



Providing high quality forest plants in the aftermath of fire events via vegetative amplification of maritime pine forest reproductive material: an emergency strategy

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Bilbao - September 9th



GrupoTragsa  
Garantía Profesional. Servicio Público



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# 01

## Introduction



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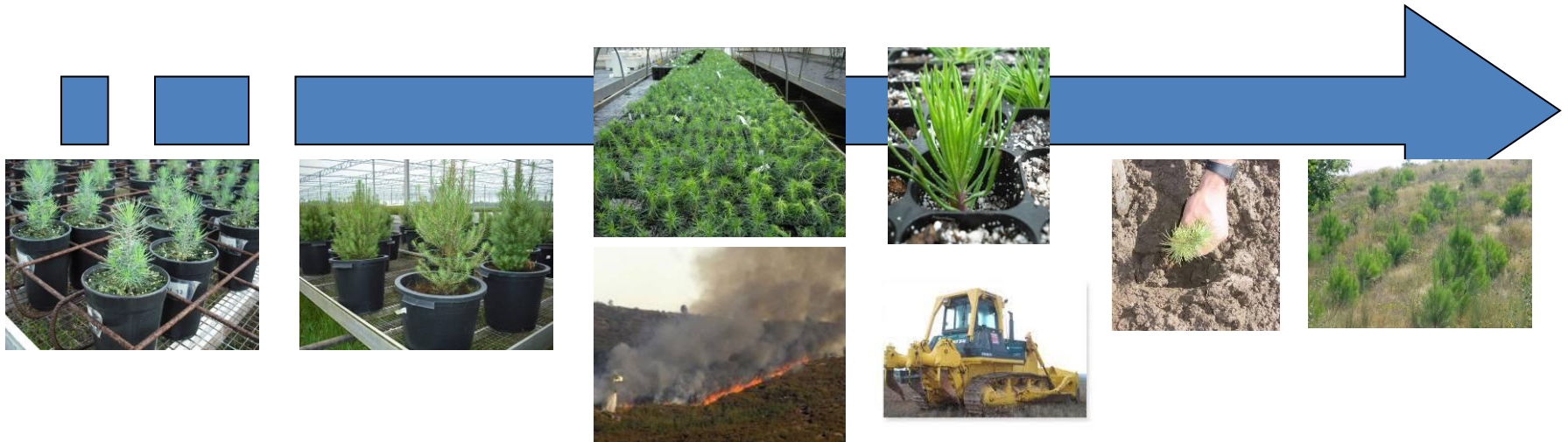


- High risk of summer fire in Galicia
- Around 15.000 ha/year of forest fires
- Sooner restoration the better for preventing soil losses
- Cell forest seedlings are seeded in spring and early summer to achieve appropriate hardening before planting
- Time can be saved by delivering already hardened cuttings cultivated in trays of small-sized cells from the end of the summer to the end of the winter
- Because of the more expensive costs in cultivating cuttings, added value of the genetic material should be a prerequisite

