Supplementary materials on Agricultural Technology, Biofertilizers, Biopesticides and Compost

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Supplementary Material 1: Agricultural Technology

Cluster 1				Cluster 2				Cluster 3				Cluster 4			
13 items				10 items				10 items				10 items			
	links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences
agricultural engineering	2	2	5	agricultural extension	5	5	6	agricultural biotechnology	4	4	6	dssat	5	5	6
agricultural robotics	2	2	6	agricultural technologies	2	3	7	china	13	15	20	kenya	15	18	9
automation	3	3	6	agricultural technology adoption	13	13	10	environment	5	7	5	livestock	7	8	7
big data	4	7	7	climate smart agriculture	8	8	5	food safety	2	3	5	maize	15	18	18
computer vision	2	4	7	conservation agriculture	14	16	9	food security	35	44	29	poverty	13	15	7
deep learning	3	6	5	crop yield	4	4	5	innovation	16	20	16	productivity	15	19	15
efficiency	8	8	9	india	9	10	7	propensity score matching	8	8	7	rice	16	17	12
image processing	6	8	7	social learning	7	7	5	q16	6	6	5	soil	3	3	6
machine learning	5	5	7	sub-saharan africa	20	25	17	sustainability	18	20	18	winter wheat	4	4	5
machine vision	4	4	6	uganda	13	16	9	technology transfer	5	6	7	yield gap	3	3	5
precision agriculture	18	26	33												
precision farming	9	9	8												
smart farming	5	5	6												

Cluster 5				Cluster 6				Cluster 7				Cluster 8			
8 items				8 items				8 items				7 items			
	links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences
corn	6	7	5	africa	16	21	10	evapotranspiration	4	5	6	agricultural technology	25	33	38
development	9	12	7	developing countries	9	9	5	gis	4	4	7	biotechnology	4	7	7
ethiopia	13	15	9	extension	12	12	6	growth	3	9	11	crops	4	4	5
management	8	9	6	extension services	2	2	5	irrigation	13	16	13	internet of things	3	3	5
nutrition	6	6	5	integrated pest management	5	5	6	knowledge	7	7	9	ndvi	1	1	6
risk	14	18	8	sustainable agriculture	13	15	11	sustainable intensification	14	16	11	remote sensing	5	7	10
simulation	6	6	5	technical efficiency	2	2	5	water use efficiency	4	5	5	wheat	8	8	11
technology	31	44	24	technology adoption	35	50	40	yield	11	17	18				

Cluster 9

7 items			
	links	link strength	occurrences
agricultural policy	8	8	5
cotton	4	4	5
organic farming	5	5	9
policy	14	15	7
precision livestock farming	3	3	5
production	6	6	7
technologies	5	5	5

Cluster 10

6 items			
	links	link strength	occurrences
adaptation	11	18	12
agroecology	2	3	5
bangladesh	4	4	5
climate change	31	50	37
climate-smart agriculture	10	17	11
panel data	9	11	6

Cluster 11

6 items			
	links	link strength	occurrences
gender	17	23	10
ghana	11	13	10
malawi	6	7	5
smallholder farmers	11	12	9
tanzania	17	21	14
willingness to pay	4	4	5

Cluster 12

5 items			
	links	link strength	occurrences
adoption	29	49	30
cassava	5	5	5
diversity	1	1	5
impact	7	8	7
nigeria	13	19	12

Cluster 13

5 items			
	links	link strength	occurrences
agricultural intensification	9	9	5
deforestation	4	4	6
fertilizer	12	13	9
pesticide	5	6	6
zambia	10	10	8

Cluster 14

4 items			
	links	link strength	occurrences
agriculture	52	92	74
conservation	6	7	5
economics	4	5	5
profitability	8	9	8

