L’acqua nel suolo

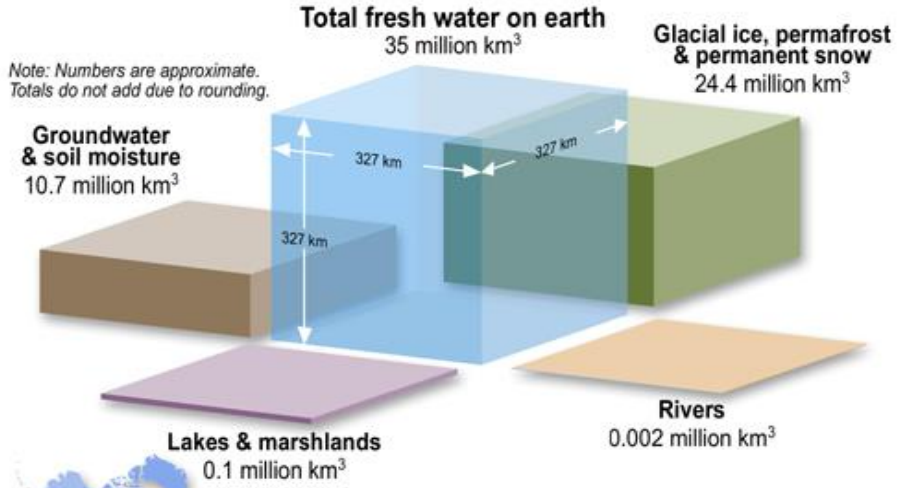
Acqua dolce





Where on earth is all that fresh water?

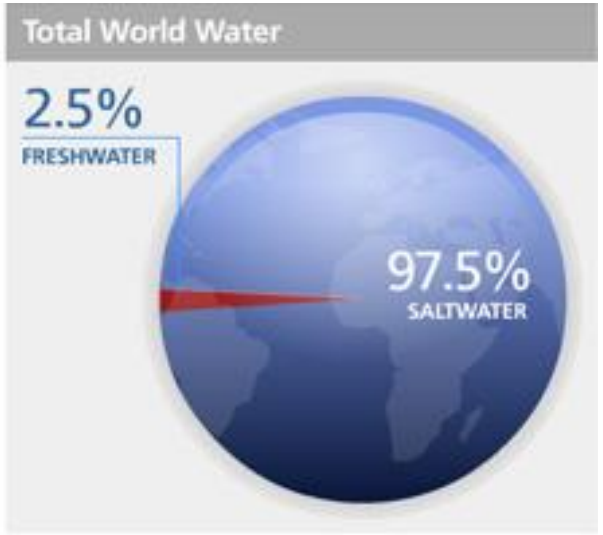
There are about 35 million km^3 of fresh water on the earth. Here's where that water is found.

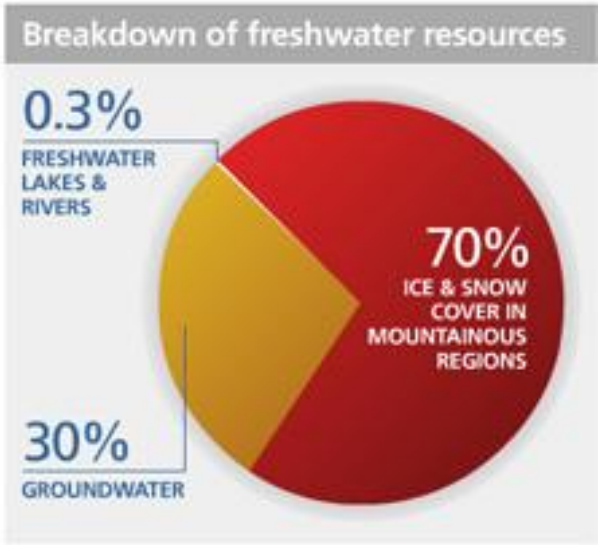


How much water is that?

There is enough fresh water on the earth to cover Canada and the United States to a depth of about 1.8 kilometres.

