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Shrimp Farms in Ecuador

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Topics for the Essay

1) Shrimp farms in Ecuador

A complete description of the shrimp farms in Ecuador, from their history to ways of cultivation, principal kind of shrimps cultivated in Ecuador, location of the shrimp farms, deceases and ways of exporting them

2) Asiatic Atypical Pneumonic

History and description of this new mortal decease, contains information like symptoms, where was discovered, when was discovered, and treatments

3) Electricity in Ecuador

History of the electrical systems in Ecuador, since the beginning until the current days. Power generation, transmission and distribution. Energy cost of generation and comercialization.

Introduction

The Gulf of Guayaquil in Ecuador owns the biggest estuary in the south pacific. This region compared with other zones in the Ecuadorian coast is considered of high productivity in biomass because of the particulars ambiental conditions. Conditions obtained by the great volume of fresh water and sediments which are provided by the Guayas river and the difference between tides (3m). This estuarine process and it's effects can be felt 30 nautical miles into the continent by the shrimp farmers.

The zone of the estuary characterized by the mixing between the fresh water of the river Guayas and the contribution of the oceanic flow, establish a salinity variety, which is function of the tide.

Moreover of the mixing of the fresh and salt water, the variation of the 2 seasons of the tropical regime is an important factor. One is the rainy season and other is the summer. In the rainy season the temperature and salinity of the water is lower than the summer, also the oxygen level in the rainy season is lower but the level of some minerals like phosphorus and nitrogen is higher than in the summer.

First Shrimp farms in Ecuador

The activity of breeding shrimp in Ecuador was started in the southeast shore of the Guayaquil Gulf, in 1969 by initiative of the farmers dedicated to thi activity. At first the seed or larva was captured at the adjacent estuaries of the shrimp farm and transported in plastic recipients without any control, so the level of survivalship was very low, then the farmers created a new system of seeding which consisted in a serie of low deep canals, so because of the tides, great quantities of larva were deposited there. In the first shrimp farms there wasn't an idea about how many seeds should be sowed by hectare, s first shrimp farmers started sowing between 15000 and 120000 seeds by hectare.

First kind of shrimp and methods of cultivation

In the year 1969 there wasn't too much knowledge about the shrimp cultivation so farmers started with the extensive method, which consist in capturin the seeds from the estuaries and then transport them into the breeding pool where they were maintained for periods of 4 and 8 months and when they turned into adult age they are ready for being reaped and commercialized. At the beginning the size of each pool was between 20 and 100 hectare, but the optimum size is 10 to 25 hectare, generally the shape of each pool is rectangular, but there are also trapezoidal pools depending on the farmer convenience.

At first the fattening process was made with the natural food along 4 o 8 months with a efficiency of 400 to 300 pounds/ha/year, Nowadays the average of that efficiency is 15000 pounds/ha/year because of the advantages of the intensive cultive and new technologies introduced in the country. Then the farmers started to renew the water more frequently for getting more food and better ambiental conditions, like salinity and temperature of the water, this process was a little difficult because of the extension of the pools.

I. Generalities about shrimp farms in Ecuador

Location of shrimp farms

In Ecuador most of the shrimp farms are located near estuaries or near the sea or any river which can provide of water to the farm, but in the last years because of the deceases and virus presence in the sea and estuaries water, shrimp farmers decided to construct shrimp farms in other zones where the contaminated water with deceases won't be a problem, these farms are called in land farms

Salt water farms are the most common in our country, they are located near the estuaries or the sea or the river so they get the water from there, most of this farms are dedicated to the extensive cultures and have the menace of lots of deceases and virus like the white spot and the Taurus virus

Fresh Water farms

These farms are a recently type of farms introduced in our country, it was introduced here because of the different virus and affections that sea and estuaries waters brings, most of this farms are dedicated to the intensive cultivation, this farms gets the water from wells, sometimes this water isn't enough salty so the shrimp can get some problems and deceases.