Supplementary Material 2: Biofertilizer

Cluster 1				Cluster 2				Cluster 3				Cluster 4			
48 items				33 items				32 items				27 items			
	links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences
adsorption	14	16	6	arbuscular mycorrhizal fungi	29	47	29	blackgram	10	10	5	abiotic stress	8	11	5
agricultural waste	8	9	6	bacillus licheniformis	6	7	5	cattle manure	10	12	7	antifungal activity	8	9	6
agriculture	31	39	17	biofertilizers	100	208	115	chickpea	27	35	11	bacillus sp.	4	7	5
algae	14	17	7	bioinoculants	17	21	10	cropping system	13	13	5	bacillus subtilis	18	20	11
anaerobic digestate	9	9	5	chemical fertilizer	26	31	12	economics	24	32	11	biocontrol agent	6	12	10
anaerobic digestion	35	81	41	chemical fertilizers	16	19	6	encapsulation	10	13	5	biofertilizer	209	784	458
antioxidants	8	9	6	fermentation	10	11	7	farmyard manure	27	39	10	biological control	19	28	19
bioactive compounds	12	16	7	fertilization	8	9	5	fym	19	34	13	characterization	12	17	8
biochar	20	30	18	fertilizers	10	10	6	green manure	11	15	7	climate change	12	14	6
biodegradation	5	8	5	foliar application	8	10	5	inm	12	12	5	drought	17	20	7
bioenergy	15	21	7	food security	8	11	6	integrated nutrient management	27	40	15	iaa	25	34	18
biofertilizer	8	9	6	glycerol	11	11	6	maize	31	41	17	indole acetic acid	14	18	8
biofuel	24	32	12	grain yield	14	18	7	methane	10	13	8	isolation	16	20	7
biofuels	11	15	6	inoculation	18	30	14	micronutrients	18	25	9	nitrogen fertilizer	5	5	5
biogas	43	98	49	irrigation	14	16	10	n fertilizer	7	7	5	pgpb	6	8	5
biomass	25	34	15	lactuca sativa	9	12	7	nitrogen	46	74	30	pgpr	87	163	74
biomethane	12	19	9	microorganisms	19	25	13	nitrous oxide	6	6	6	phosphate solubilizing bacteria	26	32	15
biorefinery	13	16	11	organic agriculture	8	8	5	nutrient content	9	9	6	phytohormone	12	14	7
biostimulants	10	12	5	organic amendment	11	12	6	nutrient management	17	17	10	phytohormones	13	17	7
biotechnology	6	9	6	organic farming	22	29	14	organic fertilizer	35	43	35	phytopathogens	6	10	5
circular economy	20	25	11	organic fertilization	11	11	15	organic manure	16	18	11	piriformospora indica	9	9	5
co-digestion	7	8	5	organic matter	19	20	18	phosphorus	44	76	32	plant growth promoting rizobacteria	11	15	11
composting	17	19	13	oryza sativa	15	15	7	plant growth promoting bacteria	12	14	7	plant growth-promoting rhizobacteria	6	7	6
cyanobacteria	31	51	24	p-solubilization	8	9	6	potassium	21	27	9	rhizobacteria	27	43	19
digestate	14	20	13	photosynthesis	6	6	6	potato	15	16	7	secondary metabolites	9	13	8
energy	9	14	5	plan nutrition	14	15	9	rice	52	84	31	siderophore	21	28	10
fertilizer	38	49	25	productivity	30	35	22	seed quality	8	11	5	sustainable agriculture	50	91	41
food waste	15	26	14	quality	18	32	14	seed yield	29	36	12				
life cycle assessment	12	13	7	rock phosphate	7	7	5	sugarcane	14	15	8				
macroalgae	15	17	5	soil fertility	32	40	20	urea	4	4	5				
microalgae	32	45	19	strawberry	11	12	5	vermicompost	45	76	38				
npk	12	15	5	water stress	9	9	8	yield	74	141	58				
nutrient recovery	8	10	7	zea mays	17	19	7								
nutrient recycling	6	9	7												
optimization	13	17	7												
phytotoxicity	12	16	7												
pyrolysis	9	15	7												

Cluster 1

48 items

	links	link strength	occurrences
renewable energy	12	19	7
rice straw	8	8	5
seed germination	7	7	5
sewage sludge	18	23	14
soil	23	26	9
soil quality	12	12	10
sustainability	23	31	16
vermicomposting	12	12	6
waste management	15	19	10
wastewater treatment	6	7	5
zinc	10	11	5

Cluster 5

25 items

	links	link strength	occurrences
am fungi	10	10	5
aspergillus niger	5	9	7
bacteria	23	30	12
bioproducts	11	13	6
bioremediation	26	39	17
consortium	9	9	7
endophytes	15	16	8
fungi	8	9	5
heavy metals	16	18	11
inoculants	7	9	5
inoculum	13	14	6
microbes	9	10	5
mycorrhiza	35	45	17
nitrogen fixation	32	54	25
nodulation	20	37	14
nutrients	18	23	11
organic acids	14	18	10
organic waste	11	12	6
phosphate	7	9	7
phosphate solubilization	37	63	23
phytoremediation	9	10	5

