

RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS AND SCRAGGLY GROWTH

SCIENTIFIC NAME	COMMON NAME
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<i>Lantana camara</i>	LANTANA
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

RESPONSE TO AMBIENT AIR POLLUTION:
PALE & SPOTTED LEAVES, REDUCED GROWTH

SCIENTIFIC NAME	COMMON NAME
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<i>Apium graveolens</i> var. dulce	CELERY
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<i>Aquilegia</i> sp.	COLUMBINE
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<i>Asplenium bulbiferum</i>	MOTHER FERN
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<i>Coriandrum sativum</i>	CORIANDER
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<i>Daucus carota</i> var. sativus	CARROT
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<i>Petroselinum crispum</i>	PARSLEY
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<i>Primula</i> sp.	PRIMROSE
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

RESPONSE TO AMBIENT AIR POLLUTION:

LEAF SPOTS, FEWER FLOWERS, REDUCED GROWTH

SCIENTIFIC NAME	COMMON NAME
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<i>Nicotiana tabacum</i>	NICOTIANA
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<i>Petunia hybridus</i>	PETUNIA
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<i>Viola sp.</i>	VIOLA
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

RESPONSE TO AMBIENT AIR POLLUTION:

FEWER FLOWERS, PALE LEAVES, REDUCED LIFE SPAN

SCIENTIFIC NAME	COMMON NAME
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<i>Lobularia matitima</i>	SWEET ALYSSUM
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS, REDUCED GROWTH & LIFE SPAN

SCIENTIFIC NAME	COMMON NAME
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Brachcome iberidifolia	SWAN RIVER DAISY
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

RESPONSE TO AMBIENT AIR POLLUTION:
NO INJURY SYMPTOMS SEEN, APRIL-OCTOBER

SCIENTIFIC NAME	COMMON NAME
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Camellia japonica	CAMELLIA
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Eucalyptus sideroxylon rosea	PINK IRON BARK
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Feijoa sellowiana	PINEAPPLE GUAVA
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Juniperus chinensis	PFITZER JUNIPER
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Magnolia grandiflora	SOUTHERN MAGNOLIA
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Nerium oleander	OLEANDER
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Pelargonium vulgaris	MARTHA WASHINGTON
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Pelargonium vulgaris	GERANIUM
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Podocarpus macrophyllis	YEW PINE
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Rhapiolepis indica	INDIAN HAWTHORN
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Tulbaghia violaeoea	SOCIETY GARLIC
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

PHOTOGRAPHS OF ORNAMENTALS
FOR WHICH

REDUCED GROWTH
IS THE MOST STRIKING
RESPONSE TO AIR POLLUTION

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 1990-91

RESPONSE TO AMBIENT AIR POLLUTION: REDUCED GROWTH

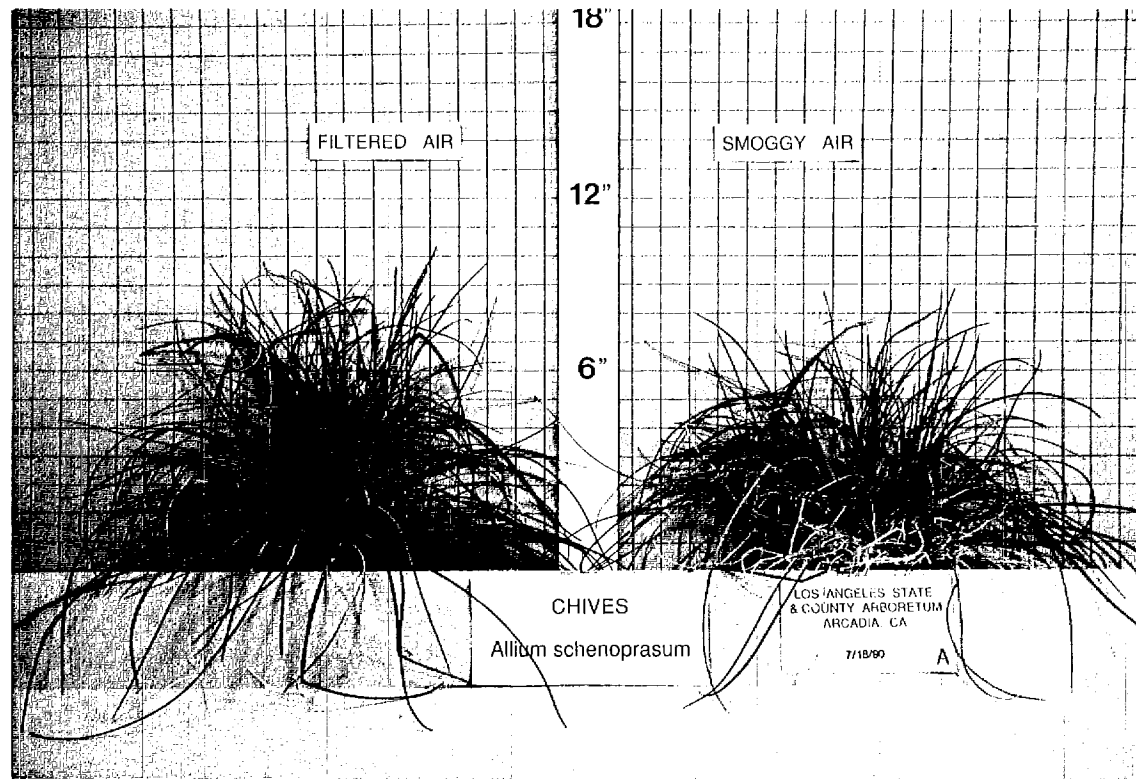
SCIENTIFIC NAME	COMMON NAME
<i>Allium cepa</i>	CALIFORNIA RED ONION
<i>Allium schoenoprasum</i>	CHIVES
<i>Centaurea cineraria</i>	DUSTY MILLER
<i>Citrus sinensis</i>	ORANGE
<i>Coleus hybridus</i>	COLEUS
<i>Coreopsis</i> sp.	COREOPSIS
<i>Gazania</i> sp.	GAZANIA
<i>Helichrysum congestifolium</i>	CURRY PLANT
<i>Lavendula</i> sp.	LAVENDER
<i>Ligustrum japonicum</i>	WAX LEAF PRIVET
<i>Origanum vulgare</i>	OREGANO
<i>Pelargonium</i>	LEMON BALM
<i>Pittosporum tobria</i>	MOCK ORANGE
<i>Rosa</i> sp.	BONICA ROSE
<i>Rosa</i> sp.	PLAYBOY ROSE
<i>Rosa</i> sp.	SILVERADO ROSE
<i>Rosmarinus officinalis</i>	ROSEMARY
<i>Washingtonia filifera</i>	CALIFORNIA FAN PALM
<i>Zinnia elegans</i>	ZINNEA

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

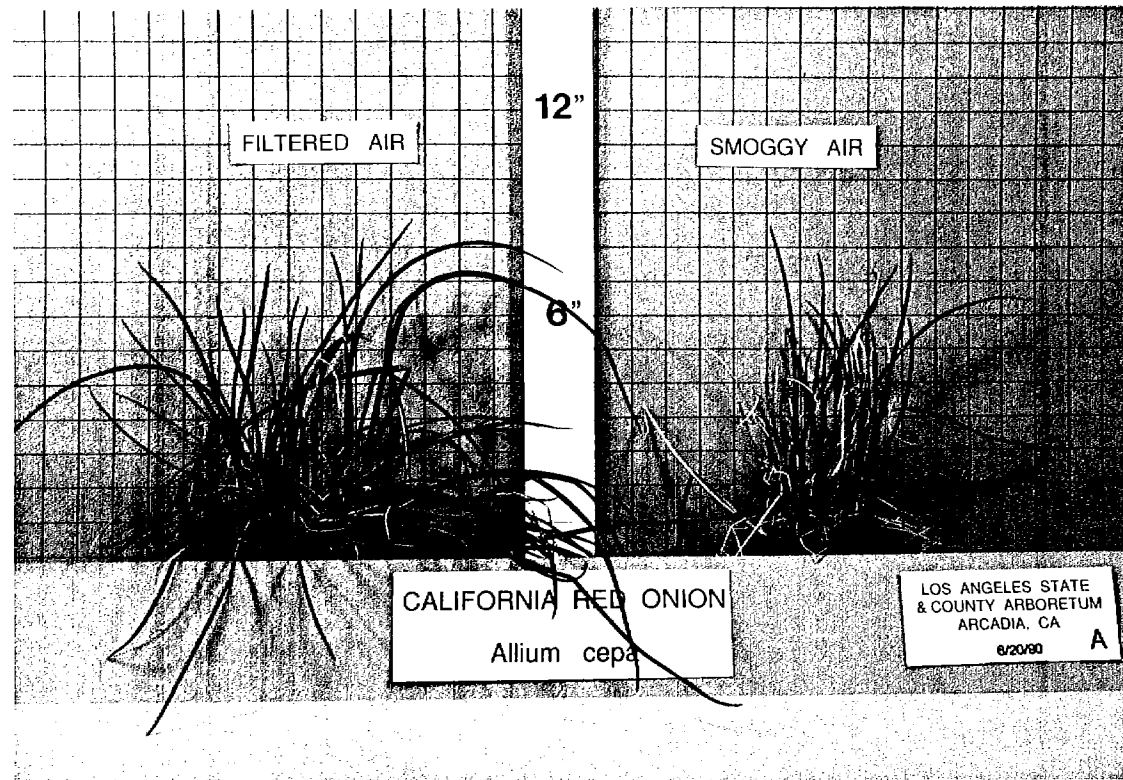
REDUCED GROWTH

CHIVES

Allium schoenoprasum



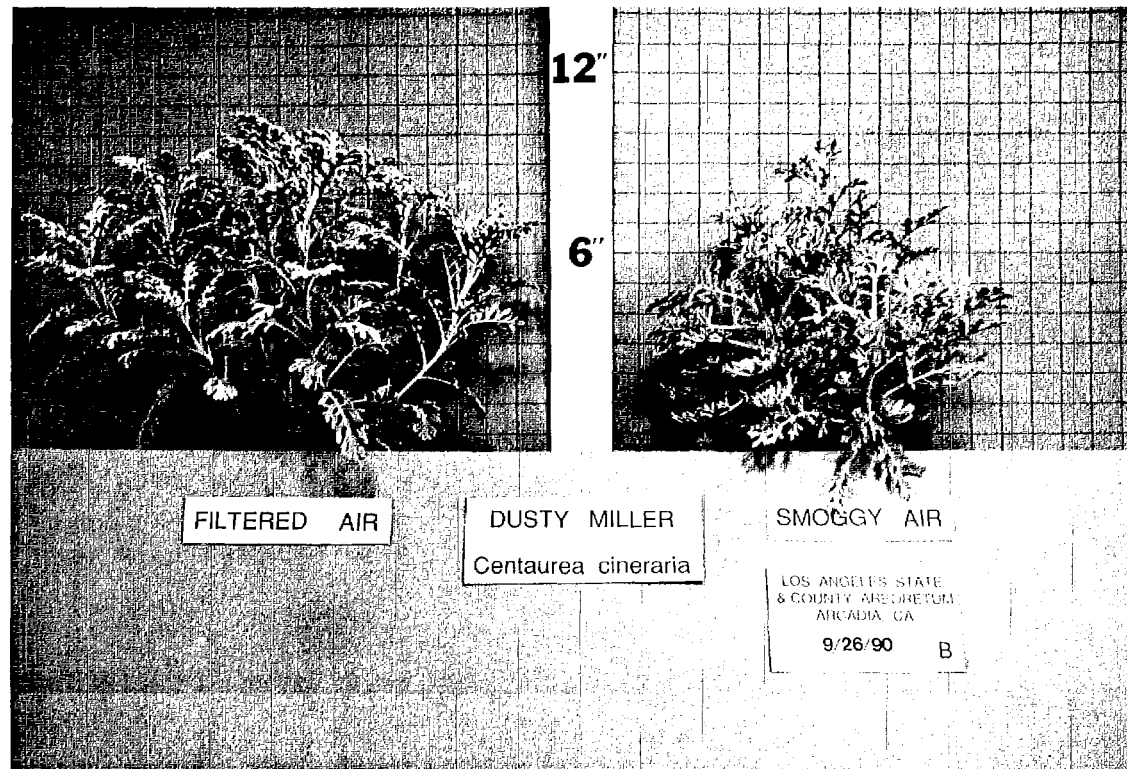
REDUCED GROWTH CALIFORNIA RED ONION *Allium cepa*



REDUCED GROWTH

89

DUSTY MILLER *Centaurea cineraria*



REDUCED GROWTH

ORANGE

Citrus sinensis



REDUCED GROWTH

COLEUS

Coleus hybridus

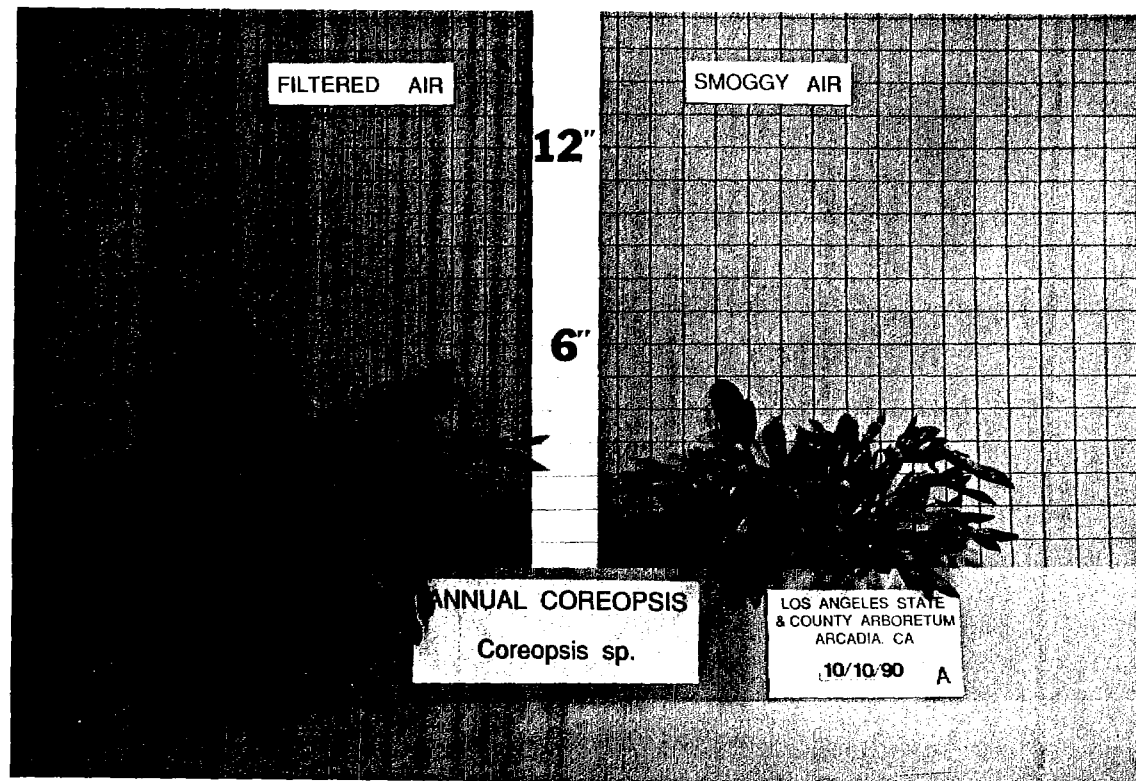


REDUCED GROWTH

COREOPSIS

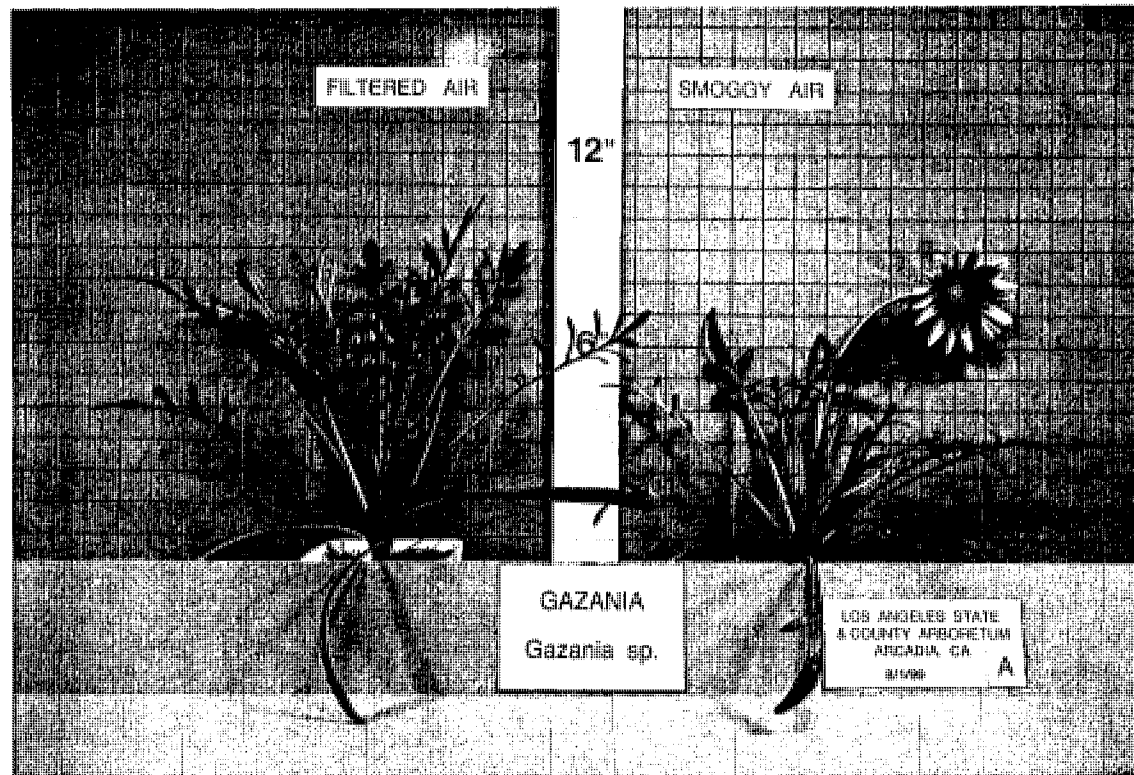
Coreopsis sp.

92



REDUCED GROWTH

GAZANIA Gazania sp.

