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
REFERTIL Objectives

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
**TECH: CRITICAL ASPECTS**

<table>
<thead>
<tr>
<th>COMPOSTING / Compost</th>
<th>PYROLYSIS / Biochar</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PROCESS CONDITIONS/LEGAL, especially ABPs: Time, Temperature, Homogeneity</td>
<td>• PYROLYSIS TECHNOLOGY DESIGN is key important.</td>
</tr>
<tr>
<td>• CLOSED vs OPEN AIR SYSTEMS</td>
<td>• PYROLYSIS DESIGN PERFORMANCE and quality defines output biochar product quality. Low end pyrolysis technologies make low end biochar.</td>
</tr>
<tr>
<td>• PROCESS CONDITIONS</td>
<td>• Modern pyrolysis technology is TOWARDS ZERO EMISSION PERFORMANCE.</td>
</tr>
<tr>
<td>• Height of piles (Oxigenation, aeration,</td>
<td>• Scale up to economical level is important.</td>
</tr>
<tr>
<td>• OTHER: Bulking materials,</td>
<td>• 3R ABC Animal Bone bioChar (3R) is leading pyrolysis original solution.</td>
</tr>
<tr>
<td>• ENVIRONMENT: Dust, Odour, Emissions</td>
<td></td>
</tr>
</tbody>
</table>
## 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 INOCULLUMS 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
SCALING UP NEEDS

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, Brussles
www.refertil.info

E-mail: biochar@3ragrocarbon.com
www.agrocarbon.com

The REFERTIL (289785) Collaborative project is co-funded by the European Commission, Directorate General for Research, within the 7th Framework Programme of RTD, Theme 2 - Food, Agriculture and Fisheries, and Biotechnology.
THANK YOU FOR YOUR ATTENTION!!!