




# **Noble Research Institute's change to regenerative agriculture - Improving soil health within our orchard**





# Regenerative agriculture is the process of restoring degraded soils using practices based on ecological principles.

Regenerative agriculture promotes:

- Building soil organic matter and biodiversity.
- Healthier and more productive soil that is drought- and flood-resilient.
- Decreased use of chemical inputs and subsequent pollution.
- Cleaner air and water.
- Enhanced wildlife habitat.





# MINDSET

FOCUS ON  
PRODUCTION

FOCUS ON  
SOURCES  
AND CAUSES



## Soil Health Principles



Know Your Context



Minimize Soil Disturbance



Increase Diversity



Maintain Continuous Living Plants/Roots



Cover The Soil



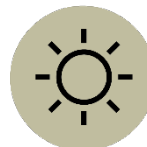
Integrate Livestock



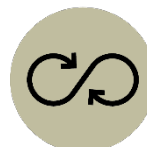
## Ecosystem Processes



Water Cycle



Energy Cycle



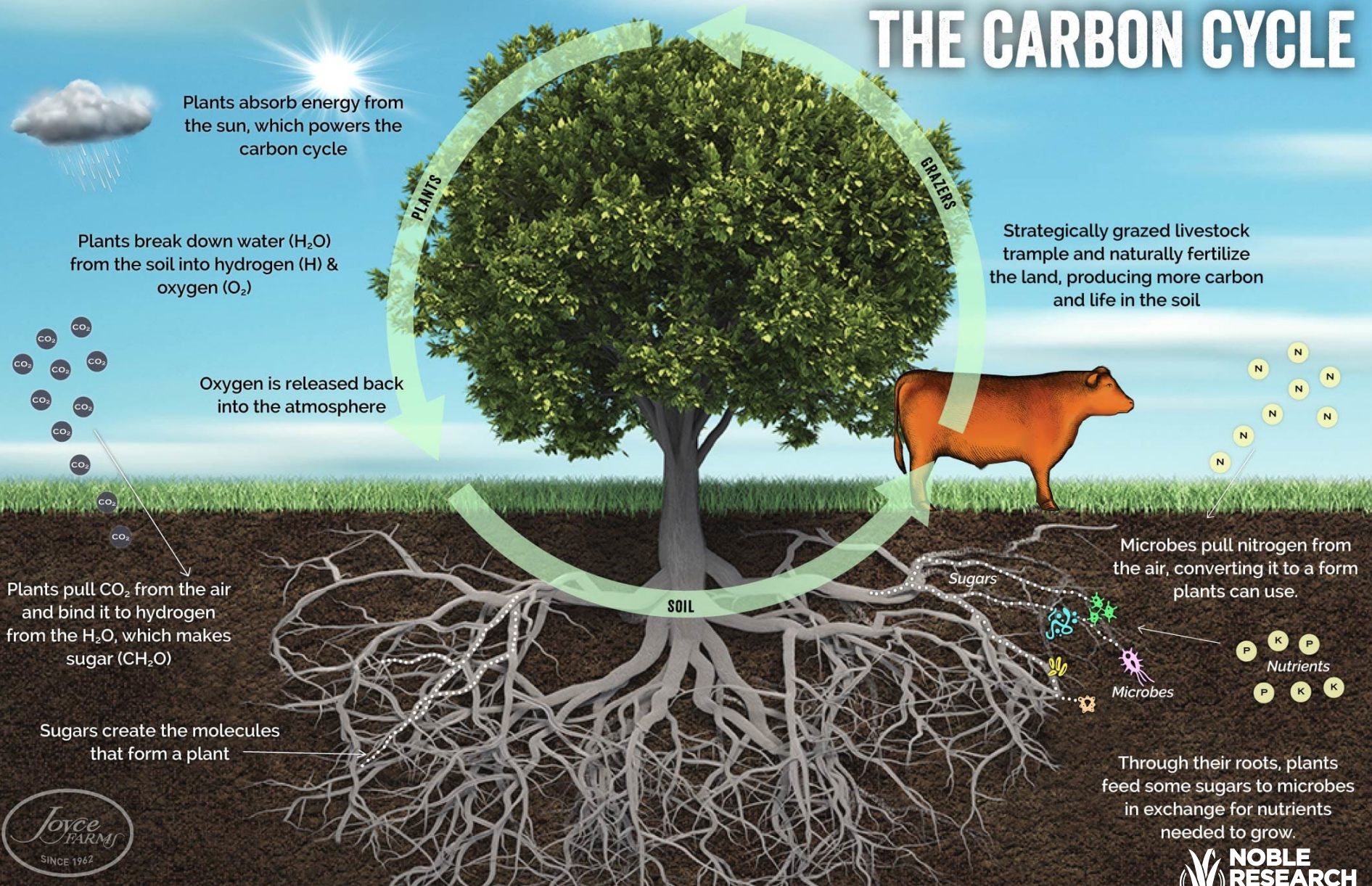
Nutrient Cycle



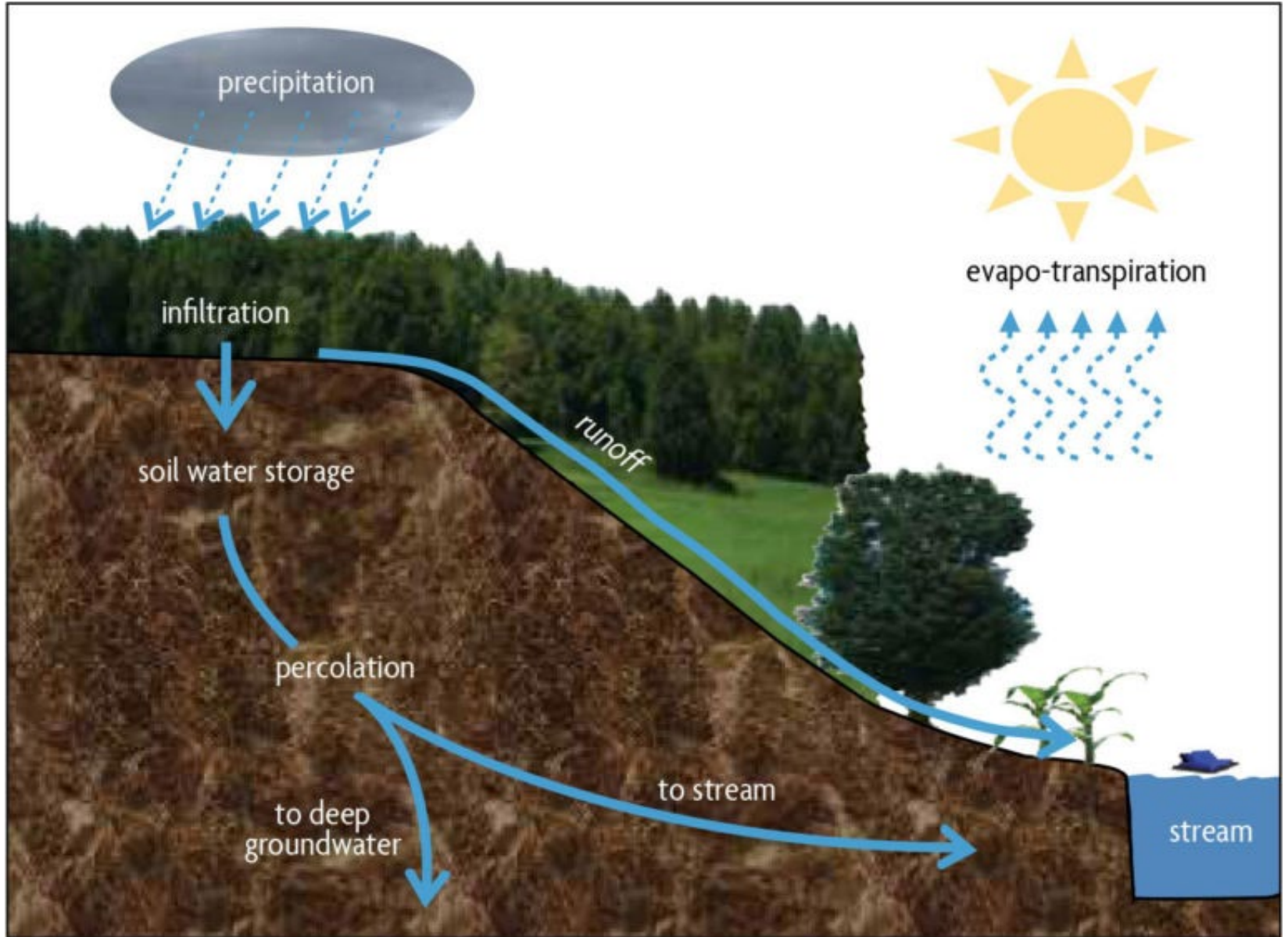
Community Dynamics

# The Energy Cycle

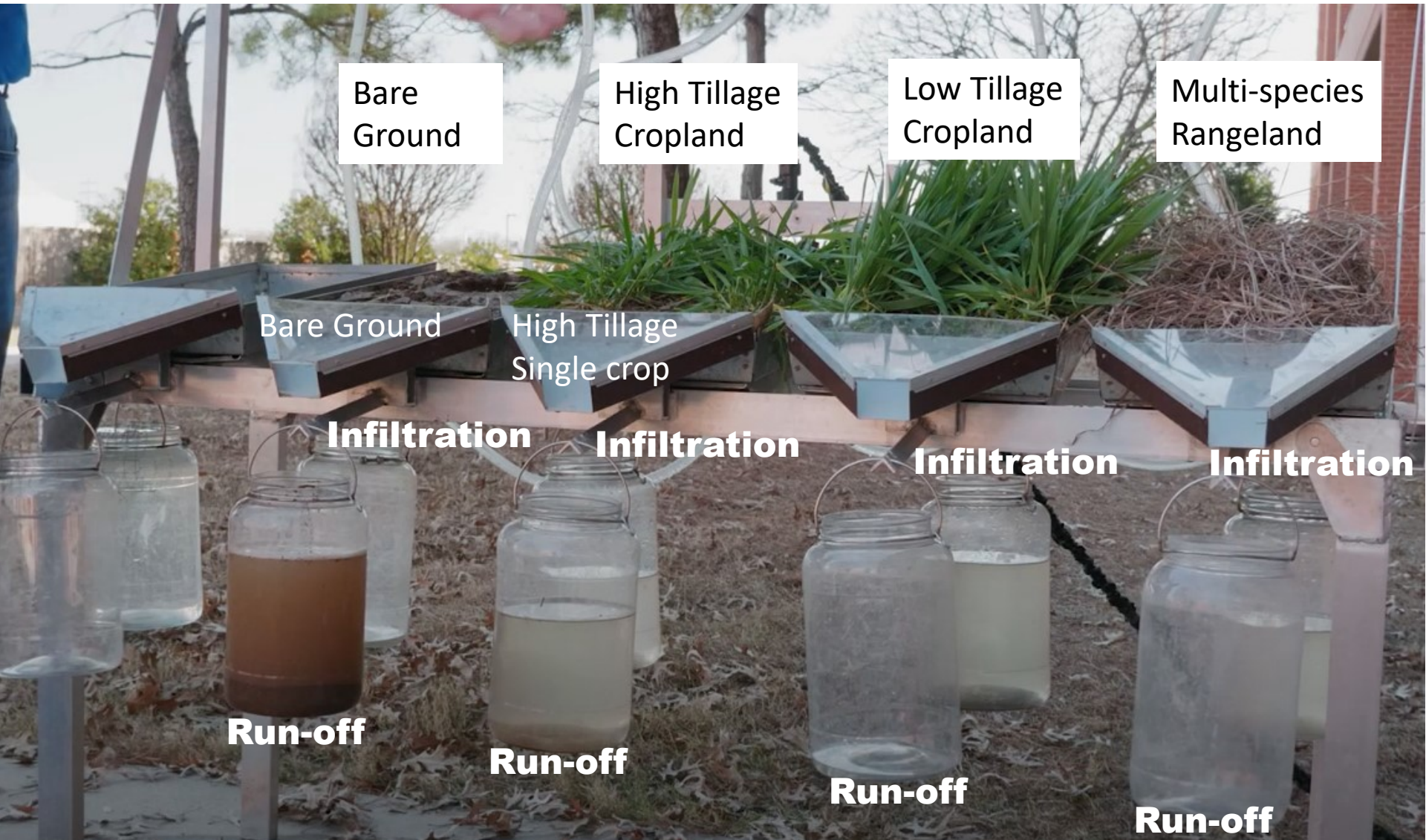
# THE CARBON CYCLE



# The Water Cycle



