

Autecology of the **WILD PEAR**

Pyrus pyraster (L.) Du Roi

Fr. : Poirier Commun
 Sp. : Peral silvestre (Peral, Piruetano, Perojo, Peral bravio, Peruyero)
 Cat. : Perera (Perera borda)
 It. : Pero selvatico (Pero pirastro, Perastro)
 Ger. : Holzbirne (Wildbirne, Birnbaum, Birne)

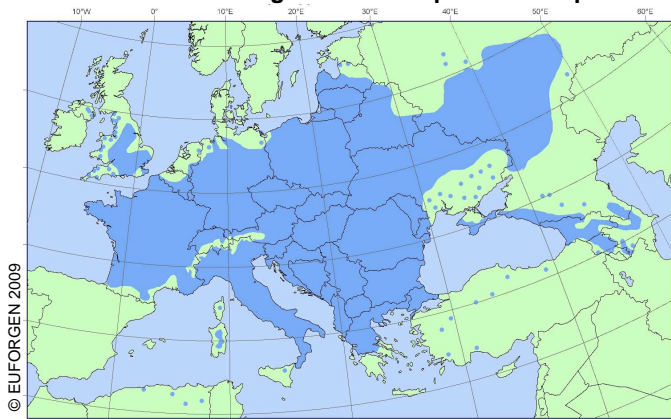


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GEOGRAPHICAL DISTRIBUTION

- Species with a large natural range: **Eurasian**, extending into **Sub-Atlantic** areas [10].
- Found everywhere in France, but less common in the Mediterranean region and in the North of France [10]; generally present in the mountainous region in the northern third of Spain, especially in hardwood forests [2].

Natural range of the Wild pear in Europe



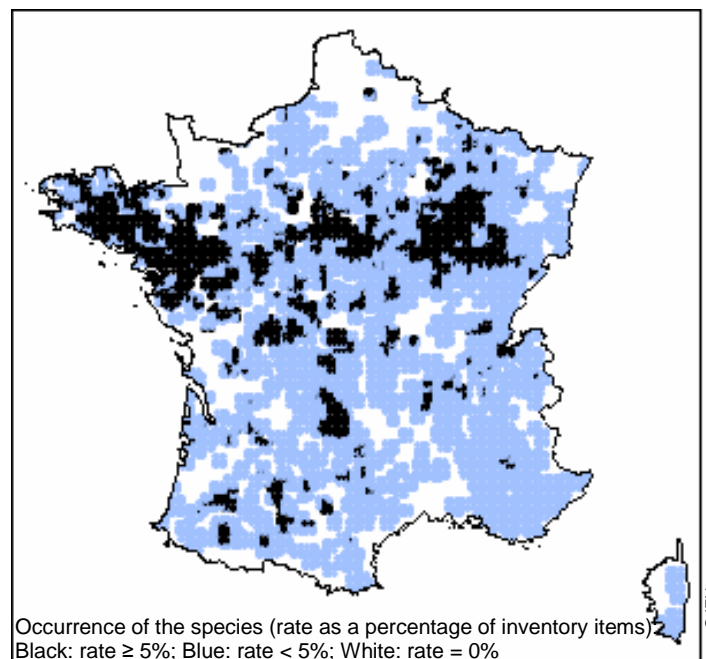
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Distribución del Peral silvestre en España



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Distribution of the Wild pear in France



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CLIMATE AND TEMPERAMENT

Bioclimatic conditions

- Thermophilic species, resistant to cold [4, 10, 8], but prefers warm topoclimates in areas with harsh climates¹ [10, 8]; considered sensitive to late frost [1].

