



Wednesday, April 15 / 14:30 - 15:30

Center for Science for Development of Digital Agriculture: Semear Digital, Brazil

Edson Bolfe*¹, Luciana Romani¹, Jayme Barbedo¹, Silvia Massruhá²

¹ Brazilian Agricultural Research Corporation, Embrapa Digital Agriculture, Campinas, Brazil

² Brazilian Agricultural Research Corporation, Embrapa Headquarters, Brasília, Brazil

Projections of world population show that there will be a greater demand for food, fiber and energy, requiring an increase in agricultural productivity, cost reduction and sustainable use of natural resources. Thus, it is essential to consider the process of digital transformation in the countryside, with the introduction of equipment and sensors to collect and generate data in amounts that easily surpass the human processing capacity. In this context, "Semear Digital" is a Brazilian research center designed to enhance agricultural productivity and sustainability through digital technologies and connectivity solutions. The center prioritizes research in inclusive digital technologies in six axis, integrating small and medium scale producers, and operates under the coordination of the Brazilian Agricultural Research Corporation (Embrapa), funded by the São Paulo Research Foundation (FAPESP), and with a collaborative consortium of Research, Development, and Innovation (RD&I) institutions. Research priorities focus on digital technologies, encompassing novel methodologies, advanced algorithms, and prototype systems for artificial intelligence applications, remote sensing, automation technologies, and precision agriculture. Additional domains include digital certification systems, blockchain-based traceability platforms, and the development of connectivity solutions. These activities are implemented within designated Agrotechnological Districts (DAT's) across ten municipalities in multiple Brazilian states – São Paulo, Minas Gerais, Rio Grande do Sul, Mato Grosso do Sul, Bahia and Pará. From this perspective, RD&I associated with the use of digital technologies is justified by bringing opportunities to Brazilian agriculture in order to: i) Insert producers into the ongoing digital transformation process, considering the regional diversity of production and natural resources; ii) Promote connectivity of electronic devices in the field, aiming to reduce implementation costs of digital technological assets; iii) Connect multiple actors in production chains to reduce transaction costs; iv) Integrate digital technologies into rural production processes in an effective and simple way, aiming to generate socio-economic impacts in the short and medium term; v) Promote technological training and the sharing of knowledge and practices, to accelerate the adoption of digital technological assets by the markets; vi) Enable new business models and operations in the digital transformation process to attract investments for scalability; and vii) Induce and strengthen models of sustainable intensification through integrated production systems, aiming at gains in agricultural efficiency and productivity. The objective of this presentation is to showcase the initiatives of Semear Digital and to prospect international partnerships for advancing RD&I, with a focus on supporting small and medium-sized rural producers.

Funding: São Paulo Research Foundation (FAPESP), grants 2022/09319-9, 2024/05205-4 and 2024/13150-5; and by the National Council for Scientific and Technological Development (CNPq/PQ), grant 302963/2025-1