



## Fruits of a Great Symbiotic Relationship

People and Plants Meant to Coexist

In recent years, as we have strived to conserve energy and create comfortable indoor environments for tenants, we've turned air pollution into an indoor problem.

Tightly sealed buildings save energy, reducing operating costs. Tight seals, however, also trap pollutants such as moulds, bacteria, and some 900 volatile organic chemicals (VOCs) released from synthetic indoor furnishings, all of which can irritate occupants.

Property managers typically don't need to test the air to know they have an

indoor air quality (IAQ) issue. Building occupants will report that their eyes are irritated, their throats are scratchy, they have shortness of breath, or they feel unusually irritable – all symptoms of poor air quality. Poor IAQ is so common that it has been tagged Sick Building Syndrome.

Sick Building Syndrome is recognized as a significant and serious concern. In 1989, the United States Environmental Protection Agency (EPA) reported to Congress that indoor air pollution posed "serious acute and chronic health risks,"

By Hella Keppo

costing tens of billions of dollars per year in medical costs and lost worker productivity.

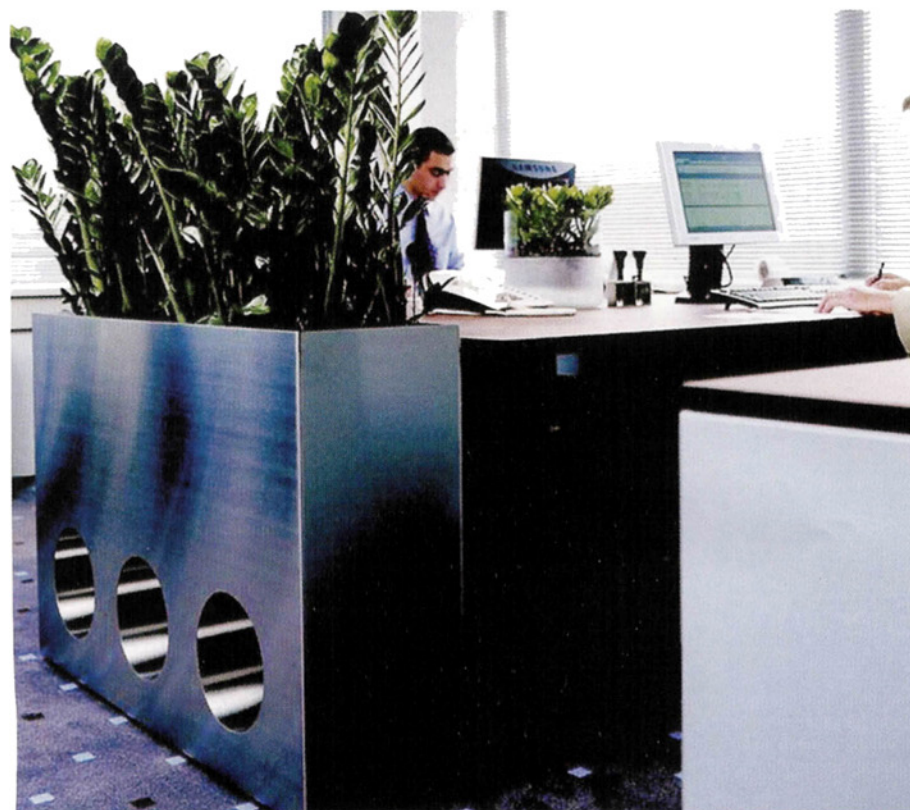
Environment Canada reports that indoor air can be as much as 100 times more polluted than outdoor air. And according to the Office of Air and Radiation, long-term exposure to VOCs has been linked to asthma, organ and tissue damage, birth defects and cancer.

Sick Building Syndrome poses serious and expensive problems for building owners to rectify. And the range of solutions is limited. Building operators can purge stale air by increasing ventilation. That, however, will probably compromise energy savings. Also, it introduces outside air, which can be equally polluted. Increasing ventilation is not efficient, cost-effective or environmentally responsible.

Allowing materials to off-gas before installation can help, but many synthetic products continue to off-gas for years. Unfortunately, the building industry has still not adequately addressed the twofold air quality problem – how to provide quality indoor air in a cost-efficient way.

