

Thematic axis workshops

- thematic partner Axis **T2 Natural risks management, especially wildfires** -

Name of the Project: **CypFire** (2G-MED09-070, 2010-2013)

Name of the Partner: **IMELSA, Valencia Provincial Council**
(Valencia, Spain)

Name of the speaker: **Bernabé Moya, José Moya**

CYPFIRE - PROJECT

Increasing the Efficiency of Fire Prevention Land Management & Capitalisation

José & Bernabé Moya
Monumental Trees Department IMELSA – Valencia Provincial Council
Photos: J. Moya, B. Moya, G. della Rocca, L.M. Ortolà

“CypFire” Project

• Location

- Place: Ravine of the Herbasana
- Municipality: Jérica, Castellón, Spain
- Altitude: 923 m.
- Environement: Forest



• Dimensions

- Plot: 228 m x 39 m
- Surface: 8.892 m²
- Composition: Barrier of cypress, 3 x 3 m.

• Features of Plantation

- Plantation 1: P. AGRIMED - 1.988
- Plantation 2: P. CAMAR - 1.992
- Nº cypresses: 946
- Height: 2,33 – 9,18 m
- Nº Varieties: 58. 95 % *Cupressus sempervirens*



“CypFire” Project

- **Climatology**

- Thornthwaite Classification : D d B'2 a'
 - Semi-aride – Mesotermique
- Bioclimatic Belt: Méso – méditerranéen

- **Vegetation:**

- Class: Querceta ilicis. Introduction of class: Pino-Juniperetea
- Botanical Species: *Quercus ilex*, *Quercus coccifera*, *Juniperus oxycedrus*, *Juniperus thurifera*, *Ulex parviflorus*
- Reforestation of pines: *Pinus halepensis*

- **Topography:**

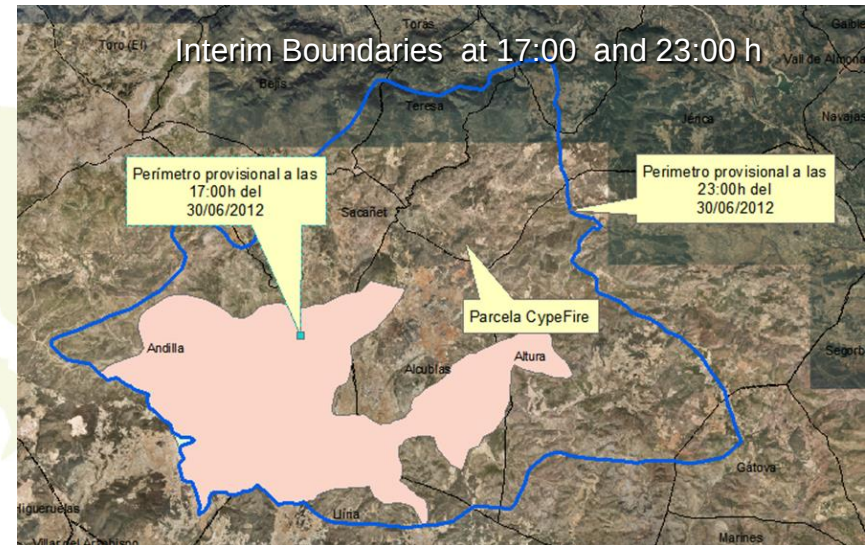
- Configuration: Slight depression
- Exposure: South
- Slope: flat slope in the plots. Between 9 and 18% in neighboring hillsides.



“CypFire” Project

• Data of Forest Fire of Andilla 2012

- Burned Area: 19,940 ha
 - Wooded: 13,293 ha.
 - Shrubby: 6,647 ha
- Impact on the Plot:
 - Data provided by the Section for the Prevention of Forest Fires.
 - Date: 30/06/2012
 - Time: 17:00 to 23:00 h
- Interim Boundaries: Rapid Evolution of the Fire.
- Propagation speed: 20 - 40 m / min
- Intensity: moderate - high



“CypFire” Project

• Evolution of the Forest Fire

- Principal Direction of the fire: SW.
- Channeled by two depressions NW and SW, end of the plot.
- The fire surrounded the plot.



