Control Mould, Ethylene and Bacteria Naturally

Proven Results

OLGEAR's customers are reducing product decay and spoilage, significantly. OLGEAR's ozone-based solutions enable packers, processors and distribution warehouses to control mold, fungi, and bacteria, and to eliminate the ripening gas, ethylene. Product quality is maintained, and through reduced wastage profits are increased.

Safer Alternative to Chemicals and Fungicides

Ozone prevents spread of spores

Ozone is safe. It does not pose the health and safety risks, or the regulatory burdens, of most chemicals. Ozone is made from oxygen and reverts back to oxygen after it has done it's work.

Workers can move in and out of the cold storage room while ozone is being applied at effective levels. Ozone is also safer for your food products and your processing and storage rooms. Harsh chemicals for example sulfur dioxide, can leave white spots and dried up stems on table grapes.

Chemicals can also corrode equipment in your storage rooms.

Workers and consumers may have an allergic reaction to many of the chemicals traditionally used.

Ozone can be used to control odor problems too. In an environment where mixed products are being kept, odours can tarnish the flavours of others. Ozone prevents this and also renders the environment more comfortable to work in.

Ozone arrests mould growth (Ozonated sample on the left, control on the right.)

Ozone Actions

- Arrests spread of mold: Botrytis, Rhizopus Rot, Penicillium, etc.
- Reduces Ethylene concentrations in air.
- Non-specific in attack.
- Kills bacteria such as Salmonella, Listeria and E.Coli
- Fumigates facilities and bins

Apples stored in ozone (Ozonated sample on right, control on the left.)

Staff & Environment Friendly

- No chemicals are consumed.
- Ozone safely reverts back to oxygen.
- No safety equipment is required.

Product Friendly

- Does not leave a chemical residue
- Ozone does not alter the taste or appearance of the product.
- OLGEAR's systems control and monitor ozone levels automatically by sensor.

Ozone Characteristic Summary	
Mold Control	All types of Mold; mold is oxidized and cannot become resistant to ozone
Ethylene Control	Converts ethylene to water and carbon dioxide (process is outside the fruit)
Residue on Fruit	No
Taste	Natural flavors maintained
Dosage / Application	Ozone is applied continuously controlling mold and ethylene constantly
Corrosion to Equipment	None at typical application levels

COLD STORAGE SOLUTIONS

OLGEAR
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COLD STORAGE SOLUTIONS

Scientific Validation

"The Buddy Ozone Generator results show good bacterocidal and sporocidal efficacy of ozone with no recovery of viable organisms in the air or surfaces after an 8 hour treatment." *1*

"Continuous ozone exposure at 0.3 ppm inhibited aerial mycelial growth and sporulation on 'Elegant Lady' peaches wound inoculated with *Monilinia fructicola, Botrytis cinerea, Mucor piriformis*, or *Penicillium expansum* and stored for 4 weeks at 5°C and 90% humidity. Gray mold nesting among 'Thompson Seedless' table grapes was completely inhibited under 0.3 ppm ozone when the fruit was stored for 7 weeks at 5°C." *2*

"The number of colony forming units (cfu) of fungi, yeasts and bacteria naturally present on the berry [grape] surface was considerably reduced by a 20 min exposure to ozone. Ozone treatments significantly reduced the extent of berry decay caused by fungi following cold storage and increased shelf-life." *3*

"Ozonizing the air in a cold storage room can reduce the level of ethylene in the air. Ozone generators may be of most use in places where ethylene-producing and ethylene-sensitive fruits and vegetables may be stored in the same room." *4*

"Gaseous ozone treatment could be a good choice for extending the shelf life of strawberries because they are easily damaged by water. Ewell (1940) indicated that the shelf life of strawberries, raspberries, currents, and grapes could be doubled if 2–3 ppm of gaseous ozone is applied continuously for a few hours per day." *5*

"The effect of low ozone concentrations (0.3 to 1.0 ppm) on other fruit has been reported. Observations include a slight but significant inhibition by ozone of the rate of decay of oranges and lemons by *Penicillium digitatum* and *P. italicum*, of strawberries by *Botrytis cinerea*, and peaches by *Monilinia fructicola*. Ozone at these low rates retarded the production of spores from infected fruit or cultures (Harding 1968; Palou et al. 2001; Palou et al. 2003; Nadas et al. 2003)." *6*

Citrus Storage Study - USDA
April, 2000, ozone at low concentrations greatly reduces the sporulation of green and blue mold. Ozone treatment lasted for 30 days at 3°C and 95%RH.
The conclusions of the study were:
0.3 ppm O3 for 12 hrs. per day = spore control
0.8 ppm O3 for 12 hrs. per day = spore mortality

References

1. SABS Microbiology Lab Testing, 2005, Ref 17/37/9.

2. Palou et al., 2002, "Effects of continuous 0.3 ppm ozone exposure on decay development and physiological responses of peaches and table grapes in cold storage", Postharvest Biology and Technology, 24(2002): 39-48.

3. P. Sarig et al., 1996, "Ozone for control of post-harvest decay of table grapes caused by Rhizopus stolonifer", J. Physiological and Molecular Plant Pathology, 48(6): 403-415.

4. Skog, L.J., 2001, "Effect of ozone on qualities of fruits and vegetables in cold storage", Can. J. Plant Sci. 81: 773-778.

5. Xu, Liangji., 1999, "Use of Ozone to Improve the Safety of Fresh Fruits and Vegetables," FoodTechnology, Vol. 53, No. 10.

6. Smilanick, Joseph L., 2003, "Use of ozone in Storage and Packing Facilities," Washington Tree Fruit Postharvest Conference."

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