Immediate effect of thinning on the yield of *Lactarius* group *deliciosus* in *Pinus pinaster* forests in Northeastern Spain

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持続的森林資源管理：日本全体→一山型

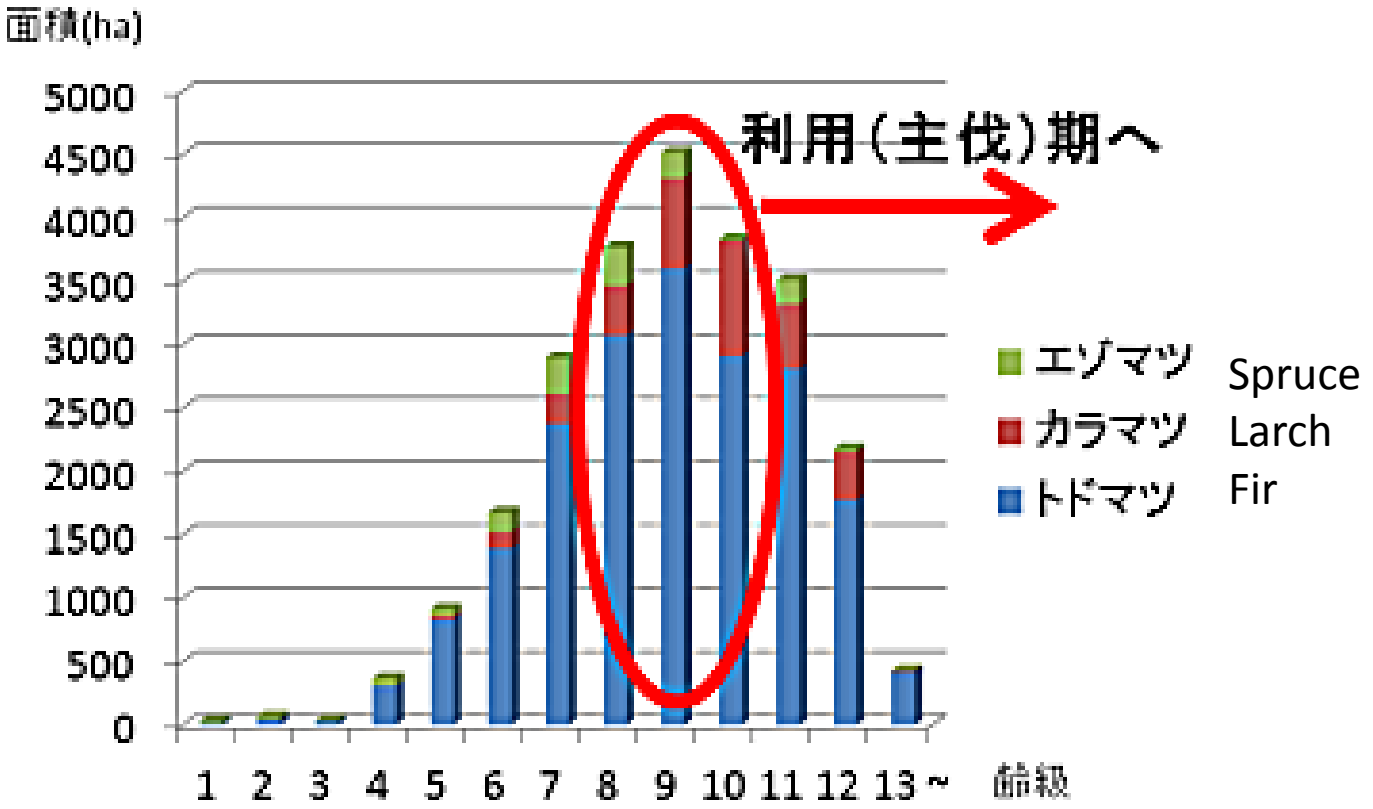
For sustainable forest resources management in Japan:

One peak distribution→ this is bad for us!!

文献紹介の背景

Background

How can we make thinning on the man-made forests!



The similar situation is found in northeast Spain!

The objective of the present work is to assess the influence of thinning on the production of *Lactarius deliciosus* group sporocarps (胞子嚢果) in an even-aged *Pinus pinaster* forest in Northeastern Spain.

