TEST FARMS

SUB-GRANTING AGREEMENT

concluded in MADRID, on 2nd of November 2022

by :

AIVOTEC, s.r.o.
Na Sádkách 2798/9,
767 01 Kroměříž
VAN : CZ24172138

(hereinafter referred to as "**Subgrantee**")

and

EIT Food CLC South
Registration number: C.I.F. B-87964060
having its registered seat at:
Calle de Serrano Anguita, 13, 28004 Madrid
represented by Begoña Perez Villarreal, Director of CLC South

(hereinafter referred to as "**CLC**").

(Subgrantee and CLC hereinafter collectively referred to as the "**Parties**")

on the above mentioned day in accordance with the following terms and conditions:

1. Definitions:

   EIT means the European Institute of Innovation and Technology in Budapest, Hungary;

   EIT Food is the international non-profit association with scientific purpose governed by the Belgian Law, having its registered office in Belgium;

   Framework Partnership Agreement ("FPA") means the agreement between EIT Food ivzw and the EIT. The FPA lays down the conditions under which the EIT Food ivzw and EIT work together, a.o. with respect to organising the activities and receiving the funding from EIT;

   Specific Grant Agreement ("SGA") means the agreement concluded between the EIT and the EIT Food ivzw, if the EIT has decided to award a specific grant to the EIT Food ivzw for the Relevant Year, in accordance with Article 2.2 of the FPA.

2. This agreement (hereinafter referred to as "Agreement") is based *on Test farms: Terms and Conditions* published on the website https://www.eitfood.eu/Entrepreneurship/projects/test-farms (hereinafter referred to as "Terms and Conditions").

3. Test farms project is implemented in the framework of EIT Food RIS Innovation Grants (EIT Food KAVA # 18265-22). CLC is providing the support to the Subgrantee through the following actions as part of the Test Farms programme for the period of 1 year from the date of signing the Agreement:
   3.1. Match-making the Subgrantee with the right farmer or organisation, in terms of conditions Subgrantee needs to test its product or service.
   3.2. Assisting the Subgrantee through the testing process by providing the advice of agricultural experts and support of the CLC team members.

Pilot plan

Startup name	AIVOTEC, s.r.o.
Farmer - name	Domenico De Martino
Farmer - location	Via Mazzini, 90 84030 Montesano S/M (SA)
Date	1.12.2022

Testing of the use of the soil conditioner MicroCHAR® was aimed at its effects regarding changes in soils microbiome (bacteria, fungi). The anticipated effect is the development of soils bacteria and fungi, especially of the genus used in the production of MicroCHAR®.

As part of the handover of MicroCHAR®, soil samples were taken and subsequently stored in the laboratory of Institute of Biochemistry, Faculty of Science, Masaryk University in Brno.

After the end of the growing season, soil samples from the same areas were taken again.

The farmer decided to choose tomatoes grown in a greenhouse as a test crop. MicroCHAR® was dosed under each plant at 10g, equivalent to 150 kg per hectare.

The variant of the soil conditioner MicroCHAR® used contained:

- 75% softwood biochar (580 °C, 30 minutes)
- 10% poultry manure
- 14.5% water with binder
- 0.5% mixture of spores of mycorrhizal fungi, Trichoderma fungi and Basillus bacteria.

Task	start date	end date	person responsible
Field planning at thge test site	02/2023		J. Kana, T. Kana
Application of MicroCHAR® to soil	03/2023	05/2023	Mimmo De Martino
Sowing corps	03/2023		Mimmo De Martino
Demonstration day	03/2024		Alessio Corti
Harvesting	07/2023	09/2023	Mimmo De Martino
Sampling	10/2023		Mimmo De Martino
Evaluation of tests	11/2023	02/2024	J. Lochmann

Test results

The basic premise of the MicroCHAR® soil conditioner is:

- To promote the development of soil bacteria and mycorrhizal fungi, which together increases the availability of soil organic nutrients to plants,
- Increase in the natural resistance of the plants to pests and stress situations,
- Better overall condition during the growing season accompanied by higher production yield and quality.