Cluster 6

21 items

	links	link strength	occurrences
bacillus megaterium	12	13	8
bio-organic fertilizer	11	12	9
biocontrol	38	70	29
biological nitrogen fixation	28	42	13
biopesticide	12	25	9
co-inoculation	15	15	6
colonization	16	16	5
cotton	9	11	6
crop yield	12	14	8
endophyte	27	40	12
fruit quality	5	7	5
growth promotion	27	34	12
indole-3-acetic acid	12	13	5
microbiome	19	22	7
nutrient use efficiency	20	23	5
paenibacillus polymyxa	11	16	6
phosphate-solubilizing bacteria	8	8	5
plant growth promotion	44	75	39
plant growth-promoting rhizobacteria (pgpr)	11	13	6
rhizobia	27	30	11
saline soil	10	14	7

Cluster 7

17 items

	links	link strength	occurrences
azospirillum	33	53	22
azotobacter	38	69	32
bacillus	27	36	19
banana	7	9	6
bio-fertilizers	13	14	13
growth	28	55	25
liquid biofertilizer	3	3	5
microbial inoculants	13	15	7
nutrient uptake	40	52	21
organic fertilizers	6	7	7
plant growth promoting rhizobacteria (pgpr)	4	7	6
psb	32	61	23
pseudomonas	23	34	19
solanum lycopersicum	5	6	5
tomato	33	48	23
trichoderma	14	17	9
vam	10	19	6

Cluster 8

15 items

	links	link strength	occurrences
azospirillum brasilense	7	8	6
azotobacter chroococcum	21	32	14
bio-fertilizer	48	64	34
bradyrhizobium	13	16	6
diversity	9	10	7
formulation	11	11	5
inoculant	21	25	8
lycopersicon esculentum	8	10	5
nitrogen-fixing bacteria	7	11	8
phyto-toxicity	10	21	7
pseudomonas fluorescens	17	20	11
soybean	30	37	14
triticum aestivum	12	15	5
vitis vinifera	6	11	5
vitormone	8	17	5

Cluster 5

25 items			
	links	link strength	occurrences
plant growth	30	38	16
root colonization	11	15	8
symbiosis	13	17	6
vinasse	10	12	6

Cluster 9

13 items			
	links	link strength	occurrences
acc deaminase	27	36	8
amf	8	8	5
azadirachta indica	3	5	5
bacterial community	7	12	7
biofertilization	24	30	20
cadmiun	10	14	7
drought stress	15	17	10
fatty acids	7	8	8
organic input	3	5	10
rhizosphere	48	88	31
salinity	23	30	19
salt stress	17	21	13
wheat	52	78	31

Cluster 10

8 items			
	links	link strength	occurrences
biostimulant	9	15	9
compost	29	40	23
fenugreek	9	11	5
manure	21	27	12
organic production	5	7	5
rhizobium	28	48	19
solanum tuberosum	7	8	5
sustainable	13	16	6

