Care and Handling

Ethylene Damage in Flowers and Plants

When it comes to common ailments and injuries affecting cut flowers and plants, an ounce of prevention is worth a pound of cure. These unfortunate flower conditions directly impact your bottom line – specifically, a product you cannot sell and corrective action in your shop that distracts your team from income-producing activities.

A usual suspect when it comes to common ailments is ethylene. On average, ethylene-related issues cause at least 30 percent of flower waste. But what is it, and why is bad?

Ethylene is the "silent killer" in floriculture. It is a gaseous plant hormone that is colorless, odorless and is present at undetectable levels in normal atmosphere unless you use sophisticated instruments to detect it. As many hormones do, it takes fairly low concentration of this chemical to cause drastic effects on plants.

For the most part, ethylene is produced by ripening fruits and vegetables and by flowers. It is also a byproduct of "incomplete combustion" of organic materials. You can find "hot spots" where the concentration of ethylene is hundreds, if not thousands, of times higher compared to the usual concentration. These hot spots in the cut-flower distribution chain are typically places like distribution centers and storage facilities where flowers and fruits are stored together. Or they could be areas where natural-gas-driven forklifts and other equipment are in operation, or even areas where old and decaying plant materials are not removed fast enough.

During the postharvest phase of cut flowers, the effect of ethylene is almost always negative, and it drastically reduces the quality and ornamental value of flowers. It is inevitable that most cut flowers will go through these "hot spots" during the distribution and storage phases. So, the likelihood of ethylene damage is very high – unless the flowers are properly treated along their journey to the end consumer.

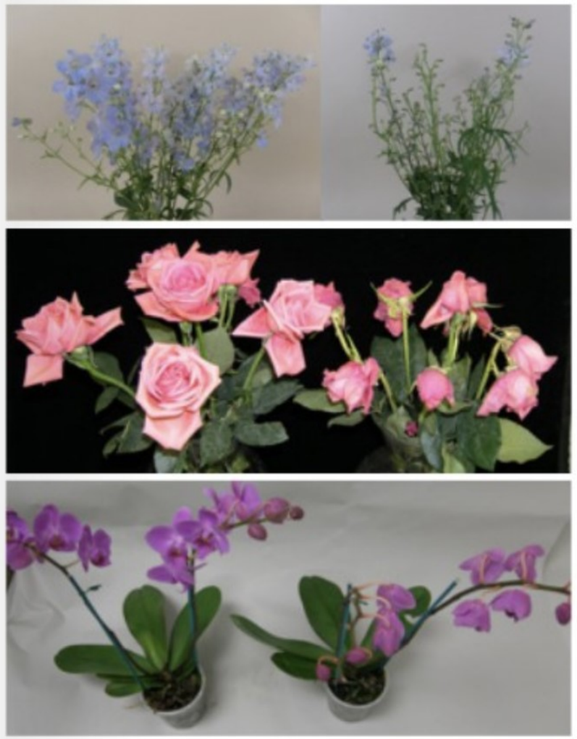
The sensitivity of cut flowers to ethylene and the damage caused by it vary a lot depending on the genetics of the genera or varieties. Given the invisible nature of ethylene, detecting ethylene symptoms is critical. Furthermore, some of the ethylene symptoms can be caused by other factors (e.g., dehydration, cold chain violation, etc.). Therefore, the cause could be misdiagnosed.

A typical ethylene symptom in carnations is called "petal in-rolling" as shown in the picture below.

Typical symptoms of ethylene damage to popular cut flowers are listed below.

Flower	Symptoms
Carnation	Petal in-rolling, failure to open
Rose	Symptoms vary depending on the variety. Abnormal opening, Petal shattering, Bent neck, Premature wilting, Petal discoloration, Leaf drop.
Orchids	Bud drop, Translucent petals, Petal wilting
Lily	Bud drop, Bud fails to open
Alstroemeria	Petal drop or shatter, leaf yellowing
Gypsophilia	Open flowers wilt, young buds fail to open, flower discoloration
Freesia	Young bud drop. Failure to open
Delphinium	Petal shattering

Examples of ethylene damage are shown in the photos on the opposite page (damaged flowers are on the right).



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As you can see, the effect that ethylene has on various crops is very different. Correctly identifying that the damage is due to ethylene is important.

Here are a couple of tips to avoid ethylene damage:

• Check that your flower supplier (grower, wholesaler, distributor, bouquet operation and/or trucking company) has treated the product you buy with an ethylene action inhibitor, such as **Ethylbloc™**.

• Monitor temperature. A proper temperature in the cooler (34 F to 38 F) can inhibit ethylene production.

• Outside the cooler, do not store or display cut flowers near ripening produce or other ethylene sources such as propane heaters, diesel fumes, cigarette smoke and "older" flowers.

EthylBloc™ Technology works by inhibiting the negative effects of ethylene and, thus, prevents or reduces premature flower death, leaf and/or flower fall, and leaf yellowing. The active ingredient in EthylBloc™ Technology binds to the ethylene receptor in plant cells. This prevents binding of harmful ethylene from the plant itself or external sources. It is the binding of ethylene to the receptors that causes damage – *not* the production of ethylene.

With these preventive steps, you, too, can enjoy healthier flowers and a healthier bottom line!

To learn more about best practices from the experts in flower care, visit *floralife.com*. ■