

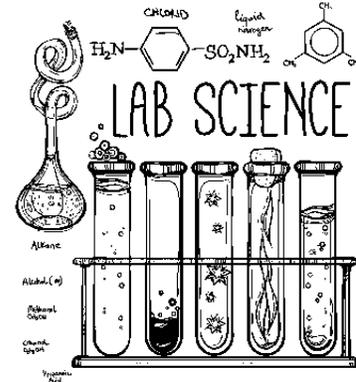
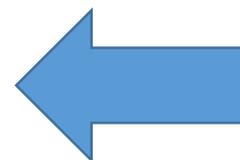
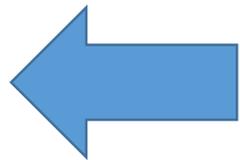
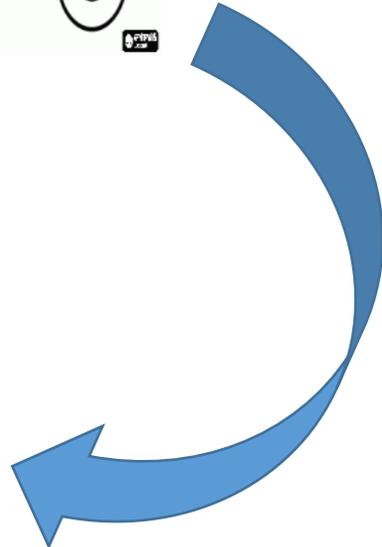
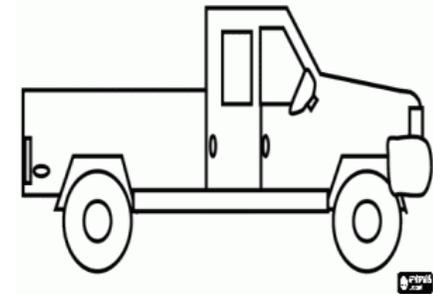
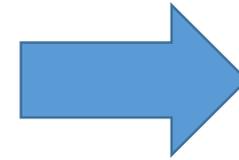
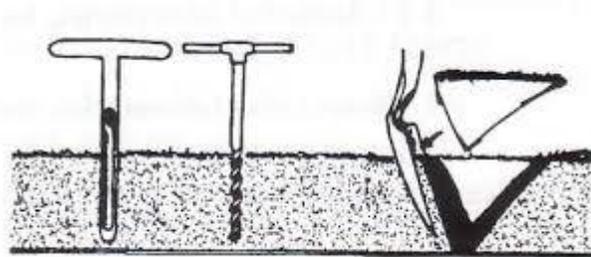
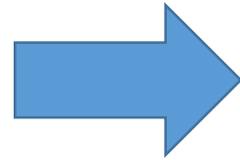
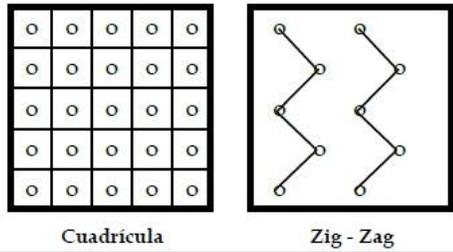


