

# Multiple functions of buffer strips in farming areas

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Grupo III

# What are buffer strips (BSs)?

- Riparian filters
- Between crop fields and water bodies
- Reduce agricultural pollution



# Which functions?

- Reduce and filter surface and groundwater runoff → less pollutants
- Reduce erosion
- Sink of CO<sub>2</sub>
- Timber production
- Aesthetic value

What are the interactions with economy and society?

# Aim

Review functions of BS testing experimentally its efficiency in providing different ecosystem services in northeast Italy

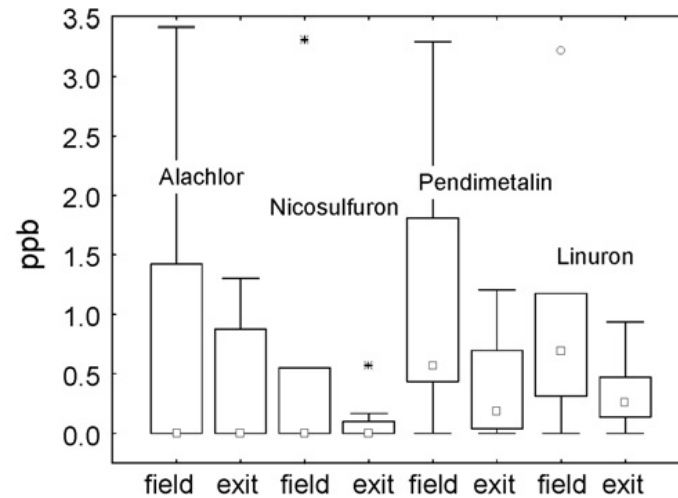
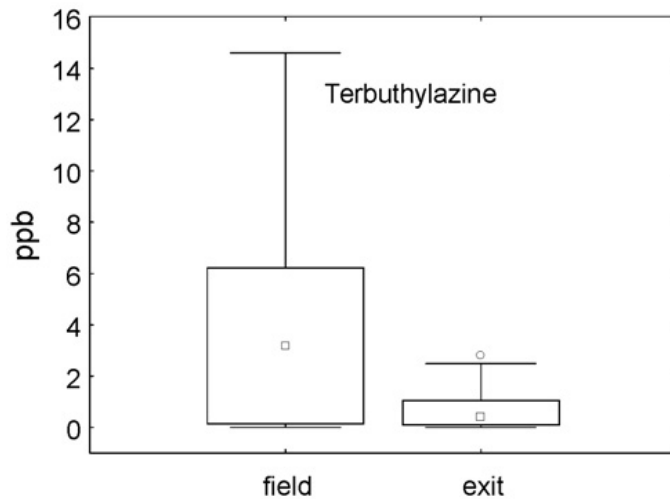
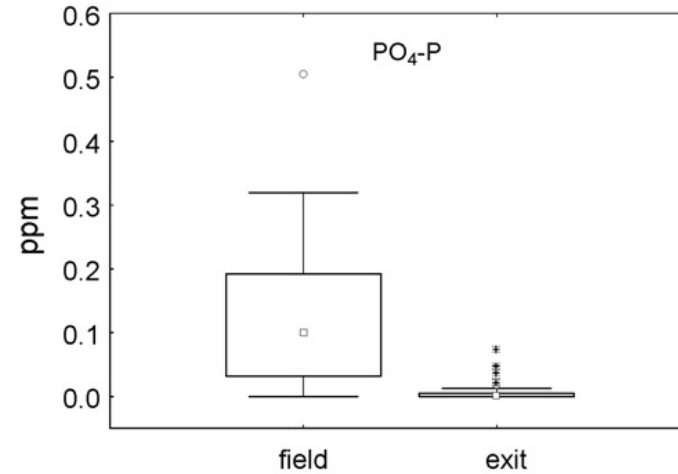
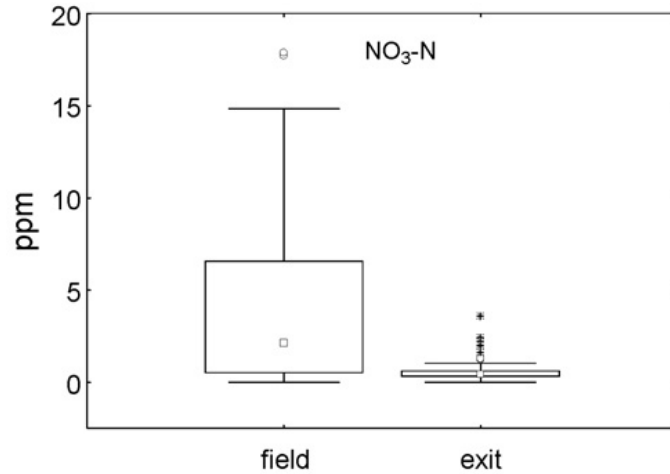