# 02

## Objectives

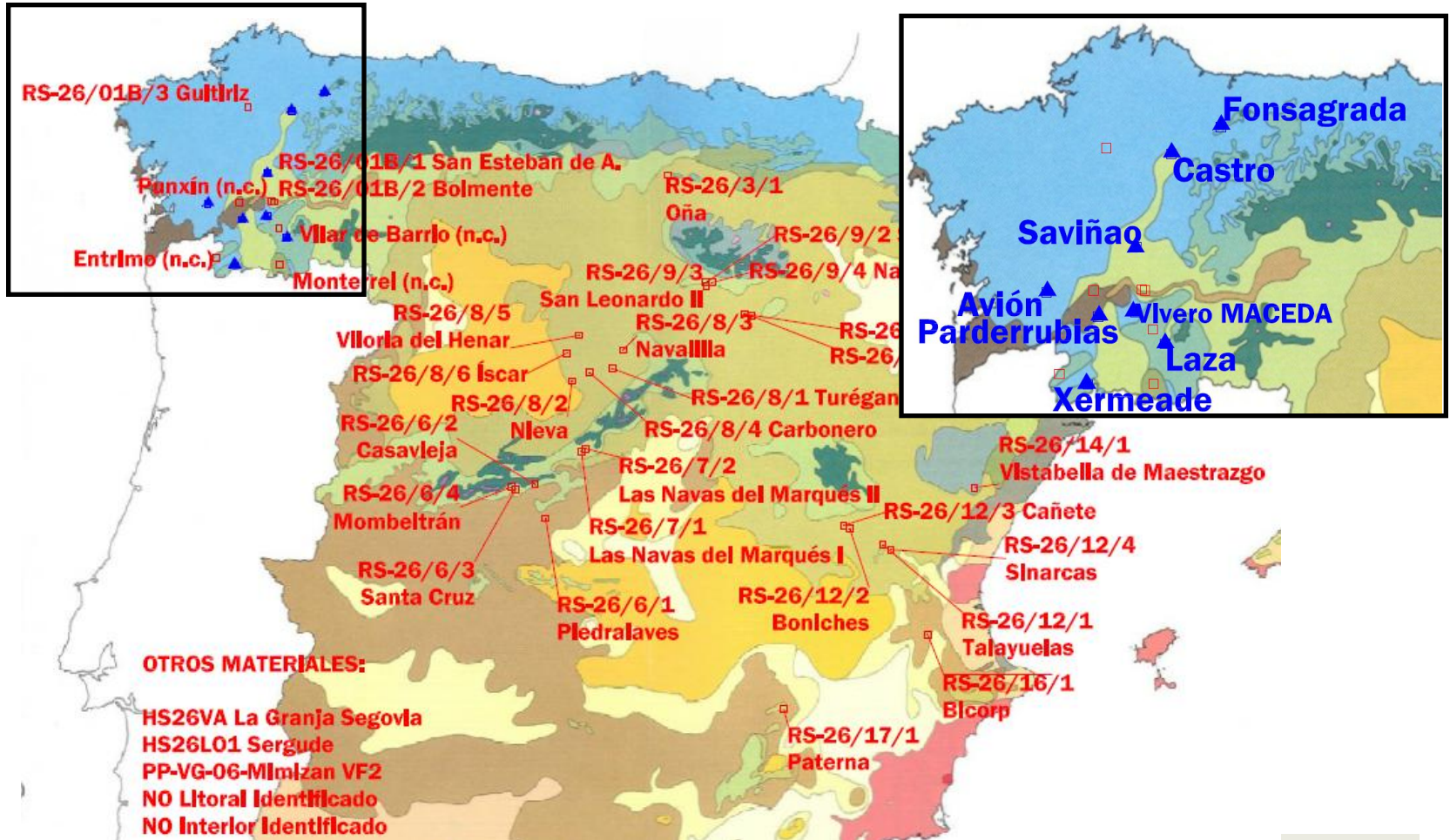
- REFORESTATION WITH 2 TO 4 MONTHS CULTURE CUTTINGS FROM ALREADY EXISTING MOTHER PLANTS BY MEANS OF USING SMALL CELLTRAYS (MINIPLUGS) INDICATED IN POST BURNED AREAS IN GALICIA (NORTHWESTERN SPAIN)