Instituto Nacional de Investigación Agropecuaria  
U R U G U A Y

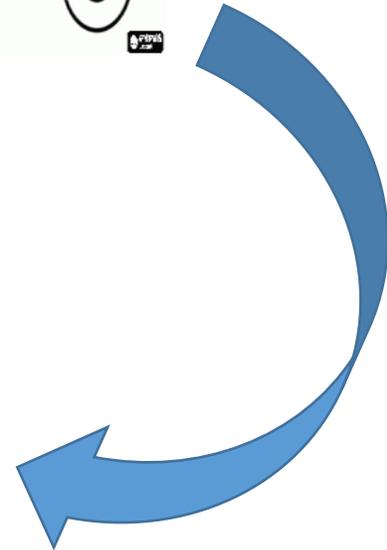
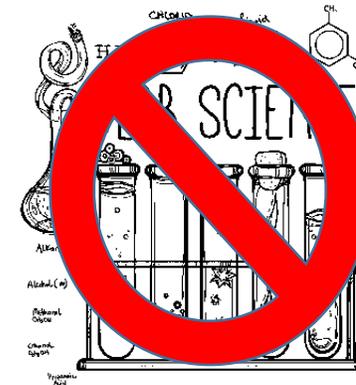
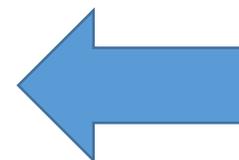
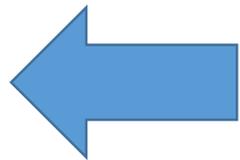
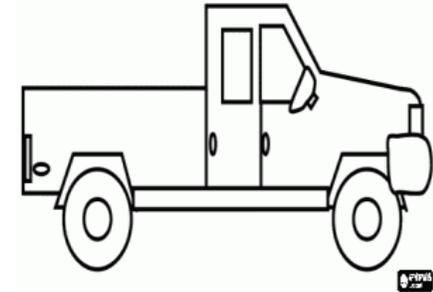
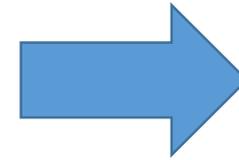
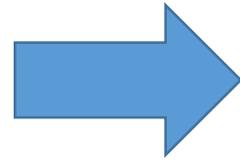
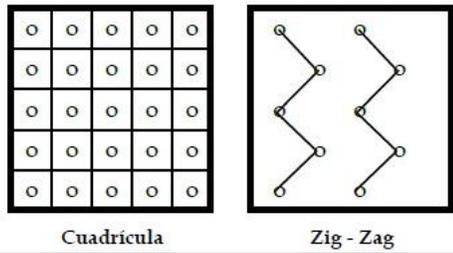
# Diagnostico de la calidad física del suelo

*Valentina Rubio*

# Diagnóstico de la fertilidad



# Diagnóstico de la Calidad física del suelo

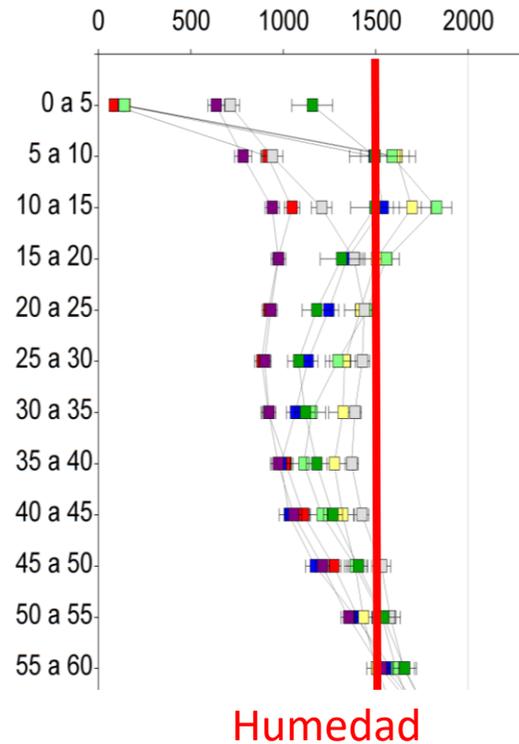


*“Lo esencial es visible a los ojos”*

# Calidad Física

Ambiente favorable para las raíces y la biota edáfica

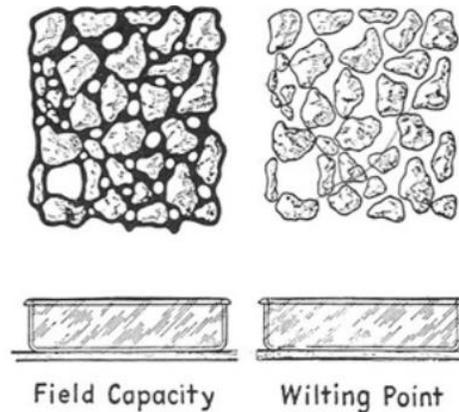
↓ Resistencia a la penetración



# Calidad Física

Ambiente favorable para las raíces y la biota edáfica

Suministre y almacene agua



- CAAD ↑

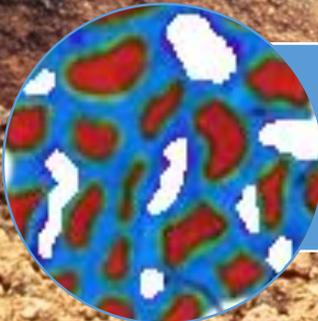
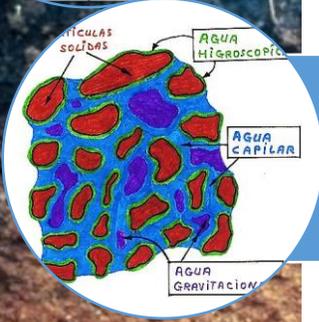
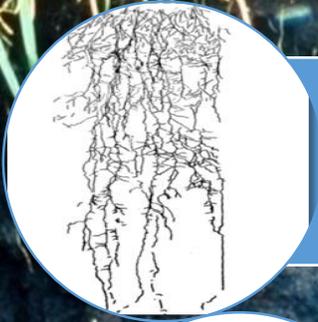
- Infiltración ↑
  - Macroporosidad ↑
  - Continuidad de poros
  - Sin estructural laminares/capas compactadas/costras