# Methods

- Experimental approaches : 3 regions of Italy (P, N, TSS, runoff, herbicides, C sinking, timber production, crop yield effects)
- Territorial surveys and economic evaluation (Aesthetic value and crop economy)

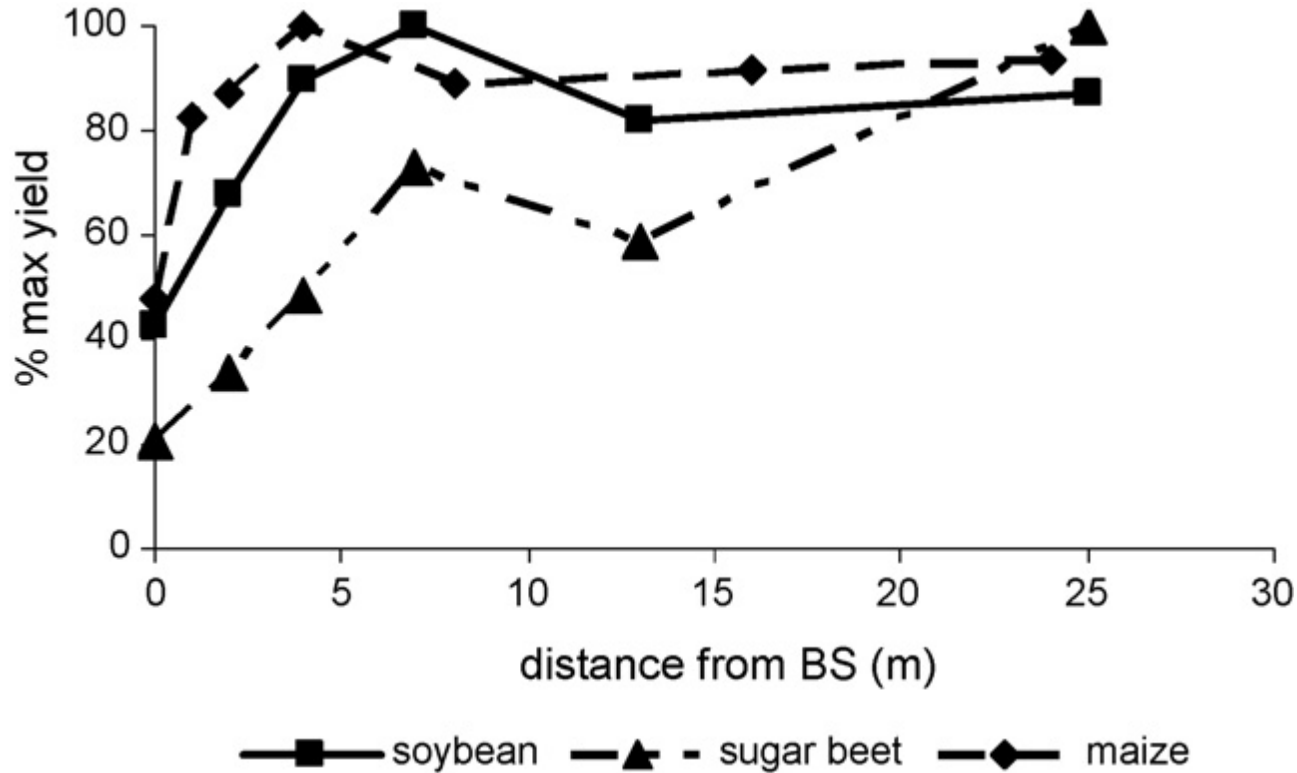


# Main results

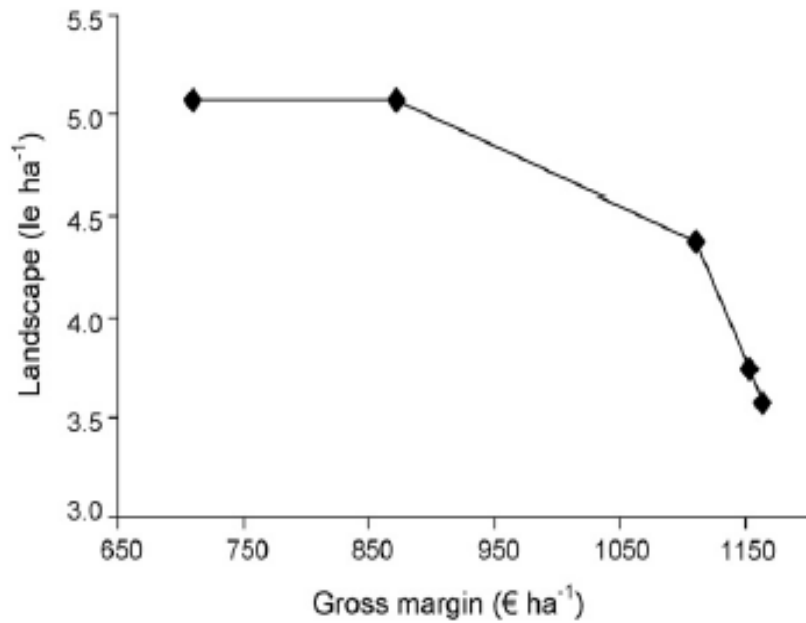


