

The background of the slide is a photograph of a lush green field filled with various leguminous plants, including tall stalks and clusters of red and yellow flowers. In the distance, there are scattered trees under a clear sky.

# Mitigação e Adaptação às Alterações Climáticas com Pastagens Permanentes Semeadas Biodiversas Ricas em Leguminosas



# Baseline situation in Montado areas

2

Around 1 million hectares of low productive natural pasture in Montado, an open savannah-like agro-forestry ecosystem dominated by cork and holm oaks

**"Natural"**



Spontaneous pastures or fallow areas from long cereal rotations



Shrub invasion



Tillage

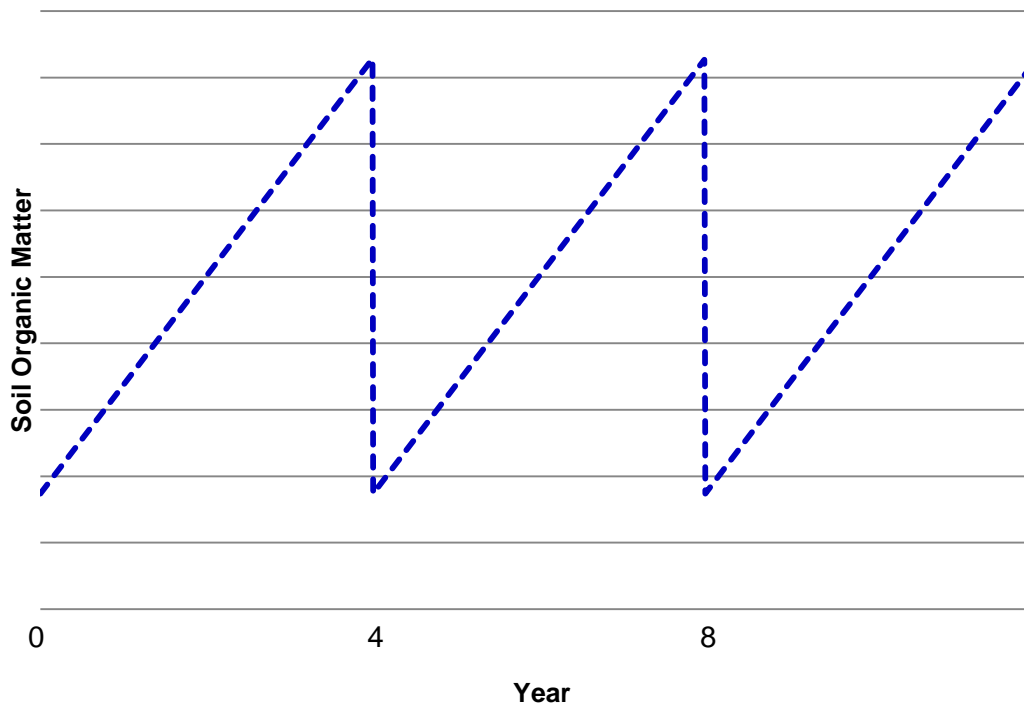


Lack of natural regeneration

# Baseline situation in Montado areas

3

Shrubland is controlled every 2 to 4 years by harrowing which causes soil loss and degradation, tree damage and other negative environmental impacts.



