



ATN-RF-19946-RG Implementación del Plan de Gestión de Conocimiento y Comunicación de FONTAGRO

Producto 11. Al menos cinco borradores de artículos científicos y al menos 10 borradores de productos de resultados escritos.

Martín Oesterheld

2024



Códigos JEL: Q16

ISBN:

FONTAGRO (Fondo Regional de Tecnología Agropecuaria) es un mecanismo único de cooperación técnica entre países de América Latina, el Caribe y España, que promueve la competitividad y la seguridad alimentaria. Las opiniones expresadas en esta publicación son de los autores y no necesariamente reflejan el punto de vista del Banco Interamericano de Desarrollo (BID), del Instituto Interamericano de Cooperación para la Agricultura (IICA), FONTAGRO, de sus Directorios Ejecutivos ni de los países que representan.

El presente documento ha sido preparado por Martín Oesterheld

Copyright © 2024 Banco Interamericano de Desarrollo. Esta obra se encuentra sujeta a una licencia Creative Commons IGO 3.0 Reconocimiento-NoComercial-SinObrasDerivadas (CC-IGO 3.0 BY-NC-ND) (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) y puede ser reproducida para cualquier uso no comercial otorgando el reconocimiento respectivo al BID. No se permiten obras derivadas. Cualquier disputa relacionada con el uso de las obras del BID que no pueda resolverse amistosamente se someterá a arbitraje de conformidad con las reglas de la CNUDMI (UNCITRAL). El uso del nombre del BID para cualquier fin distinto al reconocimiento respectivo y el uso del logotipo del BID no están autorizados por esta licencia CC-IGO y requieren de un acuerdo de licencia adicional. Note que el enlace URL incluye términos y condiciones adicionales de esta licencia.

Esta publicación puede solicitarse a:

FONTAGRO

Correo electrónico: fontagro@fontagro.org

www.fontagro.org



Tabla de Contenidos

Abstract	4
Resumen	5
Introducción	6
Resultados	6
Effects of Dried Barley Brewer’s Spent Grain on Growth, Welfare, and Carcass Quality of Merino Lambs in a Semiarid Extensive Feeding System.....	6
CRISPR/Cas9-Mediated Development of Non-Transgenic Potato Varieties Resistant to Cold-Induced Sweetening and Enzymatic Browning	6
Evaluation of Technological Maturity in FONTAGRO-Funded Projects Using the Technology Readiness Level (TRL) Scale.....	7
Enhancing Agricultural Resilience in Latin America and the Caribbean through Strategic Public Investments: Lessons from FONTAGRO Initiatives	7
Integrating Technology Readiness Levels (TRLs) into R&D Accounting: A Novel Approach for Structured Financial Decision-Making	8
Instituciones participantes	9



ABSTRACT

Researchers often struggle to present their results effectively in scientific journal articles, a challenge that is especially prominent in Latin America and the Caribbean. Throughout the region, undergraduate and graduate programs prioritize disciplinary knowledge and statistical tools, while neglecting communication skills, particularly writing. The responsibility for teaching scientific writing typically falls to thesis supervisors, who themselves often lack formal training in this area. Projects funded by FONTAGRO consistently generate high-quality scientific information, yet only a small portion of the findings are published in internationally referenced journals. One key reason is the insufficient expertise in scientific writing, which is essential for publication in recognized journals.

To address this, FONTAGRO, in collaboration with the Faculty of Agronomy at the University of Buenos Aires, has introduced a second graduate course focused on manuscript preparation and publication. In Product 4, we reported that the course was attended by 21 participants (12 of whom were women) who made significant progress in key areas: drafting well-structured paragraphs, designing clear graphics, and optimizing the structure of each section of a scientific manuscript. Participants also learned how to develop a comprehensive publication strategy and manage the editorial process—from selecting an appropriate journal to handling rejections and revisions. In this Product 5, we report that course certificates were issued by the Graduate School and digitally delivered to FONTAGRO for distribution to the students.

Keywords: Scientific publications, writing, communication.