**Reduction of : 33% runoff, 44% N, 50% P (Young BS)  
60%-90% in herbicides (Mature BS)**

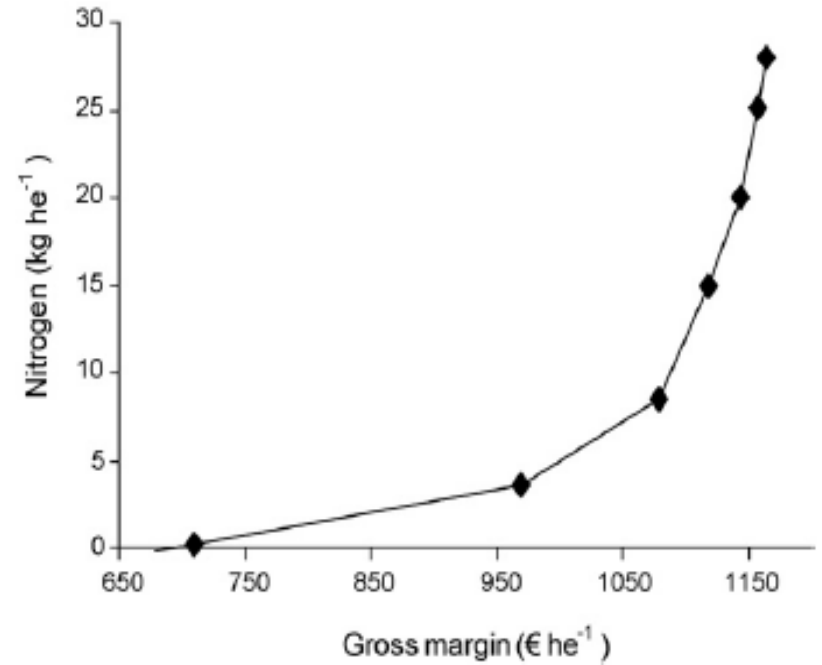
- CO<sub>2</sub> fixation up to 80 ton ha<sup>-1</sup> year<sup>-1</sup>



- 6m trees affect greatly 10m distance crops (sugar beet)