Principal
direction of
fire



Direction of fire
in relation with
the plot

“CypFire” Project

- **Behavior of the Fire: Meteorology**

- Period July 2011 - June 2012:

- Précipitation: 362,25 mm.
 - A 30% lower than the annual average for the period 2001-2012 (518 mm).
 - Summer 2012: the drier during the last 60 years.
 - Average Annual Temperature : 15,23°C



“CypFire” Project

• Behavior of the Fire: Meteorology

- Day 29/07/2012 (Day of forest fire that not affected the environment of the plot)
 - Maximum Température: 38,86 ° C
 - Minimum relative Humidity: 9,01 %
 - Maximum Wind Gust: 55,08 Km/h
 - Average Wind Direction: SW

- Day 30/07/2012 (Day of forest fire that affected the environment of the plot)
 - Maximum Température: 32,3 ° C
 - Minimum relative Humidity : 33,9 %
 - Maximum Wind Gust : 48,56 Km/h
 - Average Wind Direction: SE



“CypFire” Project

• Behavior of the Fire

- Structure and composition:
 - Tree stratum:
 - Coverage: 40 %.
 - Height: 15 m.
 - Shrub stratum:
 - Coverage: 55%.
 - Height: 0.5 - 2 m.
 - Herbaceous stratum:
 - Coverage: 45 %.
 - Height: 0,25 m
- External Influences:
 - Direct contact with the forest
 - Cut fuel available at forest road. Width: 25 m. Year 2001



“CypFire” Project

• Behavior of the Fire

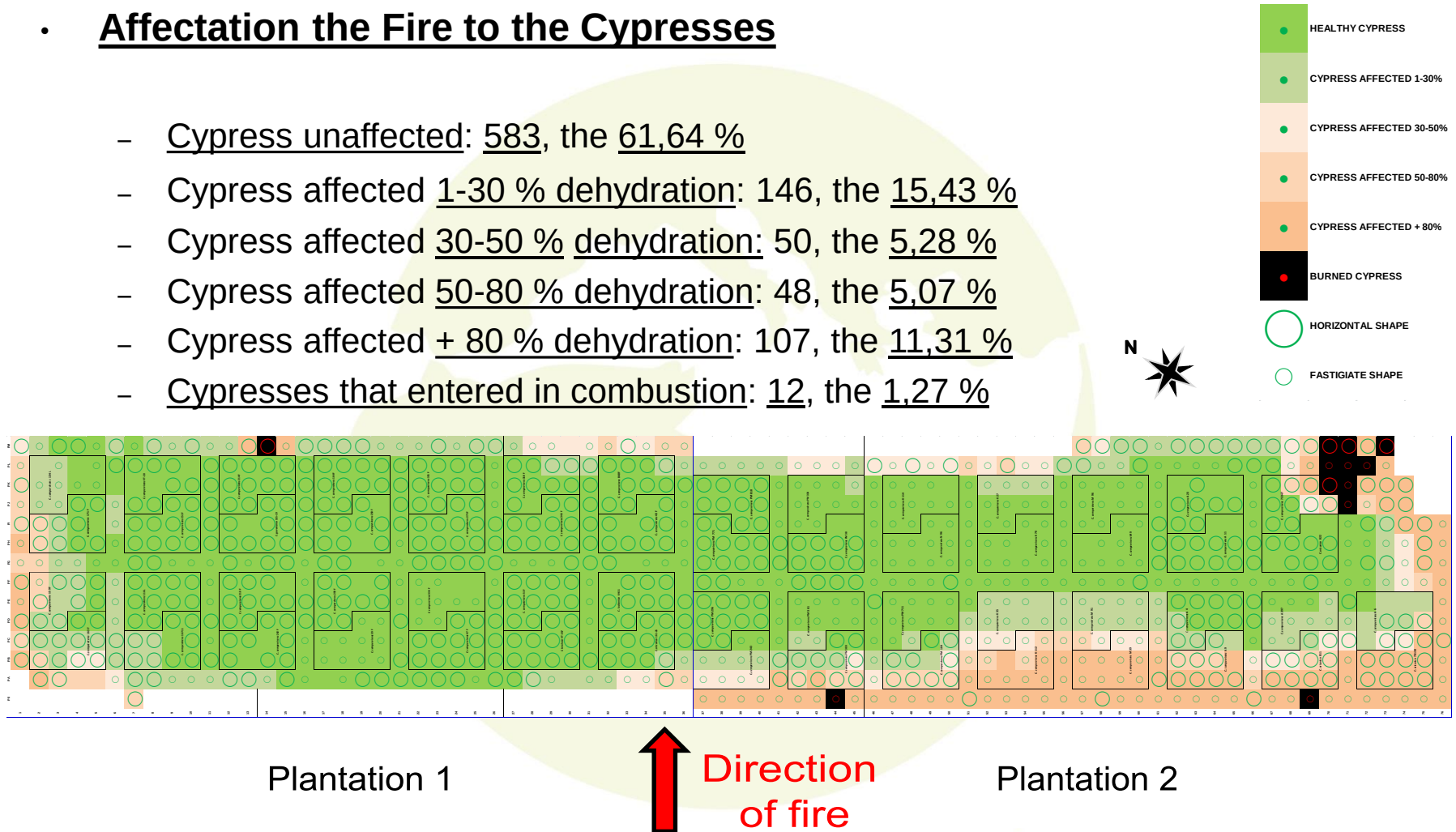
- Fuel Models, Rothermel:
 - Maquis Groupe, Model 7. Maquis composed of highly flammable species, from 0,5 to 2 m in heigh. Located Below the forest of conifers.
 - Speed of propagatioin and intensity of fire: moderate to higt.
 - Fuel Quantity: 10 – 15 t/ha
- Continuity of Fuels:
 - horizontal and vertical
- Compactness: moderate
- Type of Fire: surface and canopy



