PLS4950- Plant Science Capstone

Obstacles in Production of Popular Houseplants

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Introduction and Background

- Demand for houseplants in the United States has skyrocketed for consumers in their twenties to early thirties.
- Consumers are looking to spruce up their living space with variegated foliage varieties, air purifying species, and other unique species to flaunt on social media platforms.
- Upon the United States entering quarantine for the COVID-19 pandemic, houseplants were flying off the shelves at local garden centers and nurseries. Seeking out new colorful companions for a life spent majorly in the same four walls became a coping mechanism to many young adults.
- Growers have experienced the need to ramp up production of these new trendy houseplants at a moment's notice while still facing the same obstacles before the demand boom (Bilyj, 2019).[1]
- **Methods:** By reviewing extension literature and grower blogs, I identified common issues in production of said species that, if resolved, would lead to lower loss of propagules to pests and disease.

Research Question

- As someone who desires to enter the ornamental breeding and growing industry, I thought it would be helpful to identify any obstacles in production of ten of the most popular houseplants in the United States.
- These species are found in almost every young adult's home and are heavily sought after by individuals starting their collections.
- I hypothesize that many of these issues are caused by poor management practices and could be rectified by implementing integrated management practices.

Take Home Message

- While it is nearly impossible to maintain a production system with no hitches, the issues identified may be circumvented. Literature has provided the ailments different species are susceptible to, allowing growers to plan for those threats by utilizing integrated and preventative management practices to maximize efficiency of production.

[1]: Bilyj, B. (2019, March 20). Houseplant comeback. Retrieved April 13, 2021, from https://www.gardencentermag.com/article/houseplant-comeback/

[2]: KHOSHBAKHT, T., & BAHADORI, F., & KHALIGHI, A., & MOEZ ARDALAN, M. (2011). THE EFFECT OF PLANT GROWTH PROMOTING RHIZOBACTERIA ON MACRO ELEMENT CONTENT AND YIELD OF ALOE VERA IN GREEN HOUSE CONDITIONS. CROP PHYSIOLOGY, 2(8), 45-59. https://www.sid.ir/en/journal/ViewPaper.aspx?id=218637

[3]: Poole, R. T., Chase, A. R., Osborne, L. S. (n.d.). *Spider plant Production Guide*. Retrieved from https://mrec.ifas.ufl.edu/foliage/folnotes/spider.htm

[4]: Gilman, E. (2015, May 06). *Calathea makoyana Peacock Plant*. Retrieved from https://edis.ifas.ufl.edu/fp086#FOOTNOTE_2

Houseplants Examined

Pothos (*Epipremnum aureum*)

Location(s): Central America, Caribbean, SE United States
Obstacles: Phytophthora Root Rot, Bacterial Wilt Disease, Rhizoctonia Blight, Southern Blight
Solutions:

- Exclusion through using sterile soil and regular screening and removal of any infected propagules.
- Regular sanitization of shared irrigation infrastructure.
- Preventative fungicide applications.

Aloe (*Aloe barbadensis miller*) & Snake Plant (*Sansevieria trifasciata*)

Location(s): Southern United States, Puerto Rico, Hawaii, Africa
Obstacles: Not any true standout issues as Aloe is an extremely low maintenance plant that is natively found in low-fertility, dry soils. Snake Plants have been reported to be susceptible to root rot and often have mealybug and spider mite issues.
Solutions:

- Studies have shown that inoculating Aloe propagules with symbiotic bacteria displayed an increase in root and leaf fresh and dry weight, number and length of leaves and roots, leaf area, and increased P and K uptake (Khoshbakht et al., 2011).[2]
- Inoculated plants displayed a 42% increase in overall yield as compared to control plants.
- Soil moisture must be consistently monitored for Snake Plants and all imported propagation material should be screened for pests prior to greenhouse introduction.

Spider Plant (*Chlorophytum comosum*)

Location(s): United States, Coastal South Africa
Obstacles: Tip burn, ununiform foliage color and pattern, leaf bleaching
Solutions:

- Tip burn may be avoided by managing boron and fluoride levels in the irrigation water supply and applied fertilizers (Poole et al., n.d.).[3]
- While spider plants may grow in a variety of light intensities, leaf pigment and stripe color will vary with intensity. Growers should ensure uniform light exposure to avoid discoloration and leaf bleaching.

Philodendron (*Philodendron xanadu*)

Location(s): Tropical areas of North, South, and Central America
Obstacles: Chlorosis, leaf bleaching, foliage discoloration and twisting, tip burn
Solutions:

- Philodendrons are highly sensitive to manganese, calcium, potassium, sodium, and nitrogen levels. Excessive amounts will burn or bleach foliage while deficiencies may cause growth irregularities, chlorotic patches, and browning.
- Irrigation supply should be monitored regularly for contaminants and components of any chemical treatments applied should be studied beforehand.
- Light levels and temperature should remain moderate.

Monstera (*Monstera deliciosa*)

Location(s): Central America
Obstacles: Leaf spot, Phytophthora Root Rot, chlorotic and brown foliage, dripping off leaf lamina, leaf bleaching
Solutions:

- Regular sanitization of shared irrigation infrastructure as bacterial and fungal diseases are usually dispersed through contaminated irrigation supply.
- Infected plants should be removed immediately, and imported propagules should be heavily screened for inoculum.
- Over-watering is an extremely common issue that could be rectified by routine irrigation regimens, accounting for changes in humidity, and adequate drainage.
- Light intensity and temperature need to remain moderate as excessive light will bleach leaves and low temperatures will cause black spots.

Echeveria (*Echeveria agavoides*) & Fishbone Cactus (*Epiphyllum anguliger*)

Location(s): Central America
Obstacles: Ununiform leaves, lesions from mishandling, mycoplasma infection, mealybugs, Phytophthora Root Rot
Solutions:

- Maintaining stable and appropriate light levels is crucial in production as leaves will take on a red tint should light intensity be too high.
- Mycoplasma infection may be avoided by ensuring the use of sterile soil and removal of infected propagules.
- Exclusion should be practiced by screening all imported propagation material for mealy bugs and other pests upon arrival.

Calathea (*Calathea makoyana*)

Location(s): Tropical areas of South and Central America
Obstacles: Leaf discoloration and mites
Solutions:

- Maintaining the foliage's vibrant colors for consumers requires filtered light as too much light will cause leaves to become dull (Gilman, 2015).[4]
- Mite infestations may be avoided by utilizing preventative insecticides and exclusion through routine screening of propagules.

Pilea (*Pilea peperomioides*)

Location(s): Southern China
Obstacles: Leaf curling, chlorosis, white flies, aphids, tip burn
Solutions:

- Leaf curling is caused by excessive light or high temperatures. Pileas should remain in environments cooler than 80 degrees Fahrenheit with moderate lighting.
- Tip burn and chlorosis may be avoided by monitoring nitrogen and potassium availability to the propagules.
- Insecticides and exclusion are the best practices to control white flies and aphids.