



Agroecological  
approaches to promote  
innovative banana  
production systems

10-14 October 2016  
Montpellier,  
France



## Cover cropping enhances banana weevil regulation by affecting biological control agents

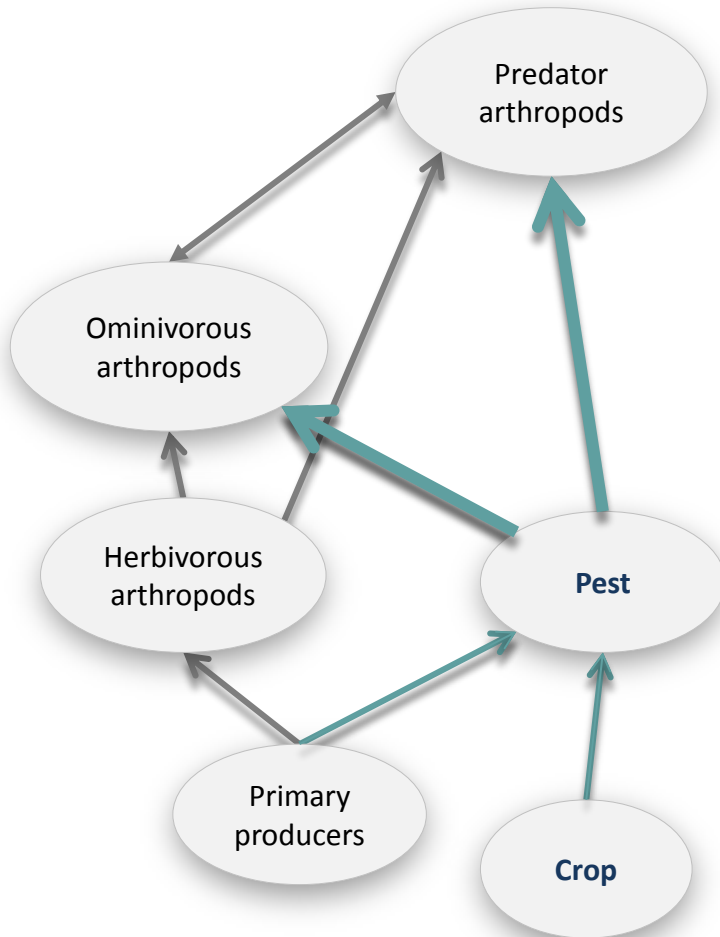
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# Biological control by generalist predators