“CypFire” Project

• Affectation the Fire to the Cypresses

- Cypress unaffected: 583, the 61,64 %
- Cypress affected 1-30 % dehydration: 146, the 15,43 %
- Cypress affected 30-50 % dehydration: 50, the 5,28 %
- Cypress affected 50-80 % dehydration: 48, the 5,07 %
- Cypress affected + 80 % dehydration: 107, the 11,31 %
- Cypresses that entered in combustion: 12, the 1,27 %



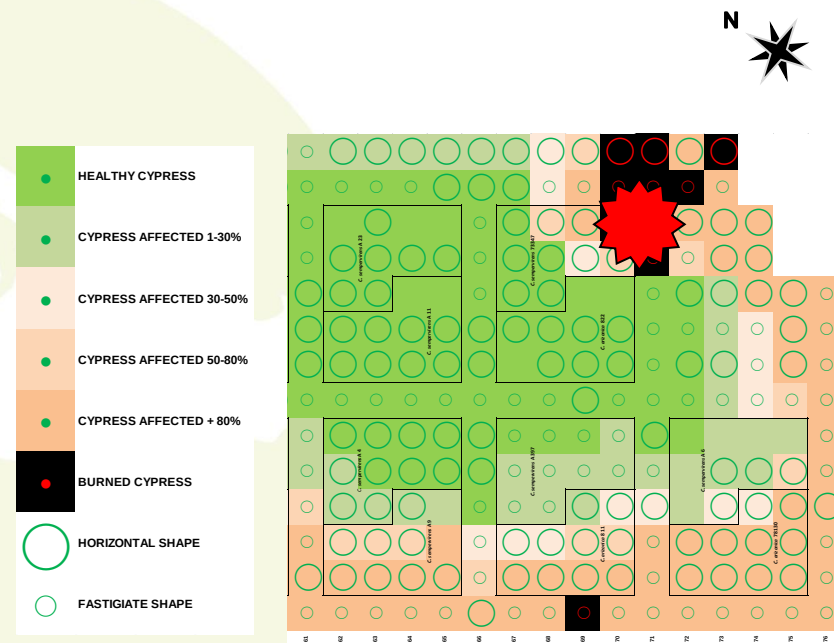
“CypFire” Project

- **Zone - Maritime pine (Pinus pinaster)**

- Presence of maritime pine inside the experimental plantation

- Position and fuels (Pinus pinaster)

- Located in the third line: 9 m.
- Height of tree: 12 m.
- Diameter of crown: 9 m.
- Age: 42 years
- Presence of necromass (needles, cones, twigs, branches). With a thickness of 10 cm. Located in the projection of the crown.
- Compactness of necromass: moderate



Plantation 2

“CypFire” Project

- **Zone - Maritime pine (Pinus pinaster)**
- **Affectation:**
 - **Origin:** dissemination of fire
 - **Cause** of ignition: **firebrands**
 - **Fuel:** necromass (needles, cones and twigs, branches).
 - **Propagation:** vertical - necromass, twigs, branches, crown.



