Modeling sugarcane growth and yield using STICS model, parameterization and applications in complex agro-systems

The STICS model

- Simulates the carbon (C), water and nitrogen (N) balances of the soil-crop system at a daily time-step.
- Description of the physical and biological processes occurring in the soil-crop system mostly relies on a unique set of general parameters for all plant crop.

Response to N fertilization

- eRcane TERO project
- Site : La Mare, Reunion island
- Technical itinerary: row-spacing 1.5m, irrigation

Perspectives

Modeling the nitrogen efficiency of sugarcane agroecosystems. Application to the integrated management of organic waste products on a territory of Reunion Island.

UR AIDA / UR Recyclage & Risques

Objectives:
To develop a modeling tool at several scales of the nitrogen cycle to assess the agronomic and environmental impacts in sugarcane fields of territorial management strategies of organic waste products in Reunion Island.

Paramaterization in Reunion Island

- Parameterization : ECOPHY database, 10 years of sugarcane trials in Reunion Island
- Currently in progress : 3 varieties (R570, R579, R582), plant crop

ICSM project simulations

- ICSM project
- Site: La Mare, Reunion island & Pangola, South Africa
- Variety: R570 plant crop (2014-2016)
- Technical itinerary: row-spacing 1.5m, fertilization & irrigation

Association experiments

- eRcane Ecocanne project
- Site: La Mare, Reunion island
- Technical itinerary: row-spacing 1.5m, irrigation & fertilization

SALSA FertiCannes

Services ALloués aux Systèmes Agricoles

CIRAD trial (plantation 2018), La Mare, Reunion is.

Design: sugarcane & legumes association (Canavalia, Jack bean) under contrasted N and irrigation supply.

Objectives:
- To assess the nitrogen intakes by legumes in association with sugarcane.
- To parametrized a multi-species growth model to assess the agronomic and environmental impact of legumes introduction in sugarcane system.

CHRISTINA Mathias1, VERSINI Antoine2, FEVRIER Amelie3, MANSUY Alizé4, AUZOUX Sandrine1
1CIRAD, UPR AIDA, St-Denis, La Reunion, France
2CIRAD, UPR Recyclage & Risques, St-Denis, La Reunion, France
4eRcane, St-Denis, La Reunion, France
mathias.christina@cirad.fr