UNIVERSITE DE LIÈGE
Gembloux Agro-Bio Tech

AgricultureIsLife.be

**Séverin HATT** [1]*, Roel UYTTENBROECK [1], Bernard BODSON [2], Arnaud MONTY [3], Frédéric FRANCIS [4]

[1] AgricultureIsLife.be, Gembloux Agro-Biotech (ULg), [2] Crop Science Unit and Experimental Farm, Gembloux Agro-Biotech (ULg), [3] Biodiversity and Landscape Unit, Gembloux Agro-Biotech (ULg), [4] Functional and Evolutionary Entomology Unit, Gembloux Agro-Biotech (ULg)

# Wildflower strips:
# A help for crop protection?

**ENVITAM PhD Student Day 2014**

**Université Catholique de Louvain**

**5th March 2014**

* severin.hatt@ulg.ac.be

# Presentation Plan

I. Context: limits of pesticide use

II. Wildflower strips: why could they be useful to biologically limit pests on crops?

III. My project: how do functional diversity and mowing regime of strips affect biological pest control?

# I. Context : limit of pesticide use


Pests on crops

Damage on crops


Pesticide application

Is there a solution?

Health risks [1]

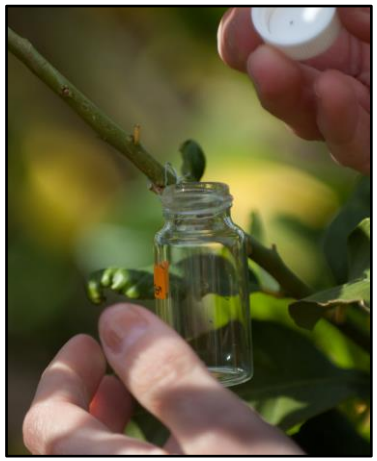
Environmental damage [2]


Pest resistance [3]

# II. Wildflower strips: why could they be useful to biologically limit pests on crops ? (1)

## Biological pest control: what is it?

*"Use of living organism to prevent and reduce losses or damages caused by pests" (IOBC, 1973)* [4]



By introduction [6]

By conservation [5]

# II. Wildflower strips: why could they be useful to biologically limit pests on crops ? (2)

① Food resource [7,8]
(nectar, pollen, alternative preys)

② Shelter [7,8]
(for reproduction and wintering)

*Wildflower strips provide to insects…*

*…because they are…*

③ Species diversed

④ Relatively undisturbed

⑤ Not treated with insecticide

# III. How do functional diversity and mowing regime of strips affect biological pest control? (1)

**About wildflower strips for pest control**

Research question 1

How does functional diversity of flower mixes affect insect diversity, their trophic relations and thus pest control?

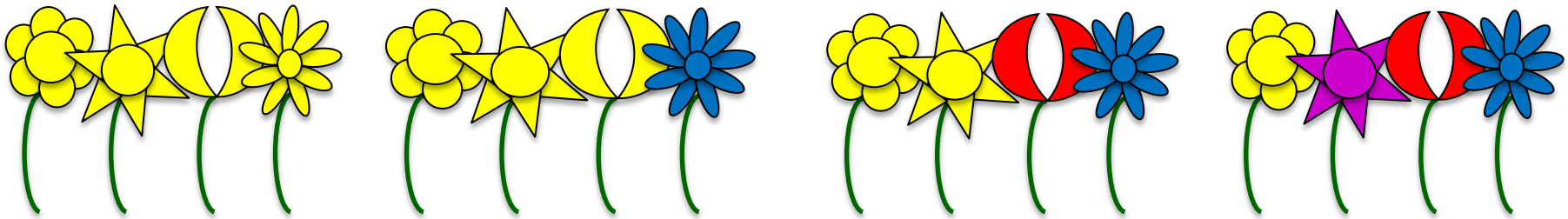
# III. How do functional diversity and mowing regime of strips affect biological pest control? (2)

## Functional diversity: what is it?

*Diversity of flower functional **traits** into a group of species* [9]