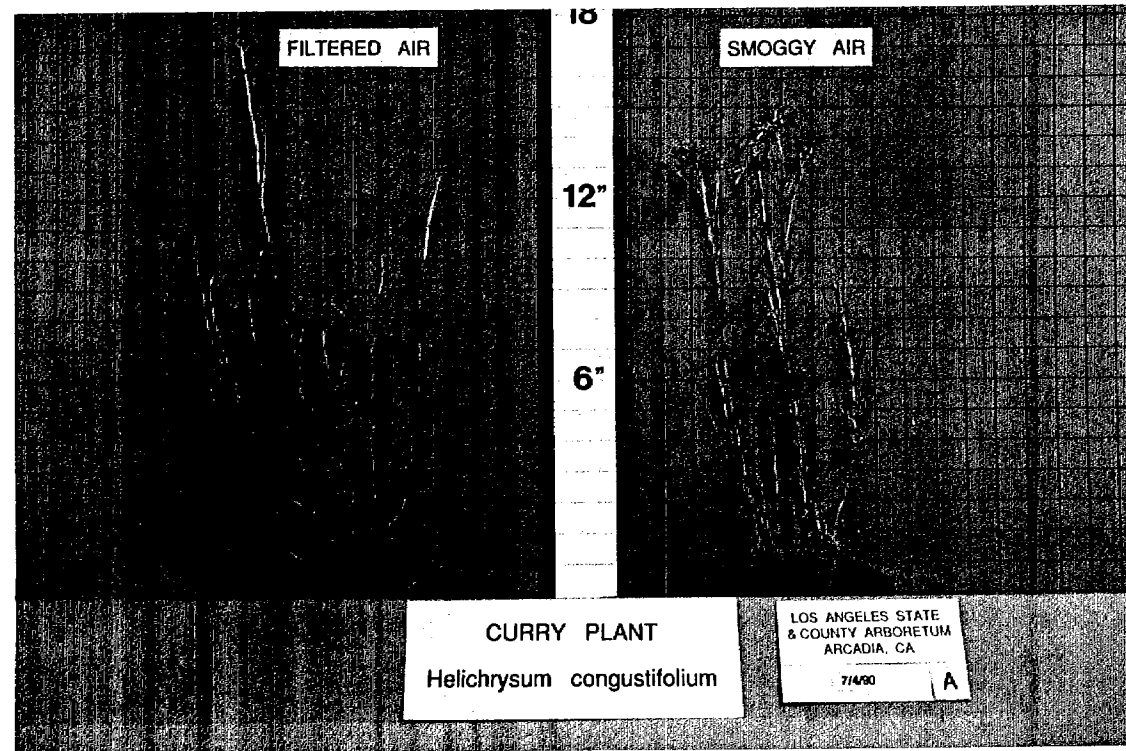


REDUCED GROWTH

CURRY PLANT

Helichrysum congestifolium

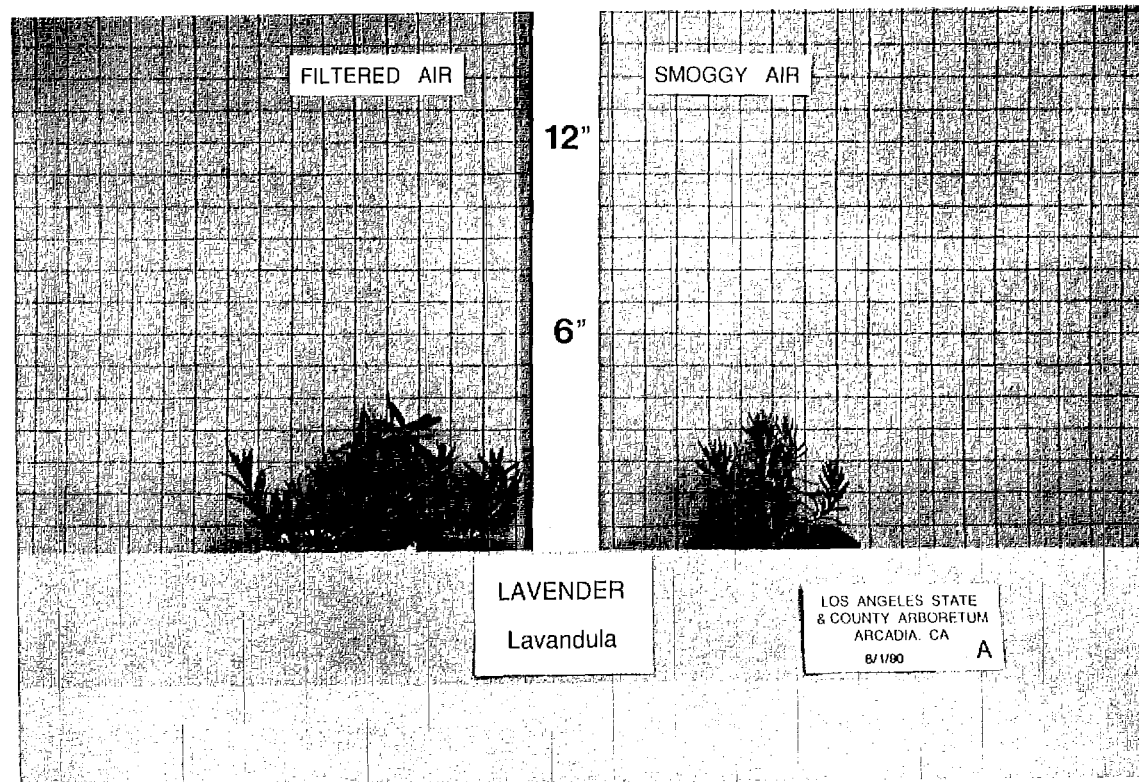
94



REDUCED GROWTH

LAVENDER

Lavendula sp.



REDUCED GROWTH

9 6

WAX LEAF PRIVET *Ligustrum japonicum*

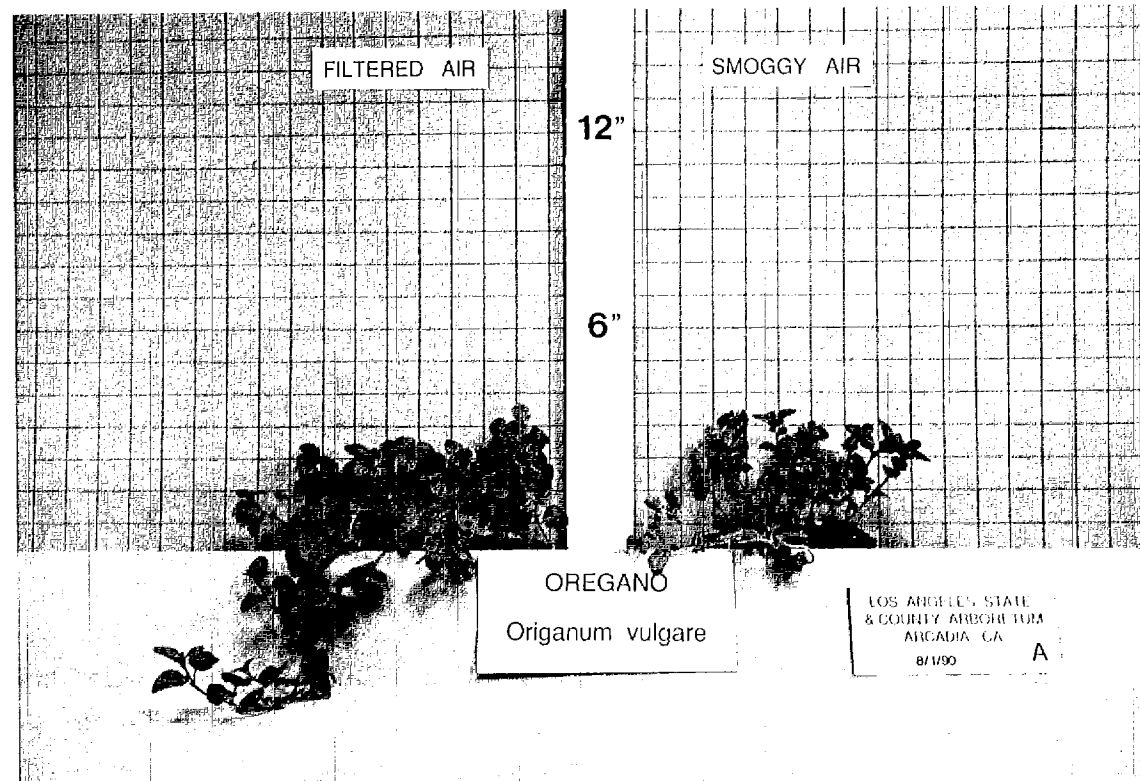


REDUCED GROWTH

OREGANO

Origanum vulgare

98



REDUCED GROWTH

99

LEMON BALM

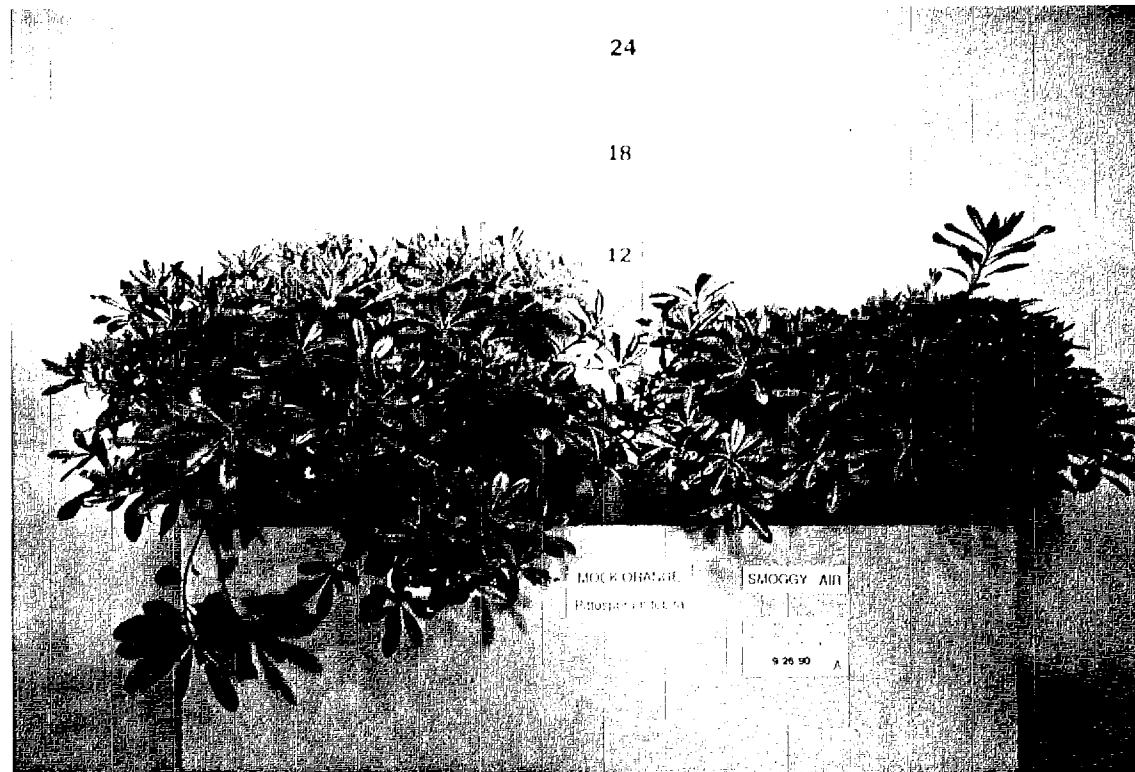
Pelargonium vulgaris



REDUCED GROWTH

MOCK ORANGE

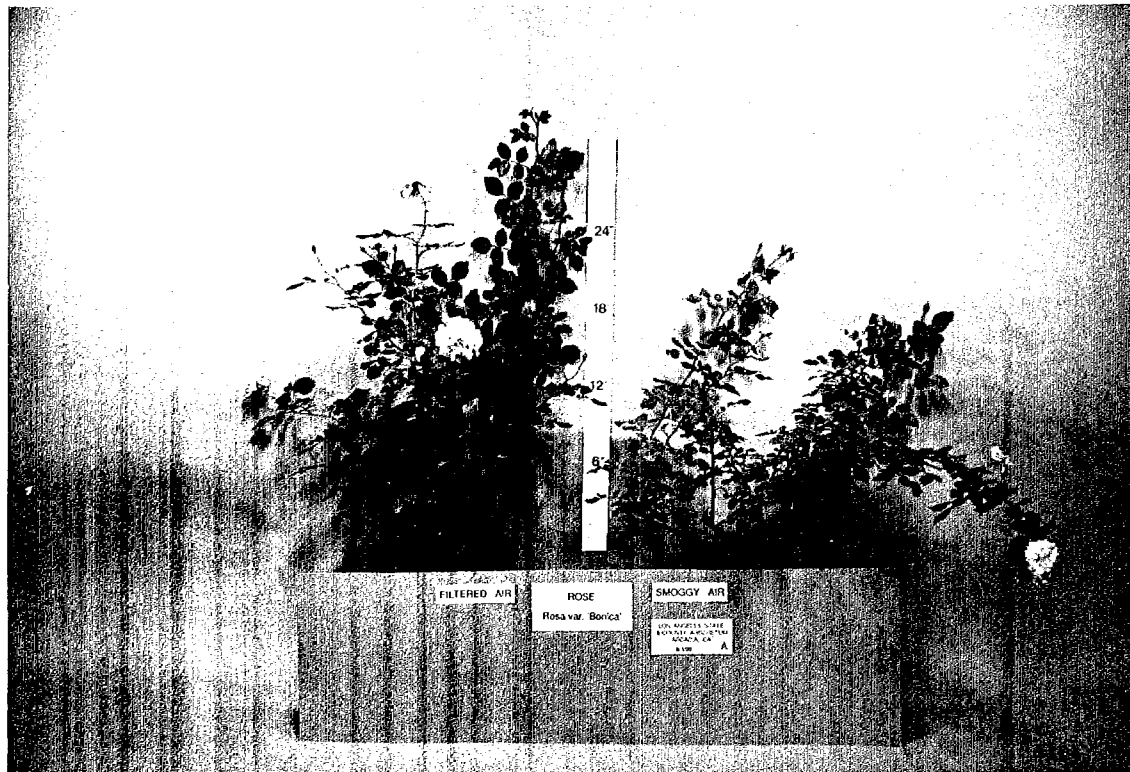
Pittosporum tobria



REDUCED GROWTH

BONICA ROSE

Rosa sp.



REDUCED GROWTH PLAYBOY ROSE *Rosa* sp.



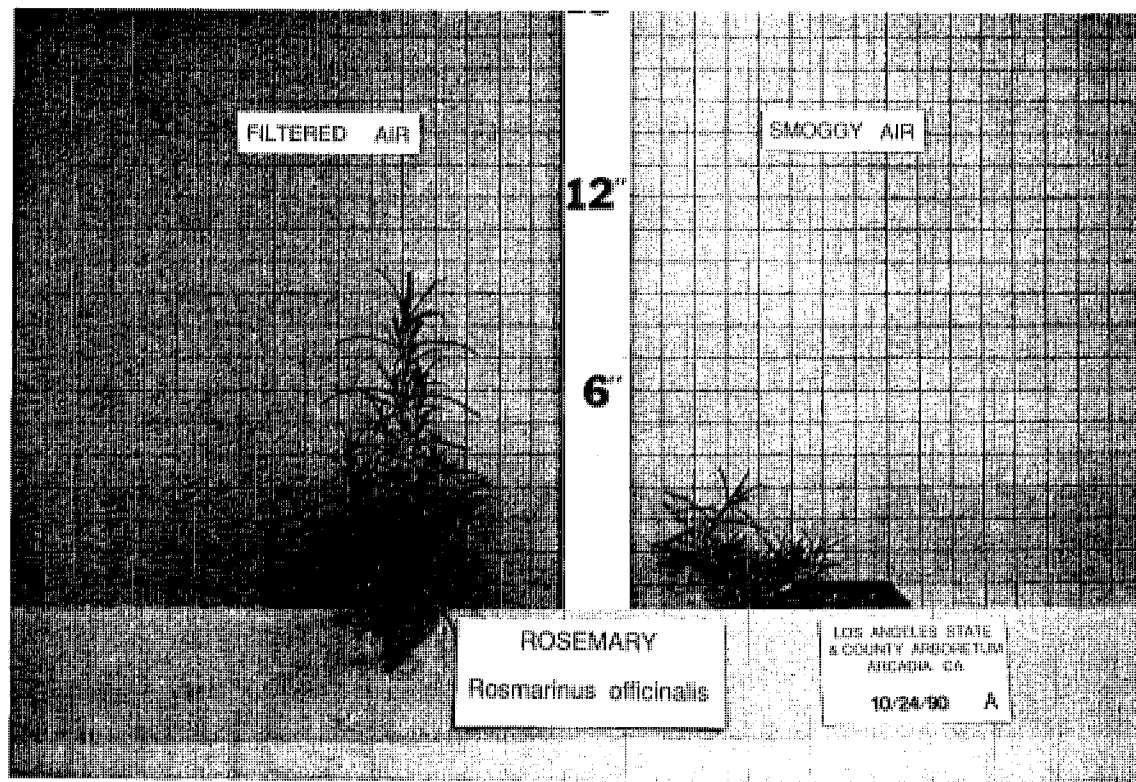
REDUCED GROWTH SILVERADO ROSE *Rosa* sp.



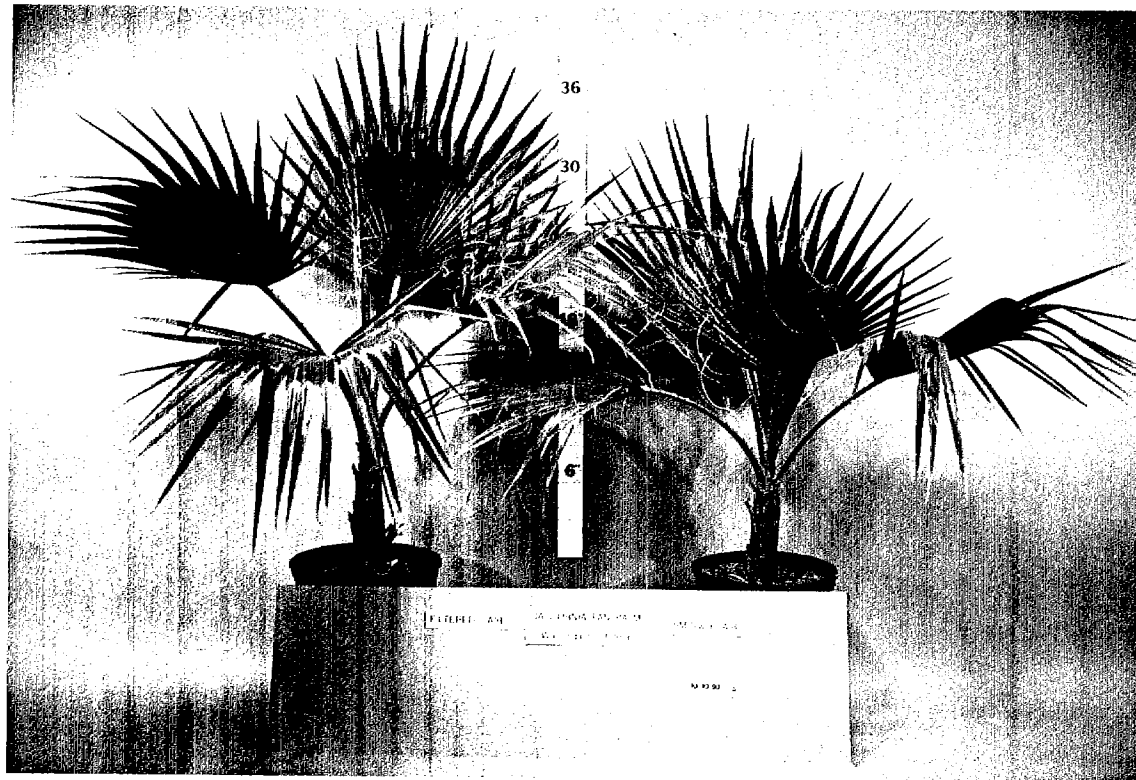
REDUCED GROWTH

ROSEMARY

Rosmarinus officinalis



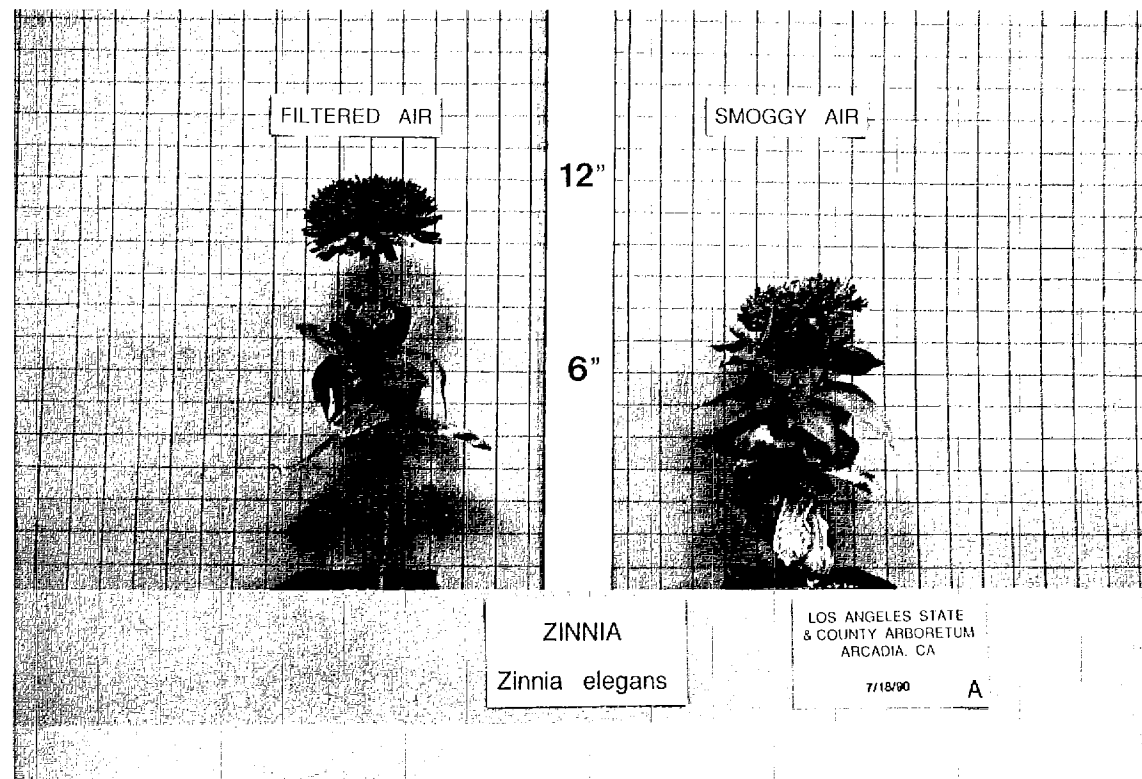
REDUCED GROWTH CALIFORNIA FAN PALM *Washingtonia filifera*