Summary of bioclimatic requirements and sensitivities of the Wild pear tree

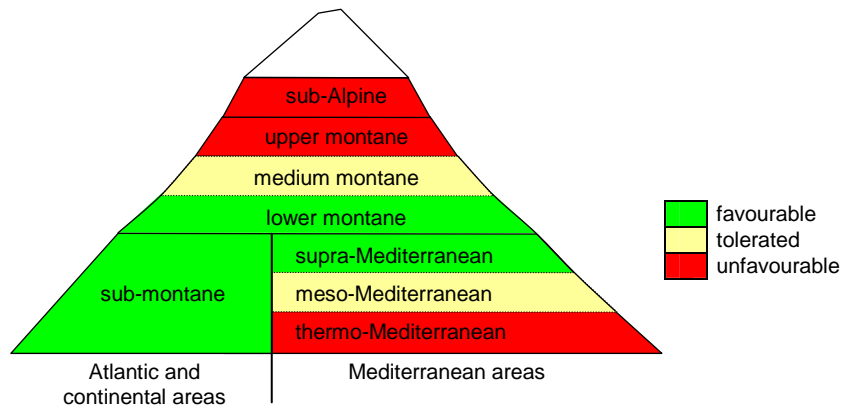
Warmth requirements	Sensitivity					
	cold	late frost	early frost	sticky snow	wind	drought
Moderate	Very low	Moderate	Low	-	Very low	Low

¹ topoclimate: variation of the local climate resulting from exposure or a particular topographic position.

Vegetation stages

- Low altitude species [4,12] occurring from sub-montane to lower montane stages up to 1200 m and at the supra-Mediterranean stage [10].

Distribution of the Wild pear according to vegetation stages



Temperament

- Fairly light-demanding [48,12, 2], especially at the adult stage [1]; can tolerate partial shade [10,5], but does not grow to a large size under cover [1].
- Sensitive to competition; tends to grow towards the light (phototropic) [1]; reacts well to canopy opening [1].



Sensitivity to competition for light	Phototropic tendency
High	Moderate

SOILS

Water and drainage

Water supply:

- Non-demanding species [10,8,12], able to grow with limited water resources [1] but fairly demanding for timber production[4]; optimum growth on fresh soils [5, 2].

Waterlogging:

- Sensitive to poor root oxygenation [8], but can colonise humid environments [1].

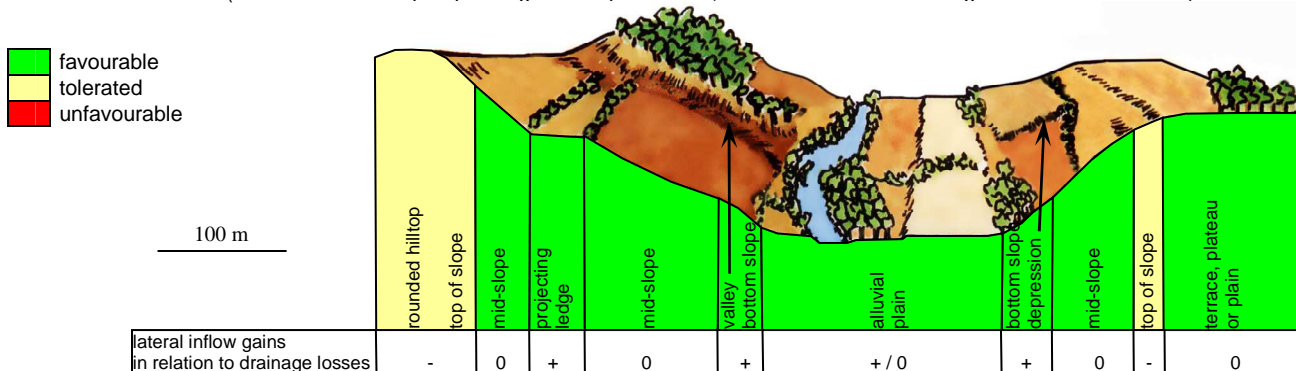
Drainage and excess water

		a	b	c	d	h	i	e	f	g
Natural drainage		excessive	good	moderate	imperfect	poor	very poor	partial	virtually non-existent	non-existent
Water table	temporary	Redox horizon with rust patches	absent or > 90cm	60-125cm	40-80cm	20-50cm	0-30cm	20-50cm	0-30cm	
	permanent	reductive waterlogged horizon	-	-	-	-	-	> 80cm	40-80cm	< 40cm

(from the *Species Ecology* file, Ministry of the Walloon Region, 1991, amended [8])

Favourable topographic situations for the Wild pear with regard to water supply

(involved in the morpho-pedological compensations, to be modulated according to the climate and soil)



Texture and materials

- Varied, equally clayey and loamy, with more or less coarse components [10]. Compact soils limit growth [8].