A note to initial expectations

As part of our participation in the Test Farms program, we wanted to test the general consequences of applying the MicroCHAR® soil conditioner to a randomly selected farmer with a preference for lower quality soils, ideally affected by the negative effects of conventional farming. By comparing with this sort of conventional practice, we could evaluate the expected positive trends that a change of approach might bring.

We were honestly at a loss as to the choice of testing site... We arrived with our product at the farm of an organically farming, likeable farmer who takes a great care of the soil in his foliar houses “as if they were his own”! In March, preparations for the growing seasons are underway with an intercrop intensively fertilized by a dozen of hens. A joyful view of a place where we really could not see room for improvement…

We have taken the first set of samples of soil of high quality with exemplary texture, hoping that at least below the surface, there will be the expected and demonstrable change.

Subjective evaluation of farmer Mimmo

The testing did not include detailed mapping of changes in yield or quality of cowpea production using quantification methods. The positive effect of using MicrroCHAR® is documented by the subjective comments of the farmer.

"When transplanting tomatoes last year, I used a product called biochar, provided to me by Biohuel, a startup from the Czech Republic. By incorporating this material into my practices, I found a significant increase in tomato yields, along with increased plant resistance to disease and environmental stresses. This confirms the potential of biochar as an effective solution to improve soil fertility, reduce the use of chemical fertilizers, and promote plant health. Its ability to retain nutrients and water in the soil, along with its carbon sequestration action, makes it a very beneficial ecological choice for farmers like me who aim for sustainability. Thanks again for everything, I am very very satisfied".

Link to video with message

https://www.aivotec.cz/wp-content/uploads/2023/09/VID-20230802-WA0018.mp4

Evaluation of soil samples

The analyses of the samples were carried out by the team of the Associate Professor Jan Lochman in the laboratory of the Institute of Biochemistry, Faculty of Science, Masaryk University in Brno. The soil microbiome is a highly complex and intricate system, which is influenced by many factors and processes, led by soil processing and replenishment of substances in the context of crop cultivation. Mechanical tillage and climatic conditions are important factors influencing the soil microbiome. This makes its development difficult to predict.

Influencing the composition of the soil microbiome to “engineer” changes is theoretically possible in defined zones, such as the root system, by purposefully “inserting” bacteria or fungi with a defined function. Mostly nitrogen-fixing bacteria and mycorrhizal fungi are “installed” in this way.

The future development of such artificial colonization of soil aggregates is uncertain due to the lack of knowledge of the current composition of the soil microbiome and thus its reaction to newly introduced genera and species. The deliberate addition of species must, from a scientific point of view, be accompanied by biological analyses of soil samples to determine the underlying trends of the complex response. These analyses are particularly difficult for complex biological soil elements. It is therefore necessary to target the analyses to the presence of specific bacterial species and the results can only be interpreted as a change in colonization rates. However, even this will not provide a statement about the activity of specific bacteria.

The analyses are based on the raw data of the detected occurrence of "Bacteria" "Fungi", sorted in a contingency table at two taxonomic levels "class" and "family". From these, only statistically significant differences in the end/beginning ratio were filtered out.

For significant abundances of a particular bacterium/fungus in the sample, the taxa found in the MicroCHAR® sample were indicated.

In general, better results are found for soil fungi, where more significantly altered taxa present in MicroCHAR® are also found, which can be interpreted as a directly dependent effect of its application.

Considering the possible scale of soil sampling and analyses due to the minimal financial budget, the analyses were performed in independent duplication, so that the conclusions only affect major trends.

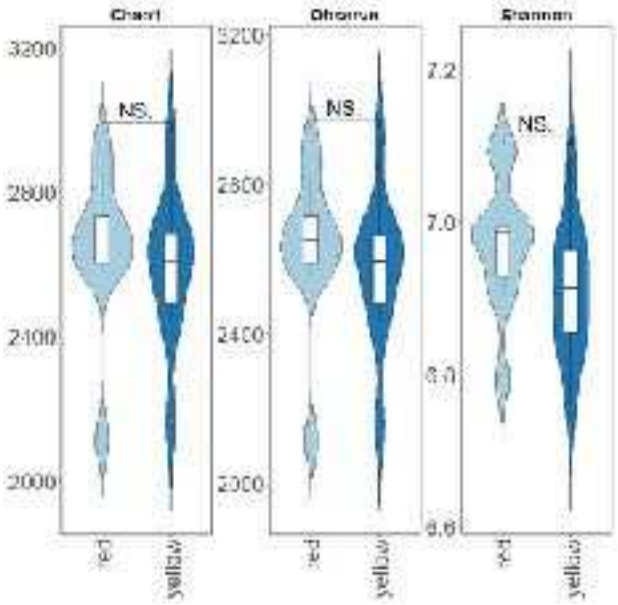
The analysis of alpha I beta diversity indicates, in the case of alpha diversity, a significant increase in the Shannon index after the growing season for fungi. No significant change was defined for bacteria.

