

Product sheet – Ethylene Buster® tablets

General

- Post harvest product for ethylene sensitive flowers (e.g. Cymbidium, Dendrobium, Dianthus, Lilium), tulip bulbs and pot plants (e.g. Achimenes, Campanula, Miltonia, Dendrobium, Ficus benjamina, Kalanchoe, Phalaenopsis, Plectranthus, Schlumbergera, Streptocarpus).
- Available in a yellow-green tablet form.
- Silver free product, based on the active ingredient 1-MCP (1-Methylcyclopropene).
- Contact your sales manager for availability in your country.



Effects

- Blocks ethylene receptors, thus protecting against internally as well as externally produced ethylene.
- Prolongs vase life of cut flowers, display life of tulip bulbs and shelf life of pot plants.
- Improves bud opening.
- Prevents premature shrinking and dropping of buds, leaves and blooms.

Applications

- Should be used in an airtight environment e.g. room, shipping container.
- For use by growers, bouquet makers and transporters.
- Can be used during transport in a truck.

Savings

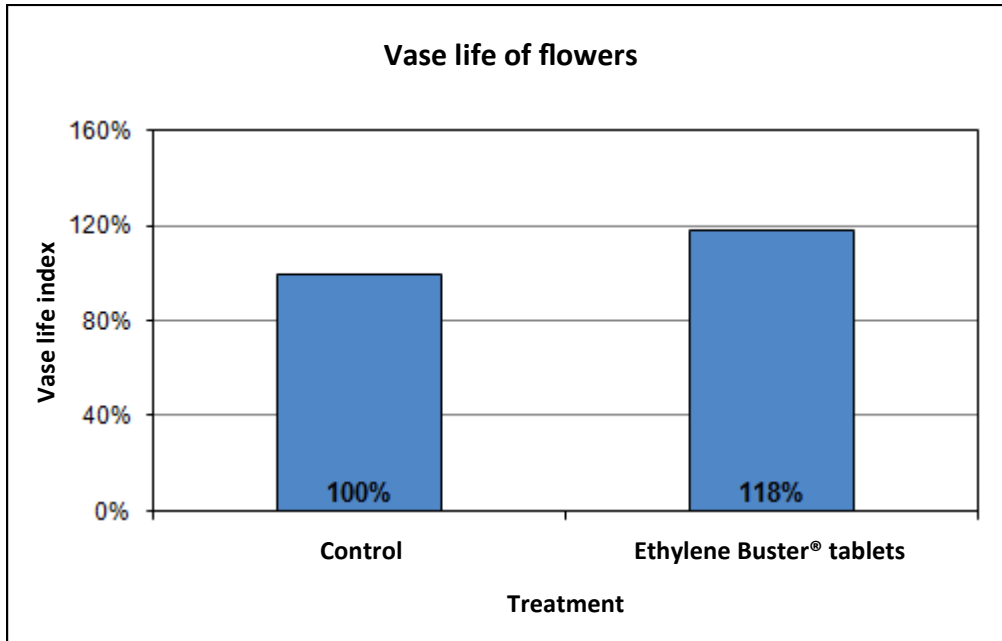
- Reduces flower, tulip bulb and pot plant wastage.
- Extension of distribution and sales period possible.

Recommendations

- Store under cool and dark conditions, preferably between 5°C and 25°C.
- Shelf life: 24 months in sealed packaging and stored under the right conditions.
- Dosage: 1 tablet for 10 m³. For more information about the use of the Ethylene Buster® tablets & Ethylene Buster® Activator Kit see product packaging.
- Keep treatment area closed for a minimum of 4 hours.
- Ethylene Buster® tablets are environmentally friendly and can be used without harm to flowers, plants and users.

Test Results

The following graph shows the effect of Ethylene Buster® tablets on the vase life of flowers compared to flowers without any ethylene treatment.



Vase life of Dianthus 'Delphi'



Treatment: none
Total vase life: 9 days
Photo taken: day 12



Treatment: Ethylene Buster® tablets
Total vase life: 12 days
Photo taken: day 12

Phalaenopsis

5 days transport simulation – Photo taken day 7 in store



Control



Ethylene Buster® tablets

Miltonia

5 days transport simulation – Photo taken day 7 in store



Control



Ethylene Buster® tablets

Dendrobium nobile

3 days transport simulation – Photo taken day 8 in store



Control



Ethylene Buster® tablets

Ethylene Buster® – Test Protocol

Do you want to test the effects of Ethylene Buster® for yourself?

With this test protocol we will guide you.

In order to compare, this test should always contain treated and control plants. Select plants that are uniform of stage and development. Use at least 6 plants per treatment.

