

Tehnologia de refacere a Humusului din Sol

Motivatia

- S-a constatat o scadere continua a continutului de humus din sol.
- Acidifierea solurilor,
- Distrugerea structurii solului si implicit a capacitatii de retinere a apei,
- Toate acestea se datoreaza scaderii drastice a numarului de bacterii, ciuperci, protozoare si altor microorganisme din sol

Analiza de sol 2019-2020

Determinare de bacterii, ciuperci, protozoare, pe baza de ADN

Evolutia microorganismelor, genuri si specii (2019-2020)

Chimia si fizica solului

Rezultate microbiologie

pH ; Humus

<u>Nume parcela: FD2</u>	2019	2020
Total <u>ciuperci/g sol</u>	810	10 000
Total <u>bacterii/g sol</u>	320 000	20 000 000
Total nematode/g sol	7	26
Total <u>protozoare/g sol</u>	16	61
pH	5.30	5.51
Humus	1.20	1.20

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<u>Nume parcela: FD1</u>	2019	2020
Total <u>ciuperci /g sol</u>	1 000	3 000 000
Total <u>bacterii/g sol</u>	350 000	130 000 000
Total nematode/g sol	44	82
Total <u>protozoare/g sol</u>	260	240
pH	5	5.52
Humus	1.47	1.70

1	METAGENOMIKA 2020			
2	#Datasets	FDI	FDII	
3	unclassified Acidobacteria	248836	316916	1
4	unclassified Actinobacteria (class)	81812	61172	1
5	unclassified Verrucomicrobia	80723	73253	1
6	unclassified Deltaproteobacteria	54689	88114	1
7	unclassified Chloroflexi	50920	66651	1
8	Sphingomonas	44872	24386	1
9	unclassified Gemmatimonadetes	41747	25166	1
10	Streptomyces	39464	7529	1
11	unclassified Alphaproteobacteria	32686	27304	1
12	unclassified Betaproteobacteria	31347	34360	1
13	Bradyrhizobium	30523	14873	1
14	unclassified Planctomycetes	22818	33700	1
15	unclassified Myxococcales	21810	15177	1
16	Nocardioides	14456	5738	1
17	Enterococcus	12763	12071	1
18	Pseudolabrys	12712	2552	1
19	Mesorhizobium	10714	4595	1
20	Kribbella	10156	2782	1
21	Candidatus Rokubacteria	9452	30629	1
22	Arthrobacter	9414	639	1
23	Solirubrobacter	8425	4366	1
24	Amycolatopsis	8073	597	1

25	unclassified Bacteroidetes	7954	7627	1
26	Agromyces	7315	597	1
27	Rhodoplanes	6704	6682	1
28	environmental samples <bacteria,supe	6241	7449	1
29	Variovorax	6223	1438	1
30	Pseudomonas	5543	2069	1
31	Phenylobacterium	5367	2982	1
32	unclassified Proteobacteria	5095	4564	1
33	Opitutus	4703	2155	1
34	unclassified Kofleriaceae	4659	5521	1
35	unclassified Gammaproteobacteria	4575	3564	1
36	Pseudonocardia	4460	1281	1
37	Nitrospira	4454	4677	1
38	Luteitalea	4449	3889	1
39	unclassified Opitutae	4410	3713	1
40	Candidatus Sulfopaludibacter	4390	3320	1
41	Microbacterium	4383	625	1
42	Candidatus Eisenbacteria	4295	17070	1
43	Gemmatirosa	4292	2630	1
44	Singulisphaera	4265	1486	1
45	Mycobacterium	4157	1747	1
46	Sorangium	4143	4834	1
47	Candidatus Solibacter	3949	2505	1
48	unclassified Myxococcaceae	3865	2210	1

