

Session: **06 Ecophysiological Bases of Agroforestry-system Design**

Mediator: Dr. John Kort, Agriculture and Agri-Food Canada

Time: 1430-1800 Room: 7

Subject matter of the session?

- How trees interact with their environment at a physiological level.
- How trees modify their environment and how the environment influences tree behavior.

Key messages of the session?

- Aida Cuni Sanchez - There is variation on baobab leaf morphology and stem characteristics based on available moisture rates
- Sali Bourou – Bioclimatic variables (temp. and precip.) keys to tamarid distributions in the Sahel region, Senegal
- Marie-Ange Ngo-Bieng – STReCTH model was effective for simulating poplar tree crown shape. Hi-sAFe model models the root structure based on available carbon in voxel and water.
- Lydie Dufour – Good relationship between shape and wheat yields, low shade = high yields, high shade = low results. STICS model accurately simulated real world conditions.
- Mark Adams - Carbon isotope discrimination effectively depicts relationship of plant to environmental variables.
- Robert Brook – Silviculture trees were too young to affect the yields of grasses but grasses did increase the growth rates of trees.
- Agustin Mercado – Vegetables planted in between tree rows can increase vegetable yields.
- Pete Waldner – Would not recommend an Agroforestry system with maize crop.

Key new insights or new ideas.

- Sali Bourou –Tamarid trees decline in density around human presence
- Marie-Ange Ngo-Bieng – Walnut and poplar trees show signs of plasticity to reach for sunlight and in roots to water and nutrient absorption. Roots grow in depth then along tree line and then below crops.
- Lydie Dufour – Demonstrated shade has negative affect on wheat yields.
- Mark Adams – Phloem sap is an accurate diagnostic for crop health. Assess nutrient and water status.
- Robert Brook – Indigenous trees of Costa Rica planted in rows in indigenous grasses showed trees varying affects to trees in carbon sequestration, PAR and water usage.

- Agustin Mercado – Must find tree-vegetable matching for sustainable vegetable growth in the Philippines. Beans and Tomatoes showed low yields close to trees, better yields away from trees, no difference very far from trees.
- Pete Waldner – Pruning trees did improve yields at base of tree row. Mulching did improve yields before trees grew high.

Action points for policy research and education\extension.

- Marie-Ange Ngo-Bieng – Develop better visualization tools to demonstrate model results
- Lydie Dufour – Selection of cereals less sensitive to sunlight could be solution of Agroforestry systems. STICS model need to be adapted in order to obtain good shade simulations.
- Agustin Mercado – Reduce competition between vegetables and trees, increase tree-vegetable complementary, and use valuable trees for other source of income.