*Example*

1 trait = colour and 4 species per mix → 4 functional diversities

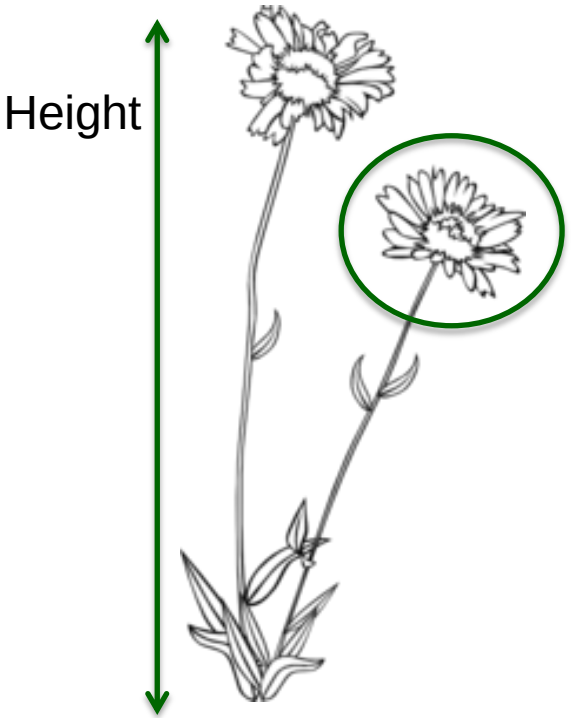


Very Low | Low | High | Very High

# III. How do functional diversity and mowing regime of strips affect biological pest control? (3)

Traits we chose: involved in the attraction of insects

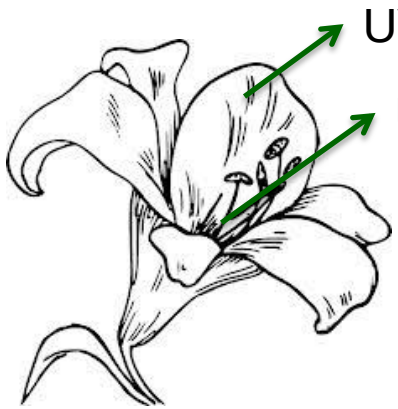
From 20 flower species
→ 4 mixes of 7 flowers




Colour

Start time of flowering

Flowering duration



UV pattern of external parts

UV pattern of internal parts

Corolla type

# III. How do functional diversity and mowing regime of strips affect biological pest control? (4)

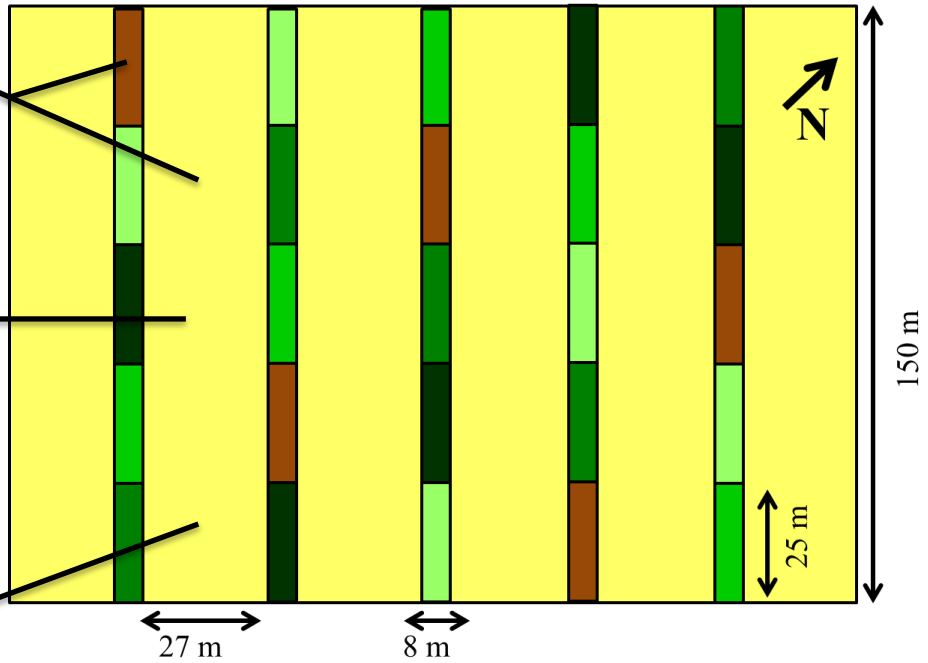
Material & Methods

Insect trapping

Insect observation to set food webs

Yield measurements

*Experimental design*




Zone 1A

Functional diversity

- Control
- Very Low
- Low
- High
- Very High
- Crop (Wheat - Rapeseed)