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Suolo: sistema complesso di sostanze organiche e minerali

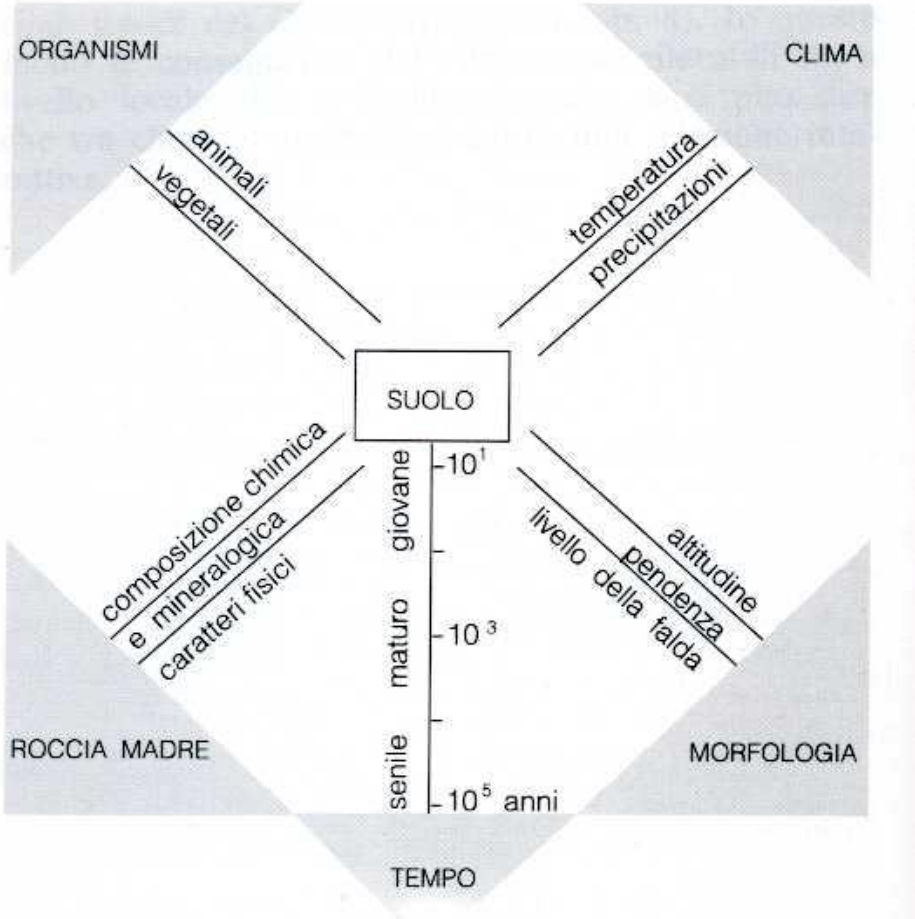


Fig. 3.1. *I principali fattori pedogenetici* (da Buol et al., 1973).