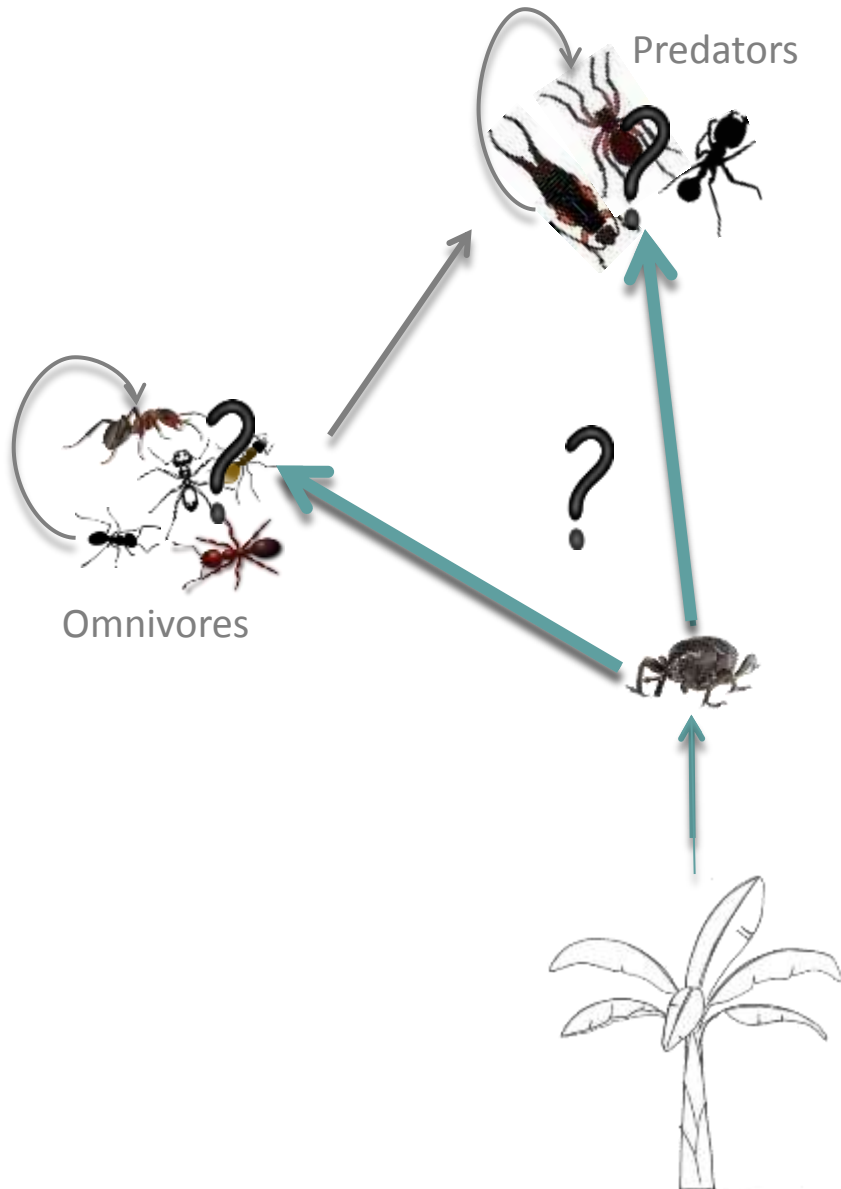


To regulate a crop pest species we can :

