



# ARE CHRISTMAS TREE PLANTATIONS A SUITABLE HABITAT FOR FARMLAND BIRDS ?

Birds in a  
changing  
world

R. Gailly<sup>1</sup>, J.-Y. Paquet<sup>2</sup>, N. Titeux<sup>1,3</sup>, H. Claessens<sup>4</sup>, M. Dufrêne<sup>1</sup>

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robin.gailly@ulg.ac.be

1. Biodiversity and Landscape Unit, University of Liège, Gembloux, Belgium  
2. Département Études, Natagora, Namur, Belgium  
3. Forest Sciences Centre of Catalonia, Solsona, Spain  
4. Forest Resources Management Unit, University of Liège, Gembloux, Belgium

## Introduction

Over the last decade, nonfood perennial crops have been increasingly prevalent in European farming systems. Here, vegetation structure and crop management greatly differ from conventional crops and may likely impact farmland birds. Impacts on birds have been examined for bioenergy agricultural systems, such as miscanthus plantations and short rotation willow coppice [1,2,3]. In Belgium, the extend of Christmas tree plantations (CTP) has recently increased dramatically in farmland but their impacts on farmland birds remain largely unknown.



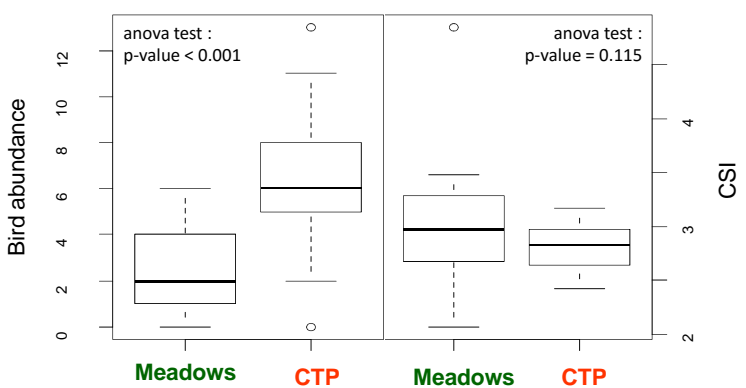
Conversion of meadows to CTP

## 1. Bird assemblage of Christmas tree plantations

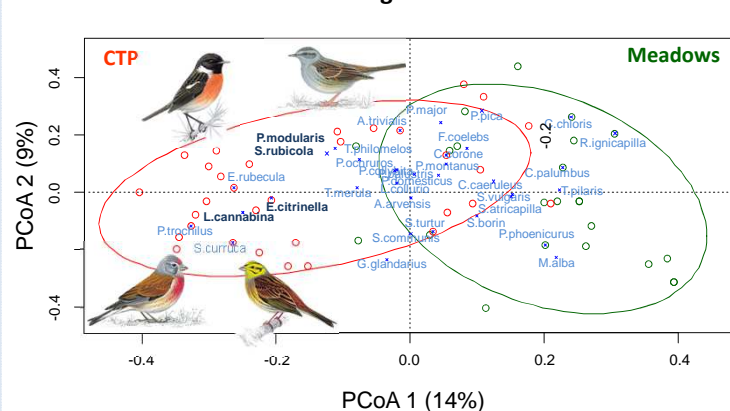
**Method :** The presence and abundance of birds were recorded twice in a breeding season (2013) in a 100m-radius of randomly selected points in meadows and CTP. Forest edges and villages were avoided. A community specialization index (CSI) was calculated to check for potential biotic homogenization [4]. Principal coordinate analysis (PCoA) on bird data allowed us to compare bird assemblage between the two habitats and IndVAL method was used to identified indicator species.

**Results :** CTP locally increase bird abundance without causing biotic homogenization and modify bird assemblages (four species associated to CTP).

Comparison of bird abundance and community specialization index between CTP and meadows



Difference of bird assemblages between CTP and meadows



**Discussion :** In impoverished farmland, CTP could constitute an interesting alternative habitat for farmland birds. However bird presence or abundance may be confounding indicator of habitat quality because individuals may be attracted to low-quality habitats in human modified landscapes [5].

## 2. Are Christmas tree plantations an ecological trap ?

**Model species :** Stonechat (*Saxicola rubicola*)

Demographic data were collected during three breeding seasons (2014-2016). CTP were compared with traditional meadows and early stages of coniferous plantation forests.

**Habitat preference :**

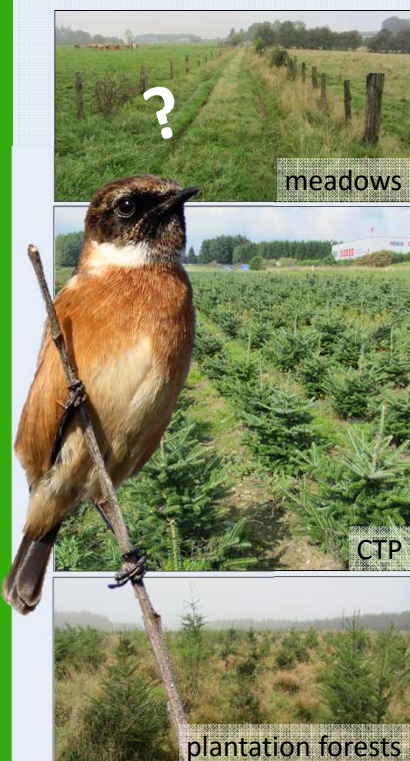
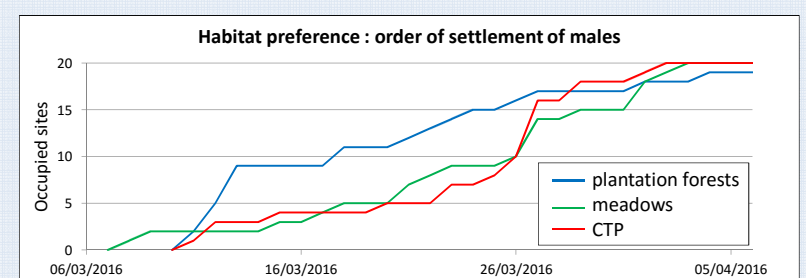
order of settlement of males at return from migration.

- Preference for early stages of plantation forests during the three breeding seasons, no difference between CTP and meadows.

**Fitness :**

number of breeding success, number of nestlings per nest and their body conditions ; adult survival rate.

- Although vegetation structure, field management and nest placement are highly different between habitats, preliminary results suggest that CTP are not of lesser quality than meadows and plantation forests.



### References

1. SEMERE, T. & SLATER, F.M., 2007, *Biomass and Bioenergy* ; 2. SAGE R. & al., 2006, *Ibis* ; 3. SAGE, R. & al., 2010, *Ibis* ; 4. LE VIOL, I. & al., 2012, *Biol. Lett.* ; 5. HOLLANDER, F. & al., 2011, *PLoS ONE*.

1. Christmas tree plantations could constitute an interesting alternative habitat for farmland birds in impoverished farmland.

2. For Stonechat : habitat quality does not seem to differ between Christmas tree plantation, traditional meadow and early stages of plantation forest.