# The Water Cycle



# The Water Cycle - Broken



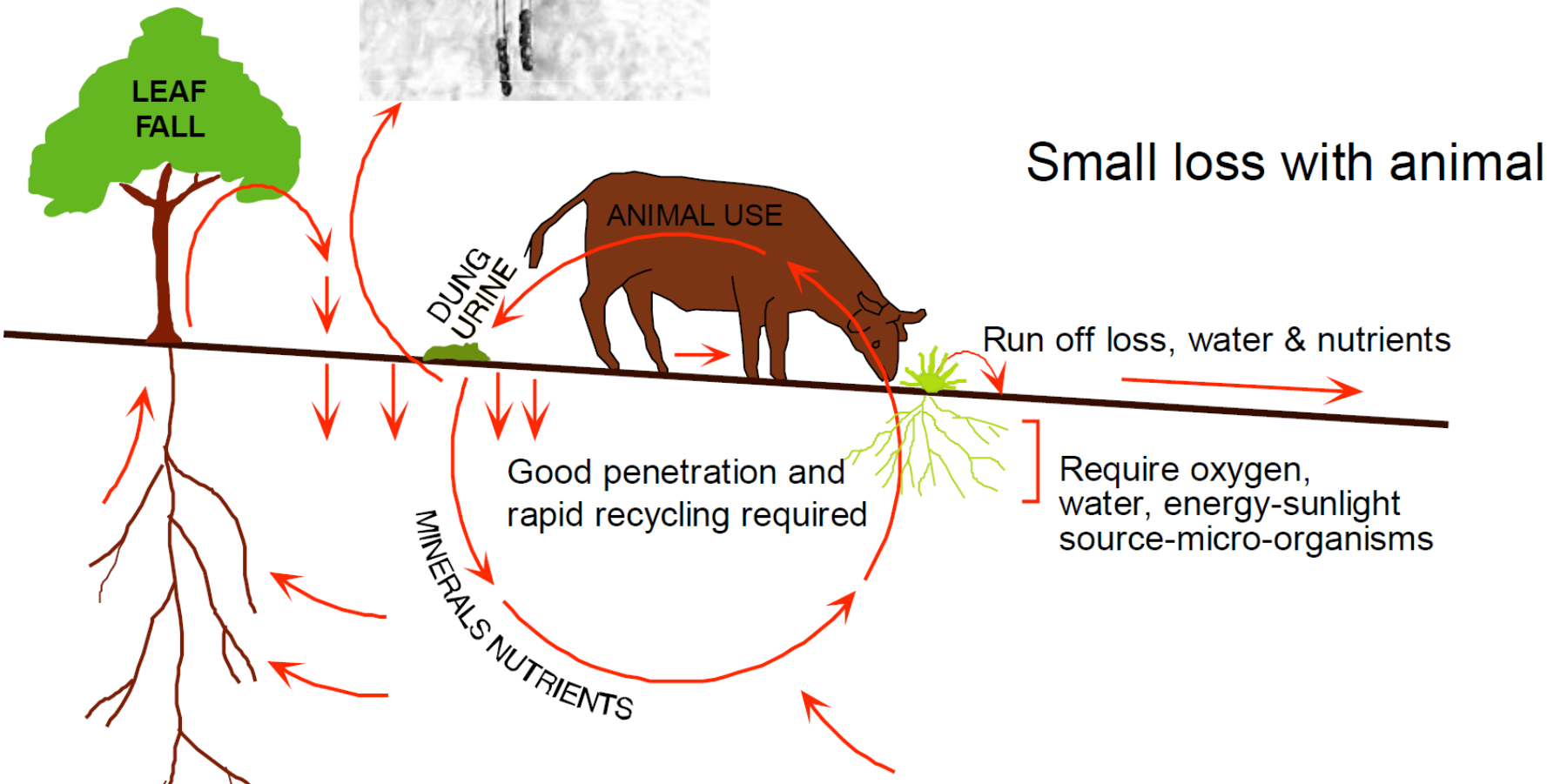
Photo by Russ Jackson



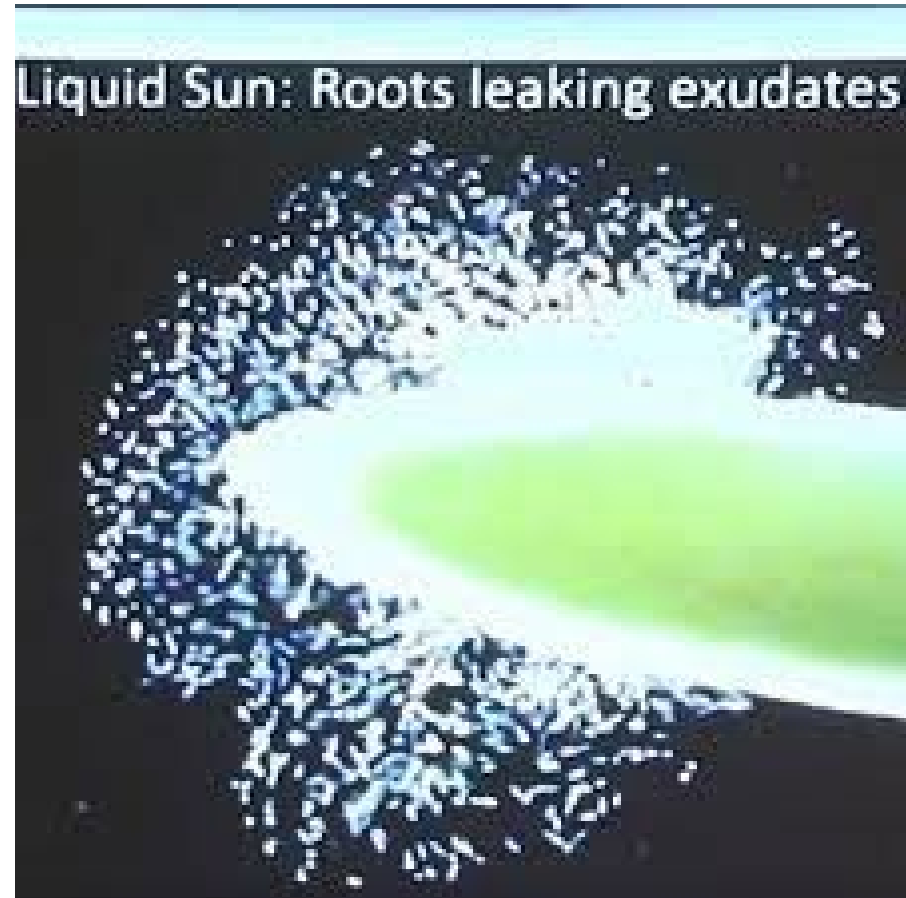
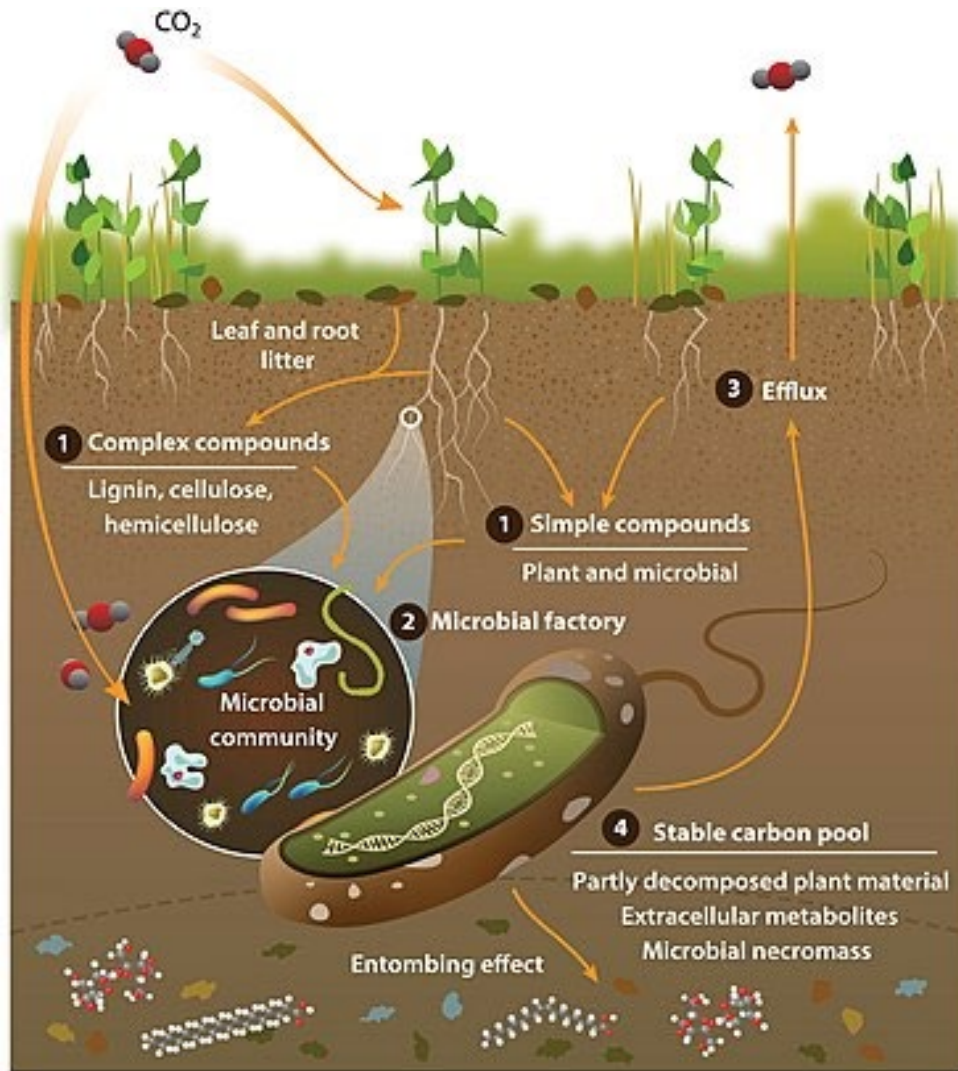
# The Nutrient Cycle



