

11.0 Water Chemistry

Script:

When we begin to think about flooding a pond we want to make sure that we all have all of our physical things done whether it's raceway walls, or making sure there's no cracks where fish can get out, or all of these things are going to be underwater. So, we want to make sure we do anything we need to do with them before we flood. The pond bottom needs to be smooth to perform like we want it to. But also as we think about flooding the pond we need to think also about okay what is our chemistry at location A or location B. And sometimes we need to amend the soils, like with limestone for example, so that that environment is healthy, and predictable, and reliable, and stable for phytoplankton for example in the water colony.

Now, sometimes we do that by adding agricultural limestone to the pond bottom. Other areas we might need to add rock salt to get a chloride level in there that's suitable for dealing with an issue that we have sometimes especially in advanced pond technologies where something happens to the bacteria that are breaking down the ammonia. We don't want that breakdown to occur so we end up with too many nitrites. Nitrites are highly toxic to the fish. In order to protect the fish against nitrite poisoning we have to have chloride in the water. A little bit of salt and simple technology, not very costly, but it's really really helpful if you're a fish and you're find yourself suddenly in an environment that has some nitrite.

So, these are the kind of any water amendments that we need to make we typically make those up front like that so that we're not playing catch up on the back end. With this in pond raceway technology this really is about managing the water differently. So, we want to try to create as much as we can practically do a high quality aquatic environment that's predictable and stable for the fish but also for all these other organisms that we're employing to help us. It used to be we ended up fighting against them because we weren't working with them. So, in this approach we're trying to work with that biode, or that bacteria, that phytoplankton, that zooplankton, all of these organisms that are in the pond we want to try to work with them, get them working for us, and they do if we just provide them what they need. Sometimes it's a calcium and magnesium carbonates, it makes their life much more desirable and they don't boom and bust quite so often. But a number of things like that are really critical and probably maybe the most critical one is plenty of oxygen and gas exchange.

So, we put in this oxygen through these blowers and create a situation where we're processing that waste load on a continual basis rather than on an intermittent basis. Because every time we stop there starts to be a build up of unoxidized material within the water colony. We don't want that at all, we want to keep that process going on 24 hours a day. In this system,

Key Points:

- Water quality is essential to the health of the fish.
- Nitrates are highly toxic for fish. Adding salt can be helpful.
- We want to create an environment that is stable and predictable to ensure the health of the fish.
- Work with the biode, bacteria, phytoplankton, etc. to support the system.

the in pond raceway system we don't do any water exchange because we don't need to. If we're using the technologies and the protocols that we prescribe you don't need to do any kind of water exchange at all other than to replace any kind of evaporative loss.

But generally speaking if you're managing this system as per the principles that we suggest you don't have any need to do that. In fact the water that you have in the pond is much better quality than what you might find outside in most parts of the world. So, we want to try to manage that water, protect that water, and increase that water quality on a continuing basis and thereby create an environment where we can optimize our yield, our efficiencies, that can return money to a project.