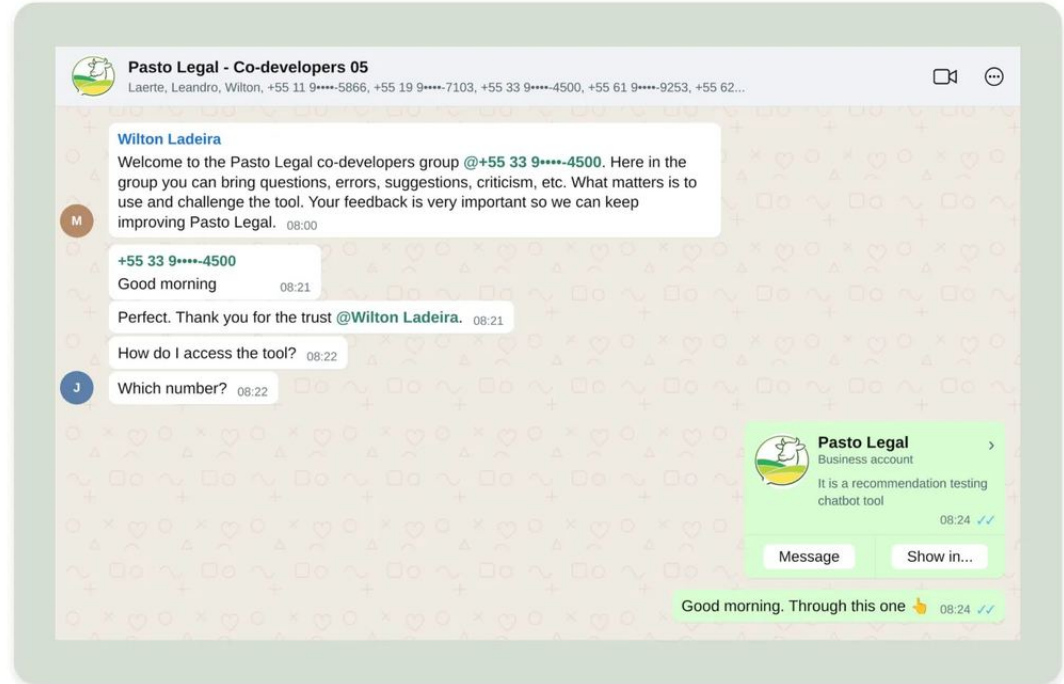
Transferable lessons



Test users from day zero

Co-creation is not a final stage — it is a starting condition.

- From the outset, a clear need to bring a group of test users on board
- Twofold goal: that they see themselves as co-builders of the tool and as its advocates
- Managing this relationship as part of product design, not as user support





Five groups, three profiles

Diversity of users for robust feedback

- 5 WhatsApp groups with distinct user profiles
- Consultants and rural extension technicians
- Beef cattle ranchers
- Dairy cattle ranchers
- Dynamics: free exploration of the tool + directed questions



Dead end reached: loss of interest → PL did not cross the "cool tool to valuable tool" barrier



