

## Impacto económico potencial de la adopción de cultivares de *Brachiaria* resistentes a cercópidos

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### Summary

The potential economic impact of the adoption of new *Brachiaria* cultivars, resistant to cercopids (spittlebugs), on livestock production systems of Colombia's northern coast and Eastern Plains areas, the Mexican tropics, and Central America was evaluated using the MODEXC economic model (Rivas et al., 1999). The model estimates the economic benefits attributable to the use of new cultivars, separated by country, region, ecosystem, production system, and large social groups (consumers and producers). The model operates with technical parameters that characterize new technology and dissemination and economic processes, indicating the market supply and demand for milk and beef products as affected by technological change. The technical parameters used in the study were based on previous research projects carried out in target countries and on the opinions of experts. Economic parameters were established based on several studies conducted on regional milk and beef markets. The benefits of the new technology were estimated for a 20-year period, starting as of 2007, and are expressed in terms of present value (PV) and annuities (A). Estimates were obtained by alternatively using economic frameworks for open and closed economies. In a closed economy, without international trade, the present value of technological benefits was estimated at US\$4155 million, of which 54% would be generated in the beef market and the rest in the milk market. Most benefits (68%) are concentrated in Mexico (US\$2831), followed by Colombia with 23% (US\$ 960 million) and Central America with 9% (US\$363 million). The estimation of the value of beef and milk production in 2003 served to determine the extent of estimated technological benefits. Their present value accounted for 44% of that year's production value, ranging from 16% in Honduras to 78% in Nicaragua. These results indicate the important role played by dual-purpose systems in livestock production in the tropics. In study countries, more than half of the technological benefits are attributed to the dual-purpose production system, as follows: 70% in Colombia, 62% in Central America, and 50% in Mexico. When production surpluses resulting from technology improvement are commercialized internally, then consumers benefit the most, being favored with the fast fall of prices, which allows them to increase their consumption. In the present case and in a closed economy, 83% of total social benefits would be captured by beef and milk consumers. In the case of an open market, the producers' share of total benefits would rise to 46%. In both schemes (open or closed economy), the poorest consumers and producers, together, received more than one fourth of the benefits generated by technological change: consumers, 27%, and producers, 31%. This amounts to a present value between US\$1137 and US\$1303 million for all study countries. The study concluded that the most critical variable in determining the level of technological benefit is yield (productivity) of new technology in terms of beef and milk/hectare. The elasticity of benefits regarding yields was estimated at 2.2 for Colombia and 1.8 for Central America and Mexico, which implies that if productivity decreases by 1%, the fall in social benefits is more than proportional. Social benefits are less elastic regarding the magnitude of the area to impact and the duration of adoption. For example, in

Colombia if the area with improved materials declined one percentile, then benefits would drop approximately six-tenths of a percentile. In all alternative scenarios proposed, the investment in developing new pastures results economically attractive, despite the adverse circumstances found in those scenarios. The technological benefits expressed as annuity—a fixed sum of money received for a given number of years—show that the region's current investment in the generation of new forage options is very low compared with the annual amount of social benefit that could be generated by the use of these new materials.