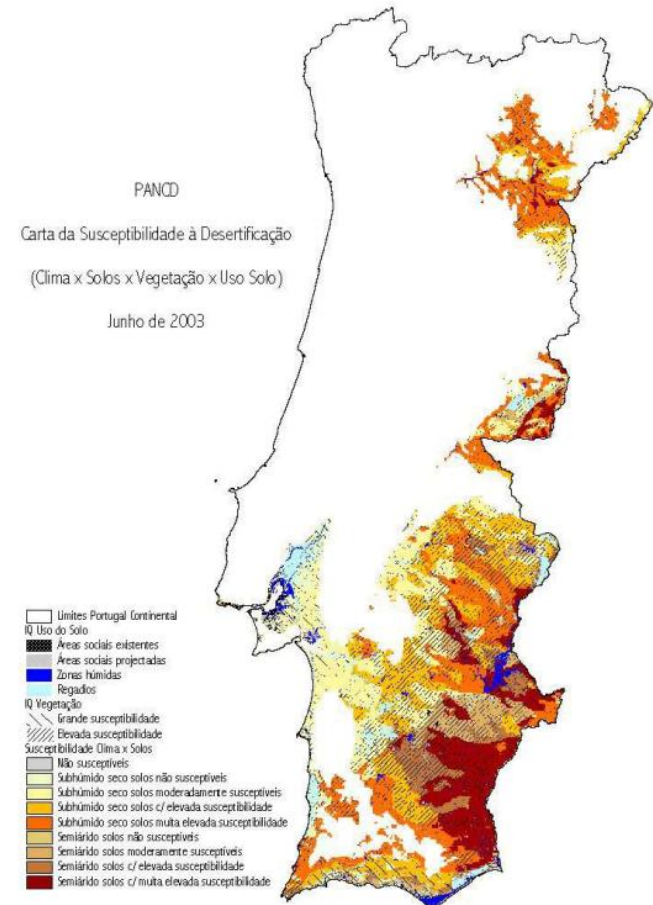
# Baseline situation in Montado areas

4

## Cork oak dieback



## High susceptibility to desertification (PAN - UNCCD, 2008)





# Benefits from the Soil Organic Matter (SOM)

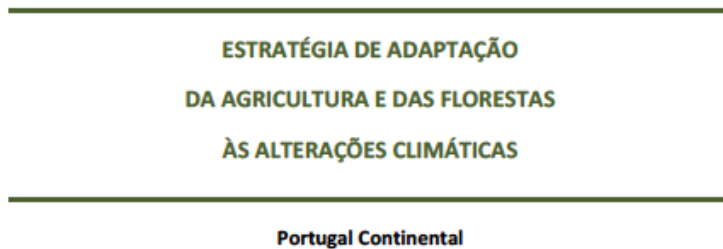
5



Adaptado de <http://www.organicagriculture.co/soil-organic-matter.php>

# Adaptation strategy

6



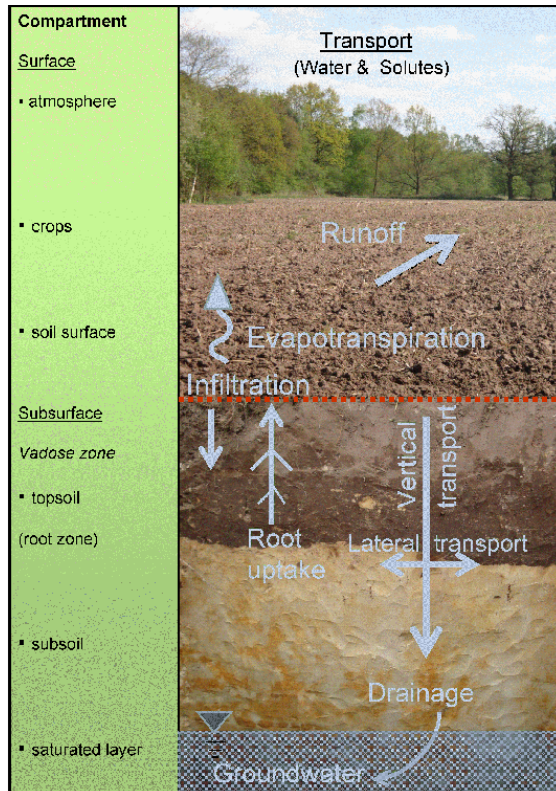
Abril 2013

“...há que considerar os impactos (...) sobre a matéria orgânica, (...) componente (...) importante para o desempenho de funções ambientais e ecológica dos solos, como a fertilidade, o sequestro de carbono e a regulação hidrológica e a biodiversidade”

# Benefits from the Soil Organic Matter (SOM)

7

- Improves water balance



<http://www.sckcen.be/en/Media/Images/Our-Research/RD-disposal-of-waste/%28offset%29/40>