Soil textures favourable for growth of the Wild pear

(involved in the morpho-pedological compensations, to be modulated according to the climate and soil)

very sandy S	coarse SA, LS, SL	loamy LmS, Lm, LI, LIS	intermediate LAS, LSA, LA, AL	clayey A, AS	very clayey Alo
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green = favourable
yellow = tolerated
red = unfavourable

Nutrients

Nutritive elements:

- Species with a wide range [13], but optimum growth on rich soils [4,8,9,1,5, 2].

Nitrogen and phosphorus:

- Demanding species (mull humus) [10,8].

Lime in fine soil:

- Not affected [10,1].

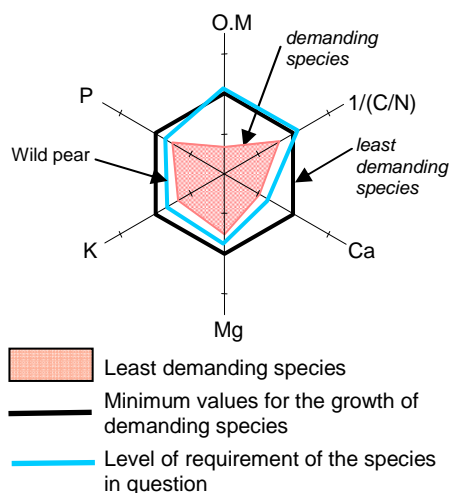
Note:

- As this species is susceptible to competition, it grows well in restrictive conditions, but thrives on all types of soils and deserves to be favoured on fertile sites [13].

Summary of water and nutrient requirements and sensitivity of the Wild pear

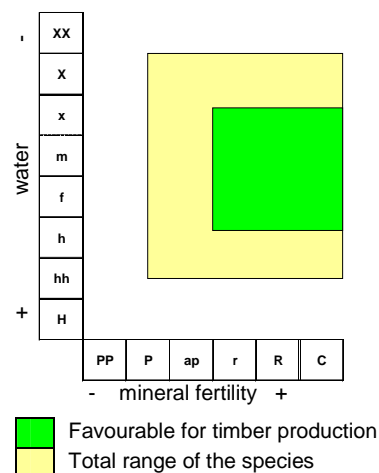
Water requirements	Moderate
Sensitivity to temporary waterlogging	High
Nutrient requirements (Ca, Mg, K)	Moderate
Nitrogen (and phosphorus) requirements	High
Sensitivity to lime in fine soil	Zero

Mineral nutrition of the Wild Pear



Ecogram for the Wild pear

(according to Rameau *and al.*, 1989,



DYNAMIC BEHAVIOUR AND CHARACTERISTICS

- Often a small-sized tree, but it can reach 20 m in height in favourable conditions [10].
- Post-pioneer species [10].
- Probably reproduces mainly from basal shoots [1].
- Fairly long-lived [32]; 150-250 years [13].
- Risk of disease related to fire blight (*Erwinia amylovora*) or cedar-apple rust (a fungal disease caused by the pathogen *Gymnosporangium juniperi-virginianae*), usually affecting cultivated pear trees [1, 7, 6, 2] and other species of the Rosaceae family (Apple, Hawthorn, etc.).
- Scattered [10] and infrequent in forest conditions due to its sensitivity to competition, despite a wide distribution range [5, 6]. This species is hard to spot in stands, which may lead to its depletion if the forest is not managed appropriately for its growth [6].
- Possible hybridization with various *Pyrus* species, including with cultivated pear trees (*Pyrus communis* L.) [1]. This constitutes a threat to preserving the genetic resources of the species [6]. It is therefore essential to ascertain the origin of artificially introduced plants or to take the risk of hybridization into account in naturally regenerating stands [6].
- Two other, smaller pear species occur in their natural state in the forest: the Plymouth pear tree (*Pyrus cordata* Desv.), an Atlantic and sub-Atlantic species, and the almond-leaved pear tree (*P. spinosa* Forssk. = *P. amygdaliformis* Vill.), a Mediterranean species [5]. In shrubby thickets, the snow pear tree also occurs (*Pyrus nivalis* Jacq.) (very localized), as well as the Iberian Pear tree (*Pyrus bourgaeana* Decne.; Piruetano, Galapero, Guadapero) present in the centre and in the west of the Iberian Peninsula [11].