Alter its resources = **Bottom-up control**

Increase predation = **Top-down control**

# How to control the banana weevil ?



Banana weevil is oligotroph

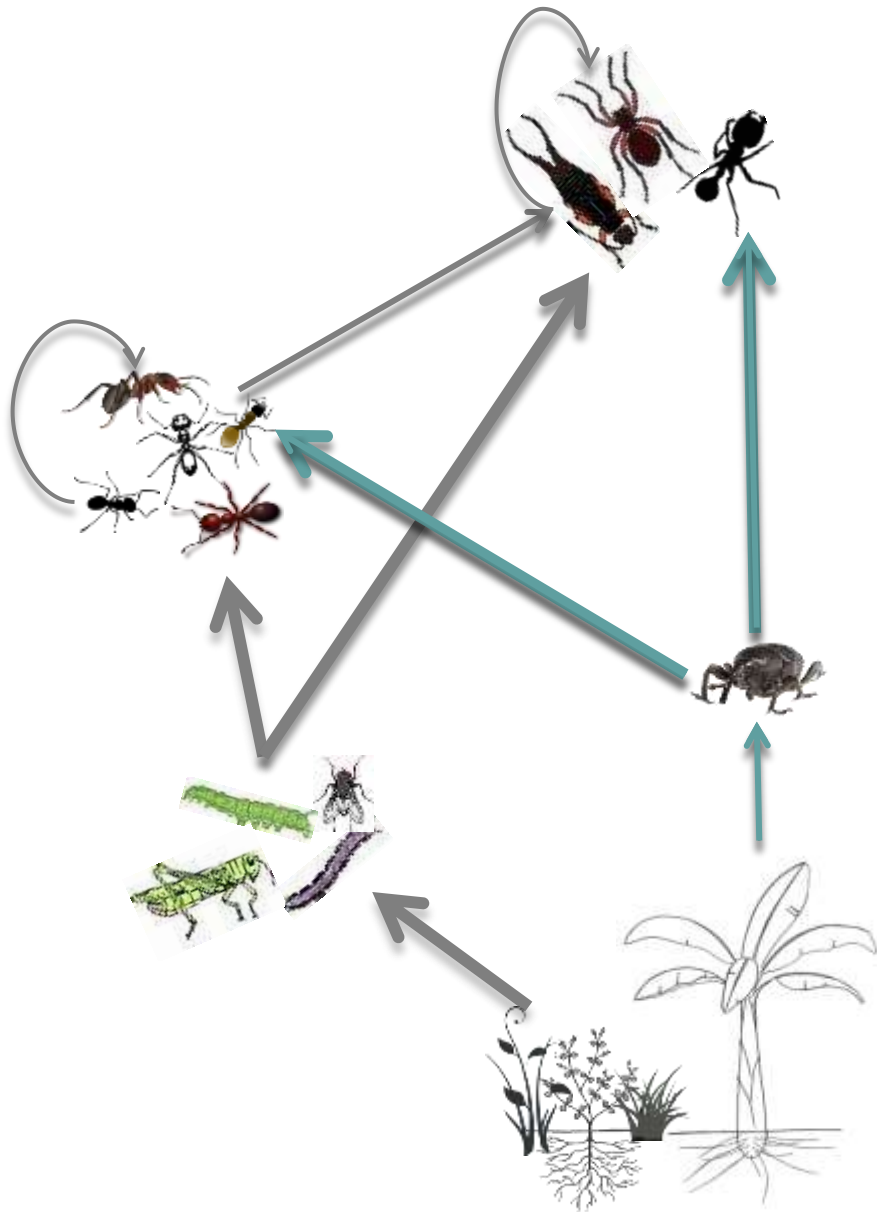
No bottom-up strategy

Who eats the banana weevil ?

Does intraguild predation matters (IGP) ?

How to increase predation on banana weevil to decrease weevil abundance ?

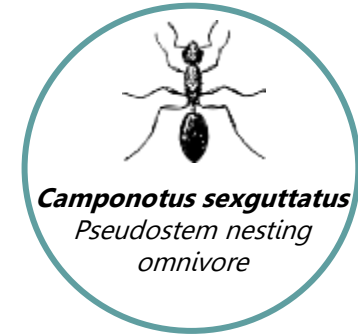
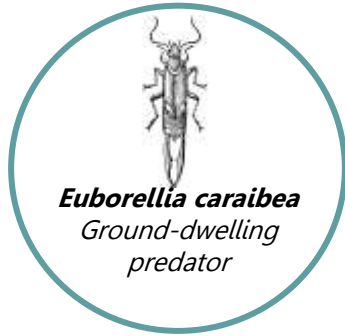
# Biological control by generalist predators



Increasing vegetal diversity and abundance in banana agrosystems should:

- Increase abundance & diversity of alternative preys
- Increase abundance of generalist omnivores & predators
- Alter intraguild predation (+ or -)
- Increase pest regulation