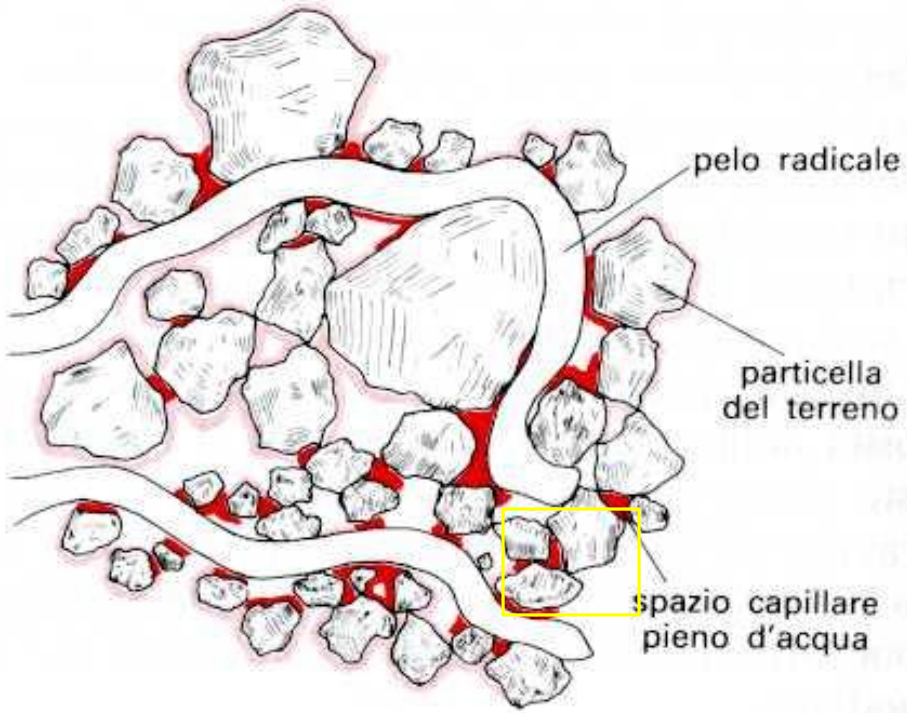
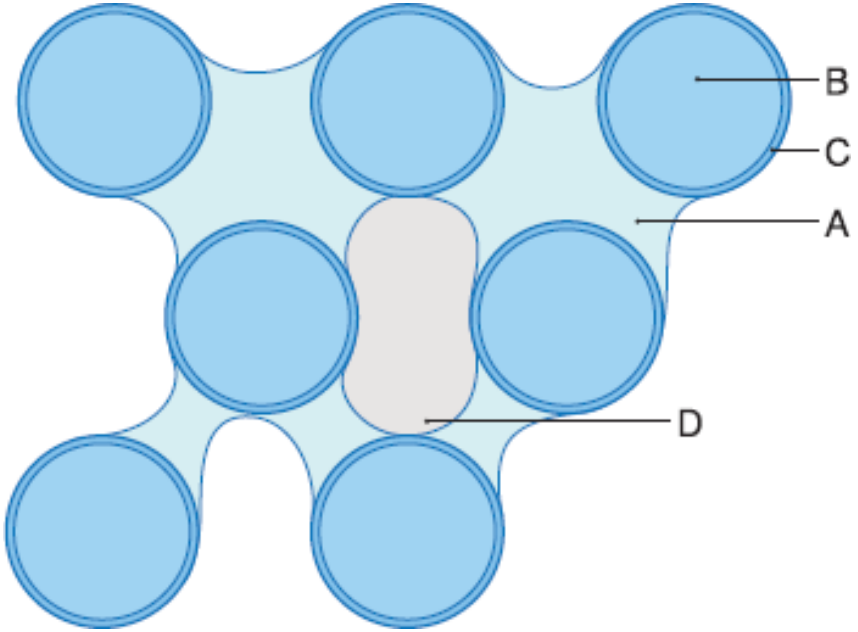


Fig. 12.26 • Peli radicali nel terreno. L'acqua che si trova tra le particelle di roccia è indicata in rosso. È evidente che gli spazi capillari pieni d'acqua non sono continui.



Schema raffigurante l'acqua trattenuta per capillarità (A), dalle particelle del suolo (B) e l'acqua igroscopica (C). Viene anche indicata l'aria tra gli spazi interparticellari del suolo (D).

