Maize yield in silvoarable systems established under *Prunus avium* L. in Galicia (NW Spain)

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INTRODUCTION

In the last years, in Galicia (NW Spain), the forest area has increased gradually and therefore the availability of agricultural area has decreased. This factor could favor the establishment of silvoarable systems in this region in which the woody vegetation is intercropped with annual or perennial crops. In the silvoarable systems, the crop production depends, among other aspects, on the density of the woody vegetation
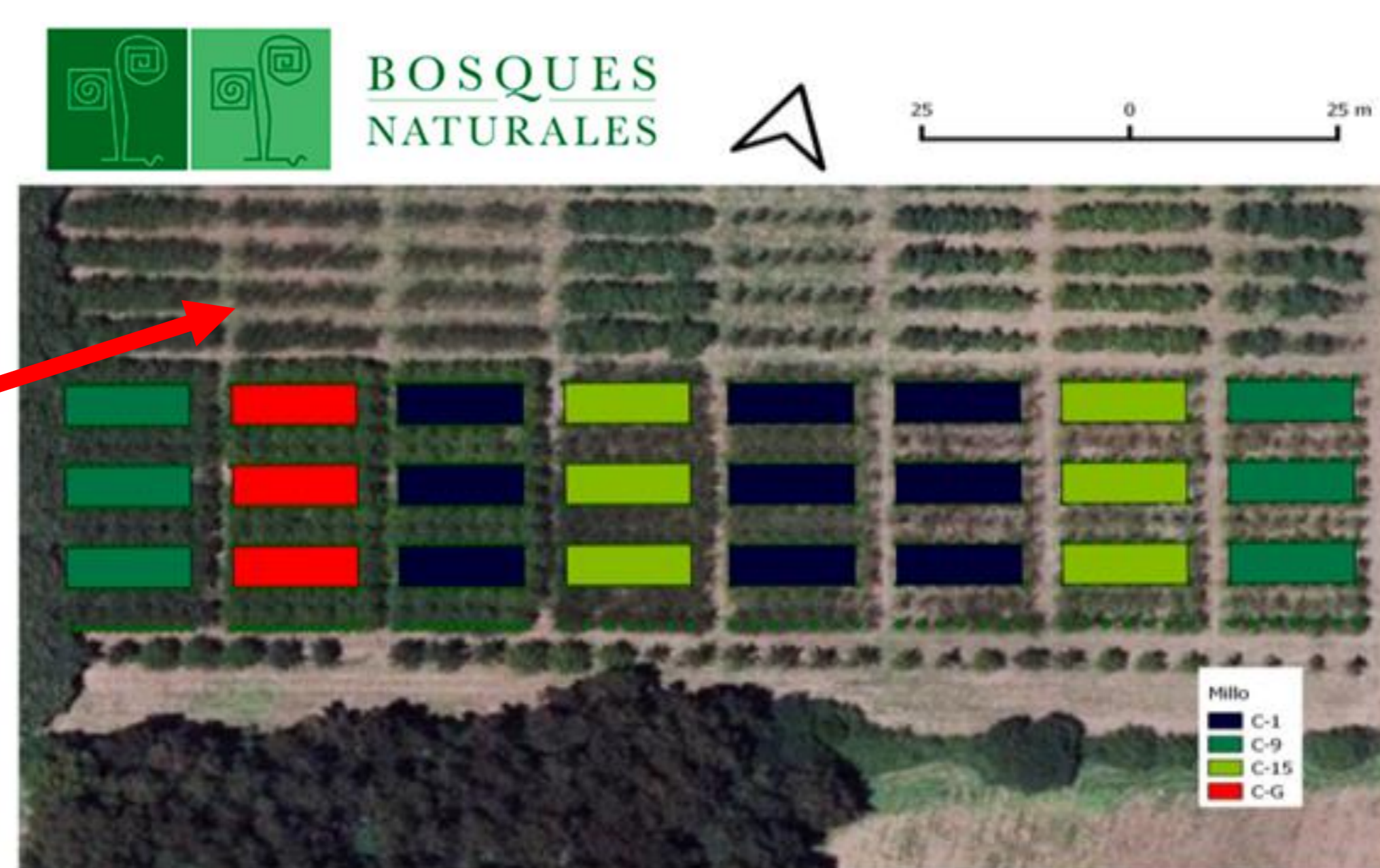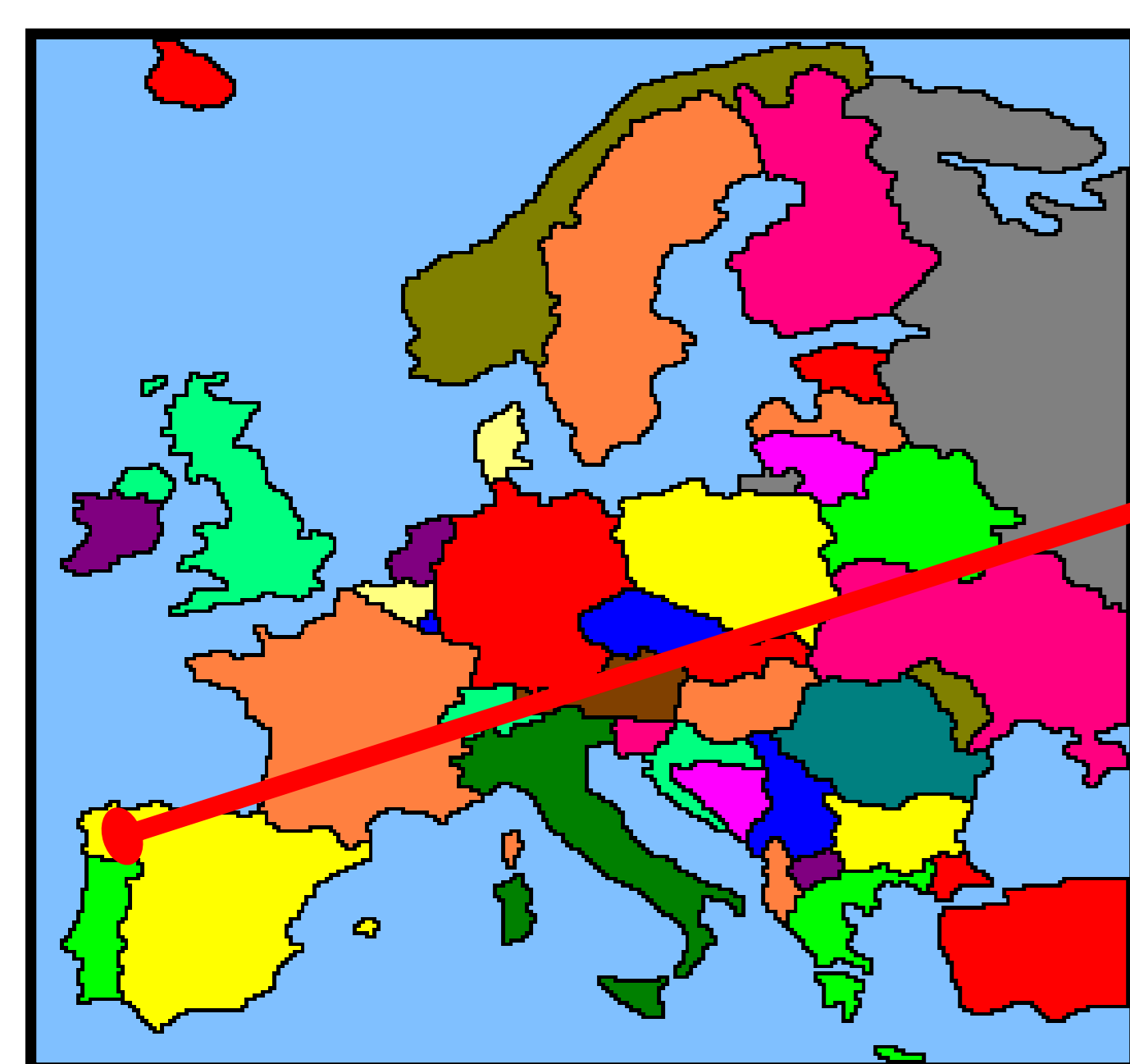
OBJECTIVE