RESUMEN

Los investigadores a menudo tienen dificultades para presentar sus resultados de manera efectiva en artículos de revistas científicas, un desafío que es especialmente pronunciado en América Latina y el Caribe. En toda la región, los programas de grado y posgrado priorizan el conocimiento disciplinario y las herramientas estadísticas, mientras que descuidan las habilidades de comunicación, en particular la escritura. La enseñanza de la redacción científica suele quedar en manos de los directores de tesis, quienes, a su vez, a menudo carecen de formación formal en este campo. Los proyectos financiados por FONTAGRO generan constantemente información científica de alta calidad, pero sólo una pequeña parte de los hallazgos se publica en revistas de referencia internacional. Una de las razones principales es la falta de experiencia en redacción científica, que es fundamental para lograr la aceptación en revistas reconocidas.

To address this situation, FONTAGRO, in collaboration with the Faculty of Agronomy of the University of Buenos Aires, has established a process to assist with the writing of five manuscripts about some of its initiatives. This document presents the drafts of those texts, which will continue to be worked on after this consultancy. These are scientific manuscripts on a) the use of dried barley bagasse in the feeding of Merino sheep, b) gene editing of quality traits in potatoes, c) the level of technological maturity reached by the projects funded by FONTAGRO, d) the unique nature of FONTAGRO as a research funding mechanism, e) the value of evaluating the level of technological maturity in capitalizing on the costs of technological development phases.

Palabras Clave: Publicaciones científicas, escritura, comunicación.



INTRODUCCIÓN

Los proyectos financiados por FONTAGRO generan constantemente información científica de alto nivel académico. Sin embargo, en Latinoamérica y el Caribe pocos son los conocimientos científicos que son publicados en revistas referenciadas en el ámbito internacional. Entre las razones por la cuales los resultados generados no son publicados, se encuentra la necesidad de fortalecer en capacidades para la escritura adecuada de los artículos científicos, que permita la aceptación en las revistas científicas reconocidas.

Para abordar esta situación, FONTAGRO, en colaboración con la Facultad de Agronomía de la Universidad de Buenos Aires, ha establecido un proceso de asistencia para la escritura de cinco manuscritos sobre algunas de sus iniciativas. Este producto presenta los borradores de esos textos.

RESULTADOS

A continuación, se incluyen los resúmenes de los cinco borradores en elaboración.

[Effects of Dried Barley Brewer's Spent Grain on Growth, Welfare, and Carcass Quality of Merino Lambs in a Semiarid Extensive Feeding System](#)

Abstract: Sustainable intensification practices in livestock aim to optimize resource efficiency and resilience to climate change, particularly in extensive systems. This study evaluated the effects of replacing soybean meal and part of the maize and alfalfa with dried barley brewer's spent grain (BSG) in the diet of Merino lambs raised in a semiarid environment. Twenty-six male Merino lambs were fed either a control diet (55% maize, 10% soybean meal, 35% alfalfa pellet) or a BSG diet (45% maize, 35% dried BSG, 20% alfalfa pellet) for 48 days. The results showed no significant differences in body weight gain, feed intake, or feed conversion ratio between the two dietary treatments. Additionally, biochemical parameters and ruminal fermentation, including pH and protozoa concentration, were largely unaffected. However, lambs fed the BSG diet exhibited a reduction in visceral fat deposition, and a slight decrease in kidney fat coverage, compared to the control group. These findings suggest that BSG can be an effective alternative feed ingredient, contributing to reduced feeding costs and environmental impact without compromising lamb growth or meat quality.

[CRISPR/Cas9-Mediated Development of Non-Transgenic Potato Varieties Resistant to Cold-Induced Sweetening and Enzymatic Browning](#)

Abstract: Enzymatic browning and cold-induced sweetening affect the post-harvest quality of potato tubers. Tuber enzymatic browning is primarily caused by the action of Polyphenol Oxidase



