Pain and Growth
Response to Pain
Strengthening trunk, adjusting to light
Long-Term Stability
Repeated cycles of leaning and standing firm

Stability Learning
Light Adjustment
Takes time to adapt to increased light

Structural Support
Leaning on Neighbors
Trees use each other for support
Self-Support
Develop stability after loss of neighbor

Tree Relationships

Planted vs. Natural Forests
Planted Forests

Behavior
Trees behave like loners, suffer from isolation
Harvest Age
Ready to harvest at about 100 years old

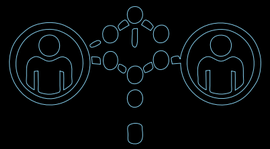
Natural Forests

Memory and Learning
Mimosas Experiment
Learn and remember to ignore harmless stimuli
Tree Screams
Ultrasonic sounds when water flow is interrupted

Social Behavior of Trees

Purpose
Shared advantages, ecosystem stability

Friendship
Branch Growth
Careful not to grow overly thick branches in each other's direction
Root Connection
Sometimes die together



Electrical Signals

Mechanism
Electrical signals sent through leaf tissue and roots

Speed
Slow, about a third of an inch per minute

Purpose
Trigger defensive compounds

Tree Communication

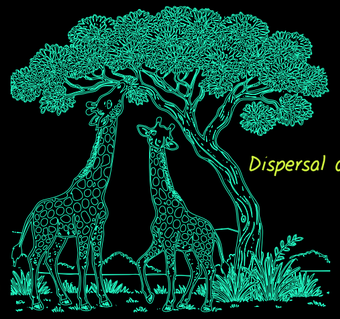
Scent Communication
Example Scenario: Giraffes feeding on Acacias Trees
Response: Acacias pump toxins into leaves and release ethylene
Effect: Giraffes move to unaffected trees

Fungal Networks
Wood wide web discovered by Dr. Suzanne Simard
Description
Chemical signals sent through fungal networks
Speed
Similar to animal nervous systems
Role
Transmit news about insects, drought, and other dangers

Tree Health and Communication
Vulnerability
Weakened trees lose their communication skills
Implication
Insects target trees that don't respond to warnings
Isolation
Loner trees are more susceptible to pests

Defensive Compounds
Identification
Trees can identify specific insect saliva
Response
Release pheromones to attract beneficial predators

Example
Elm and Pine
Call parasitic wasps to combat caterpillars



Dispersal of Signals

Airborne
Range
Effective within about 100 yards
Advantage
Quickly covers long distances

Positive Communication
Blossoms
Purpose
Attract pollinators with scent
Reward
Nectar for insects