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## Book of Abstracts



### “*Faidherbia-Flux*”: adapting crops to climate changes in a semi-arid agro-sylvo-pastoral open observatory (Senegal)

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The adaptation of semi-arid crops to climate changes is theoretically possible through agroforestry, provided that the trees exert little competition, or even increase the multifunctional LER (LER\_M).

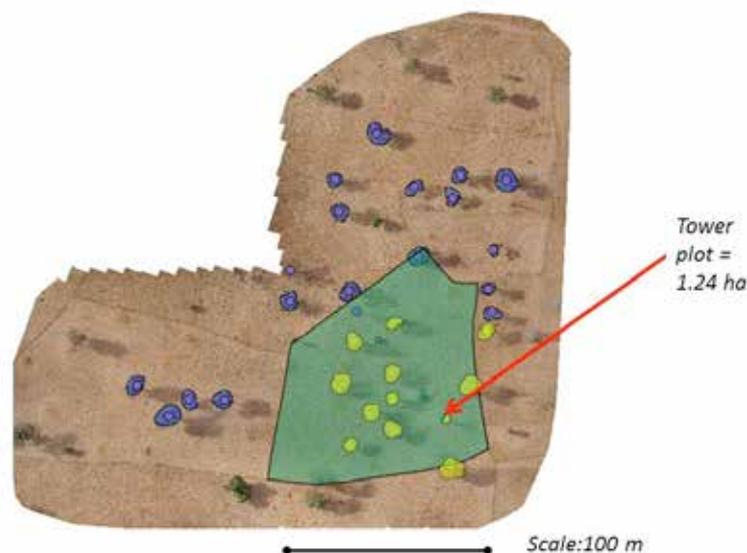
We monitored microclimate, net primary productivity (NPP), CO<sub>2</sub> and H<sub>2</sub>O fluxes in a semi-arid agro-sylvo-pastoral system (Niakhar, Senegal), dominated by the multipurpose *Faidherbia albida* (FA) tree. Undercrops were mainly millet and peanut, under annual rotation.

We scanned a 1.24 ha millet under FA plot with UAV photogrammetry in RGB, thermal infrared and multispectral bands. At harvest, we collected 12 subplots of 15 millet holes each, distributed either below the crown of FA, or at 2.5 x crown radius, or at 5 x crown radius. We separated all organs. The whole millet root system (0-200 cm) was sampled also in 2 m trenches, totalizing 4 millet holes, where all roots were sorted by layer. The whole plot harvest will allow extrapolating yield from subplots, through UAV images.

Millet yield per unit ground area was about 3 times higher below FA, with still a positive influence at 2.5 x crown radius and less impacts of pests close to FA. In the trenches, we noted higher soil humidity and SOC close to the FA trunks.

This observatory is open for collaboration.

#### Overview of the plot



Orthomosaic of the 1.24 ha experimental plot, with the position of the *Faidherbia* (FA) trees (green and blue shapes). Mosaic image from UAV (drone) flight in May 2018 (A. Audebert and E. Faye). GIS from Demarchi G.

**Keywords:** Faidherbia effect, LER\_M, Drone, yield, pests.