2 (PPO2), activated during storage and post-harvest due to mechanical damage. Cold-induced sweetening occurs due to vacuolar invertase converting sucrose into reducing sugars fructose and glucose, which react with aminoacids during frying forming brown pigments and acrylamide. Cold storage prevents sprouting and minimize diseases, but increases vacuolar invertase expression. In Argentina, the most widely used varieties are cv. Atlantic for potato chips and cv. Spunta for fresh consumption. The inactivation of genes using CRISPR/Cas9 has proven to be effective in producing potatoes that maintain quality when stored at low temperatures and reduced bruises to mechanical damage. In our study, new potato varieties were developed using protoplast transfection of cv. Atlantic and Spunta with CRISPR/Cas9 and specific gRNAs to deactivate the vacuolar invertase and PPO2 genes. Lines 6A (cv. Atlantic) and L28 (cv. Spunta) showed complete knockout of the vacuolar invertase gene, maintaining the quality of potato chips even after 60 days of storage at 4°C. Line 6A is under process inscription as a new non-transgenic variety, beneficial for potato chip producers, allowing cold storage of tubers without reducing sugar production and avoiding the use of anti-sprouting chemicals. Line L28 will be evaluated for registration as a non-transgenic variety, useful for fresh consumption and high-quality frying. Additionally, lines L11 (cv. Spunta) and L28 showed partial edits in PPO2, with reduced enzymatic browning in L11. This work pioneers the development of edited and non-transgenic potato varieties with significant improvements in resistance to oxidative browning and cold-induced sweetening.

Evaluation of Technological Maturity in FONTAGRO-Funded Projects Using the Technology Readiness Level (TRL) Scale

Abstract: The Technology Readiness Level (TRL) scale is a widely recognized framework for assessing the technological maturity of research and development (R&D) projects, from concept to full deployment. This scale, comprising nine levels, helps evaluate the progression of technologies from basic scientific principles (TRL 1) to fully operational systems (TRL 9). In the context of 50 completed FONTAGRO-funded projects, the modal starting TRL was 3, indicating the phase where critical experimental proof of concept is conducted. The projects typically reached a final TRL of 6, which corresponds to the demonstration of a system or subsystem prototype in a relevant environment, moving closer to real-world application. The average technological leap was 2.6 for projects initiated up to 2013 and 2.9 for those initiated thereafter. This analysis highlights the dynamic nature of technological development, often involving non-linear progress and the need for multidisciplinary evaluations to navigate the complexity of advancing through TRL stages.

Enhancing Agricultural Resilience in Latin America and the Caribbean through Strategic Public Investments: Lessons from FONTAGRO Initiatives

Abstract: The agricultural sector in Latin America and the Caribbean (LAC) faces significant



challenges, from climate change to food insecurity. To address these issues, public investments in agricultural research and innovation have proven critical, with FONTAGRO playing a pivotal role. Over 25 years, FONTAGRO has co-financed 193 projects, leveraging over USD 142 million to promote sustainable agricultural practices. This paper analyzes the outcomes of the 2020-2025 Medium-Term Plan (MTP), highlighting its strategic investment in farm resilience, sustainable agroecosystems, and food security. The report reveals a 3.44:1 leverage ratio, with FONTAGRO driving significant technological and institutional innovations in the region. Future initiatives must continue to prioritize collaboration, effective monitoring, and increased private sector involvement to ensure sustained progress and resilience in LAC's agricultural systems.

[Integrating Technology Readiness Levels \(TRLs\) into R&D Accounting: A Novel Approach for Structured Financial Decision-Making](#)

Abstract: While Technology Readiness Levels (TRLs) are widely used in sectors such as aerospace and energy to assess the maturity of technologies, their potential for guiding accounting decisions in Research and Development (R&D) has been largely unexplored. This article proposes using TRLs as a structured framework for determining when R&D costs should be treated as expenses or capitalized as intangible assets in accordance with IFRS and GAAP standards. In early TRL stages (1-3), costs are typically expensed due to uncertainty about future economic benefits. However, as projects advance through mid-TRL stages (4-6), increasing confidence in commercialization may justify partial capitalization. At later TRL stages (7-9), when technologies are near market-ready, capitalization becomes more viable. This approach could introduce more precise and justifiable accounting practices for R&D-intensive industries, aligning technical progress with financial reporting. Despite its potential, TRL-based accounting remains under-documented, suggesting a need for pilot studies to evaluate its practical application and benefits in enhancing the transparency of R&D investments.



INSTITUCIONES PARTICIPANTES

.UBAagronomía
FACULTAD DE AGRONOMÍA



Secretaría Técnica Administrativa



Con el apoyo de:



www.fontagro.org

Correo electrónico: fontagro@fontagro.org