Water Loss as a Consequence of Using Mechanical Aeration in Aquaculture Ponds

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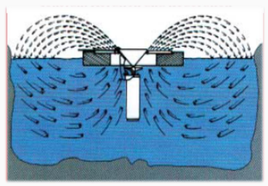
Background

- There is a need to understand the relationship of aquaculture to local hydrology and water availability.

- Aeration is increasingly used to improve water quality and increase yields in aquaculture ponds.
- Surface aerators create a greater area of contact between water and air (favors higher evaporation rate).

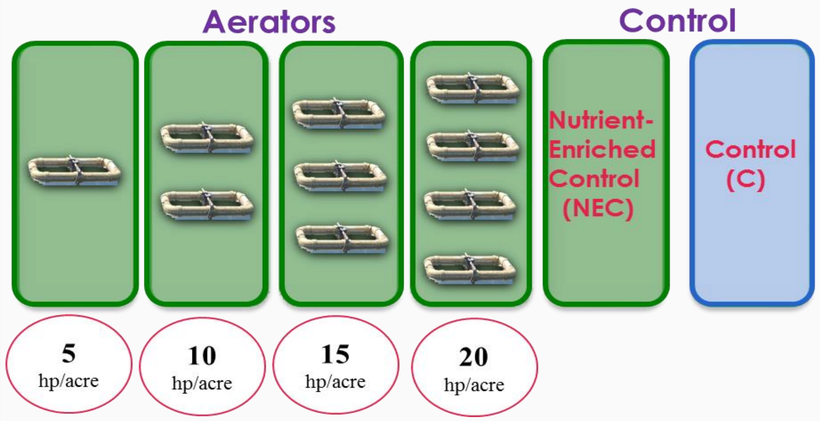


- Evaporation results in heat loss from water bodies.
- Temperature is an important factor determining the growth rate of fish.

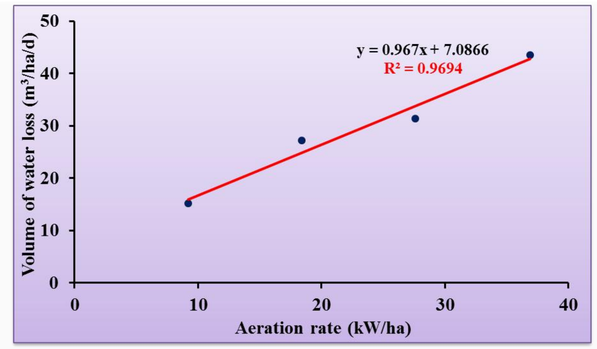
Research Objective

- To evaluate the influence of aeration on evaporation and water temperature in ponds

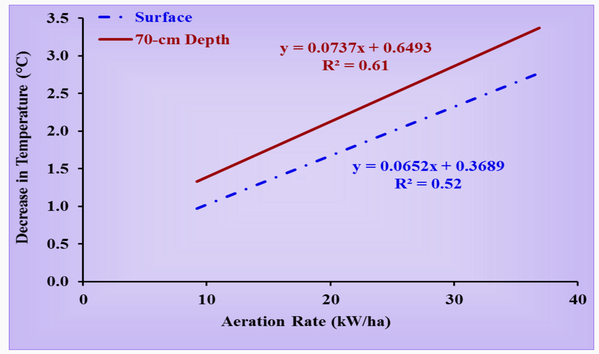
Methodology



Results



Relationship between the aeration rate (kW/ha) and the mean volume of water loss (m3/ha/d) caused by aeration using 0.37-kW Air-O-Lator units for 24 h.



Relationships between the difference in average daily water temperature at the surface and 70-cm depth in aerated ponds and the nutrient-enriched control pond

Conclusions

- Increased aeration rate lowers water temperature and increases the evaporation rate.
- Water loss caused by aeration is higher during daylight.
- A nutrient-enriched pond evaporates more than that of unfertilized pond.
- Economic benefits from reduced pumping costs may be obtained by restricting aeration to periods of need.