49	unclassified Blastocatellia	3765	8331	1
50	environmental samples <bacteria,class	3739	1646	1
51	bacterium	3662	3261	1
52	Archangium	3552	1119	1
53	unclassified Actinobacteria	3403	2501	1
54	unclassified Gemmatimonadales	3286	2418	1
55	unclassified Acidobacteriia	3167	2507	1
56	Marmoricola	3141	1334	1
57	Flavobacterium	3062	767	1
58	unclassified Sphingobacteriaceae	3007	817	1
59	Actinoplanes	2970	1227	1
60	Gaiella	2657	2161	1
61	unclassified Rhizobiales	2533	1411	1
62	Minicystis	2500	2122	1
63	Lysobacter	2473	1550	1
64	unclassified Gemmataceae	2451	2493	1
65	Occallatibacter	2369	120	1
66	unclassified Thaumarchaeota	2332	3226	1
67	unclassified Chitinophagaceae	2216	1012	1
68	unclassified Bdellovibrionales	2182	732	1
69	Polyangium	2181	2461	1
70	Labilithrix	2130	2063	1
71	Enhygromyxa	2061	2453	1
72	unclassified Solirubrobacterales	2056	954	1

3375	Hibiscus	0	2	1
3376	Myrtales	0	2	1
3377	unclassified Triticeae	0	2	1
3378	Eragrostis	0	2	1
3379	Zea	0	4	1
3380	Ensete	0	2	1
3381	Musa	0	2	1
3382	Papaver	0	2	1
3383	Thalictrum	0	2	1
3384	Kantovirus	0	3	1
3385	Kembevirus	0	2	1
3386	unclassified Autographiviridae	0	2	1
3387	Bendigovirus	0	3	1
3388	Wellingtonvirus	0	2	1
3389	Barnyardvirus	0	2	1
3390	Hawkeyevirus	0	2	1
3391	Sansavirus	0	2	1
3392	Mitovirus	0	2	1
3393	Shelly beach virus	0	3	1
3394	Kaumobavirus	0	3	1
3395	Cedratvirus kamchatka	0	2	1
3396	Hokovirus	0	2	1
3397	Terrestrivirus sp.	0	2	1
3398	GENURI			3 395

METAGENOMIKA 2020 SPECII

1				
2	#Datasets	FDI	FDII	
3	Acidobacteria bacterium	166934	207677	1
4	Actinobacteria bacterium	79371	59410	1
5	Verrucomicrobia bacterium	67040	61082	1
6	Deltaproteobacteria bacterium	47508	80608	1
7	Chloroflexi bacterium	34755	49273	1
8	Gemmatimonadetes bacterium	30536	16906	1
9	Alphaproteobacteria bacterium	22872	21153	1
10	Myxococcales bacterium	17885	11160	1
11	Betaproteobacteria bacterium	17746	11484	1
12	Planctomycetes bacterium	12228	21486	1
13	Rhodoplanes sp. Z2-YC6860	6320	6437	1
14	Candidatus Rokubacteria bacterium	5428	16415	1
15	uncultured bacterium	5114	6391	1
16	Enterococcus faecium	5026	4844	1
17	Proteobacteria bacterium	4902	4414	1
18	Bacteroidetes bacterium	4875	5952	1
19	Kofleriaceae bacterium	4659	5521	1
20	Luteitalea pratensis	4449	3889	1
21	Gemmatirosa kalamazoonesis	4292	2630	1
22	Pseudolabrys taiwanensis	4168	840	1

23	Sorangium cellulosum	4142	4832	1
24	Candidatus Solibacter usitatus	3949	2505	1
25	Myxococcaceae bacterium	3865	2210	1
26	Candidatus Eisenbacteria bacterium	3813	14895	1
27	uncultured Phycisphaerae bacterium	3739	1646	1
28	Myxococcales bacterium 68-20	3678	3658	1
29	bacterium	3662	3261	1
30	Gemmatimonadales bacterium	3286	2418	1
31	Blastocatellia bacterium	3279	6075	1
32	Archangium gephyra	3240	864	1
33	Sphingomonas sp. URHD0007	3236	2812	1
34	Sphingomonas sp. URHD0057	3232	1633	1
35	Sphingobacteriaceae bacterium	3004	817	1
36	Solirubrobacter soli	2928	1712	1
37	Sphingomonas sp. YJ09	2781	854	1
38	Gammaproteobacteria bacterium	2594	2198	1
39	Nocardioides sp. SB3-45	2502	454	1
40	Minicystis rosea	2500	2122	1
41	Deltaproteobacteria bacterium RBG_16_71_1	2459	525	1
42	Gemmataceae bacterium	2451	2493	1
43	Occallatibacter savannae	2369	120	1
44	Gaiella occulta	2313	1933	1