Porosità del suolo (% di spazi vuoti): generalmente 30-60% del volume totale

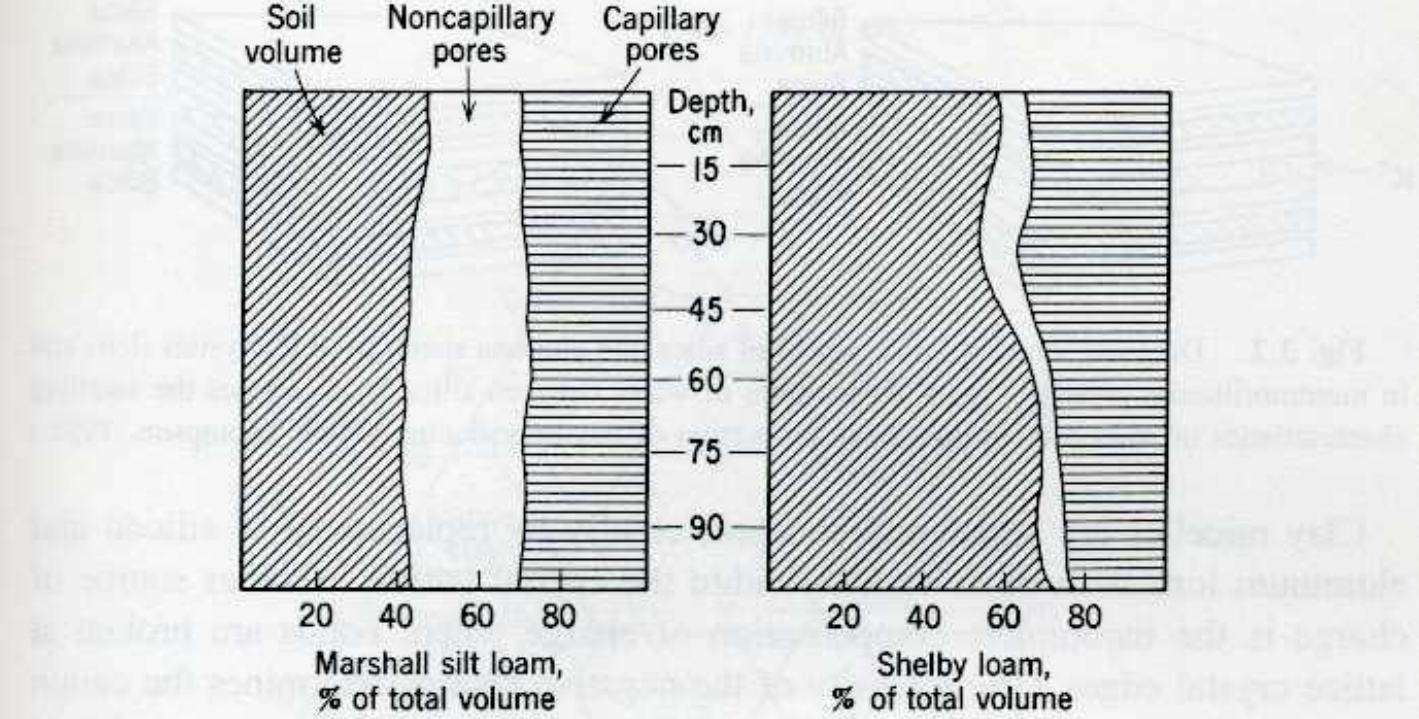
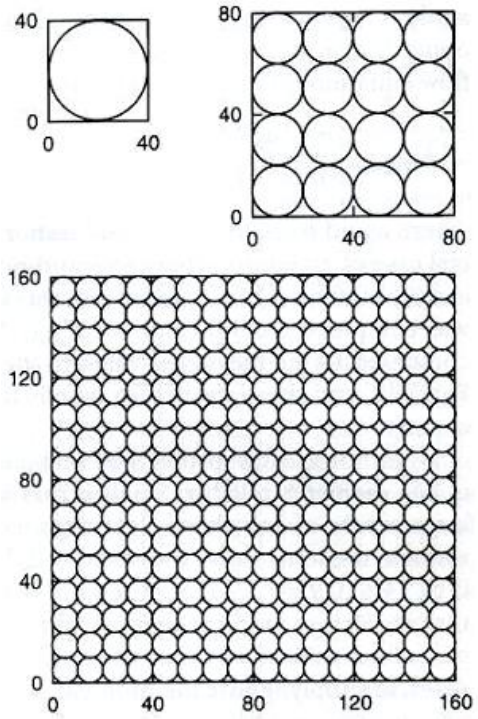


