

BECOME A SUPER SLEUTH TO DIAGNOSE FLOWER DISORDERS

> Keeping customers happy is key to repeat business. Flowers need to look fresh, open properly, last longer than expected, and be free of insects, diseases and mechanical damage. Such flowers will have buyers returning for more.

Flower disorders include:

- premature death of flowers,
- wilting, shattering and dropping of flower petals or leaves,
- failure of flowers to open,
- premature leaf yellowing and browning,
- diseases and/or insects, and
- mechanical damage.

Each of these problems diminishes flower value and may even render flowers unmarketable.

Retail florists should hone their detective skills to identify problems early and develop strategies for avoiding them in the future. The causes of flower disorders can occur anywhere along their journey from production to retail settings. Fortunately, in many cases, the solutions are inexpensive or even free!



FIGURE 1. Gerberas in perfectly clean water (left) last longer than flowers in water that is even a little bit dirty.



FIGURE 2. Ethylene kills some rose varieties or reduces vase life, while other varieties are not affected.

Premature Death of Flowers

Flowers require water and sugar to live, even after harvest. Water is needed for cells to stay alive and function properly, while sugar maintains metabolism within the leaves and flowers. Water is pulled up the stem by a pressure differential between the base of the stem and the leaves.

The tiny vessels through which water flows might be thought of as a series of straws that connect the water at the base of the stem to all other parts of the flower. Water flows best in clean and unobstructed vessels. The most common obstruction of water flow is bacteria that forms at the base of the stem or within the stem, restricting or blocking the flow. Dirty water is the most common source of these bacteria (Figure 1).

A number of factors may interfere with water absorption by cut flowers. These include extended storage periods, flower age, or improper processing. As flowers age, the ability to transport water is diminished, so it is important to purchase flowers that are truly fresh and that have been processed, shipped and handled properly. Extended storage should be avoided. Also, cut flowers (except tropical flowers) should be stored at 34 - 36 F to preserve the natural sugars produced prior to harvest.

Solution: Buy fresh flowers, process with a flower food that provides sugar and limits bacterial growth, keep water and containers clean, and store at 34 - 36 F.

Wilting, Shattering and Dropping of Petals and Leaves

As with premature flower death, wilting of petals happens whenever water fails to move into them. Water is needed to keep the cells functioning properly.

Another likely suspect is ethylene — a naturally occurring hormone that kills flowers. Ethylene is given off by aging flowers, fruits and vegetables, along with combustion engines (for example, gas-powered delivery vehicles, propane heaters, or propane-powered floor buffers). In these cases, ethylene gas in the air will damage flowers.

But these are not the only suspects to rule out. Flowers can produce ethylene internally, causing petal wilting, shattering and dropping of leaves and buds. Ethylene is called the wound hormone, because it is generated by flowers as a result of stress from drying out, high temperatures, or vibration during transport. In these cases, ethylene is not measurable in the air.

Flowers often recognized as being ethylene sensitive include carnations, delphinium, lily, cymbidium and dendrobium orchids, baby's breath and roses. The response to ethylene in these and other flowers varies with the variety. For instance, Figure 2 shows two rose varieties that have been exposed to ethylene gas. One is resistant; the other variety shows flower wilting caused by ethylene. Anti-ethylene products can significantly improve the quality of susceptible varieties.

Solution: Use a flower food, properly mixed, when processing flowers, and ask your suppliers to pre-treat flowers with an anti-ethylene product. These products protect flowers from atmospheric ethylene and block the internal production of ethylene.

Failure of Flowers to Open

Flowers need water and sugar — to live, but also for petals to enlarge. Petals expand as water enters the cells. No water means no expansion! In addition, current research is demonstrating that some rose varieties fail to open when exposed to ethylene. This discovery suggests that there may be more than one solution to this problem.

Solution: Process flowers soon after arrival and use a commercial flower food, clean buckets and fresh clean water. Request that all ethylene-sensitive flowers be pre-treated with an anti-ethylene product.

Premature Leaf Yellowing and Browning

The root cause of leaf yellowing and browning is a hormonal deficiency that is dependent on the type of flower and the variety. Leaf yellowing is commonly seen on some lily and alstroemeria varieties.

Fortunately, there are hormonal treatments that can eliminate these problems.

Recently, premature yellowing and browning of chrysanthemum leaves has become a problem (Figure 3). The exact cause is not known, but the American Floral Endowment has begun funding of a project to identify the cause of this problem and how to correct it.

Solution: Pay attention to variety and select those that do not develop yellow leaves. Or, if you use a variety that consistently suffers from leaf yellowing, ask whether the grower can treat with commercial anti-leaf-yellowing products before shipping.

Presence of Diseases and Insects

First, flowers should be inspected for insects and diseases prior to processing. If you find insects and diseases, report these culprits to your supplier immediately. While many insects and diseases can affect cut flowers, the prime suspect is gray mold or botrytis.

Botrytis growth is promoted by high humidity levels. In the presence of high humidity, botrytis spores will develop even at cold temperatures. The spores of botrytis enter the petals and inject a toxic substance that begins to kill the cells, resulting in browning of the flowers (Figure 4).

Botrytis is difficult to control, but research supported by the American Floral Endowment shows promise in uncovering some new techniques for managing this problem. There are also new commercial products on the horizon.

Solution: Good sanitation is the most effective way to limit the expansion of botrytis, since spores can be spread on clothing and clippers, and can accumulate on leaves and flowers on floors or in open garbage cans. It is best to remove the plastic sleeves from flower bunches during processing to prevent condensation.

Mechanical Damage

All mechanical damage results from rough handling of the flowers, even when they are still in boxes. Dropping boxes on the floor or tossing flower bunches onto



FIGURE 3. Premature leaf yellowing of chrysanthemum.



FIGURE 4. Botrytis kills flowers!

processing tables can bruise flowers. Damaged flowers or leaves are more vulnerable to botrytis spores. And mechanical damage to the flowers may also lead to internal production of ethylene.

Solution: Just be gentle! Make sure your staff is sensitive to the need to treat boxes, bunches and stems with care.

Track Down the Culprits

You know the most likely suspects: bacteria, ethylene, botrytis. Knowing the symptoms and where to look for

solutions will help keep your flowers in top form. But don't forget to investigate the other possible culprits: lack of sugar, mechanical injury and vulnerable varieties as you look for ways to make your cut flowers stand out in the marketplace. 🌸

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