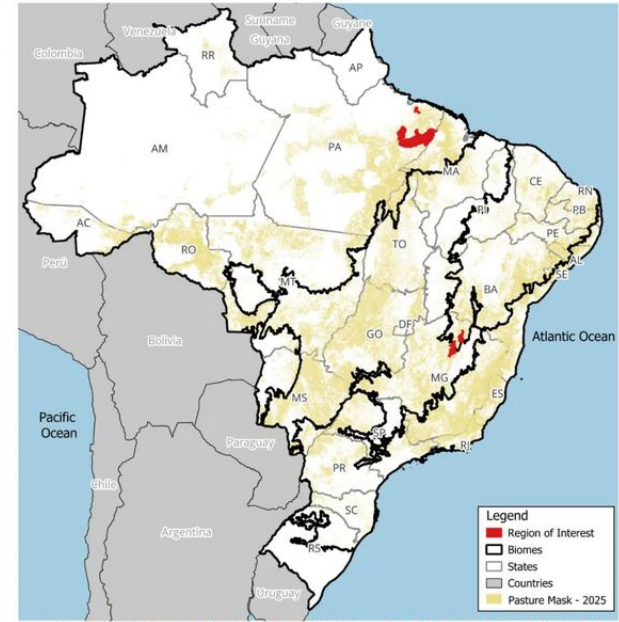
Decision to go to the field



Two regions, one table

The contrast is the argument

	Northern Minas Gerais	Northeastern Pará
Municipalities	Montes Claros, Janaúba	Paragominas, Tailândia, Castanhal
Biome	Cerrado/Caatinga	Amazon
Cattle herd	182.873	536.253
Annual rainfall	1.000 mm (INMET)	1800-2400m (IBGE/Embrapa)
Dry-season onset	~early May, abrupt	mid-June, gradual
Duration / peak	~4 months, rainfall ~0	Jul–Sep, without equivalent moisture loss (driest month: ~50 mm)
Degradation driver	biomass loss, soil exposure	invasive weeds (juquira), loss of nutritional value
Satellite signal	reliable for stock	overestimates vigor

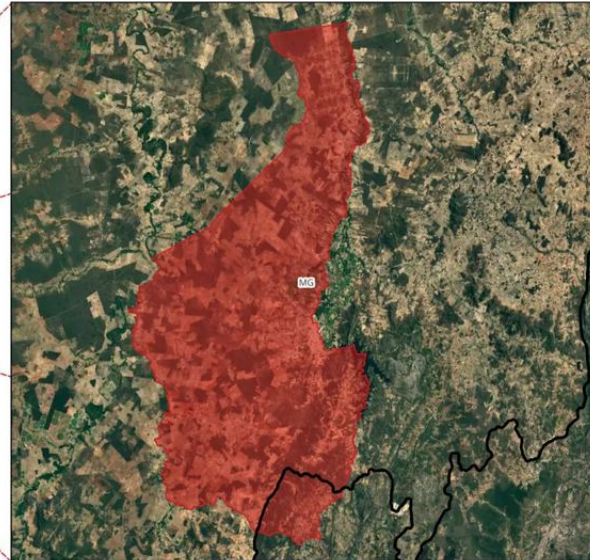
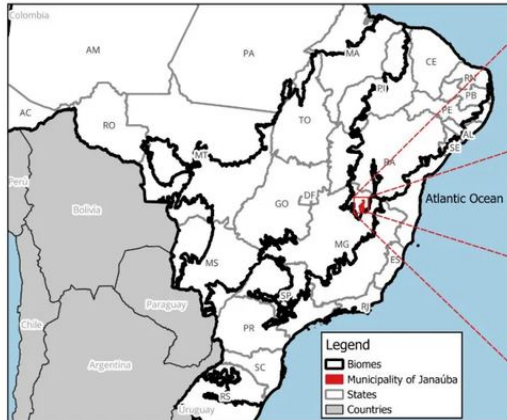




BLOCK 2 · THE DATA

The field, in images

See the pasture and the people before going back to the pixel.



*Tailândia Ranch, Janaúba,
Minas Gerais state*



*Villa Santa Maria, Janaúba
Minas Gerais state*



BLOCK 2 · THE DATA

The field, in images

See the pasture and the people before going back to the pixel.



*Farmer's Association, Montes Claros
Minas Gerais state*



*Villa Santa Maria Ranch, Janaúba,
Minas Gerais state*



BLOCK 2 · THE DATA

The field, in images

See the pasture and the people before going back to the pixel.



*Xingu Ranch, Castanhal,
Pará state*



*Degraded pasture, Tomé-Açu,
Pará state*



BLOCK 2 · THE DATA

The field, in images

See the pasture and the people before going back to the pixel.



*Xingu Ranch, Castanhal,
Pará state*



*Xingu Ranch, Castanhal,
Pará state*



BLOCK 2 · THE DATA

The field, in images

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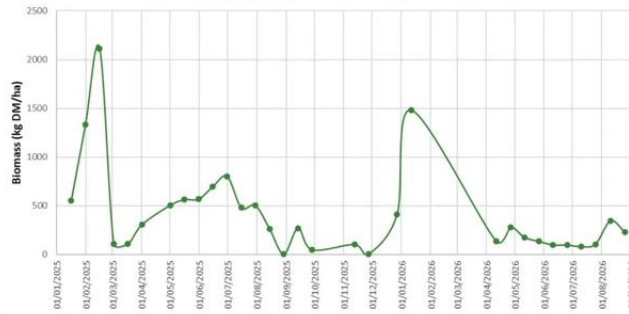


Different realities demand different information

There is no generic “biomass data” — there is biomass data for a decision calendar.

