

Ethylene Exposed

By Gay Smith

IN THE PLANT WORLD, HORMONES, OR PLANT growth regulators (PGRs), trigger specific cell activities including stem stretching, leaf yellowing, leaf abscission and premature aging. Sometimes, that's a good thing: To speed ripening, growers expose bananas to ethylene gas, a PGR. Ethylene exposure, however, is bad for flowers.

Understanding the implications of ethylene exposure and taking steps to minimize it are important topics for anyone who works in a flower shop. This month, I'll tackle common ethylene-related questions.

Question: Where does ethylene come from?

Answer: There are two main sources. Flowers and plants produce ethylene **internally** in response to stress (e.g. harvesting, bumps, bruises, smashes, overheated and dehydrated conditions). **External** ethylene sources include smoke, combustion engines and ripening fruits and veggies.

Q: How can I tell if ethylene exposure is a problem?

A: While ethylene is odorless and colorless, tell-tale signs indicate exposure: closed buds that drop off stems (Asiatic lilies, wax, kalanchoes, gloxinias, aggies, leptos); dropped petals (delphiniums, monk's hood, bleeding hearts, sweet peas); leaf abscission (roses, euphorbias, coffee foliage); shriveled or transparent petals (dendrobians, snaps, freesia florets, alstroemeria, roses); distorted, blasted or unopened buds (gyp, glads, tulips, mini carnations); and blooms that have lost color vibrancy, appear blue-ish or florets that die fast (nerines, carnations, anemones and roses).

Q: If ethylene is a naturally occurring gas, is it really such a big deal?

A: Ethylene gas is deadly in minute amounts.

Chainoflifeflow.org states, "the longer flowers and plants are exposed to ethylene, the higher the probability that ethylene-induced damage may appear."

Q: What about temperature control? Should I have special cooler procedures in place?

A: Temperature plays an important role in the degree of damage caused by ethylene exposure. In warmer temperatures, less ethylene is required to cause damage and "conversely it takes higher ethylene levels to cause damage at

lower temperatures," according to Chainoflifeflow.org. To combat the dangers, measure and log cooler temperatures daily. Set the thermostat between 34°F to 36°F, and then use a simple kitchen thermometer to record the temperature of a bucket solution. Doing so will confirm your system is operating at 100 percent efficiency. Calibrate the thermometer by swirling it in ice water slush for a few minutes to make sure it drops to 32°F. Don't rely on wall thermostats for accurate readings; wayward carts often damage wall units.

Q: Are all plant and flower varieties equally at risk?

A: No, and knowing which flowers are sensitive helps you take the appropriate precautions. The delphinium family (hybrid delphinium, 'Volkerfrieden', belladonna, bellamosa and larkspur) is very sensitive to ethylene gas. When exposed, petals shatter. Gerberas, on the other hand, are not especially sensitive to ethylene. (For a complete list and more information, see Info to Go.)

Q: Can I "fix" ethylene damage?

A: Once exposure has occurred, it is just a matter of time before your flowers poop out, which is why ethylene-sensitive, cut flowers are best treated at grower level with STS in the first drink after harvest. (Plants require a different treatment than cut flowers. They respond best to a gas-vapor treatment for protection. Ask plant vendors if they treat sensitive varieties with 1-MCP for protection.)

Q: What are the main things I should be doing to reduce incidences of exposure?

A: Talk to your supplier to find out if ethylene-sensitive flowers are pre-treated at farm level. (They should be.) Keep track of varieties that are not ethylene sensitive and order by name. Avoid holding flowers dry too long. Always store flowers between 34°F and 38°F. (Tropical blooms such as anthurium and spray orchids are the exception. Store these flowers between 50°F and 55°F.) Avoid cigarette smoke in shop or delivery vans and avoid exhausting delivery vehicles into the back area when loading. Rotate flowers on a first in, first out method so nothing sits too long.

Most importantly, establish standard procedures everyone in your organization understands. Keep a weekly record (by variety name) of dumped bunches. Include the supplier ID and reason the flowers are tossed so you learn which suppliers provide the highest quality. Rough handling is one kind of flower stress we sometimes forget to consider. Dropping boxes on pallets, high-stacking bunches and dumping box contents on processing tables triggers the internal production of ethylene and, if the flower's tissues are damaged, invites Botrytis infection. 🌿



Info To Go

What's Ethylene Sensitive?

For a list of ethylene-sensitive flowers and varieties, click on the Info to Go logo on www.safnow.org. Or call SAF's Fast Fax, (888) 723-2000 and request document #950.

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