# Calidad Física

Ambiente favorable para las raíces y la biota edáfica

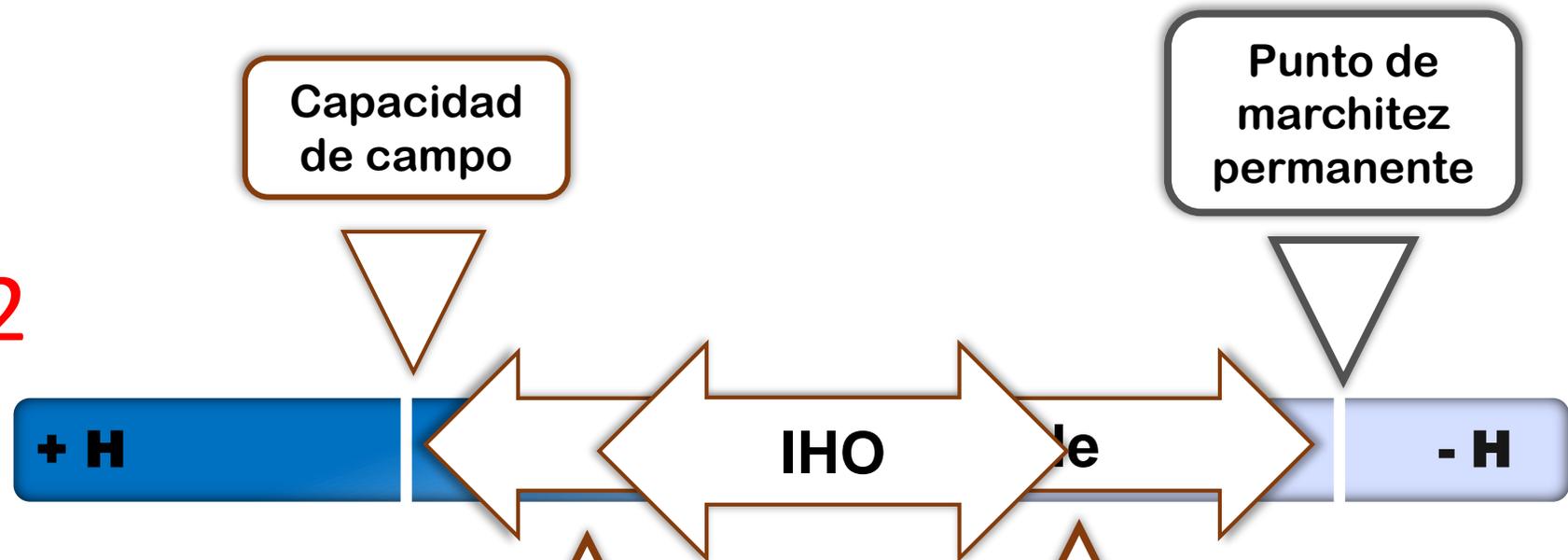
Suministre y almacene agua

Suministre O<sub>2</sub>

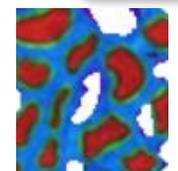


Falta O2

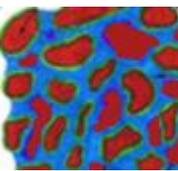
+ RP



Suelo "normal"