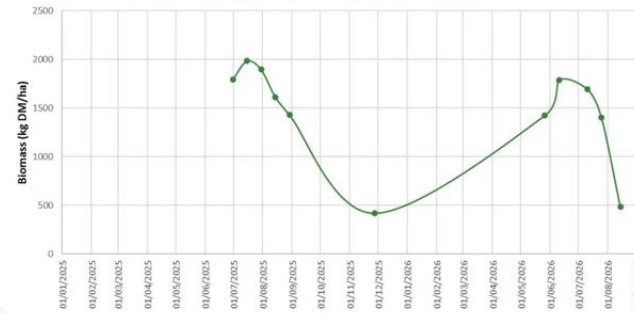
- Cerrado: biomass at the end of the rainy season is the stock that defines dry-season management / strategies
- Amazon: the rancher's question is different — what is growing, how pasture is responding to my management
- The same satellite product answers one question well and the other with higher uncertainty

Grassland Biomass (15-Day Aggregation) - Point (-16.8100, -52.4265)



Example of Cerrado pasture

Grassland Biomass (15-Day Aggregation) - Point (-1.4267, -48.1074)



Example of Amazon pasture

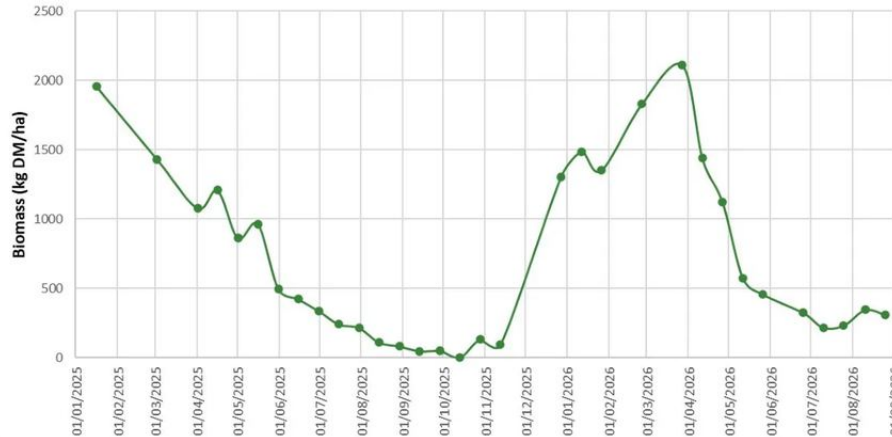


Cerrado — stock as the central data point

Well-defined seasonality makes satellite data a good strategical instrument.

- Rainfall concentrated in ~6 months (October to March); dry season with near-zero precipitation
- Dry-season onset in Montes Claros: ~early May, abrupt transition, ~4-month dry season
- Degradation generally associated with biomass loss and soil exposure — the satellite sees it well
- What the rancher does with the data: stocking-rate adjustment, supplementation decisions, timing of sales

Grassland Biomass (15-Day Aggregation) - Point (-16.9760, -50.0996)

