



## Hot Water Pest Eradicator Project

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### Project Summary:

Pesticides are a rather toxic and harmful chemical that is used extensively throughout agriculture for both crops and ornamental plants. The goal of this project is to test an alternative to the pesticides that rather than using chemicals just uses hot water.

The research done to show that this technic works was done at the University of Hawaii at Manoa. They studied a large spread of plants to say which of the plants could handle what temperature of water and for what duration. Then they found the point at which the pests living on the plants would die at. This resulted in a large variety of plants tested and accounted for in there research so that if others where to replicate the device to deliver this water they would know how to treat the plants.

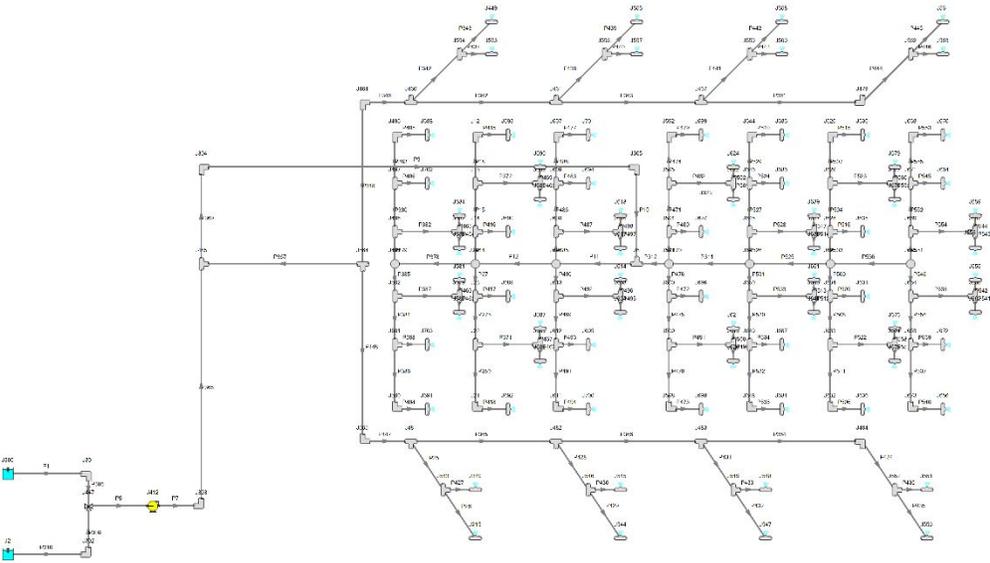
For our project we were tasked with replicating this water delivery system with our own modifications to make it more efficient at producing the water and delivering it. To get the best delivery system we used the AFT Fathom program to help us design our complex pipe network that would help us understand the type of pump required and the materials we may need in order to get the require pressure desired through the system.

Through the program we designed in detail our network and then experimented with different pumps and pipe diameters to understand what would be best. Through this we learned that we could use a smaller pump than initially thought and we would only require a single pump rather than two, as well as only needing to use 3/4" piping rather than 1.5" piping.

After our pipe network was designed we advanced quickly and created a small-scale prototype to test the system. From here, we where able to program our controller and other components to properly deliver the hot water required to treat the plants.

Overall the small-scale system was a success and we where able to collect all required data. Now we are waiting to travel to San Diego, CA to build the full-scale system for our client. Here we will get a true test on the accuracy that the Fathom software predicated for the piping network.

AFT Fathom workspace view of the hot water pest eradicator system.



Working prototype of the hot water pest eradicator tanks with a scaled version of the piping system for demonstration purposes.