### LUNGS FOR THE PLANET & WORKPLACE

One way to address this relatively new problem is with an age-old solution. Plants. The planet evolved from a highly toxic environment into a life-supporting ecosystem with the help of plants. Since they first appeared, plants have been purifying air on earth.





"The earth can be viewed as a living organism," NASA scientist Dr. Bill Wolverton explains. "Rainforests act as the earth's lungs, producing oxygen and removing carbon dioxide – the opposite process to human and animal lungs. Wetlands function as the earth's kidneys. Aquatic plants filter nutrients and the environmental toxins from the water as it flows back into streams, rivers and oceans in much the same way as kidneys filter impurities from our blood."

Plants and people have a great symbiotic relationship. People breathe in air and release carbon dioxide. Plants take in carbon dioxide and release fresh oxygen. Considering people spend most of their time indoors, it makes sense to bring plants indoors as well.

When it comes to reducing symptoms of Sick Building Syndrome, a two-year Norwegian study found that when plants were introduced to the environment, fatigue was reduced by 20%, dry skin by 25%, sore throats by 30%, coughs by 40%, and headaches by 45%.

The building industry has been discovering how interior plants can create a sustainable ecological system within a hermetically sealed building. A concern, though, is the perception that one needs to create a jungle to make a difference.

While it is true that simply placing a few interior plants in a building with poor IAQ will not significantly affect the indoor environment, an individual can achieve a noticeable difference by placing a plant within his or her personal breathing zone – i.e. the six to eight cubic feet surrounding someone's workspace. Houseplants can help clean the air within a personal

breathing zone, but providing clean, healthy air for an entire building is best.

**LARGE AND SMALL SCALE APPLICATIONS**

For an entire building or a large office space, the great news is progressive advances have been made with indoor ecosystem technology, answering many of the skeptics' concerns. Stems Interior Landscaping has been involved in a combined project by the University of Guelph and Humber College. At the University of Guelph, a plant wall has been created that uses biofiltration as an alternative to ventilation for maintaining indoor air quality and removing common air pollutants.

The living biological filter, termed a biofilter, has a porous surface wall covered with specialized microbial species, mosses and other plants. The biofiltration aspect of the wall parallels the concept of tropical rainforests acting as the lungs of the planet. The biofilter wall creates large volumes of fresh air that is then distributed by a mechanical ventilation system.

Integrating plants with highly adsorbent filtering media and mechanical air movement increases the ability to filter pollutants, and significantly reduces the number of plants required. A true sustainable indoor plant solution is emerging.

Although a biofilter wall may be impractical for most existing buildings, improved IAQ can still be achieved in a feasible manner by designing the interior with plant species known to purify air. In addition, studies show plants also reduce noise, freshen air, define space, provide privacy, reduce glare, exchange carbon dioxide for oxygen, and control humidity levels.

**PERCEPTION AND WELL-BEING**

One study found indoor landscaping was the number one return on interior décor investments. Indoor plants cost less than most alternative corporate décor choices,



and they enhance the image of the building. Clients and employees were found to perceive a building with interior plants as more upscale, more welcoming, and more relaxed than one that lacked greenery.

As for well-being, studies show live plants significantly lower workplace stress and enhance productivity. Dr. Roger S. Ulrich of Texas A&M University, Helen Russell, of Surrey University, England, and Dr. Virginia Lohr of Washington State University found research participants were 12% more productive and less stressed than those who worked in an environment without plants. An eight-month study with men showed those who work among plants and flowers were 15% more creative.

Not only that, the studies show that once exposed to plant settings, employees feel less tired and experience an increase in happiness, friendliness, and assertiveness on the job. Researchers conclude that workspaces with indoor plants signal stability and offer employees a touch of humanity, while stimulating a more productive environment.

Attracting and keeping happy tenants in a buildings is critical. The comfort level is key to meeting tenants' needs. Consider the age-old solution that has kept our planet hospitable for all life – plants. Plants are an affordable way to improve the IAQ in a building and help keep the tenants healthy. ▲

*Hella Keppo is an interior landscaper and expert on using plants and aquariums to create beautiful, functional, and healthy indoor environments. For more information, see the web site at [www.stems.ca](http://www.stems.ca).*

