



Integrated Crop-Livestock-Forestry: is it the new Brazilian green revolution?

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Abstract:

Statement of the Problem: Climate change is a world concern and reducing agriculture environmental impacts has become a major challenge, given the ever growing food and energy demands. Integrated farming systems (IFS), combining crops (C), livestock (L) and/or forestry (F), reached over 12 million hectares in Brazil, in 2016, becoming a sustainable alternative to large monoculture. IFS involves intercropping, rotation and/or succession, enabling the production of food, fiber and energy on the same area (Fig. 1). “How promising are IFSs to promote production increase while reducing the environmental impact of agriculture, under climate change conditions” is the subject matter of this exploratory paper. Methodology: a literature review was carried out considering, particularly, the Brazilian context. It explored the research question, critically analyzing IFS benefits and challenges.

Findings: Research has shown several benefits of IFS in Brazil, under different edaphic and climate conditions, arrangements, and others. In general, the synergisms occurring in IFS lead to greater production of biomass, improving soils conditions, which, in turn, results in better pasture and animal performance, and less weeds. Cover or cash crops lend pasture some residual fertilization, and receive back better physical and biological soil conditions that result in yield increase. The introduction of trees can represent additional source of farm income, while promoting animal welfare and ecological services, like carbon emissions mitigation. Additionally, IFS allows for good economic returns and reduced income risks. Brazilian government has been incentivizing IFS through specific credit program, but the adoption of such systems remains limited because of cultural aspects, lack of holistic under-



standing of IFS and structural and market constraints.

Conclusions: To increase the uptake of IFS and consolidate it as the “new green revolution” further fostering of agriculture and energy supply chains is necessary, along with government spending on infrastructure. Farmers’ training should also be addressed.

Biography:

Bachelor in Animal Sciences (1999) and master’s in Applied Economics (2001), both at Viçosa Federal University/Brazil. PhD on Agricultural Management at Lincoln University, New Zealand (2011). Since 2001, she joined the Brazilian Agricultural Research Corporation – EMBRAPA, as a researcher, initially, working at the Strategic Management Secretary (SGE)

Recent Publications:

1. Esteves, E.M.M, Esteves, V.P.P., Bungenstab, D.J., Araújo, O.Q.F. et al. (2018). Greenhouse gas emissions related to biodiesel from traditional soybean farming compared to integrated croplivestock systems. *J. Clean. Prod.*, 179, 81-92. <https://doi.org/10.1016/j.jclepro.2017.12.262>

Webinar on World Agriculture Applied Economics | April 21, 2020 | Venice, Italy

Citation: Mariana de Pereira; Integrated Crop-Livestock-Forestry: is it the new Brazilian green revolution?; *Agri* 2020; April 21, 2020; Venice, Italy