

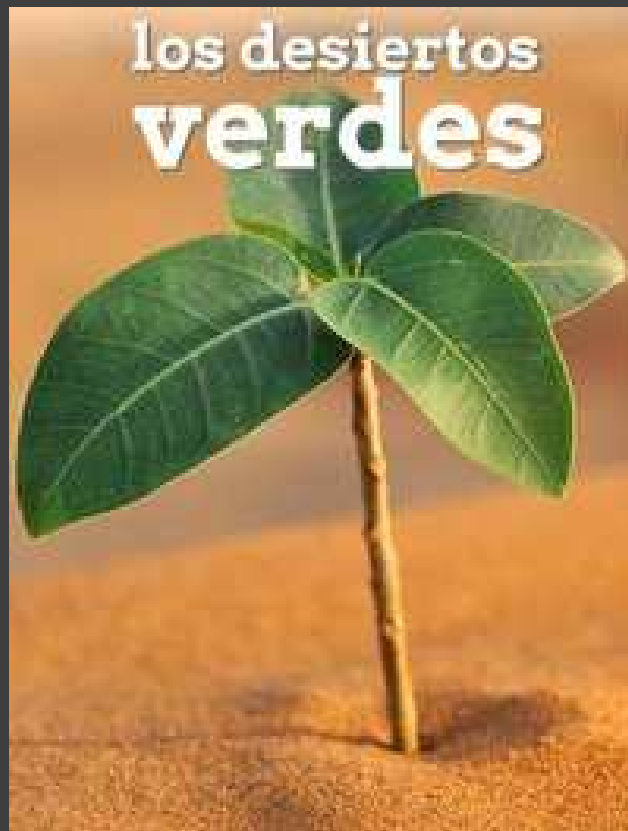


**Fundación General**  
Universidad de Valladolid



BARCELONA 20/03/2012

# PRELIMINARY RESULTS OF THE RESEARCH OF THE GREEN DESERTS PROJECT IN FIVE SPANISH PROVINCES



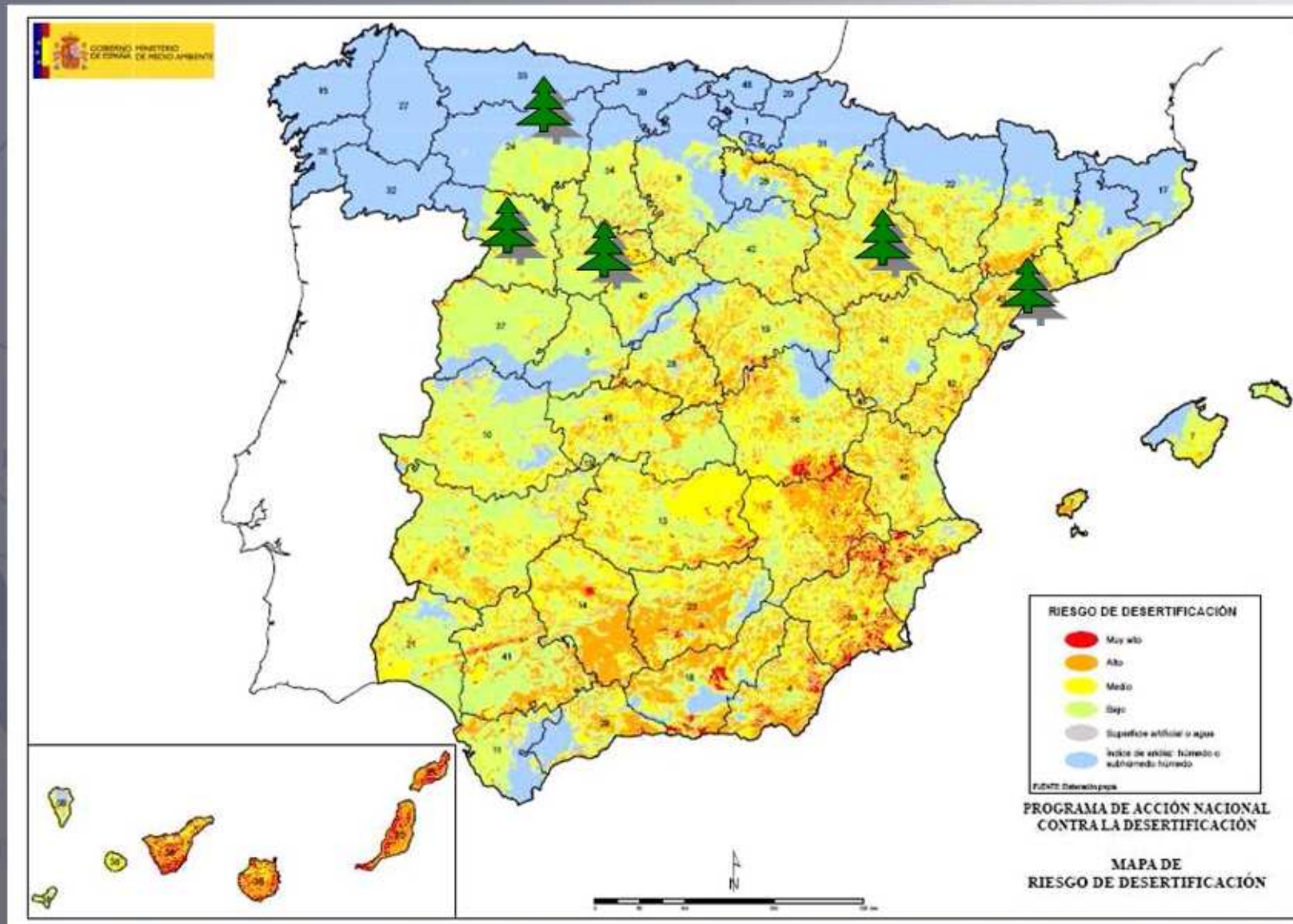
- Zacarias Clérigo
- Jose Luis Marcos
- Salvador Hernandez
- Fermín Garrido
- Luis Ortiz

