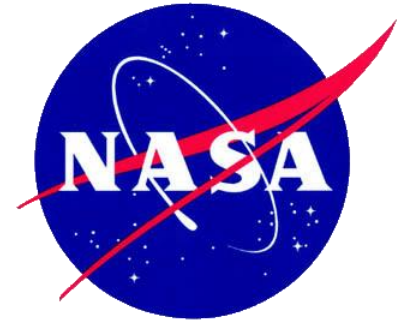


PLANTS FOR GREEN BUILDINGS



DR BC WOLVERTON



“The ability of indoor plants to improve the quality of the air we breathe is now accepted scientific fact”



GLOBAL RESEARCH

Research from around the globe has shown indoor plants have the following primary benefits:

- ✓ Improvement in air quality
- ✓ Reduction in health complaints
- ✓ Reduced absenteeism
- ✓ Increased productivity
- ✓ Increased sense of well being



Volatile Organic Compounds (VOC's)

VOC's are responsible for more than 1.6 million deaths each year, according to a 2002 World Health Organization report.



**World Health
Organization**



➤ USEPA ranks indoor air pollution among top 5 threats to human health



➤ More than 900 VOC (volatile organic compounds) can be present in indoor environmental air.



NATURE'S AIR PURIFIERS

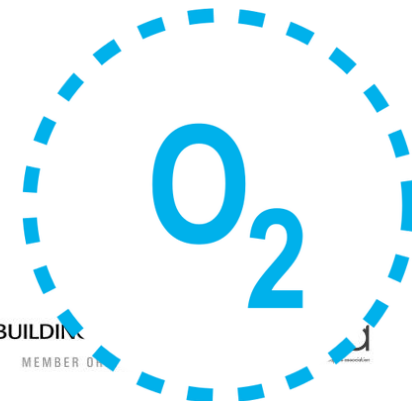
- Sydney University of Technology showed plants helped to reduce VOC's between 50 to 75% within 24 hours



- Wolverton Environmental Services Inc. showed 50 to 65% of VOC removal can be attributed to root & soil microbes

INCREASED CONCENTRATION

- High carbon dioxide levels can cause drowsiness, headaches and affect concentration levels
- Sydney University of Technology found that in air-conditioned buildings plants reduced carbon dioxide levels by 10%
- In buildings that were not air-conditioned, figure rose to 25%



ABSENTEEISM

Research in Norway showed plants reduced absenteeism by 30%



1st

SOUTH AFRICAN RESEARCH PROJECTS



Business Connexion

Connective Intelligence™



People With Whom You Can Build Your Future



IMPROVEMENTS IN IEQ

- 21% reduction in CO₂ levels
- 3% reduction in ambient temp
- Stabilization of ambient temp
- Stabilization of humidity levels
- But 8% reduction in humidity

IMPACT ON STAFF WELL BEING



RESULTS

PRIMARY DEPENDENT VARIABLE TOTALS

	MEAN SCORE NO PLANTS	MEAN SCORE PLANTS	TREND
1. Employee Physical Wellbeing	2.8947	3.0064	↑
2. Employee Psychological Wellbeing	3.5894	3.6057	↑
3. Perceptions of the Work Environment	3.2076	3.2598	↑
4. Employee Work Engagement	3.8677	3.7842	↓



There is evidence of an **upward trend** in the data collected across all three assessments.

EXPLANATION

- A large number of employees did not stay in the same area throughout all three assessments.
- There was a Significant event that took place in the area, which no doubt impacted the results of this study.
- The plants were not in for long enough.





IMPROVEMENTS IN IEQ

- 2.67% reduction in CO₂ levels
- 0.22% reduction in ambient temp
- 16.62% reduction in humidity levels



IMPROVEMENTS IN IEQ

- 20% reduction in Total VOC's
- 14.29% reduction in Benzene levels
- 7.69% increase in Xylene



IMPACT ON EMPLOYEE WELL-BEING



WHAT WAS ASSESSED

- 1) Work Engagement
- 2) Psychological Well-Being
- 3) Physical Well-Being
- 4) Aesthetics of Workplace & Plants



RESULTS

- There were no significant differences found after introducing plants, on the above variables
- Aesthetics of the workplace and of plants did not affect any of the above relationships



**In the Interiors Tool Indoor Plants
will provide 0.5 points**



Minimum Requirements

- Provide 1 x plant unit per 50m² of regularly occupied office space / 0.5 plant units per full time employee
- 70% of plants must be suited to environment
- 2 year horticultural maintenance plan



THANK YOU