REDUCED GROWTH

ZINNIA

Zinnia elegans



PHOTOGRAPHS OF ORNAMENTALS
FOR WHICH

LEAF INJURY

IS THE MOST STRIKING
RESPONSE TO AIR POLLUTION

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 1990-91

RESPONSE TO AMBIENT AIR POLLUTION:
LEAF INJURY SYMPTOMS, APRIL-OCTOBER

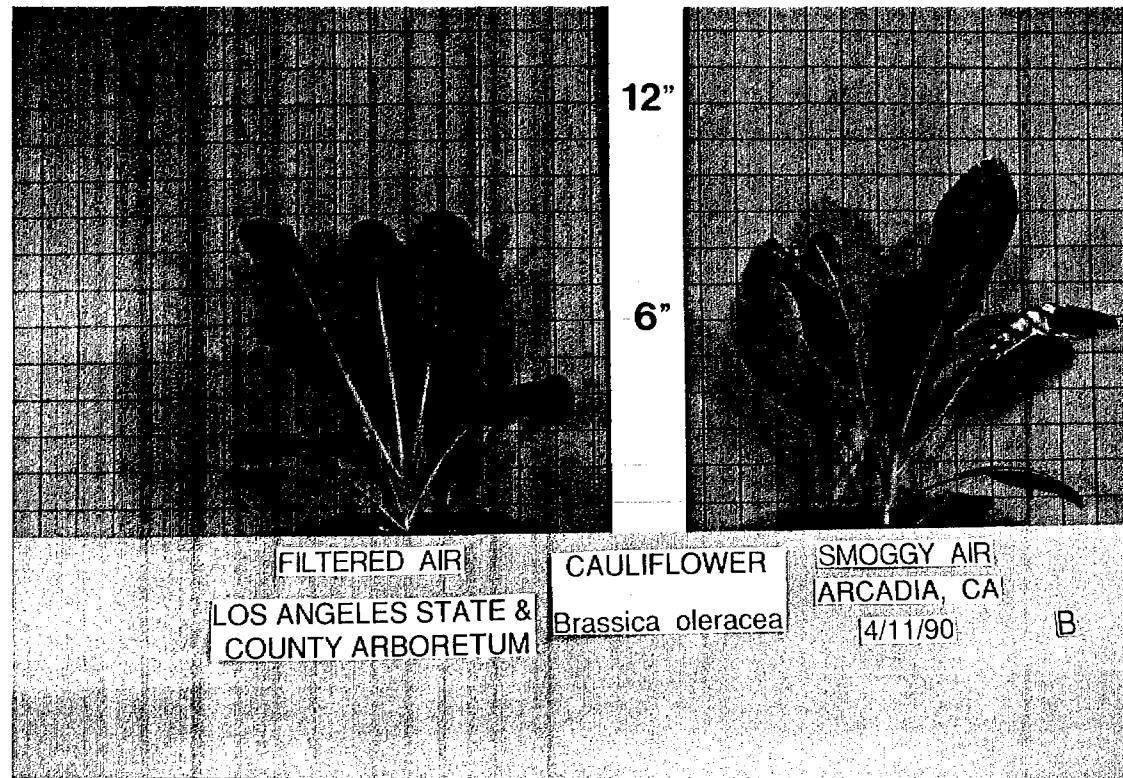
SCIENTIFIC NAME	COMMON NAME
<i>Brassica oleracea</i>	CAULIFLOWER
<i>Dianthus</i> sp.	CARNATION
<i>Gomphrena globosa</i>	GLOBE AMARANTH
<i>Mentha pulegium</i>	PENNYROYAL
<i>Rumex scutatus</i>	SORREL
<i>Schinus molle</i>	CALIFORNIA PEPPER TREE

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

LEAF SPOTS

CAULIFLOWER

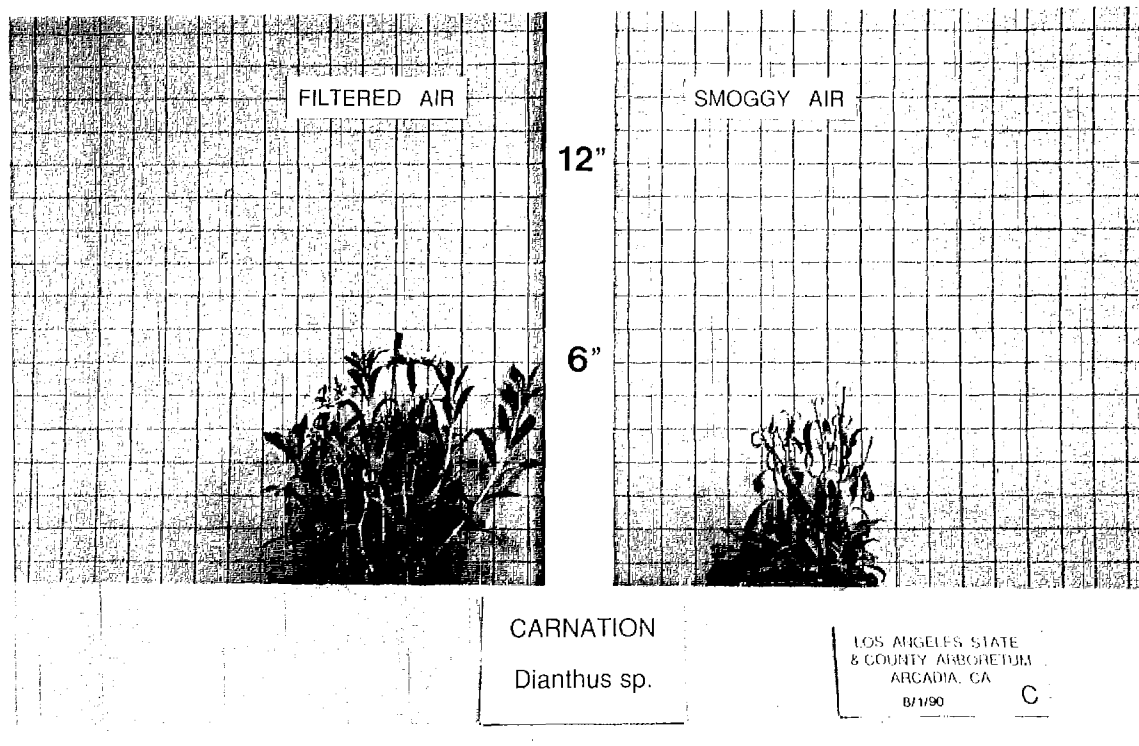
Brassica oleracea



LEAF SPOTS

CARNATION

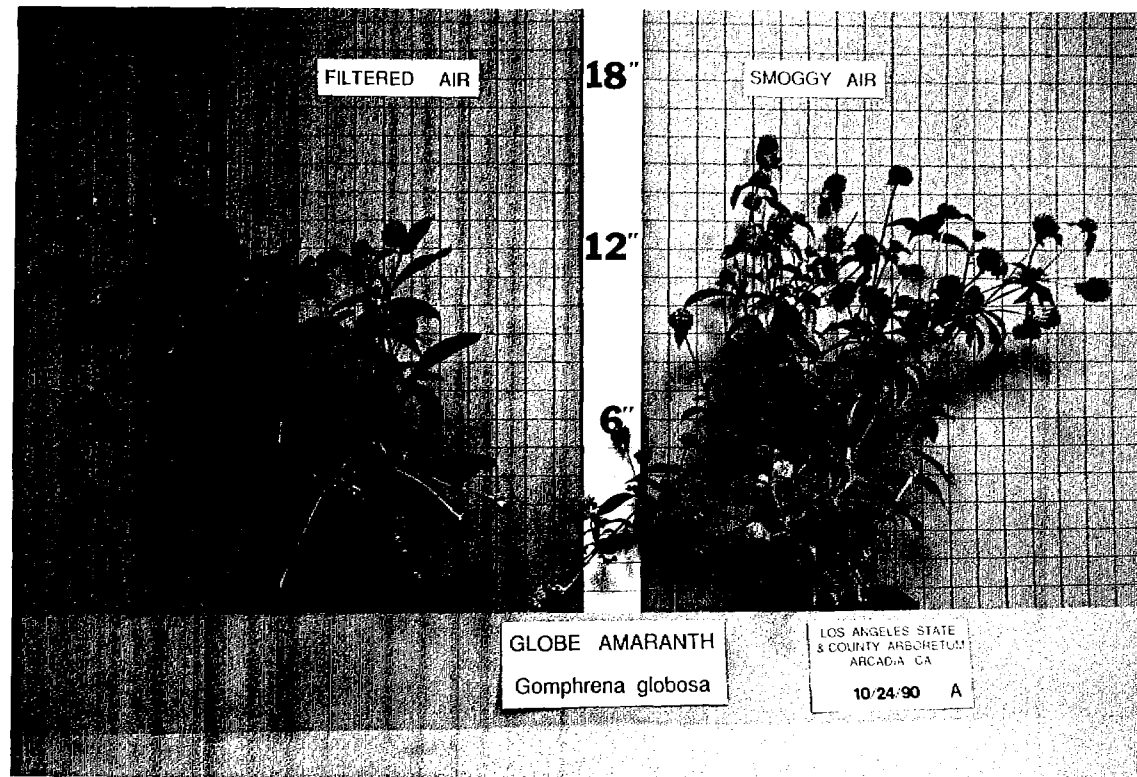
Dianthus sp.



PALE LEAF COLOR

111

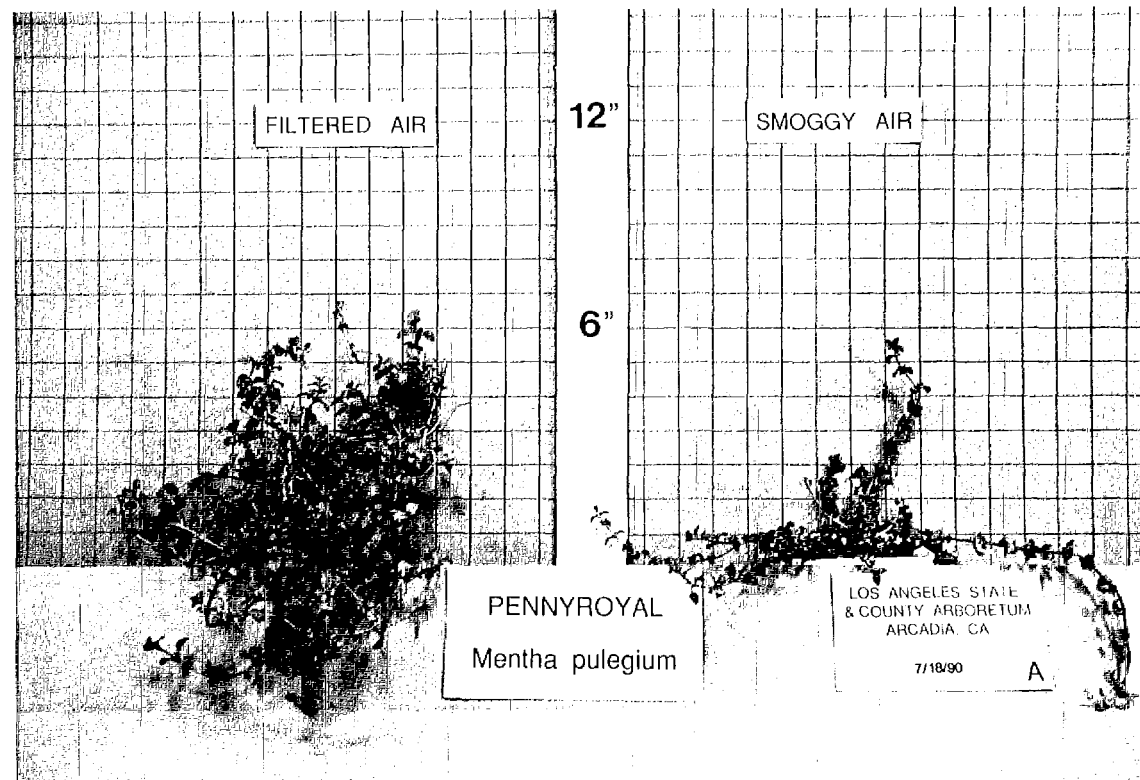
GLOBE AMARANTH *Gomphrena globosa*



PALE LEAF COLOR

112

PENNYROYAL *Mentha pulegium*

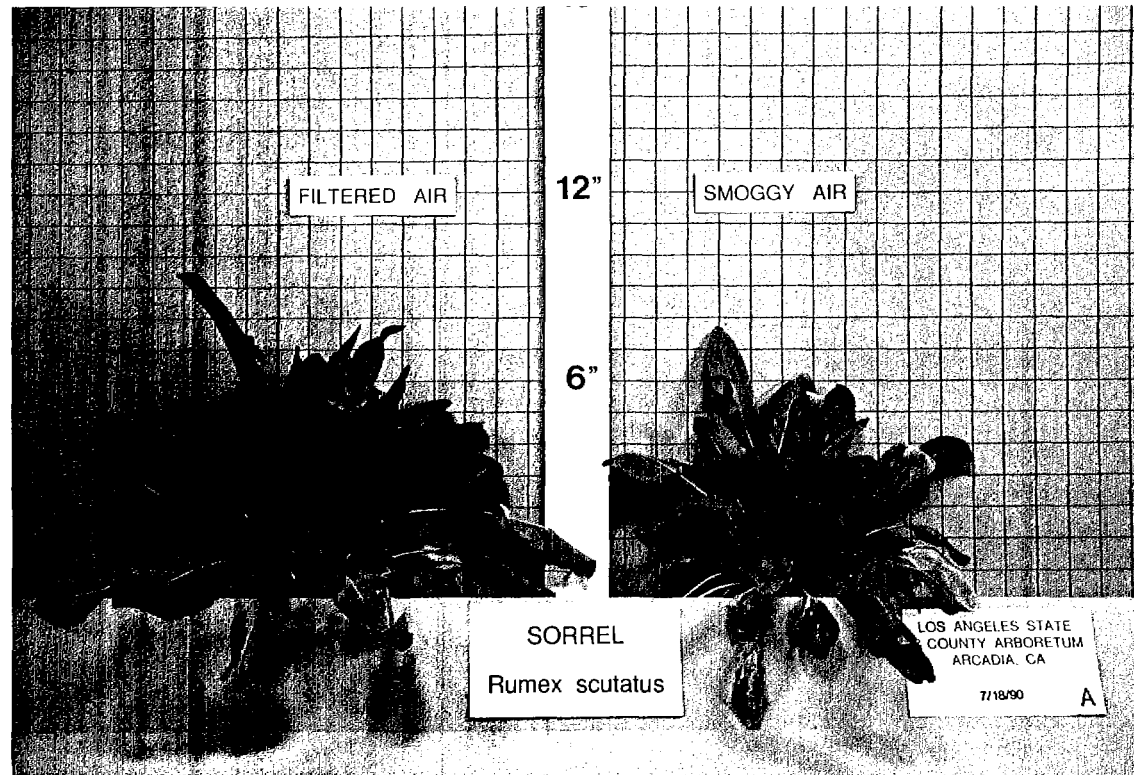


LEAF SPOTS

SORREL

Rumex scutatus

113



LEAF SPOTS

CALIFORNIA PEPPER TREE Schinus molle



PHOTOGRAPHS OF ORNAMENTALS
FOR WHICH A

SHORTER LIFE SPAN

IS THE MOST STRIKING
RESPONSE TO AIR POLLUTION

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 1990-91

RESPONSE TO AMBIENT AIR POLLUTION: SHORTER LIFE SPAN

SCIENTIFIC NAME

COMMON NAME

Lactuca sativa

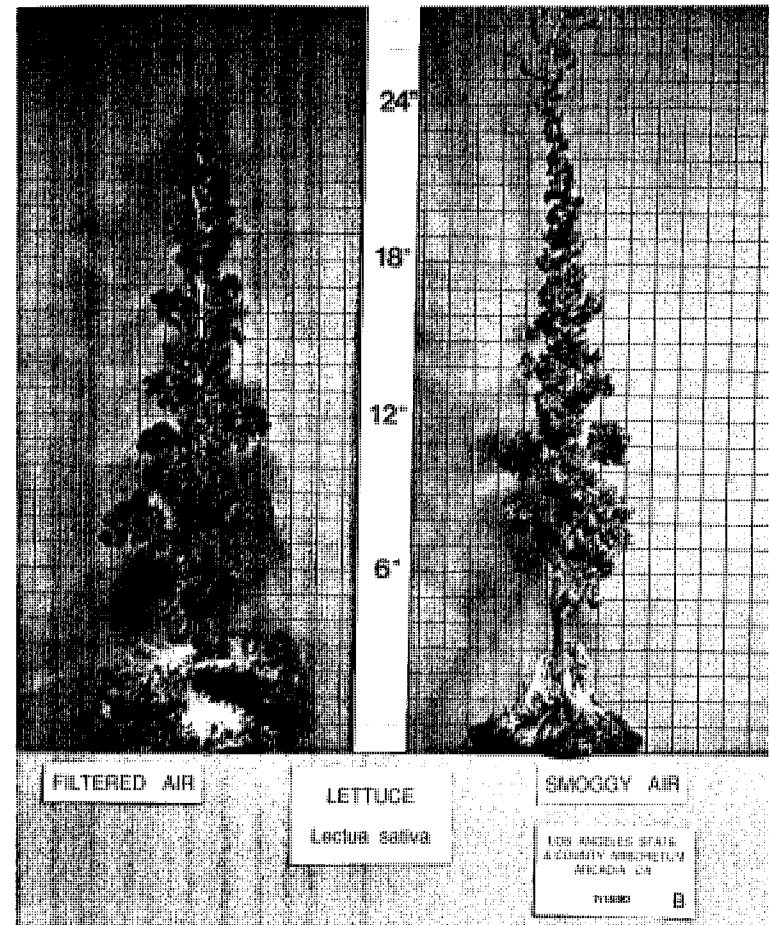
LETTUCE

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

DIES SOONER

LETTUCE

Lactuca sativa



PHOTOGRAPHS OF ORNAMENTALS
WHICH SHOWED

MORE THAN ONE
STRIKING RESPONSE
TO AIR POLLUTION

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 1990-91

RESPONSE TO AMBIENT AIR POLLUTION: PALE LEAVES AND REDUCED GROWTH

SCIENTIFIC NAME

COMMON NAME

Ageratum houstonianum

FLOSS FLOWER

Capsicum annum

PEPPER

Celosia plumeria

COCKSCOMB

Cucumis sativus

CUCUMBER

Dahlia hybridus

DAHLIA

Gardenia sp.