At market

Mashuroom hunting in a pine forest

Pinus pinaster

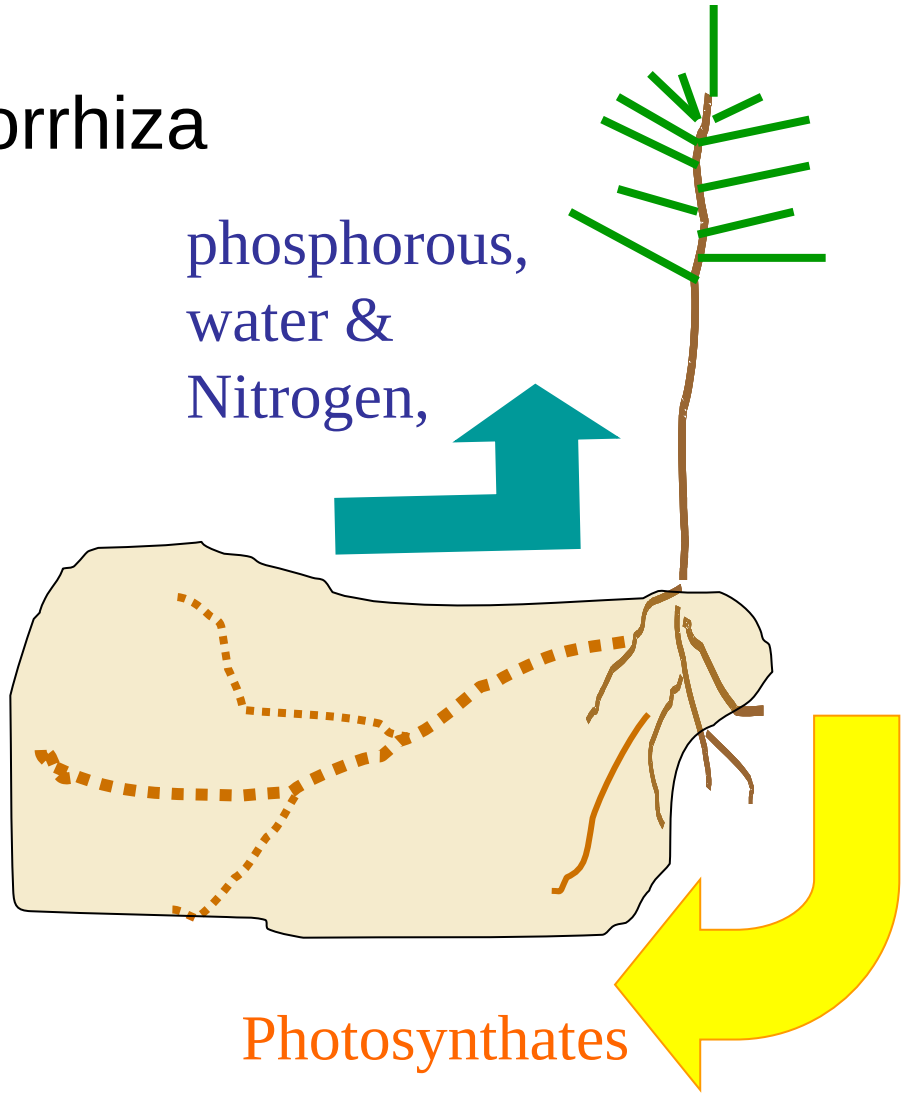
How can we increase production of saffron milk caps ?
making new tax!!

Role of ectomycorrhiza infection on seedlings grown under soil acidification

1）Development of ectomycorrhiza is usually well at slightly acid condition.

2）Under infertile condition, ectomycorrhiza can provide phoshorous and water to host plants.

3）Ectomycorrhiza obtain the photosynthates from host plants.



2）＋3） Symbiosis

From different opinion

The apparent contradiction that
open forest conditions with relatively low basal areas typical to the early phase of natural forest succession (before canopy closure) were favorable for saffron milk caps production.

Canopy closure was an important factor influencing their findings and proposed the use of silviculture treatments to decrease the density of older stands in order to enhance *L. deliciosus* production.

A total of 30 plots with a basal area reduction ranging from (胸高断面積合計）
0% to 77% were established in 2008 and monitored during the autumn mushroom seasons of 2009 and 2010.
Fifteen non-thinned plots were also surveyed in 2008.

Positive response of saffron milk cap production to thinning.
Production was
5 times greater in plots in the first year after thinning and
2 times greater in the second year, vs. the non-thinned plots.

