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3R-AGROCARBON FAQ - Frequently Asked Questions

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What is the importance of phosphorous mineral fertilisation?

Phosphorous (P) plays a series of functions in the plant metabolism and is one of the essential nutrients required for plant growth and development. It has functions of a structural nature in macromolecules such as nucleic acids and of energy transfer in metabolic pathways of biosynthesis and degradation. Next to nitrogen, phosphorous is the most abundant nutrient contained in the microbial tissue, making up as much as 2% of the dry weight.

Phosphorous occupies a key place among nutrients because of its relative scarcity and its essential role in all life forms. P is a major constraint on food and fibre production in many parts of the world. Therefore, an **economical supply of P is a necessity for a secure production in agriculture and forestry**. Nutrients such as nitrogen and phosphorous are removed from soils by plant growth and need to be replaced.

What is fertilizer?

Fertilisers are plant nutrients. Fertilizers are made of organic or inorganic materials produced from natural or synthetic origins that are added to plant systems in order to supply one or more nutrients required for the plants healthy growth. A fertilizer is any material, organic or inorganic, natural or synthetic, that supplies plants with the necessary nutrients for plant growth and optimum yield. All fertilizers can be grouped into those that are organic or those that are inorganic.

Why do we need fertilizer?

Often, the soil does not hold enough nutrients in the quantities needed for desirable plant growth and promotion.

What is the conventional/synthetic/inorganic fertilizer?

Synthetic fertilisers are mined, refined or manufactured products containing one or more essential plant nutrients in available or potentially available forms and in commercially valuable amounts without carrying any harmful substance above permissible limits. Although organic fertilizers are also being prepared and used, they are not yet covered by the term fertilizers, largely due to tradition. (FAO) Inorganic fertilisers are derived from non-living sources and include most of our man-made, commercial fertilisers.

Phosphate rock is mined from sedimentary deposits, with phosphorites being the predominantly mined deposit type. Some phosphate rocks display elevated uranium, thorium, heavy metal, metalloid and rare earth element levels. Although phosphorus is a nutrient, P-fertilizer also contains variable amounts of cadmium (Cd), an intrinsically toxic substance and one of the “heavy metals”, which is also absorbed by growing crops, and subsequently leads to intake by consumers in the food that they eat. P-fertilizer is the only mineral fertilizer that suffers from this problem.

Synthetic fertilizers are made from chemically treated phosphate rocks. **They are not recommended for use as they are highly concentrated and reactive.** When applied on the field they react with calcium, iron, magnesium and aluminium, creating within seconds compounds that make phosphorous unavailable for plants. They may react also with trace elements, locking them up and causing deficiencies of micronutrients.

What is the problem with the quick release fertilisers?

Inorganic fertilizers are typically quick release, and **have a high burn and leach potential** compared to organic fertilizers. Because of the lack of carbon, inorganic fertilizers “feed the plant but not the soil.”

What is the problem with the intensive agriculture?

Intensive farming is concerned above all with productivity and uses a **high level of inputs** to achieve it. The inputs are usually in the form of chemicals, fertilisers, pesticides and growth-regulators produced by energy intensive industrial processes and additional energy in the form of high levels of mechanisation. Food production systems are partially responsible for contributing to elevated levels of green-house gases in the atmosphere due to the heavy reliance on fossil fuels.

Traditional chemosynthetic P fertilizer production is based on chemical processing of insoluble mineral phosphate high-grade ore, which includes **an energy intensive** treatment with sulphuric acid at high temperature. Since natural gas is such a critical resource in fertilizer production, natural gas price fluctuations have a dramatic effect on fertilizer costs. As energy costs continue to rise, and the demand for fertilizers increases, this effect is becoming more pronounced.

What is the organic fertiliser?

