The information and results presented come from the INTERREG ReCon Soil research programme. The results presented are not generalizable due to the heterogeneity of the materials.

Treated dredged sediment / agricultural topsoil mixture

Description

Dredged estuarine sediments were collected from Tancarville (Seine River Estuary), France. The sediments were electrokinetically treated to reduce metal and salt contents and then mixed with agricultural soil to make a reconstructed soil (Reconstructed Soil 2).
Intended use: Reconstructed Soil 2 was used to grow courgette plants.
Mixture preparation: Reconstructed Soil 2 comprised 30 % treated sediments and 70 % agricultural soil

Collection of dredged sediments (a) and treatment using electrokinetics(b)

Fertility

The mixture was relatively fine since the sediments were significantly finer than the agricultural soil used

Physical properties

		Unit	Result	Interpretation
bD [(a)]		g.cm^{-3}	1.19	*Good bulk density for plant growth -*
Soil moisture content at field capacity		mm/1cm depth	ND	
WHC [(b)]			ND	
Particle size distribution	< 2µm	g.kg^{-1} dry mass	4.1	*Silt loam*
	2 – 64µm		70.6	
	64-2000µm		25.3	
	Organic matter content		4.9	Rich in organic matter
Illite + smectite		%	29.4	*~3% swelling clay minerals*
Aggregate stability		MWD[(c)] (mm)	ND	

(abD : bulk density ; (b) WHC : Plant-Available Water Holding Capacity ; (c) MWD : mean weight diameter
ND: not determined

Chemical properties

	Unit	Result	Interpretation
pH	-	8.04	*Alkaline*
CEC Metson	meq.100g^{-1}	ND	
Total $CaCO_3$	%	10.9	*As calcite and dolomite*
Total C		2.72	
Organic C		ND	
Total N		0.16	
C/N		17	
P Olsen		ND	
Conductivity	mS/cm	6.5	*Saline*

Chemical composition

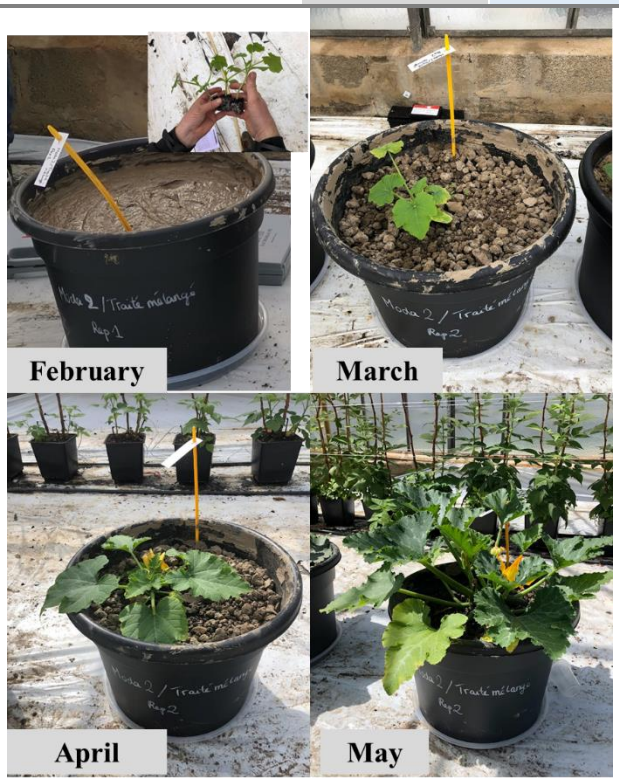
Major elements

	Unit	Result
Al	g.kg^{-1}	50.8
Ca		43.9
Fe		5.5
K		22.7
Mg		4.3
Mn		0.4
Na		4.9
P		1.4
Si		268
Ti		2.2

Trace elements

	Unit	Result	Interpretation[(c)]
As	mg.kg^{-1}	9.6	-
Ba		384	-
Cd		<0.1	-
Cr		<1.4	-
Cu		38.3	-
Mo		1.5	-
Ni		36.2	-
Pb		48.9	-
Se		ND	-
Zn		83.1	-

[(c)] Comparison with geochemical background values



The growth of courgette in Reconstructed Soil 2 (© ReCon Soil)

Microbiology:

Microbial diversity

Enzymatic activity involved in the carbon cycle

These parameters were not measured for the soil mix. An assessment of the soil microbiome could range from a measure of microbial abundance (fluorescene diacetate assay through to measurement of the presence of specific enzymes) to microbial sequencing to identify bacterial and fungal species present. Analysis of fatty acids may also give an indication of the bacterial/fungal abundance and balance.

Plant Growing and plant health

Yield ($t.ha^{-1}$)

Results	Interpretation
This section can be used to give an indication of the growing potential of the soil in terms of plant yield.	

Courgette fruit analysis (trace elements)

	Unit	Results	Interpretation
As	$mg.kg^{-1}$	<0.1	
Cd		ND	
Cr		<0.02	
Cu		0.64	0.51 in fruits grown in control
Pb		<0.02	
Zn		2.4	1.9 in fruits grown in control