

## Plants Are Pretty Amazing Too

In the past I have written about animal instinct and how fascinating I find animal behavior. But if you really think about it, plants are pretty amazing also. Well, OK, regular readers will probably say I seem to be fascinated about just about everything in Nature, and I won't deny that, but let's just explore some things that happen in the Plant kingdom and see if you don't agree.

To paraphrase the old philosophical question, which came first, the plant or the seed? I am not going to answer that question here, but let's think about seeds for a while.

The largest class of plants, by far, is the angiosperms, or flowering plants that produce seeds inside a covering. Many seeds can exist under the right conditions in a dormant state for not only years, but decades or more, and still germinate and produce viable plants when conditions are right.

Think about this. A very tiny (sometimes as small as the period at the end of this sentence) collection of chemicals arranged in certain ways somehow manages to survive without rotting, degrading or decomposing for very long periods of time, but when conditions become just right, changes occur in the structure of this tiny seed and a living green plant is produced. More specifically, here is what happens.

The seed coat which has kept water from entering the seed and causing it to rot while in its dormant state has to crack, weaken, thin or otherwise begin allowing water to seep into the seed. As the seed adsorbs water and the cells begin to expand, chemical reactions begin to take place to rearrange the molecules in the seed into other types of chemicals that make up roots and shoots.

For most species, the seed must push aside some soil and produce a tiny root to allow it to adsorb even more water before it can begin to form a shoot. It must then produce a small shoot which it sends through the soil up to the surface and then produce one or two tiny green leaves.

Note that all of the chemicals, except for water, and all of the energy required to accomplish this transformation, must come from inside that tiny seed. Until green leaves are formed, no photosynthesis can occur and no new plant material can be produced.

Once green leaves receive sunlight, carbon dioxide from the air and water and minerals from the soil can be combined to form more leaves, more roots, stems, etc. Inside that tiny seed was also stored the information to direct the growing plant as to what kind of leaves to make (size, shape, arrangement), what kind of stems to grow, and where to make branches. Also stored in the plant DNA of the seed are the instructions about when, where and how to make flowers.

What if this is a large tree? It might be many years before it becomes mature and able to make seeds of its own, but somehow the information as to how and when to do this was stored in that original seed's DNA. It is as if a clock, or a calendar, was built into that tiny seed.

We think of plants as being stationary, unlike animals that move about. But plants do move, turning their leaves toward the sun and twining around objects if they are vines.

When we think of all of the complexities of animal behavior, it seems at least likely that much of the many coordinated activities they display are directed by their brain or at least their nervous system. But plants don't have brains, or nervous systems. And how one part communicates with another is not at all well understood.

So, I think I am justified in being fascinated by our amazing plants.

One thing to remember the next time you plant a seed. Pay attention to the directions for planting depth. If a small seed is planted too deeply, it will not have the amount of chemicals nor the energy to grow a long shoot to push through too much soil, so your plants will never see the light of day.

Also, some seeds have such a thick, hard seed coat, that water cannot seep into the seed to begin germination, unless the seed coat has been scarified (scratched) to weaken the seed coat. Passing through the digestive system of birds or other animals is how many plant species solve this problem.

Until next time...

Jim Stanley is a Texas Master Naturalist and the author of the books "Hill Country Ecology," "Hill Country Landowner's Guide" and "A Beginner's Handbook for Rural Texas Landowners." He can be reached at [jstmn@ktc.com](mailto:jstmn@ktc.com). Previous columns can be seen at [www.hillcountrynaturalist.org](http://www.hillcountrynaturalist.org).