- Decreases soil erosion





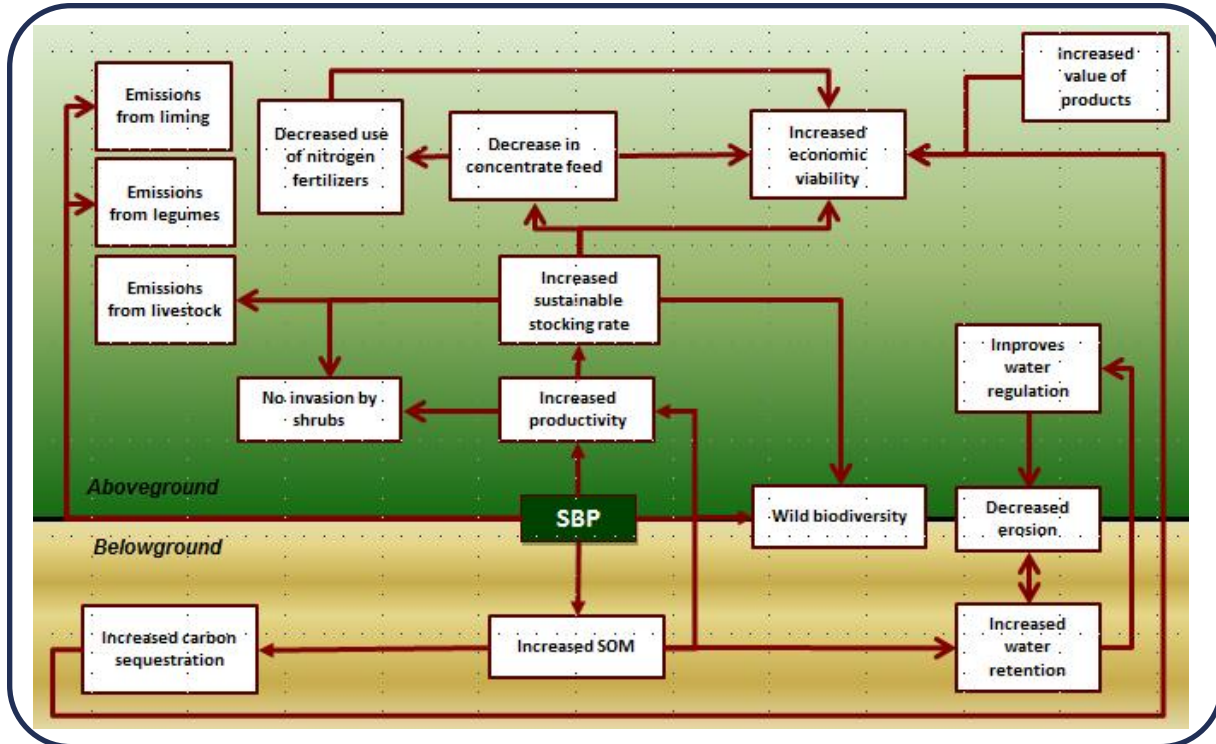
# Sown Biodiverse Pastures

8

Sown Biodiverse Pastures



...permanent, rich in legumes









# Sown Biodiverse Pastures

## Species and varieties at Herdade da Defesa de Cima:

### Legumes:

	<i>Trifolium subterraneum</i>	<i>ssp. Subterraneum</i>	<i>cv. Dalkeith, Losa, Seaton, Park, Woogenellup, Campeda</i>
	<i>Trifolium subterraneum</i>	<i>ssp. Yanninicum</i>	<i>Gosse, Napier</i>
	<i>Trifolium subterraneum</i>	<i>ssp. Brachycalycinum</i>	<i>Antas</i>
	<i>Trifolium balansae</i>		<i>Frontier, Paradana</i>
	<i>Trifolium resupinatum</i>		<i>Prolific</i>
	<i>Trifolium vesiculosum</i>		<i>Cefalu</i>
	<i>Trifolium incarnatum</i>		<i>Contea</i>
	<i>Biserrula pelecinus</i>		<i>Mauro, Casbah</i>
	<i>Ornithopus sativus</i>		<i>Cádiz, Erica, Margarita</i>
	<i>Ornithopus compressus</i>		<i>Charano</i>

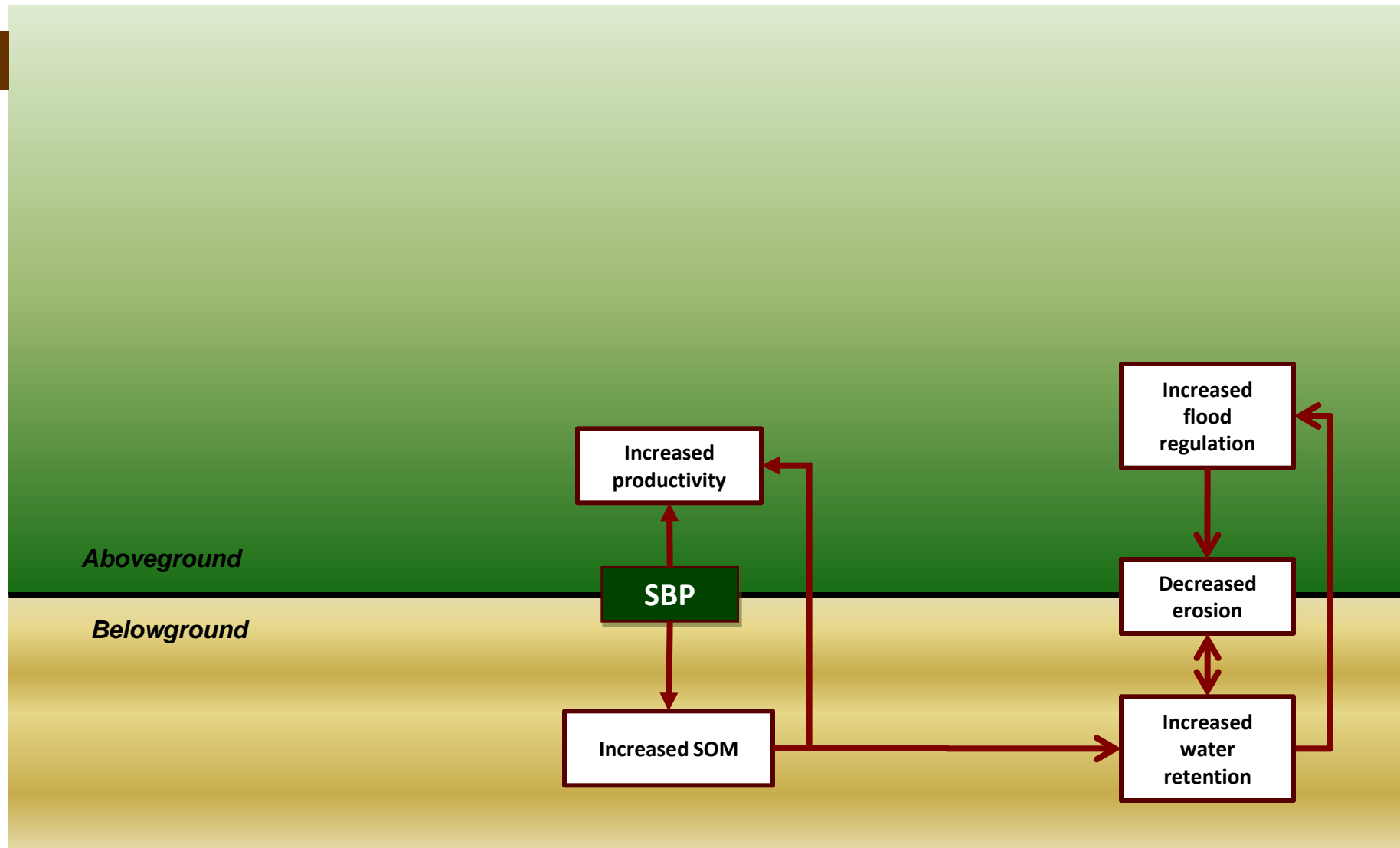
### Grasses:

	<i>Lolium multiflorum</i>	<i>Pollanum, Litoro</i>
	<i>Dactylis glomerata</i>	<i>Currie</i>



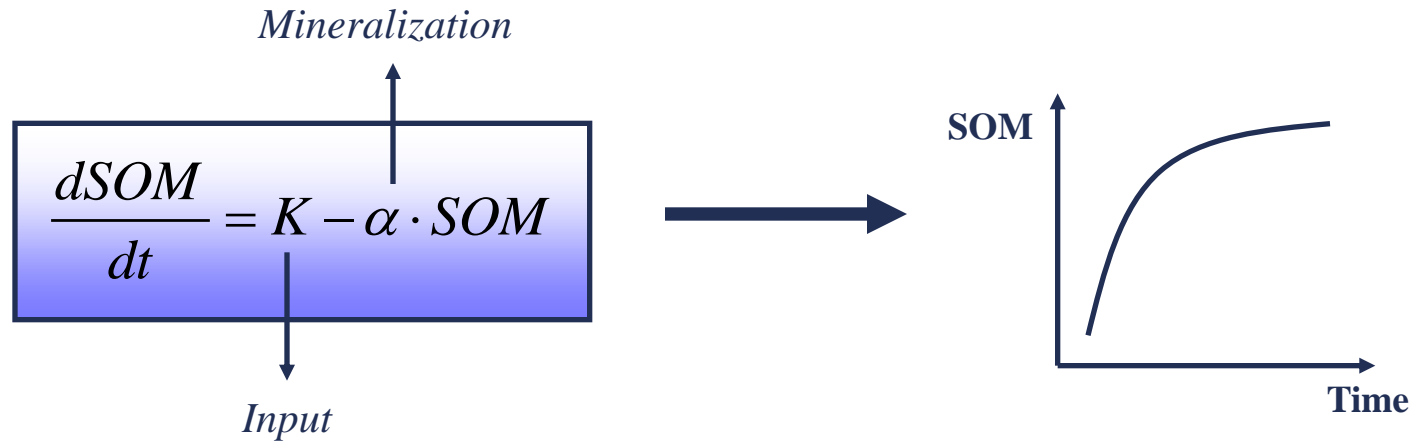
# Sown Biodiverse Pastures (SBP) increase Soil Organic Matter (SOM)

11



# Sown Biodiverse Pastures (SBP) increase Soil Organic Matter (SOM)

12



Two possibilities for the statistical determination of parameters:

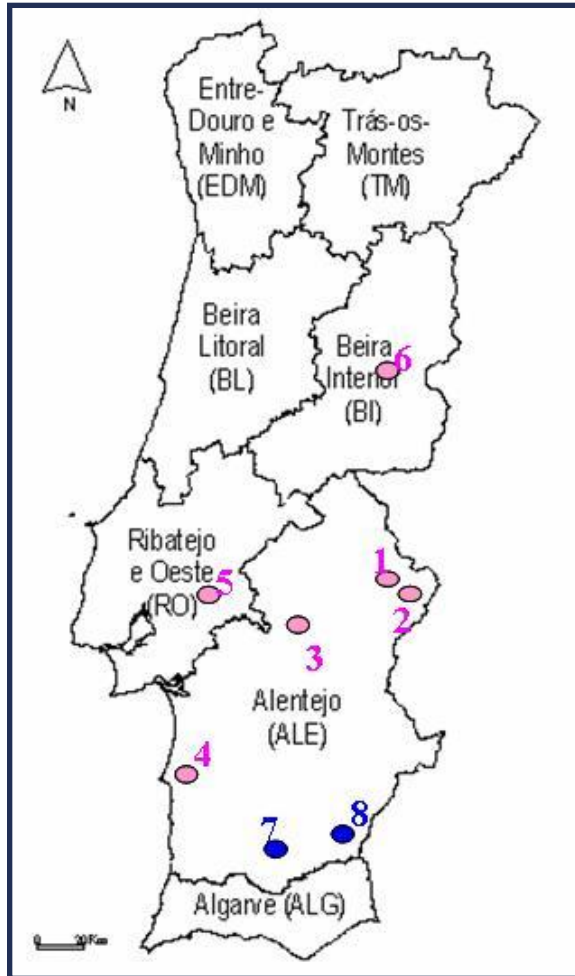
- **Specific model** (all parameters are a function of the grassland system)
  - Three different models, one for each grassland system (NG, FNG, SBPPRL)
- **Pooled model** (mineralization rate is constant between grassland systems)
  - One single regression for all grassland systems

Carneiro, J.P., et al. (Eds.), (2005). *Relatório Final do Projecto AGRO 87*. Estação Nacional de Melhoramento de Plantas, Universidade de Évora, Instituto Superior de Agronomia, Direcção Regional de Agricultura do Alentejo, Fertiprado, Laboratório Químico Agrícola Rebelo da Silva.



# Sown Biodiverse Pastures (SBP) increase Soil Organic Matter (SOM)

13

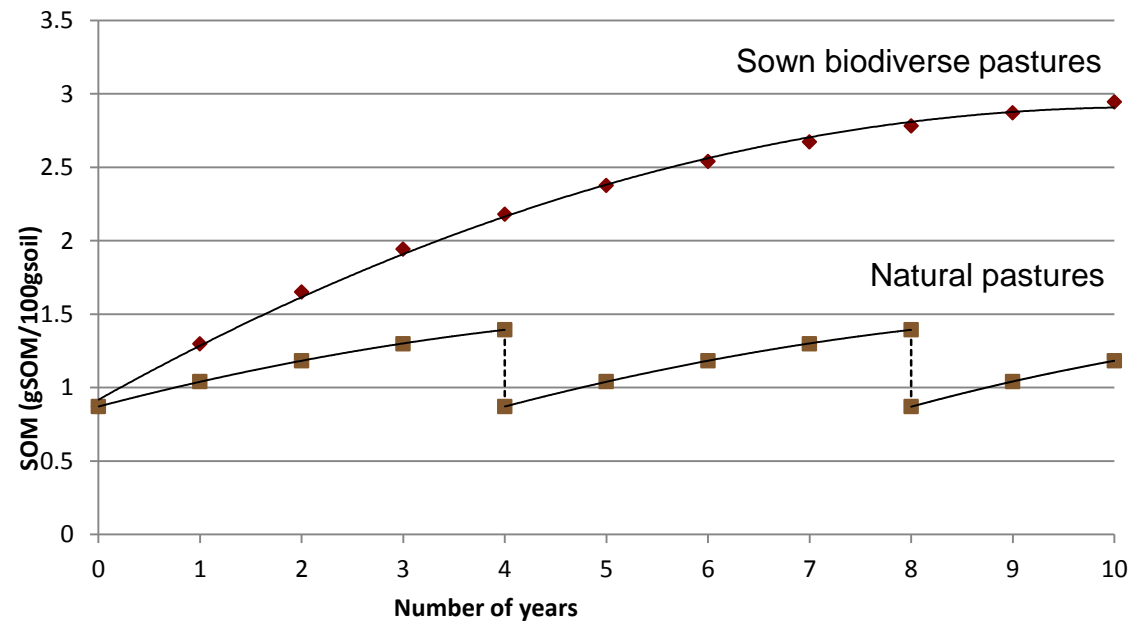
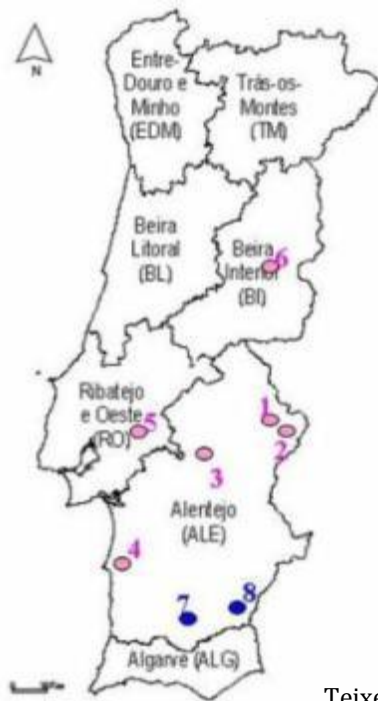