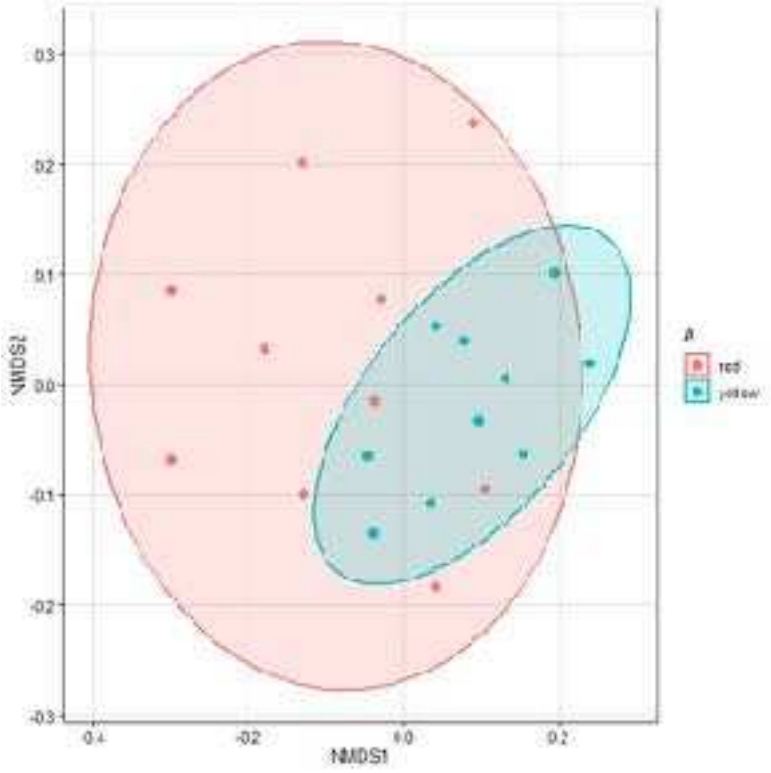
In the case of beta diversity, no significant change was defined, only in the post-harvest samples, there is little more variance between samples, which can be clearly seen with the scatter of the dots.

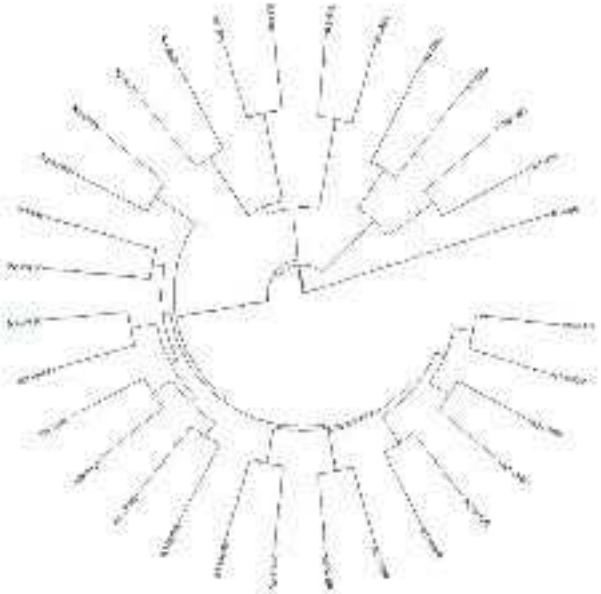
A significant increase in the abundance of bacteria and fungi with a significant change was defined at different taxonomic levels. Since the ratio is red vs yellow, negative numbers mean higher abundance at the end of the period and probably can be associated with the application of MicroCHAR®.