Organic fertilisers are derived from living or once-living material, including animal wastes, crop residues, compost and numerous other by-products of living organisms. The term organic fertilizer is used to describe **nutrient sources of organic origin either natural or processed**, containing at least 5% of one or a combination of the three primary nutrients (N; P₂O₅; K₂O). In these sense organic materials of animal origin such as guano, bone meal, fish meal, leather meal, are true organic fertilizers, but commonly used organic sources of nutrients such as manure, slurry, compost. If the nutrient content is below 5% they are considered as organic amendments.

What are the advantages of the slow release natural fertilisers?

A slower nutrient release **results in more sustained availability of the nutrients**, and a lower “burn” and leach potential compared to their inorganic counterparts. In addition organic fertilizers may act as an energy source for microorganisms in the soil, which can improve soil structure and plant growth.

What is the problem with the synthetic phosphorus fertilizers?

Today agriculture relies on phosphorus fertilizers mostly processed from mined phosphate rock which is a non-renewable resource that takes 10-15 million years to form and current known reserves are likely to be depleting 50-100 years. **PR phosphate rock is a finite, non-renewable natural resource. Geological deposits of different origin are found throughout the world. Currently, few PR deposits are mined.** The rate of production of economically available phosphate reserves will soon reach a peak, followed by a rapid steep decline and subsequent ongoing decline of productivity. Demand for phosphorus fertilizers is expected to increase by 50-100% over the next 50 years due to increased population, increased demand for meat and dairy-based diets and increased demand for non-food crops like biofuel crops. The quality of phosphate rock is continuously declining: the concentration of P₂O₅ in mined P rock is decreasing; and the concentration of associated heavy metals like Cadmium is increasing. The Uranium contamination is a naturally occurring element in the phosphate rock, therefore in many cases the phosphate rock is primarily used for production of Uranium extractions for nuclear power plant fuel, while the phosphate is an by-

product for this nuclear industrial operation. The Cadmium content of the sedimentary phosphate rock can be very high. This is either considered a harmful concentration for application in agriculture or expensive and energy intensive to remove. Cadmium can accumulate in soils and plants through repeated fertilizer use. The fertilizer application to agricultural land may result in the transfer of cadmium into the food chain. **There is an increasing social and ecological need for recovery, recycling and reuse of the phosphorus resources like harvested biomass, food industrial and animal wastes (food grade bone meal of hog origin) which are reach in phosphorus into natural Phosphorus fertilizers.**

For more information please visit: <http://www.3ragrocarbon.com/Img/Black.htm>

How can we replace the finite non-renewable phosphate rock and inorganic phosphorus fertilisers? What are the alternatives of the chemical P-fertilisers?

Manure and compost typically have very low NPK content but reach in organic carbon and containing active microflora. For manure or compost **very high quantity (20-30 t/ha) is needed for providing sufficient nutrient.** Cu and Zn are used as growth promoters at pharmacological levels, or because large safety margins are applied, Cu and Zn are often oversupplied in pig diets. Consequently, these elements are highly concentrated in pig manure and accumulate in soil, where they may impose a medium or long-term toxicity risk to plants and micro-organisms.

Soft rock phosphate and natural phosphate is mined from sedimentary deposits, with phosphorites being the predominantly mined deposit type. Some phosphate rocks display elevated **uranium, thorium, heavy metal, metalloid and rare earth element levels** and **also contains variable amounts of cadmium (Cd)**, an intrinsically toxic substance and one of the “heavy metals”, which is also absorbed by growing crops, and subsequently leads to intake by consumers in the food that they eat.

Guano is a bird or bat droppings with 12-15 % P content. Guano has accumulated over centuries on small islands on the Pacific Ocean or the coast of Chile and Peru, where it was mined in such large quantities that its deposits are **now severely depleted.** In contrary to phosphate rocks it is a renewable resource, however only over a long period. Bats are highly vulnerable to regular disturbance to their roosts.

Sea-bird guano has high minreal (As) contamination and only long period renewable resource.

