



## **Relationships between plant community functioning and soil carbon stocks in permanent mowed grasslands**

Solène Masson (1), Elise Tassetta (1), Annette Morvan-Bertrand (1), Bernard Amiaud (2), Jean-Bernard Cliquet (1), Katja Klumpp (3), Frédérique Louault (3), and Servane Lemauiel-Lavenant (1)

(3) INRA, Grassland Ecosystem Research, Clermont Ferrand, France , (1) Normandie Univ, UNICAEN, INRA, EVA, Caen, France, (2) Université de Lorraine, Ecologie et Ecophysiologie Forestières, Nancy, France

Grasslands represent the most widespread ecosystems on the surface of the earth and provide many ecosystem services. They are managed by farmers in order to produce provisioning services through forage production. They also offer regulation services for the humankind such as carbon (C) storage. According to their management, grasslands may constitute a C source or a sink. Plants control both C input through photosynthesis and C output release directly via their own respiration and indirectly via soil microflora respiration through organic matter mineralization. Plants can thus be considered as a gas stream center. To better understand the role of vegetation on soil C stocks, the P2C “Plant Pilot Carbon” project aims at evaluate C stocks in mowed permanent grasslands characterized by various edaphic and climatic conditions and identify the drivers (vegetation composition, plant community functioning, management, history) of soil C stocks.

We focused on 32 grasslands selected over two French Regional Natural Parks (Normandy-Maine / Lorraine) and an experimental farm (ACBB SOERE, Theix, Auvergne). We measured then their floristic composition as well as their functional composition through a trait based approach. Leaf traits (SLA, LDMC, LNC, LC/N) were measured at the plant community level (community weighed mean traits) and soil C stocks were analyzed in the top soil (0-10 cm) and in a deeper layer (10-30 cm). The grassland sampling has allowed to obtain a great variability of both soil C stocks and plant community functioning which give the opportunity to assess the relationships between C stocks and vegetation considering climatic, edaphic and management parameters