# III. How do functional diversity and mowing regime of strips affect biological pest control? (5)

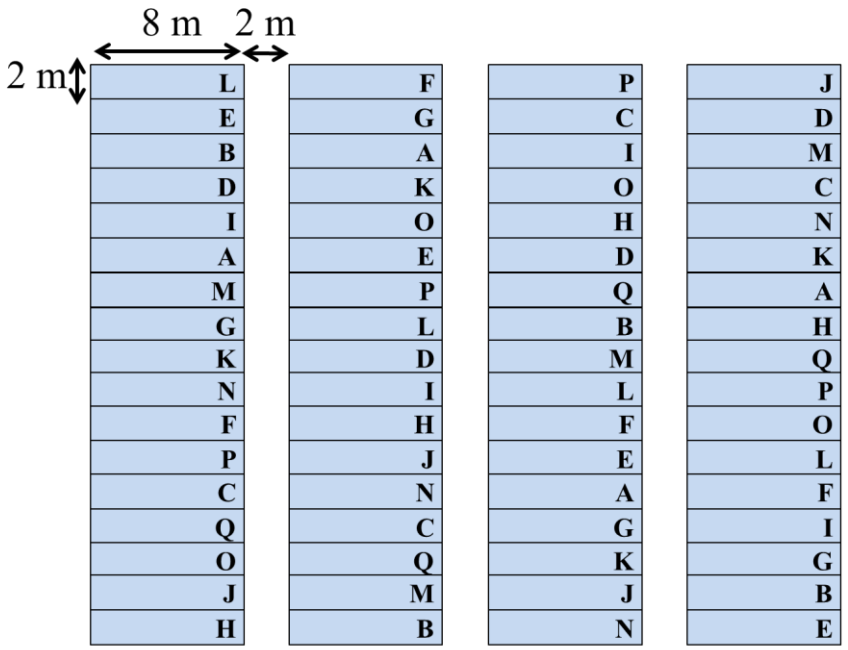
Supplementary question to explain observations done in mixes:

**Are insects attracted by particular species or traits ?**

## Material & Methods

Sweep netting

## *Experimental design*




Zone 1C

***Species used to set mixes***

| | |
|---|---|
| Achillea millefolium | A |
| Anthriscus sylvestris | B |
| Crepis biennis | C |
| Galium verum | D |
| Geranium pyrenaicum | E |
| Heracleum sphondylium | F |
| Hypochaeris radicata | G |
| Knautia arvensis | H |
| Leontodon hispidus | I |
| Leucanthemum vulgare | J |
| Lotus corniculatus | K |
| Lythrum salicaria | L |
| Malva moschata | M |
| Medicago lupulina | N |
| Origanum vulgare | O |
| Prunella vulgaris | P |
| Trifolium pratense | Q |

# III. How do functional diversity and mowing regime of strips affect biological pest control? (6)

## About wildflower strips for pest control

Research question 1

How does functional diversity of flower mixes affect insect diversity, their trophic relations and thus pest control ?

Research question 2

How does mowing regime of flower mixes affect insect diversity?

