Becaps (Argentina) — Chemical Displacement per Hectare

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> **SUI Statement:** One application of Becaps microbial biostimulant to one hectare of cultivated land displaces **102.4 kg CO?e** of synthetic chemical inputs, net of counterfactual, verified against a three-tier SSOT pipeline (±12%, 95% CI).

Company Overview

Becaps is an Argentine agri-biotech company that has developed a proprietary microencapsulation technology for soil microorganisms. The core product delivers high-viability microbial consortia — primarily nitrogen-fixing bacteria and phosphate-solubilising fungi — to agricultural soils in a formulation that survives harsh field conditions and achieves root-zone colonisation at commercially meaningful rates.

Technology differentiation:

- Microbial viability at application: ?10^{11} CFU per gram (Colony Forming Units)
- Synthetic Displacement Ratio: 1.3:1 — for every 1 kg of Becaps product applied, 1.3 kg equivalent of synthetic nitrogen or phosphate fertiliser is displaced
- Field persistence: active colonisation confirmed at 90-day post-application in field trials
- Crop compatibility: validated for soy, maize, wheat, sunflower, and vegetable cultivation

The SUI: Chemical Displacement per Hectare

Parameter Set

Parameter	Value
SUI Name	Chemical Displacement per Hectare
Outcome Domain	Climate — GHG Emissions Avoided
IRIS+ Code	PI5765 (GHG Emissions Avoided by Investees)
Application Event	Application of 1 kg Becaps biostimulant to 1 hectare of cultivated land
Baseline	220 kg N/ha synthetic nitrogen application (INDEC 2023, Argentina national average)
Observed	85 kg N/ha (average across 120 trial plots, 2022–2024, certified by INTA)
Net Displacement	135 kg N/ha
CO?e Conversion	135 × 0.758 CO?e/kg N (IPCC AR6, Tier 1 emission factor for synthetic N production)
SUI Magnitude	102.4 kg CO?e per hectare per growing season
Uncertainty	±12.3 kg CO?e (±12%, 95% CI, based on plot-level variance across 120 trials)
Verification Protocol	Annual LCA audit by certified GHG verifier; SSOT ingest from ERP batch records + INTA lab reports

The Becaps SSOT Architecture

Tier 1: Ingest

- **Source 1:** ERP production records — batch ID, quantity produced (kg), production date, microbial viability QC result (CFU/g)
- **Source 2:** Logistics records — delivery date, customer ID, delivery location (GPS), quantity delivered (kg)
- **Source 3:** Customer application records — hectares treated per batch delivery (customer-reported, validated against land registry data for customers >50 ha)
- **Source 4:** INTA lab reports — soil nitrogen content pre/post application for monitored plots (12 per 500 ha treated, stratified sampling)

Tier 2: Digital Twin

- Model: Python-based LCA model (version-controlled in Becaps GitLab)
- Emission factors: IPCC AR6, INDEC regional agricultural statistics (updated annually)
- Baseline model: INDEC 2023 national average, disaggregated by province and crop type
- Uncertainty propagation: Monte Carlo simulation, 10,000 iterations per batch

Tier 3: Conversion

- IRIS+ PI5765 report: monthly update to GIIN platform
- SUI Ledger: append-only PostgreSQL table with one row per application event

- Auditor export: quarterly CSV package with full calculation audit log
- Blended finance dashboard: cumulative CO?e displaced vs. milestone thresholds (real-time)

Blended Finance Structure

Becaps secured a blended finance structure in Q3 2024 using the SUI as trigger metric:

- **First-loss provider:** IDB Lab (via DGGF intermediary), $800K guarantee
- **Commercial co-investor:** Latin American agri-tech VC, $2.4M equity
- **Leverage ratio:** 3:1 commercial to concessional
- **Milestone 1 trigger:** 500 tonnes CO?e displaced (verified) ? $200K of guarantee converts to grant, interest rate on commercial debt reduces 75 bps
- **Milestone 2 trigger:** 2,000 tonnes CO?e displaced ? Full guarantee conversion, green revenue note eligibility

Key Lessons for Other AgTech Companies

1. **The INTA partnership was decisive.** Having national agricultural research institute validation of field trial data gave the LCA model credibility that self-collected data alone could not. For CTH portfolio companies, identifying the equivalent national research institute in their country early is critical.
2. **Crop-specific baseline disaggregation mattered.** Becaps initially used a single national nitrogen average — investors challenged this. Disaggregating the baseline by crop and province improved accuracy and defensibility.
3. **The viability specification (10^{11} CFU/g) became a product standard.** Defining the minimum viable SUI trigger (a product lot must meet this viability threshold to count as an application event) forced quality discipline in production that improved product performance.
4. **Customers became data partners.** Integrating data collection into the customer relationship (land registry verification, application reporting) initially faced resistance. Framing it as "your data helps us show the financial system what you're doing" shifted the conversation.

Next: [MubOn (Colombia) — kWh Delivered per Charging Point]

Revisión #1
Creado 2026-06-08 20:35:14 UTC por Angelica Diaz
Actualizado 2026-06-08 20:35:14 UTC por Angelica Diaz