The organo mineral fertilizers typically consist of organic materials (peat, meat, meal and composted and humified cow or chicken manure) mixtured with mineral fertilizers (DAP) or natural P source (mostly GAFSA rock phosphate). The problem is the Uranium, Cd impurities.

There are no any other high P content (15-18%) material known than apatite minerals, which is either in phosphate rock or bone charcoal formation. The P content of other materials may occur as low as 0,1-0,5 % only, if any.

Does the steam processed bone meal provide a safe alternative solution for substitution of the phosphate rock based fertilisers?

NO. Steamed bone meal has a high (15%) P – content, but there is concern as to whether the 133 °C/20 min/3 bar standard steam or thermal treatment practice is sufficient for safe microbiological inactivation of MBMs. Furthermore the **bone meal is an optimal culture medium for bacterial infections of public health concern, resulting risk of cross contamination** after thermal inactivation, unless high temperature treatment is executed.

Only the animal bone charcoal produced from animal bone meal **by thermal process up to 850 degree C (carbonization)** provides a microbiologically free and safe P rich material.

What is the 3R-AGROCARBON?

The 3R-AGROCARBON is a natural Phosphorous recycling technology, where food grade hog animal bone meal by-products are added value utilized. **3R-AGROCARBON is a slow released natural biofertilizer** with plant growth promotion and biopesticide properties.

The 3R-AGROCARBON is plant and/or animal excess biomass material origin (by-products/refuse material from agriculture, food and forest industry) formulated carboniferous based natural fertilization NPK, multi effect and carbon negative soil application substance produced by the 3R technology zero emission industrial process. The multi-purpose economical application goals are the plant growth promotion, natural fertilization, biocontrol by-effects in food crop production at low input and organic farming cultivations.

The 3R-AGROCARBON is:

- a **combined and multi effect carbon-mineral-microbiological natural soil substance**, which applications targeting organic farming horticultural production, low input food crop agricultural production and forest nurseries,
- a **special carbon quality** produced by closed system pyrolysis means,
- **integrated thermal and biotechnological formulated** for use in open ecological agricultural soil environment,
- is an **economical valorisation process** to convert low value excess/waste feed materials into added value output natural products,
- providing **targeted effects**, including **improvement of crop yield, quality, nutritional value, biocontrol effects, resistance to diseases and environmental stresses, plant growth promotion, natural NPK fertilization, restoration of soil biodiversity and natural balance**, generally improving the environmental, ecological and economical sustainability of large-scale food crop agricultural production,
- it efficiently **works in different climatic and soil conditions**,
- the full 3R-AGROCARBON life cycle from feed material supply, production processing, formulation to open ecological application is **certified** for environmental sustainability and **meets major international, industrial and environmental norms/standards**,
- it is **EU Authority permitted industrial production process and agricultural field application product**, and
- the 3R-AGROCARBON is an **zero emission industrial production process and carbon negative in all applications**.

For more information please visit: <http://www.3ragrocarbon.com/Img/3RSolutions.htm> and http://www.3ragrocarbon.com/dat/3R_AGROCARBON_application.pdf

Who is Edward Someus?

Edward Someus is a senior Swedish environmental engineer, graduated at the University of Lund in Sweden with core competence in coal & carbon, waste management by pyrolysis means and soil carbon, including soil biotechnological processing. Mr. Someus is the **original source** inventor, developer and technology designer of the 3R-AGROCARBON system and its wide applications.

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The 3R Environmental Technology Ltd is fully owned by the inventor Someus, as an innovative technology research, technical development and industrial engineering organization for management of product and services for environmental industry and agriculture on the rapidly developing EU and U.S Markets.

The 3R Environmental Technologies Ltd. International holding company established in 2007 for legal uniting of patents and rights related of the 3R technology systems. Under the holding there are several companies (Terra Humana Ltd, established 1989 (former joint venture with the 140 years old Lang Machine Works/Alstrom, 1868), Terrenum Ltd (2003), and Kajaso Agro Ltd (1958).

