Cocahoe Production Systems

There are two types of production scenarios regardless of the growing facility (whether ponds, pools or recirculating systems). These scenarios are the two-phase system, which uses two isolated units: one for broodstock to produce eggs and the other to hatch and grow the minnows to market size. The three-phase systems have separate units for broodstock, hatching eggs, and grow out (Figure 1). A dependable supply of salt or brackish water of good quality and quantity is very important to the successful culture of killifish in a production facility. Size of production system is usually dependent on the water to refill between crops and the quantity of fish that can be handled safely. The systems used in production are summarized below.

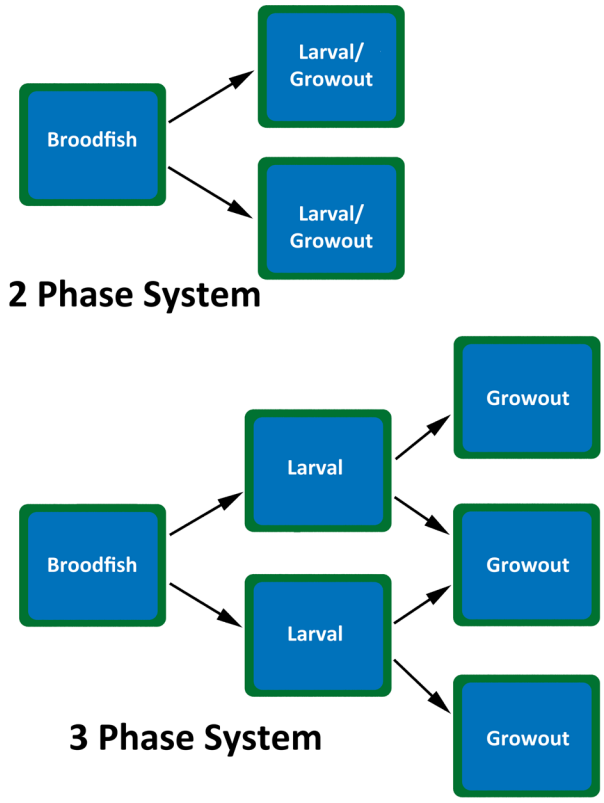

Figure 1. Two and three phase system.

Ponds

Pond aquaculture is one of the oldest methods of growing fishes. Pond culture has been used successfully in raising cocahoe minnow in several southern coastal states. Growth of cocahoes is inversely related to stocking density; hence juvenile minnows (0.3 g to 0.5 g each) have been grown at 50,000 to 200,000 fish per acre in grow-out ponds depending on how soon they are needed on the market. Generally, the lower the stocking density, the faster the growth will be.

The optimum pond size has not been evaluated because most of the experimental studies have used smaller ponds (about 0.2 to 1 acre surface area). Natural productivity is critical to the successful culture of cocahoe minnows in ponds hence water should be fertilized to stimulate production of natural foods. Pond bottoms should be smooth and well graded to allow easy drainage. Culture ponds should have catch basins to assist in harvesting fish (Figure 2). Ponds of approximately 3-4 feet average depth having about 1.5 feet at the shallow and 5 feet at drainage end are good for minnow culture. All ponds should be filled with water that is passed through a fine cloth filter, about 800 microns or 0.03 inch is recommended, to eliminate wild fish that could compete for food or eat the cocahoes.

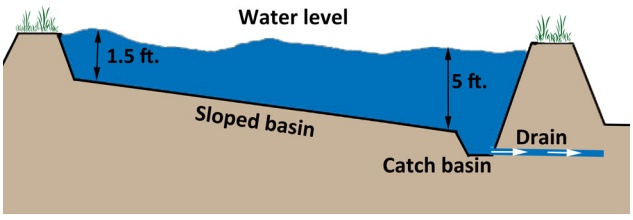

Figure 2. Lateral diagram of ideal pond form.

