Reaction Growth in Trees

Reaction growth in trees refers to the way trees adjust their structure in response to mechanical stresses, such as wind, gravity, or physical contact with objects. Trees are constantly responding to these external forces through two main types of growth: tension growth and compression growth. Tension growth occurs when the tree responds to forces that pull or stretch its tissues. This typically happens on the side of the tree that faces the force. For instance, if a tree is bent due to wind or leaning, the tension side (the side away from the bending direction) will increase its growth, producing cells that elongate and stretch to resist further bending.

On the opposite side, compression growth takes place where the tree is compressed or pushed together by external forces. This is particularly important in the side of the tree that faces the direction of the force. For example, when a tree is subjected to heavy wind, the side that faces the wind will undergo compression growth, where the tissues compact and produce cells that are shorter but more dense. This adjustment helps the tree maintain its stability and resist being uprooted or broken.

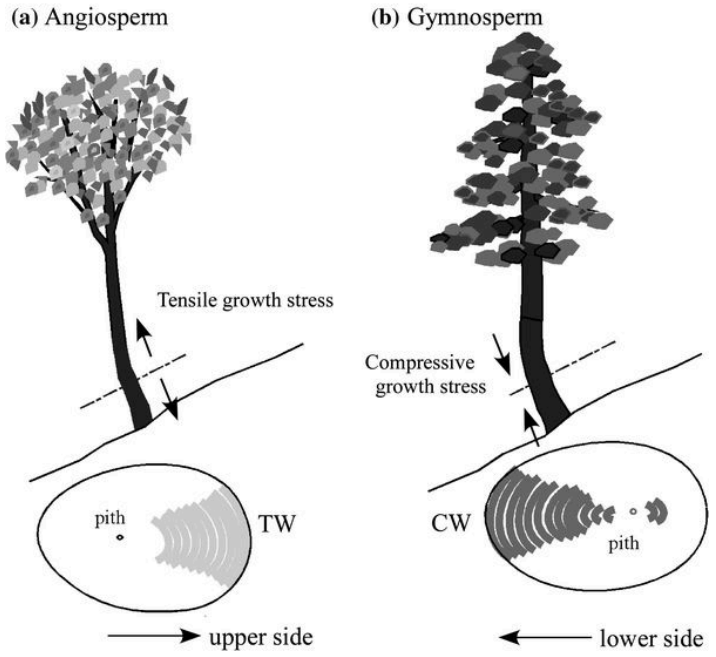

Image from Pinterest. Angiosperms are flowering plants that produce seeds enclosed within a fruit, while gymnosperms are non-flowering plants that produce seeds exposed on cones or other structures.

Both tension and compression growth are crucial for the overall stability of trees. They allow trees to grow upright and adapt to their environment, ensuring that they can withstand external stresses over time. These growth patterns are visible in many tree species, such as conifers,

which often show visible bending or spiral growth patterns in response to wind. The process of reaction growth is essential for trees to continue growing in challenging environments, such as coastal areas with frequent storms or areas with strong prevailing winds.

Citations:

1. *Kozlowski, T. T., & Pallardy, S. G. (1997). Physiology of Woody Plants.* Academic Press.
2. *Niklas, K. J. (1992). Plant Biomechanics: An Inquiry into the Developing Paradigm.* University of Chicago Press.
3. *Givnish, T. J. (2002). Adaptive significance of evergreen vs. deciduous leaves: solving the triple paradox.* Silva Fennica, 36(3), 217-224.