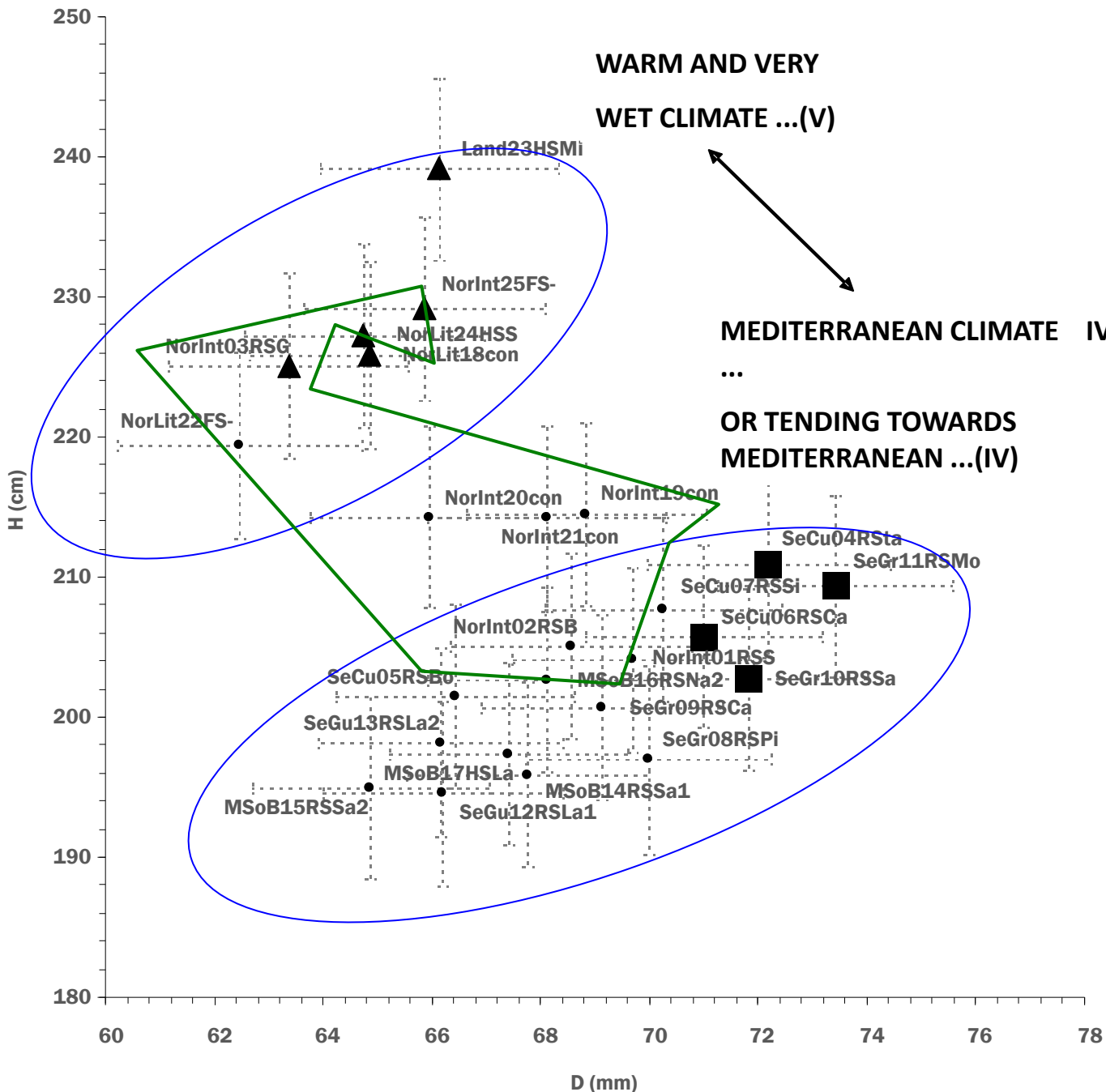




# 02

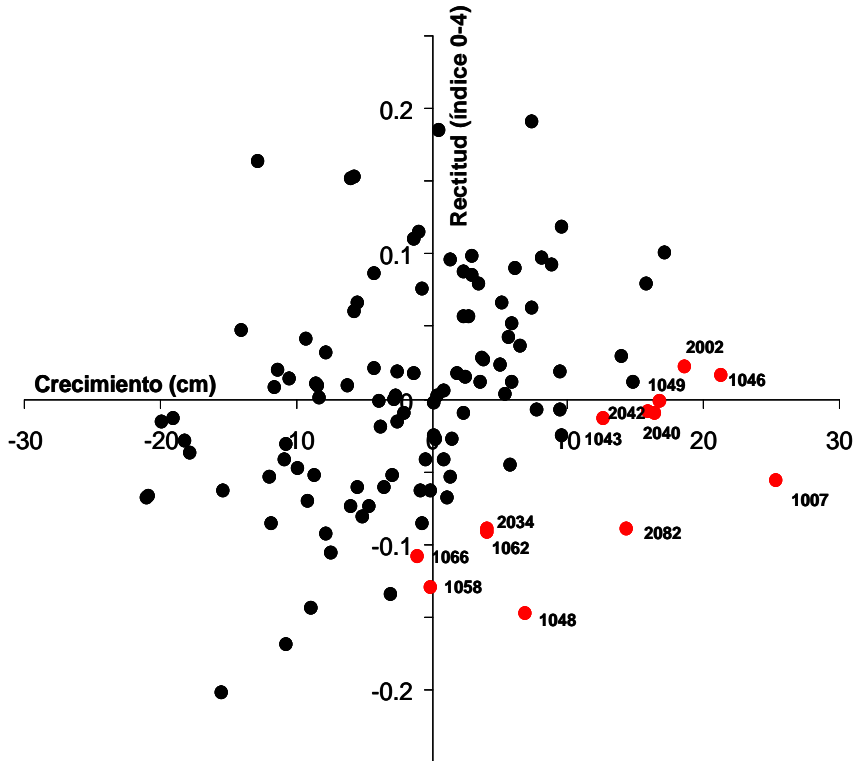
## Genetics Material





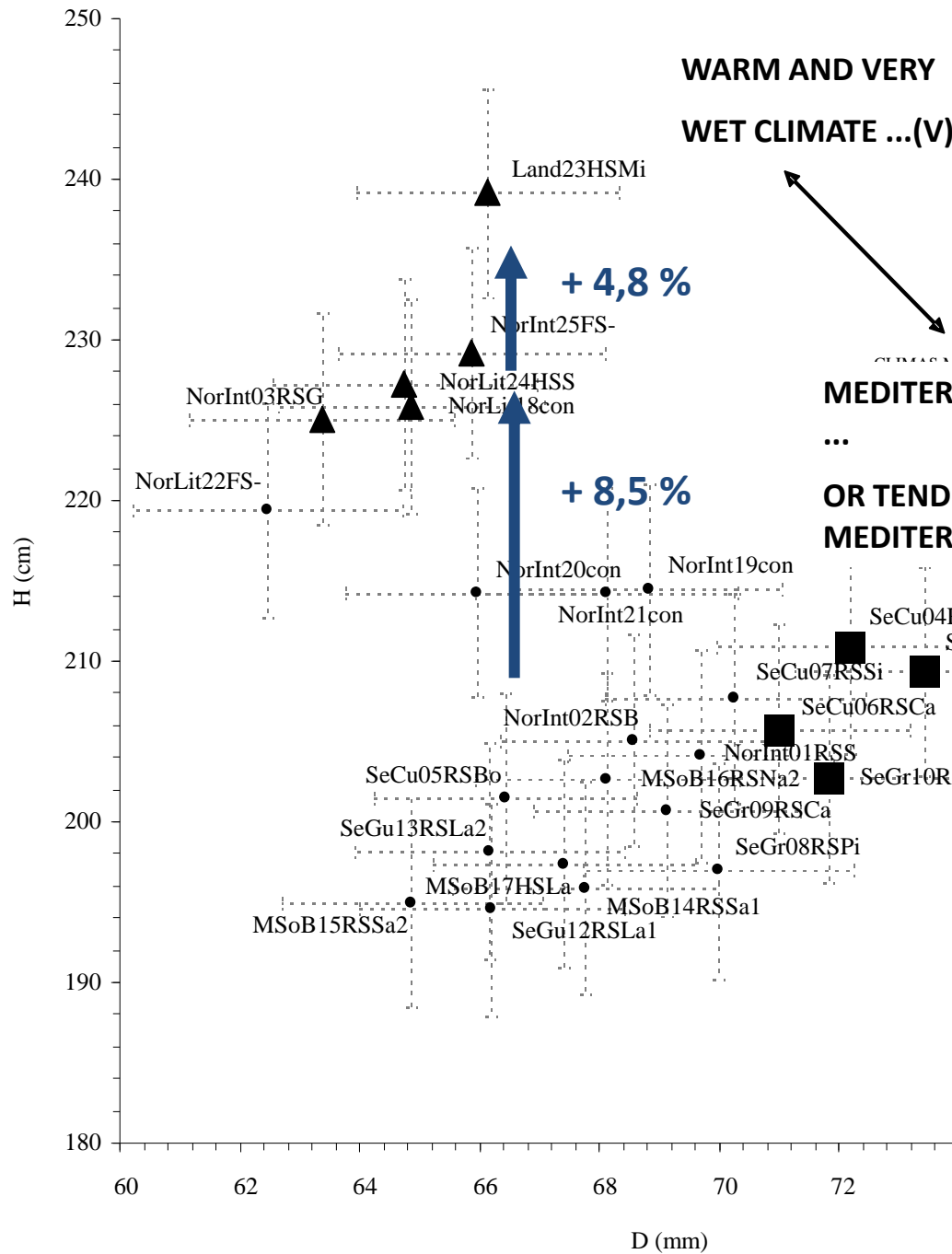
# 02

## Genetic Material



Genotypes	Height %	Straightness %
1007	10.1	5.7
1046	7.5	-1.1
2002	7.2	-3.4
2040	7.2	0.9
1049	7.0	-0.4
2082	6.2	7.6
2042	5.4	0.8
1043	5.1	0.4
2034	1.6	8.5
1062	1.5	7.2
1058	0.0	12.3
1066	-1.1	8.2

Zas & Lario 2008  
 OVERALL HEIGHT IMPROVEMENT MEAN **4,8%**



	H Media MC	H Sigma	Mejora (%)
Total	209,50	1,13	-
Land23HSMi	239,14	6,54	14,2
NorInt25FS-	229,19	6,60	9,1
NorLit24HSS	227,22	6,55	8,5
NorLit18con	225,87	6,63	7,8
NorInt03RSG	225,11	6,57	7,5

	D Media MC	D Sigma	Mejora (%)
Total	67,73	0,40	-
SeGr11RSMo	73,41	2,17	8,4
SeCu04RSta	72,18	2,24	6,6
