Dream Team Concept

The Dream Team concept is a concept that has been put forth to describe a series of products that can be used to effectively manage disease and prawn production. In the production of prawns especially *Litopenaeus vannamei* (white shrimp) and *Penaeus monodon* (Tiger Prawn) disease is a factor that each and every farmer dreads.

One of the most common disease is the White-spot Syndrome (WSS) which is caused by a group of viruses called the White Spot Baculovirus Complex (WSSV). These viruses are able to infect many different hosts for example the white shrimp, tiger shrimp, crabs, lobsters and crayfish. White-spot disease is spread quickly and can cause up to 100% mortality. White-spot can be transmitted horizontally via healthy shrimp consuming a diseased dead shrimp or spread vertically from broodstock to fries in hatcheries. White spot is found in the wild population of shrimp, however only in cultured shrimp has mass mortalities been observed.

Disease outbreaks are usually observed in 2 conditions. Either the disease is extremely virulent and causes immediate outbreaks and mortalities or alternatively, the animals can be carriers and only when stressed do the symptoms of disease manifests themselves. Thus there are 2 main ways to prevent outbreaks of disease.

The first is to prevent the spread of the disease from an infected animal to a naïve animal. In the shrimp industry, this is commonly seen when crabs and feral shrimp which are infected with the White-spot virus come into contact with uninfected shrimp. The virus spreads when a shrimp eats an infected dead shrimp or crab.

One way to prevent the horizontal spread of the virus is to ensure that all the virus carriers ie the wild shrimp and crabs are killed before naïve shrimp are stocked into a pond. Bayer's Neguvon or trichlorfon can be used to kill unwanted crustaceans.

The second way to manage disease or prevent their outbreak is to make sure the animals are cultured in good conditions and are stress free. Many factors cause stress to an animal. Especially in aquaculture, the crowded conditions and bad water quality are 2 of the main factors that can cause stress in an animal.

When conditions are right, the shrimp will consume optimal amounts of feed to achieve optimal growth and FCR. However, because of intensive culture, there is still a lot of waste being produced and discharged into the water. The water quality of a pond can very easily go from good to bad. Live phytoplankton and good bacteria growing in the water help to maintain good water quality by removing ammonia, nitrate and nitrites from the pond water. However this delicate balance is easily upset. Any changes in weather, over feeding phytoplankton crashes can cause water quality to change drastically. Once there is a buildup of organic matter there will be a bacterial bloom that can consume precious oxygen in the water. If the farmer is unaware and not observant, conditions can deteriorate rapidly thus stressing out the shrimp. Shrimp that until now could have been carriers but not symptomatic of the disease will start to show symptoms. Since shrimp are naturally carnivorous, they will feed on any dead shrimp. Once the numbers of dead shrimp reach a certain point say 10% of the population, there will be a rapid spread of the disease which will cause massive mortalities.

Thus the key here is to maintain good water quality by using appropriate beneficial bacteria like Novozymes Pond Plus, Pond Protect and Pond Dtox. Pond Plus is a consortium of 7 species of *Bacillus* bacteria that help to maintain good water quality. Each of these species have their own unique qualities. Some are able to degrade organic matter in high salinities, some in low salinities. Some require aerobic conditions, some work equally well in anaerobic conditions. Depending on the conditions of the pond, perhaps out of the 7 species, 3-4 species might flourish and grow as they maintain the water quality. As time goes on, conditions of the pond will change, as the amount of feed increases, as the bodymass of the shrimp increases, as the weather changes, the initial 3-4 species might not find the condition of the pond quite as conducive to their growth and start to die out. This therefore is the reason Pond Plus is added at intervals of 10-14 days (depending on the pond conditions) to allow the pond condition to select the strains of bacteria that will be suitable for the pond condition at that time.

If there is a sudden increase in ammonia levels in the pond and water exchange is not an option (as it is not nowadays), then Pond Protect can be used to reduce the levels of ammonia and nitrites in the water. Pond Protect consists of *Nitrosomonas eutropha* (it is able to oxidize 1000-1200 molecules of ammonia/kg/hr)and *Nitrobacter winogradskyi* (it is able to oxidize 250-300mg nitrite/kg/hr). This will help to almost immediately reduce the ammonia buildup in the water which can quickly kill the shrimp. Meanwhile, Pond Plus is added to hasten the breakdown of the rotting organic material which is producing the excess ammonia.

Another problem often encountered in the shrimp industry is the formation of hydrogen sulphide which is due to the anaerobic (no oxygen) breakdown of organic material. This happens when there is a layer of rotting algae layering the pond bottom or when the pond is very old and has not been cleaned for some time. This layer prevents oxygen from penetrating to the soil layer and so hydrogen sulphide is formed. Hydrogen sulphide is very very toxic to shrimp and can kill the shrimp at 0.1ppm levels. As the most sensitive test kit and meters can only detect hydrogen sulphide when levels are at 1ppm, by the time it is verified, the shrimp could be all dead. The other way to determine the presence of hydrogen sulphide is the smell of rotting eggs, black soil near the middle of the pond, bubbles seen popping up near the middle of the pond and reddish shrimp parking at the side of the pond in the early morning and shrimp going off feed. Pond Dtox is made of *Paracoccus pantotrophus* a highly efficient bacteria that can degrade hydrogen sulphide. The effect of applying Pond Dtox will be seen about 2 days after application.

Last but not least, if and when there is a severe bacterial outbreak that is pathogenic, the bacteria can be reduced so that beneficial bacteria can recolonise the pond and maintain good water quality. Often there are bacterial outbreaks during the culture period for example after DOC50. As antibiotics are not recommended, the use of a water disinfectant like Bayer's Remedor Aquatic (RA) can be invaluable as a tool to reduce bacteria, virus and fungus in the water. RA is an organic water disinfectant that can be added to the pond water while the shrimp are still in it. After the numbers of bacteria have been reduced, the beneficial bacterial numbers are built up again by adding more Pond Plus.

And so with the Dream Team group of products, an excellent strategy can be adapted to suit each farmers' need. Efficient management of water quality using the tools from the Dream Team (virus killer- Neguvon; Beneficial Bacteria- Pond Plus, Pond Protect and Pond Dtox; Water Disinfectant- Remedor Aquatic) will ensure better production and profits in the long run.