Necromass under Maritime Pine, June 2011

“CypFire” Project

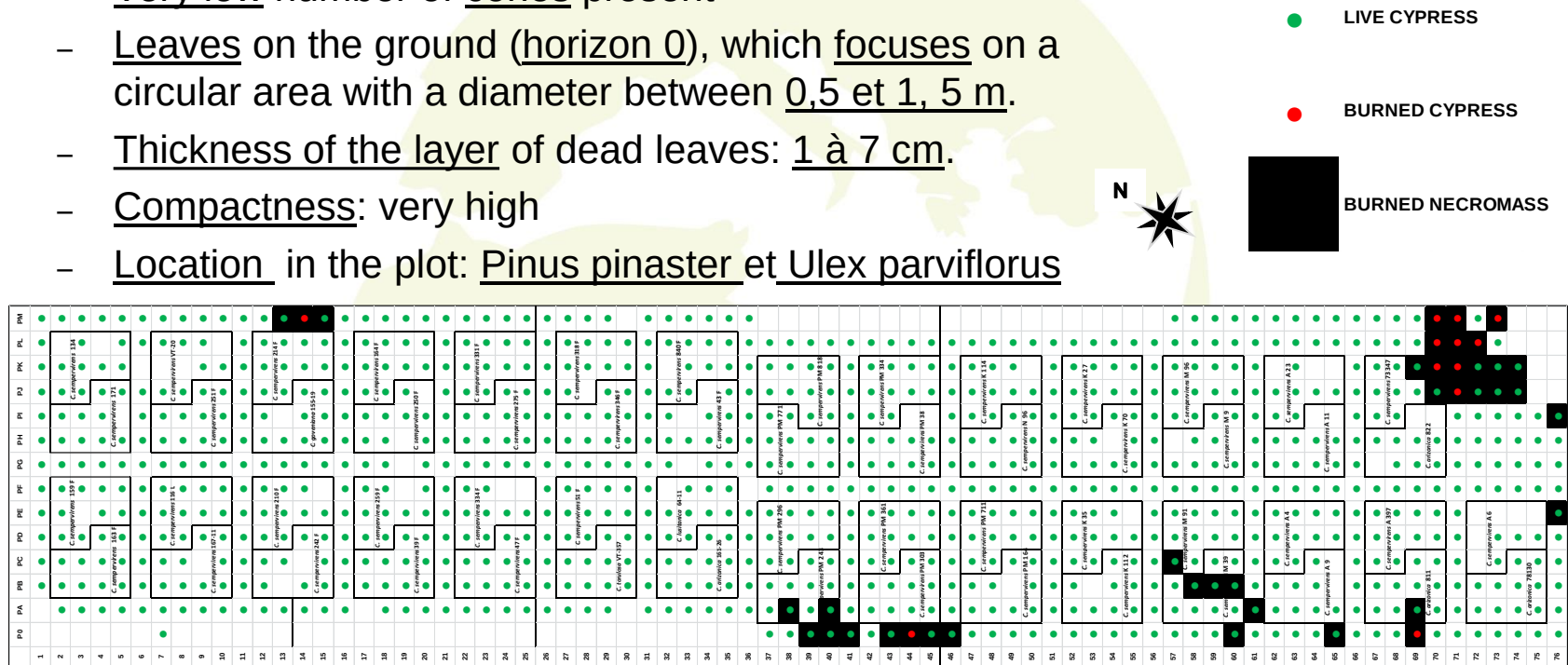
- **Zone - Maritime pine (Pinus pinaster)**
- Behavior of the fire
 - Presence of fire inside of the barrier, originated from maritime pine
 - Combustion of 9 cypresses. The highest rate in all plantation.
 - The damage to the cypresses were in units that were under the influence of the pine necromass.
 - Presence of cypresses with half crown burned and the other green
 - No propagation of fire within the barrier, horizontal or vertical



“CypFire” Project

- **Impact of the fire to the plots: Necromass**

- Absence of dead branches on the ground.
- Very low number of cones present
- Leaves on the ground (horizon 0), which focuses on a circular area with a diameter between 0,5 et 1, 5 m.
- Thickness of the layer of dead leaves: 1 à 7 cm.
- Compactness: very high
- Location in the plot: Pinus pinaster et Ulex parviflorus



Plantation 1

 **Imelsa**
ARBRES MONUMENTALS
DIPUTACIÓ DE VALÈNCIA

Direction of fire

Plantation 2



Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)

Project cofinanced by the European Regional Development Fund (ERDF)



“CypFire” Project

• Affectation of the fire: Necromass

- Density: up to 235 firebrands / m²
- Combustion of necromass
 - Ignition: 40 individuals, 4,23%.
 - Intact: 906 individuals, 95,77%
- Location: associated with specific areas, maritime pine, Ulex, woody connection.
- Partial combustion, there is no horizontal or vertical propagation of fire to other individuals of plot.



