



Reducing mineral fertilisers and chemicals use in agriculture by recycling treated organic waste as compost and biochar products



# COMPOSTING and PYROLYSIS TECHNICAL ASPECTS, RESEARCH and SCALING UP NEEDS



Workshop "Regions at work for Bio-Economy"  
Rennes, 7-9 July 2014

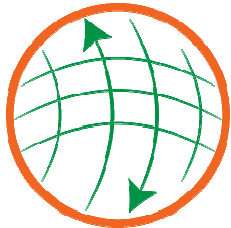


## COMPOSTING / Compost

- Definition of INPUT MATERIALS
- TECH. SURVEY: 21 PLANTS in 6 EU countries
- 6 Selected compost EVALUATION: ecotox, overall and microbiological safety, environmental, agronomical, economical.
- COMPOST TECH IMPROVEMENT, BATs DEMONSTRATION, compost field trials.
- COMPOST STANDARDISATION POLICY SUPPORTING

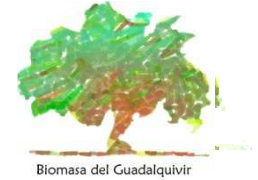
## PYROLYSIS / Biochar

- Definition of INPUT MATERIALS
- TECH. SURVEY: 7 PLANTS in 6 EU countries.
- 7 Biochar product EVALUATIONS: ecotox, overall safety, environmental, agronomical, economical.
- PYROLYSIS TECH IMPROVEMENT, BATs DEMONSTRATION, biochar field trials
- BIOCHAR STANDARDISATION POLICY SUPPORTING



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# TECH: CRITICAL ASPECTS



## COMPOSTING / Compost

- **PROCESS CONDITIONS/LEGAL, especially ABPs:** Time, Temperature, Homogeneity
- **CLOSED vs OPEN AIR SYSTEMS**
- **PROCESS CONDITIONS**
- **Height of piles** (Oxygenation, aeration,
- **OTHER:** Bulking materials,
- **ENVIRONMENT:** Dust, Odour, Emmissions
- **COMPOSTING vs A.D.**
- **COMPOST QUALITY:** OM, NPK, IMPURITIES...

## PYROLYSIS / Biochar

- **PYROLYSIS TECHNOLOGY DESIGN** is key important.
- **PYROLYSIS DESIGN PERFORMANCE** and quality defines output biochar product quality. Low end pyrolysis technologies make low end biochar.
- Modern pyrolysis technology is **TOWARDS ZERO EMISSION PERFORMANCE.**
- Scale up to economical level is important.
- 3R ABC Animal Bone bioChar (3R) is leading pyrolysis original solution.





# RESEARCH IN PROGRESS



## COMPOSTING / Compost

- COMPOSTING PROCESS OPTIMIZATION
- QUALITY IMPROVEMENT OF COMPOST USE EVALUATION
- DEVELOPMENT OF COMPOST LEACH WATER ADSORPTION AND GAS EMISSION
- DEMONSTRATION AS BEST AVAILABLE TECHNOLOGIES
- NEW INOCULUMS AND ADDITION TO COMPOST PROVED

## PYROLYSIS / Biochar

- REFINING OF BONE OIL INTO FINE CHEMICALS
- NITROGEN EXTRACTION FROM PAP PROCESSED ANIMAL PROTEIN - ANIMAL RENDERING WASTE
- CONVERSION OF PYROLYSIS OIL INTO BIO-KEROZENE BIOFUEL.
- ABC BIOCHAR APPLICATIONS IN SOILLESS CULTIVATIONS.

- TECHNICAL, LEGISLATIVE, COST EFFICIENTLY, BENEFIT, RISK EVALUATION ENVIRONMENTAL VIABILITY AND SAFETY OF THE IMPROVED TECHNOLOGIES AND PRODUCTS
- AGRONOMIC EFFICIENCY, effect of application to different soils and different climatic conditions
- COMBINATION OF BIOCHAR AND COMPOST WITH MYCORRHIZAL FUNGI
- INVESTIGATION ABOUT DIFFERENT INPUT MATERIALS

## COMPOSTING / Compost

- **NO SPECIAL PROBLEM WITH SCALE UP**
- **COMPOSTING PLANTS SIZE CRITICAL FOR IPPC 2010/75/EU, Annex I, for BATs, emission limits**
  - Under 75 tpd... non regulated
  - Over 75 tpd... Regulated
- **REDUCED SCALE** related to **SELECTED WASTE STREAMS (QUALITY COMPOST)**
- **BIGGER SCALE** RELATED TO **CENTRALISED MIXED M.S.W. (STABILISED BIOWASTE)**

## PYROLYSIS / Biochar

- **TECHNOLOGY READINESS LEVEL (TRL):** ready for implementation industrial replication model.
- **THE “3R” IS SCALE UP TO 20,000 T/Y** food grade animal bone meal throughput capacity.
- **HIGH EFFICIENT THERMAL PROCESSING** providing high quality ABC Animal Bone bioChar organic P fertilizer outputs
- **ZERO EMISSION COMPREHENSIVE SOLUTION.**



**INVITATION:**



## REFERTIL INTERNATIONAL CONFERENCE

June 23, 2015, Brussels

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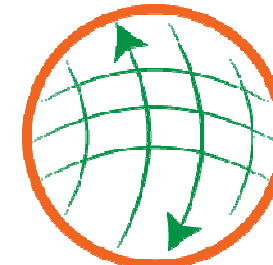
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**THANK YOU FOR YOUR ATTENTION!!!**



Biomasa del Guadalquivir



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