GARDENIA

Lycopersicon lycopersicum

PATIO TOMATO

Lycopersicon lycopersicum

PRESIDENT TOMATO

Mentha piperita

PEPPERMINT

Ocimum basilicum

BASIL

Salvia splendens

SCARLET SAGE

Solanum melongena

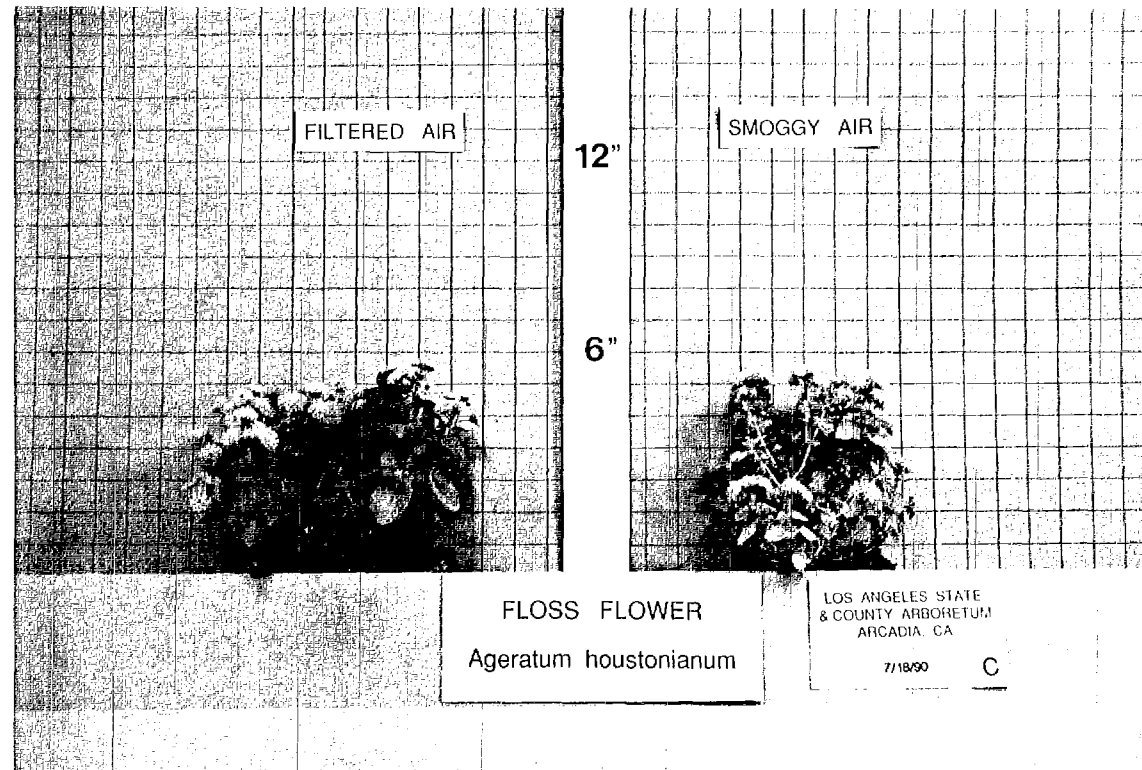
EGGPLANT

Tanacetum vulgare

COMMON TANSY

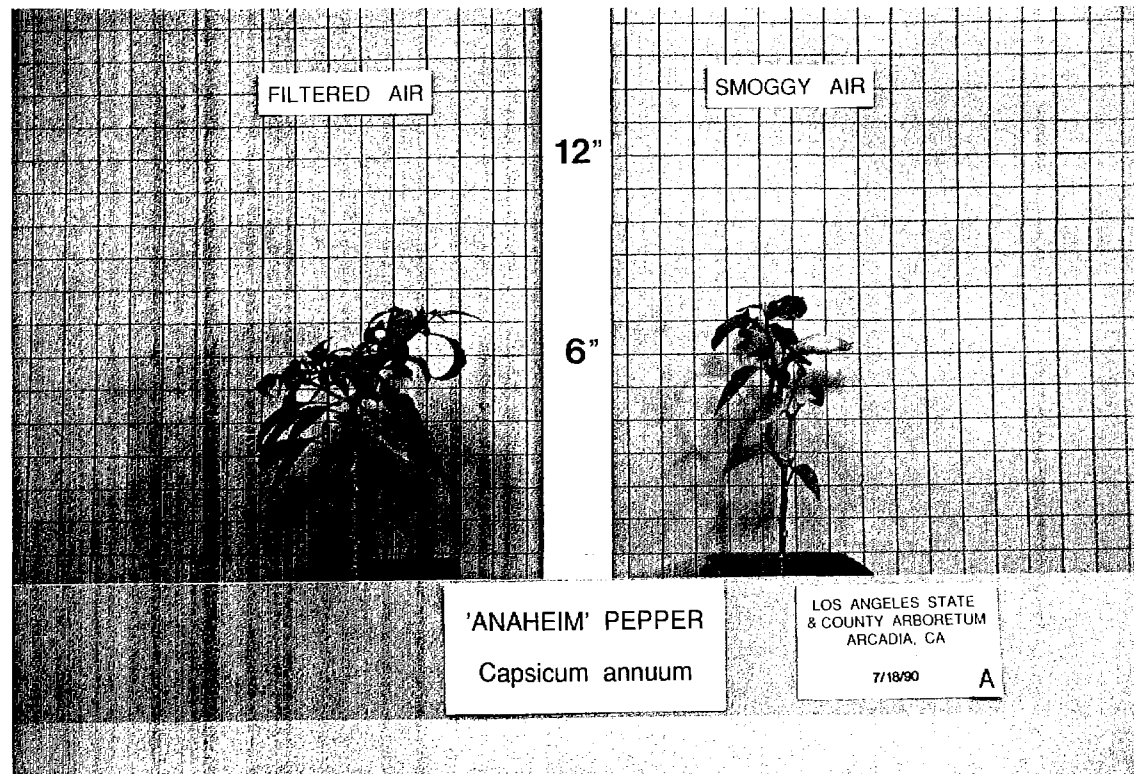
LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

PALE LEAVES
REDUCED GROWTH
FLOSS FLOWER
Ageratum houstonianum



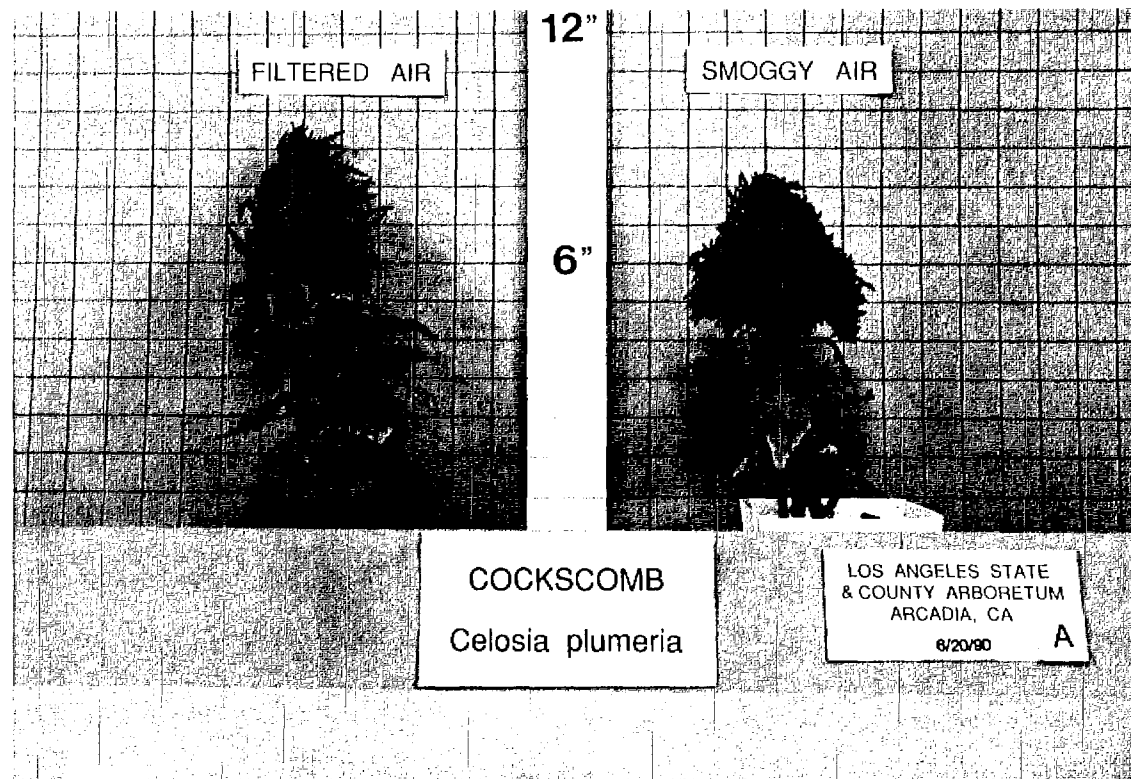
PALE LEAVES REDUCED GROWTH PEPPER *Capsicum annuum*

121



PALE LEAVES REDUCED GROWTH COCKSCOMB *Celosia plumeria*

122

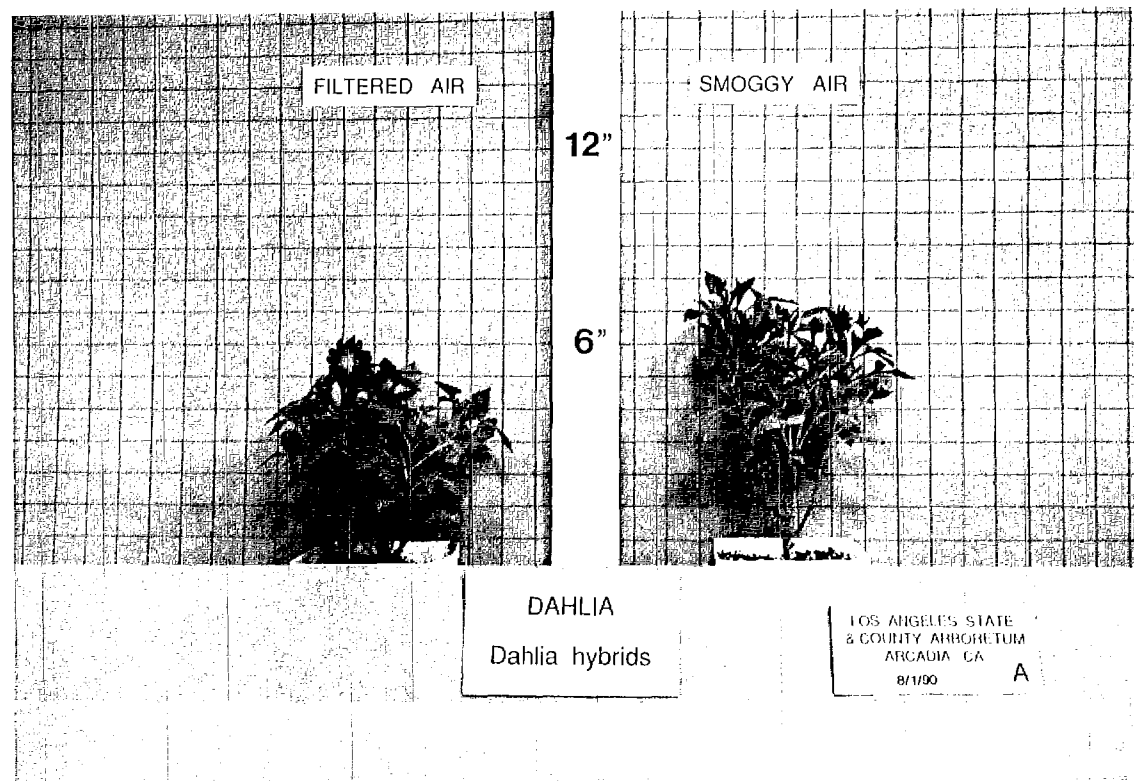


PALE LEAVES REDUCED GROWTH CUCUMBER *Cucumis sativus*

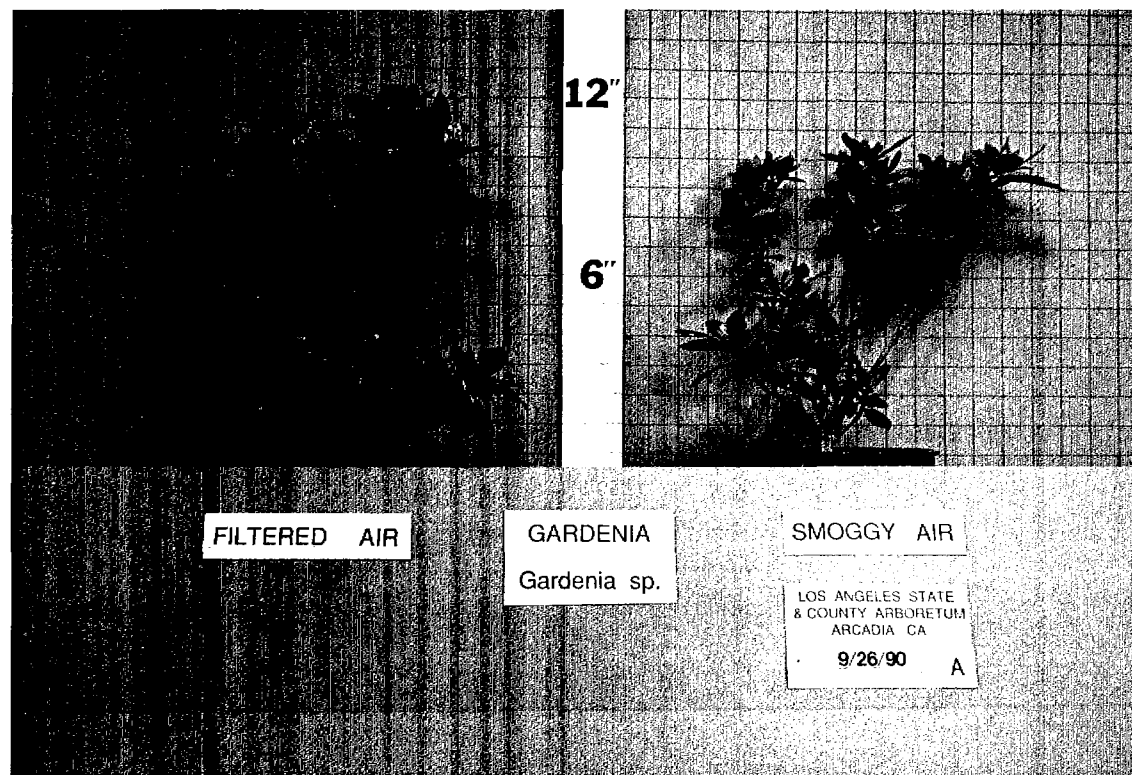
1 2 3



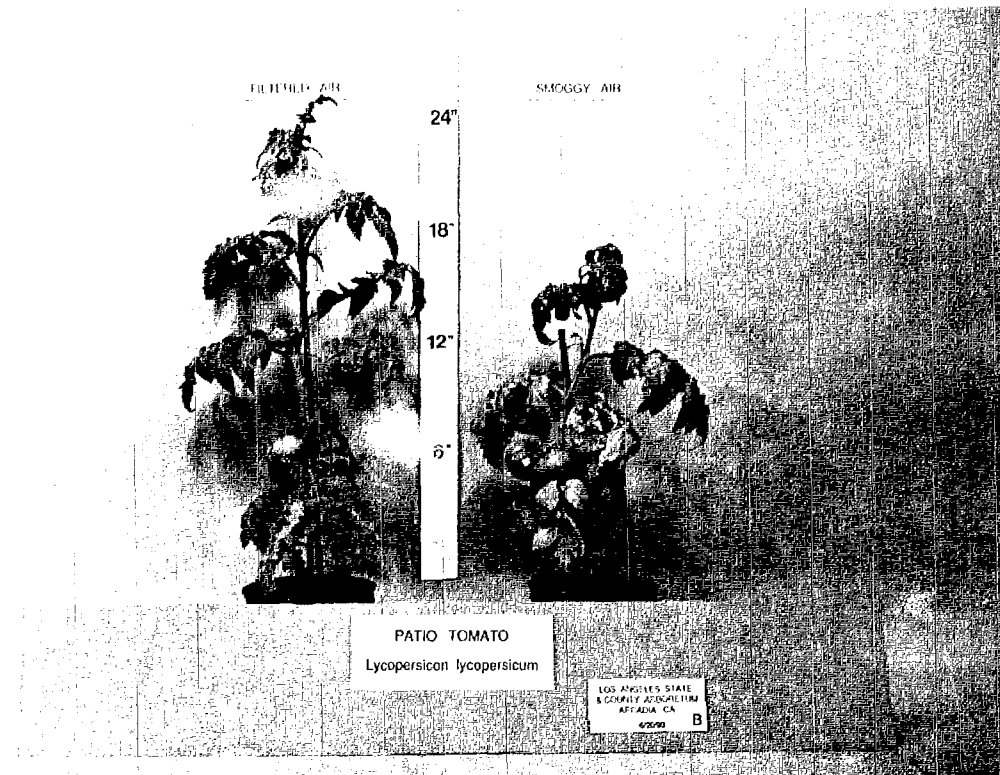
PALE LEAVES REDUCED GROWTH DAHLIA *Dahlia hybridus*



PALE LEAVES REDUCED GROWTH GARDENIA Gardenia sp.