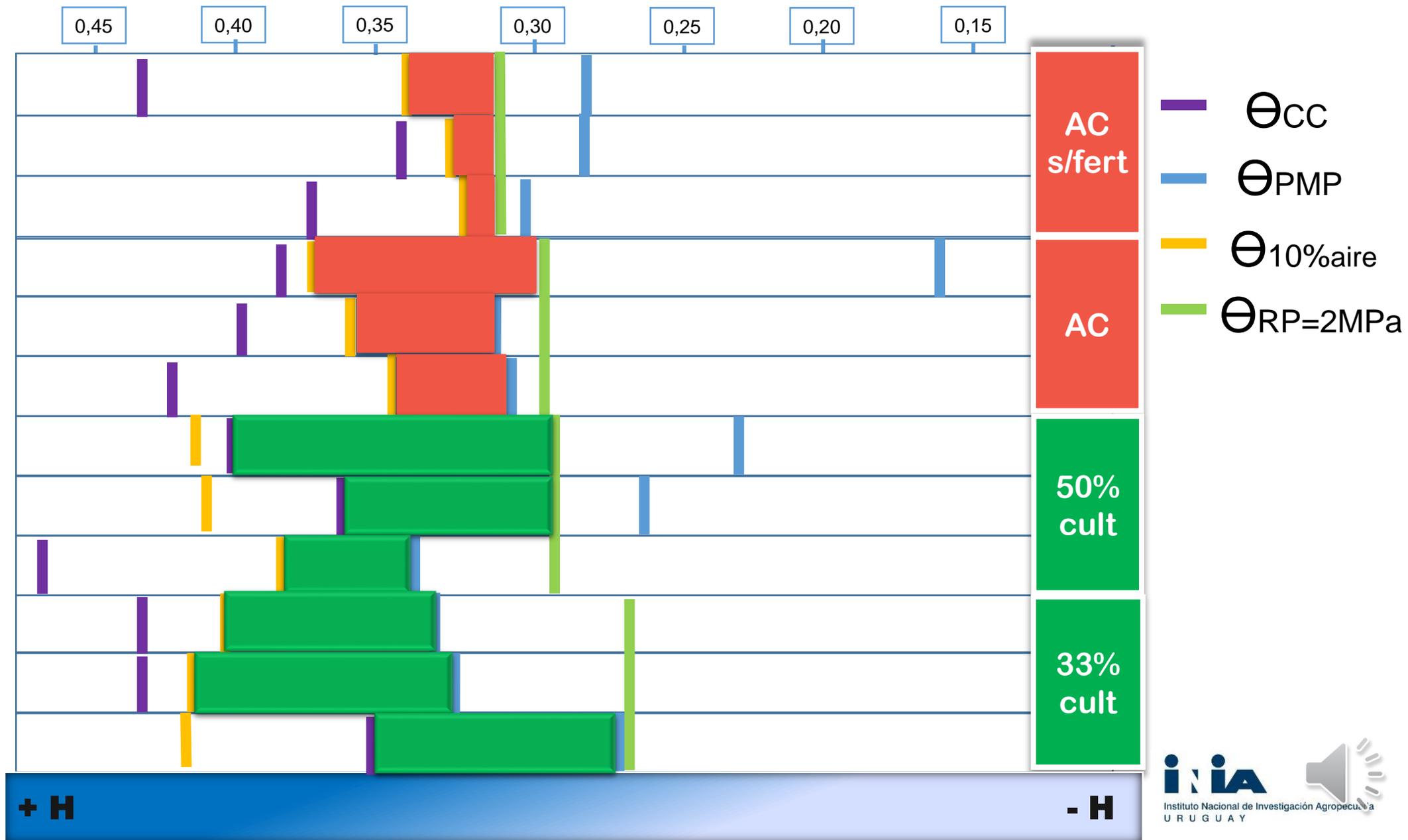
Suelo compactado



# Agua disponible