Place the plants in a room with a stable climate (ideally $\pm 20^{\circ}\text{C}$ and $\pm 60\%$ relative humidity) and make sure that the plants of each treatment are in similar conditions (light, airflow) to be able to make good comparisons.

The plant hormone ethylene stimulates ageing symptoms like leaf, bud and flower drop, flower wilting and fruit ripening on sensitive flowers and plants. More damage effects of ethylene are observed at when plants are exposed to higher temperatures, sources of higher concentration of external ethylene or when exposed for longer periods.

Ethylene can have multiple causes, internal and external.

- *External ethylene*: Sources of external ethylene include fruits, old flowers, polluted air, insulation in new trucks and buildings and exhaust fumes.
- *Internal ethylene*: Internal ethylene production is enhanced by the plant and flowers in 'stress situations' such as darkness for a longer period, transport movements, large temperature fluctuation even for a few hours etc.

Requirements of the test

- 4 boxes
- Fruit such as tomatoes or bananas
- Plants treated with Ethylene Buster®
- Control plants

Test procedure external and internal ethylene:

- Apply Ethylene Buster® on the plants; for usage and dosage see appendix.
- Be aware that the ethylene damage can take a few days, sometimes even weeks, before it comes visible. Internal ethylene can especially have a delayed effect.
- For some crops the ability of re-blooming is negatively affected by ethylene, in case of crops which are able to re-bloom, use a long observation period.
- Take photos of the effects.

The following test scheme can be used:

Box no.	Box content	Treatment
1	Light-tight box without fruit	None
2	Light-tight box without fruit	Ethylene Buster® tablet
3	Light-tight box with fruit	None
4	Light-tight box with fruit	Ethylene Buster® tablet

1. Fully saturate the soil with water and number each plant related to a treatment.
2. For testing with *internal ethylene* we create a 'stress situation'. In this case:
 - a. Place the plants in a box without light for 7 days at 20°C (68°F), without opening the box during the test.
 - b. Another option could be to put the plants in a box and exposed to wide temperature fluctuations for example one day at 8 – 10°C (46 – 50°F) and three days at 18 – 20°C (64 – 68°F).
3. For testing the effect of *external ethylene* we put the plants in an box containing ripening fruit such as bananas or tomatoes (3 – 5 pieces).
4. Place a control treatment in the box with and without the presence of ripening fruit.
5. Let the plants stay in the box for around 7 days. Do not open the boxes during the test. Keep the boxes far apart from each other, preferably in a separate room.
6. After 7 days remove the plants from the boxes and put them in a climate controlled room.
7. Observe the plants every day on flower opening, leaf drop, leaf yellowing, shelf life and bud loss.
8. Compare the results between the untreated control plants and the plants treated with Ethylene Buster®.
9. Re-water the plants if necessary.

Appendix

Application method tablets

The minimum space needed to conduct the trial is 10 m³. If you do not have an airtight space of 10 m³ please contact Chrysal, they could provide a tent for trial purposes.

Before the application, make sure that the areas are correctly sealed without leaks or cracks. The internal ventilation must be on.

Then follow the below instructions:

- Open the bag containing the Activator Kit.
- Leave the Activator Solution vessel (the generator) in the carton block. Remove the cap from the Activator Solution vessel. Check that the cap has a small vent hole.
- Remove the pack of 2 blue Activator Tablets from the carton box.
- Place 2 blue Activator Tablets in the inverted cap. Always use 2 blue Activator Tablets.
- Remove the appropriate number of yellow-green **Ethylene Buster**[®] Tablets from the blister pack: **Use 1 yellow-green tablet per 10 m³**.
- For volume to be treated < 100 m³, the calculated amount of tablets must be rounded.
For example:
 - if 3.47 tablets calculated, round to 3 tablets
 - if 3.53 tablets calculated, round to 4 tablets
- For a volume to be treated > 100 m³, round always to the lower number of tablets.
- Place the yellow-green tablets in the inverted cap along with the two blue Activator Tablets.
- Peel off the foil seal from the Activator Solution vessel taking care not to spill the Activator Solution.
- Add both the blue Activator Tablets and the yellow-green **Ethylene Buster**[®] Tablets to the Activator Solution.
- Replace the cap tightly.
- Place the Activator Solution vessel (in the carton box) on a stable, level surface like the pavement of the room.
- Close the door within two minutes and keep it closed for a minimum of 4 hours for ornamentals. The internal ventilation must be on to ensure a good air circulation in the area. All scrubbers (CO₂ and ethylene) and ozone generators must be switched off. The use of lime to scrub CO₂ will not interfere with the application.
- During treatment with **Ethylene Buster**[®] a sign must be attached to the access door with the following text: "CAUTION. Do not enter area. **Ethylene Buster**[®] application in progress."