Supplementary Material 3: Biopesticide

Cluster 1				Cluster 2				Cluster 3				Cluster 4			
40 items				39 items				30 items				22 items			
	links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences
alkaloids	8	8	5	acetylcholinesterase	6	6	5	allelochemicals	6	8	7	antibacterial	12	14	6
aphid	11	14	7	aedes aegypti	19	21	12	allelopathy	10	12	9	antibacterial activity	8	9	6
aphids	9	10	5	agriculture	13	18	10	bio-herbicide	7	10	5	antibiotics	12	14	7
azadirachta indica	8	11	6	biocides	4	4	5	bioassay	10	10	8	antifeedant	16	18	8
azadirachtin	25	40	29	biocontrol agent	9	10	9	biocontrol agents	13	18	7	antifungal activity	23	32	22
behavior	11	11	8	bioinsecticide	23	27	20	biodegradation	8	9	8	antimicrobial	10	12	7
bio pesticides	5	6	5	biopesticide	151	358	256	biodiversity	24	28	10	asteraceae	3	4	6
bio-pesticide	5	5	8	biosafety	26	37	15	biofertilizers	22	35	16	bio-pesticides	10	10	8
bioactivity	15	16	8	botanical insecticides	25	31	20	bioherbicide	13	13	10	botanicals	18	20	12
botanical insecticide	20	23	15	culex quinquefasciatus	13	18	8	bioherbicides	4	4	5	chemical composition	11	17	7
botanical pesticide	10	11	9	culicidae	15	20	5	biopesticides	163	451	257	crv toxins	10	14	6
callosobruchus maculatus	12	14	6	cytotoxicity	9	11	6	biosurfactant	10	16	6	ecotoxicology	11	12	5
compatibility	7	7	5	dengue	11	17	7	biotechnology	11	13	5	fungicides	6	6	6
contact toxicity	8	10	7	essential oil	41	63	34	climate change	9	9	5	insecticidal	14	15	5
control	4	6	5	essential oils	38	54	31	insect pests	26	36	13	insecticides	18	19	11
cowpea	13	16	7	fish	3	3	5	medicinal plants	9	13	7	lipopeptides	9	12	7
cypermethrin	4	6	5	fumigant	7	8	5	mode of action	19	23	10	pest	11	12	6
entomopathogenic nematodes	15	17	8	gc-ms	14	18	8	nanotechnology	28	35	15	pesticides	36	47	29
enzymes	6	7	6	histopathology	7	8	5	pest control	13	22	14	phytopathogens	22	35	12
extraction	5	5	6	insecticide resistance	20	24	9	phytotoxicity	12	16	11	plant extracts	21	31	20
greenhouse	5	6	5	larvicidal	14	15	9	plant diseases	11	19	5	repellence	8	10	5
imidacloprid	7	7	5	larvicidal activity	12	17	9	plant pathogens	5	7	6	secondary metabolites	22	33	17
ipm	36	48	27	larvicide	13	15	6	resistance	16	19	7				
microbial diversity	8	8	6	midgut	9	10	5	rhamnolipid	9	11	5				
mortality	14	15	14	monoterpenes	8	9	6	rnai	6	6	5				
natural enemies	12	12	8	mosquito	14	17	9	soybean	8	10	6				
natural products	15	22	12	mosquito control	19	27	13	sustainable agriculture	26	44	18				
neem	15	19	9	mosquitoes	16	19	10	synergy	10	12	5				
neem oil	10	11	9	musca domestica	11	14	8	weeds	16	16	5				
okra	12	14	6	nanoformulations	9	12	5	wheat	11	12	7				
organic farming	16	17	8	nanoparticles	16	21	7								
repellency	10	11	5	phytochemicals	17	21	9								
saponins	8	10	8	plant esential oils	8	8	6								
sesquiterpenes	9	10	5	plants	10	10	5								
sitophilus zeamais	9	9	5	repellent	16	21	12								
spodoptera frugiperda	12	13	8	silver nanoparticles	12	14	7								
spodoptera litura	11	13	14	spodoptera littoralis	6	9	7								
thrips	10	11	5	toxicity	38	53	31								
tribolium castaneum	7	8	5	zika virus	11	15	5								
whitefly	10	13	5												

Cluster 5

20 items			
	links	link strength	occurrences
aflatoxin	8	13	6
antagonism	23	25	7
antifungal	19	24	18
artemisa absinthium	4	5	5
aspergillus flavus	12	21	11
biocontrol	73	142	74
biofertilizer	12	26	14
botanical pesticides	28	36	20
cellulose	6	7	5
fermentation	12	16	8
growth	11	13	9
mass production	8	9	5
pgpr	12	23	8
plant extract	9	10	7
plant growth promotion	9	16	5
pseudomonas fluorescence	6	9	6
rizosphere	22	26	10
seed treatment	9	10	5
trichoderma	16	25	12
yield	14	17	11

Cluster 6

20 items			
	links	link strength	occurrences
alphabaculovirus	11	11	5
baculovirus	19	34	21
biological control	100	211	115
citrus	6	8	8
crop protection	18	27	15
encapsulation	11	15	7
entomopathogenic fungi	31	68	38
entomopathogenic fungus	12	15	10
fall armyworm	9	9	5
formulation	37	48	23
genetic engineering	5	7	5
granulovirus	15	25	8
integrated pest management	54	100	43
lepidoptera	25	34	16
microbial control	28	41	16
nucleopolyhedrovirus	12	24	9
pathogenicity	15	19	9
shelf life	4	7	5
stability	5	5	6
virulence	17	24	15

