

EXTENDING KNOWLEDGE >> CHANGING LIVES

NDSU

EXTENSION

# Air Plants

The fascinating world of Tillandsia:  
plants that grow without soil!



NDSU

EXTENSION

# What are Tillandsias “Tillies”?

- Air plants are epiphytes, meaning plants that grow without dirt. They do have roots but don't use them to obtain nutrients. They absorb water & nutrients through their leaves.
- Air plants attach themselves to rocks, trees, fences or other structures with their roots. They do not steal nutrients from their host.
- Tillandsia is a genus of evergreen, perennial flowering plants in the family Bromeliaceae, native to the forests, mountains and deserts of the southern United States, Mexico, Central America and South America.

# Trichomes

- All plants have trichomes, which are little scales on their leaves that are like little reservoirs that grab water and nutrients from the air. The trichomes close to hold in water and open to absorb water.
- Air plants have a more pronounced trichomes. The scales are made to catch dust or moisture from the air and absorb them into the plant. Trichomes also reflect sunlight off the leaf surface.



# Tillies in the Wild



# Air Plants & Photosynthesis

- Most plants exchange carbon dioxide through their stomata during the day due to the sunlight's role in photosynthesis.
- Air plants are a little different in that they use their stomata to exchange gases or “breathe” at night when the plant is cool using CAM (Crassulacean Acid Metabolism) photosynthesis. This reduces the loss of transpiration of water during the hottest and driest parts of the day.
- CAM photosynthesis helps plants like Tillandsia, succulents, bromeliads and cacti survive in arid conditions.

# Air Plant Care

There are 3 things air plants need for good health:

1. Water
2. Light
3. Air Circulation



# Water

- Spray misting is insufficient as a sole means of watering in dryer climates but is beneficial between regular watering to increase humidity. You can get away with misting heavily several times a week to daily if air is humid.
- Submerging, 30 minutes to 1 hour will rehydrate your plant. Some growers water up to 8 hours. Water every 1-2 weeks. Give a good shake to remove water trapped in the leaves and air dry upside down to totally within 4 hours. They can rot if not dried before storing.
- Use clean container while watering. Tap water is not ideal. Dissolved minerals, especially calcium can clog leaves. If using tap water, let it sit overnight to allow chlorine to dissipate. Do not use softened water.



# Water continued

- Never use distilled water since it does not contain nutrients.
- Rain or spring water is ideal. You can also use bottled drinking or reverse osmosis water.
- Watering in the morning is best because of CAM photosynthesis. This allows them to have a full day to absorb and store the water.
- Keep an eye on the shape and color of the leaves of your plant. If you notice the leaves are curling under or turning brown, water more often.
- Water according to air temp, humidity and season. In summer you may need to bathe weekly and a little less often in the winter.

# Light

- All air plants love light so give them plenty, but direct sun can burn them... give them bright, filtered light. Silver-leafed air plants can take more direct sunlight.
- Ideally place within 1-3 feet of a window, but no more than 6 feet
- Adaptable to grow lights or indoor lights but preferably needs 12 hours of lighting.
- Too much light can burn the leaves. Since they are slow growing they are slow to recover.

# Air Circulation

- They like fresh air. They can do fine in an enclosed space, as long as there is some air flow
- Crack a window for some air movement
- Grow them in an indoor/outdoor space
- Rotate them indoors and on the patio if possible
- Using a fan is good but not directly on them

# Air Plant Types

- There are more than 600 species of air plants. There are two main types.
- *Xeric Tillandsias* flourish in super dry and hot locales (think the desert), and they have larger and denser trichomes to absorb light and water and have very little root system. General rule of thumb, plants with fuzzy trichomes are xeric tillies. They often have a silvery appearance and can handle more sunlight and can handle less frequent watering.
- *Mesic Tillandsias* grow in more moderate climates that receive a little more moisture (think Central America). This variety has a smooth, porous surface with less trichomes and often have a “tank” to collect water and also produce “normal” roots. They are used to the shade and don’t like a lot of hot, direct sunlight. They require more misting during the week.

# Fertilizing

- Air plants require very little supplemental nutrients to thrive, but most appreciate light monthly feedings to support their growth and blooming. Use air plant-specific fertilizer or a bromeliad fertilizer.
- If you use a non-air plant fertilizer make sure it is copper-free.
- Fresh pond water or fresh water aquarium water can be used for watering/fertilizing.
- Withhold fertilizer in the winter.
- Do not over fertilize or that fertilizer is too strong. It may burn your plant if not diluted.

# Acquiring more tillies

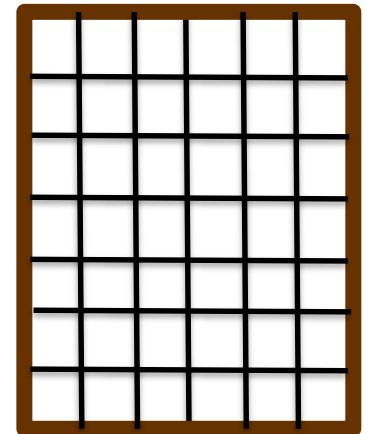
- Seeds (takes 2-4 years to grow a sizeable plant)
- Air plants bloom but once in their lifetime. Blooms can last a short while or a long time depending on the variety. After a Tillandsia flowers, they produce “pups” or new plants emerging from the base of the mother plant. Pups can be kept on the mother plant to create a “clump” or can be removed when they’re at least 1/3 the size of the mother plant. Gently pull apart to separate mother plant and pup.
- If your plant blooms or buds, don’t submerge the flower or bud while watering.

# Air Plant Displays

- As harmless and pretty as copper appears, it is toxic to air plants and should be avoided. Don't use displays with rust.
- Open containers are best. Make sure to allow air plants to dry completely after watering especially if using a display with low air circulation.
- Without the confines of a pot, you can set them on a shelf, hang them on a wreath or by wire! Gluing air plants to a display won't kill them but may not allow you to water them properly.



Photo credit: Sarah Snavelly



# Extras

- No soil.... no mess... no bugs
- Be careful, the oils in your hands can clog the trichomes.
- Thinner leaf tillies will tolerate less direct sunlight vs plants with thicker, fuller leaves
- Dry or loose leaves can be trimmed, but it's not necessary
- With good care, air plants can live for a very long time,