The 3R Environmental Technology is one of the leading international carbonization, solid state fermentation and formulation science & technology original source knowledge and industrial engineering center. The specific bone char thermal treatment technology developed and designed is the only one known on the international market which can produce the bio specific bone char solid carrier. The integrated bone char and biotech processing technology is the only one known on the international market with specific performance.

For more information: http://www.3ragrocarbon.com/dat/CV_Edward_Someus.pdf

What are the input materials for 3R-AGROCARBON production?

The input feed streams are low value (plant/animal based) organic and/or inorganic by-products; such as high Phosphorous content animal bone meal, refuse grain, food processing and agricultural by-products and excess organic materials; which can be valorization transformed/processed by added-value means.

What is the 3R TECHNOLOGY?

The 3R is a horizontally arranged and indirectly heated low temperature zero emission carbonization system which is directly integrated into the novel agro biotechnological – solid state fermentation and formulation processing units.

For more information: http://www.3ragrocarbon.com/dat/3R_AGROCARBON_Production.pdf and <http://www.3ragrocarbon.com/Img/3RTechnology.htm>

Does the 3R-AGROCARBON technology provide environmentally safe solution?

YES, fully safe and sustainable solution provided. The full 3R-AGROCARBON life cycle from feed material supply, production processing, formulation to open ecological application is certified for environmental sustainability and meets all major international, industrial and environmental norms/standards, with special market target of the EU, USA, Canada, Australia and Japan.

- **The 3R-AGROCARBON technology is a fully safe ZERO EMISSION solution.**
- **The 3R-AGROCARBON products are fully safe for any open ecological soil applications, including use in natural conservation areas, and is a CARBON NEGATIVE solution.**

What is the animal bone char carrier?

Animal bone char carrier is a formulated carboniferous material produced from animal bone meal by thermal process. Food grade hog animal bone meal is a left over from food industry which, after thermal process up to 850 degree C (carbonization), contains high concentrations of natural

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Phosphorus (P) and Calcium (Ca). The porous structure of bone char offers the microbes a protected niche when introduced into soil.

This product, called 'animal bone char' or 'ABC', can be used as a carrier for formulated biological control agents or other beneficial microorganisms, meanwhile delivering P and Ca for plant growth.

What are the added value valorised output products?

The output products are different types of specific formulated carbon and mineral carrier composites and formulated microbiological fungus and/or bacteria strain consortium. Depending on the local/regional feed material availability in short transport distance and the different soil and climate application strategies and conditions, different types of application relevant economical 3R-AGROCARBON products can be made.

What nutrients are in the 3R-AGROCARBON product?

The specific animal bone charcoal carrier based 3R-AGROCARBON is containing high plant available P₂O₅ (13%) and Ca (27%) which makes it available for efficient, environmentally safe and natural renewable phosphorus supply. Beside the high plant available phosphorus content the animal bone charcoal is containing important trace elements, and other nutrients such as N and K.

The heavy metal content of the 3R-AGROCARBON product is towards non detectable levels and is significantly below the Targeted Permit Limit Value, set by in any country.

Chemical analysis of 3R-AGROCARBON (m/m%) made from animal bone meal.

N	P ₂ O ₅	K ₂ O	Ca	Mg
1,87	13,03	0,31	27,3	0,57

The 3R-AGROCARBON product is a microbiological formulated substance which means that beneficial natural soil microorganisms are entrapped on the internal and external surface of the carrier. These microorganisms are able to solubilise the nutrients of the 3R-AGROCARBON carrier makes it available for plant. These microorganisms can also utilize the chemically bounded soil nutrients which are not available for plants. The positive side effects of the application of the 3R-3R-AGROCARBON TECHNOLOGY technology are the plant grown promotion activity and biopesticide effects. Different types of specific biochar and mineral carrier composites are available depending on the input material and carbonisation process.

Does the 3R-AGROCARBON product provide a safe alternative for natural phosphorus supply?