**Fig. 3.** Efficient frontier income-landscape for the land use combinations reported in Table 5.



**Fig. 4.** Efficient frontier income-nitrogen for the land use combinations reported in Table 6.

## Negative relationship

economic income ---- landscape and N reduction



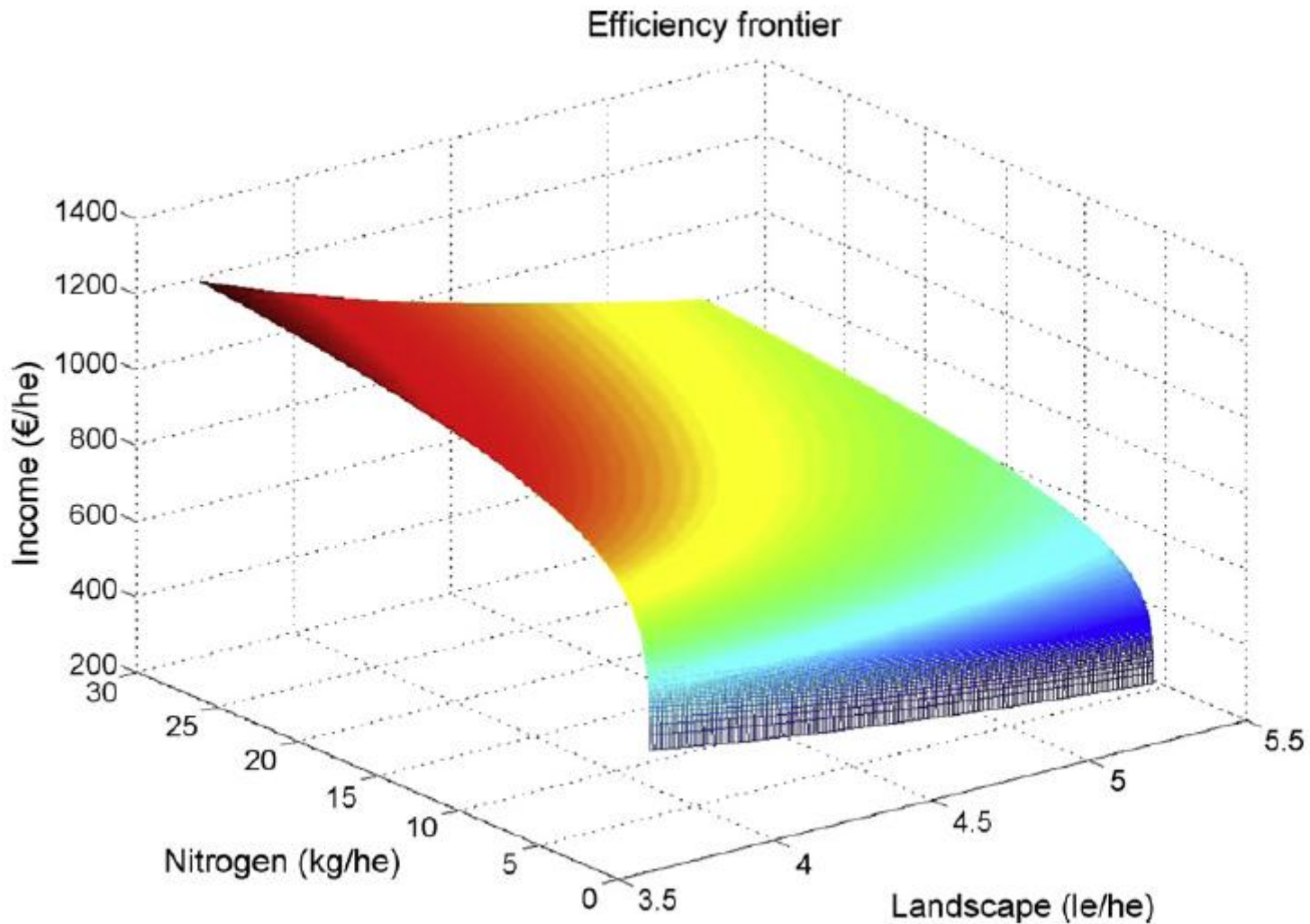


Fig. 5. Efficient frontier income, landscape and nitrogen releases.