MAIN FACTORS LIMITING THE PRODUCTION OF GOOD QUALITY TIMBER

- competition for light
- strong soil compaction may cause waterlogging problems
- low water balance
- mineral poverty and slow recycling humus (moder)

Autecology of the EUROPEAN WILD APPLE

Malus sylvestris Mill.

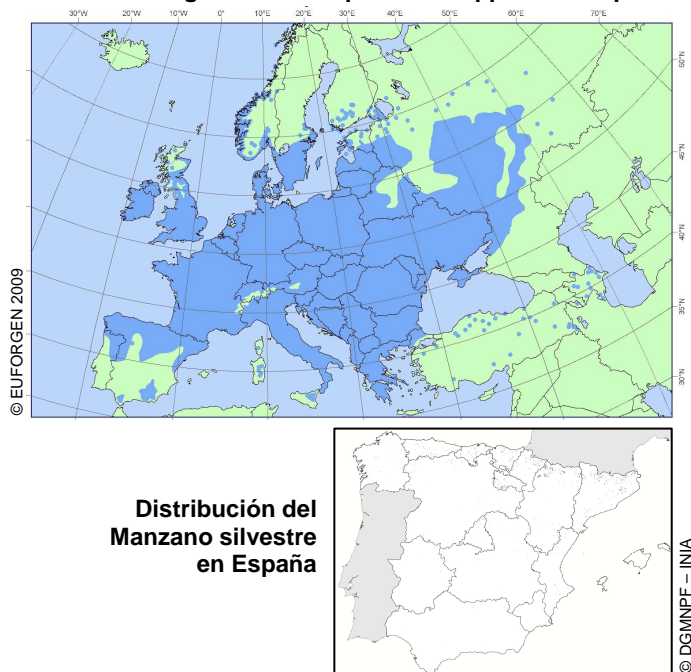
Fr. : Pommier Sauvage
 Sp. : Manzano (Manzano Silvestre, machi); Cat. : Pomera borda
 It. : Melo selvatico (Pomo selvatico)
 Ger. : Holzapfel (Wilder Apfelbaum, Wildapfel)



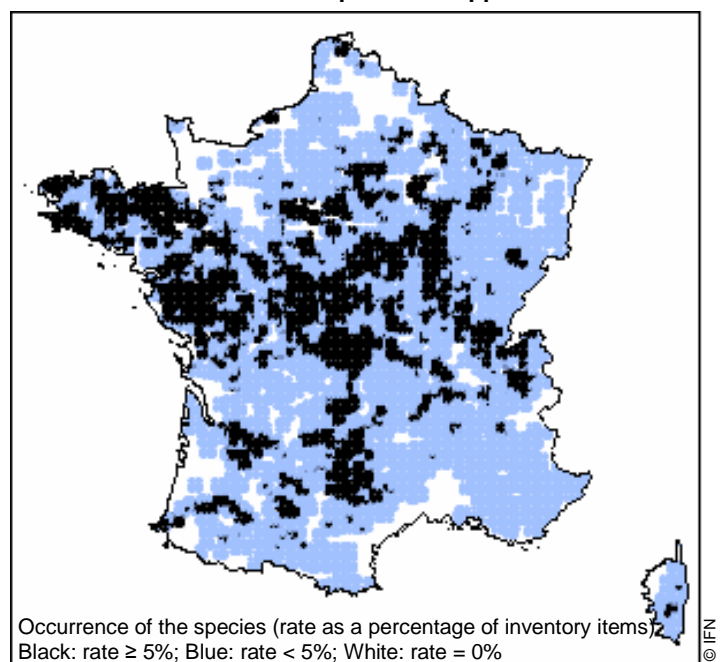
GEOGRAPHICAL DISTRIBUTION

- Species with a large natural range: Eurasian, with an affinity for the sub-Mediterranean stage [10].
- Found everywhere in France, but less common in the Mediterranean region [10]; present in Spain, mainly in the north half of the country. [11, 7]

Natural range of the European wild apple in Europe



Distribution of the European wild apple in France



CLIMATE AND TEMPERAMENT

Bioclimatic conditions

- Withstands harsh climates [8,12] and [7] cold conditions; in Spain, favours temperate climates with some humidity and without hot summers [11, 7].