43	<i>Occallatibacter savannae</i>	2369	120	1
44	<i>Gaiella occulta</i>	2313	1933	1
45	<i>Thaumarchaeota archaeon</i>	2213	3121	1
46	<i>Labilithrix luteola</i>	2130	2063	1
47	<i>Enhygromyxa salina</i>	2061	2453	1
48	<i>Acidobacteriia bacterium</i>	1906	1378	1
49	<i>Acidobacteria bacterium RIFCSPLOWO2_12_0</i>	1885	3265	1
50	<i>Sandaracinus amylolyticus</i>	1884	1330	1
51	<i>Chthoniobacter flavus</i>	1868	1725	1
52	<i>Opitutus</i> sp. GAS368	1855	724	1
53	<i>Pedosphaera parvula</i>	1825	1763	1
54	<i>Planctomycetes bacterium ETA_A8</i>	1819	1481	1
55	<i>Candidatus Sulfopaludibacter</i> sp. SbA4	1716	1355	1
56	<i>Xanthomonadales bacterium</i>	1578	2013	1
57	<i>Acidobacteria bacterium RIFCSPLOWO2_02_0</i>	1481	1986	1
58	<i>Opitutae bacterium Tous-C1TDCM</i>	1379	1208	1
59	<i>Alphaproteobacteria bacterium 64-11</i>	1376	212	1
60	<i>Zavarzinella formosa</i>	1353	1055	1
61	uncultured <i>Thermomicrobiales</i> bacterium	1327	1180	1
62	<i>Dongia</i> sp. URHE0060	1321	550	1
63	<i>Chitinophagaceae</i> bacterium	1304	660	1
64	<i>Verrucomicrobiaceae</i> bacterium	1303	1360	1
65	<i>Opitutus terrae</i>	1265	496	1

13582	Arthrobacter phage Kumotta	0	2	1
13583	Gordonia phage Sixama	0	2	1
13584	Microbacterium phage FuzzBuster	0	4	1
13585	Microbacterium phage Megan	0	2	1
13586	Mycobacterium phage Onyinye	0	6	1
13587	Pseudoalteromonas phage Pq0	0	2	1
13588	Rhodococcus phage ChewyVIII	0	2	1
13589	Siphoviridae sp. cttb18	0	2	1
13590	Streptomyces phage Kromp	0	2	1
13591	Thermobifida phage P1312	0	5	1
13592	Mitovirus sp.	0	2	1
13593	Shelly beach virus	0	3	1
13594	Kaumobebavirus	0	3	1
13595	uncultured phage	0	2	1
13596	Methanosarcina virus MetMV	0	2	1
13597	Cedratvirus kamchatka	0	2	1
13598	Hokovirus HKV1	0	2	1
13599	Terrestrivirus sp.	0	2	1
13600	uncultured marine microorganism HF4000_0	0	4	1
13601	uncultured marine microorganism HF4000_A	0	2	1
13602	uncultured marine microorganism	0	3	1
13603	uncultured organism MedDCM-OCT-S11-C23	0	2	1
13604	SPECII			13601