YES. The 3R-AGROCARBON product not only a slow released natural P-biofertiliser but also has a plant growth promotion and biopestice effects, increasing the plant natural resistance and help in natural restoration of the degraded soil without any negative environmental impact. **There is no any other high P content (15-18%) material known than formulated bone char that can provide an environmentally safe and renewable natural and plant available phosphorus source.**

What are the physical properties of the 3R-AGROCARBON made from bone char?

Physical state and appearance:	granulated solid substance
Granule size distribution	
<ul style="list-style-type: none"> > 2.0 – 1 mm 	<ul style="list-style-type: none"> 91%

<ul style="list-style-type: none"> • 1 - 0.63 mm • <0.63 mm 	<ul style="list-style-type: none"> • 3,5 • 5,5
Colour:	Black
Odour:	Odourless
pH	8.0
Specific gravity (kg/dm ³)	0,53
Moisture content (m/m %)	5
Dry matter content (m/m %)	95
Solubility:	Slow release solubility, promoted by formulated micro-organism fungus
Packing	25 kg, big bag 1000 kg (90x90x160 cm)

The physical characteristic and chemical composition of the 3R-AGROCARBON end products may also depending on the input material characteristics.

What type of microorganisms does the 3R-AGROCARBON product contain?

The 3R-AGROCARBON product contains only **Non-GMO natural soil fungal strains** which application is safe for environment and human health. Human health and environmental safety evaluation tests have been executed and **the safety of the microbiological substance has been proved.**

Is the 3R-AGROCARBON-PROTECTOR authority permitted?

Yes, both of the 3R-AGROCARBON production and applications are fully Authority permitted.

PRODUCTION PERMIT:

The 3R-AGROCARBON is produced in the **ZERO EMISSION** performance 3R carbonization technology, which process is approved by the following EU Authorities:

1. Environmental Protection Agency
2. Industrial Safety Inspection
3. Fire Protection Inspection
4. Human Health Protection Inspection
5. Workers Safety Inspection
6. Local Building Construction Office
7. Soil and Plant Protection Inspection
8. Road Inspection
9. Chimney Authority
10. Water Works
11. Electrical Works
12. Gas Works

First case permitting is done in Hungary under EU legislation.

APPLICATION PERMIT

The detailed Authority permit test investigation has been going on in four years 2005-2008 by different independent and accredited departments from the HU national Soil and Plant Protection Authority under EU legislation.

The following **authority certification** and test reports are available for the Acrocarbon-Protector:

- Biological efficiency tests of PROTECTOR AGROCARBON:
 - In different treatment (green house, open field) and soil conditions (calic chernozem soil, sandy)
 - Different independent Authority test areas.
 - Test plants: tomato, sweet pepper, broccoli, corn, bean, cauliflower, chinese cabbage.
 - Complete soil and plant chemical analysis (input-output)
 - plant/fruit yield and quality analysis
 - Economical aspects
- Impact analysis on other (monocotyledonous and dicotyledonous) plants.
- Ecotoxicological analysis, soil microbiological test , dehydrogenase enzyme activity test .
- Detailed physical and chemical analysis.
 - Organic and inorganic (including heavy metal analysis)
 - Macro and micro nutrient analysis
- Weed and germination test , phytotoxic effect assessment.
- Safety assessment of the microbiological substance: human health and environmental safety evaluation.
- Material Safety Data Sheet (MSDS).

For more information: http://www.3ragrocarbon.com/dat/3R_agrocarbon_authority_test.pdf

Summary of the 3R-AGROCARBON-PROTECTOR permit:

Manufacturer and Permit Holder:	3R-Environmental Technologies Ltd./Edward Someus
Permit Registration Number	02.5/67/7/2009.
Date of registration:	31, March, 2009.
Permit validity:	31, March 2019.
Substance:	Formulated granulated agrocarbon biochar microbiological substance (animal and plant base origin).
Product Application Area:	Open soil and green/glass house organic, low input and conventional vegetable cultivations.
Mode of action:	Plant growth promotion, natural mineral fertilization.
Recommended dose:	400-1000 kg/ha
Microbiological strain safe deposit number in Hungary:	114/2008. At National Collection of Agricultural and Industrial Microorganisms

Has the 3R-AGROCARBON been field demonstrated?

