Systematizing forest restoration through trials in South-Central Chile: two examples

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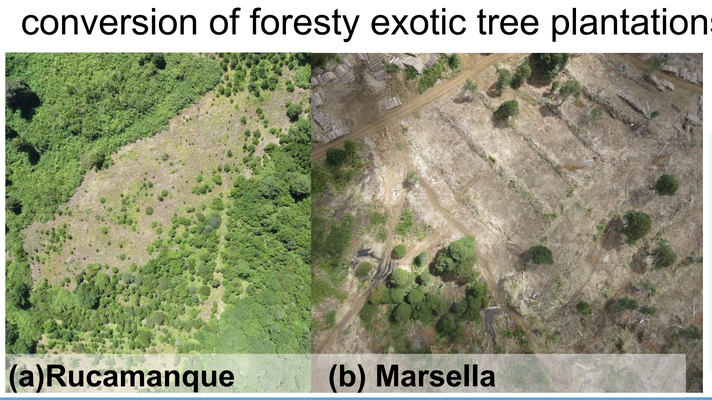
Introducción

Forest loss and degradation has determined a global concern for implementing effective restoration activities. Several countries has committed to restore vast amount of land setting goals, e.g., Inintiative 20×20 and the Bonn Challenge. Scaling restoration from local initiatives to larger areas is a global need.

Chile has commited to restore ~ 500 thousand ha until 2030.Since 1990, about one houndred restoration initiatives have been reported in the country, but most of them refer to small isolated examples (< 1 ha). The frequent low survival and performance of native tree species for active restoration, needs attention.

We systematize two rehabilitation trials set in 2015, associated to frequent scenarios that face restoration in south- central Chile: (a) rehabilitation of abandoned degraded pasture lands, and (b) re-conversion of foresty exotic tree plantations (after clear felling).



(a)Rucamanque (b) Marsella

General discussion points

Moving from small local experiences (<1 ha) to large restoration initiatives will be a great challenge in Chile, particulalrly given the poor survival rate that native tree species show (i.e., those you find in common nursuries)

Systhematizing restoration/rehabilitation initiatives as those shown in this poster, may contribute to identify common findings, wins and losses.

Reporting and analyzing nonsuccessful experiences is not commonly seen among scientists, and can contribute to the challenge of restoring at larger scale

Main results are given for **plant survival and performance after 12-17 months.** We identify common findings, giving general tips for discussion.

Different disturbances, similar approach

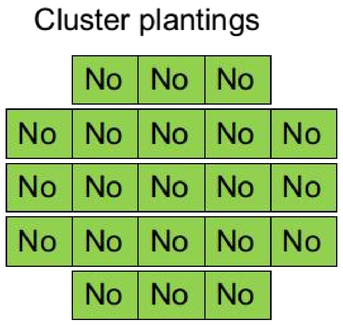
Both trials were located in the Araucanía region (38°S), associated to *Nothofagus* dominated forests.

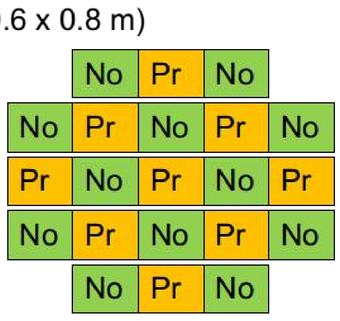
The abandoned pasture land trial, was set in the valley at (a) the University Forest Rucamanque ~ 300 m.a.sl [0.57 ha]. The reconversion trial was set after clear felling of a Douglas-fir plantation located in the Andes at an area of Conguillío National Park (b) Marsella ~1000 m.a.s.l [17.3 ha].

Natural *Nothofagus* regeneration (~0.2x0.7m), compared with a succesfull traditional raw planting squeme (3 x 2 m) in central-south Chile.

By considering tree species in reference areas nearby, we selected two *Nothofagus* (i.e., pioneer species, No) and two Proteaceae species (i.e., plastic, shade intolerant, with proteoid roots, Pr) for each area. Species were selected also due logistics, considering those possible to find in local nursuries.

Cluster plantings (0.6 x 0.8 m)





Traditional row planting (3 x 2 m)

In Marsella (b) we included also repetitions with non regular cluster planting

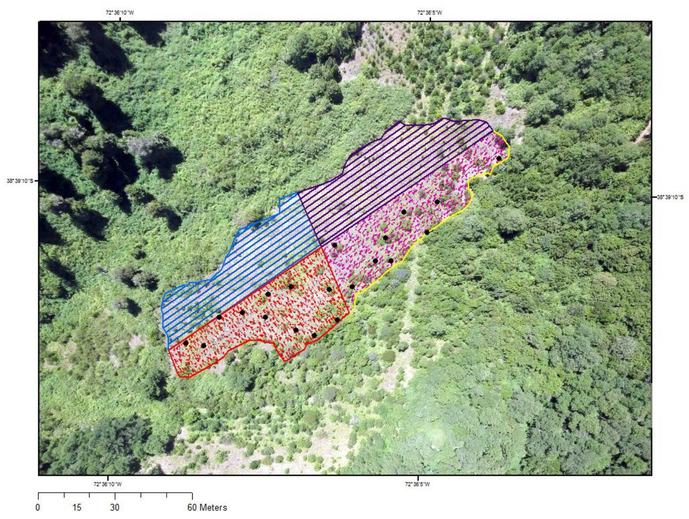
Plantation was set in mono specific and bi specific squemes for each trial, comparing cluster (group) planting with traditional row planting.