1	Fila 2							
2	Izolare AND , Tapestation Metagenomica izolálás, Tapestation QC Metagenomika	DNS	SC BIOFARM SRL					
3			FD 1-6 Ha			FD 2-20 Ha		
4			2019	2020	Multipl.	2019	2020	Multipl.
5	Acidobacteria bacterium		4 683	248 836	53	7 476	316 916	42
6	Contribuie la reconstructia solului chiar si in solurile acide cu un continut scazut de materie organica							
7	Verrucomicrobia bacterium		3 575	80 723	23	3 577	73 253	20
8	Oxideaza metanul, fixeaza nitrogenul, au rol puternic in dezvoltarea radacinilor							
9	Actinobacteria bacterium		4 672	81 812	18	3 005	61 172	20
10	Au rol in descompunerea celulozei si a materiei organice si reconstructia solului							
11	Chloroflexi bacterium		1 283	50 920	40	1 982	66 651	34
12	Produc materie organica din dioxid de carbon							
13	Deltaproteobacteria bacterium		1 651	54 689	33	1 965	88 114	45
14	Rol in utilizarea sulfului							
15	Alphaproteobacteria		1 969	32 686	17	1 684	27 304	16
16	Reprezinta o grupa de bacterii foarte vechi si diversificate cu rol in fixarea azotului din aer in sol							
17	Gemmatimonadetes bacterium		903	41 747	46	806	25 166	31
	Bacterii gram negative cu capacitatea de a se dezvolta atat in conditii aerobe							

19	Planctomycetes bacterium	474	22 818	48	690	22 818	33
20	Au rol in descompunerea micro si macromoleculelor, si in asimilarea subsatantelor nutritive din sol de catre plante						
21	Bacteroidetes bacterium	462	7 954	17	572	7 627	13
22	Reprezinta una din cele mai importante bacterii din zona radacinilor, cu rol in constructia solului si asimilarea substantelor nutritive.						
23	Candidatus Rokubacteria	280	9 452	34	400	30 629	77
24	Bacterii simbiotice care au capatat o gena cheie, ce regleaza schimbul de sulf in noile celule.						
25	Betaproteobacteria bacterium	493	31 347	64	398	34 360	86
26	Au rol in fixarea azotului la diferite plante, oxideaza amoniul si produc nitriti in timpul metabolismului						
27	Rhodoplanes sp.	297	6 704	23	345	6 682	19
28	Bacterii biocatalizatoare fotosintetice						
29	Candidatus Eisenbacteria bacterium	53	4 295	81	283	17 070	60
30	Au rol in hidroliza glutaminei, descompunerea glutenului.						
31	Sorangium cellulorum	106	4 143	39	207	4 834	23
32	Bacterii saprofite, care descompun in mod aerob celuloza.						
33	Acidobacteriaceae bacterium	109	908	8	165	1 181	7
34	Asigura procesele sinergice din sol						
35	Kouleothrix auranti	64	1 139	18	138	1 139	8
36	Bacterii filamentoase cu roluri multiple in metabolism si procese sinergice						

Exemplu de tehnologie EDF

1. Scarificare la 30-40cm in cazul in care avem un sol foarte tasat
2. Aplicarea de compost EDF
3. Discuit la adancimea de 3-5cm,
4. Semanat amestec de seminte cu 10-12 tipuri de plante.

- trifoi de alexandria
- fan grecesc
- iarba de sudan
- in
- facelia
- negrilica
- ridiche
- mustar etiopia

La intrarea in iarna vom avea o masa vegetala de aproximativ 1 m inaltime si ridichi de aproximativ 50 cm in sol











6. Primavare se face o mulcire a resturilor de plante si se seamana porumbul, grau de primavara
7. Combaterea buruienilor se face mecanic cu grapa stelara-Eibock
8. In timpul perioadei de vegetatie se aplica 2-4 stropiri cu stimulatori de crestere
9. Dupa treierat se toaca marunt resturile vegetale se imprastie compost si dupa 10 zile se seamana graul de toamna.
10. Nu se folosec ingrasaminte chimice si nici pesticide!
|
11. Nu se fac lucrari adanci ale solului.

Rezultate

1. Solul devine afanat
2. Creste capacitatea solului de retinere a apei
3. Se evita eroziunea solului
4. Se reface complexul coloidal al solului, flora si fauna, diversitatea microbiologica, se reduce prezenta organismelor patogene- **IMUNITATEA SOLULUI**

Daca te intereseaza sanatatea
Ta atunci trebuie sa te intereseze si
solul.

MULTUMESC!