Farm No.	Grassland system	SOM (%)				
		2001	2002	2003	2004	2005
1	SBPPRL	1.55	-	3.05	3.60	3.80
1	FNG	1.30	-	2.60	3.40	3.00
2	SBPPRL	1.75	-	2.65	2.70	5.40
2	FNG	1.95	-	3.00	4.50	3.50
2	NG	1.95	-	2.70	4.00	4.00
3	SBPPRL	-	0.73	1.20	1.63	1.60
3	FNG	-	-	1.10	1.40	2.00
3	NG	-	-	1.10	1.20	1.15
4	SBPPRL	3.40	3.08	5.10	4.60	5.60
4	FNG	3.80	-	4.70	5.40	5.60
4	NG	3.80	-	4.70	5.60	-
5	SBPPRL	0.65	-	1.00	1.28	1.50
5	FNG	0.55	-	1.10	1.15	1.25
5	NG	0.55	-	-	0.75	0.55
6	SBPPRL	1.82	-	2.40	2.18	2.70
6	FNG	1.75	-	2.90	2.70	2.70
6	NG	1.75	-	3.10	2.40	-
7	SBPPRL	0.55	0.83	1.14	1.60	-
7	NG	1.10	1.20	1.20	1.33	-
8	SBPPRL	0.80	1.40	1.54	2.08	-
8	NG	0.84	1.06	1.10	1.45	-

Carneiro, J.P., et al. (Eds.), (2005). *Relatório Final do Projecto AGRO 87*. Estação Nacional de Melhoramento de Plantas, Universidade de Evora, Instituto Superior de Agronomia, Direcção Regional de Agricultura do Alentejo, Fertiprado, Laboratório Químico Agrícola Rebelo da Silva.

# Sown Biodiverse Pastures (SBP) increase Soil Organic Matter (SOM)

14



Teixeira, R., Domingos, T., Costa, A.P.S.V., Oliveira, R., Farropas, L., Calouro, F., Barradas, A.M., Carneiro, J.P.B.G. (2011). Soil organic matter dynamics in Portuguese natural and sown grasslands. *Ecological Modelling* 222: 993-1001



António Mendes D' Oliveira, (Herdeiros)

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Contribuinte n.º 900 606 657

Tel. 045 / 52298 - 52351 - Herdade do Rebôlo

MOSTEIROS - 7340 Arronches

FACTURA

Nº 102

Data 24/09/2010

Ex.º Sr. TERRAPRIMA SERVIÇOS AMBIENTAIS, SOCIEDADE UNIPESSOAL, LDA.

Morada QUINTA DA FRANÇA

CONTR. N.º 508759790

VEÍCULO

CARIA

Quant.	DESIGNAÇÃO	Preço Unit.	IVA Taxa	Importância
	<u>SEQUESTRO DE CARBONO EM PASTAGENS SEHEADAS BIODIVERSAS RICAS EM LEGUMINOSAS - PROGRAMA DE APOIO A PROJECTOS NO PAIS.</u>			
<u>19,08</u>	<u>HECTARES</u>	<u>50,72</u>		<u>967,74</u>
			<u>21%</u>	<u>203,22</u>
	<u>TOTAL</u>			<u>1170,96</u>

Local de carga

Local de descarga

Data / /

Data / /

Hora saída

Hora prov.

Certificado



Terraprima

Certificado

**Terraprima - Serviços Ambientais, Lda.**, declara que  
*Herdade da Ribeira do Carbono*

participou no Projecto Terraprima - Fundo Português de Carbono  
e sequestrou, no ano de 2010, 700 toneladas de CO<sub>2</sub>,  
através das Pastagens Permanentes Semeadas Biodiversas  
Ricas em Leguminosas, contribuindo para o cumprimento  
do Protocolo de Quioto por Portugal e simultaneamente  
prestando múltiplos serviços ambientais.

Não é transaccionável.