# Who eats the banana weevil ?



## Does intraguild predation occur (IGP)?

Search the dumps of *P. jelskii* colonies



Look for hard fragments of  
carcasses of *C. sordidus*



28 %

Look for pincers of *E. caraibea*  
and heads of *C. sexguttatus*



32 %



39 %

## 3 bare soil plots



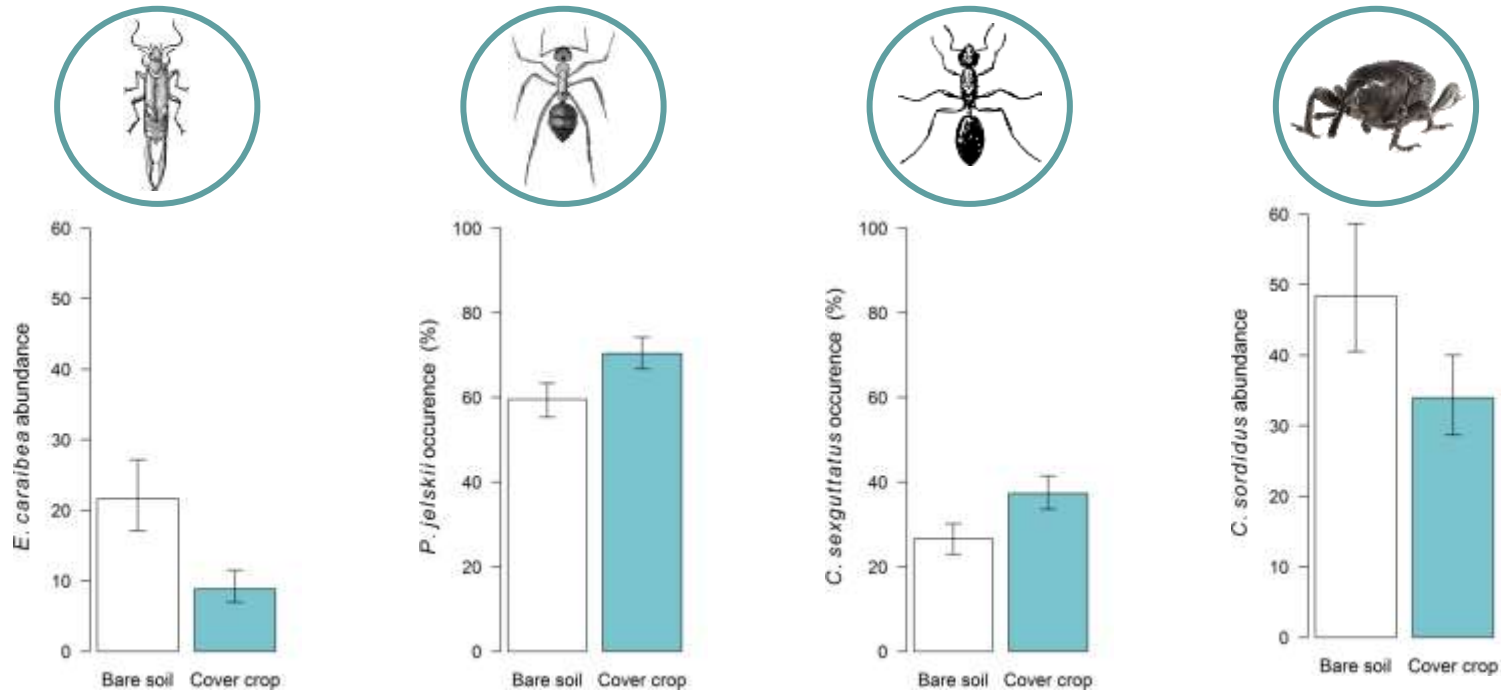
## 3 cover crop plots



Field experiment to assess of the effect of the addition of a cover crop (*Paspalum notatum* (Poaceae) on:

- Weevil abundance
- Abundance/occurrence of the biological control agents
- ~ 2.5 years survey (4-5 crop cycles)