# OBJECTIVES

- ▶ Study the reforestation survival with the Groasis Waterboxx
- ▶ Protection of slopes by the erosion process.
- ▶ Re-establishment and improvement of autochthonous wildlife and landscape features of each area
- ▶ Try new SIG methodologies and Global Satellite Navigation Systems



# LOCATION OF THE TRIALS



# GENERAL INFORMATION OF THE PLOTS

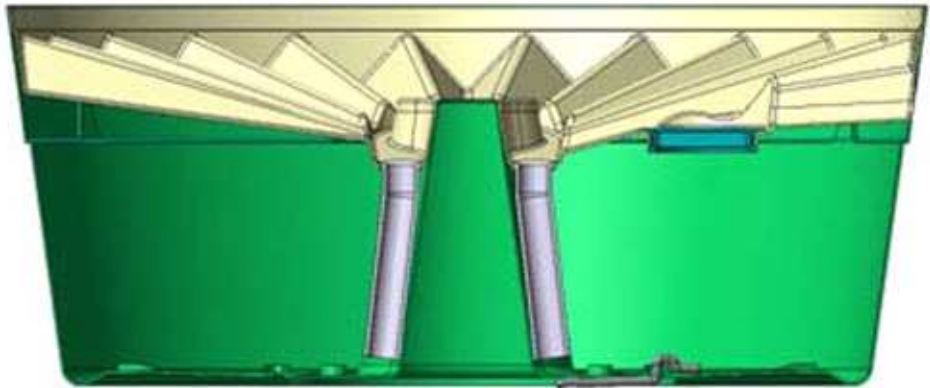
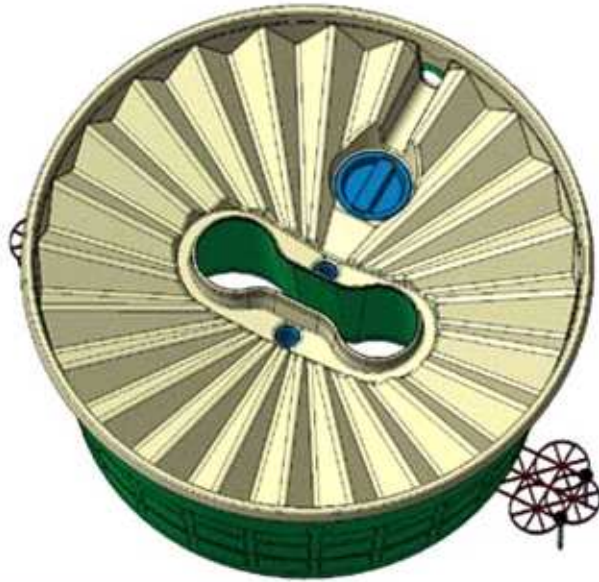
Responsible of sawing	Diputación de Valladolid	Diputación de León	Ayuntamiento de San Mateo de Gállego	Ayuntamiento Río Frío de Aliste	Viladecans Barcelona
Availability of the land to saw	28 hect.	10 hect.	10 hect.	10 hect.	5 hect.
Area	Matallana (30 km NW of Valladolid)	San Isidro (80 km to the North of León)	San Mateo de Gállego (25 km to the north of Zaragoza)	Río Frío de Aliste (70 km to the NW of Zamora)	San Pedro (60 km to the North of Barcelona)
Type of soil	Dry, erosion, steep and deforested slopes	Rocky, some areas with sand and small rocks	very poor soils high erosion, rocky soils	Very poor soils, rocks and sand	Dry poor soils, rocky
Height	800 m	1.600-1.800m	300m	900m	300m
Weather	Cold (winter) extremely hot and dry in summer over 38°	Very cold (winter) warm in summer over 25°	Moderate / cold in winter, very hot and dry in summer, over 40°	Cold in winter extremely hot and dry in summer over 40°	Moderate in winter and dry in summer over 35°
Wind	strong, specially in spring and autumn	Strong winds in spring and winter	wind all year around	windy	Wind does not affect forest
Last use	Agriculture (cereals), dump	Forest	Agriculture: cereals	All year around Forest	
Current use	Natural park and trials with new crop species	Winter: ski station Summer: cows graze the grasslands	Low yields crops	Agriculture extensive livestock	In June 2009, 50 hectares. Were burned in a forest fire
Challenge	Restore the forest area in the steep slopes Restores the ilegal dump with trees	Difficulty of the plant to root give the lack of water Restore the area	Agriculture is not in use Other economic alternative for farmers.	Public land with no use Economic offer for the community	Reforest the damaged area



