



BIOCHAR IN CATTLE FARMING, LAND FARMING AND HORTICULTURE

- Complex R&D Project for the Sustainable and Organic Agriculture and Closed Loop Agri-Systems -

Project Developer: Green Living Matrix

Location: Hungary

Timeframe: 2014-16

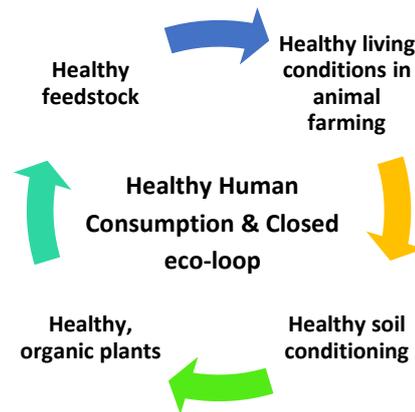
MANAGEMENT SUMMARY

The Project targets the development and usage of a formula of the combination of

biochar + effective microorganism (EM) + minerals
 and
a complex Know How in the agro-systems.

The Project includes various fields of the agriculture attempting to close the eco-cycle loop of the involved agro-systems:

- ✓ large-scale cattle farming (+1000),
- ✓ small scale cattle farming (-500)
- ✓ organic manure treatment, composting
- ✓ animal feedstock
- ✓ large-scale land farming, tilling
- ✓ horticulture (fruits, vegetables).



Target is to develop a biologically sustainable, 100% natural agricultural methodology. The Formula significantly reduces the harmful CO₂, methane and N₂O emissions. It creates healthy bacterial life displacing pathogenic living conditions.

The result is improved product quality both in the livestock-, (meat and milk) and land farming (cereals, vegetables and fruits). Pesticides and artificial fertilizers can be eliminated while the GHG emission reduction will also be measurable. The Project largely contributes to the international know how transfer. The Project is supported by the Hungarian Government.

MEMBERS OF THE PILOT PROJECT

Although, the developer of the project, Green Living Matrix, as well as members of the project consortium are 100 % Hungarian based entities, the Project involves the respectful cooperation of international strategic partners. The Consortium is of three members, while there is a group of strategic contributors, contractors, research institutes, farmers that act vital role in the project.

MEMBERS OF PROJECT CONSORTIUM



Fino-Food Holding

Consortium Leader. Hungarian large scale cattle breeder and dairy producer. The site of Fino-Food Holding is the central location of the Project on 4000 ha land and 2600 cattles. Both large and small scale cattle researches, manure treatment and composting researches will be executed in this site.



Representative: Mr. EGYED László

University of Corvinus, Department of Soil Science and Water Management

Member of Consortium. This Hungarian University executes the soil researches, measurements, evaluation of the Project. The results shall be of evidential proof and documented being acceptable on the market;



Responsible: Prof. Dr. BÍRÓ Borbála

Carbon Management Hungary Ltd.

Member of Consortium. This company obtains substantial experience and know how in standardized, marketable CO₂ reduction methodologies. Results of the Project will be measured and standardized CO₂, methane and N₂O emission reduction methodologies will be set up



Representative: Dr. FOGARASSY Csaba

STRATEGIC PARTNERS

Iwamoto Inc.

Japanese developer and manufacturer of Super Stone Clean 530 pyrolysis reactor series biochar producing technology. This is the latest and highest standard biochar machine on the world. Iwamoto Inc. also provides minerals and production know how for Iwamoto Mineral Biochar, a series of highly effective targeted biochar blends. GLM has chosen Iwamoto as a strategic partner also because of the ideas of Iwamoto Inc on sustainable closed eco-cycle systems.

Representative: Mr. Tetsuomi IWAMOTO, President

Thomas Rippel

Swiss expert of biochar related cattle researches in Switzerland. Mr. Rippel contributes to the international know how transfer.

Soil Foodweb Inc

Dr. Elaine Ingham is an American soil biology researcher and founder of Soil Foodweb Inc. She is known as a leader in soil microbiology and research of

the soil food web. In 2011, Ingham was named as The Rodale Institute's chief scientist. We work together on composting methodologies.

Representative: Dr. Elaine Ingham, Founder

Various farms

Places of horticultural and composting researches including organic farm and ordinary farms and the Study Farm of the Szent István University of Gödöllő.

PROJECT MANAGER

Green Living Matrix

The project manager and developer of the Project. GLM was founded in 2011 and acts as agricultural consultant, project developer and project manager.