Main results

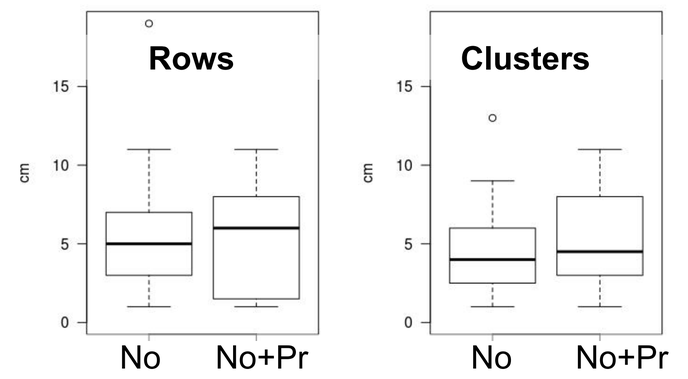
Overall, plant survival was low on both trials (always <80%), particularly in Rucamanque (abandoned pasture land, 15-32%)

Cluster planting treatments presented better survival than row planting, only in Marsella (reconversion after forestry plantation)

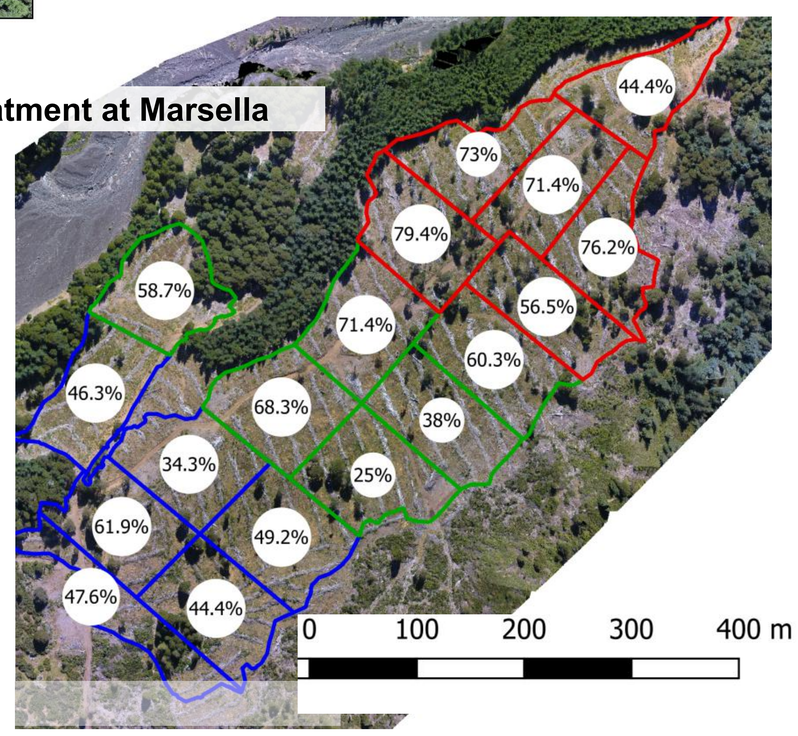
Performance in terms of height growth (cm), did not vary among treatments; and bi-specific settings did not present a clear pattern of improving survival or performance.

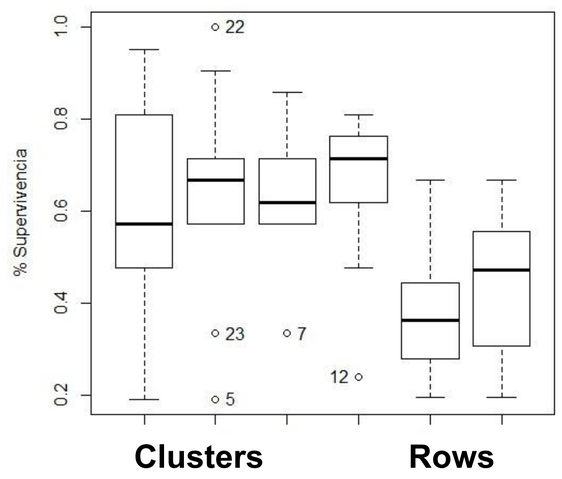


Annual height growth in Rucamanque



Survival rates of different treatment at Marsella





Acknowledgments

Funding was provided by CONICYT PAI 821320069 and Vicerrectoría de Investigación y postgrado, Universidad de la Frontera. We appreciate the authorization given by the National Forest service of Chile (CONAF) to collect data in Marsella, part of Conguillío National Park (# 04/2017 IX). Thanks go to several graduate and under students for their help in data collection and processing: Fernando Llanquilef, Joaquín Riquelme, Carla Manríquez, Daniela Barra, Franco Perez, Camilo Matus. Acknwoledgments to the biometrics fellows at UFRO: Dr. Christian Salas E and Dr. Andrés Fuentes-Ramírez. We appreciate the invitation of Dr. John Stanturf and the kind work of Janet Revell ((US Forest Service).