Pools

Above ground tanks made of plastic or fiberglass have been used as pools for growing minnows. Research at the Aquaculture Research Station has utilized pools with bottoms filled with dirt, which has proved to be valuable in regulating ammonia concentrations. As in ponds, natural productivity in pools is very important as it provides supplemental nutrients, which may be absent or in insufficient amounts in the artificial diets given to the minnows.

Figure 3. Fiberglass pools used for egg production. Photo: Craig Gothreaux

Using pools instead of ponds has several advantages. Predation can be controlled from birds and other mammals as pools can be covered with nets. In addition, there are no problems with seepage from the surrounding area, which can contaminate pond water and even become toxic to fishes.

Recirculating Aquaculture Systems (RAS)

Compared to ponds and pools, this is a rather recent technology for growing fish. Unlike the ponds and pools, this system enables the growing of fish at high densities in indoor tanks with a "controlled" environment for year-round production. In using RAS, farmers need very good biofilters to regulate nitrogenous wastes like ammonia. Many RAS units contain ultraviolet (UV) filters and other sterilization tools to keep algae and pathogens (associated with diseases) out of culture tanks. However, they are not required in all cases. Tanks need to be aerated continuously to supply DO to the minnows.

RAS offer fish producers a variety of advantages over pond culture. These include a method to maximize production on a limited supply of water and land, nearly complete control over the culture environment to maximize growth, the flexibility to locate production facilities near markets, complete and convenient harvesting, and quick and effective disease control.

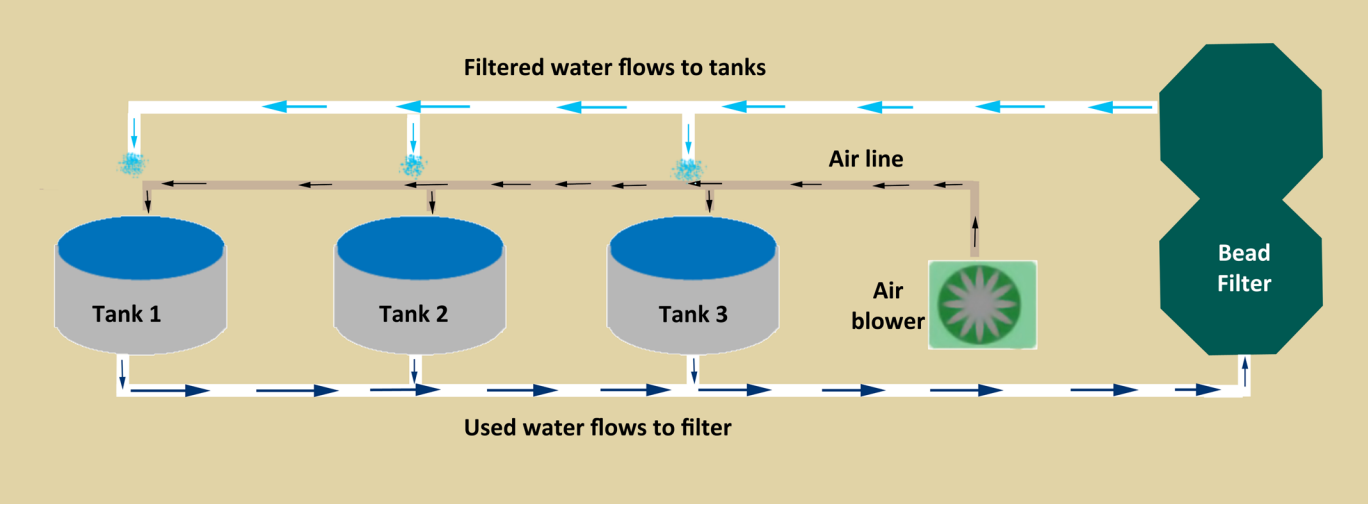

Figure 4. Diagram of a typical recirculating aquaculture system.

Contributors:

Samuel Ofori-Mensah

Jill Christoferson

Julie Anderson

Chris Green

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