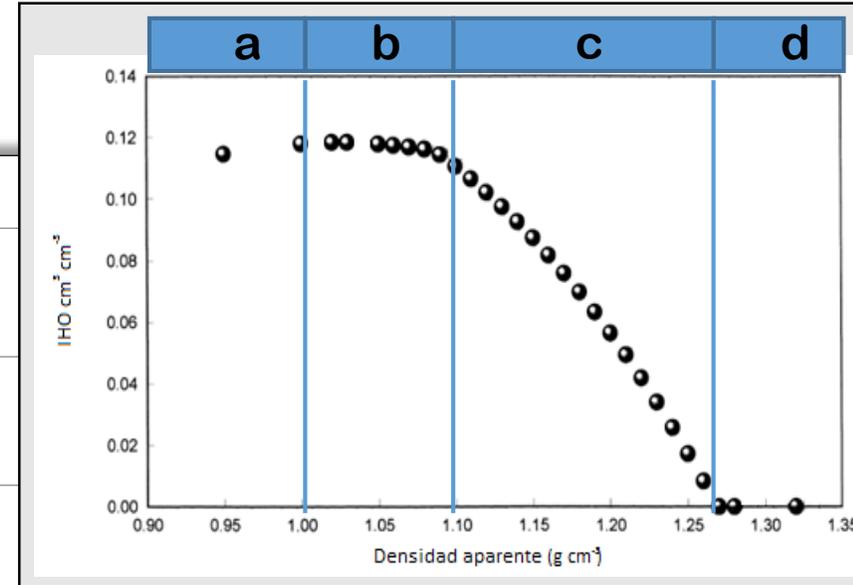
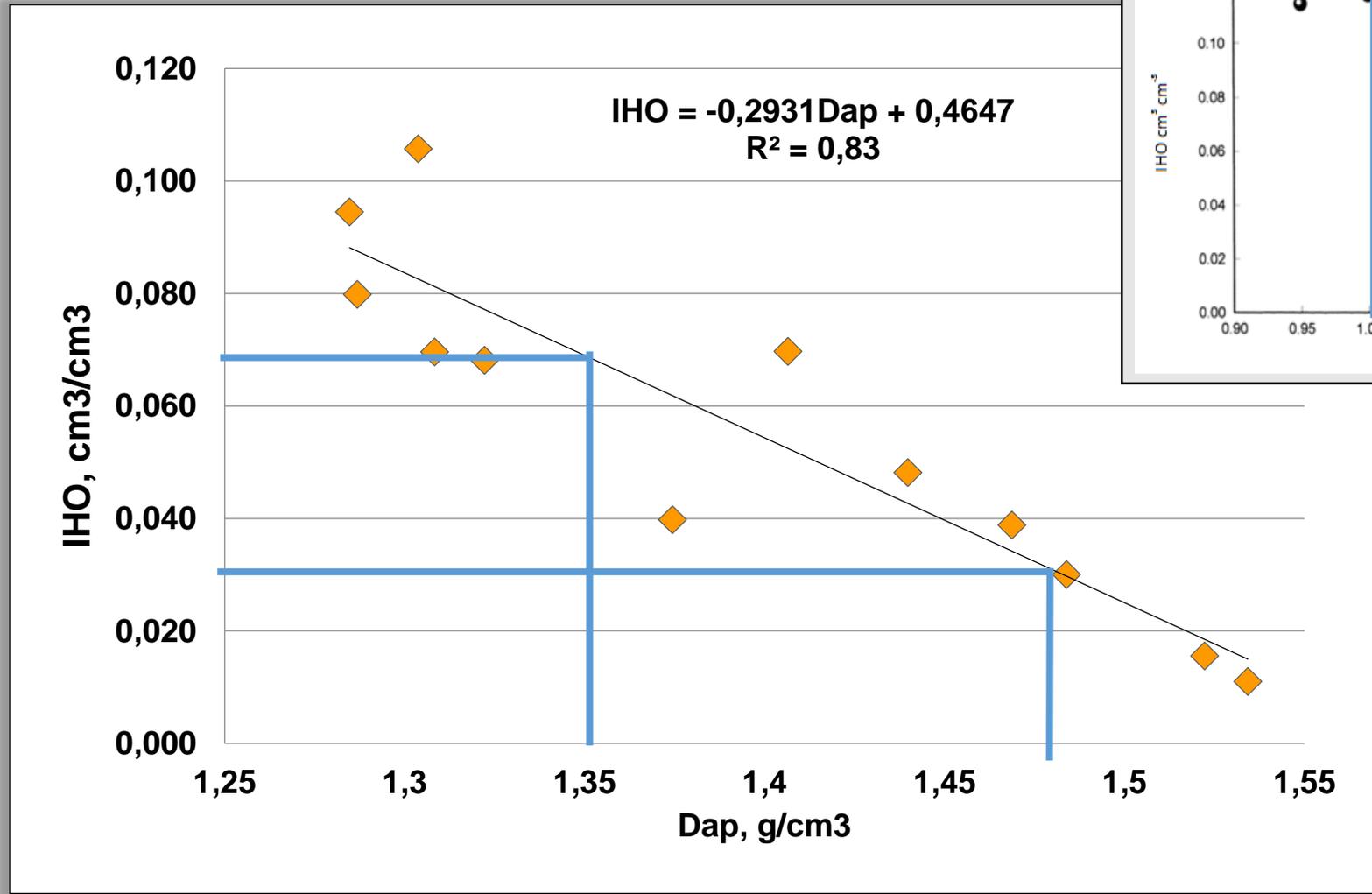
# Intervalo hídrico óptimo