SeGr10RSSa	71,82	2,19	6,0
SeCu06RSCa	71,00	2,17	4,8



# 03

## Genetic Material

OPERATIONAL BALANCE WITH THE MEAN PLANT/Ha				
YEAR	CONCEPT	INVERSIÓN (€)	RETORNO (€)	RESULTS (€)
0	PLANT	231,83	-	- 231,83
0	PLANTATION	2.767,77	-	- 2.767,77
2	CLEARING 1	368,90	-	- 368,90
4	CLEARING 2	387,57	-	- 387,57
10	THINNING 1	562,48	573,48	11,00
20	THINNING 2	1.981,66	3.170,40	1.188,74
30	FINAL CUT	8.202,60	18.383,08	10.180,48
		<b>14.502,80</b>	<b>22.126,96</b>	<b>7.624,15</b>

**254 €/Ha year**

OPERATIONAL BALANCE WITH BRED CLONAL AMPLIFICATED PLANT/Ha				
YEAR	CONCEPT	INVERSIÓN (€)	RETORNO (€)	RESULTS (€)
0	BRED PLANT	811,39	-	- 811,39
0	PLANTATION	2.767,77	-	- 2.767,77
2	CLEARING 1	368,90	-	- 368,90
4	CLEARING 2	387,57	-	- 387,57
10	THINNING 1	774,57	788,53	13,96
20	THINNING 2	2.499,67	3.991,67	1.492,00
30	FINAL CUT	9.852,06	22.083,19	12.231,14
		<b>17.461,93</b>	<b>26.863,39</b>	<b>9.401,46</b>
CPI %	2,5	INTER -ANNUAL VARIATION OF PRICES %	2,5	

GesMO 2009  
Diéguez-  
Aranda et al  
2009



GesMO<sup>TM</sup>  
2009  
Instituto de Investigación y  
Producción de Madera  
Forestal

**313 €/Ha year**

In Site Index 14 sites of coastal areas...from  
 13,26 m<sup>3</sup>/hayear to 16,17 m<sup>3</sup>/hayear  
 (GesMO© 2009)

<p>13,3 % HIGH IMPROVEMENT</p>	<p>IRR % from 4,02 to 4,18 if for particle industry</p>
<p>3,8 % STRAIGHT IMPROVEMENT (Zas &amp; Lario, 2008)</p>	<p>IRR % from 5,25 to 5,72 for more added value destinies (sawmills,etc.)</p>

