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Plantation density of *Corylus avellana* influences the precocity and kinetics of burgundy truffle production

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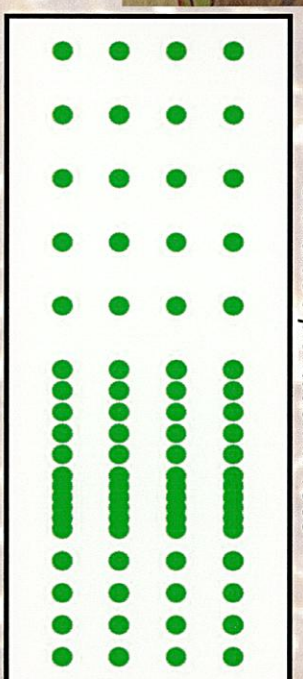
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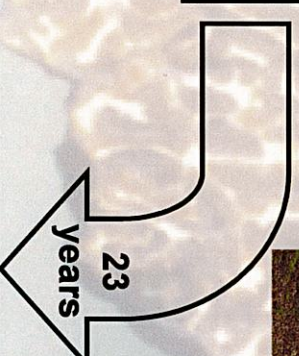
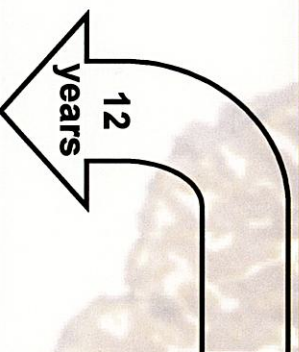
Objective: To test the influence of tree density on the production of burgundy truffle and its evolution up-to-date.

Context: Recommendations for truffle orchards establishment and further management are not always adapted to the ecology of each truffle species, in interaction with its host trees. As an example, the most common plantation density for Burgundy truffle orchards in the past 40 years was often adopted from Périgord black truffle.

A Burgundy truffle hazel orchard was planted in 1985, with four plantation densities in four blocks located near Commercy in the North East part of France (48°45'42 N, 5°35'31 E), 250 km East of Paris. The densities tested were: 2000, 1000, 666 and 333 trees per ha. The exposure of the plot is North, with a 5% slope. The soil is classified as a silt-fine clay with 330, 520 and 150 g.kg⁻¹ of clay, silt and sand respectively.



Results:

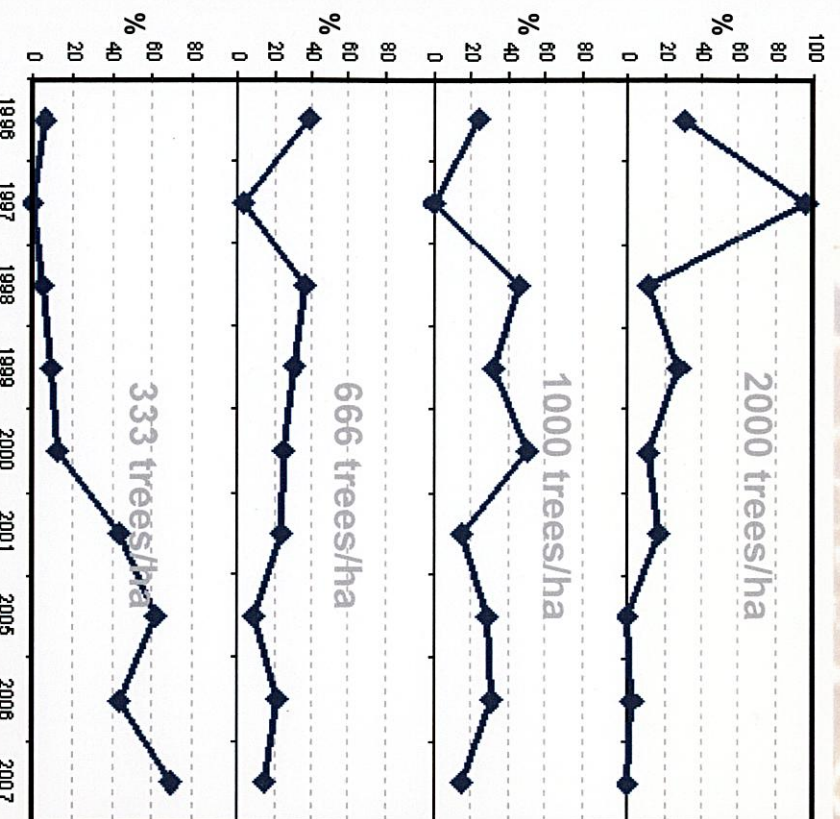


Truffles harvested between 1996 (white) and 1999 (dark blue)

Truffles harvested in 2005 (orange) and 2006 (dark orange)

Truffles harvested in 2007

The successive harvests are displayed on the map according to their distance to the trees and azimuth. Production spots change with time from the highest to the lowest plantation density.



Kinetics of the production for the four plantation densities, expressed for each density in percentage of total orchard (whole densities) production.

Highest plantation density (2000 trees/ha) produced early and during the first four years after the beginning of production. This density ceased almost to produce after the 20th year after plantation.

Medium plantations densities (1000 and 666 trees/ha) showed the same history; the optimum was reached between 13 and 16 years after plantation. Afterwards the harvest decreased every year but still produced 23 years after plantation. The production peaked 15 years after plantation for these two densities.

The lowest plantation density started to produce truffles 16 years after plantation, and therefore was the latest to initiate production. This density is the most productive at the present time.

Conclusion: Recommendations for burgundy truffle are the following in order to keep the optimal ecological conditions for the fungi propagation and fructification: plantation density at 1000 to 2000 tree/ha at the installation of the orchard and progressive thinning to 300 and 400 tree/ha up to 16 years after plantation.