“CypFire” Project

- **Shrub and Herbaceous Biomass, inside**
 - Coverage: less than 1%.
 - Combustible on surface: rare and discontinuous.
 - No tillage since 2001.
 - Rarity: limit the penetration of fire in the plot.
 - Hypothesis of reduction of biomass:
 - Allelopathy.
 - Inhibition of germination by acid pH reaction of the organic matter in the soil.
 - Structure and disposition of the cypress root system.



“CypFire” Project

• Conclusions

- The forest fire did not cross the barrier of cypress.
- Neither was transmitted through the cypresses.
- The most common affectation was the dehydration of cypresses. No accompanied by inflammation or combustion.
- Cypresses that entered in combustion: 1,27%.
- Low flammability necromass .
- The presence of biomass in soil is very low.



“CypFire” Project

• Conclusions

- Cypress barriers showed high resistance to specific level an to structure of vegetation.
- Varieties of *Cupressus sempervirens* horizontalis provides more screen effect. Here are the most appropriate fou use as barriers
- Hope: it has been detected, the growth in the most cypresses in areas affected for dehydration. Cypresses affected less than 50% dehydration, have sprouted and have been recovered.



Dehydration, NW corner CyFire plot, July 2012



Recovering of dehydration, NW corner CypFire plot, Feb. 2014

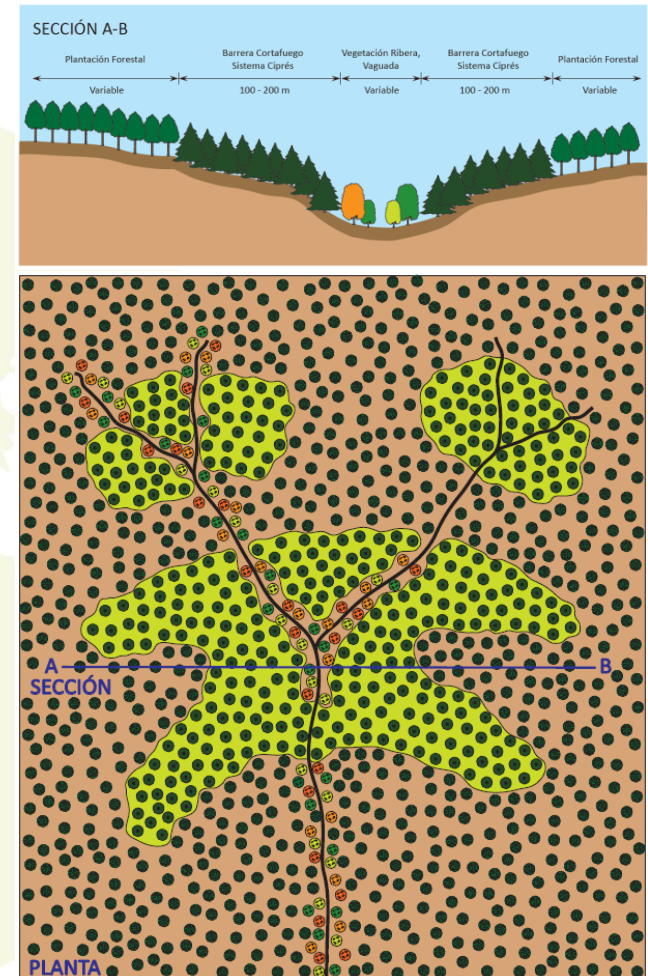
“CypFire” Project – Applications - Management

- **Security Council: Clean the Hedges**
- **Considerations – Hedges:**
 - Pruning: regular
 - Accumulation of necromass
 - Poor maintenance
 - Easily flammable
 - Danger in case of fire
 - It occurs in all species. Some of these:
Lantana camara, *Myoporum pictum*,
Ligustrum ovalifolium, *Teucrium fruticans*,
Nerium oleander...



“CypFire” Project – Land Management

- **Considerations: “Cypress System”**
 - Plantation: in strategic locations in order to delay the progress of the surface fire and crown.
 - Ravines
 - Wildland urban interface
 - Firebreaks
 - Cypress: maintain the natural shape, creating a continuity of vegetation at ground level and height.