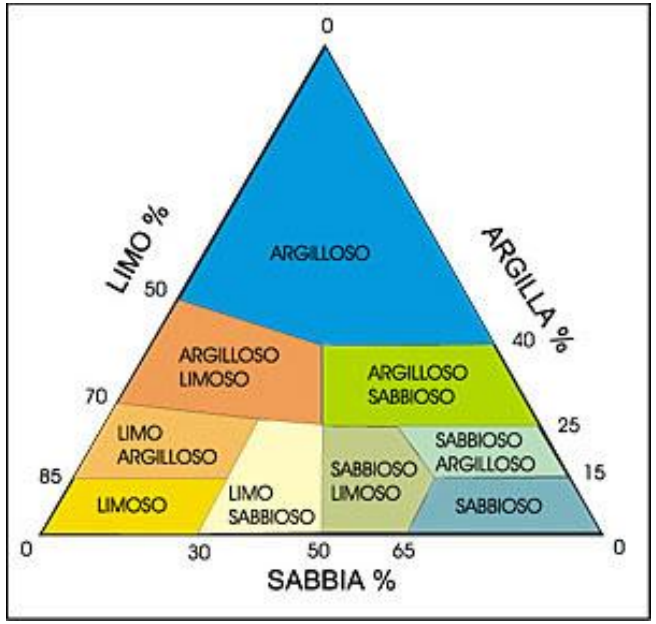
Fig. 3.1. Examples of the differences in amount of capillary and noncapillary pore space in two dissimilar soils. A large proportion of noncapillary pore space is desirable because it promotes drainage and improves aeration. (Adapted from Baver, 1948.)

Porosità: dipende da tessitura e struttura del suolo



			ISSS	USDA	
SCHELETRO			> 2mm	> 2mm	
TERRA FINE	SABBIA	GROSSA	2 - 0,2 mm	2 - 0,2 mm	
		FINE	0,2 - 0,02 mm	0,2 - 0,05 mm	
	LIMO		0,02 - 0,002 mm	GROSSOLANO	0,05 - 0,02 mm
				FINE	0,02- 0,002 mm
	ARGILLA		< 0,002 mm	< 0,002 mm	

Triangolo tessiturale



Struttura del suolo: aggregazione e disposizione delle particelle nello spazio. Dipende dalla dimensione prevalente delle particelle minerali e dalla quantità di sostanza organica

Struttura e porosità determinano la capacità di trattenere l'acqua

Componenti del potenziale dell'acqua nel suolo

$$\Psi_{suolo} = \Psi_p + \Psi_s + \Psi_m$$

Ψ_s quasi sempre trascurabile

Ψ_p : componente di Ψ_{suolo} più importante

$$\Psi_p = -2T/r$$

$T = 7.28 \times 10^{-8}$ MPa m
(tensione superficiale dell'acqua)

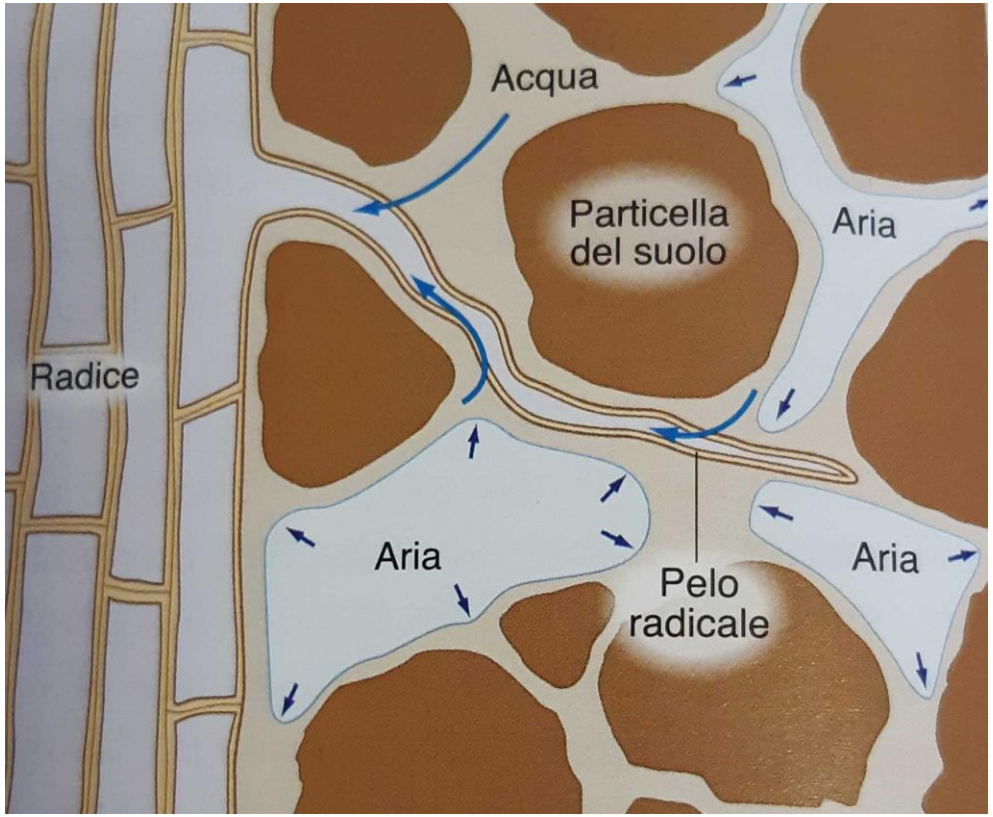
r = raggio di curvatura all'interfaccia aria-acqua