Based on the analyses, it can be concluded that there was a significant increase in both soil fungi and bacteria after MicroCHAR® application and therefore a positive development of the soil microbiome complex. From a scientific perspective, it would be advisable to continue the application and sample analyses in subsequent growing seasons and monitor the continuation of the established trends.

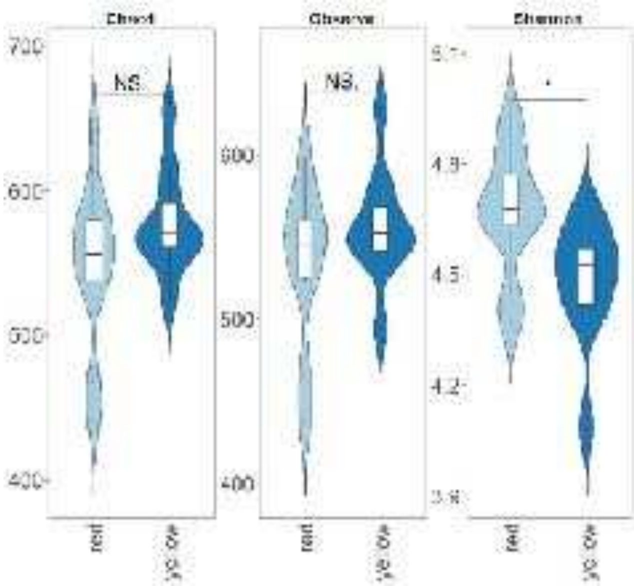
Population	Source1bk1 AvR	Source1bk2 AvR	Source1bk1 SRL	Source1bk2 SRL	Source1bk1 LHL	Ratio (End/Start)	P value
Actinobacteria	2538	2282	4442	4486	25656	1.8	0.007
Alphaproteobacteria	9879	9104	12523	12699	9529	1.3	0.016
Bacteroidota	908	1012	713	694	0	0.7	0.047
BD2-11 terrestrial group	124	113	96	88	0	0.8	0.034
Chloroflexi	718	708	546	1036	0	1.4	0.023
Deinococci	7	11	41	50	0	5.2	0.024
Elusimicrobia	3	6	18	21	0	4.3	0.019
Fimbriimonadia	41	35	57	56	0	1.5	0.034
Gammaproteobacteria	9496	10303	7437	7716	0	0.8	0.021
Holophagae	318	225	108	112	0	0.5	0.001
NA	1316	1552	1017	825	0	0.7	0.032
Oligoflexia	138	143	84	78	0	0.6	0.006
Planctomycetia	0	0	0	3	0		0.030
Polyangia	1844	1858	1426	1858	0	1.3	0.016
Subgroup 22	66	64	14	7	0	0.2	0.019
Subgroup 6	191	228	107	76	0	0.4	0.038
Surnetales	90	88	204	242	0	2.4	0.021
Vampirovibrionia	9	20	75	85	0	3.4	0.011

