

LIFE SUBSED - LANDFARMING TO VALORIZE PHYTOREMEDIATED MARINE SEDIMENTS FOR THEIR REUSE IN NURSERY

C. MACCI¹, S. DONI¹, D. MANZI¹, E. PERUZZI¹, F. VANNUCCHI¹, M. CASTELLANI², G. MASCIANDARO¹

¹CNR-IRET, via Moruzzi 1, 56124, Pisa, Italy; ²Flora Toscana Soc. Agr. Coop, Via Montecarlo, 81, 51017 Pescia (Pistoia), Italy

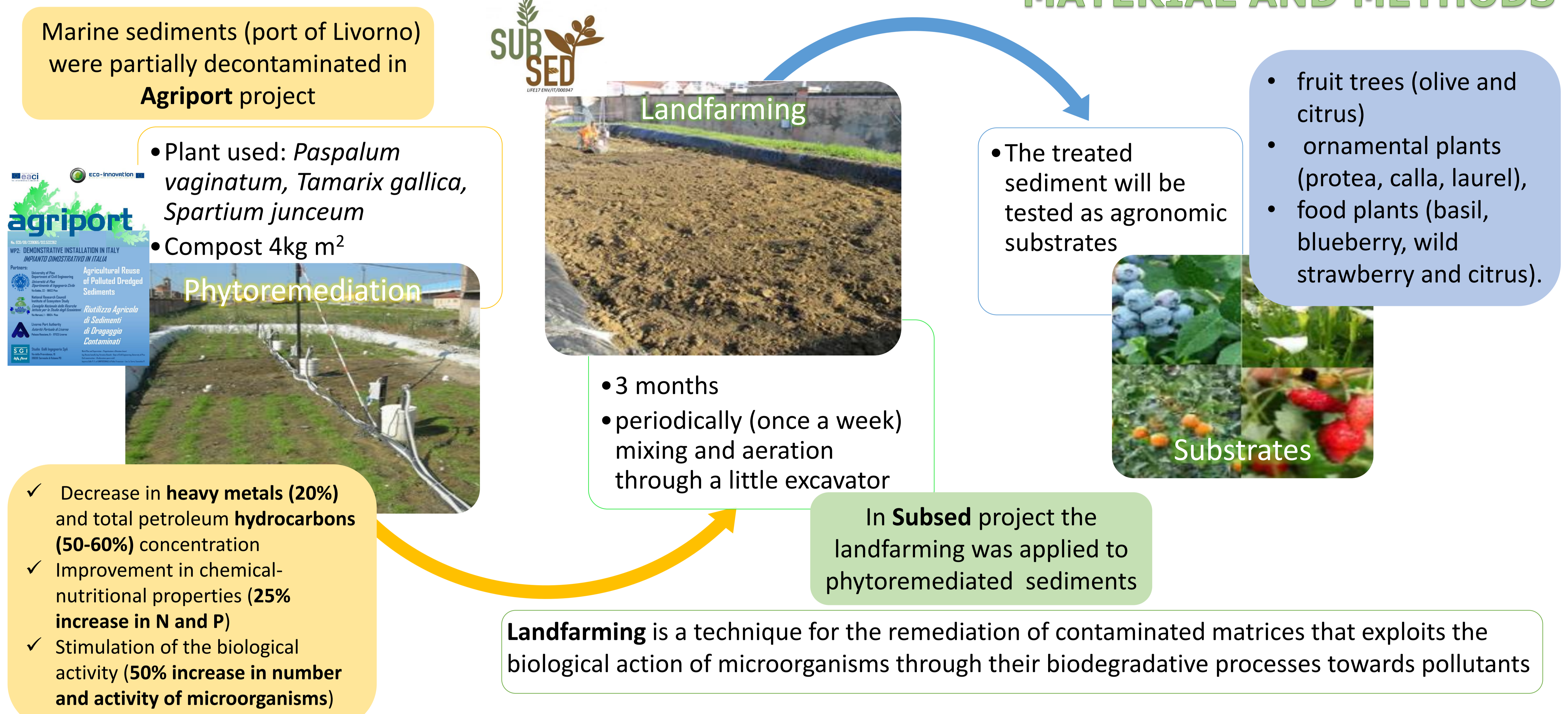
Email: cristina.macci@cnr.it



INTRODUCTION

The management of dredging sediments represents a great problem. In Europe every year up to 100-200 million m³ of contaminated sediments are dredged and need to be treated in order to be reused. Phytoremediation and landfarming represent two biological methods for the remediation of polluted sediments. The aim of **SUBSED project** is to demonstrate the suitability of landfarming process on marine phytoremediated dredged sediments to create a new substrate able to replace the conventional one

