

MSU Plant Science Research Greenhouses

Recent Accomplishments and Near-Term Goals

May 2020

Strategic Plan

The Plant Science Research Greenhouse facility at MSU has undergone a major shift in organization and oversight. These changes are the result of five years of discussions, evaluations, surveys, interviews, and recommendations by the Greenhouse Faculty User's Committee. In this report to the user community, a list of changes that have already occurred is provided along with plans for the facility for the near future. A major shift in long-range planning has occurred with the COVID-19 pandemic, in that a \$20 M greenhouse improvement project (funded by the State of Michigan and MSU) is unlikely to occur in the next one to three years. We have thus adjusted the strategic plan, anticipating that some control systems will need to be upgraded and other maintenance that was to be deferred until the major remodel will now have to be completed with existing resources.

Recent Accomplishments

- Staff changes – Based on interviews and reviews by the Greenhouse Committee, it became clear that major changes needed to be made in management and staff composition to ensure safety of university employees and improve functionality of the facilities. The following staff changes were made:
 - Before the new Greenhouse Director was hired, the decision was made for the Greenhouse Director to be supervised by the co-chairs of the Greenhouse Faculty User's Committee (currently Tom Sharkey and Erik Runkle) instead of by the Director of AgBioResearch.
 - Chrislyn Particka, Director – took over management of the facility starting in September 2019.
 - Lisa Murphy, Greenhouse Coordinator – reassigned July 2019 to the Plant Biology Department when management of the Plant Biology Teaching Greenhouses was separated from the Research Greenhouses.
 - Larry Thayer, Greenhouse Engineer (licensed electrician) – started November 2019. Will ensure that repairs, renovations, and improvements are conducted in a manner that ensures safety of greenhouse users and employees.
 - Lance Forsberg, Pesticide Coordinator – as of March 2020 is 100% employed by the Research Greenhouses. Lance previously had a 25% appointment in Horticulture to apply pesticides in the Teaching Greenhouses and Horticulture Gardens.
 - Trevor Hardwick, Greenhouse Coordinator (to replace Andrew Mitin) – will start late May 2020.
- Successful implementation of greenhouse fee system to offset some of the costs of greenhouse operations. All revenue from fees is used to improve the facility. Funds

coming to the greenhouses from ABR and CNS were not reduced when the fee structure was initiated.

- Improved relationship with IPF.
- In coordination with IPF, renovations are being made to the north and south headhouse basements:
 - *In the north basement*, work completed to date includes removal of unwanted items that had been left behind, asbestos abatement, new lighting, new windows, drain cleanout, and installation of drain tile around the perimeter of the headhouse. IPF had begun work to identify how water continues to get in the basement when the first stay-at-home order was executed, so that work is on hold/ongoing. Once the basement is watertight, greenhouse staff will install shelving and assign storage space to interested lab groups.
 - *In the south basement*, IPF structural engineers determined the basement was structurally unsound, but in no immediate danger of collapsing. The basement was closed off and support beams were installed. The south headhouse is slated for demolition as part of the \$20M capital improvement project.
- New LED lighting fixtures were ordered for ranges 21 and 22. IPF is covering the majority of the cost for range 22 in an effort to reduce campus-wide energy use. These lights are on campus and IPF was set to start installation when the first stay-at-home order was executed. Lights for range 21 have been ordered. Greenhouse staff is in the process of assisting USDA with the purchase and installation of LEDs for some of their greenhouses.
- Installation of new fin tube for steam heat in the west range by IPF (ongoing). Greenhouse staff assists by identifying ranges that can be renovated and moves benches, etc., so that IPF can access the fin tube.
- Safety improvements. Notably, the greenhouse facility has ordered a personnel lift so that greenhouse staff will no longer use extension ladders to access ridge vent motors, vent arms, etc.
- New benches for Horticulture Farm greenhouses. Thirty-six expanded-metal benches were purchased (assembly/installation was interrupted by the stay-at-home order) for two of the greenhouses to replace old plastic-top benches that are breaking. New irrigation will also be installed in these two houses.
- Corrected issues caused by past management (ongoing). Greenhouse staff have identified multiple issues, including incorrect installation of control systems and other equipment, improper electrical wiring, etc. Many issues have been found and resolved, but we expect to find more.
- Improved greenhouse sanitation (to reduce pest and disease load throughout the facility). Greenhouse staff practices have been upgraded and users are contacted when sanitation issues need to be addressed.
- Plastic pots and recycling. New pots were investigated and selected for facility-wide use. Six sizes of plastic pots are now supplied, ranging from 1 pint to 2.25 gallons. We started a plastics recycling program in cooperation with the MSU Recycling Center and East Jordan Plastics.

- Greenhouse tours to support Capital Outlay request (will hopefully continue!). In October, we hosted state senators and representatives who are members of the Capital Outlay Committee. From December through early March, we also hosted two trustees (Brianna Scott and Kelly Tebay), Chuck Lippstreu (new president of the Michigan Agri-Business Association), and the Farm Lane Society.
- Greenhouse space reassignments. Approximately 15 lab groups were moved to new greenhouse spaces and 5 new irrigation systems were built. The flexibility in making space assignments resulted in “right sizing” space and moving programs to better quality space in several instances. In addition, users who have pesticide application restrictions are now using adjacent greenhouse sections.
- Worked with EHS to develop a system to collect and properly dispose of pesticides that are left in the spray tank after application as well as spray tank rinsate.

Near-Term Goals

- Continue to replace outdated and inefficient HPS light fixtures with LEDs as budget allows, which will improve lighting uniformity, improve cooling in the summer, and reduce electricity usage.
- Improve climate control in greenhouses. Currently we are exploring options to develop a long-term strategy for controllers. We are planning improved control systems and will replace controls based on our planning process and informed by need and cost-benefit ratio. The goals are to improve the level of control, reduce high and low temperature episodes that can damage plants and result in expensive staff call backs, and allow for a day-night differential in temperature set point.
- Disposal of transgenic plants. Autoclaves in surrounding buildings are running at capacity so we need a new solution. Our current plan is to begin using the EHS incinerator facility on Farm Lane at a cost of \$0.22/lb. Procedures will be implemented in the near future.
- Purchase a new steamer bin for the organic waste to replace the current one, which is rotting through. This is being done in coordination with Surplus Store and Recycling.
- Field soil replacement. Identify and stock a replacement for the field soil that greenhouse staff self-mixed in the past.
- Outdoor soil storage area. Plans have been developed with IPF Landscaping to build a fence between ranges 29 and 31 to create a secure outdoor storage area for potting media and other large items to free up space in the storage shed.
- Establish a framework for what work will be completed by IPF vs. greenhouse staff. Previous management largely avoided working with IPF to complete projects. This resulted in inefficient management and extra costs to the greenhouse facility. The Greenhouse Director has initiated this conversation with IPF and a meeting that includes IPF unit leaders will be planned after the COVID-19 pandemic has passed.
- Develop a “Greenhouse Bootcamp” to provide new users with information on best practices in growing plants in greenhouses.

- Continue to work with and support college and university planners for Research Greenhouse renovations if and when MSU receives the capital outlay request.
- Implement online ticketing system for work requests. Dan Adams, System Administrator for RTSF has been assisting with this, but ran into some technical issues that should be resolved in the near future.

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