Cluster 7

20 items			
	links	link strength	occurrences
biofumigation	5	5	5
brinjal	4	5	5
chemical pesticides	11	14	6
cotton	12	13	5
efficacy	22	27	12
helicoverpa armigera	14	17	15
maize	18	19	7
management	26	31	16
meloidogyne incognita	12	14	7
microbes	12	13	8
pest management	34	45	26
registration	18	23	7
regulation	21	29	11
risk assessment	13	16	10
rna interference	7	8	7
semiochemicals	20	24	8
spinosad	29	41	21
spodoptera exigua	8	10	6
sustainability	15	17	7
tomato	36	46	23

Cluster 8

12 items			
	links	link strength	occurrences
antimicrobial activity	12	14	8
bacillus subtilis	23	43	18
bio-fungicide	10	22	7
biofungicide	17	25	17
induced resistance	12	12	5
insecticidal activity	19	21	23
milastin-k	7	22	6
nematicidal activity	8	9	7
phyto-toxicity	7	22	6
plant protection	22	26	15
rhizobacteria	20	32	13
vitis vinifera	10	12	6

Cluster 9

10 items			
	links	link strength	occurrences
bacillus thuringiensis	65	117	86
beauveria bassiana	30	67	45
chitinase	19	27	15
cry toxin	5	7	5
entomopathogen	14	25	10
isaria fumosorosea	7	14	7
metarhizium anisopliae	8	21	11
organic	6	8	5
plutella xylostella	14	18	12
streptomyces	12	13	8

Cluster 10

10 items			
	links	link strength	occurrences
bacillus	9	10	7
bacteria	19	33	13
entomopathogens	17	30	11
fungi	20	36	13
integrated pest management (ipm)	14	19	9
mycoinsecticides	13	16	5
nematodes	15	21	8
pseudomonas	9	11	6
tetranychus urticae	13	15	9
vector control	6	6	6

Cluster 11

8 items			
	links	link strength	occurrences
bioinsecticides	8	9	10
insect pest	9	10	5
microencapsulation	11	12	7
sublethal effects	9	13	9
synergism	13	16	8
terpenes	9	10	5
trichoderma harzianum	8	11	7
tuta absoluta	10	11	5

Cluster 12

5 items			
	links	link strength	occurrences
fungicide	14	25	12
herbicide	11	22	8
insecticide	26	53	21
metharhizium	6	8	5
pesticide	22	30	15

Supplementary Material 4: Compost

Cluster 1				Cluster 2				Cluster 3				Cluster 4			
30 items				25 items				22 items				18 items			
	links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences		links	link strength	occurrences
agriculture	16	19	11	anaerobic digestion	19	33	14	acid mine drainage	6	6	5	ammonia	8	10	6
antibiotic resistance	7	11	5	bioenergy	8	9	7	adsorption	13	18	9	biodegradation	18	24	25
antibiotics	10	13	7	biofertilizer	6	8	8	aerobic composting	13	13	8	biofilter	3	4	5
compost	150	421	300	biogas	21	34	16	agricultural waste	12	14	10	biofiltration	3	5	6
cover crops	11	16	7	biomass	17	22	12	arsenic	5	5	5	c/n ratio	11	14	8
crop yield	11	11	5	carbon sequestration	14	18	14	biodegradability	3	3	5	composting	98	200	139
degradation	7	9	10	circular economy	19	25	14	cellulose	6	8	5	earthworms	16	20	9
dissipation	11	17	9	climate change	18	21	10	compost maturity	9	9	6	enzyme activities	9	10	9
earthworm	11	11	6	energy	8	10	5	heavy metal	27	39	20	greenhouse gases	15	23	8
ecosystem services	9	10	6	environment	8	9	5	heavy metals	32	49	33	hydrogen sulfide	7	9	6
fertilization	10	10	5	fertilizer	20	29	18	humic acid	4	4	6	inoculation	10	12	7
immobilization	9	9	6	food waste	16	29	16	humic substances	15	19	12	microbial communities	8	8	5
incubation	5	5	5	greenhouse	11	12	7	metals	6	7	5	microbial population	7	10	6
irrigation	7	7	5	greenhouse gas	14	17	9	microbial activity	14	15	9	municipal solid waste	14	21	15
manure	45	76	36	life cycle assessment	13	16	8	microorganisms	7	7	6	nitrogen loss	11	14	6
mechanical porperties	3	3	5	methane	11	16	10	nutrients	13	16	10	pollution	9	9	7
mineralization	12	12	5	organic waste	33	48	22	organic carbon	8	8	6	sewage sludge	40	63	29
organic amendment	13	15	11	recycling	14	16	9	organic manure	13	15	12	vermicomposting	19	27	14
organic amendments	17	19	15	sludge	11	16	11	rice	7	8	6				
organic farming	5	5	5	soil organic carbon	9	9	8	soil remediation	11	14	6				
organic matter	26	37	20	solid waste management	9	11	7	substrate	7	9	8				
organic waste management	6	7	5	sustainability	21	24	18	wastewater treatment	7	11	6				
persistance	6	9	5	sustainable agriculture	13	18	8								
soil	39	59	32	waste	8	8	6								
soil fertility	20	30	21	waste management	26	46	17								
soil health	19	21	9												
soil organic matter	12	13	6												
soil quality	17	19	12												
soil salinity	6	7	5												
temperature	10	13	6												