MATERIAL AND METHODS

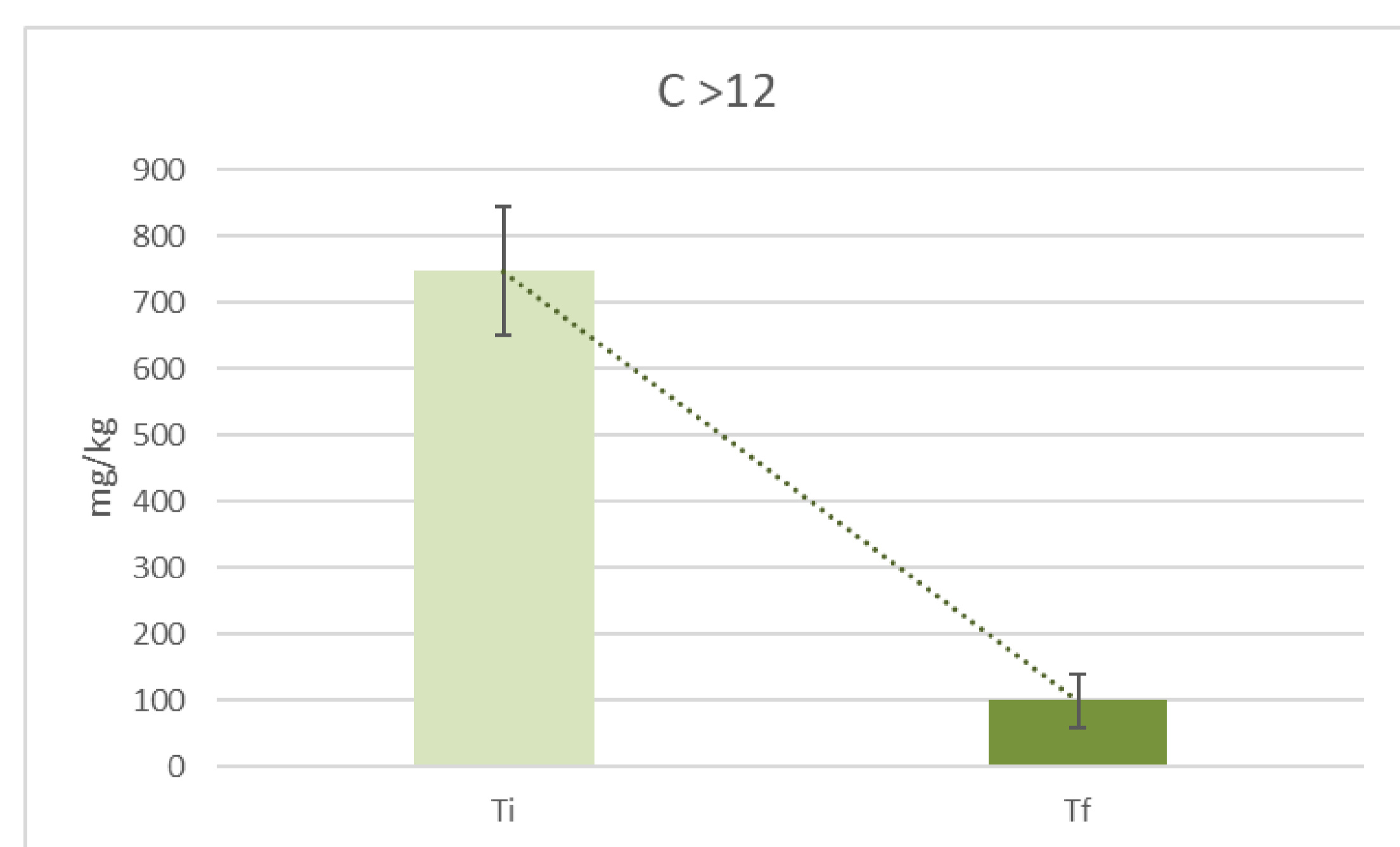


LANDFARMING RESULTS

		Ti	Tf	D.Lgs 75/2010
Bulk density	g/cm ³	1.49 ± 0.004	1.19 ± 0.05	0.95
pH		7.5 ± 0.1	7.4 ± 0.02	4.5-8.5
EC	dS/m	0.26 ± 0.03	0.14 ± 0.02	<1
Cation Exchange Capacity	meq/100g	12.6 ± 1.1	12.6 ± 0.1	-
Total Organic Carbon	%	1.35 ± 0.08	1.38 ± 0.08	4
Total Phosphorus	%	0.042 ± 0.002	0.037 ± 0.002	-
Total Nitrogen	%	0.11 ± 0.01	0.11 ± 0.01	<2.5
Cu	mg/kg	45 ± 6	49 ± 2	230
Zn	mg/kg	151 ± 2	146 ± 4	500
Ni	mg/kg	38 ± 2	38 ± 1	100
Pb	mg/kg	39 ± 2	37 ± 6	140
Cr	mg/kg	60 ± 5	50 ± 4	150
Butyrate esterase	mmol/kg h	455 ± 53	317 ± 16	

- ✓ The **bulk density** and the **conductivity** significantly decreased at the end of landfarming process
- ✓ As expected, no variations for **heavy metals** were detected

✓ **Hydrocarbon C>12** decrease noticeably (<100 mg/kg)



In compliance with Italian regulation for agronomic substrate (D.lgs. 75/2010) with the exception of **TOC** (lower) and **bulk density** (higher)

to reach the limits required, mixing of sediments with a source of organic matter rich in carbon and light, such as **peat, coconut fiber, wood fiber**, is necessary

Conclusion The landfarming process was effective in homogenizing the treated sediments and reducing organic contamination, reaching suitable physical and chemical characteristics for its use for agricultural sector in association with other substrates.