- Trade-off among N, Landscape and gross income
- Useful for managers

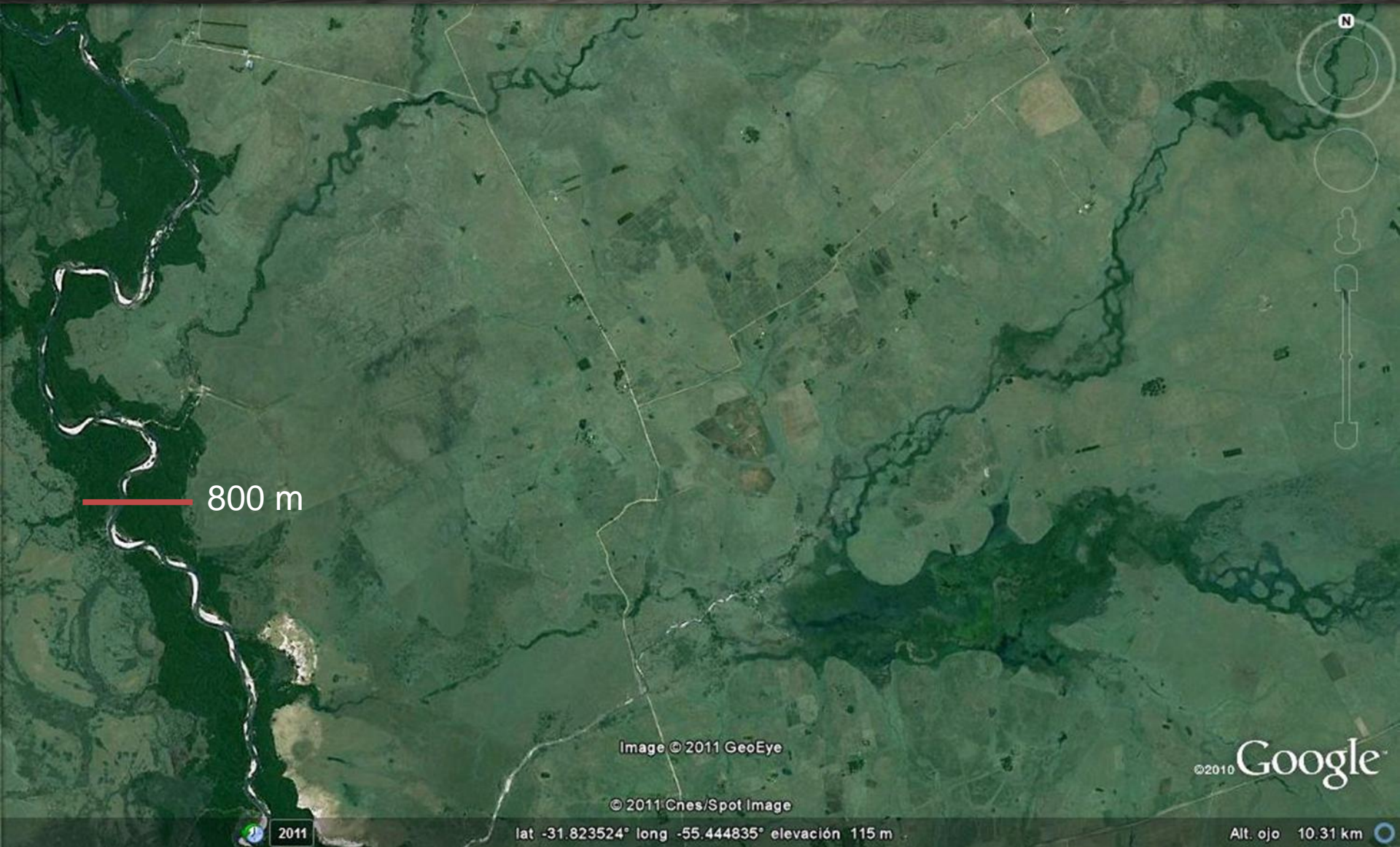
# Discussion

- BSs provide several ecosystem services, as confirmed in this study
- Particularity as pollutant filters
- Economically viable (Timber, energy)
- CO<sup>2</sup> immobilization?
- More to study e.g. flood control