Representative: Mr. PETRÓ Tibor

BACKGROUND & FACTS of TODAY'S AGRICULTURE

Serious problems in the overall agro-production chain can be experienced:

Due to the lack of fresh organic matters and manure supply the hummus content of the arable lands have significantly degraded. Global average is less than 2%;

The land supply with fertilizers is not sufficient and does not bring in sufficient soil conditioners. The microbial life of the soil has almost diminished;

17 kg of fertile soil diminishes with each 1 kg of vegetable production;

The infirm plants are kept alive on eroded soil with chemical plant-health products;

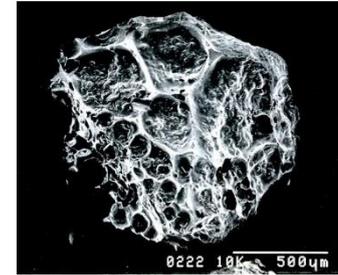
Cereals are low in nutrition and micro-nutrient and can only be given to the animals after high heat treatment of 140 Celsius;

Farm animals are fed with antibiotics and drugs because their environment is surrounded with pathogen bacteria. Manure is handled with improper microbial life, which can only be treated as waste;

Because of the unhealthy sub-processes of the agro-production system, there is no healthy and sustainable biological life and circulation!

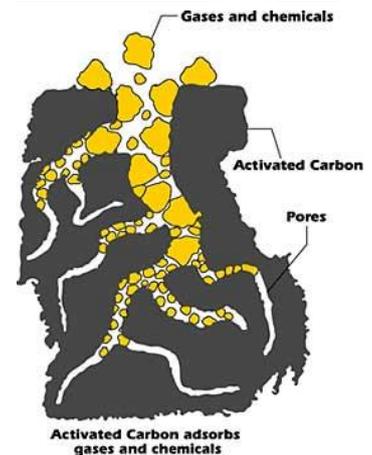
TERMS

Biochar Name for activated charcoal when it is used for particular purposes, especially as a soil amendment. Biochar is created by pyrolysis of manure, woodchips, or any kind of biomass. It is of substantial matter binding, absorbent and filtering features. The list of use of biochar is endless starting from agriculture till construction industry.



Effective microorganism (EM) Any of the predominantly anaerobic organisms blended in commercial agricultural amendments, medicines, and nutritional supplements based on the trademarked product originally marketed as EM-1 Microbial Inoculant, aka Effective Microorganisms and EM Technology.

Minerals There are 4900 classified types in rocks, ores and gems. They are vital to keep up the healthy and balanced growth of all natural organisms. As a general solution we use Humic Acid that contains min. 63% natural hummus and can be found in Hungary in large quantities. For targeted product Formula specific minerals can be emphasized in the Formula.



Compost Organic matter that has been decomposed and recycled as a fertilizer and soil amendment. Compost is a key ingredient in organic farming. The Project attempts to collect the international know how and upgrade results by using Alginit, Humic Acid, Pumicit and EM. Aerob and anaerob compost will be classified.

Formula The end product, know how of the research. Targeted receipes will be determined for animal feeding, manure treatment and soil fertilization.

SCOPE of PROJECT

1) *Research of biologically sustainable microbiological processes of the cattle farm eco-cycle: animal health, zoology, forgery and manure treatment.*

The Formula is spread around the animals and added to the feedstock. The Formula binds the methane and N₂O content of the manure, thus releasing smell and its emission to the air. It supplants pathogenic bacteria enabling space for the life supporting bacteria. Target is to 1) improve the immune system, decrease death and eliminate drugs, 2) increase weight and quality of milk and meat 3) decrease urine content of the milk.



2) *Manure treatment for organic manure and composting*

The Formula is added to the manure to make organic manure or used in composting. After the fermentation period the manure/compost can be spread in the soil soaking it with organic nutrients. There are researches with various international methods adding high hummus content minerals like Alginit, Dudalit, Humic Acid, Pumicit.

3) *Efficiently increase the fertility of the soil*

The Formula activated compost improves fertility of the lands. Moreover, we also research the usage of the Formula directly on lands both for cereals and horticultural. We research the balance of the soil microbiological life and the fertility keep up ability of the land.

4) *Plant health researches*

We want to prove that even the low quality soil treated with the Formula will produce high quality plants. Soil life will be restored in the soil thus enabling healthy plant growing conditions. We examine the nutrient contents of the cereals. Target is to grow tasteful cereals, vegetables and fruits full with nutrient and to reduce or substitute artificial fertilizers and toxic pesticides.

5) *Developing protocols for GHG emission reduction with the Formula*

The technology is suitable for measuring the CO₂, methane and N₂O (Green House Gas) reduction in a standardized manner resulting in tradable CO₂- Agro Carbon quotas. The know how will be certified in various quota systems. This provides further economic return on the investments.



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