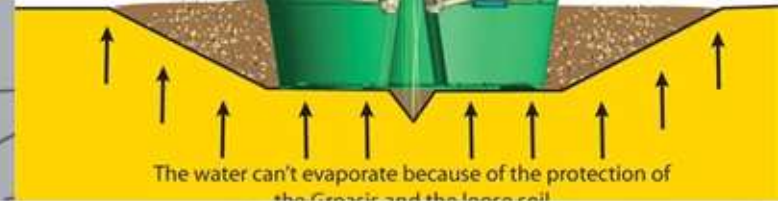


# METHODOLOGY

## Waterboxx



- Quadrupled water output
- Prevention of water loss through less evaporation
- The Groasis can't be blown away anymore
- If the Groasis is made of biopolymer, it stays after planting and will be degraded into nutrients through micro-organisms
- If the Groasis is made of polypropylene it will be removed after a year and used for the next tree. One Groasis can plant around 10 young trees during a 10 year period.



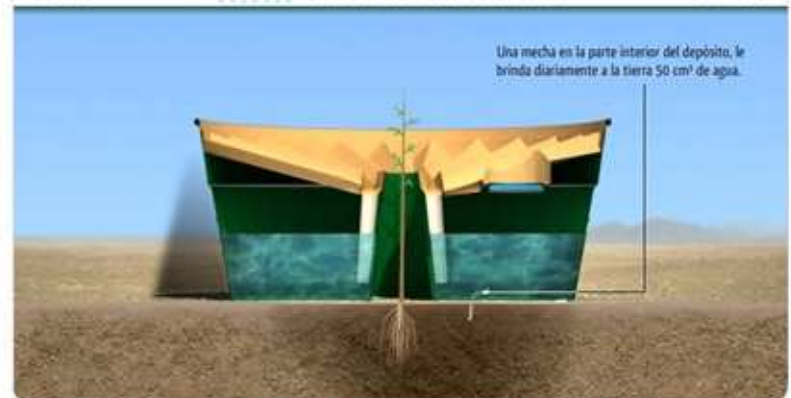
The water can't evaporate because of the protection of the Groasis and the loose soil