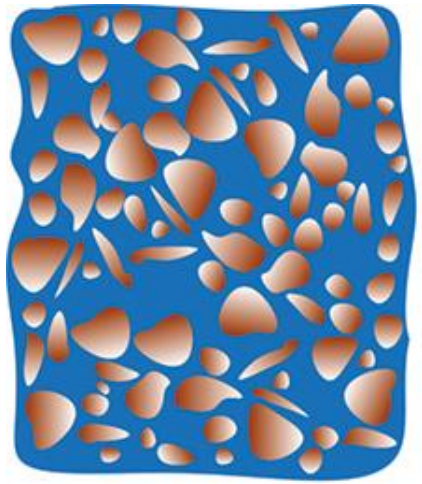
Es:

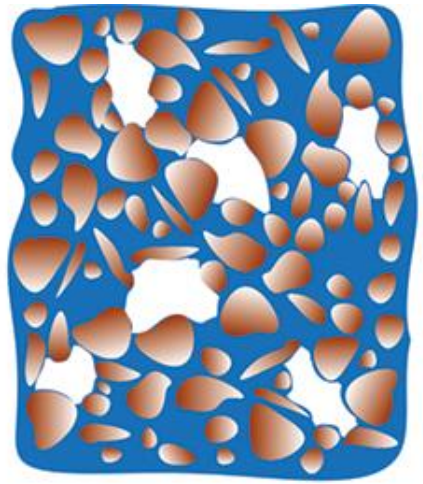
r = 0.5 μm → Ψ_p = -0.3 MPa

r = 0.05 μm → Ψ_p = -3.0 MPa

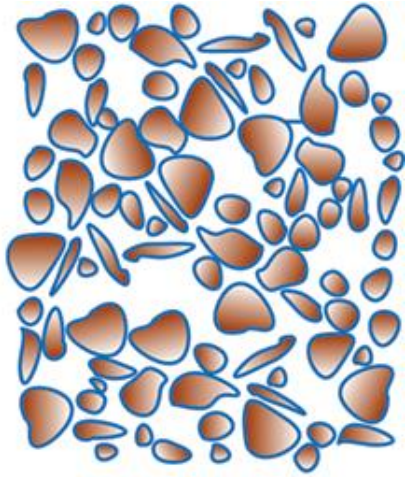
Ψ_m (potenziale di matrice)