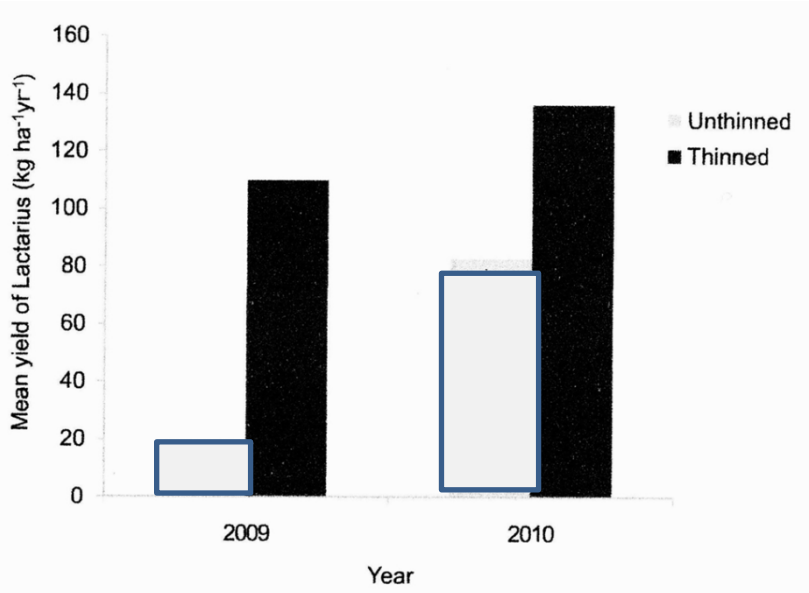
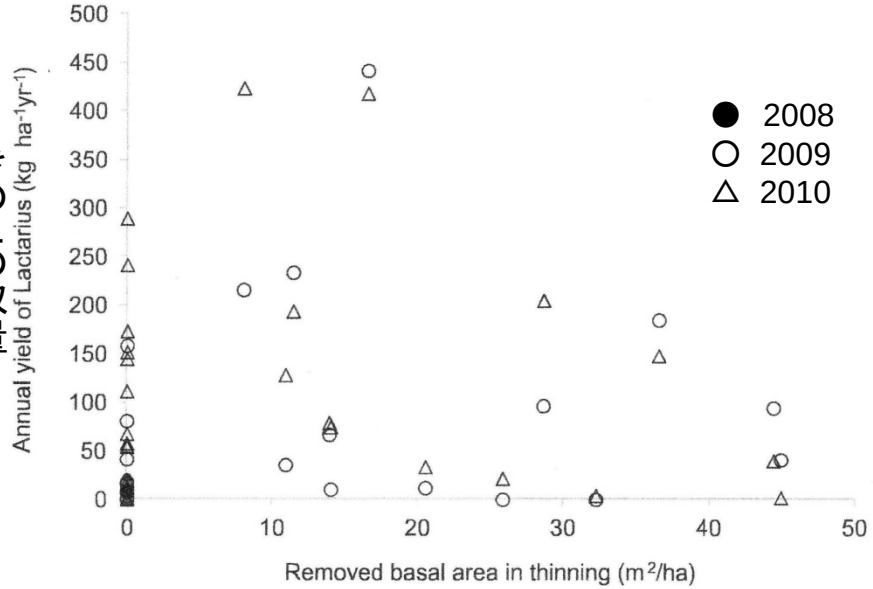


Fig. 1. Effect of thinning on *Lactarius* group *deliciosus* yield in 2009 and 2010.

Thinning intensity and precipitation during Aug. and Sept
were the most significant factors explaining yield of mushroom.

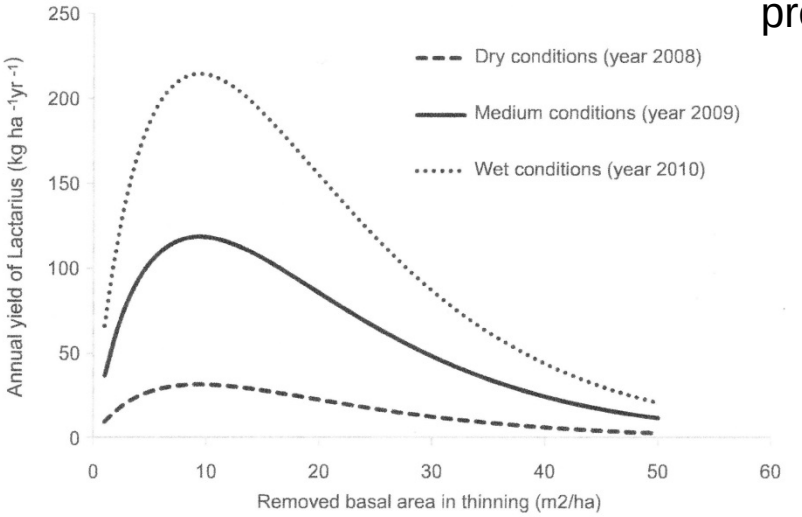


きのこの収量

間伐した胸高断面積合計

キツネタケの一種

年間の収量



precipitation (mm)

672

706

898

Fig. 4. Relationship between the annual yield of *Lactarius* group *deliciosus* and removed basal area in thinning in the years of study.

林内
展示の試み

Yield of mushroom and precipitation

- An increase in species richness with higher precipitations
- A positive correlation yield and precipitation of Aug and Sept

→ Thinning improve light condition as well as moisture condition on the forest floor!

Negative effects of heavy thinning on mushroom production may be due to
decreased soil water availability as a consequence of higher solar exposure, higher evaporation rates and higher soil temperatures.