< Volver

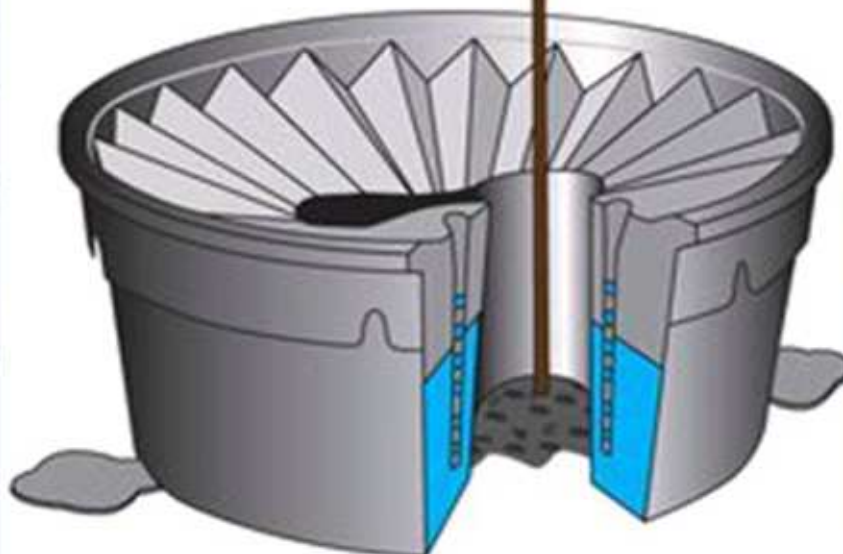
groasis

Cómo funciona el Groasis waterboxx

Continuar >



Una mecha en la parte interior del depósito, le brinda diariamente a la tierra 50 cm<sup>3</sup> de agua.





# DIFFERENT SPECIES AND WATERBOXX

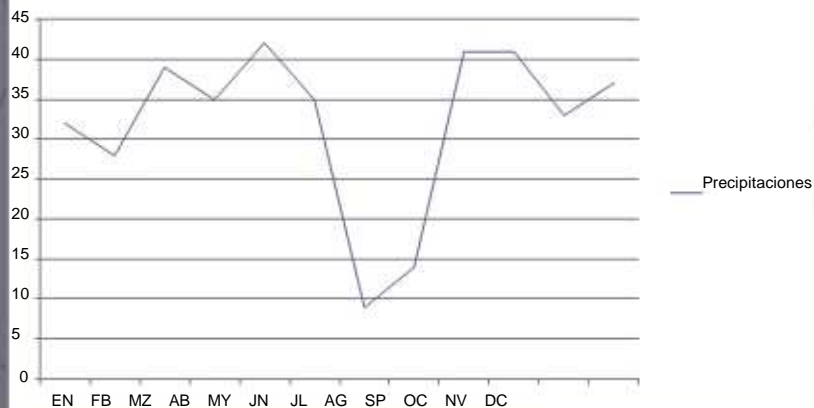




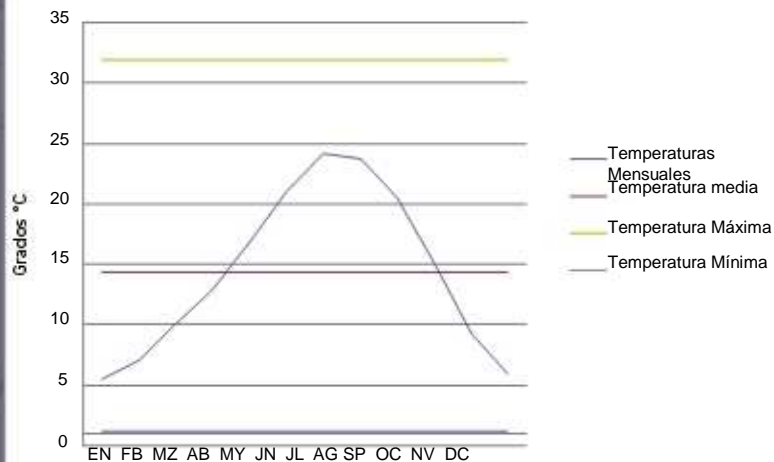


# PREVIOUS STUDIES

## PRECIPITACIONES



## TEMPERATURAS



Centro tecnológico agrario y agroalimentario

## Valoración

Cliente: Salvador Hernández  
 N° de muestra: 102404  
 Fecha Muestreo:

Descripción: Suelo  
 Finca:  
 Parcela: ZR - 24

## Propiedades químicas

			Interpretación	Observaciones
			<span style="color:red">■</span> Muy bajo <span style="color:blue">■</span> Bajo <span style="color:green">■</span> Normal <span style="color:yellow">■</span> Alto <span style="color:red">■</span> Muy alto	
<b>Materia orgánica oxidada</b>	Niveles de referencia:	g/100g		
volumétrica redox. PNT-S-02	Nivel analítico:	1,38		
<b>Carbonatos</b>	Niveles de referencia:	g		
Bernard. PNT-S-03	Nivel analítico:	41,0		
<b>Fósforo asimilable</b>	Niveles de referencia:	mg/kg		
Olsen. PNT-S-04	Nivel analítico:	9,5		
<b>Potasio asimilable</b>	Niveles de referencia:	mg/kg		
Emisión atómica. PNT-S-07	Nivel analítico:	126		
<b>Calcio asimilable</b>	Niveles de referencia:	meq/100g		
Absorción atómica. PNT-S-0	Nivel analítico:	26,4		
<b>Magnesio asimilable</b>	Niveles de referencia:	meq/100g		
Absorción atómica. PNT-S-0	Nivel analítico:	0,85		
<b>Sodio asimilable</b>	Niveles de referencia:	meq/100g		
Emisión atómica. PNT-S-07	Nivel analítico:	0,10		

