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Tropical Forages and the Diffusion of *Brachiaria* Cultivars in Latin America



Independent
Science and
Partnership
Council

Standing Panel on Impact Assessment (SPIA)

August 2018

Brief Number 70

BACKGROUND AND CONTEXT

Tropical pastures are important sources of food, income, and, increasingly, environmental services in many parts of Central and South America. *Brachiaria* grasses are native to Africa and were introduced to the Americas in the early 1950s due to their high potential productivity in livestock systems and adaptability to the region. *Brachiaria decumbens* cv. Basilisk (CIAT 606) was the first cultivar adopted in Latin America and remains an important forage grass cultivar. However, early research identified some limitations of *Brachiaria decumbens* in various countries, i.e., susceptibility to spittlebugs. In response, the [International Center for Tropical Agriculture's \(CIAT\)](#) tropical forages program evaluated and selected well-adapted, highly-productive pastures that would not only increase farm productivity but also improve soil quality and other environmental outcomes. The work of CIAT and partners in the region made possible the release of other *Brachiaria* cultivars, mostly in the 1980s and early 1990s, such as *B. brizantha* cv. Toledo (CIAT 26110) and cv. La Libertad (CIAT 26646), *B. humidicola* cv. Humidicola (CIAT 679), and *B. dictyoneura* cv. Llanero (CIAT 6133).

In the late 1990s, CIAT started a genetic improvement program after 20 years of experience in tropical forage research, taking advantage of the 1,680 grass accessions in its genebank. Using molecular markers for specific traits (apomixis, spittlebug and aluminum resistance), and rapid and reliable screening methods (developed by CIAT in 1998), the first genotypes were generated and 11 of them selected for recombining a new population. In 2003, the first *Brachiaria* hybrid was officially released with

the name Mulato (CIAT 36061). The program remained active in the 2000s and a new set of *Brachiaria* hybrids were made available for livestock producers: Mulato II (CIAT 36087), Cayman (CIAT BR02/1752) and Cobra (CIAT BR02/1794). Since 2002, a CIAT-private sector alliance has been promoting new *Brachiaria* hybrids, which is expected to significantly increase uptake.

A considerable expansion of *Brachiaria* grasses has been reported in various countries, but the documentation of their uptake has been limited and has relied mainly on anecdotal evidence. One objective of this study was to provide rigorous estimates of the adoption of improved *Brachiaria* grasses at scale in key tropical livestock producing countries in Latin America, outside Brazil.

DATA AND METHODOLOGY

The study combined the collection of nationally-representative household data (Colombia and Nicaragua) with expert opinion consultation (Peru, Costa Rica and Honduras). In Colombia and Nicaragua, 1,041 and 480 livestock producer households, respectively, were interviewed. For Peru, Costa Rica and Nicaragua, livestock experts came to a consensus on national and sub-national adoption numbers. A set of econometric models were used to understand the correlates of adoption for the Colombian dataset.

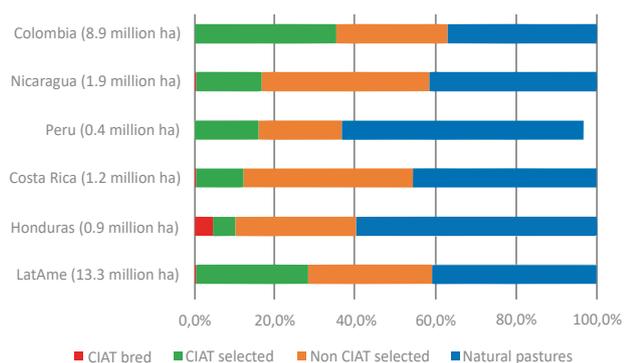
Analysis of adoption distinguished between natural pastures and introduced/improved pastures. The introduced/improved pastures are mainly *Brachiaria* grasses and fall into three categories: 1) introduced pastures that were selected and disseminated by CIAT research, 2) introduced

pastures that were selected and disseminated by non-CIAT research, and 3) genetically improved pastures from CIAT breeding program.

WIDESPREAD *BRACHIARIA* ADOPTION, BUT LOW UPTAKE OF HYBRIDS

Out of the 13.3 million hectares of pastures in the selected countries, an estimated 59.2 percent is planted with *Brachiaria* grasses (Figure 1). Almost half of this acreage is with CIAT-selected *Brachiarias*. The uptake of CIAT *Brachiaria* hybrids, however, is low—reaching only 0.5 percent of the total area under pastures. The largest uptake (63 percent) of *Brachiaria* cultivars has occurred in Colombia where high uptake of CIAT-selected cultivars was also found (35 percent). Natural pastures dominate Peru and Honduras (60 percent of acreage). The lowest uptake of CIAT-related cultivars (10.3 percent) is in Honduras, but this is where the highest hybrid adoption rate was found (4.7 percent).

Figure 1. Level of adoption of pasture cultivars in Latin America



IN COLOMBIA, ADOPTION IS ASSOCIATED WITH FARM- AND REGIONAL- LEVEL FACTORS

The larger the farm size, the lower the adoption of improved pastures. A significant proportion (35 percent of 1041 sampled farmers) of livestock production in tropical Colombia is by large producers with an average farm size of over 100 hectares. Most have adopted *Brachiaria* cultivars, however, the use of improved cultivars declines as farm size increases. This finding could have policy implications given current trends toward land consolidation in

the sector.

Owner-managed farms have lower probability of adopting *Brachiarias*. Landowners who also manage their farms are less likely to intensify livestock production through adoption of improved forages. Farms that are managed by specialized livestock professionals are most likely to adopt *Brachiaria* cultivars. This may reflect the fact that professionally-managed farms are more likely to be run as productive enterprises whereas owner-managed farms may prioritize multiple economic and social objectives.

Proximity to input markets matters. Colombian livestock producers located closer to input markets (and therefore possibly facing lower input costs) were more likely to adopt *Brachiaria* grasses as well as other inputs such as fertilization, weed control, and animal vaccination. This is consistent with the results of forage research that highlight the need for improved farm management in order to realize the optimal benefits of improved pastures.

Regions affected by political violence are less likely to adopt *Brachiaria* grasses. Colombia has been affected by internal conflicts for the last 50 years, including areas where tropical livestock production takes place. Analysis showed that the areas with more episodes of violence had lower probability of adoption of *Brachiaria* grasses.

SOURCE

Labarta, R., Martinez, J.M., Yacelga, A., Reyes, B., Gomez, L., Maredia, M., DeYoung, D., Carriazo F., and Toro, M. (2017). *Assessing the adoption and economic and environmental impacts of *Brachiaria* grass forage cultivars in Latin America, focusing in the experience in Colombia*. Unpublished report submitted to the Standing Panel on Impact Assessment of the ISPC.

FUNDING ACKNOWLEDGEMENTS

Financial support for forage breeding and general research at CIAT for over 40 years has come from ACIAR (Australia), BMZ (Germany), CORPOICA (Colombia), Ministry of Agriculture Colombia (MADR), Papalotla group (Mexico), DOW Agrosiences (USA), CRP Livestock (previously Fish/Livestock), MAFF (Japan), JIRCAS (Japan), SOLIDARIDAD Network (Netherlands), INIFAP (Mexico) and CATAS (China).