

COST Action 838

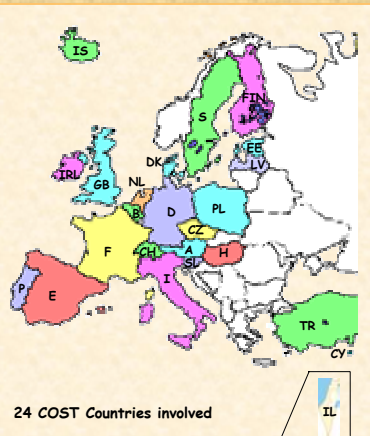
Managing arbuscular mycorrhizal fungi for improving soil quality and plant health in agriculture



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<http://www.dijon.inra.fr/cost838/>



ARBUSCULAR MYCORRHIZA (AM): Main elements

Photos from Barea, Alonso-Aguilar, Baga & Ferraz

- External mycelium
- External mycelium
- Arbuscule (by H. Schlegel)
- Arbuscule
- Spore
- Vesicles

Key AM functions

AM improve:

- Seedling establishment
- Plant growth & nutrition
- Plant protection against biotic and abiotic stresses
- Soil conservation
- Plant diversity and succession

Photo from G. Gianinazzi
Teffnes & Barea (2001)

More than 400 millions years of common history of the plants and their mycorrhiza

400 millions years ago

Contemporary arbuscular mycorrhizas

Mycorrhizal Control

Since more than 50 years ago it has been well-demonstrated that AM inoculation improves nutrient acquisition by plants

Mycorrhiza interact with rhizosphere bacteria to develop the so-called mycorrhizosphere

Photo from P. Bonfante & col.

Rhizob. Myc- Rhizob.

Field inoculation of Mycorrhiza - Rhizobium

Barea et al.

Four Working Groups

Working Group 1: Population Biology

Contact: Soeren Rosendahl (DK) soerenr@bot.ku.dk

- Unicellular vegetative spores
- 2000-9000 nuclei
- Variability among spores and nuclei

Analysis of AM fungal diversity

Extraction → DNA → PCR → 18S rDNA Fragments → TTGE → Sequencing

Fingerprinting → Phylogenetic analysis → 18S rDNA Sequences

Working Group 2: Plant Health

Contact: José-Miguel Barea (E) jimbarea@eez.csic.es

AM help plant to be adapted to abiotic stresses

Mycorrhiza can protect plants against pathogenic fungi

Photo from Cordier, Gianinazzi-Pearson, Gianinazzi

Polycyclic aromatic hydrocarbons → Genetic stress → Laval et al. → Mycorrhizal Control

AM is a critical factor in Phytoremediation (Turano, Haselwandter, ...)

Heavy Metals → Mycorrhizal Control

Non-Mycorrhizal Non-Mycorrhizal + P. parasitica Mycorrhizal Mycorrhizal + P. parasitica

Working Group 3: Genetic and Cell Programmes

Contact: Paola Bonfante (I) p.bonfante@csmt.to.cnr.it

Mycorrhizal messenger profiling of mycorrhiza-registered genes

Localization of genes in interphase nuclei of *Sig. marginata* (FISH)

Proteomics of arbuscular mycorrhiza

GAINDS 4.05 (I)

highly repeated sequence

Antibiot et al., unpublished

Working Group 4: Mycorrhizal Technology

Contact: H. von Alten (D) von-alten@mbox.ipp.uni-hannover.de

Commercial inoculum production and testing

A collaboration COST 838-Federation of European Mycorrhizal Fungi Inoculum Producers (FEMFIP)

Photos from B. Bial

CONTROL ENDORIZE

Selecting AM fungi

Producing AM-plants

Research

Field application

noculum production → Nursery production of AM-plants

Mycorrhizal Technology in Agriculture From Genes to Bioproducts

Some deliverables from COST 838

South from Europe, in the city of Granada...

The 5th International Conference on Mycorrhiza (ICOM5), will be held

Next in January

but 12-16 July, 2006

Deliverable from COST 838

ICOM5 in Granada (E)

EEZ-CSIC

Web site for the Fifth International Conference on Mycorrhiza (ICOM5): www.eez.csic/icom5/ (available 12/2004)