

Integrated Systems of Agriculture and Aquaculture (AQUAPONICS)

[Active link to Camera and data collection in Aquaponics Greenhouse at University of Arizona](#)

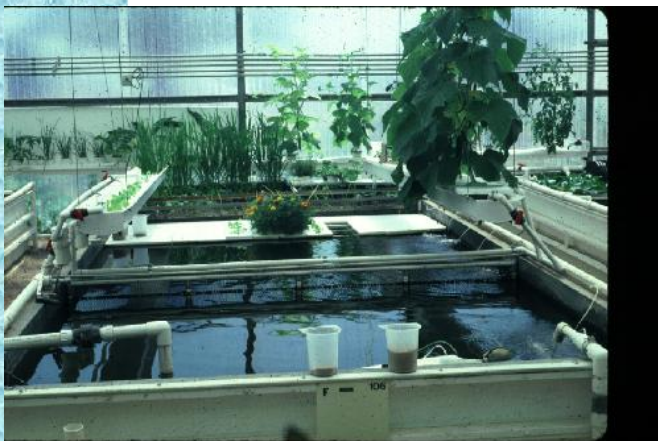
[Link to video of Aquaponics](#)

[Aquaponics PowerPoint Presentation](#)



A variety of plants grown in Tilapia effluent (University of Arizona)

Another use of aquaculture in the classroom that is gaining in popularity is the use of aquaculture in systems where a secondary crop of plants is grown using the effluent from the aquaculture facility. In many cases, these plants aid in filtration, acting as biofilters to remove nitrates from the water.



An experimental aquaculture/hydroponic system (U of A)

There are several ways of creating integrated systems as a part of recirculating systems. These most often include effluent from the tank or pond first running through a clarifier, or some sort of settling basin to remove the majority of the suspended solids. After this step, the water runs through a container where plants are grown. This may be a series of trays which have plants floating on the water, or the plants may be growing in a media such as gravel. This water may then flow through another filter or just be returned to the aquaculture tank. The combination of agriculture and aquaculture in this way is commonly referred to as aquaponics. Plant crops in aquaponics are usually limited to lettuce and other leafy crops, since they readily use the



An A frame system of lettuce grown with fish effluent. (U of A)

nitrogen available as a waste in aquaculture systems but don't need phosphorus (which is not present in aquaculture systems) as many

fruiting plants do. The pictures below link to several places where people are using aquaponics, either in research, or as a source of food and/or income.



Dr. James Rakocy at the University of the Virgin Islands developed an aquaponic system that relies on rain water catchment, rotating mechanical biofilters, and floating polystyrene panels that hold the tomatoes and leafy vegetables.

[A text update on the UVI system](#)



This aquaponic system is one of the many worthwhile projects being developed at The Cabbage Hill Farm (found in their aquaponics section on the home page). You can see the fish tanks on the left, which feed the lettuce in the grow trays on the right. Their web page provides some good background material, while they also provide technical assistance for schools who wish to use aquaponics in the classroom.



Carol Webb's class at the Mineral County Vocational Technical Center in West Virginia has received many grants for establishing a hands-on classroom where students are in charge of all aspects of an aquaponics system, from starting plant seedlings to fish production. Here you can see lettuce growing in gravel beds which have fish effluent flowing through them.

The [Appropriate Technology Transfer for Rural Areas \(ATTRA\)](#) found in Fayetteville, AR, has developed an aquaponics page which contains all of these links and many more interesting and informative sites.



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