4th World Congress on Agroforestry

20–22 May 2019
Montpellier, France

Book of Abstracts

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Mr Emmanuel MACRON
President of the French Republic

4th World Congress
on Agroforestry

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INVESTISSEMENTS
D'AVENIR

8:30 AM   Room Joffre B (level 1)

L18 - Cereals and annual crops in agroforestry
Chairs: Shibu Jose, Delphine Mézière & Andrea Vityi

Keynote talk
- PARDON Paul - Merelbeke, Belgium: Silvoarable agroforestry systems in temperate regions: impact of tree rows on crops, soil and biodiversity

Regular talks
- GILL Rishi - Ludhiana, India: Interventions to improve productivity and sustainability of poplar-based agroforestry system in Indo Gangetic plains
- ARENAS-CORRALIZA M. Guadalupe - Plasencia, Spain: Shade improves physiological performance and grain yield in barley cultivars in central Spain
- PANOZZO Anna - Legnaro (PD), Italy: Durum wheat in an olive orchard: impact on yield, yield components and morphology of different durum wheat cultivars
- MARTINEZ-GARCIA Jaume - Bellaterra, Spain: How to deal with too close neighbors: from model systems to crops

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8:30 AM   Room Joffre C (level 1)

L22 - Agroforestry: pests, diseases and weeds
Chairs: Jacques Avelino & Rolando Cerda

Keynote talk
- SOW Ahmadou - Montpellier, France: Vertebrates contribute to natural control of the millet head miner in tree-crop agroforestry systems

Regular talks
- DURAND-BESSART Clémentine - Montpellier, France: Analysis of the interactions of shade trees on coffee leaf diseases and coffee yield in complex agroforestry systems
- MOTISI Natacha - Montpellier, France: Antagonistic effects of shade on the epidemiological mechanisms driving coffee berry disease
- IMBERT Camille - Avignon, France: Pests, but not predators, increase in mixed apple tree - cabbage plots as compared to control cabbage plots
- MERLE Isabelle - Montpellier, France: Estimating microclimate in agroforestry systems based on nearby full sun measures to forecast coffee rust development

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8:30 AM   Room Joffre 4 (level 1)

L25 - Open session
Chairs: Virendra Pal Singh & Patrick Jagoret

Keynote talk
- DUPRAZ Christian - Montpellier, France: From Agroforestry to Agrivoltaism : an extension of the mixture concept

Regular talks
- ASMARA Degi Harja - Quebec City, Canada: Agroforestry on post-mining restoration: a multispecies and multifunctional approach
- LANDICHO Leila - College, Philippines: Agroforestry and Food Security of Households in Selected Upland Farming Communities in the Philippines
- DOUNIAS Edmond - Montpellier, France: Eliciting Children's culture: Sustainable hunting in backyard agroforests by budding trappers in the Congo Basin
- MELVANI Kamal - Darwin, Australia: Farmers' values sustain forest gardens

Estimating microclimate in agroforestry systems based on nearby full sun measures to forecast coffee rust development

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In Central America, coffee is grown in agroforestry systems. Since 2012, coffee leaf rust, caused by the fungus *Hemileia vastatrix*, has produced major epidemics in this region. To prevent future epidemics, the European Union through its PROCAGICA program (Programa Centroamericano de Gestión Integral de la Roya del Café) promotes the creation of an early warning system based on weather monitoring.

To build models to forecast the disease we must first identify which microclimatic variables are responsible for rust development and then be able to estimate these variables under different agroforestry systems as a function of the data provided by weather stations, established at full sun. From a trial set up in Costa Rica where disease and weather data were monitored, we deduced, without a priori [1], that the different disease development stages (see figure) were the result of complex combinations of microclimatic variables acting at different periods (times and durations). Then, to estimate the effect of agroforestry systems on these microclimatic variables, a second trial was conducted in Costa Rica within an altitudinal gradient. In each site, meteorological stations were set up in a full sun reference plot and coffee plots with different shade trees. Using boosted regression tree method, we found that microclimate under shading depends mainly on full sun weather with nonlinear relationship, hour, shade tree species, orientation, canopy openness and plot slope in this order.
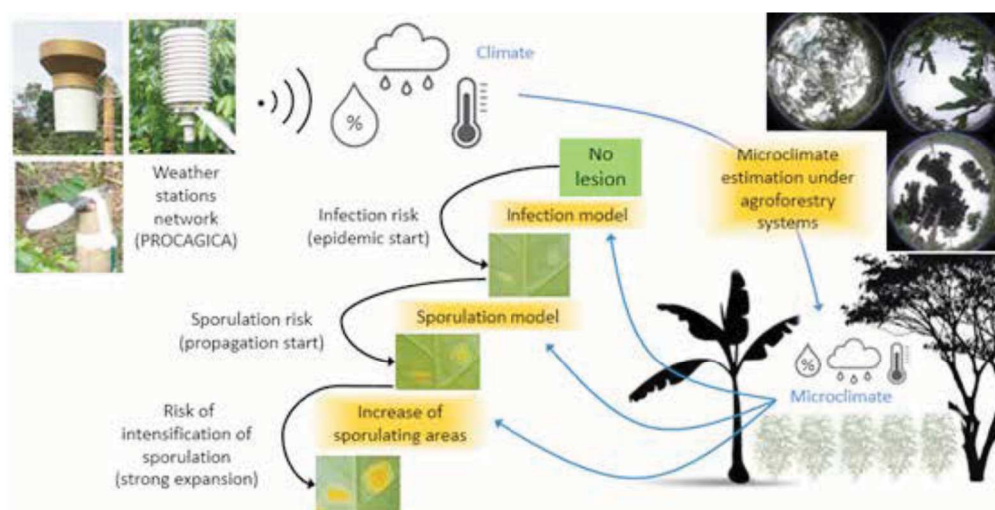

Illustration of modeling needs (orange) for weather based coffee leaf rust forecasting in Central America

Keywords: Hemileia vastatrix, Shade.

References:

1. Bugaud et al., 2015, J Sci Food Agric, 96(7): 2384-2390

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