

TACOS

A step further towards trait-based agroecology: considering agrosystem specificities in relationships between the functional structure of plant communities and the services provided in perennial cash crops/ cover crop system.

ABSTRACT

A step further towards trait-based agroecology: considering agrosystem specificities in relationships between the functional structure of plant communities and the services provided in perennial cash crop / cover crop systems

The design of cultivated communities that provide a set of targeted services requires specific tools and methods to evaluate these services and compare the performances of different cropping systems. However, such tools and methods barely exist for multispecies communities. An increasing number of studies shows the high potential of trait-based ecology to tackle this issue, but also a lack of a methodology adapted to the specificities of the agrosystems.

Year : 2017

Project number : 1702-014

Type of funding : AAP

Project type : AAP YOUNG SCIENTISTS

Research units in the network : SYSTEM

Start date : 2018-09-01

End date : 2020-04-30

Flagship project : no

Project leader : Gaelle Damour

Project leader's institution : CIRAD

Project leader's RU : GECO

Budget allocated : 20000 €

Total budget allocated (including co-financing) : 20000 €

Funding : Labex

GOAL

The objective of this project is to develop knowledge and methods to explore the relationships between the functional structure of the cover crop community associated to (semi-)perennial cash crops and the functions underlying the provision of targeted services.

This should be based on an adaptation of the protocols of traits measurements and of the methods for building relationships between the functional structure of the community and its functions. This adaptation should integrate the main specificities of the highly-managed plant community of the agrosystem: i) the importance of the variations of trait values within a species, ii) the necessary inclusion of the absolute densities and biomasses of species of the community, iii) the integration of the temporal variability of the functional structure.

To reach this objectives the project is based on two complementary cash crop / cover crop systems banana cropping systems of the French West Indies (Guadeloupe) and vineyards of the Mediterranean region (around Montpellier).

RESULTS

The project will provide three main results :

A quantification of the magnitude of the trait variability, for the main cover crops used in the two systems under study and for traits widely used in the literature, and to assess its impact on the assessment of the functions of cover crops. This will be based on the analyses of existing data on cover crop traits, extracted from published peer-reviewed articles, online databases, grey literature and unpublished results of the partners of the project.

Methods that consider trait variability when acquiring and analyzing trait data, and when relating the functional structure of the community to indicators of its functions. This will be based on field experiments, in which the cash crop will be associated to a multispecies community including cover crops (composed of a mixture of cover crops or of one cover crop and spontaneous species).

Relationships between the dynamics of the functional structure of the community and indicators of its functions underlying the provision of targeted services, at the time they are expected.