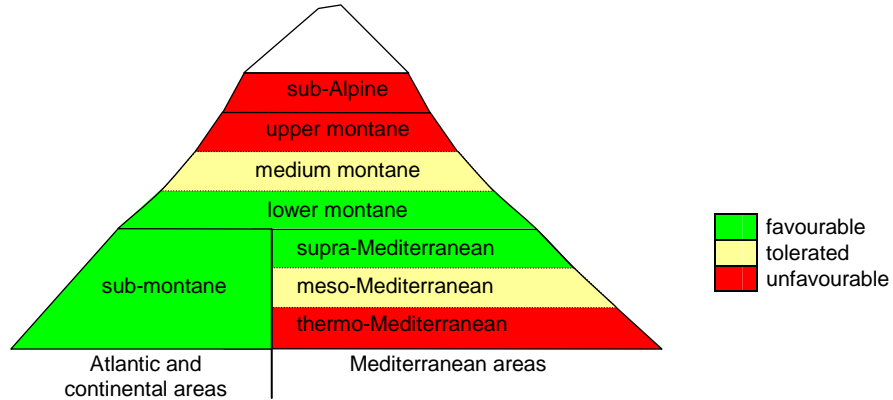
Summary of bioclimatic requirements and sensitivities of the European wild apple

Warmth requirement	Sensitivity					
	cold	late frost	early frost	sticky snow	wind	drought
Moderate	Very low	Low	Low	-	Low	Low

Vegetation stages

- From the sub-montane to the montane stage (up to 1300 m in France) [10].

Distribution of the European wild apple according to vegetation levels



Temperament

- Heliophilic, tolerates shade [10, 11], but this considerably slows its growth [5].
 - Very sensitive to competition [4,8, 9].



Sensitivity to competition for light	Phototropic tendency
High	Moderate

SOILS

Water and drainage

Water supply:

- Mesophilic [10], fairly undemanding [8], but grows best on thick, fresh soil with good water reserves [5, 11, 7].

Waterlogging:

- Sensitive [8,12].

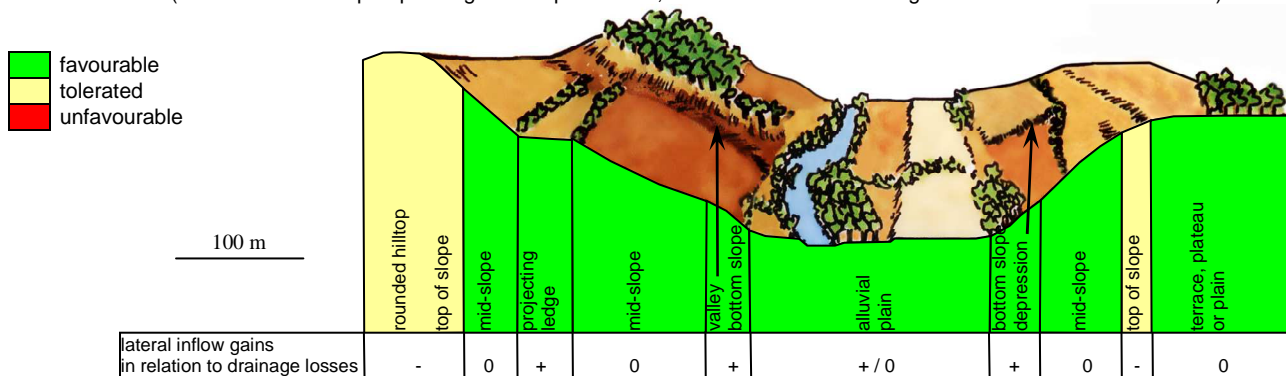
Drainage and excess water

		a	b	c	d	h	i	e	f	g
Natural drainage		excessive	good	moderate	imperfect	poor	very poor	partial	virtually non-existent	non-existent
Water table	temporary	redox horizon with rust patches	absent or > 90cm	60-125cm	40-80cm	20-50cm	0-30cm	20-50cm	0-30cm	
	permanent	reductive waterlogged horizon	-	-	-	-	-	> 80cm	40-80cm	< 40cm

(from the *Species Ecology* file, Ministry of the Walloon Region, 1991, amended [8])

Favourable topographic situations for the European Wild Apple with regard to water supply

(involved in the morpho-pedological compensations, to be modulated according to the other site characteristics)



Texture and materials

- Varied, equally clayey and loamy, with more or less coarse components [10]. Highly compacted soil limits growth [8].