# 04

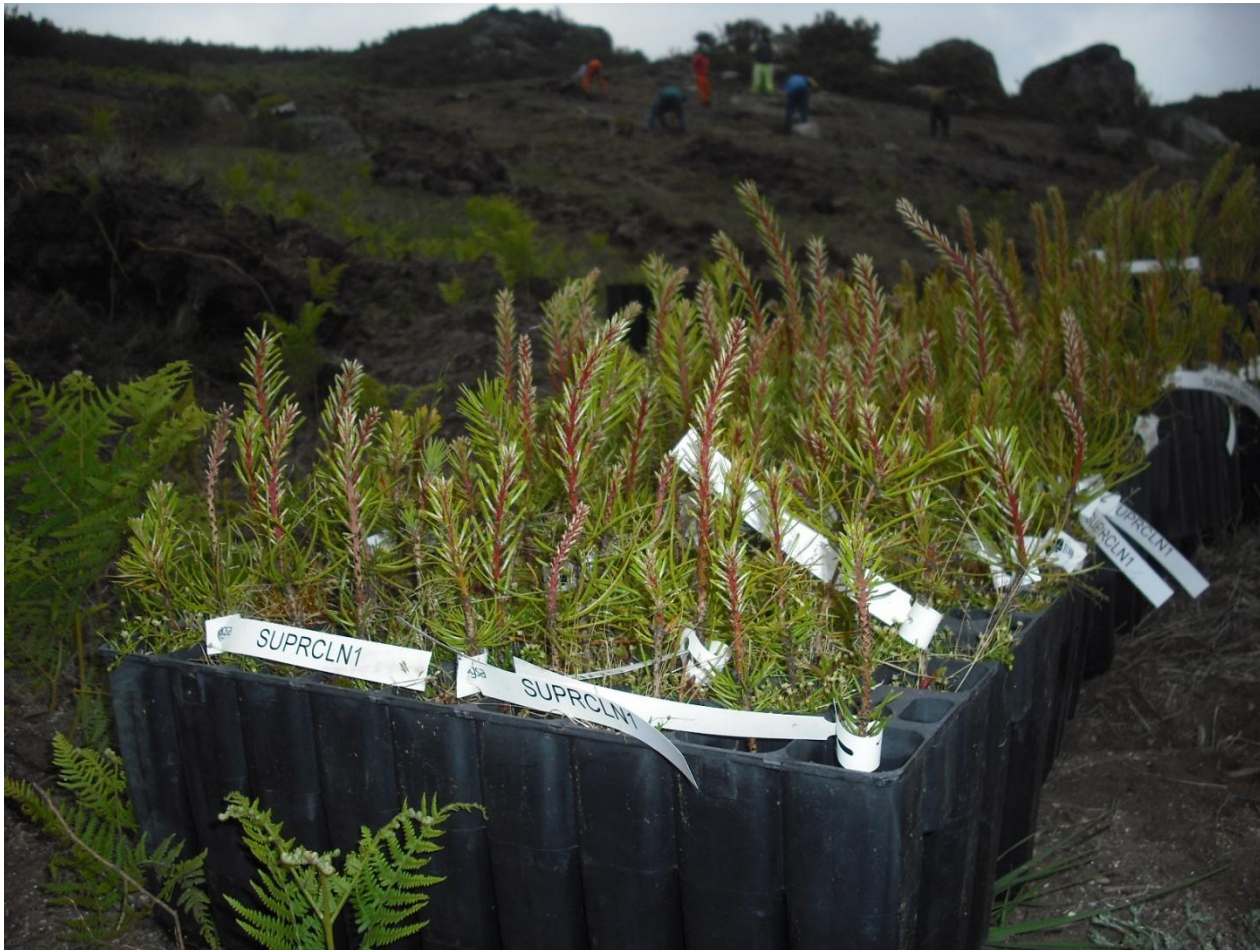
## Demonstrative plantations



ID	LOCATION	TYPO OF DEMONSTRATIVE PLANTATION
1	Mañón (A Coruña)	cuttings in miniplugs and plugs/seedlings genetic controls
2	Crecente (Pontevedra)	cuttings in miniplugs and plugs/seedlings genetic controls
3	Sordos (Ourense)	cuttings in miniplugs
4	Parderrubias (Ourense)	cuttings in plugs/seedlings genetic controls

# 04

## Demonstrative plantations



**INTERREG SUDOE 3/P2/F523 FORRISK Project. Bilbao September 9th**



# 04

## Demostrative plantations





■ Thank you!

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**INTERREG SUDOE 3/P2/F523 FORRISK Project. Bilbao September 9th**