Planting proposal of barriers of “Cypress System”

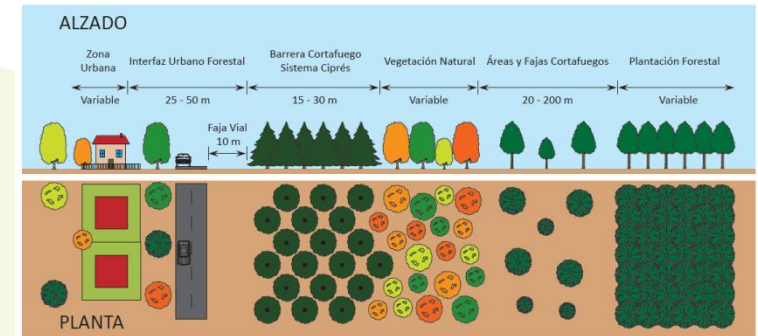
“CypFire” Project – Land Management

• Considerations: “Cypress System”

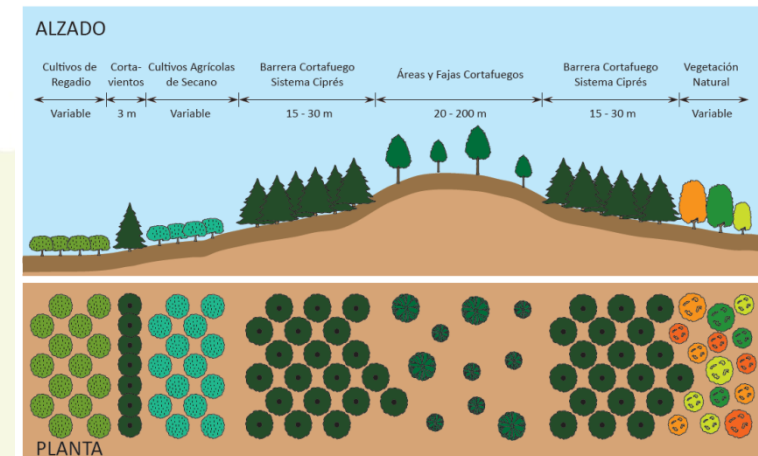
- Selected varieties of Cupressus sempervirens horizontalis
- Permeable to the passage of people in an emergency.
- Mode, context, enhancement and specific maintenance of the site



Permeability of the barrier of cypress



“Cypress System” - Wildland urban interface



“Cypress System”
Rural wildland interface & Areas and firebreaks lanes

“CypFire” Project – Training

- **Training School Florence, Italy, 2011**
 - 11 professionals trained
 - 6 Countries: Italy, Spain, Turkey, Tunisia, Greece and Malta.
 - Locations: Istituto per la Protezione delle Piante, Florence; Viale de Bolgheri; Nurseries of Pistoia.
- **Training School Faro, Portugal, 2012**
 - 11 professionals trained
 - 7 Countries: Italy, Spain, Turkey, Tunisia, Israel, Portugal and Malta.
 - Locations: Instituto Superior de Agronomía, Lisbon; Autoridade Florestal National, Faro; Burned Areas and Reforested Areas



“CypFire” Project – Capitalisation

- **Barriers of « Cypress System »:**
- In 2014 in the Province of Valencia we will carry out experimental plantations with 10,000 cypresses.
- Origin: IPP, Florence.
- Object of the pilot areas:
 - Collection of species, germplasm bank and biodiversity, conservation “ex situ”
 - Timber production
 - Ornamental use.
 - Use as windbreaks.
 - Use against erosion.
 - Use against forest fires
 - Training students in the School of Forest Foremen Requena. Valencia Provincial Council.