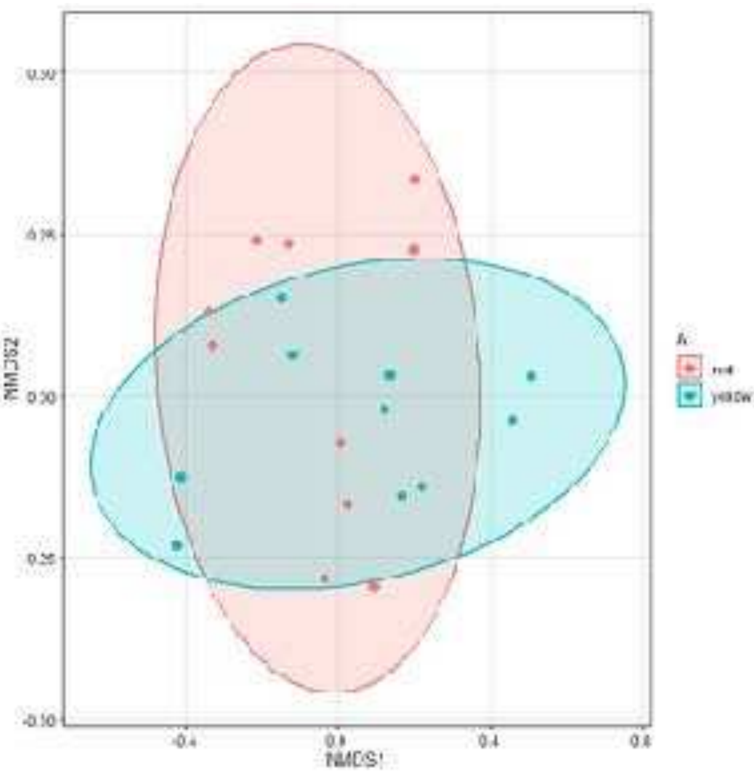


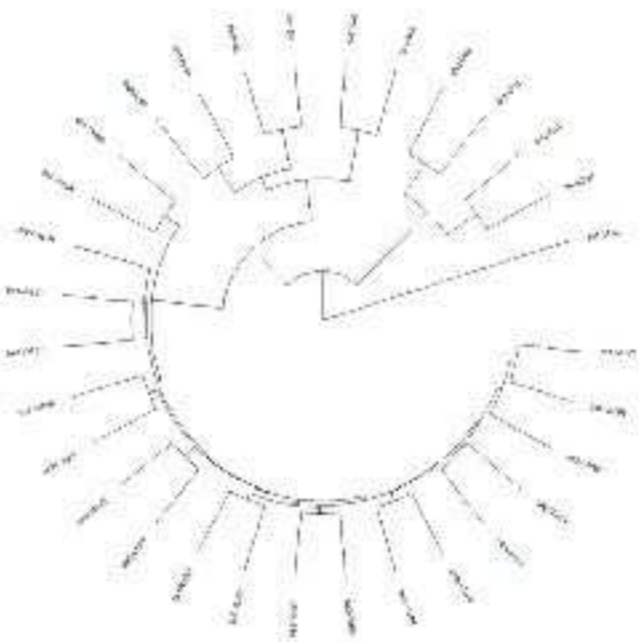




[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Ratio [illegible]	P-value
c__Agaricomycetes	18	64	2129	2165	14	[illegible]	0,020
c__Aphelidiomycetes	12	12	31	24	0	3,3	0,047
c__Dothideomycetes	3802	3873	12971	13482	1990	3,4	0,001
c__Kickxellomycetes	6	16	66	48	0	4,5	0,037
c__Leotiomycetes	31	241	575	836	2352	3,8	0,035
c__Mortierellomycetes	767	510	1864	2449	0	4,8	0,047
c__Oomycetes	2531	2187	776	688	0	0,3	0,040
c__Rhizophlyctidomycetes	30	47	6	7	0	0,1	0,020
c__Sordariomycetes	496	486	2619	2268	3868	[illegible]	0,014
c__Tremellomycetes	143	163	396	501	1534	2,2	0,032
c__unclassified_Basidiomycota	4	10	31	33	0	4,8	0,016
c__Wallemiomycetes	6	18	32	42	81	2,8	0,049
NA	14651	12214	542	888	152	0,1	0,006







Farm Domenico De Martino and farmer Mimmo

soil preparation - intercrops

soil sampling

forwarding MicroCHAR®

Project cost accounting

PROJECT EIT FOOD TestFarms		**AIVOTEC s.r.o., CZ**	
PRODUCTION MicroCHAR®	**160 €**		
SAMPLE DELIVERY (BUSINESS TRIP)	**2 112,09 €**		
purpose of the trip	MicroCHAR® handover, sampling, test design		
destination	Farma Domenico DeMArtino. Via Mazzini. 90 84030 Montesaro		
deadline	25.02.2023 -	28.02.2023 ,	05.03.2023
number of days	5		
Passengers	Jan Káňa	38 h	
	Tomáš Káňa	38 h	
	Jana Káňová	38 h	
travel allowances	**750 €**		
costs billed	**1 362,09 €**		
include			
fuel	245,21 €		
toll	250,2 €		
Accommodation	544,68 €		
other costs	312 €		
ANALYSIS OF SOIL SAMPLES	**950 €**		
set 1	250 €		
set 2	250 €		
Evaluation	400 €		
CELKOVÉ NÁKLADY PROJEKTU	**3 222 €**		