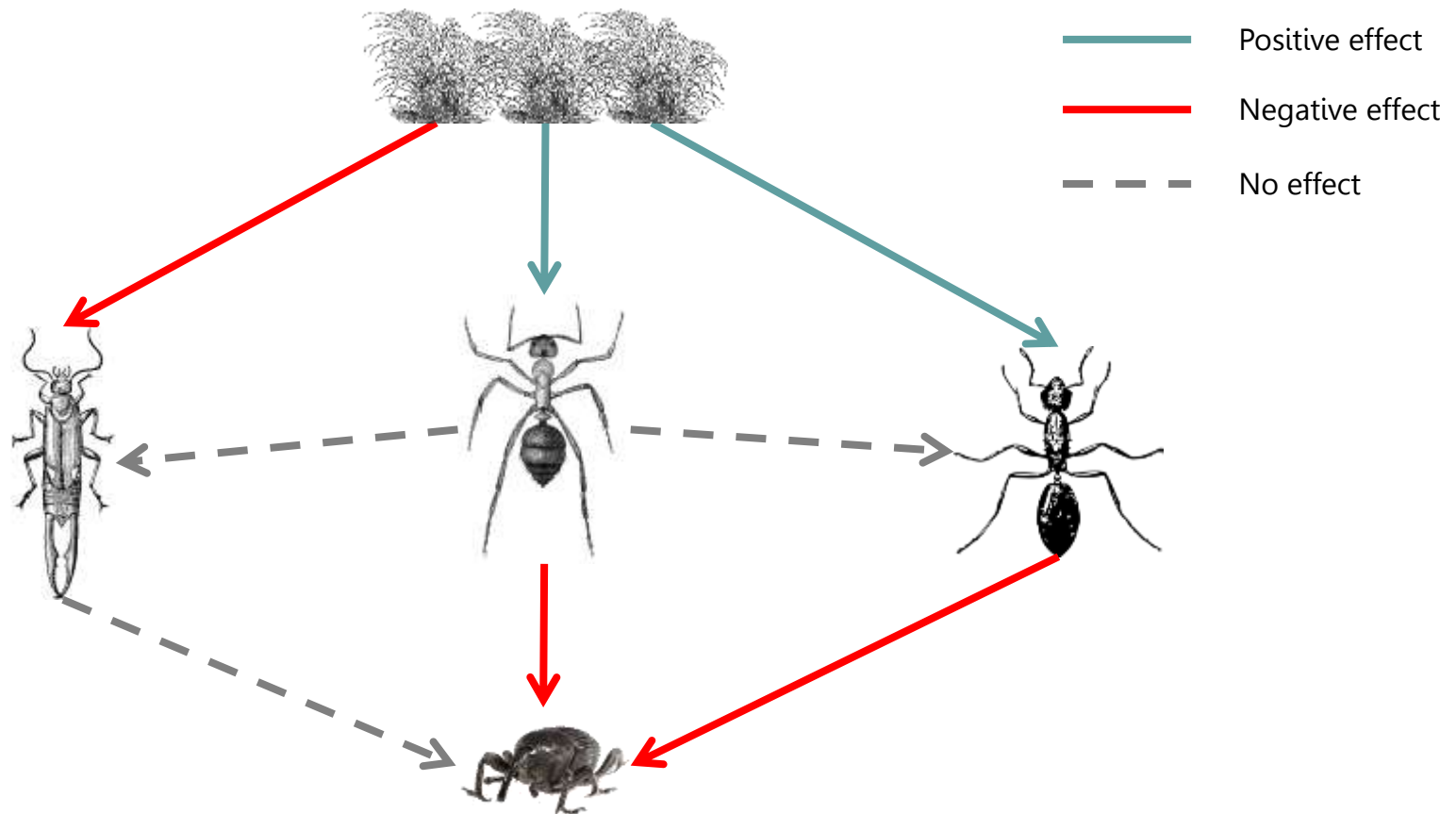
# Results



The addition of the cover crop was **positively correlated** with the occurrence of *P. jelskii* and *C. sexguttatus* while it was **negatively correlated** with the abundance of *E. caraibea*.

The **abundance of *C. sordidus* was reduced** by almost 30% in the plots with the cover crop

# Relationships between the 5 species



The **regulation of *C. sordidus*** was related to the **occurrence of *P. jelskii*** and ***C. sexguttatus*** but not with the abundance of *E. caribeana*.

Intraguild predation by *P. jelskii* did not affect the biological control.





## Take home message:

**The addition of a cover crop enhances  
the biological control of the banana weevil**

**Thanks !**