# III. How do functional diversity and mowing regime of strips affect biological pest control? (7)

## Mowing regime: what is it?

*Frequency and season of cutting strips*

*Before mowing*

Cutting…

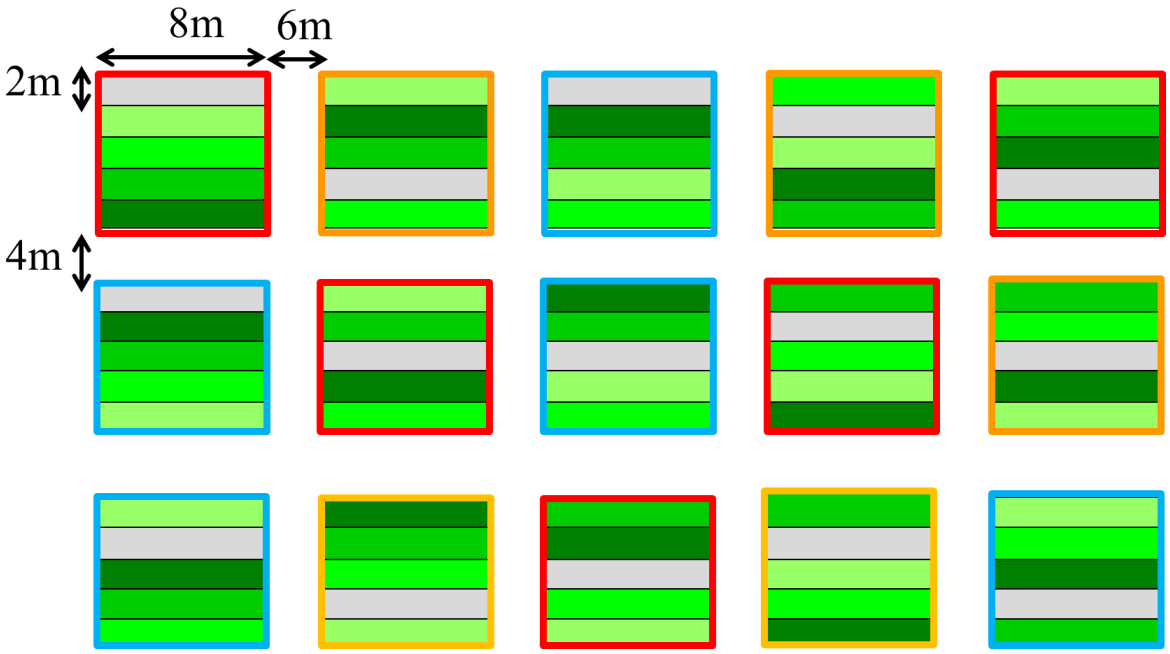
…is a necessity to maintain flower diversity[10] …


*After mowing*

…but destroys food resource and habitat for insects[10]

# III. How do functional diversity and mowing regime of strips affect biological pest control? (8)

*Experimental design*




Zone 1B

Material & Methods

Sweep netting

Functional diversity

- Control
- Very Low
- Low
- High
- Very High

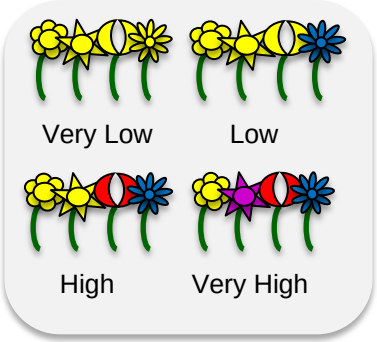
Mowing regime

- Summer & Autumn
- Autumn
- Summer

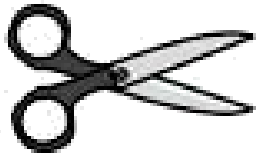
# Summary

*Goal: Enhance biological pest control*

*Wildflower strips*

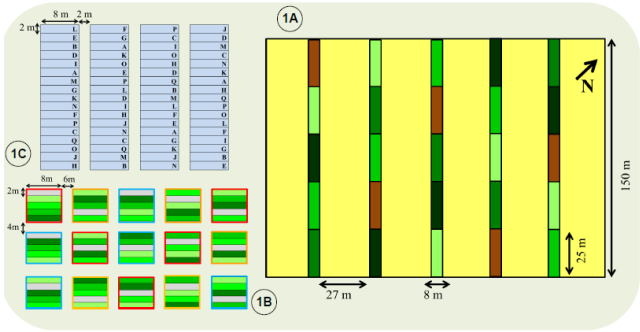



Functional diversity?



Mowing regime?

*Research questions*




*Experimental field*

*Insect trapping and observation*


***Efficiency of biological pest control?***

# Cooperation & Partnerships

Agriculture Is Life.be

**Pollination service**


*Roel Uyttenbroeck*

*Roel.uyttenbroeck@ulg.ac.be*

**Grasshoppers and seeds as sources of lipid**

*Aman Paul*

*Paul.aman@ulg.ac.be*

中国农业科学院
The Chinese Academy Of Agricultural Sciences

***Institute of Crop Protection***

*Pr. Julian Chen*

# THANK YOU FOR YOUR ATTENTION !

# References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