

People and plants don't have much in common, other than they need each other to survive. But there is one very key thing that we have in common. Hormones. Plants have hormones, just like people. They play a very important role in the way that plants grow and look. Hormones affect the growth habits, the length of branches, even where the plant branches. Plant hormones are chemicals that are made in the plant and moved to a different location in the plant. They are used by the plants in very low concentrations. Growers can use plant hormones or plant growth regulators to increase or decrease plant growth. Plant growth regulators are very similar to the hormones, but they are a man-made product instead of being made by the plant. There are five main plant hormones, auxin, abscisic acid, cytokinin, ethylene, and gibberellic acid. I will start with auxin because it is arguably the most important.

Auxin is produced in the top most bud of the plant and translocated, or moved, through the plant to the roots. Auxin causes stem elongation and is responsible for phototropism. Phototropism is the scientific term for when a plant is left in one spot for too long without turning, resulting in the plant tilting toward the light source. Auxin is broken down by light, so when the light is always on one side of the plant, the auxin builds up on the darker side of the plant. Because auxin causes elongation, the cells on the opposite side of the plant elongate more, causing it to look tilted. This can be prevented by giving the plant a quarter turn on a regular basis. Auxin is also responsible for branching. This hormone suppresses branching, which is why most plants don't branch near the top of the plant, where the concentration of auxin is the highest. As you move lower on the plant, the auxin concentration decreases, and branching is no longer suppressed. Growers will remove the top bud that produces auxin in order to have bushier plants, such as poinsettias. Auxin promotes root growth, and can be seen on rooting hormone labels as IAA, or indole acetic acid, the chemical name for auxin.

Auxin can also be used to kill plants. In too high of concentrations, it can cause leaf curling and cupping. Leaf cupping is when the outside of the leaf does not expand as much as the rest of the leaf, and looks kind of like a drawstring bag. It can also cause the stem of the plant to twist and grow in odd patterns, along with many other symptoms. Many common herbicides are auxin-like plant growth regulators that give the plant more auxin than it can handle, killing it. A common auxin-like chemical that can be used as an herbicide is 2,4-D.

Cytokinin works as the opposite to auxin, like two sides of a seesaw. It is produced in the roots and translocated up the plant. It promotes shoot growth and is responsible for the initiation of shoots. As well as the division of cells in the tips of roots and shoots, causing them to elongate. The high concentration of cytokinin at the base of the plant is what causes branching, going hand in hand with the low concentration of auxin. Cytokinins are not effective as herbicides.

As you can see, auxin and cytokinin are vital to the plants to control many aspects of their growth. But too much of a good thing can also kill the plants. The other three plant hormones, abscisic acid, gibberellin, and ethylene will be discussed in more detail in next week's column. If you have any questions please contact me at the Buffalo County Extension Office, 308-236-1235, or at mearnest2@unl.edu.