+ H

- H

# Relación IHO y Dap



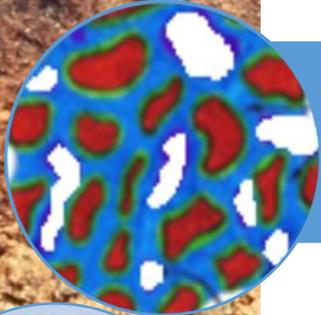
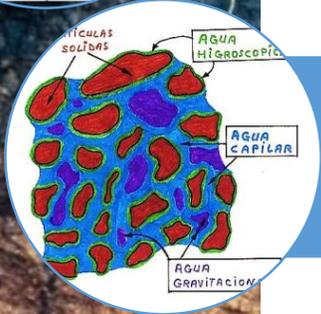
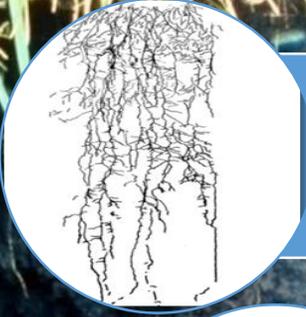
# Calidad Física

Ambiente favorable para las raíces y la biota edáfica

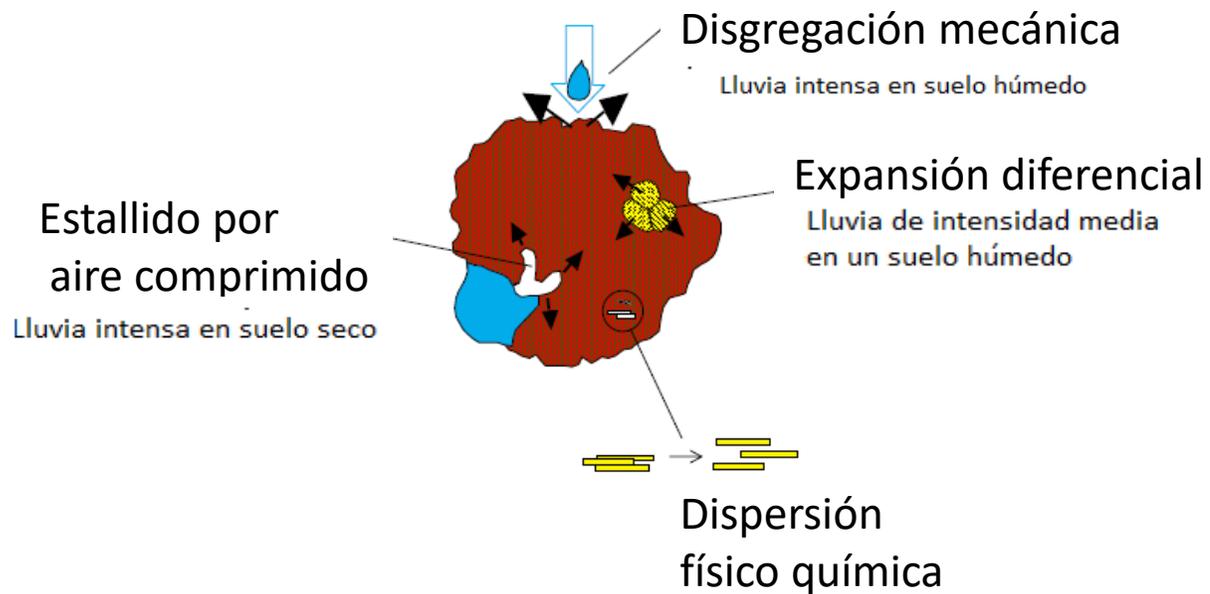
Suministre y almacene agua