Tiago Domingos  
Gestor do Projecto



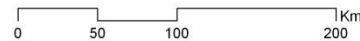
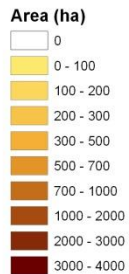
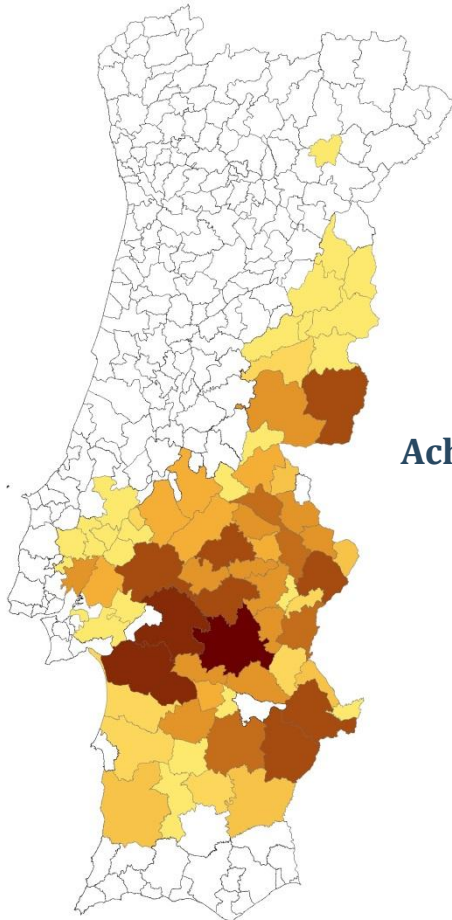
Fundo português de Carbono