Textures favouring growth of the European Wild Apple

(involved in the morpho-pedological compensations, to be modulated according to the climate and soil)

very sandy S	coarse SA, LS, SL	loamy LmS, Lm, Ll, LIS	intermediary LAS, LSA, LA, AL	clayey A, AS	very clayey Alo
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Nutrients

Nutritive elements:

- Large amplitude species [7], greater than that of the [13] pear tree, but optimum growth is on rich soils [10,8,9,5]; uncommon on acid soils [5].

Nitrogen and phosphorus:

- Demanding species (mull humus) [10,8].

Lime in fine soil:

- Not affected by low content [10, 8].

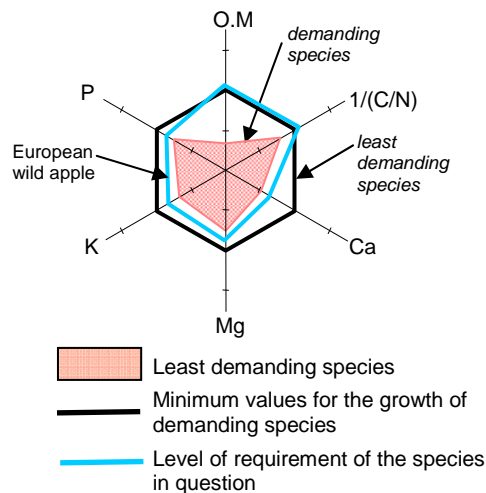
Note:

- Due to its sensitivity to competition, this species grows well on restrictive sites, but thrives on all types of soils and deserves to be favoured on fertile sites [13].

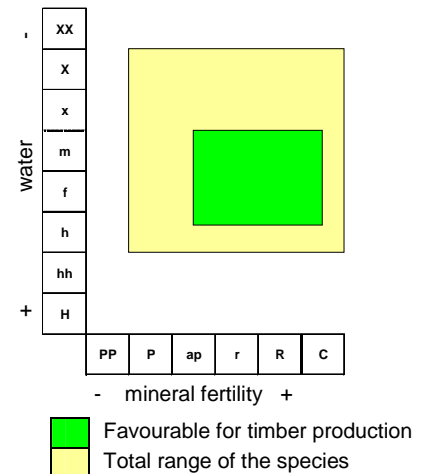
Summary of the water and nutrient requirements and sensitivity of the European wild apple

Water requirements	Moderate
Sensitivity to temporary waterlogging	High
Nutrient requirements (Ca, Mg, K)	Moderate
Nitrogen (and phosphorus) requirements	High
Sensitivity to lime in fine soil	Very low

Mineral nutrition of the European wild apple



Ecogram for the European wild apple (according to Rameau *and al.*, 1989, amended)



DYNAMIC BEHAVIOUR AND CHARACTERISTICS

- Small tree reaching 10 m in height [10].
- Life span estimated at 70-100 years [10].
- Scattered [10] and infrequent occurrence in forest conditions due to its sensitivity to competition, despite a broad distribution range [65]. The species is hard to spot in stands, which may lead to its depletion if the forest is not managed appropriately for its growth [6].
- In forest conditions, the orchard apple tree (*Malus domestica* Borkh.) can occasionally occur naturally [10]. Many individuals identified as wild apple trees on the basis of morphological criteria are also hybrids of the orchard apple tree; the risk of hybridization, currently under study, should be taken into account when managing the genetic resources of the species [3]. In particular the origin of the plants should be ascertained if artificially introduced or the risk of hybridization in natural regeneration operations should be taken into account [6].

MAIN FACTORS LIMITING THE PRODUCTION OF GOOD QUALITY TIMBER

- competition for light
- low water balance or soil waterlogging
- soil compaction may cause waterlogging problems
- mineral poverty and slow recycling humus (moder)



■ This factsheet was produced under the European POCTEFA 93/08 "Pirinoble" project (www.pirinoble.eu) involving four French and Spanish partners: CNPF - Institut pour le Développement Forestier (IDF), Centre Régional de la Propriété Forestière de Midi-Pyrénées (CRPF), Centre Tecnològic Forestal de Catalunya (CTFC), Centre de la Proprietat Forestal (CPF).

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