

What makes a corn plant tick?



Breeder's Journal

By DAVE NANDA

Key Points

- Stomata in corn leaves allow corn to take in carbon dioxide and release oxygen.
- Night should be a period when corn rests, as long as temperatures aren't too high.
- Plants care about producing maximum live seeds, not 200 bushels per acre.

If we understand how corn plants work and what they need for their growth, we can do an even better job of increasing yield.

The first basic concept is that green plants have microscopic “windows,” called stomata, which can be opened or closed as needed. These windows are used by the plants to exchange gases from the atmosphere.

During photosynthesis, plants absorb carbon dioxide from the air, and take up water and nutrients with their roots. With the help of light and heat from the sun, they create sugars, starches, oils, proteins and many other compounds.

Plants also use stomata as a defense mechanism against excess heat or drought. When corn leaves curl up, they close these windows to reduce their transpiration and respiration rates. At this point, plants are under stress and aren't very productive.

Efficient plant

Before plants appeared on this planet, the atmosphere had an abundance of carbon dioxide and no oxygen. Carbon dioxide is made of carbon plus oxygen.

Corn is one of the most efficient plants

for converting carbon dioxide and water, plus nutrients, into organic matter, or biomass. A corn plant produces about three times as much biomass as a soybean plant does.

How corn functions

Plants absorb carbon out of carbon dioxide during the day and release oxygen back into the atmosphere through stomata. At night, plants respire and don't release any oxygen.

Plants slow down during the night and deposit the products of photosynthesis where needed. During vegetative growth, these products are used to build leaves, stalks, tassels and ears. After pollination, during the grain-fill period, sugars, starches, oils and proteins are deposited into seeds.

Plants are really not concerned about producing the highest yield. Their objective is to procreate and produce as many viable progeny as possible based upon genetics and environment.

Both the macro-climate, such as soil

type, weather, water supply and nutrients, and the microenvironment, such as competition from weeds or other corn plants, determine how many progeny a corn plant can produce.

Each plant produces as many kernels as it possibly can based upon its own environment. It will sacrifice other parts of the plant to fill the needs of embryos and seeds.

Why this matters

Nutrient and water deficiencies can result in plants sending products made from photosynthesis, now in leaves and stalks, to seeds. This can cause weak stalks and lodging.

It's very important to provide enough space to each individual plant. Plants that are too close together may produce nubbins.

To maximize yield, a grower has to be an “equal opportunity employer.” Plants are working for you as employees. If you provide good working conditions for them, they will be more productive and give you higher yields.

Knowing how plants work allows you to make better management decisions and produce higher yields.

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FACTORIES AT WORK: Each corn plant is a factory, working as your employee, but it's also concerned about producing viable seeds.