



Indoor Air Quality in Florida: Houseplants to Fight Pollution¹

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Houseplants under some conditions can effectively remove benzene, formaldehyde, CO and nitrogen oxides (undesirable products of burning tobacco and wood). In a NASA research project, Spider plants were placed in closed chambers with 120 ppm carbon monoxide (CO) or 50 ppm nitrogen oxide (NO₂).

After 24 hours, spider plants removed:
96% CO, 99% NO₂

After 24 hours, Golden pothos removed:
75% CO

A second research project conducted through NASA and the Associated Landscape Contractors of America screened house plants for the removal of Benzene, Trichlorethylene and Formaldehyde. Plants used include Bamboo palm, Chinese evergreen, English ivy, Ficus, Gerbera daisy, Janet Craig, Marginata, Mass cane/Corn cane, Mother-in-law's tongue, Peace lily, Pot mum and Warneckei.

The results of these tests suggest:

- Low-light-requiring houseplants with activated carbon plant filters have potential for improving indoor air quality.
- The plant root-zone is effective area for removing volatile organic chemicals. (Maximum air exposure to plant root-soil area for best air filtration.)
- Use of activated carbon filter should be a part of the houseplant/air cleaning plan.

Additional research conducted through NASA Laboratories indicates other plants can assist in reducing indoor air contaminants in certain conditions. They are listed in descending order of effectiveness.

- Heart leaf philodendron
- Elephant ear philodendron

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- Green spider plant
- Lacy tree philodendron
- Aloe vera
- Golden pothos
- Chinese evergreen
- Mini-schefflera
- Peperomia
- Peace lily
- Peperomia (*peperomia obtusifolia*)
- Peace lily (*spathiphyllum clevelandii*)
- Corn plant (*dracaena fragrans 'massangeana'*)
- Snake plant (*sansevieria traifasciata*)

The most effective plants to use in removing pollutants like formaldehyde are those with a large leaf surface area.

- Heart-leaf philodendron (*philodendron scandens*)
- Elephant ear philodendron (*philodendron domesticum*)
- Green spider plant (*chlorophytum elatum*)
- Lacy tree philodendron (*philodendron selloum*)
- Golden pothos (*epipremnum aureum*)
- Chinese evergreen (*aglonema modestum*)
- Mini-Schefflera (*bassaia arboricola*)

Careful selection of indoor plants is necessary if anyone suffers from exposure to molds, pollens, odors or dust. Remember also, houseplants add moisture to the environment. **All** the water used on the plants goes into the air. This is a plus in dry parts of the country or during dry times of the year. In Florida each gallon of water added for watering plants will require about 3.5 Kwh of electricity to remove. If moisture and mildew problems are being experienced in a home or office, plants can have negative energy and comfort effects; and can also increase moisture and mildew problems.

Before considering the use of plants to control indoor air pollution:

1. Identify contaminants that are above the Threshold Limit Value®.
2. Control source of pollution.
3. Check structure for air leakage and correct.
4. Check for the proper design, use, and maintenance of HVAC systems.