To evaluate the production of maize at different distances to the trees (1.5, 3 and 6 m) in a silvoarable system established with *Prunus avium* L. in Galicia compared with an exclusively agronomic system

MATERIALS AND METHODS

LOCALIZATION

EXPERIMENTAL DESIGN

The experiment was established in a plantation of *Prunus avium* L. managed by the Bosques Naturales company. The trees were planted in 2000 (5 m x 12 m)

In May 2015, the forage maize (DKC 4608 Ponho) was sown in an alley between two trees rows. The maize was sown in 10.5 m alley, leaving 0.75 m both sides of the tree row. The distance between maize plants rows was 0.75 m and the distance between maize plants within a row was 0.15 m

FIELD SAMPLINGS

In October 2015, the production of maize was estimated at three distances of the trees (1.5 m, 3 m and 6 m). In each distance and in three different points, ten plants of maize were collected and weighed. The maize final density in the rows was taking into account. The production of maize was also estimated in a tree-less area

ANALYSIS IN THE LABORATORY: the plants were fractionated into aborted cobs, cobs without grains, stems, leaves and grains. These components were dried and weighed (60ºC x 48 hours). The maize production per hectare was calculated considering the area occupied by the trees. Total maize production was determined by summing the production of the different components
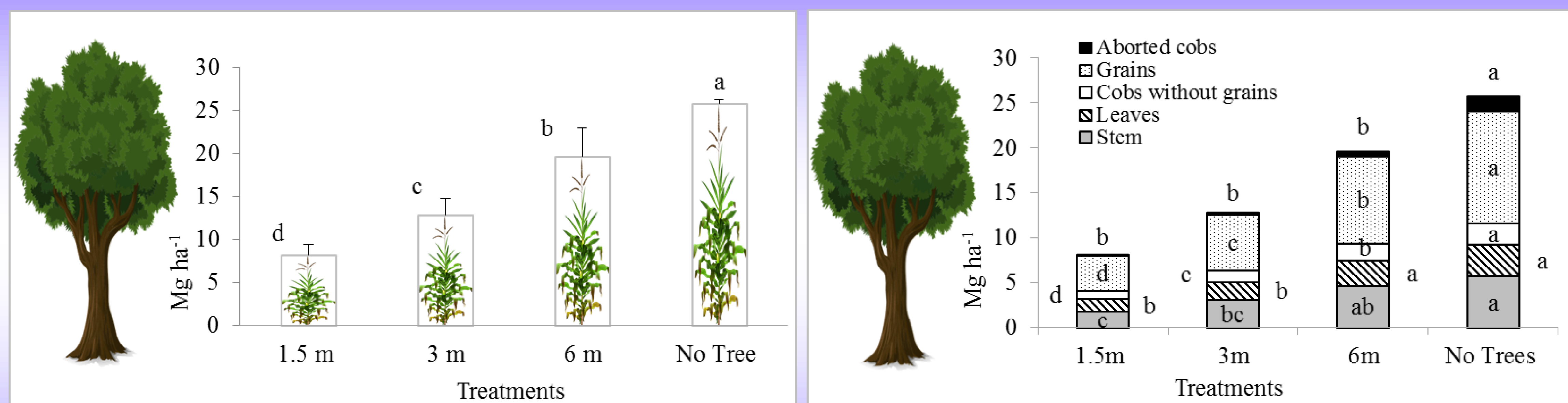
STATISTICAL ANALYSIS

ANOVA and LSD

RESULTS

The maize production increased with the distance to the trees

✓ Negative effect of shade (maize variety was selected for open sites)

✓ Competition for soil nutrients and water

***Surface occupied by trees was discounted

Figure 1. Total production of maize (Mg DM ha^{-1}) and production of the different components of maize (aborted cobs, cobs without grain, stems, grains and leaves) (Mg DM ha^{-1}) under the different treatments in 2015. 1.5 m, 3 m and 6 m are the distances between the trees and the maize. Different letters indicate significant differences between treatments. Vertical lines indicate mean standard error

CONCLUSION:

silvoarable maize systems under an adequate tree density are a good option of land use due to its economic and environmental benefits compared with exclusively agricultural and forest systems