Suministre O<sub>2</sub>

Resista la degradación

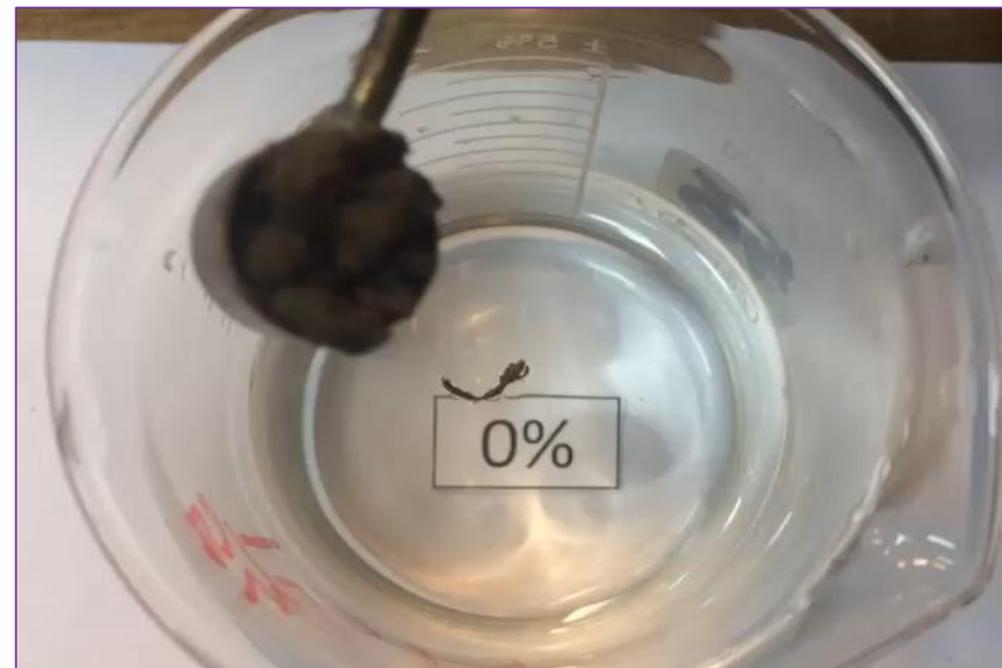


# Estabilidad de Agregados



Adaptado de Chenu y Cosentino, 2007

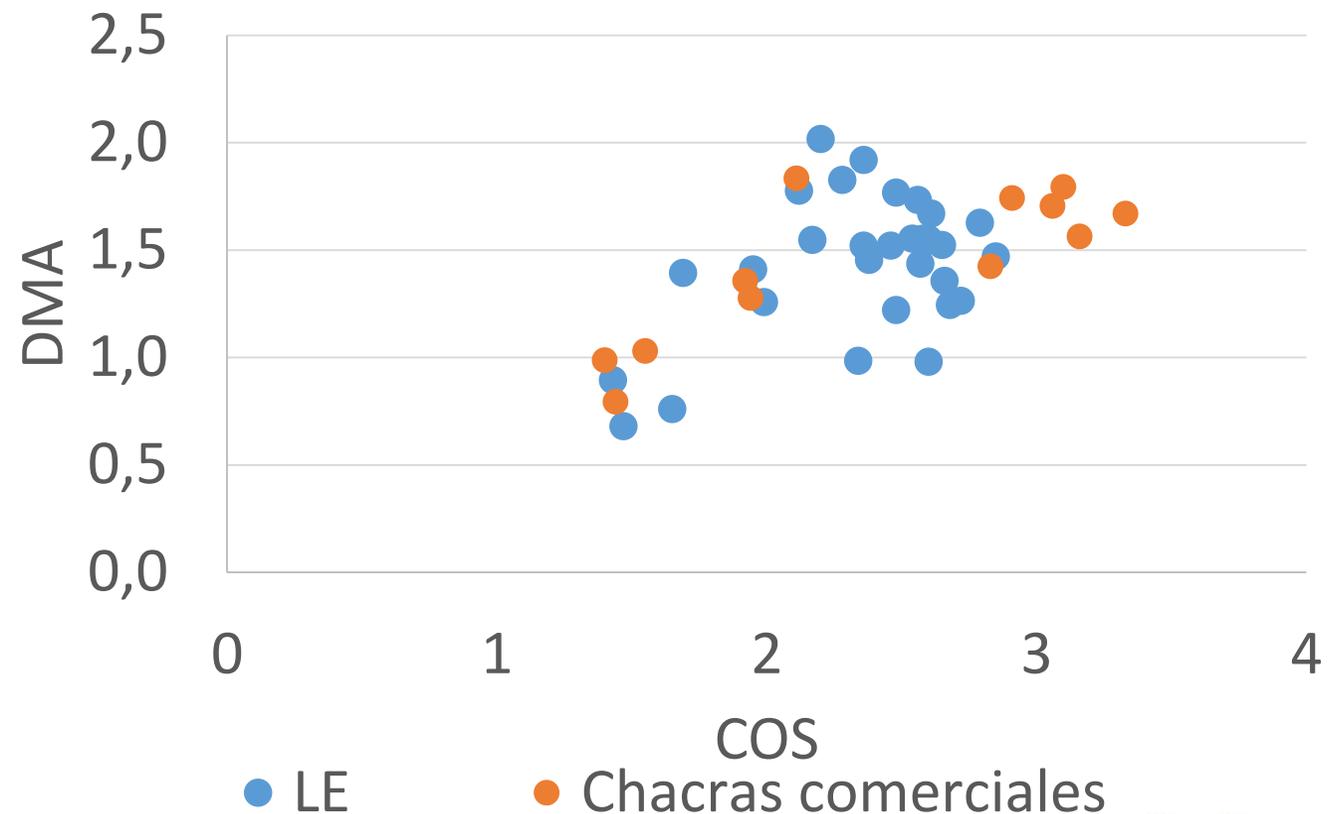
Resistencia del suelo a mantener su arreglo espacial (Amézqueta, 1999).