# POSSIBLE VEGETATION

## LEON

- ▶ Pinus nigra
- ▶ Pinus Pinaster
- ▶ Pinus sylvestris
- ▶ Pinus uncinata
- ▶ Populus sp
- ▶ Prunus avium
- ▶ Fraxinus excelsior
- ▶ Quercus ilex
- ▶ Quercus pyrenaica
- ▶ Quercus petraea
- ▶ Quercus robur

## VALLADOLID

- Pinus pinaster
- Pinus pinea
- Quercus faginea
- Quercus ilex
- Sorbus domestica
- Spartium junceum

## ZAMORA

- Pinus pinaster
- Pinus pinea
- Pinus sylvestris
- Pinus nigra
- Fraxinus angustifolia
- Fraxinus excelsior
- Populus alba
- Populus nigra
- Populus tremula
- Quercus faginea
- Quercus ilex
- Quercus pyrenaica
- Quercus suber
- Sorbus aria
- Sorbus aucuparia
- Sorbus domestica
- Rhamnus frangula

## BARCELONA

- Juniperus thurifera
- Rosa Cannina
- Quercus coccifera
- Prunus spinosa
- Pinus halepensis
- Arbusto unedo
- Crataegus monogyna
- Quercus ilex
- Lupinus

## ZARAGOZA

- Juniperus thurifera
- Quercus coccifera
- Quercus faginea
- Quercus ilex subsp. Ballot
- Crataegus monogyna
- Prunus spinosa
- Viburnum tinus







# Sampling

<b>Number</b>	<b>Correlative 1, 2, 3 ....</b>								
<b>Specie</b>	<b>Name</b>								
<b>Height</b>	<b>cm</b>								
<b>Phenological status</b>	<b>Alive or dead</b>								
<b>Biotic damages</b>	<b>Damages by pests, diseases or insects</b>								
<b>A biotic damages</b>	<b>Damage by frosts, hail, wind ...</b>								
<b>Leaves status</b>	<b>Good/ Dry / Percentage of defoliation</b>								
<b>Discoloration</b>	<p>The discoloration is defined as the alteration of the color of the leaves in comparison of the theoretical Normal color of the specie in that location. Dead leaves are excluded in this evaluation.</p> <p>Code:</p> <p>0 No discoloration</p> <p>1 Slight discoloration</p> <p>2 Moderate discoloration</p> <p>3 Severe discoloration</p> <p>4 Dry tree</p>								
<b>Outside temperature of the soil</b>									
<b>Inside temperature of the soil</b>									
<b>Water temperature</b>									
<b>Air temperature</b>									
<b>Quantity of water</b>	<b>Empty / Half / Full</b>								