YES, highly impressive results of the efficiency trials made in several countries under different climatic, soil and ecological conditions:

For validation of the PROTECTOR effects several open field and green house cultivation tests have been executed in Germany, Netherlands, Israel, Italy and Hungary. Applied doses was 400 – 1000 kg/ha.

- (1) **HEALTHY PLANT in NURSERY:** Already in the seedling period was realized >20 mm size differences benefit for the PROTECTOR products in greenhouse nursery. Stronger plant at nursery stage provides life time positive effect for plant growth.
- (2) **FIRST HARVEST GREEN HOUSE YIELD INCREASE:** >300% related to the non-treated control PROTECTOR treatments resulted earliness concerning yield results at the first harvest.
- (3) **SECOND HARVEST GREEN HOUSE YIELD INCREASE:** >50% increased plant yield and quality after PROTECTOR treatment in several greenhouse vegetables cultivation.
- (4) **OPEN FIELD YIELD INCREASE:** extra surplus yield 2.5-5 tonnes/hectare. Significantly increased plant yield and quality after the PROTECTOR treatment in open field cultivation with several vegetables test plant, such as tomato, green pepper, broccoli and Chinese cabbage.
- (5) **FRUIT QUALITY IMPROVEMENTS:** the >10% increased mineral and nutrient content resulted highly improved fruit quality, better taste and extended fruit storage performance. On the basis of extended soil analysis PROTECTOR treatment influenced favourable the soil structure and increased plant available soluble macro and micro nutrient content of soil.
- (6) **RESTORATION OF SOIL NATURAL BALANCE and IMPROVEMENT of PLANT NATURAL RESISTANCE:** PROTECTOR treatment influenced favourable the soil structure, increase P₂O₅ availability with >20% and increased the plant available soluble macro and micro nutrient content of soil. The treatment enhanced the plant natural biocontrol ability.

The results of the Authority field tests is clearly indicated that the 3R-AGROCARBON is effective natural plant nutrient source, plant growth promoter and plant health improver with biological control effects against soil borne plant diseases. The biological efficiency of the 3R-AGROCARBON is evident. After the 3R-AGROCARBON treatment the soil plant available Phosphorus content is significantly increased which results significantly higher plant yields compared to the untreated control.

For more information: http://www.3ragrocarbon.com/dat/3R_agrocarbon_authority_test.pdf

Are there any 3R-AGROCARBON industrial like pilot plant?

The 3R-AGROCARBON Technology is a part of the **Agricultural Biotechnological Innovative Research, Demonstration, Validation and Training Center** in Polgardi, 80 km West from Budapest. Operational field: from applied science to economical scale up industrialization.

- Location: West Hungary, 80 km W. of Budapest at M7 highway (2 kilometres from the site) and Balaton Lake East, 170 km East from Vienna.
- Area: 8000 m² land area, 642 m² build in area (recently rebuilt for RTD use, including 100 m² conference room)
- Infrastructure utilities: full (natural gas, industrial electricity, municipal water, own water well with large capacity, sewage water treatment facility, fire protection water pipe lines, fire protection water tank 100 m³)
- Industrial permits: the site is fully permitted by ten Authorities for coal & carbon, renewable energy and agro biotechnological industrial production and interrelated RTD-Demonstration programmes.

For more information: <http://www.3ragrocarbon.com/Img/3RDemoSite.htm>

What equipment resources are available for 3R-AGROCARBON agro-biotechnological development and production of soil fertilisation and microbial products?