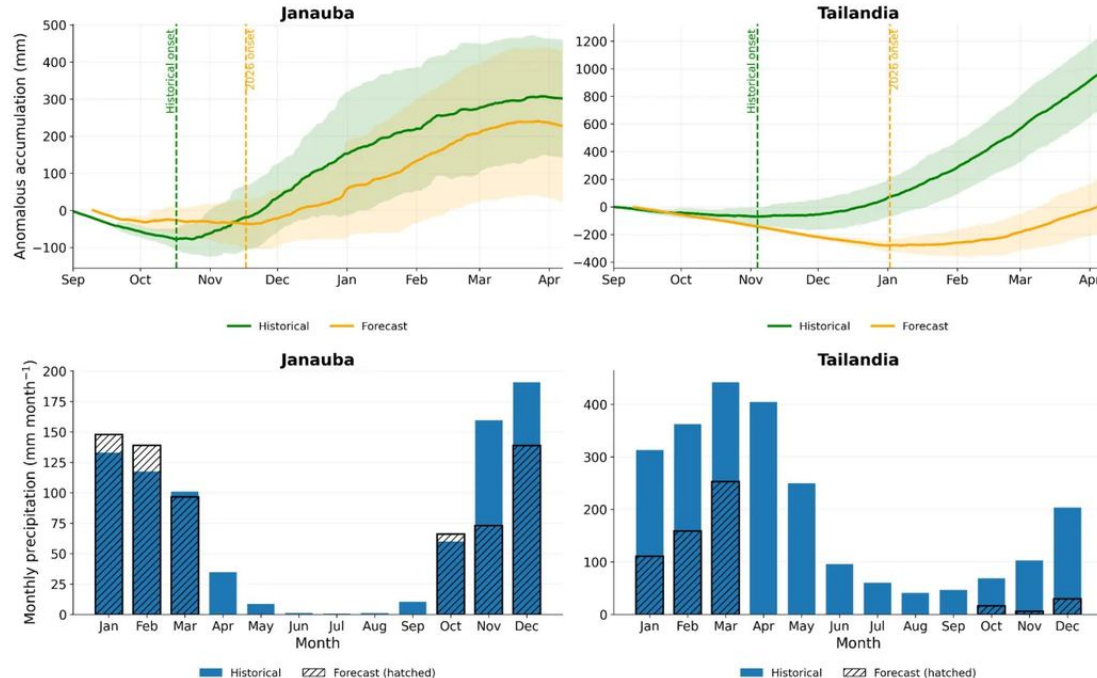


Pasture in Jandaia, Goiás state



Rainy-Season Monitoring and Forecasting Framework

Rainy-Season Diagnostics



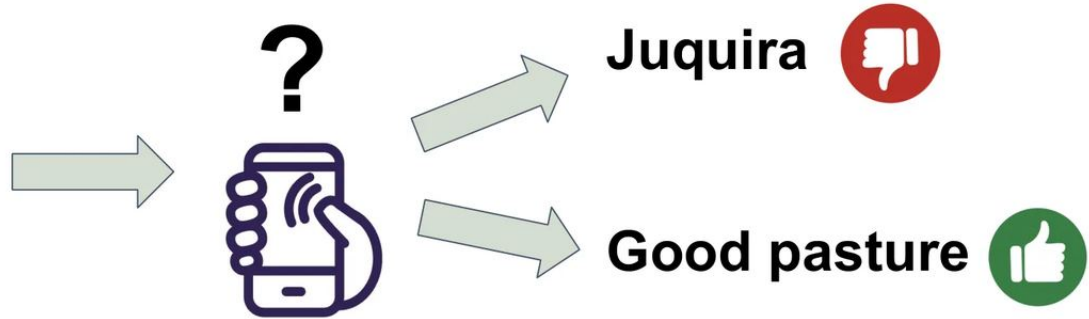
- In Brazil, BR-DWGD is used to characterize the **historical rainfall climatology** and the typical rainy-season behavior.
- The ECMWF seasonal ensemble, with **51 members**, is then used to forecast **rainy-season evolution** for approximately the next 6 months.
- The same framework can be applied elsewhere using alternative datasets, such as **CHIRPS for African countries**.



Amazon - the correction layer only the user has

The rancher's knowledge of their own farm qualifies the data — and the tool needs somewhere to receive it.

- What the rancher knows and the satellite doesn't: forage species, presence of invasives, pasture renovation history, current stocking rate
- How Pasto Legal can receive this: conversational questions that reinterpret the map
- This is not validation of the data — it is interpretation giving the data meaning

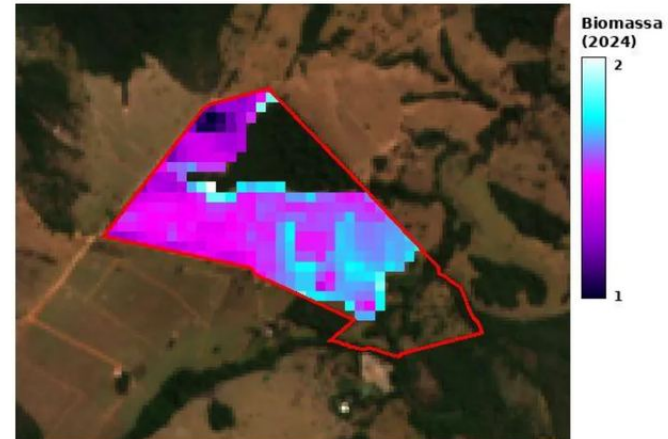
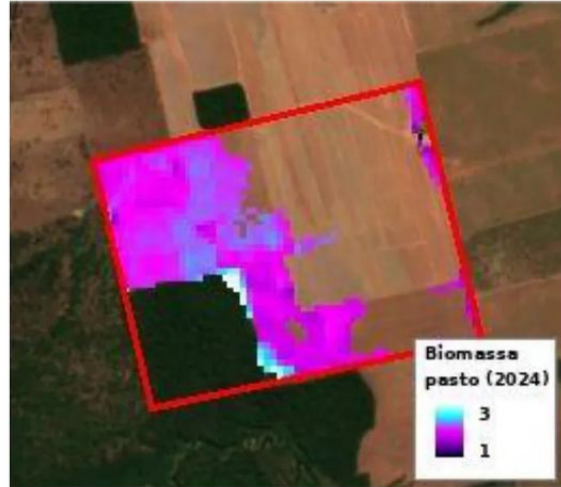




Stock levels or magnitude labels, not value judgments

Low / Medium-low / Moderate / Medium-high / High — never “good” or “poor”.