PALE LEAVES
REDUCED GROWTH
PATIO TOMATO
Lycopersicon lycopersicum

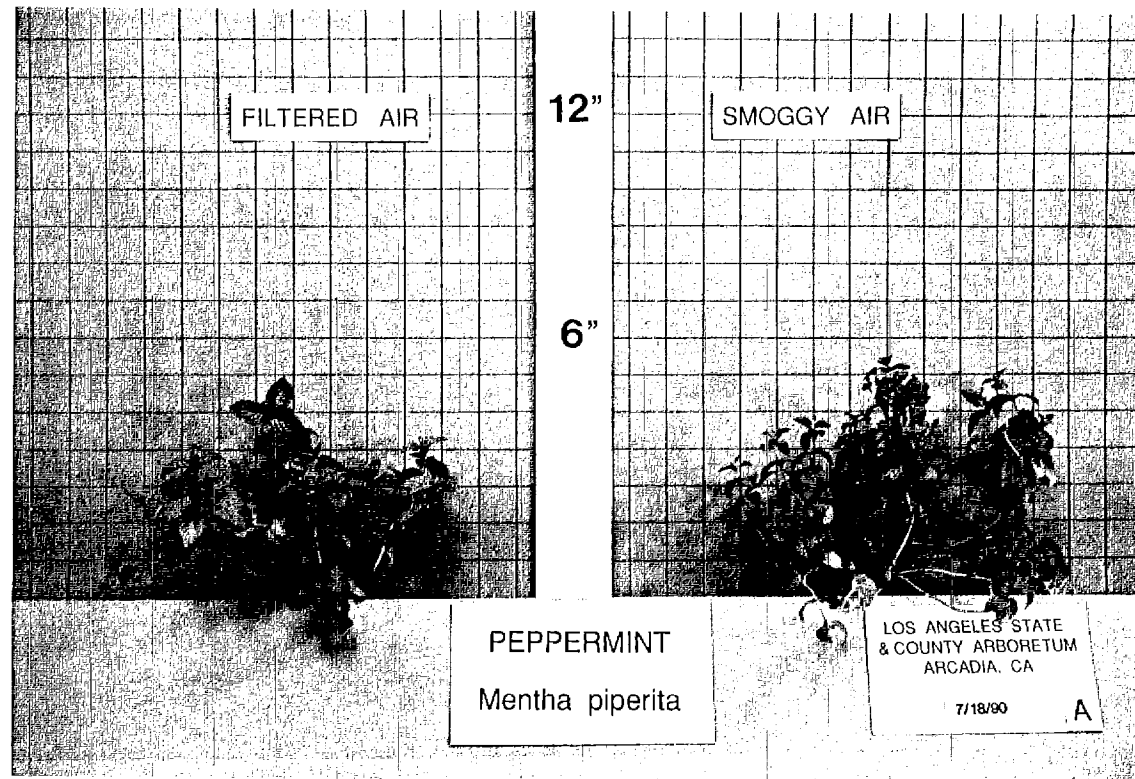


PALE LEAVES
REDUCED GROWTH
PRESIDENT TOMATO
Lycopersicon lycopersicum

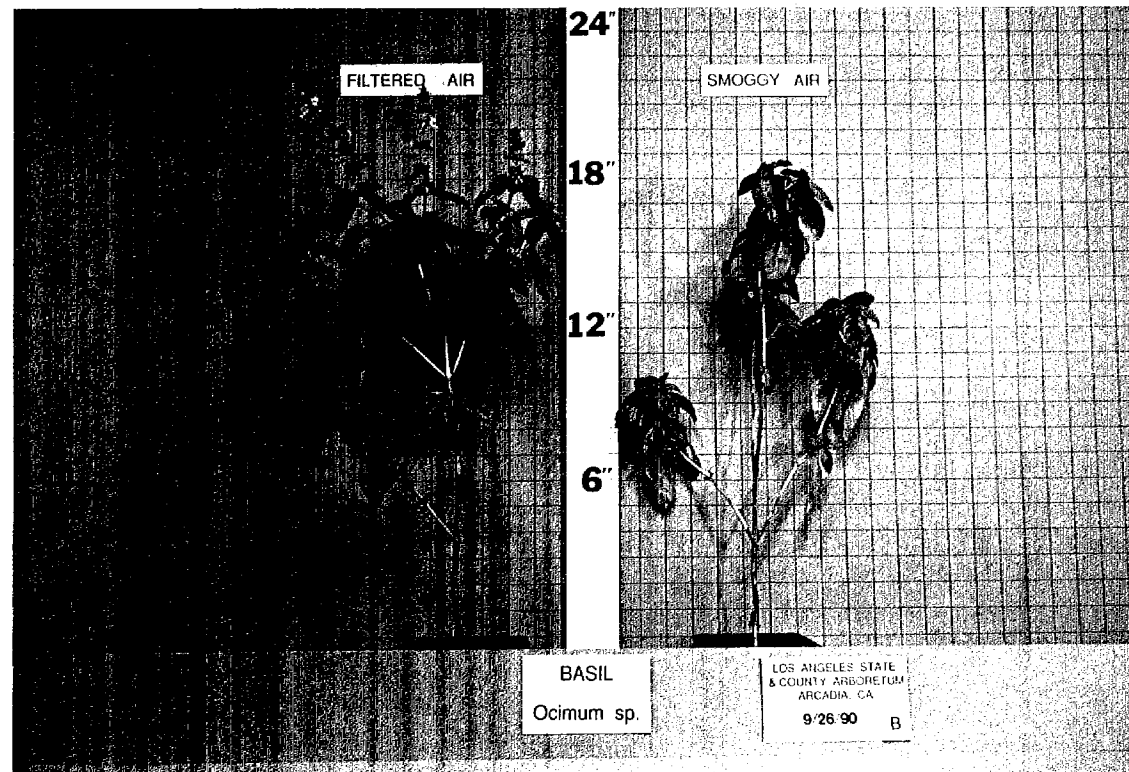
1 2 7



PALE LEAVES
REDUCED GROWTH
PEPPERMINT
Mentha piperita

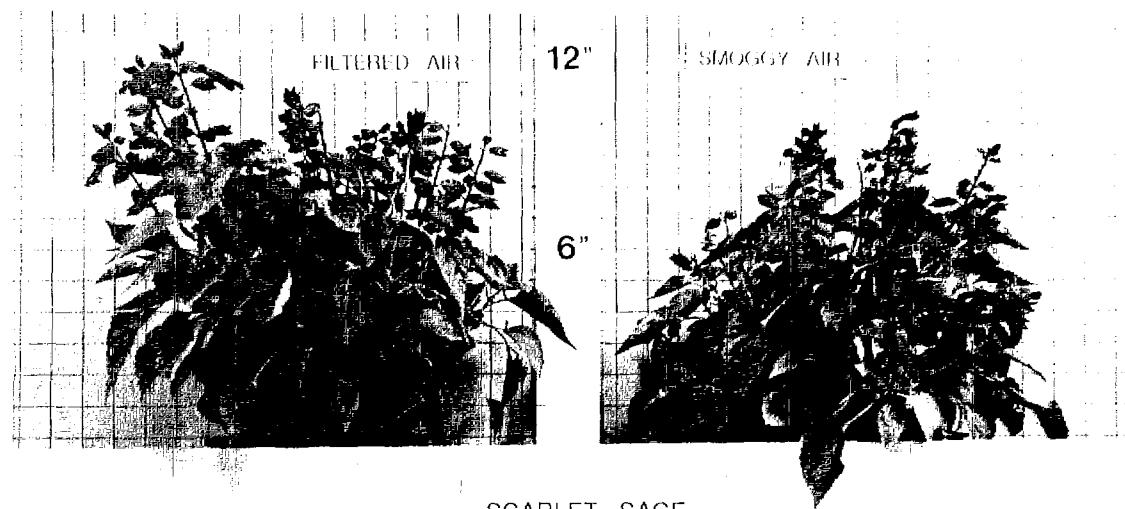


PALE LEAVES REDUCED GROWTH BASIL *Ocimum basilicum*



PALE LEAVES REDUCED GROWTH SCARLET SAGE *Salvia splendens*

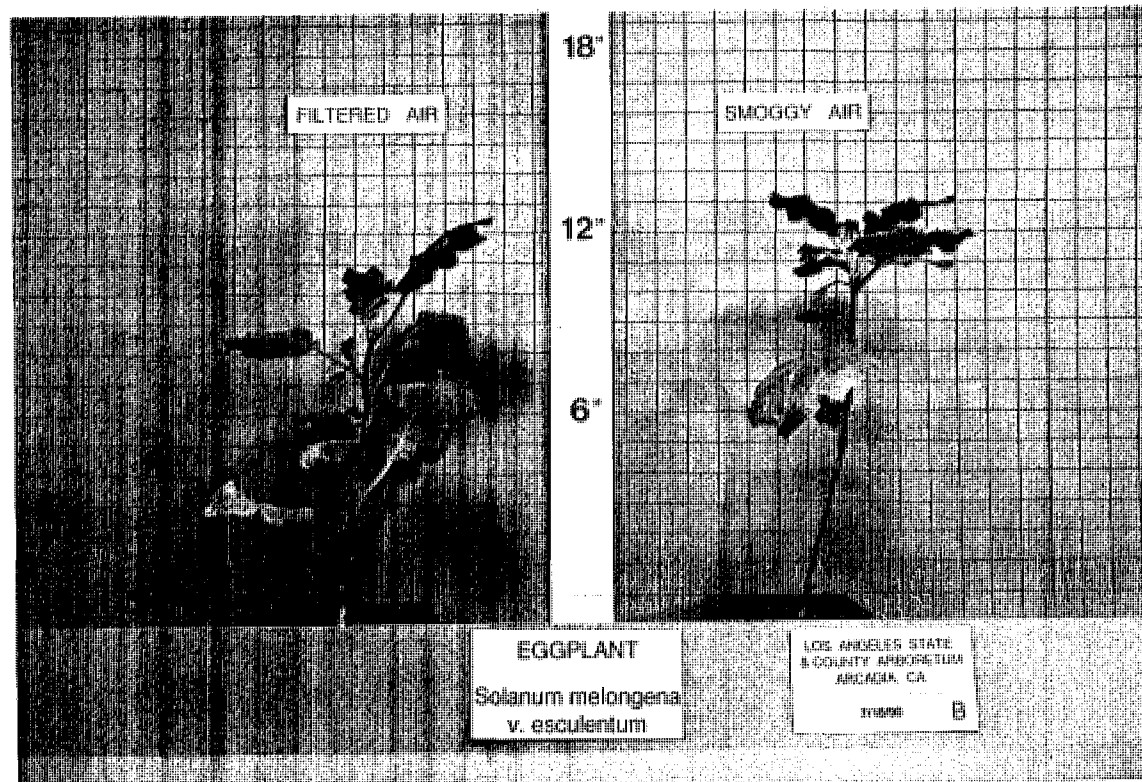
130



SCARLET SAGE
salvia splendens

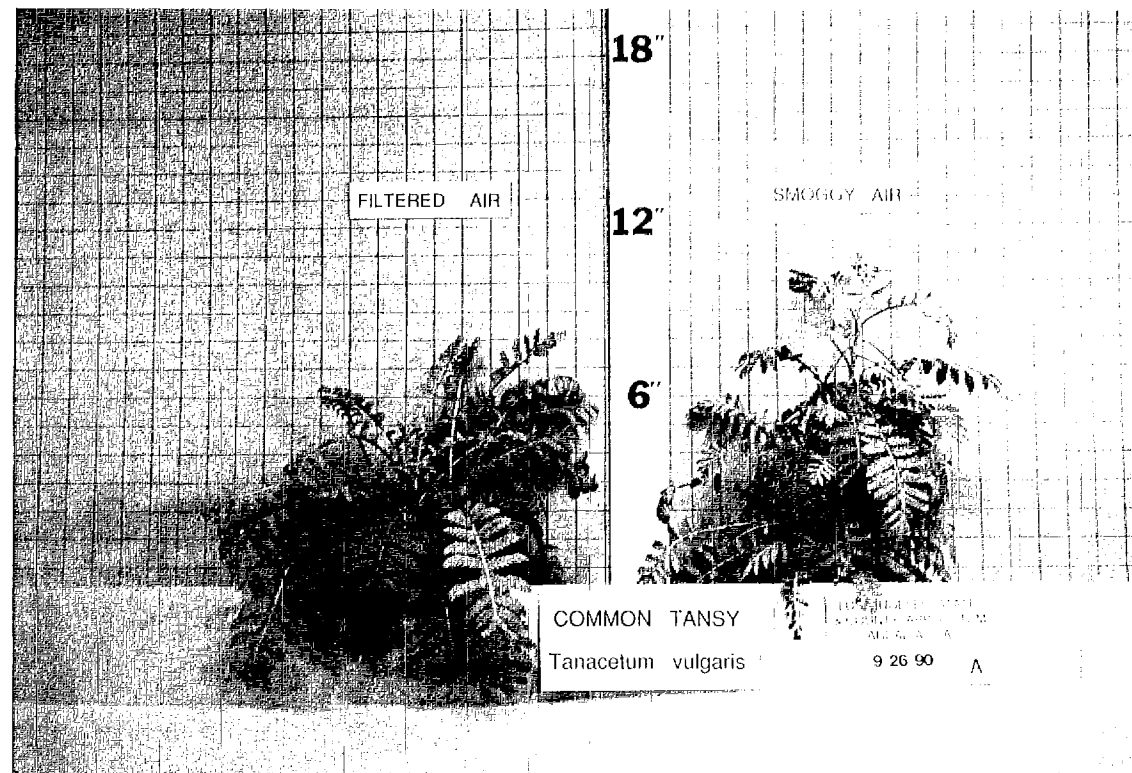
LOS ANGELES STATE
& COUNTY AIR QUALITY
DEPARTMENT
6/20/80 A

PALE LEAVES REDUCED GROWTH EGGPLANT *Solanum melongena*



PALE LEAVES
REDUCED GROWTH
COMMON TANSY
Tanacetum vulgare

1 3 2



RESPONSE TO AMBIENT AIR POLLUTION: SPOTTED LEAVES AND REDUCED GROWTH

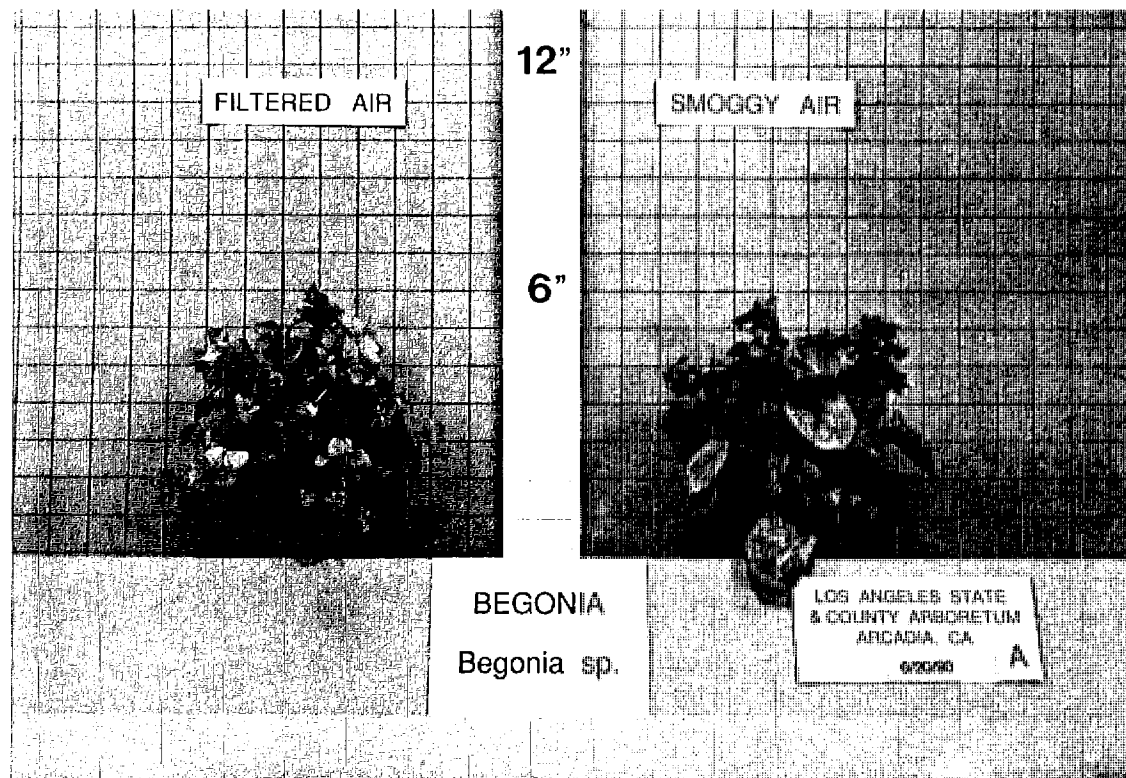
SCIENTIFIC NAME	COMMON NAME
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Begonia sp.	BEGONIA
Phaseolis vulgaris	BUSH BEAN
Phaseolis vulgaris	KENTUCKY BLUE BEAN
Phaseolis vulgaris	PINTO BEAN
Raphanus sativus	RADISH
Vitus sp.	NIAGRA GRAPE
Zea mays	CORN

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

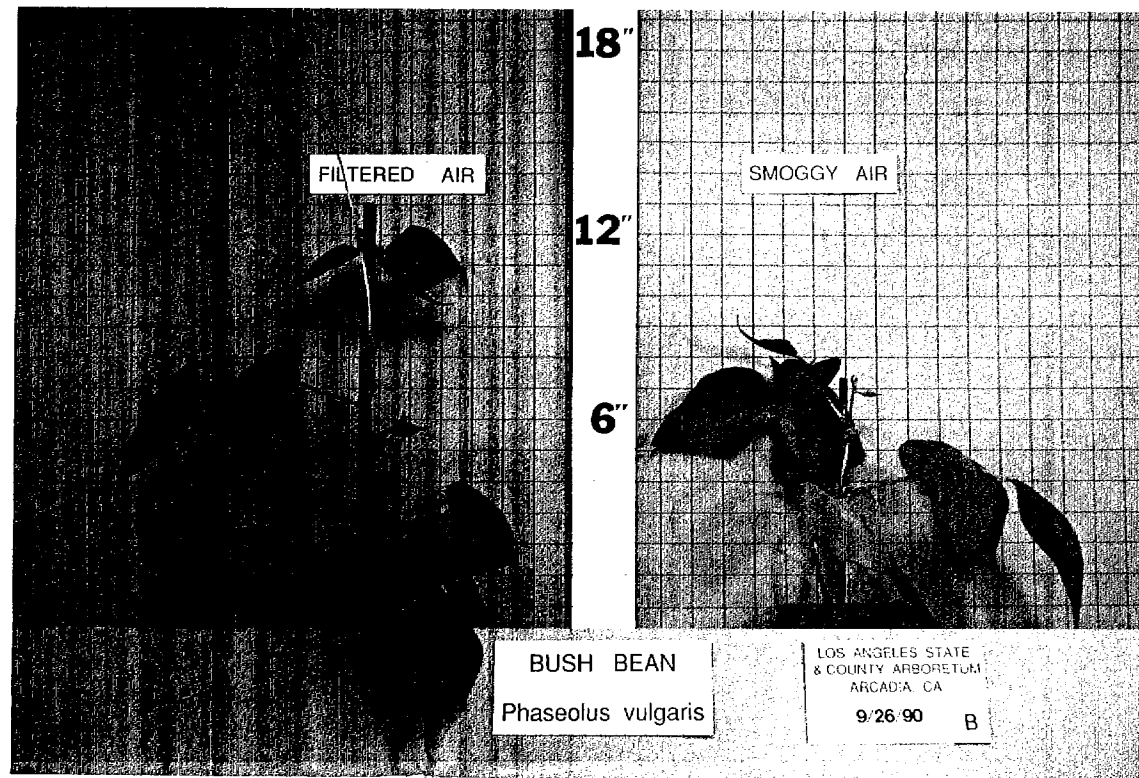
SPOTTED LEAVES REDUCED GROWTH

BEGONIA *Begonia* sp.

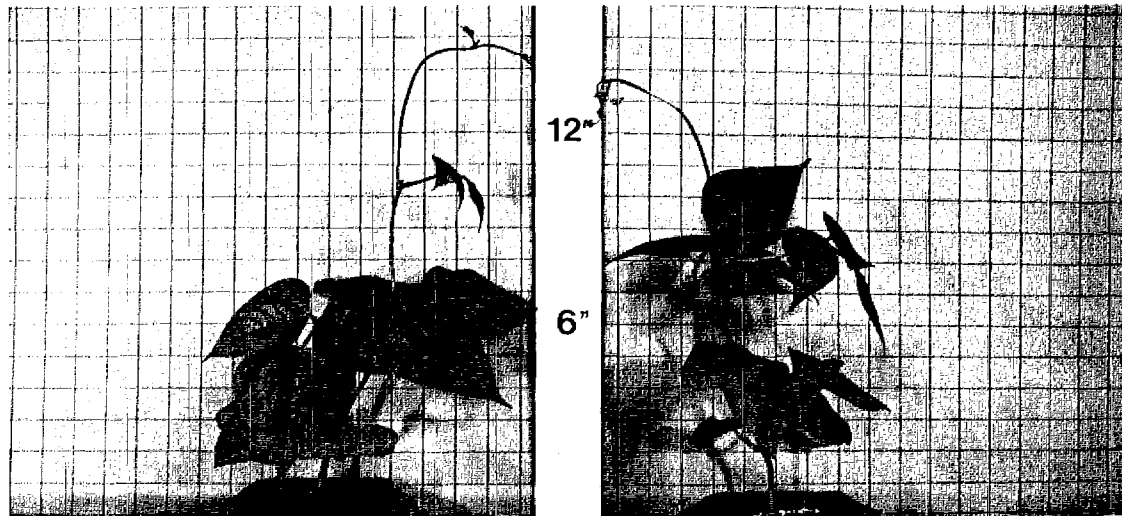


SPOTTED LEAVES REDUCED GROWTH BUSH BEAN *Phaseolus vulgaris*

136



SPOTTED LEAVES REDUCED GROWTH KENTUCKY BLUE BEAN *Phaseolus vulgaris*



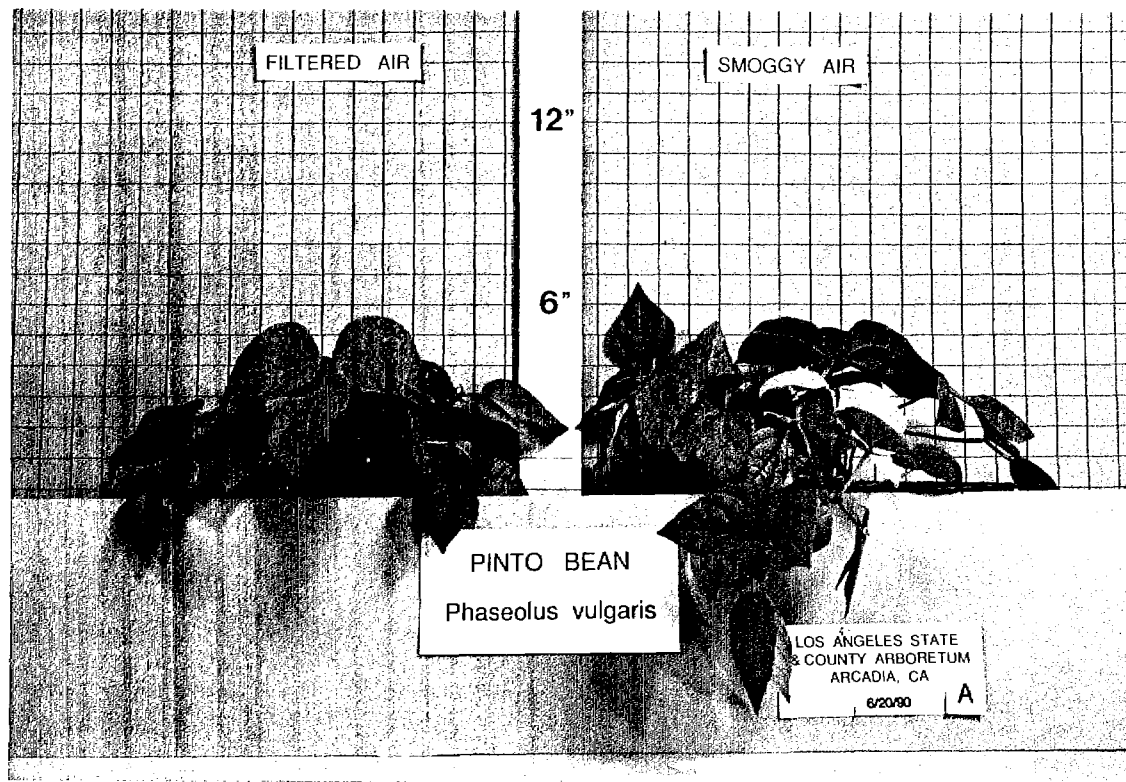
FILTERED AIR
LOS ANGELES STATE &
COUNTY ARBORETUM