## NUTRIENT CYCLE



# Community Dynamics



Naylor D, et al. 2020.  
*Annu. Rev. Environ. Resour.* 45:29-59

# Common Problems in the Pecan Orchards



Poor water infiltration



Disease and pest



Lack of biodiversity



# Three things you can do right now

# 3

**1**

**Walk your orchard  
and look for signs of  
ecological  
brokenness**

**2**

**Shovel test**

**3**

**Bury some undies....**



## Shovel test

- Look at Soil a cross the orchard
- Take notes and photos
- Look at trees, then at the ground



**SOIL  
SMELL**





**SOIL  
STRUCTURE**





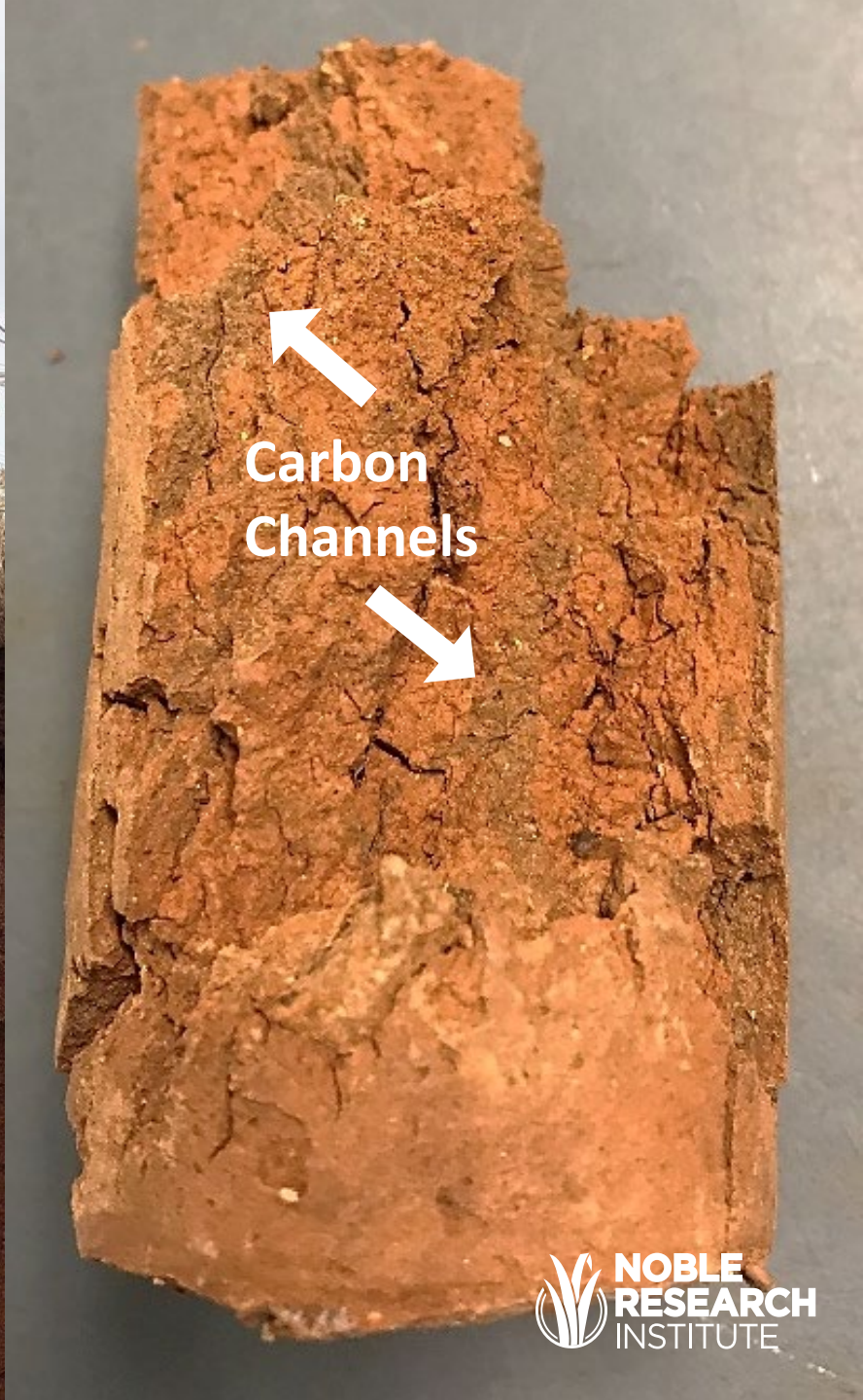
**BIOLOGICAL  
ACTIVITY**







**SOIL  
COLOR**



**Carbon  
Channels**



**ROOTING  
RESISTANCE**





# Soil Your Undies..

## a quick and easy soil microbe observation test

- Bury during the active growing season
- Bury 4 – 6 inches deep
- Bury for 6 weeks
- Observe if microbes are active by state of degradation



## Follow us online:


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## Additional Resources:

 Noble Rancher: <https://www.noble.org/news/publications/>

 Dirt to Soil: One Family's Journey into Regenerative Agriculture  
Gabe Brown  
ISBN-10 : 9781603587631  
Chelsea Green Publishing; 1st edition (Oct. 11, 2018)



# Improving Soil Health

## Regenerative Silvopasture



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