CARBON DIOXIDE FOR GREENHOUSES

Carbon dioxide: An essential building block for plant growth and production.

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CARBON DIOXIDE FOR GREENHOUSES

HOW IT WORKS

The growth and health of plants is the result of the photosynthesis process in which the energy of the sun is used by the plant in combination with carbon dioxide (CO₂) and water to synthesize organic matter, while giving off oxygen. Consequently, CO₂ is one of the three major components responsible for plant growth. A supply of CO₂ in a greenhouse helps maintain a concentration higher than the average air to help stimulate the photosynthesis process.

INNOVATIVE SOLUTIONS

Growing plants require CO₂ and atmospheric levels of CO₂ in many greenhouses are so low that it can restrict plant growth. Adding CO₂ to the greenhouse not only promotes faster plant growth, but also allows for a larger cash crop. Air Liquide is a worldwide leader in the technology and application of gases and our specialists in CO₂ can help assess and integrate solutions to greenhouse applications.

BENEFITS

By injecting CO₂ into your greenhouses:

- Normal atmosphere CO₂ levels are just under 400 ppm
- In a closed greenhouse on a sunny day, CO₂ levels can fall so low that growth stops by mid-morning (9:00am)
- Optimum CO₂ levels for plant growth range from 700 to 900 ppm
- Optimum levels for your crop promote higher productivity
- Optimum CO₂ levels for your crop promote faster crop maturity and harvest cycles
- CO₂ enrichment works for vegetable production of any green medicinal or recreational products
ENHANCED GROWTH OF GREENHOUSE PRODUCTS THROUGH CO$_2$

<table>
<thead>
<tr>
<th>Product</th>
<th>Optimum levels of CO$_2$</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>1000 ppm</td>
<td>✓ 20 to 40% increase of productivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Cultivation period decrease of 5 to 18 days</td>
</tr>
<tr>
<td>Green plants</td>
<td>800 ppm</td>
<td>✓ Increase the leaf surface area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Precocity</td>
</tr>
<tr>
<td>Cucumber</td>
<td>1000 – 1200 ppm</td>
<td>✓ 11 to 20% increase of productivity</td>
</tr>
<tr>
<td>Rose</td>
<td>800 – 1000 ppm</td>
<td>✓ Approximately 11% increase of productivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Cultivation period decrease of up to 21 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Higher Quality</td>
</tr>
</tbody>
</table>

BIOMETRIC ANALYSIS ON THE USE OF CO$_2$ ON TOMATO FRUITS\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>% Germination</th>
<th>% Maturation</th>
<th>Avg. diameter of fruit (mm)</th>
<th>Total weight of fresh fruits per bunch (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With CO$_2$</td>
<td>95.8</td>
<td>53.3</td>
<td>70.8</td>
<td>1,093.4</td>
</tr>
<tr>
<td>Without CO$_2$</td>
<td>81.2</td>
<td>39.8</td>
<td>64.1</td>
<td>844.4</td>
</tr>
<tr>
<td>% increase</td>
<td>+ 14.6</td>
<td>+ 13.5</td>
<td>+ 10.5</td>
<td>+29.5</td>
</tr>
</tbody>
</table>

\(^1\)Data retrieved April 3, 2008
FINDING SOLUTIONS
IS IN OUR NATURE

See your account executive for applications specific to your brewery not listed inside or contact our specialists.

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✉️ us.info@airliquide.com

Contact one of Air Liquide Canada’s food specialists:

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📞 Western Canada: 780 485-7404
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