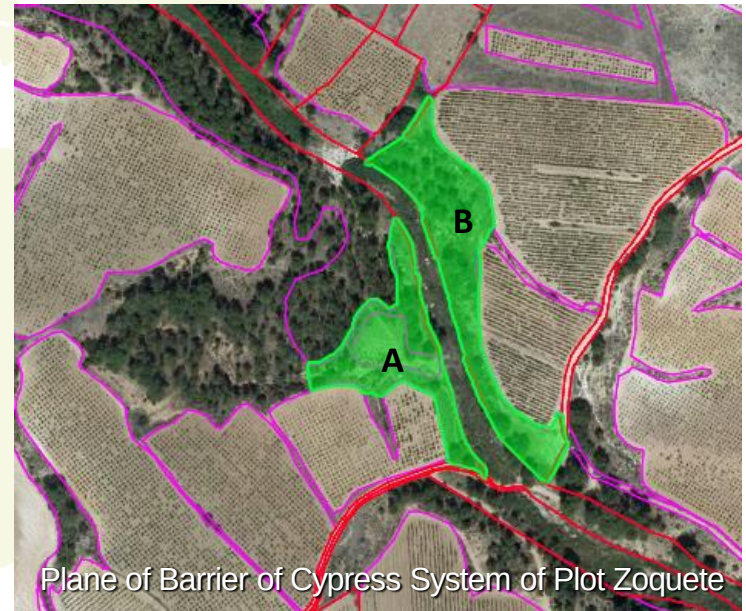


“CypFire” Project – Capitalisation

- **Barriers Pilot of « Cypress System »**
Valencia 2014 - 2015:
 - Location: Quart de Poblet, Venta del Moro, Requena, Jérica.
 - Total area: 10 ha.
 - Environment: agriculture, forestry, wildland urban interface, wildland_agricultural interface, ravines.
 - Example Barrier Pilot of Ravine in Venta del Moro, Plot of Zoquete or Dehesa Way.
 - Surface: 1 ha.
 - Environment: Forest Ravine



View of location of plot Zoquete before plantation



Plane of Barrier of Cypress System of Plot Zoquete

“CypFire” Project – Media & Communication



BBC MUNDO

Inicio Últimas Noticias América Latina Internacional Economía Tecnología Ciencia Salud

Descarga nuestra aplicación gratuita y mantente informado de las últimas noticias

El misterio de los cipreses que resisten al fuego

Alejandra Martins
BBC Mundo

Jueves, 16 de agosto de 2012



Los cipreses mediterráneos sobrevivieron al incendio que arrasó con otras especies en Andilla, Valencia.
Foto: Bernabé Moya y José Moya

Press releases of BBC



EL PAÍS

PORTADA INTERNACIONAL POLÍTICA

SOCIEDAD

VIDA & ARTES EDUCACIÓN SALUD CIENCIA MEDIO AMBIENTE IGUALDAD CONSUMO

ESTÁ PASANDO Privatisación Sanidad en Madrid Pobreza Hambre Colegios públicos

AVANCE Consulte la portada de EL PAÍS, Edición Nacional, del martes 11 de julio

El enigma de los cipreses ignífugos

La resistencia de un bosque de estos árboles en el último incendio forestal de Valencia sorprende a los expertos, que debaten su uso como barrera verde frente a las llamas

JOAQUÍN GIL | Valencia | 12 AGO 2012 - 22:48 CET

Archivado en: Ecologistas Ecología Bosques SEO BirdLife Incendios forestales Organizaciones medioambientales Árboles Incendios Flora Accidentes Comunidad Valenciana



Los casi mil cipreses plantados en el barranco de Herbasana, Jérica, se salvaron tras el incendio de Andilla, que arrasó otros muchos árboles.

0 Cuando Bernabé Moya, director del Árbol de la Diputación de Valencia,

Press releases El Pais

“CypFire” Project – Media & Communication

Cooperation stories from the MED PROGRAMME

Can one tree save another one?

Beyond the colours and the climate that gave its reputation to the Mediterranean summer, the latter is also known for a recurrent phenomenon which devastates its forests: fires.

When on the 1st of July 2012, a fire sparks off and wipes away 20.000 acres of vegetation in Valencia region in Spain, the news seem to be rather usual. However, among the ruins, something survived: a patch of 946 cypresses is still standing, hardly scratched by 5 days of fire. This is not an accident nor a miracle, but the confirmation of the incredibly resistant nature of this tree.

It is precisely this quality which in 2010 encourages the 12 partners (from 9 Mediterranean countries) of the CypFire project co-financed by the MED Programme to design a new strategy to counter forest fires in the Mediterranean. This strategy aims at planting rows of protective trees able to slow down and circumscribe the most stubborn fires and thus forming ‘barriers of cypresses’.

Can a simple row of trees protect the complex ecosystem of a forest? Yes, this is what the CypFire partners firmly believe in. They study the cypress in the minutest detail in order to reveal its mysteries and to fully exploit its qualities.



The unfortunate incident of Valencia brings a ray of hope in the endless fight against fires in the Mediterranean. The cypress patch, still standing, was planted for experimentation purposes on the occasion of a previous European project now completed.

This incident clearly legitimates the financial support provided by the MED Programme which within the framework of its objective ‘prevention of and fight against natural risks’, supports six other projects on forest management.



The photo of the miracle cypresses here on the left is the best testimony of an idea that should be taken into account and which born by territorial cooperation dynamism will maybe become someday common practice.



More information about the project?