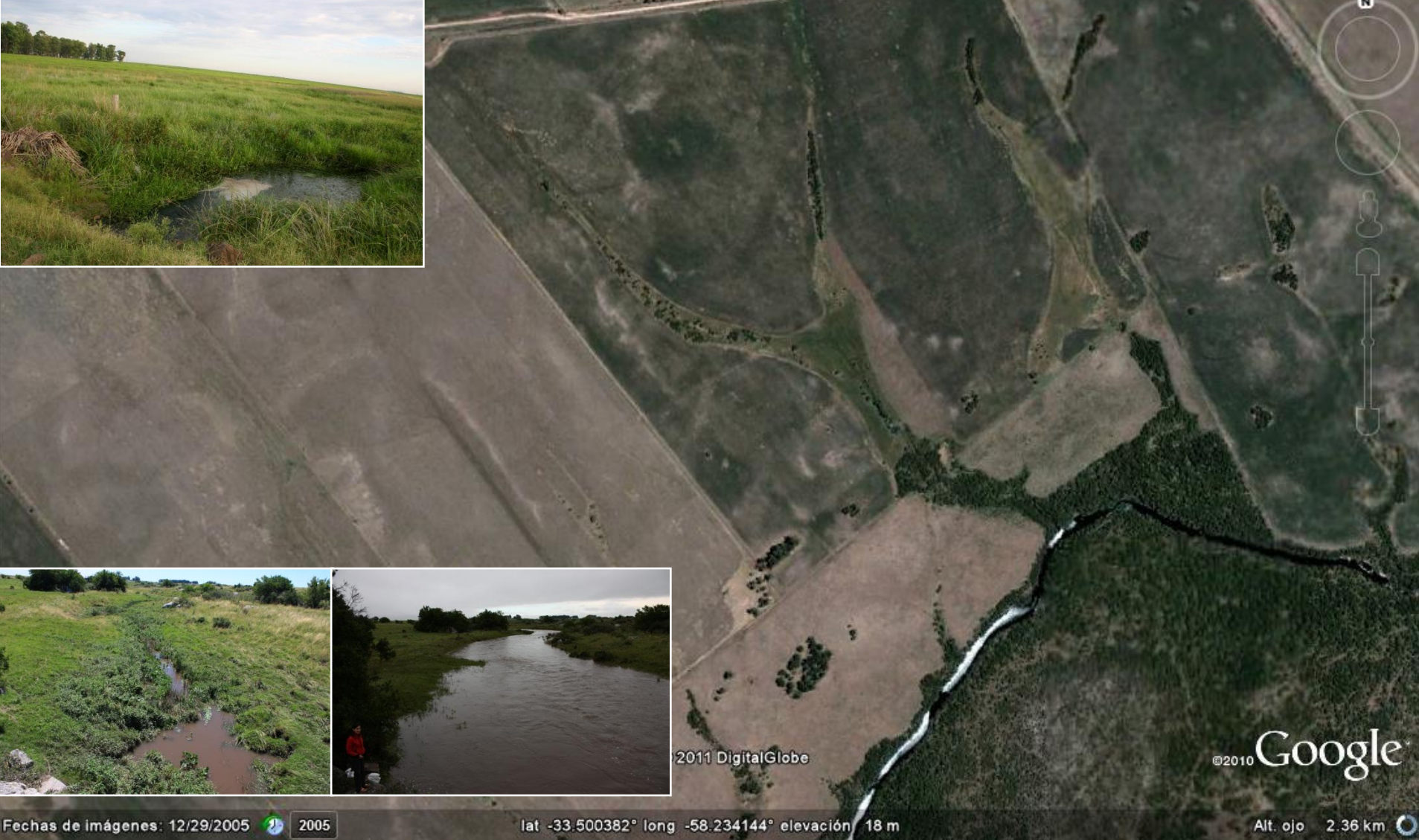
# Discussion

- Best BSs installation one row of mature trees :  
  
for aesthetics and nutrient reduction, the opposite  
for crops
- Improve efficiency: timing, species composition, interaction with crops
- Morphological features
- Filter capacity, erosion control of species

# BSs in Uruguay?



- Native woods!!



Natural filters to preserve ecosystems services

A landscape photograph showing a grassy field in the foreground, a line of tall grasses and shrubs in the middle ground, and a dense line of trees in the background under a clear blue sky. A semi-transparent green rectangular box is overlaid in the center of the image, containing the text "Thank you!!!".

**Thank you!!!**