KENTUCKY BLUE BEAN
Phaseolus vulgaris

SMOGGY AIR
ARCADIA, CA
4/11/90 B

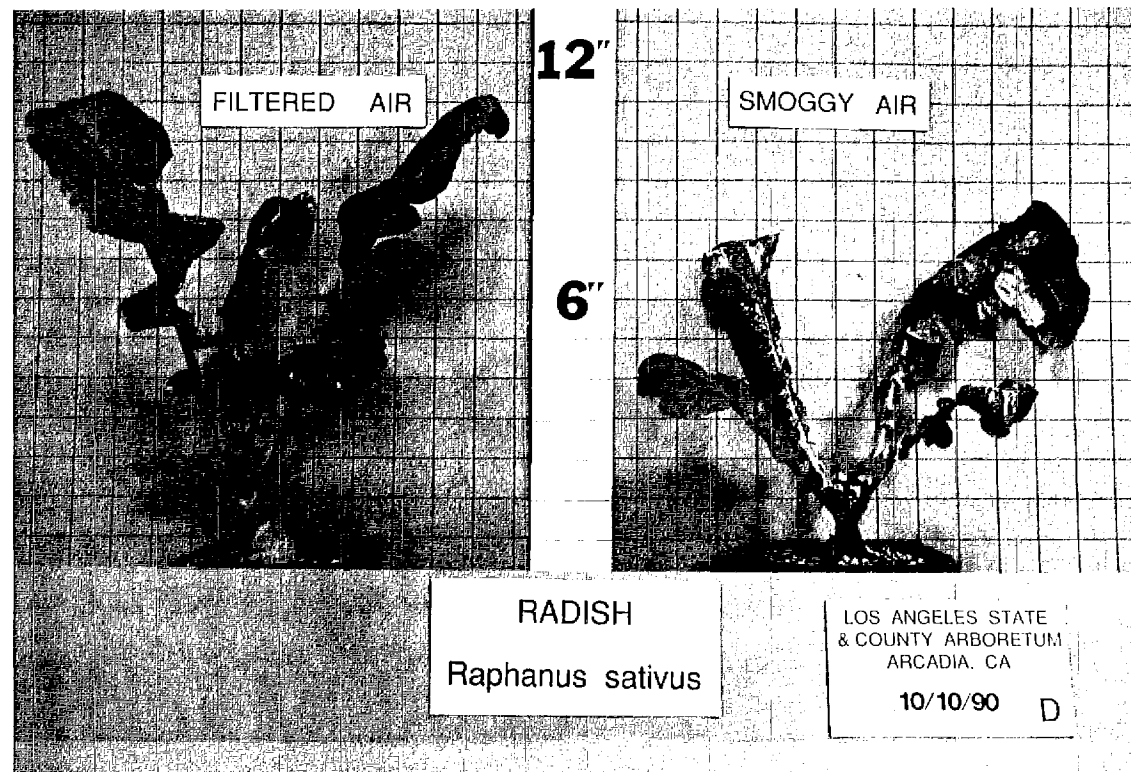
SPOTTED LEAVES REDUCED GROWTH PINTO BEAN *Phaseolus vulgaris*

139

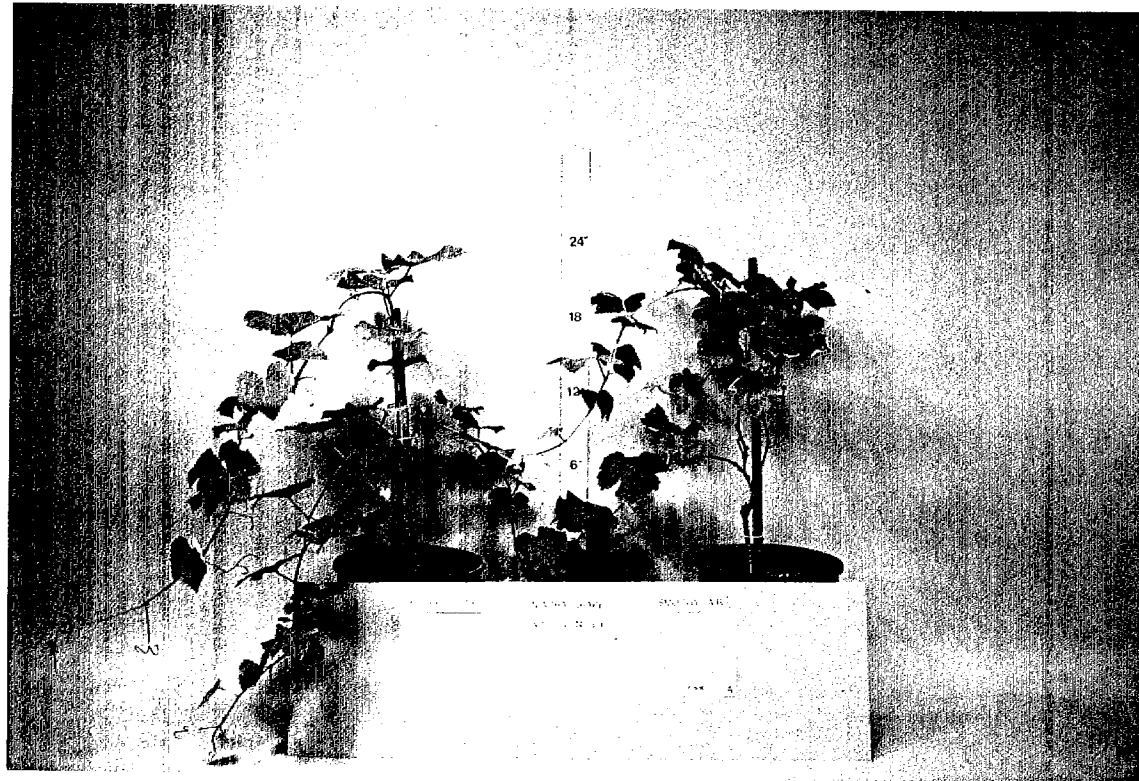


SPOTTED LEAVES REDUCED GROWTH RADISH *Raphanus sativus*

1 4 0

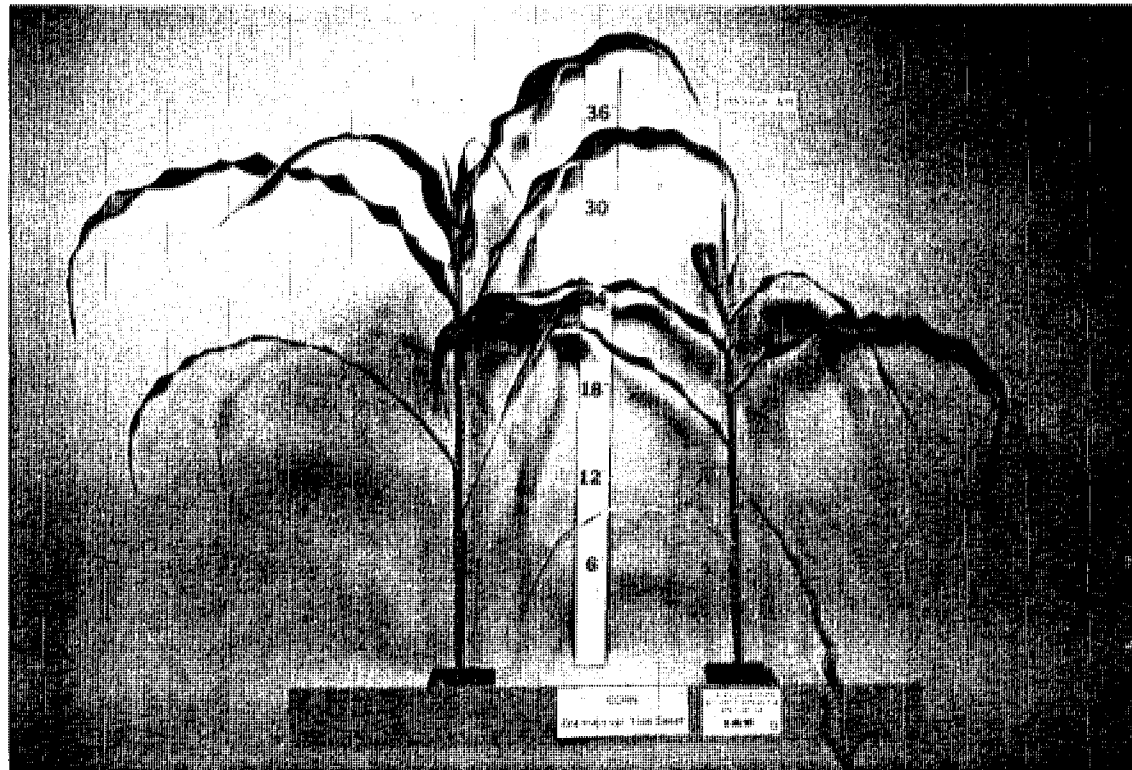


SPOTTED LEAVES
REDUCED GROWTH
NIAGRA GRAPE
Vitis sp.



SPOTTED LEAVES REDUCED GROWTH

CORN
Zea mays



RESPONSE TO AMBIENT AIR POLLUTION: FEWER LEAVES AND REDUCED GROWTH

SCIENTIFIC NAME	COMMON NAME
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Bougainvillea sp.	BOUGAINVILLEA
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Cyclamen sp.	FLOREST'S CYCLAMEN
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Impatiens sp.	BUSY LIZZIE
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FLOWERS REDUCED GROWTH

BOUGAINVILLEA
Bougainvillea sp.

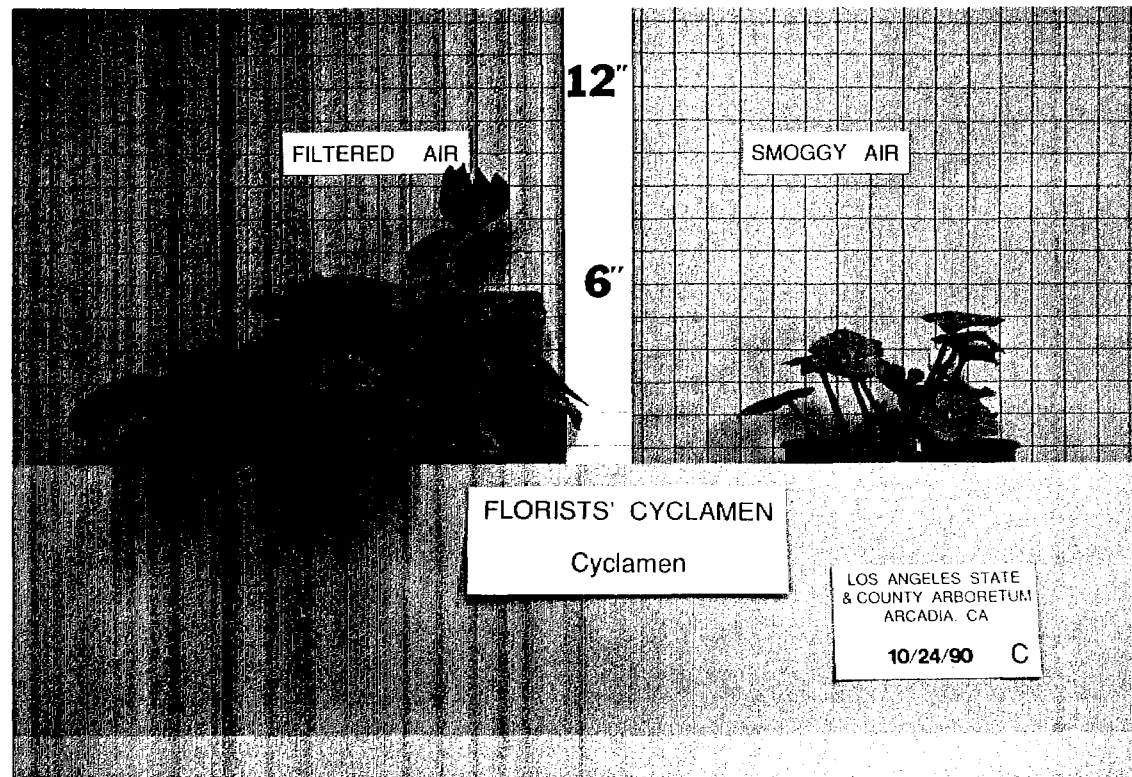


FEWER FLOWERS REDUCED GROWTH

CYCLAMEN

Cyclamen sp.

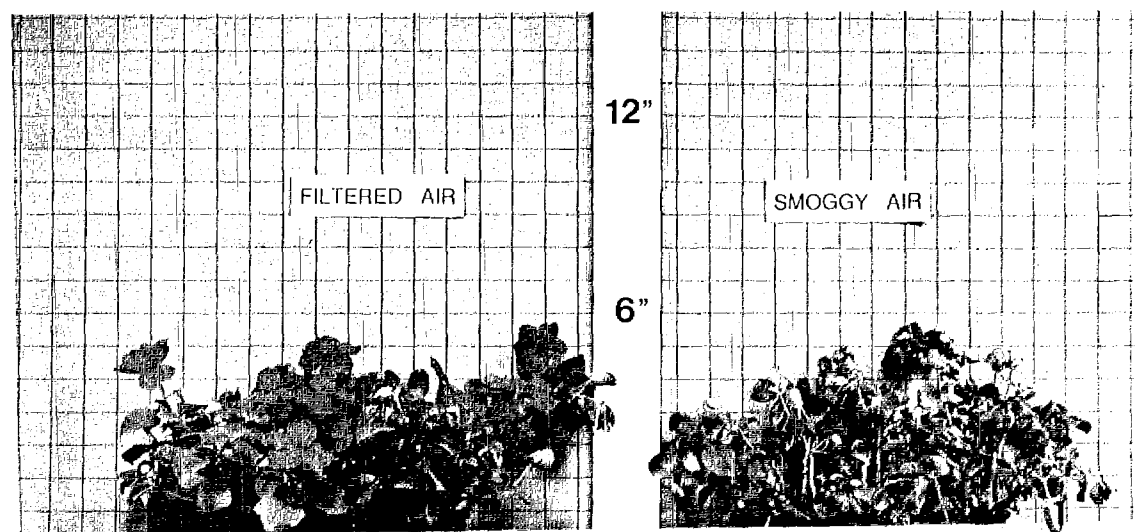
145



FEWER FLOWERS REDUCED GROWTH

BUSY LIZZIE *Impatiens* sp.

146



BUSY LIZZIE
Impatiens sp.

LOS ANGELES STATE
& COUNTY ARBORETUM
ARCADIA, CA
8/1/90 A

RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FRUITS AND REDUCED GROWTH

SCIENTIFIC NAME	COMMON NAME
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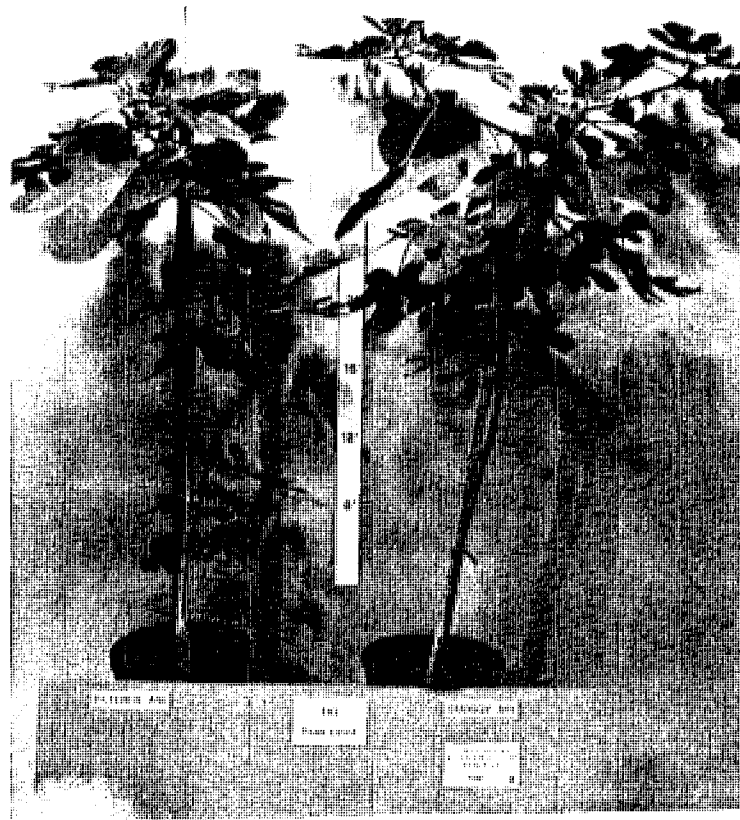
<i>Ficus carica</i>	FIG
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FRUIT REDUCED GROWTH

FIG

Ficus carica



RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS AND REDUCED LIFE SPAN

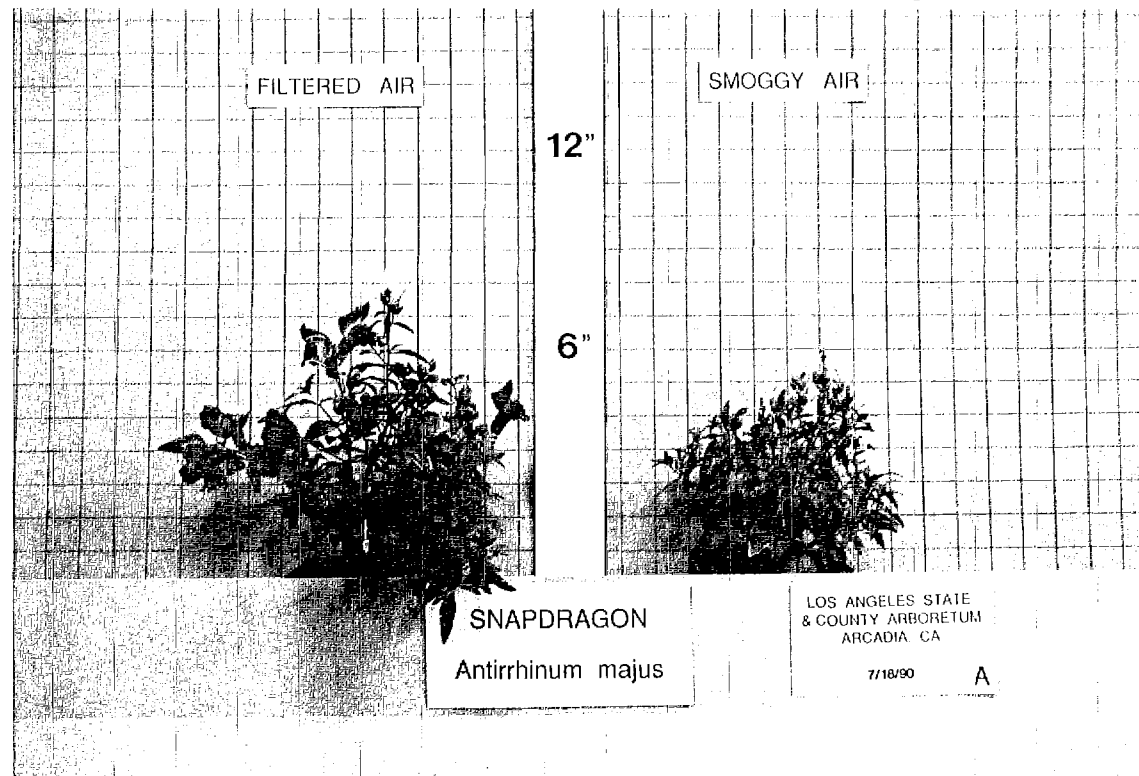
SCIENTIFIC NAME	COMMON NAME
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<i>Antirrhinum majus</i>	SNAPDRAGON
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FLOWERS DIES SOONER SNAPDRAGON *Antirrhinum majus*

150



RESPONSE TO AMBIENT AIR POLLUTION:
REDUCED GROWTH AND REDUCED LIFE SPAN

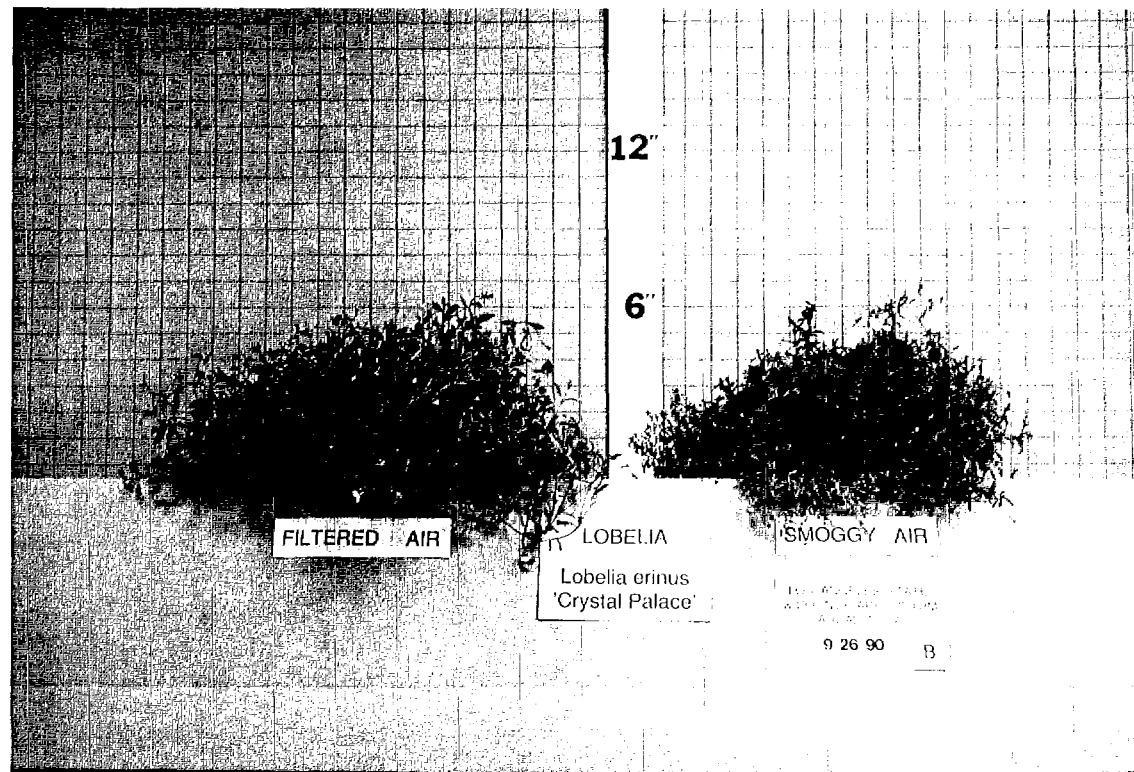
SCIENTIFIC NAME	COMMON NAME
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<i>Lobelia erinus</i>	CRYSTAL PALACE LOBELIA
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REDUCED GROWTH DIES SOONER