Contact the Lead Partner Salvatore Marranca at smarranca.foreste@regione.sicilia.it

More about the MED Programme on WWW.programmamed.eu



Programme cofinancé par le Fonds Européen de Développement Régional
Programme cofinanced by the European Regional Development Fund



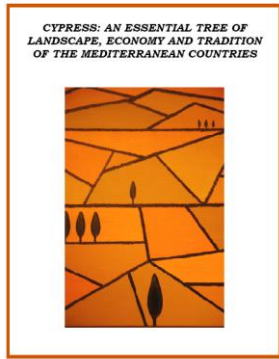
Publication of the MED Programme, serie "Cooperation Stories", Presented in Cyprus in October 2012.

“CypFire” Project – Media & Communication

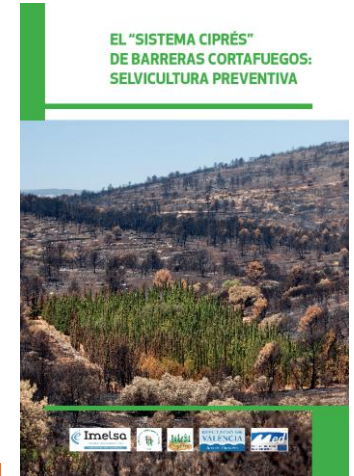
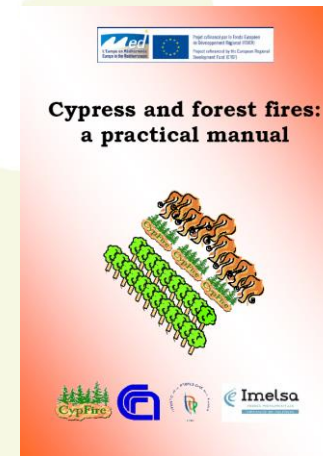
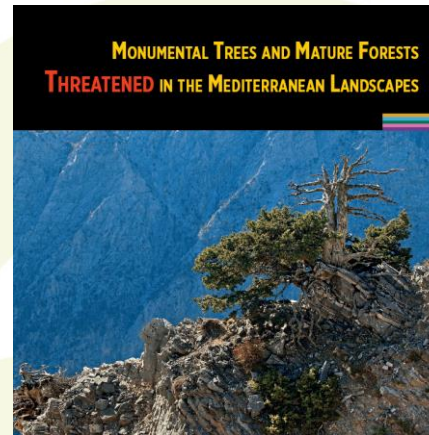
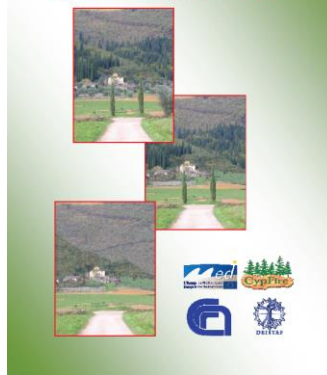
- **Media:**
 - **Press:** BBC Mundo, La Razón, ABC, Antena 3, El País, El Levante, El Periodic, El Correo, El Mundo, Las Provincias, Diario de Córdoba, Revista XL Semanal, Gabinete de Prensa Diputación de Valencia.
 - **Radio:** Radio Nacional de España; Wissen.dradio.de, Germany
 - **Televisión:** Antena 3; Cuatro; RTVV, Canal 9; TVE. España; TVE Comunitat Valenciana, Tele 5, Gabinete de Prensa Diputación de Valencia.
 - **Internet:** Youtube, Twitter, Facebook.



“CypFire” Project – Publications



Cypress: mainspring of economic and sustainable development in the Mediterranean Countries



- **You can download de books:**
 - www.cupressus.ipp.cnr.it & www.imelsa.es

“CypFire” Project – Monumental Trees - Horizon 2020

• Management

- Project MEDLAND 2020. Topic 1: Integrated management of natural protected areas
- Natural Protected Areas.
- Protection of forest biodiversity.
- Conservation of genetic variability.
- Social and economic valorisation of de territory.
- Rural development.
- Sustainable tourism.



“CypFire” Project – Monumental Trees - Horizon 2020

• Governance and participation

- European Union Biodiversity 2020: New Strategy Nature 2000 Network.
- Threats, pressures and disturbances: 80% of the mature trees have disappeared over the last century.
- Juridical proteccion: Local Governance.
- Conservation and geriatry of the tree: Individualised management.
- Sustainable use and disemination: participation
- Monumental trees and Mature Forest, Agricultural Landscapes and Gardens



Looting of Monumental Olive trees, Spain



Olea europaea L. El Maestrazgo, Spain

“CypFire” Project



We are available to visit the plots



Thank you for your attention