- The same kg DM/ha means different things for Brachiaria and for Panicum (Guinea grass)
- The biomass model cannot distinguish species (yet!!)
- The agronomic interpretation (is this enough for my species and my stocking rate?) belongs to the rancher and/or technician
- The map must show quantity, not quality





Stock, productivity and accumulation rate are three data layers, not one

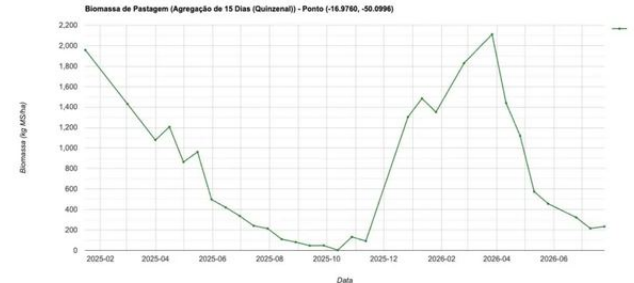
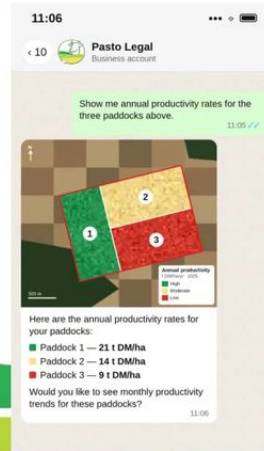
Each layer answers a different decision.

BLOCK LESSON: the satellite signal needs a correction layer that only the user has — and classification rules stable enough for the user to learn to read them.

Stock (kg DM/ha on a given date)
→ tactical decision: dry-season planning

Annual productivity (t DM/ha/yr) → structural decision: pasture renovation, investment

Accumulation rate / curve
→ the most actionable: supplementation, sales, maintenance fertilization

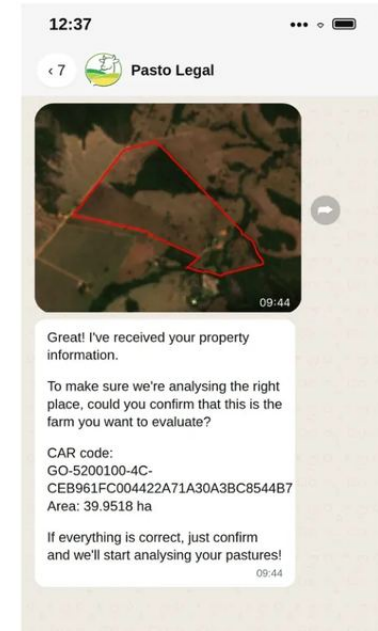




CAR as entry point — and as a problem

The most convenient reference technically was the most costly relationally.

- Why CAR (Rural Environmental Registry) was the obvious choice: coverage, farm geometry, unique identifier
- Why it reinforces the regulatory reading: it is the instrument of environmental compliance
- What this led us to change: multiple entry points (see block 4)
→ the user sets what the system can "know" about his property





The challenge of listening

Having the data is not enough: it must be useful, and in formats that make sense to each user.

- Overcoming initial distrust
- Building a horizontal relationship
- Creating trust through dialogue and constant feedback
- The rancher needs to SEE that their input was incorporated





Knowledge anchored in territory

There is no knowledge about pasture that is not anchored in the territories and social relationships that sustain Brazilian cattle ranching.



Information vs. management: who sets the boundary

Offering data is not the same as proposing decisions. The user says how far the platform may go.

- Back to: “I want it to tell me how my farm is doing, not what to do with it.”
- Where Pasto Legal went: diagnosis, comparisons, farm summary
- Where it should not go on its own: management prescriptions
- This is not a limitation — it is design. The user is the one who tells the tool how far they want help about management



BLOCK LESSON: *trust is built before the data, and any sign of enforcement destroys it; the rancher does not necessarily want prescription.*



Fitting into the routine without friction

The tool adapts to the technician's and the farm manager's day — not the other way round.

