Biological Invasion Detection via Sentinel Gardens in Alabama

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Project Description:

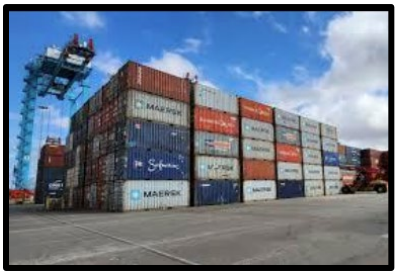
Invasive pests and pathogens pose a serious threat to both local environments and global commercial trade, with infectious plant diseases quickly becoming an increased threat to biosecurity. The implementation of sentinel gardens provides early warning systems for invasives that would allow for faster response times and the prevention of the spread of invasive pathogens and insects.

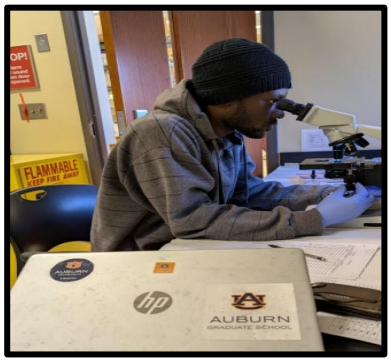
With the Port of Mobile being a major hub of activity and commercial trade, it was chosen as the site for two sentinel plantings. Its ports serve as a crucial checkpoint for the pathways of invasives while its proximity to urban areas allow for community involvement that would increase bio-surveillance, thereby increasing early detection rates of pests and pathogens.

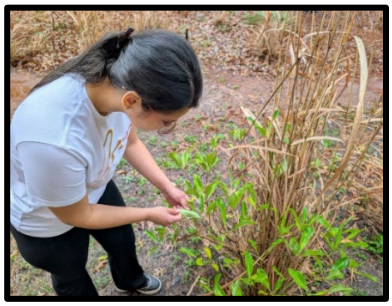
Tree and shrub species for the plantings were selected through a series of surveys that resulted in a list of trees and shrubs native to Alabama that are a mix of economic, ecological, and cultural importance, such as loblolly pine, bald cypress, sassafras, and rhododendron.

Once the planting is concluded, the trees and shrubs will be used as bait and proactively screened for invasive species that may enter through the Mobile ports. Spore and insect traps will be established and monitored monthly for the surveillance of pathogens and potential invasive insects. Yearly workshops and the involvement of citizen scientists will be used to drive up interest and to help monitor nearby vegetation beyond the gardens.

Morphometric and molecular approaches will be used to identify pathogens in the event of detected disease, and partners will be leveraged for diagnostics where needed.







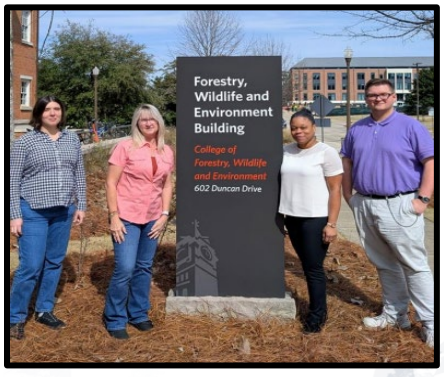
Project Timeline and Outcomes:

This 3-year project aims to oversee the planning and implementation of two sentinel garden sites. The first year will consist of species selection and acquirement, garden design. And the engagement of citizen scientists, while years two and three will consist of establishing the plantings and maintenance/monitoring. Results from the project shall provide:

- Establishment and demonstration of a sentinel garden approach to biosecurity
- The immediate and long-term impacts of outreach on the effectiveness of early detection
- The implementation of citizen scientists and workshops for community involvement
- Conduction of general surveys and sampling for invasive pests, including non-regulated species

Project Impact and Future Objectives:

As the second sentinel garden planted in North America, this project serves as a tipping point in biosecurity and pest detection. The future objective of this project is to further the understanding and education of invasive species to the surrounding Alabama communities, as well as the establishment of future gardens along riverways used for transportation of shipping containers near Montgomery. The need for active monitoring in plants is expanding, and with Alabama's rich biodiversity and booming timber industry, the effectiveness of sentinel gardens is crucial to the success of Alabama's ecological future.



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