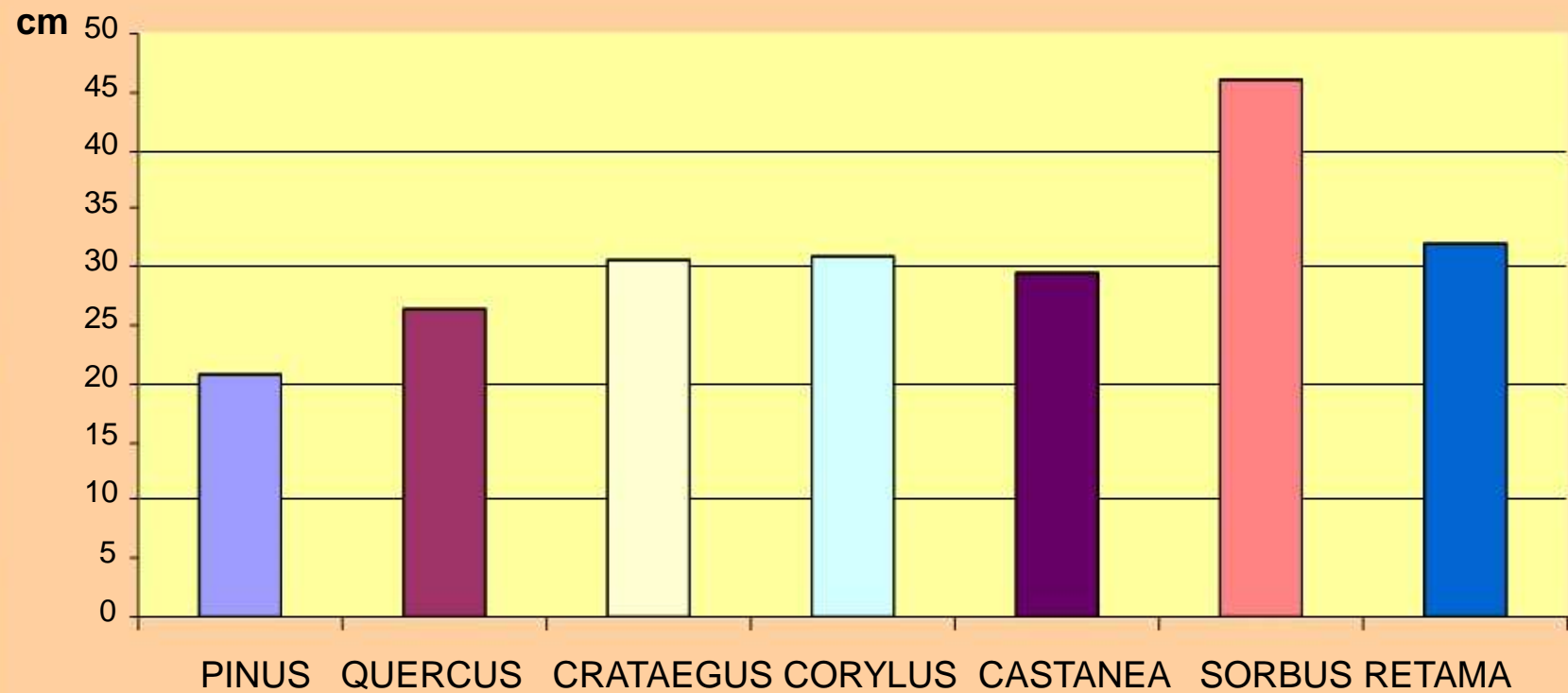
# EVOLUTION OF THE PLANTS





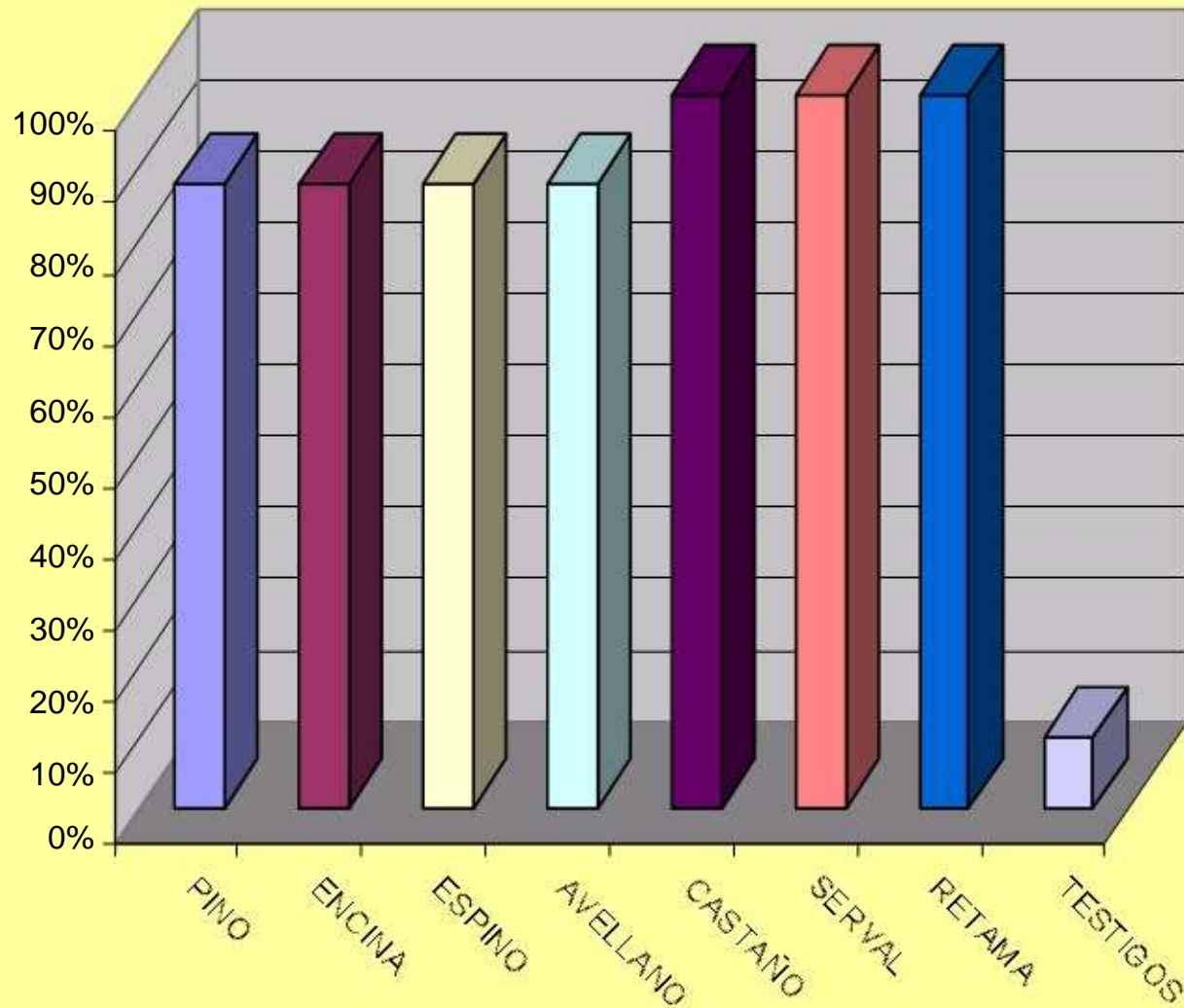
# RESULTS

## HEIGHT OF THE PLANTS



# RESULTS

## SURVIVAL





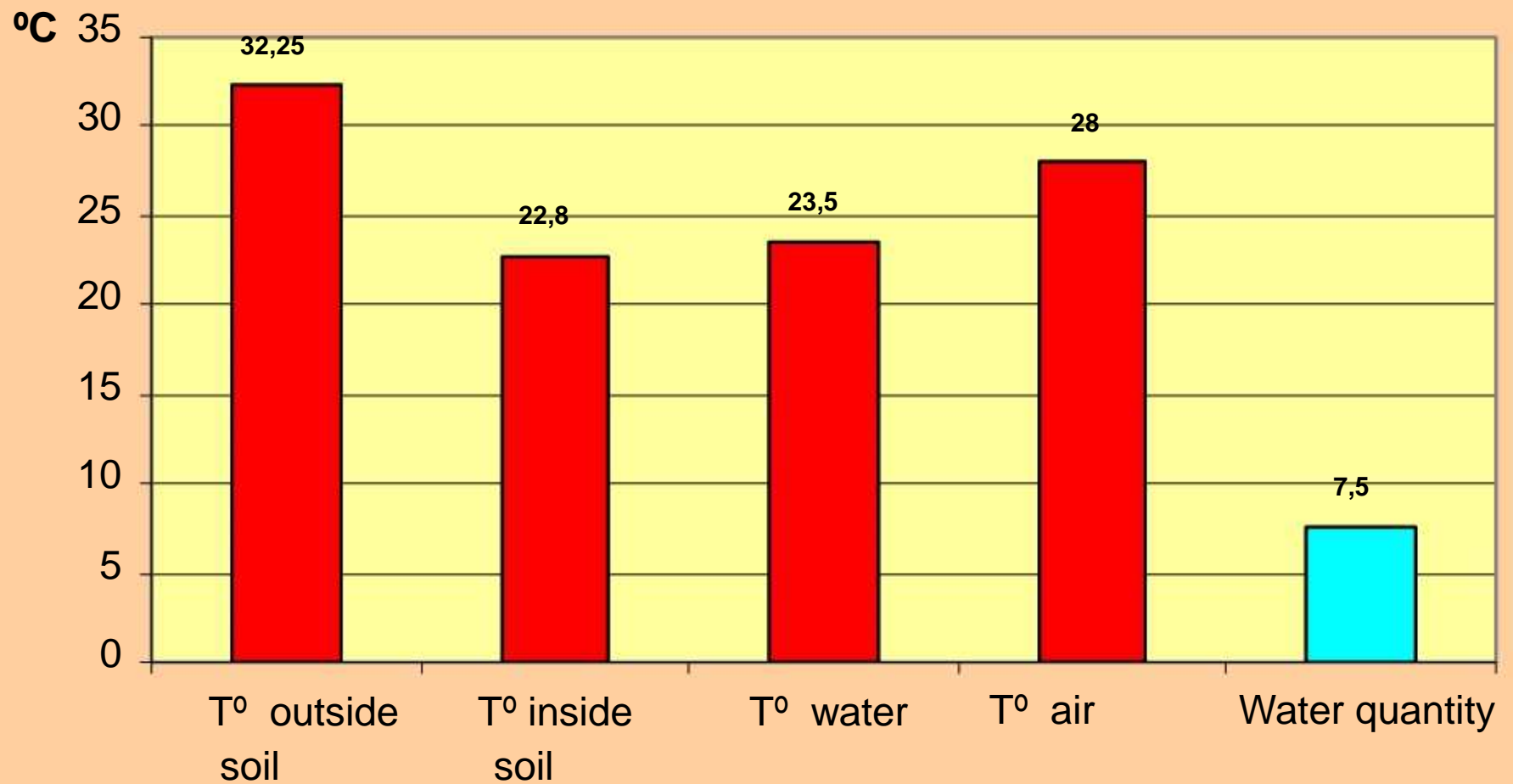
# TEMPERATURE MEASUREMENT





# RESULTS

## TEMPERATURES

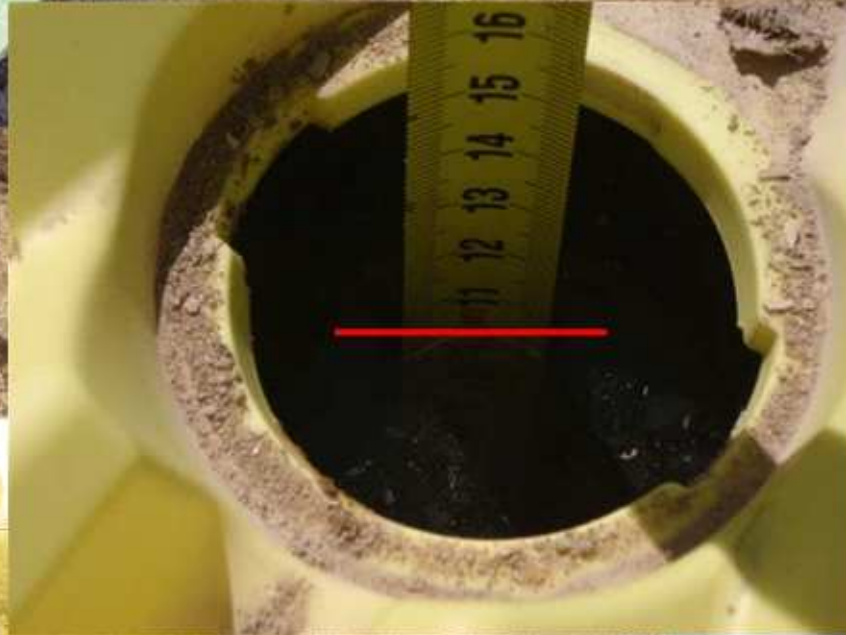


# CONDENSATION DROPS OF WATER





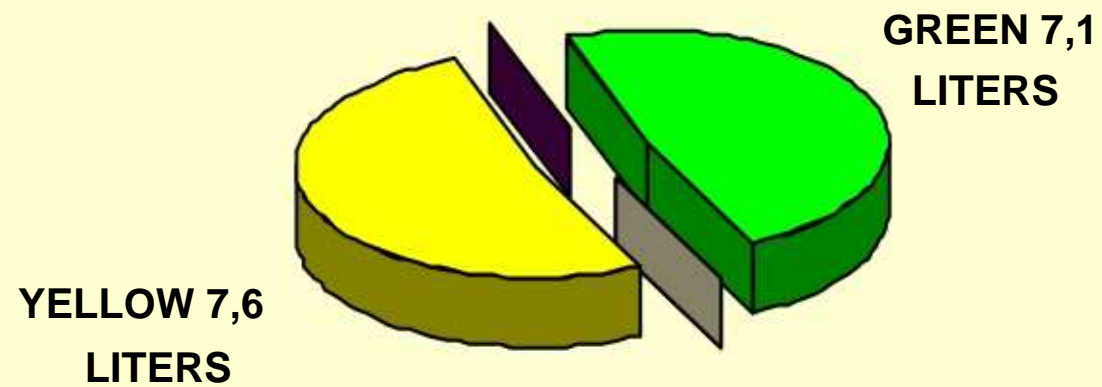
# LEVEL OF WATER





# RESULTS

## QUANTITY OF WATER







**PROBLEMS  
FOUND**





**PROBLEMS  
FOUND**



# PROBLEMS FOUND







**PROBLEMS  
FOUND**





# PROBLEMS FOUND





# PRELIMINARY RESULTS

- ▶ 90% of the trees with the Waterboxx have survived
- ▶ 78% of the control plants have died
- ▶ Most of the plants showed a great growth
- ▶ In some cases they showed burned leaves produced by the high insolation
- ▶ Water level was over the 70% of the total volume after summer
- ▶ During the day, the average temperature inside the waterboxx is 5° less than outside
- ▶ During the morning, the average temperature inside the waterboxx was 2° superior to the air temperature

THANK YOU!!!