# Estabilidad de Agregados

*Le Bissonais (1996)*

Entender la importancia de los diferentes procesos involucrados en la ruptura de agregados, y las propiedades del suelo que hacen a su susceptibilidad, para poder fomentar prácticas de conservación.



# Caracterización del sitio (0-20cm)

- VESS: Evaluación visual de la estructura del suelo. “Método de pala” AARHUS University

Escala del 1-5 (1 es mejor 5 peor):

- Tamaño y apariencia de agregados
- Presencia de raíces
- Apariencia del pan luego de ruptura
- Porosidad de macro agregados
- Apariencia de agregados pequeños (1,5 cm)



Soil Structure	Soil Profile	Soil Structure				
1-1 Structure Highly porous with large aggregates	Highly porous fluffs throughout the soil					
1-2 Structure A mixture of porous and non-porous aggregates	Mix of porous and non-porous aggregates	Mix of porous and non-porous aggregates	Mix of porous and non-porous aggregates	Mix of porous and non-porous aggregates	Mix of porous and non-porous aggregates	Mix of porous and non-porous aggregates
1-3 Structure A mixture of porous aggregates from 20% to 50% and non-porous aggregates	Mix of porous and non-porous aggregates					
1-4 Structure Mostly large > 10 cm and sub-angular aggregates	Few macropores and cracks					
1-5 Structure Mostly large > 10 cm, very few < 2 cm angular and non- porous	Very few pores Macropores may be present. May contain animal faeces, roots, if any	Very few pores Macropores may be present. May contain animal faeces, roots, if any	Very few pores Macropores may be present. May contain animal faeces, roots, if any	Very few pores Macropores may be present. May contain animal faeces, roots, if any	Very few pores Macropores may be present. May contain animal faeces, roots, if any	Very few pores Macropores may be present. May contain animal faeces, roots, if any



**VESS Promedio**

**1.53**



**VESS Promedio**

**1.46**



**VESS Promedio**

**3.33**



**VESS Promedio**

**2.88**

Relevamiento de suelos Quincke et al. s.p.

# Algunas modificaciones

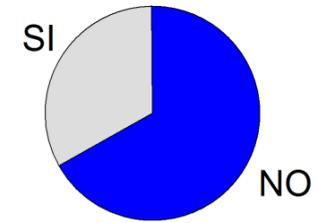


- Presencia de estructura laminar
- Es continua?
- Donde se ubica?
- Que espesor tiene

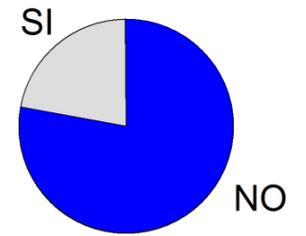


## ***Estructura laminar***

HISTORIA 33-66



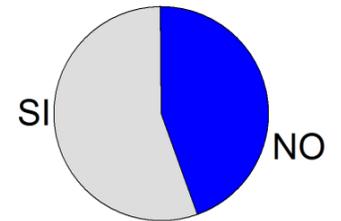
HISTORIA 50-50



HISTORIA 50-50B



HISTORIA AC



# Resumen

- Importancia de mirar el suelo y las raíces
- Buscar la profundidad en la cual tengo limitantes (RP, visual)
- Monitoreo en el tiempo
  - COS
  - Dap

# Consultas

- [vrubio@inia.org.uy](mailto:vrubio@inia.org.uy)