# Project Sown Biodiverse Pastures

## Project Terraprima/FPC 2009-2014

17



### Achievements:

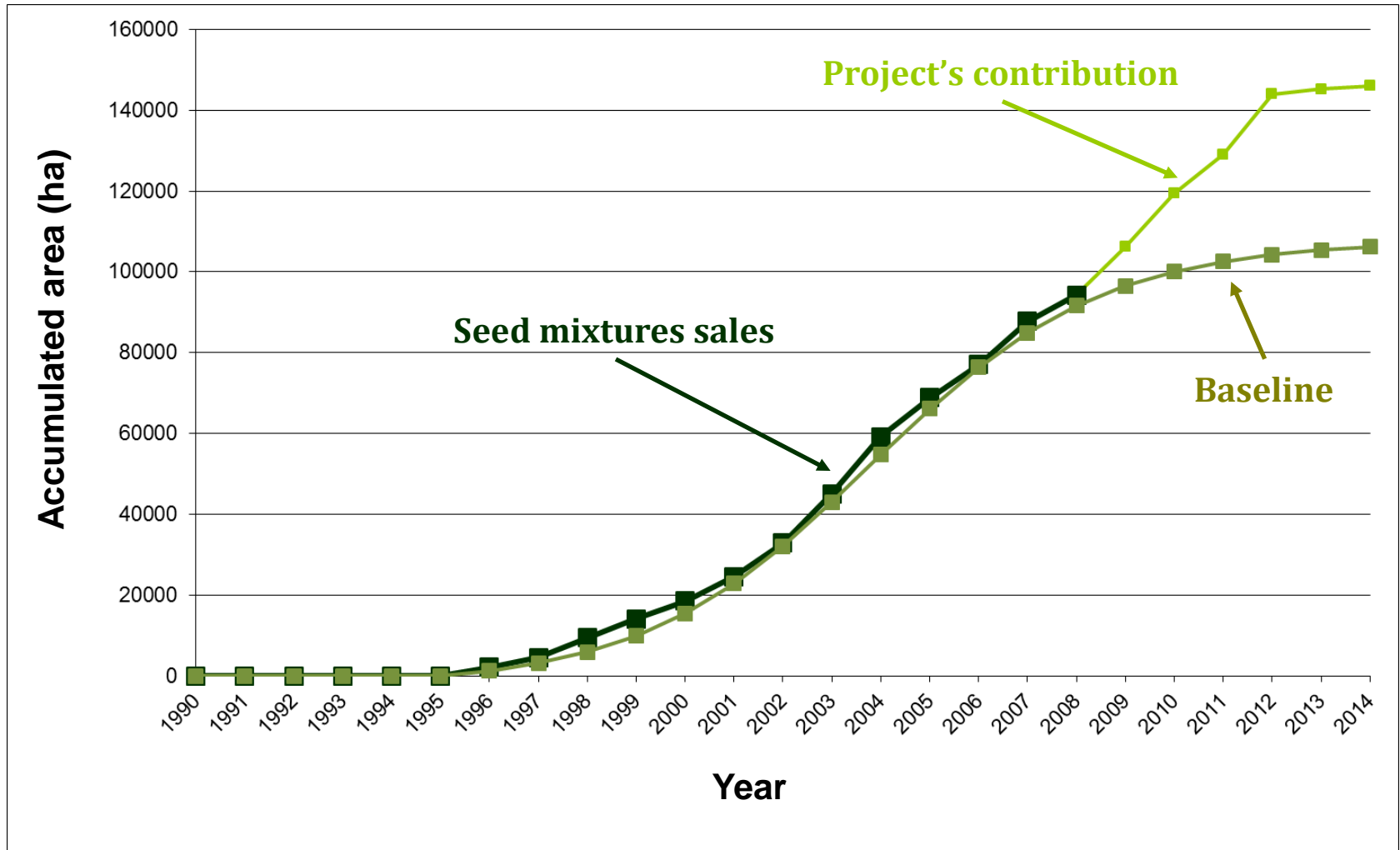
- 50,000 ha
- 1 Mt CO<sub>2</sub>





# The scale of the project's implementation

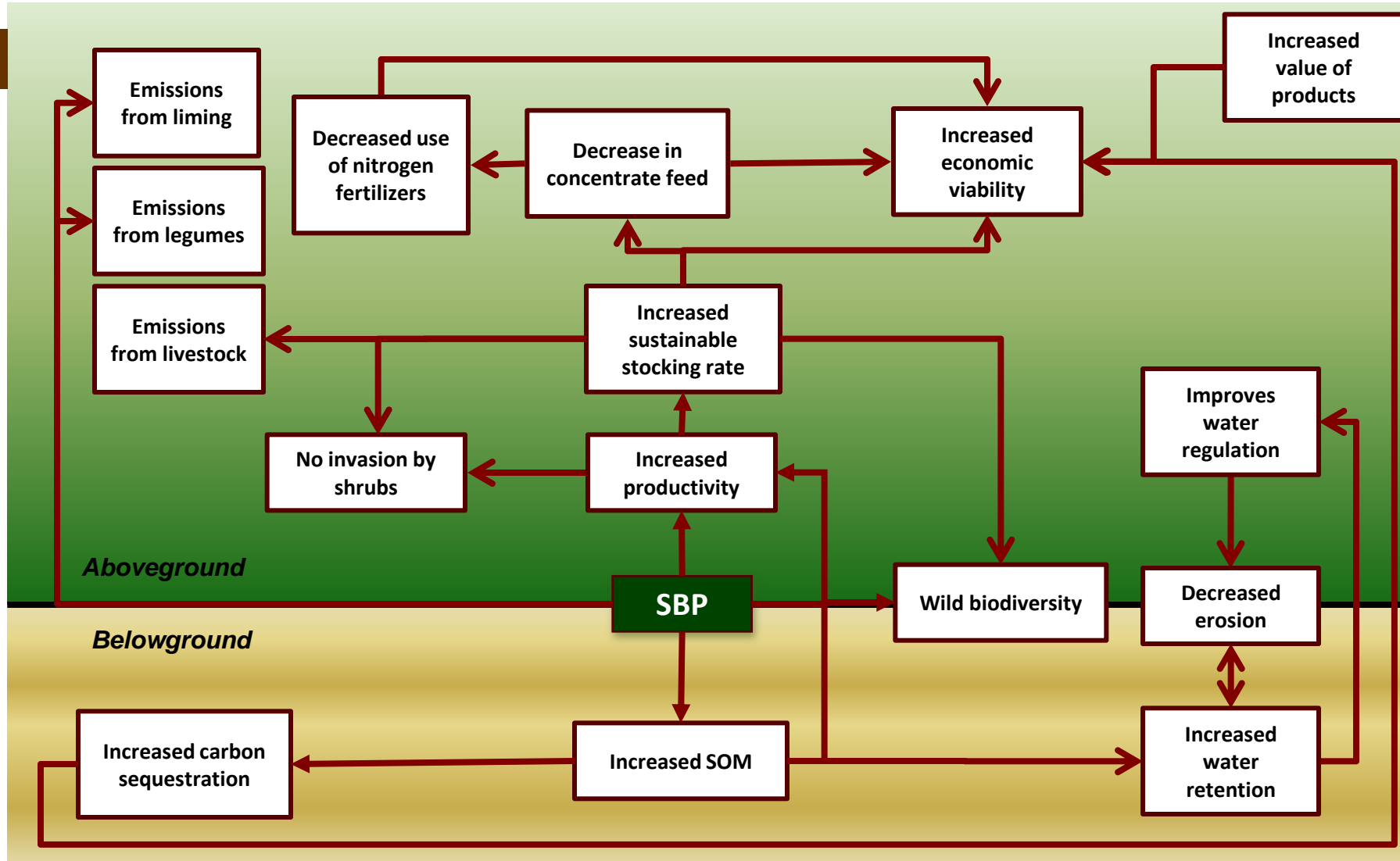
18



# Sown Biodiverse Pastures

## An integrated approach

19



## TWO EXAMPLES OF SOIL CONSERVATION PROJECTS THAT MITIGATE AND ADAPT TO CLIMATE CHANGE



GALARDÃO REDE CLIMÁTICA  
OURO



semi-finalist  
Land for Life

### Project Sown Biodiverse Pastures



<http://youtu.be/WR4tINbSXp4>



a world you like  
with a climate you like

<http://world-you-like.europa.eu/pt/>



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