CRYSTAL PALACE LOBELIA

Lobelia erinus



RESPONSE TO AMBIENT AIR POLLUTION:
LEAF SPOTS AND REDUCED LIFE SPAN

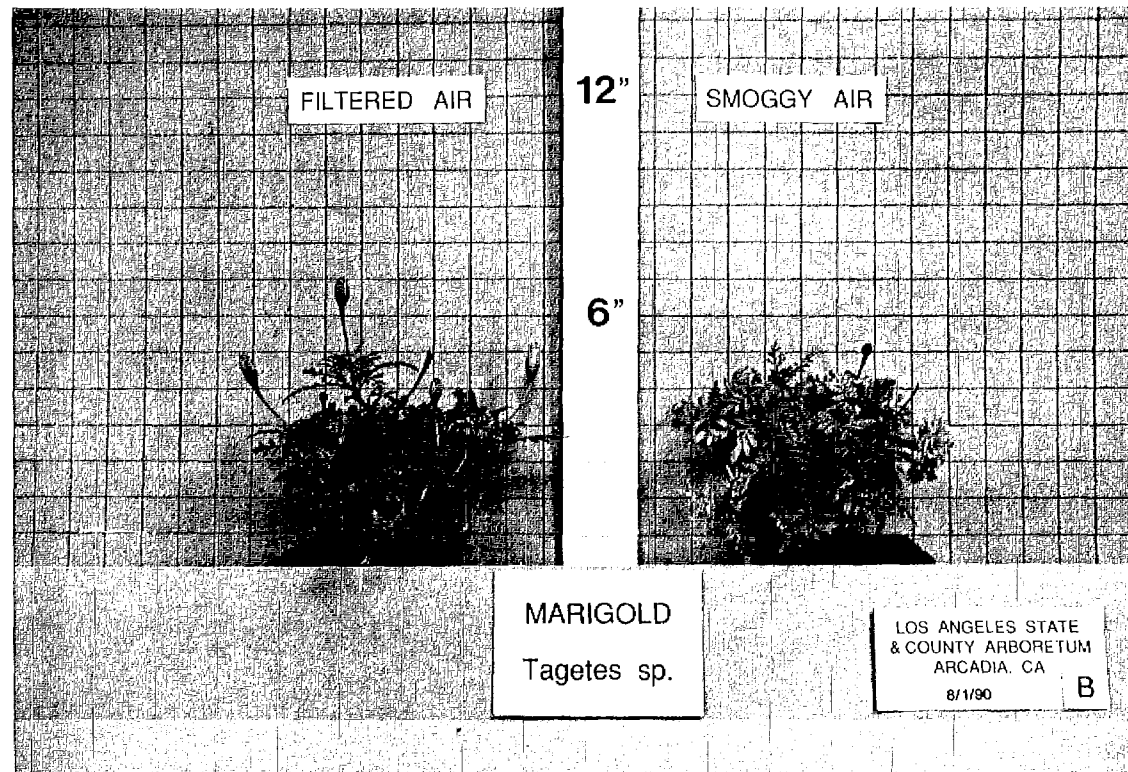
SCIENTIFIC NAME	COMMON NAME
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Tagetes sp.	MARIGOLD
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

LEAF SPOTS DIES SOONER

MARIGOLD *Tagetes* sp.



RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS AND SCRAGGLY GROWTH

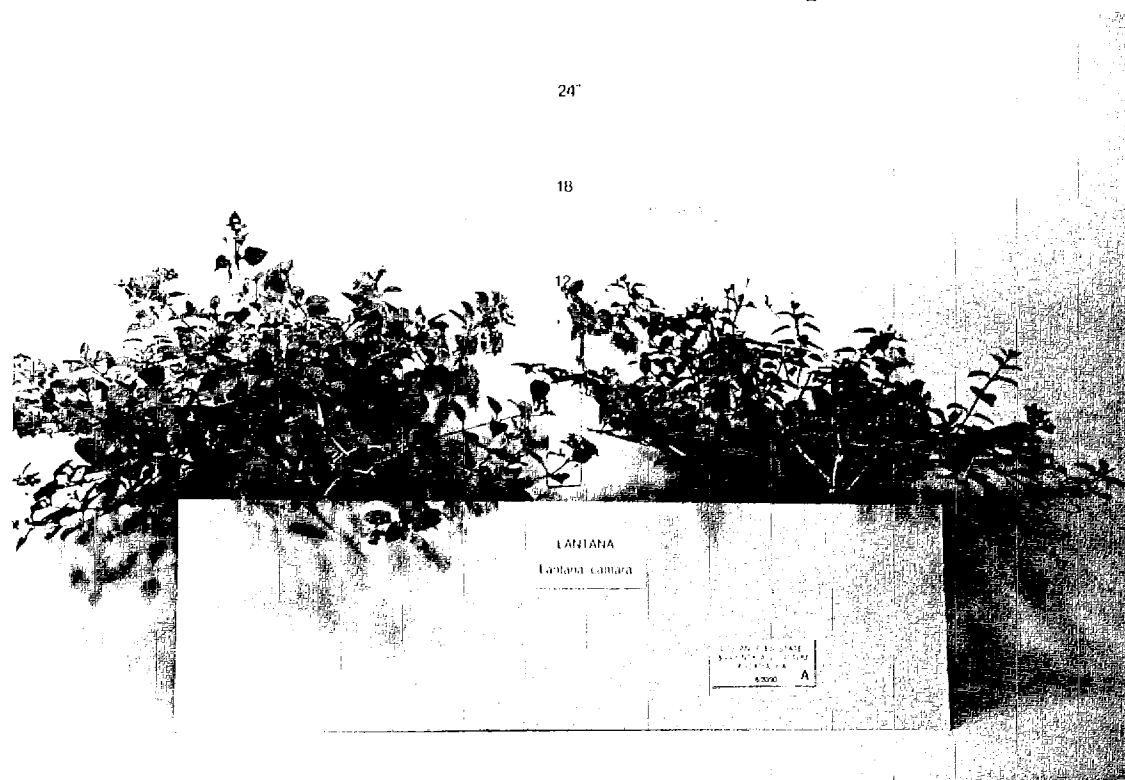
SCIENTIFIC NAME	COMMON NAME
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Lantana camara	LANTANA
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FLOWERS SCRAGGLY GROWTH

LANTANA
Lantana sp.



RESPONSE TO AMBIENT AIR POLLUTION:
PALE & SPOTTED LEAVES, REDUCED GROWTH

SCIENTIFIC NAME

COMMON NAME

Apium graveolens var. *dulce*

CELERY

Aquilegia sp.

COLUMBINE

Asplenium bulbiferum

MOTHER FERN

Coriandrum sativum

CORIANDER

Daucus carota var. *sativus*

CARROT

Petroselinum crispum

PARSLEY

Primula sp.

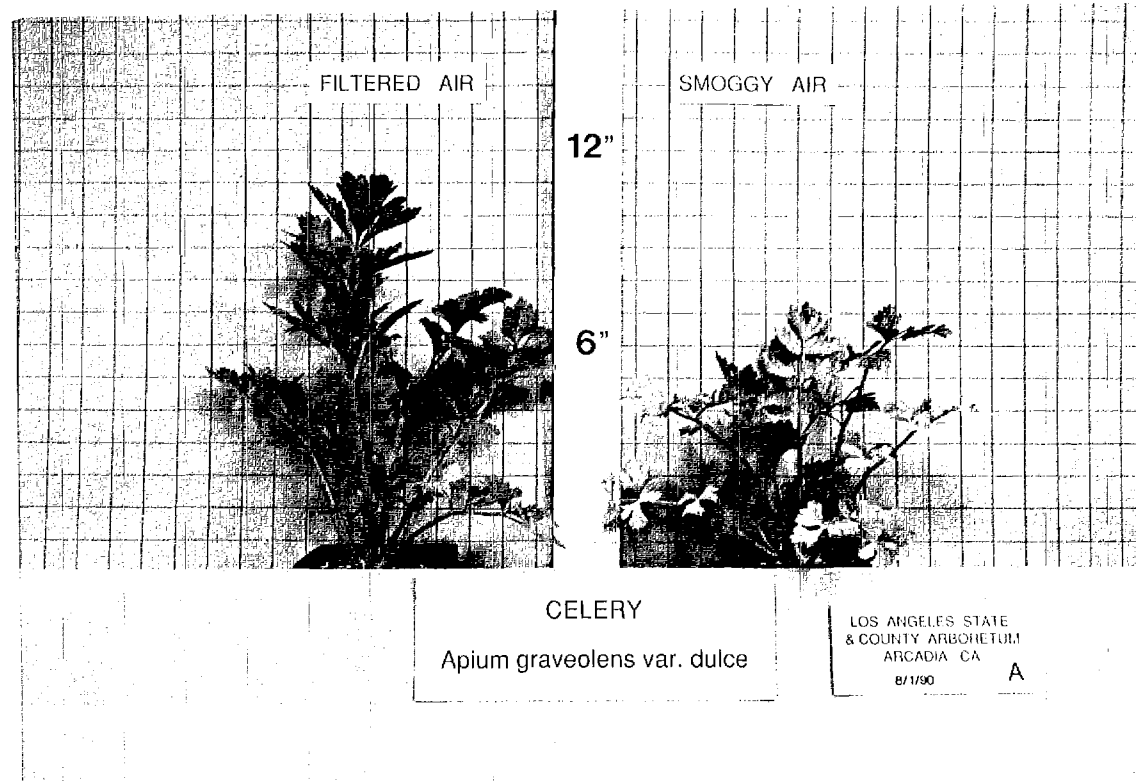
PRIMROSE

LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

PALE, SPOTTED LEAVES
REDUCED GROWTH

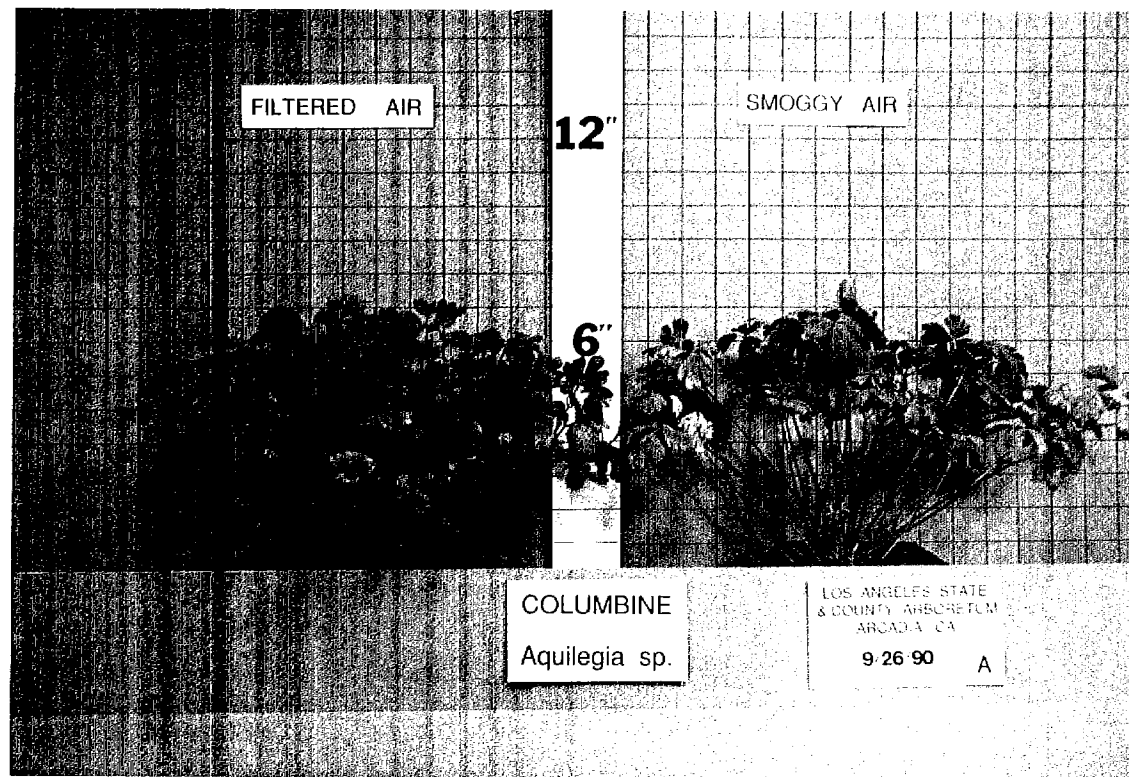
CELERY

Apium graveolens var. *dulce*



PALE, SPOTTED LEAVES
REDUCED GROWTH

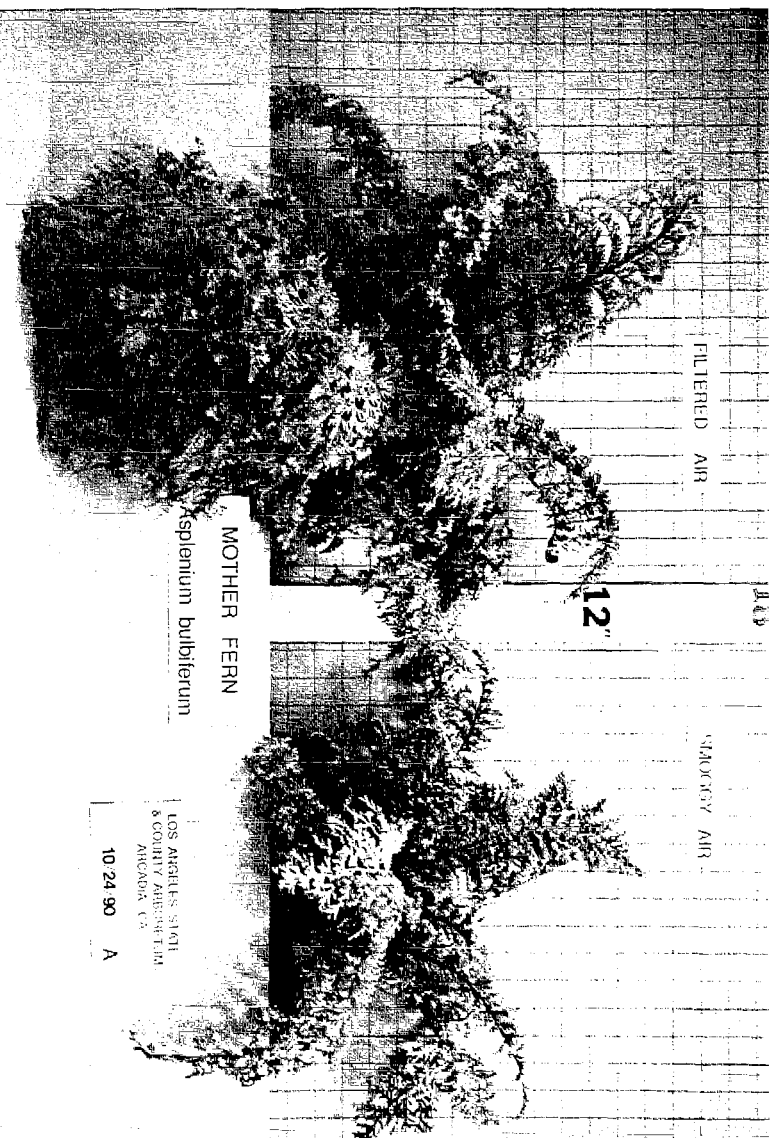
COLUMBINE
Aquilegia sp.