- Passive tool (user decides what he asks and gets) vs. active tool (PL suggests way forward, supplies alerts, reminders and periodic summaries)
- The journey needs some stimulation — at least until the user is familiarized with the possibilities



Scientific precision vs. readability on a phone screen

What fits in 6 inches defines what can be communicated.

- Biomass data as Pasto Legal's key differentiator — and the hardest thing to show on a phone
- Simplification choices
- What is lost and what is gained



From a single door to multiple entry points

CAR, SIGEF, point + buffer, shapefile upload.

- Inputs: CAR · SIGEF · point + buffer · upload of farm and paddock shapefiles
- An output that “leaves the phone”: a PDF with the farm's general summary, which circulates on the farm and with the technician
- Each entry point serves a different profile and level of formalization



Three profiles, three journeys

Technician, farm manager and rancher (large vs. small) do not want the same screen.

- Technician / consultant: several farms, comparison, reports for clients
- Farm manager: operational routine, alerts, paddocks
- Large vs. small rancher: how can I improve my management x where do I start

Variables	Technician	Large farmer/Manager	Small farmer
Decision Level	Memory for different properties	Strategic + Tactic	Strategic decisions
Data Level	Farm + paddocks	Paddocks	Farm
Information type	Emphasis on data	Emphasis on data	Prescriptive emphasis and knowledge input

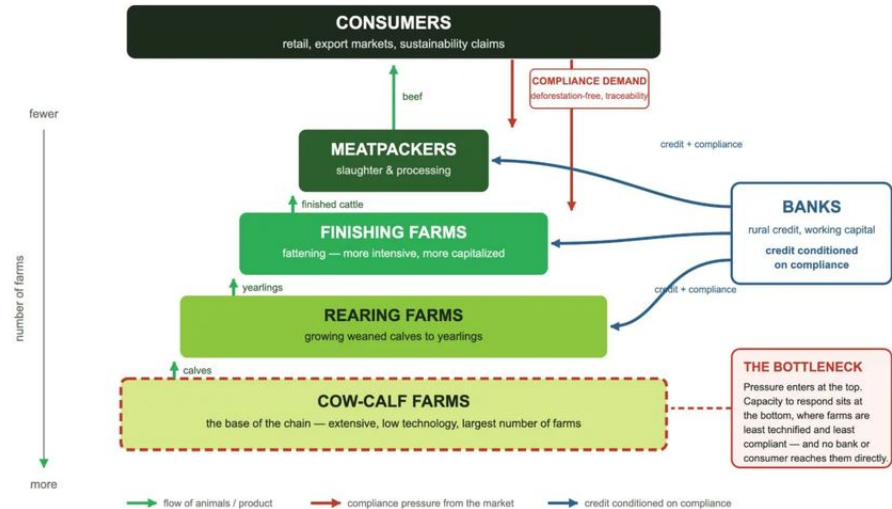


The adoption paradox

Those who need the data most are those who find it hardest to adopt the tool.

- Already-intensive production: already monitors, adopts easily, needs it less
- Extensive production: needs it more, adopts less
- Implication: the tool does not scale on its own through the individual user

The beef cattle chain: where the pressure comes from, where the capacity sits





How Pasto Legal can scale

The large can bring the tool to the small.

- Opportunity: more modern farms need to help modernize the base of the chain they depend on
- Where this already appeared in the field: large farmers complaint about calf scarcity, some deciding to start breeding calves
- Possibility for PL to serve as knowledge tool for small farmers brought by large buyers and as monitoring tool for banks and meatpackers in pasture recovery projects.

BLOCK LESSON: usability is routine, not interface; and scale in cattle ranching runs through the chain, not the individual user.



Six lessons for anyone building tools on top of pasture maps

What Pasto Legal learned that may apply to other projects



1. There is no generic biomass data; there is data for a decision calendar.



2. The satellite signal needs a correction layer that only the user has.



3. Any echo of enforcement destroys trust before first use.



Five lessons for anyone building tools on top of pasture maps

What Pasto Legal learned that may apply to other projects



4. Tool development must advance interlocked with trust building and must respect the rhythm of the users, not of developers



5. The rancher wants diagnosis, not prescription — and sets the boundary.



6. Scale runs through the chain, not the individual user.