- Liquid fermentor with 400 litre capacity, comprehensive installation & operating unit
- Solid state fermentor with 400 litre capacity
- Inoculum storage and transfer with 100 litre capacity
- Sterile air supply with temperature control between 15°C to 40°C
- Pneumatical solid material transport
- Carbonization - pyrolysis rotary kiln, for sterile production of solid carriers: comprehensive installation, continuously operated (up to 6000 h/year) indirectly heated, capacity 100 kg-250 kg/h up to 1000 t/year input (depending on the feed material qty), treatment temperature up to 850°C, incl. process control automatization and comprehensive field instrumentations.
- Air selector of solid carrier materials (0-5 mm), capacity up to 250 kg/h
- Liquid fermentor with 600 litre capacity (planned installation, hardware is delivered to the site but not yet installed)
- Liquid fermentor with 6000 litre capacity (planned installation, hardware is delivered to the site but not yet installed).
- AGRICULTURAL WASTE RECYCLING UNITS FOR ADDED VALUE UPGRADE.

For more information: http://www.3ragrocarbon.com/dat/3R_Biotechnological_facilities.pdf

What types of laboratory resources are available in 3R-Agro-Biotechnology on site biotechnological laboratory?

- Microbiological Optimalization Research Liquid Fermentor with 3 x 5 litre capacity (Chemoferm)
- Microbiological Optimalization Research Liquid Fermentor with 12 litre capacity (Chemoferm)
- Microbiological Optimalization Research Liquid Fermentor with 3 x 10 litre capacity (INEL-RICHTER)
- UV spectrophotometer 190 nm – 1100 nm for liquid and solid materials
- Atom absorption spectrophotometer for heavy metal analyses
- Research microscope 1000x with digital camera
- Research microscope 1000x
- Autoclave 100 litre
- Sterile box (several units)
- Centrifuge
- Ball mill unit 7 kg capacity
- Thermostat
- Vacuum drier
- Comprehensive laboratory installations (all stainless steel)
- Laboratory thermal treatment test oven (4 litre), up to 1150 °C
- Sieve – selection solid carrier materials 50 micron to 5600 micron
- Drying, moisture, weight and volume standard on site measurements
- When accredited and/or additional laboratory analytics are needed, than samples submitted to an very modern and well equipped accredited environmental laboratory 10 km from the site at an multinational chemical industrial factory. Mobile measurements are also available. Other labs and university research lab facilities are also connected to our works.

When will be available the first industrial demonstration of the 3R-AGROCARBON Technology?

Following the success of the FP6 PROTECTOR applied RTD programme, a four members of consortium led by Mr. Edward Someus (a Swedish environmental engineer) successfully contracted for EACI CIP Eco-innovation Grant (2009-2012, Contract Number: ECO/08/238984/532247)) for first industrial application and market replication of the 3R-AGROCARBON technology and product. The full scale design, industrialization and implementation of innovative **3R-AGROCARBON technology up to 8 m³/batch solid fermentation capacities will be expected by mid 2010 in Hungary. During the 36 months project lifetime full industrial scale POTECTOR substances will already be commercially test produced and market introduced in the EU and North America.**

In which climatic areas and soils the 3R-AGROCARBON application has been developed for?

The 3R AGROCARBON has been specifically developed for **TEMPERATE CLIMATIC ZONE** applications (in each hemisphere, the temperate zone is found between 60 and 30 degrees latitude) flexible for different soils strategies, especially for degraded soil conditions.

What are the 3R-AGROCARBON application scenarios and market targets?

- Horticultural low input farming, horticultural organic farming, medicinal and aromatic plant farming, environmentally sensitive area farming and farming in natural conservation areas.
- Enhanced biomass production and energy forest plantation programmes for improved biomass energy production cultivations.
- Regeneration of degraded agricultural and natural soil conservation areas.
- Conventional farming, targeting decreased or substitution of synthetic inputs towards healthier food crop production.
- Environmental applications, such as absorbent for gas/liquid.

