



# Use of aquaculture effluent to relieve water shortage and reduce fertilizer use in Guam

David P. Crisostomo

Kristen Cruz

Cooperative Extension Service

College of Natural & Applied Sciences, University of Guam

Statement of Problem: Major problems facing many farmers in parts of Guam and other islands include low water pressure, high cost of fertilizer and electrical power. To address this problem the SOUTHWEST STATES AND REGIONAL WATER PROGRAM funded a project in Guam to look at the benefit of aquaculture tanks to provide a reservoir of water for irrigation, as well as reduce the amount of commercial fertilizer needed to produce crops.

\* Existing aquaculture tank systems can be modified to meet the demands of agriculture utilizing standard drip irrigation systems.

- Passive settling and mechanical filtration with two disk filters (130 and 100 micron) effectively remove solids to allow for drip irrigation
- High nitrogen levels in fish tank can help farmers reduce costs of production by reducing their fertilizer needs
- Farmers with low water pressure can have the water needed and sufficient water pressure to utilize drip irrigation technology. Fish tank refills overnight when water demand is low.
- Environmental concerns over contamination of water resources are addressed.
- Water usage by drip line is .36 gallons per linear foot.
- More work will be done to define the savings in fertilizer cost for at least 3 common vegetable crops in Guam - (eggplant, hot pepper, and chinese cabbage)



Prospective farmers and students observe and learn about the system design and operation.



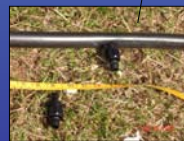
Standard aquaculture tank - 15' diameter w/ biomass of 700 pounds (tilapia fish)



Plastic tank (400 gallon) and 2" siphon tubes



1/2 hp submersible water pump (25psi)



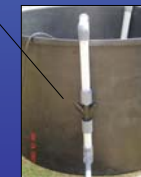
LS adapter - to connect drip irrigation to 1" poly hose



Rotary Air Blower - 1 hp



In-line disk filters (130 micron and 100 micron)



Pressure regulator @ 20 p.s.i.