PALE, SPOTTED LEAVES
REDUCED GROWTH

MOTHER FERN

Asplenium bulbiferum

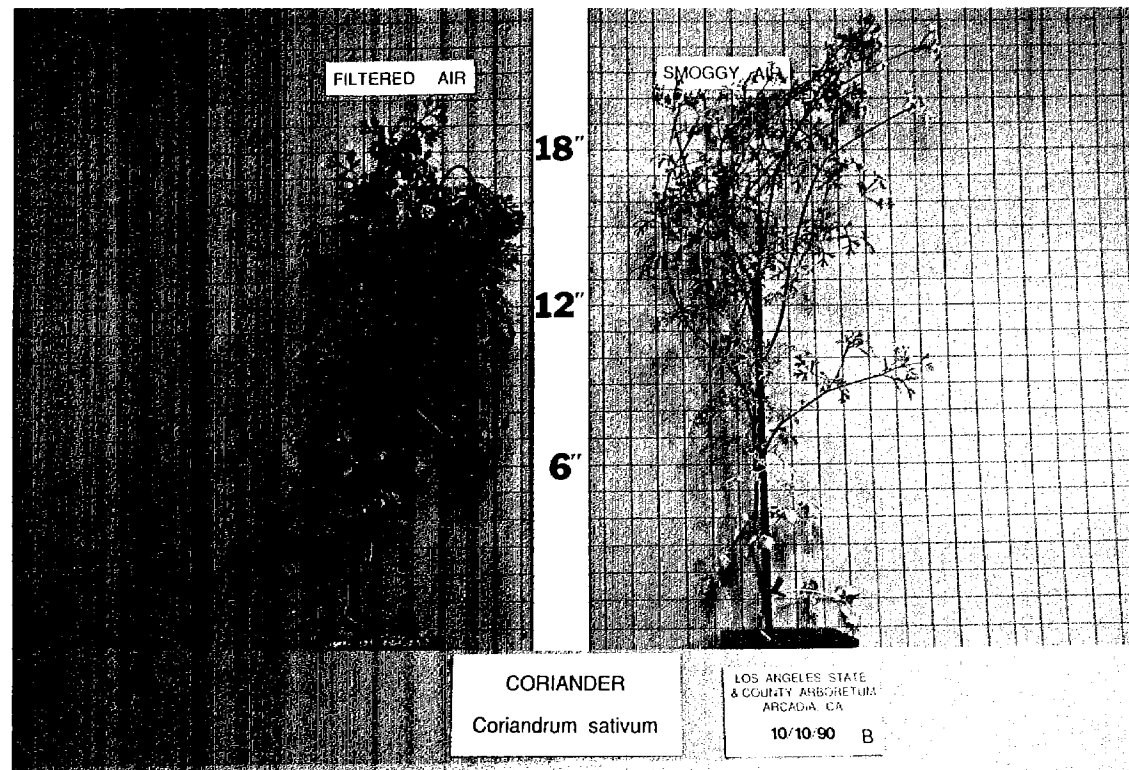


10 24 90 A

PALE, SPOTTED LEAVES
REDUCED GROWTH

CORIANDER

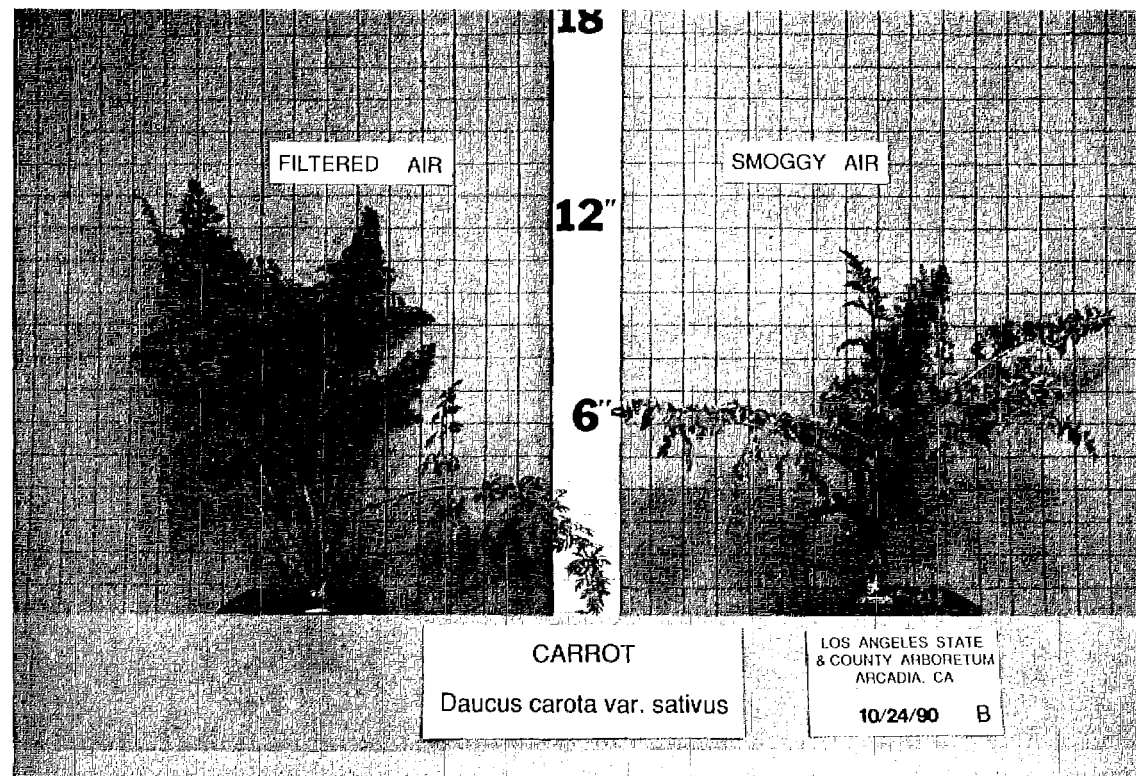
Coriandrum sativum



PALE, SPOTTED LEAVES
REDUCED GROWTH

CARROT

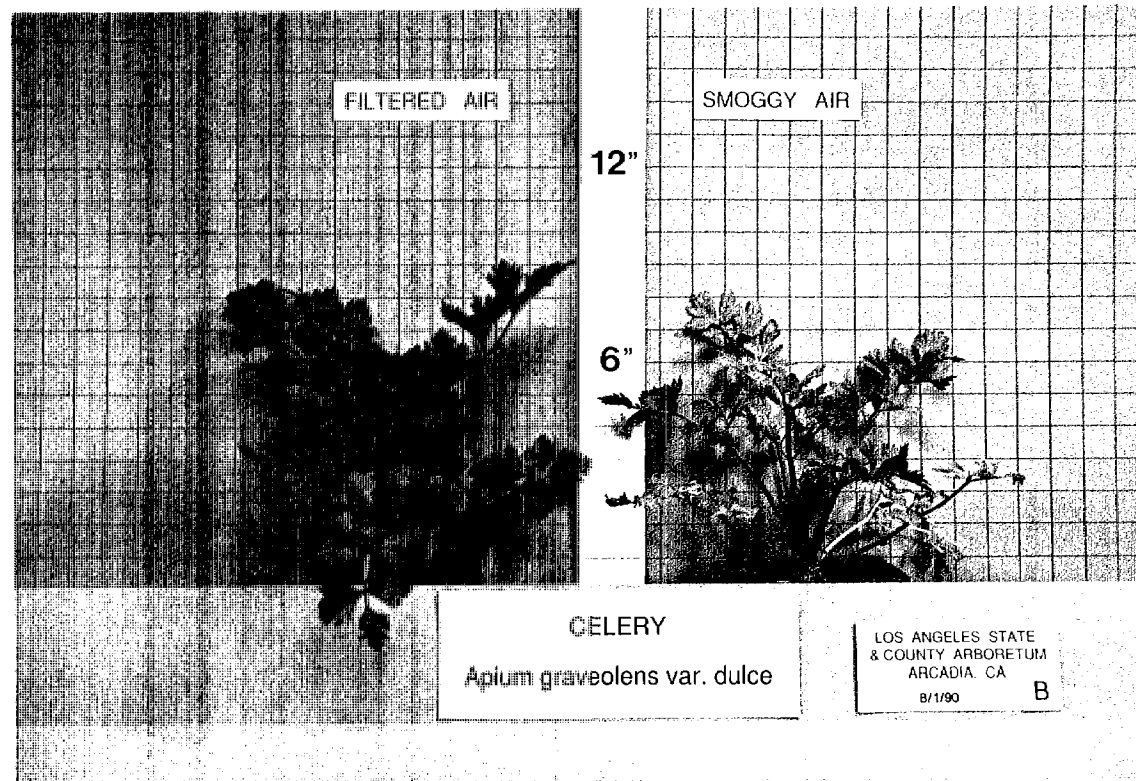
Daucus carota var. *sativus*



PALE, SPOTTED LEAVES
REDUCED GROWTH

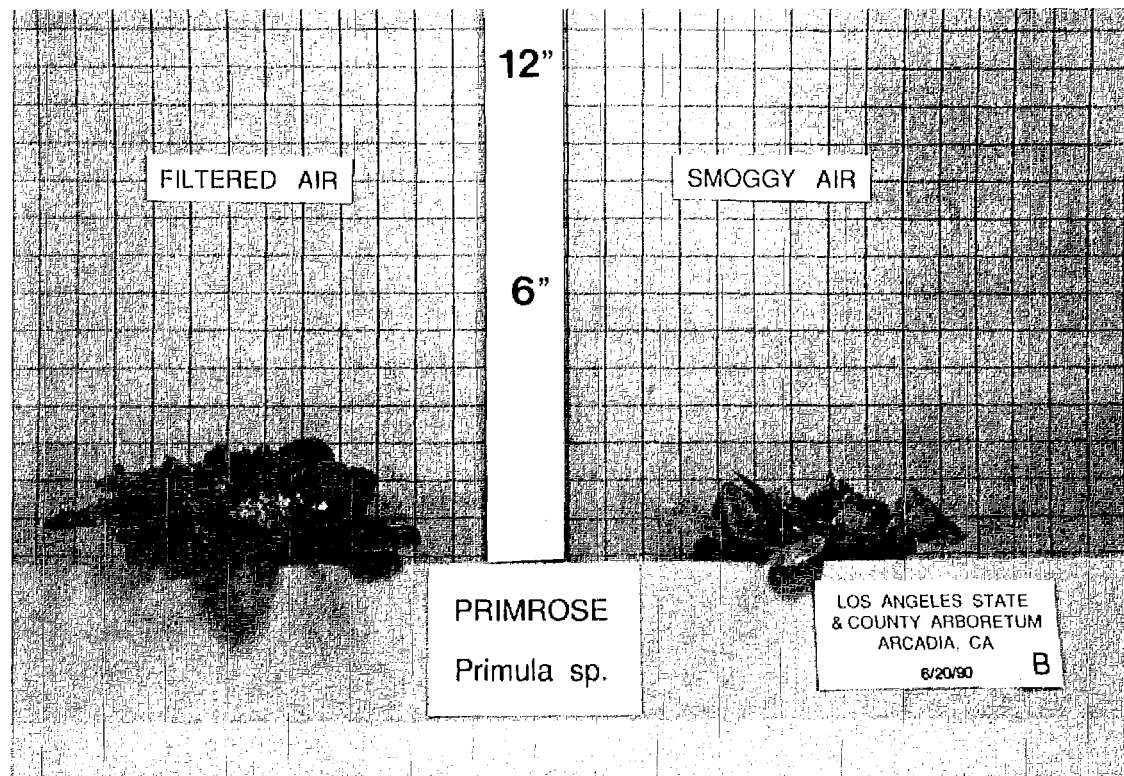
PARSLEY

Petroselinum crispum



PALE, SPOTTED LEAVES
REDUCED GROWTH

PRIMROSE
Primula sp.



RESPONSE TO AMBIENT AIR POLLUTION:

LEAF SPOTS, FEWER FLOWERS, REDUCED GROWTH

SCIENTIFIC NAME	COMMON NAME
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Nicotiana tabacum	NICOTIANA
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Petunia hybridus	PETUNIA
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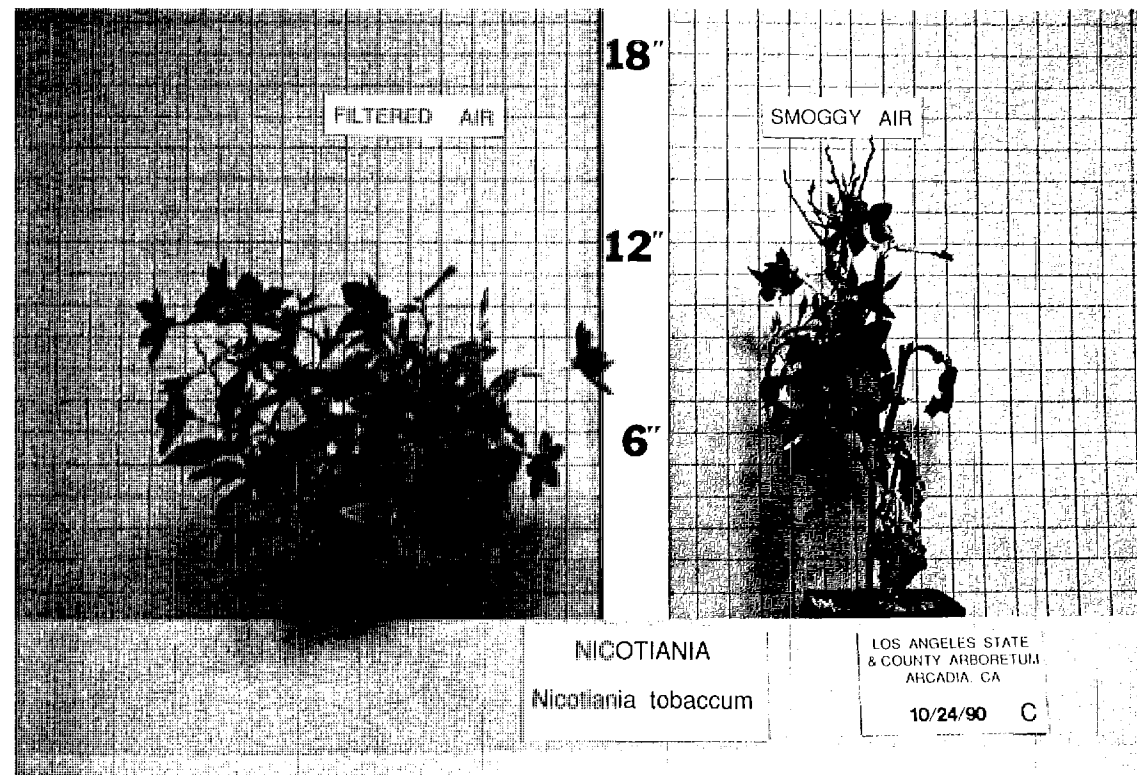
Viola sp.	VIOLA
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

LEAF SPOTS, FEWER FLOWERS, REDUCED GROWTH

NICOTIANA

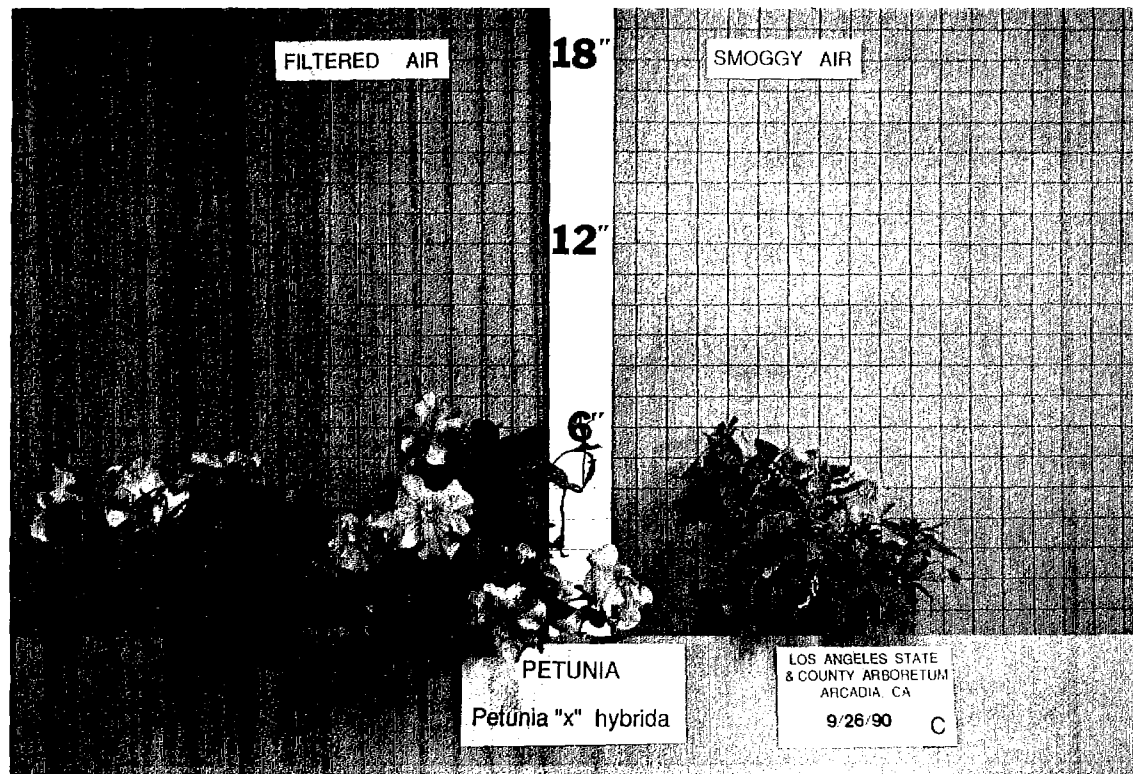
Nicotiana tabacum



LEAF SPOTS, FEWER
FLOWERS, REDUCED GROWTH

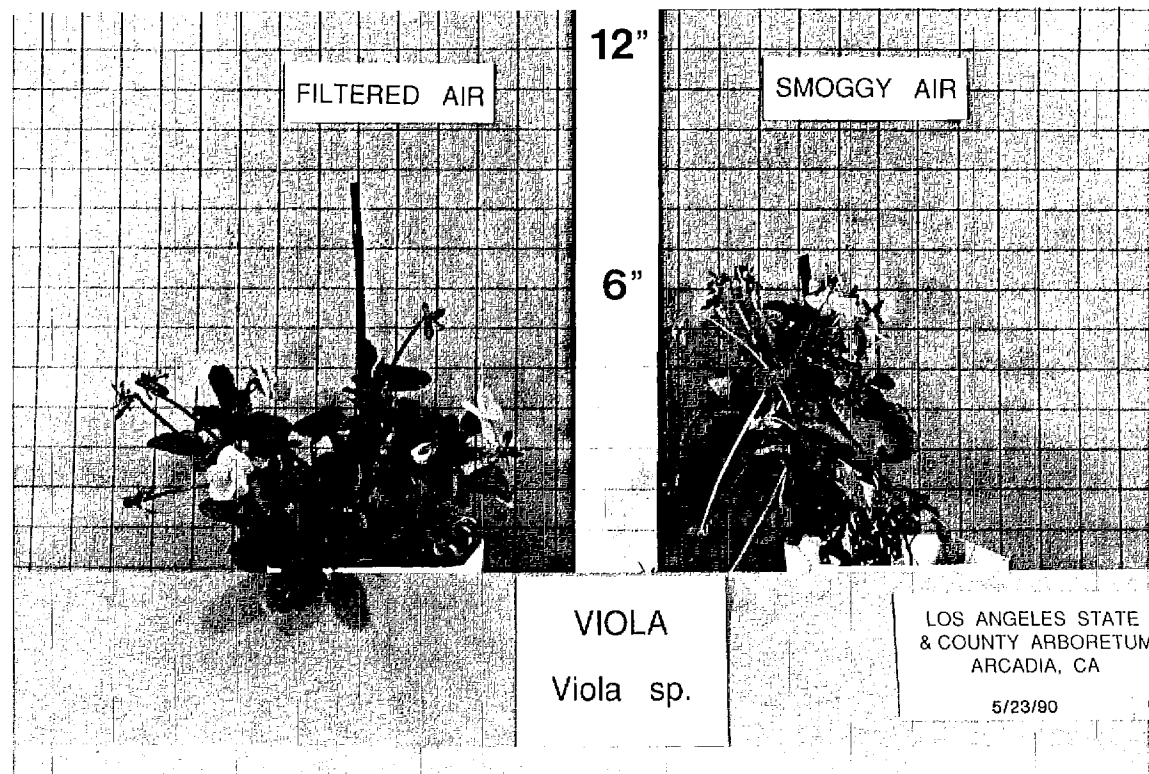
PETUNIA

Petunia hybridus



LEAF SPOTS, FEWER
FLOWERS, REDUCED GROWTH

VIOLA
Viola sp.



RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS, PALE LEAVES, REDUCED LIFE SPAN

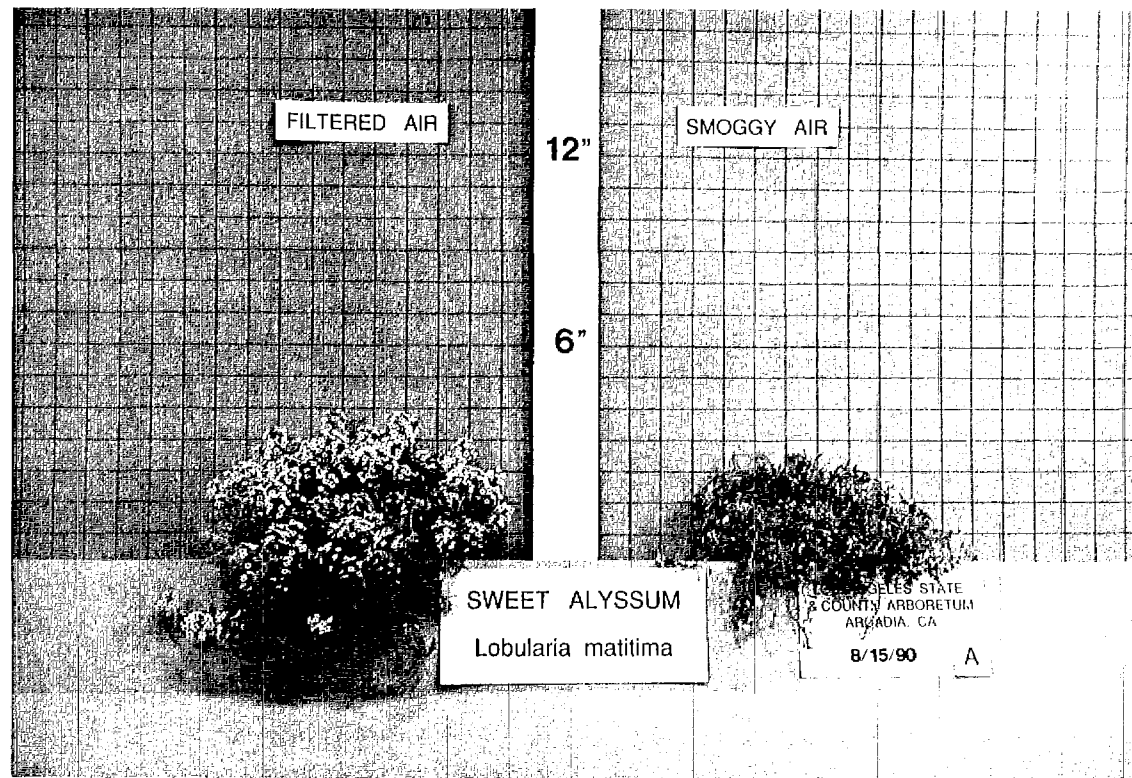
SCIENTIFIC NAME	COMMON NAME
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<i>Lobularia matitima</i>	SWEET ALYSSUM
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FLOWERS, PALE LEAVES
DIES SOONER

SWEET ALYSSUM
Lobularia matitima



RESPONSE TO AMBIENT AIR POLLUTION:
FEWER FLOWERS, REDUCED GROWTH & LIFE SPAN

SCIENTIFIC NAME	COMMON NAME
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<i>Brachcome iberidifolia</i>	SWAN RIVER DAISY
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LOS ANGELES STATE AND COUNTY ARBORETUM, ARCADIA 90-91

FEWER FLOWERS, REDUCED
GROWTH AND DIES SOONER

SWAN RIVER DAISY
Brachycome iberidifolia