Who are the 3R-AGROCARBON product consumers and targeted end user groups?

- Horticultural low input and organic farming producers (vegetables, flowers, medicinal plants)
- Food chain organic by-product producers: slaughterhouse (bone), sugar industry (sugar beet pulp, molasses), corn wet milling industry (corn steep liquor), fruit juice producers by-products (fruit pulp), milk (whey) industry residuals.
- Food chain organic waste processors: animal waste, sugar waste, vegetable oil and milk residual processors. Interest: safer, better, faster and less costly processing and waste management.
- Biomass energy production units, energy forest younglet plantations.
- Capital investors. Interest: turning “trash into cash” with the AGROCARBON product system, applicable to a wide international market with strong demand.

What is the status of the 3R-AGROCARBON Technology?

It has been developed under EU FP6 Programme, 2005-2009, now it is a permitted product and industrialized system, with 30,000 m³/y bone meal throughput. 100% of the IPR belongs to Edward Someus, juridical clean and clear.

- The comprehensive and complete AGROCARBON process developed = COMPLETED
- Successful field tests executed with dose 500 kg-1000 kg/ha = COMPLETED
- Successful product permit tests at EU Authority made 2005-2008 = COMPLETED
- Comprehensive risk assessment = COMPLETED
- Comprehensive scale up engineering design (30,000 m³/y bone meal throughput) = COMPLETED
- Market evaluation, SWOT analysis, CBA analysis = COMPLETED

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The status of the 3R technology is post development, industrially proven and field demonstrated with clearly achieved full scale industrial phase; with comprehensive fully scale up engineering design.

The 3R-AGROCARBON technology is a patented original solution, which is also protected by comprehensive and very specific know how which is well documented and prepared for technology transfer during replication phase.

The 3R-AGROCARBON **technological solution has already been successfully true industrial value real life tested in Hungary while its products successfully real life field tested in Israel, Italy, Germany, The Netherlands and Hungary.** The prototype system has been “industrial “product like”, including all components and elements of scale up, therefore no potential technical reason to expect that it will not work in larger scales. Thus, the technological risk is limited to almost zero, e.g. to same as for any commercial solutions. However, still need a push from proven prototype to industrialization level.

What is the basic economy in full scale 3R-AGROCARBON production?

The AGROCARBIN is conversion of waste materials into high level added value products, it is a valorization process.

The AGROCARBON is SAFER, BETTER, FASTER and LESS COSTLY than any know competitive technologies. Basic production unit is 30,000 m³/y, for natural P recycling bone meal input case it is 20,000 t/y input and 10,000 t/y output. High feed flexibility for alternative feed materials for different application strategies. The system is energy self sustaining. The output product value starts from €/2/kg EXW whole sale, while the investment is on reasonable level. Short return on investment, 2-4 years.

What are the economical advantages to use 3R-AGROCARBON in agriculture and forestry industries?

Higher crop yield, significant better fruit quality, substitution of expensive agro chemicals, better crop protection, possibility to restore degraded soils, and generally higher product value in the application fields of low input and organic farming. AGROCARBON has high flexibility for

different alternative application strategies as of need in different temperate climatic and soil environment.

What are the 3R-AGROCARBON Business objectives?

- 3R-Agrocarbon technology licensing and technology transfer.
- Enter EU/North American/Australian stock exchange AIM market listing.
- Develop a world wide marketing centers in North America (USA, Canada), Europe (IT, DE, NL, FR, UK, ES., HU) and Pacific Area (Australia, Japan). Territorial licenses considered for Western Europe, North America and Asia.
- “Value for Money” by the combination of reasonable License and Royalty Fees.

Basic contact for further technical and business information

Mr. Edward Someus

3R AGROCARBON

<http://www.3ragrocarbon.com> or <http://www.terrenum.net/protector>

EU AGRINET

http://ec.europa.eu/research/agriculture/success_protector_en.htm

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