

## 66. Can woody plants management provide soil amendments to enhance agroecosystem productivity and resilience in West Africa?

Felix Georges<sup>1</sup>, Hien Edmond<sup>2</sup>, Lahmar Rabah<sup>3,4</sup>, Douzet Jean-Marie<sup>3</sup>, Founoune-Mboup Hassna<sup>5</sup>, Ndour Yacine<sup>5</sup>, Niang Dial<sup>4</sup>, Séguis Lus<sup>6</sup>, Gautier Denis<sup>7</sup>, Zongo Edmond<sup>8</sup>, Manlay Raphael<sup>9</sup>, Barthes Bernard<sup>9</sup>, Clermont-Dauphin Cathy<sup>9</sup>, Masse Dominique<sup>9</sup>, Belem Mahamadou<sup>10</sup>, Groot Jeroen<sup>1</sup>, Scholberg Johannes<sup>1</sup>, Tiftonell Pablo<sup>1</sup>, Cournac Laurent<sup>9</sup>

<sup>1</sup>Wageningen University, Biological Farming Systems, Wageningen, the Netherlands

<sup>2</sup>Ouagadougou University, UFR-SVT, Ouagadougou, Burkina Faso

<sup>3</sup>CIRAD, UPR SCA, Montpellier, France

<sup>4</sup>ziE, Laboratoire LEAH, Ouagadougou, Burkina Faso

<sup>5</sup>ISRA, LNRPV, Dakar, Senegal

<sup>6</sup>IRD, UMR HSM, Montpellier, France

<sup>7</sup>CIRAD, UPR BSEF, Montpellier, France

<sup>8</sup>Association Eben Ezer, Service Nature et Développement, Ouagadougou, Burkina Faso

<sup>9</sup>IRD, UMR Eco&Sols, Montpellier, France

<sup>10</sup>Centre Régional Agrhymet, Niamey, Niger (present address WASCAL, Ouagadougou, Burkina Faso)

Soil degradation and fertility loss pose severe threats to the livelihood of farmers in sub-Saharan regions. Due to the need for land, continuous cultivation with staple food has gradually replaced previous shifting cultivation systems, so that fallow periods have considerably reduced and no longer fulfill their soil regeneration role. Here we explore the use and management of native woody resources for providing an *in situ* renewable organic amendment as a basis for increasing soil carbon and biological status, thus sustaining fertility, enhancing water capture and utilization and therefore buffering climatic stress. In areas such as the central plateau in Burkina Faso, slash- and drought-tolerant shrub species are commonly present in farmers' fields. Cut branches from these shrubs are sometimes placed on degraded soils as part of traditional soil restoration practices. Moreover, shrubs tend to intercept sediments and leaves and promote biological activity whereby they may form fertility islands of increased crop yield. We will review available data on traditional practices and current co-innovation efforts and outline first results from an EU-supported project we have initiated in Burkina Faso and Senegal (ERA ARD WASSA). This project is investigating if a sustainable use of native woody resources could be made, in combination with other organic sources such as crop residues or manure, to amend soils and help preserving fertility at the whole field scale. Through experimental plot trials and farmers' fields surveys, we are evaluating how woody residues use and management practices may impact agronomic performance and soil biological processes. Crop response to use of ligneous material will be linked with the availability and distribution of woody resource in the landscape, and the ways it could be eventually increased and sustainably managed. The socio-economic implications of implementing such practices are also considered.