Cluster 5

18 items			
	links	link strength	occurrences
antibiotic resistance genes	11	13	7
cattle manure	9	9	5
co-composting	25	29	18
compost quality	10	12	9
digestate	17	25	11
fungi	10	11	9
green waste	17	22	11
humification	9	11	6
lignocellulose	9	11	5
maturity	12	16	8
metagenomics	10	15	8
microbial community	13	16	9
network analisys	9	10	6
phytotoxicity	9	11	9
productivity	10	10	6
seed germination	7	7	5
straw	16	20	12
thermophilic	4	5	5

Cluster 6

16 items			
	links	link strength	occurrences
compost leachate	5	6	5
essential oil	11	11	5
growth	14	24	9
lead	10	12	8
microbial biomass	17	19	11
nutrient	12	13	5
nutrient uptake	11	13	8
organic manures	13	15	7
proline	13	15	5
quality	10	13	6
salinity	8	10	7
soil amendments	7	7	8
soil properties	17	23	13
spent mushroom composte	17	19	12
yield	36	56	28
zeolite	12	14	8

Cluster 7

15 items			
	links	link strength	occurrences
amendments	10	12	9
arbuscular mycorrizal fungi	14	15	7
bioavailability	11	12	7
biochar	72	138	73
bioremediation	16	18	10
biowaste	10	11	5
contamination	7	9	5
germination index	4	5	5
humus	11	13	6
maize	17	22	13
metal(loid)s	7	12	5
phytoremediation	14	16	16
remediation	15	19	13
soil degradation	9	10	6
toxicity	9	9	6

Cluster 8

11 items			
	links	link strength	occurrences
chemical fertilizer	10	14	7
food safety	6	7	5
green waste compost	6	6	5
organic fertilizer	14	17	16
physicochemical properties	7	11	7
pig manure	14	19	10
poultry manure	10	15	12
rice straw	5	7	6
soil amendment	13	19	9
trichoderma	3	4	5
vermicompost	51	70	45

Cluster 9

10 items			
	links	link strength	occurrences
aeration	11	16	5
agaricus bisporus	10	11	6
biocontrol	5	6	5
compost tea	4	4	9
enzyme activity	17	19	10
fermentation	10	10	5
germination	3	4	7
organic agriculture	9	11	9
secondary metabolites	5	6	5
substrates	9	9	6

Cluster 10

10 items			
	links	link strength	occurrences
bulk density	16	21	8
composting process	13	13	5
growing media	12	16	5
humic acids	6	7	5
lignin	16	21	9
particle size	16	17	6
peat	14	18	5
physical properties	19	22	6
plant growth	25	31	11
sawdust	14	16	5

Cluster 11

8 items			
	links	link strength	occurrences
micronutrients	10	11	5
nitrogen	23	37	19
organic	5	5	7
organic fertilization	3	3	5
organic fertilizers	3	3	10
phosphorus	16	30	16
potassium	8	14	7
soil enzymes	6	6	5

Cluster 12

6 items			
	links	link strength	occurrences
animal manure	8	11	6
antibiotic resistance gene	7	12	6
bacterial community	13	25	13
chicken manure	13	18	9
dissolved organic matter	6	12	6
fungal community	9	12	5