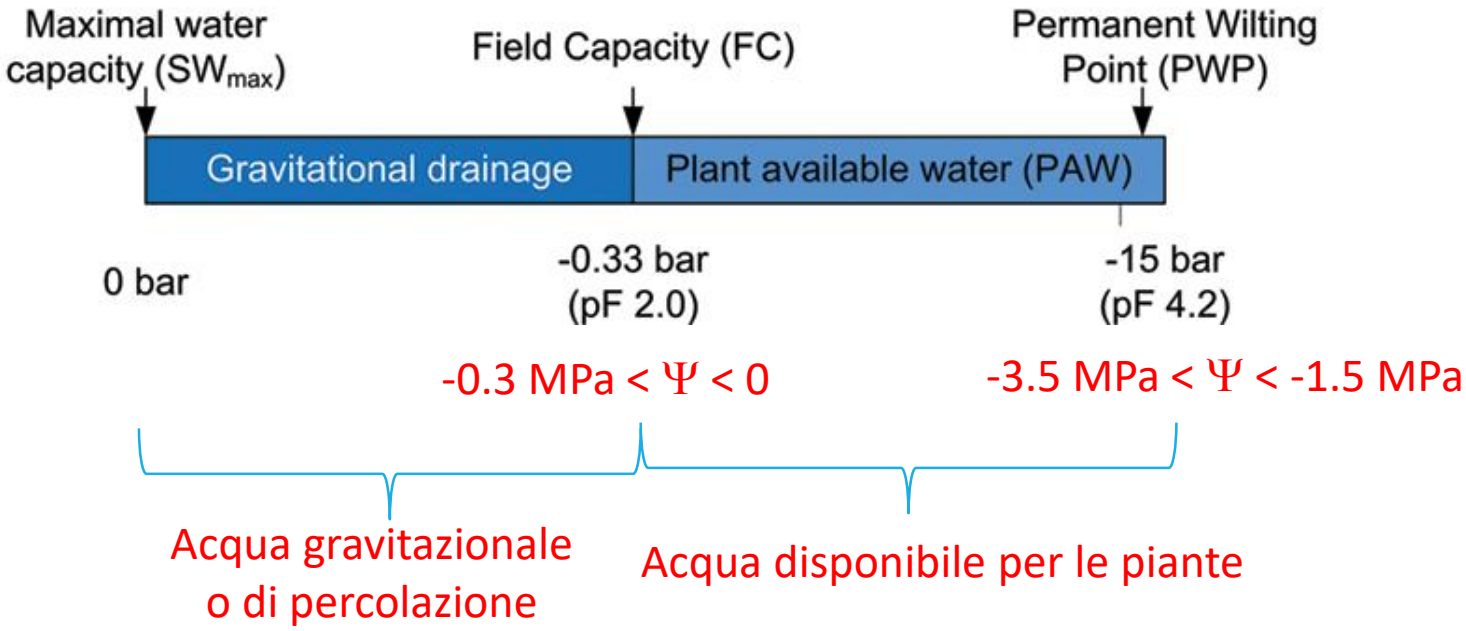




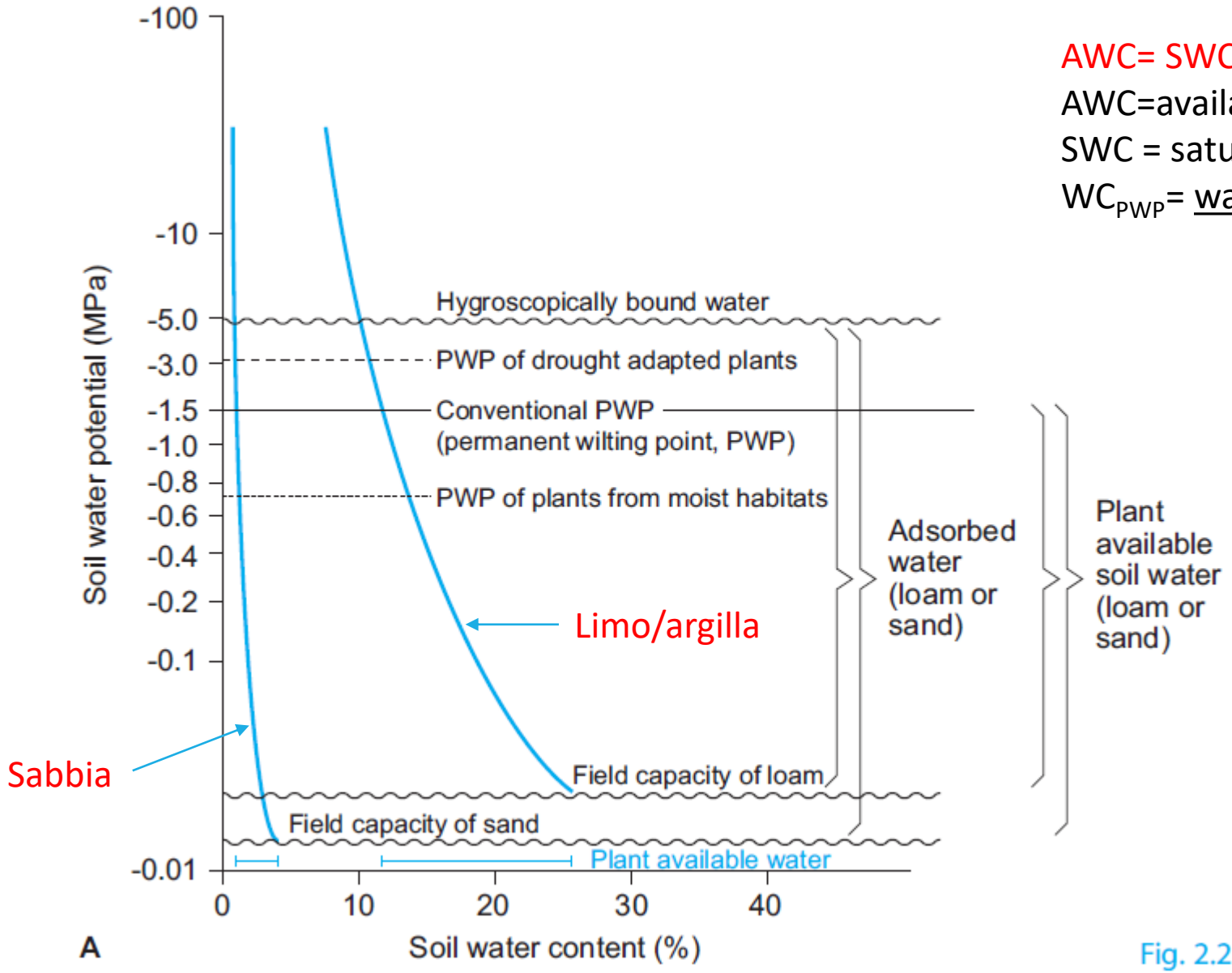
(Capacità di campo)



(Punto di appassimento permanente)



Curve pressione-volume del suolo



AWC= SWC – WC_{PWP}

AWC=available water content

SWC = saturated water content

WC_{PWP}= water content at permanent wilting point

↓

È variabile, dipende dal punto di perdita di turgore della specie

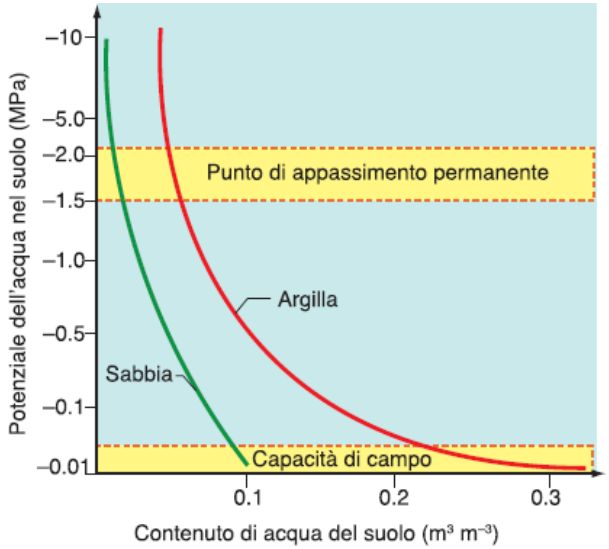


Fig. 2.2.4. A