



**We'll Maintain Your Plants... You Maintain Your Image!**

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## **PLANTS ARE A NICE AMENITY, BUT THEY DON'T REALLY WORK ALL THAT HARD, DO THEY?**

**1. Has anyone conducted “real life” office studies to measure the direct relationship between clinical health complaints and plant installations? Sick Building Syndrome is a serious and expensive issue, and we need to know the degree to which interior plants can positively affect our employees’ health.**

Professor Tove Fjeld of the Agricultural University in Oslo, Norway carried out several conclusive studies regarding health claims relating to Sick Building Syndrome among workers. This crossover study was conducted among 51 offices. During one period, plants were included in the offices. And during another, plants were not included. All participants worked in identical, single offices, with a floor area of 10 m<sup>2</sup> and a window covering most of the outer wall. When plants were included, the participants were exposed to 13 commonly used foliage plants placed in three containers on a window bench, and a terracotta container with plants in the back corner of the office. Data from the study can be found in the table below.

### **Recorded Health Improvements at the Statoil Offices After the Introduction of Interior Plants**

#### **AILMENT --% REDUCTION**

**Fatigue 20**  
**Headache 30**  
**Sore/dry throats 30**  
**Coughs 40**  
**Dry facial skin 25**  
**Well-being 84**

**2. Can you provide us with legitimate documentation linking interior plants to stress reduction?**

Numerous studies indicate that plants have a positive psychological impact on people (see, for example, Lohr et al, 1977). This study verified that, once exposed to plant settings, test persons demonstrated more positive emotions such as happiness, friendliness, and assertiveness and less negative emotions such as sadness and fear. As stress rises in the modern working and living environment, the incidences and expenses of stress-related disorders increases. Working with plants has been used as a therapy to relieve stress since the earliest recorded history, and recent studies are beginning to document the value of working with plants (Doxon et al, 1987).

Simply viewing plants has even been shown to reduce stress. In one study, students who had just completed an exam were experiencing some anxiety (Ulrich, 1986). Their stress levels were measured through questionnaires before and after they viewed slides of nature scenes with vegetation, or urban scenes without vegetation. Students exposed to the vegetation scenes reported significantly improved emotional states.

Another study documented people's ability to recover from stress within five minutes of being exposed to nature settings (including plants) by quantifying physiological measures such as muscle tension, skin conductance, and pulse (Ulrich and Simons, 1986).



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### **3. Can interior plants seriously impact my hard IAQ numbers? Exactly how do interior plants remove harmful chemical toxins from the air in office buildings?**

Plant leaves can absorb certain organic chemicals and destroy them through a process called “metabolic breakdown.” A group of German scientists proved this when they labeled formaldehyde with a radioactive carbon 14 tag and followed its absorption and metabolic destruction inside a spider plant. The formaldehyde was metabolized and converted into tissue products such as organic acids, sugars and amino acids as demonstrated by the radioactive carbon 14 tag.

When plants transpire water vapor from their leaves, they pull air down around their roots. This supplies their root microbes with oxygen. The root microbes also convert other substances in the air, such as toxic chemicals, into a source of food and energy. Microbes, such as bacteria, can rapidly adapt to a chemical contaminant by producing new colonies that are resistant to the chemical. As a result, they become more effective at converting toxic chemicals into food the longer they are exposed to the chemicals. It is also important to remember that the efficiency of plants or a filtering device decreases as the concentration of chemicals in the air decreases. For example, the removal rate of a chemical is much higher at seven parts per million (ppm) exposure than at 2 ppm.

### **4. Can having live plants really affect absenteeism?**

According to studies done by JCAHO, IAQ (indoor air quality) related absenteeism has been on an alarming upswing. In recent studies 40% of absenteeism was attributed to IAQ related illnesses. Similarly, the same report demonstrates an increase of Worker Compensation Claims from 1980 to 1994 for IAQ related issues.

The number of such cases rose by almost 5000 claims within that period and has continued to rise over the last five years. Data from Bio-Safe Incorporated confirms that without the air filtering provided by live plants, energy efficient, sealed office structures are often 10 times more polluted than the air outside!

Research shows that plant-filled rooms contain 50-60 percent fewer disease causing airborne molds and bacteria than rooms without plants. For almost twenty years, Dr. Billy C. Wolverton and his aids in the Environmental Research Laboratory of John C. Stennis Space Center have been conducting innovative research employing natural biological processes for air purification. “We’ve found that plants have been found to suck these chemicals out of the air,” he says. “After some study, we’ve unraveled the mystery of how plants can act as the lungs and kidneys of these buildings.” The plants clean contaminated office air in two ways. They absorb office pollutants into their leaves and transmit the toxins to their roots, where they are transformed into a source of food for the plant.

Wolverton has found that plants are especially needed in office buildings in which sick building syndrome is common. He goes so far as to suggest that everyone have a plant on his or her desk, within what he calls the “personal breathing zone.” This is an area of six to eight cubic feet where you spend most of your working day.

Jay Naar, author of *Design for a Livable Planet*, suggests 15 to 20 plants are enough to clean the air in a 1,500 square foot area.