Principals kinds of shrimp

In our country there are several kinds of shrimp but the most common of cultivation shrimps are the vannamei and the steel

Vannamei

It's common name is white shrimp, scientific name: *Penaeus Vannamei*. The rostrum is armed with dorsal and usually, 2-4 (occasionally, 5-8) ventral teeth, which are moderately long, and in young distinctly surpassing antennular peduncle. They are shorter in adults, sometimes reaching only to the midlength of second antennular segment. Carapace has pronounced antennal and hepatic spines, and lacks orbital and pterygostomial spines. The postocular sulcus is absent. The postrostral carina is of variable length, sometimes almost reaching posterior margin of carapace. Habitat: This marine shrimp likes muddy bottoms at depths from the shoreline down to about 72 meters, it grows until 45 gr

Steel

It's common name is blue shrimp, scientific name: *Penaeus Stylirostris*. It is found in the coast of our country, Panama and distributed in the eastern Pacific from Sonora, Mexico to Tumbes in northern Peru. It is smaller than the vannamei, it grows until 28gr, it can be differentiated of the vannamei by looking the genitals, the steel genitals are more developed than the vannamei

Methods of shrimp cultivation

Extensive

The extensive cultivation is also called open cultivation, it's characterized for the big areas pool used (10 – 25ha), usually aerators are not required, neither alimentation nor parameters monitoring aren't so frequently, usually the larva used in this type of cultivation are wild larva captured in the sea the density of the cultivation is 10 larva for square meter so the production is a low production: 1000 to 2000 pounds for hectare.

Intensive

The intensive cultivation is the newest method of cultivation, usually pools are covered with a plastic cape for controlling the water temperature (30° to 33°), the pools are small pools (1 to 3 ha), aerators are strongly required (6 to 8 for each hectare) and a constantly parameters monitoring and feeding is required in periods of 6 hours but it can turn to 1 hour periods in extreme situations, the density of this cultivation is 100 larva for square meter, so the production is very high: 10000 to 15000 pounds for hectare, the larva used in this type of cultivation are laboratory larva, the period of growing up of the shrimp in this period is 3 to 4 months, the optimum weight is 12 to 15gr.

Policultive

The policultive can be intensive or extensive, it is characterized because the shrimp is sown with another specie of animal, usually fishes like the tilapia or the chame. It is a new type of cultivation and allows the cultivation of two species of animal in the same pools.

III) Common affections and deceases of shrimp

The shrimp larva is exposed to several problems for deceases and affections produced by inappropriate nutrition, overpopulation, inadequate use of ambiental parameters, water quality and introduction of infected species. Shrimps present the following symptoms when they are infected: under nutrition affects, lack of food in the digestive tube, wrong swimming, misshaped bodies and incomplete change of skin.

Shrimp deceases represents a big complex problem and there are only a few specialist in our country for treating this kind of shrimp deceases, depending the method of cultivation, shrimps cultivated via the intensive cultivation are the most propended to get any decease.

The White Spot

This is the last decease that affected the Ecuadorian shrimp, at first it was discovered in Thailand in 1990, it is caused by a virus called *Baculovirus*. This virus has an incubation period of three to five days. Direct transmission is thought to occur through several vectors including contaminated water, decomposing fecal matter or tissue, cannibalism of dying shrimp (in hatcheries), and from fluid from infected females. The white spot decease is characterized by the loss of hunger of the animal, wrong swimming, lethargy of the shrimp, and the appearance of white spots along the body of the infected shrimp, in a period of between 3 and 7 days the shrimp can die. This virus caused lots of damage of the Ecuadorian shrimp production; nowadays there are fewer repercussions than the days when this decease appeared in our sea.

The Taurus syndrome

It was discovered in 1991 in Ecuador, then between 1994 and 1995 the virus was expanded along all the regions in America disposed to the shrimp cultivation. This decease is caused by a virus classified in the family of the *Picornaviridae*, this virus affects to the vannamei and steel kind of shrimp, the virus is located in the river Guayas, it can affect to the shrimp from the larva state to the adult state, but most of the times it affect in the young stage of the shrimp live. Direct transmission is occurred via cannibalism of dying shrimp (in hatcheries), contaminated water and between father and son. Common symptoms of this virus are: loss of hunger of the shrimp, they swim along the surface of the pools so they can be ate by any bird, sometimes they turn into a red color, they get a soft skin and an empty stomach

Ways of confronting deceases

Confronting shrimp deceases is very hard, there are some process that can be followed for confronting this deceases: for this virus there is not treatment for the affected shrimp, it can only be prevented following a sanitary prophylaxis: clean and disinfections to the reservoirs, pools and canals before repopulate them including the elimination of any crustacean including shrimps which can be already infected with the virus, elimination of any organism in the rechangeable waters and avoiding the interchange between maintenance equipment (webs, boats, buckets, etc). In case of outbreak: total isolation of the infected reservoir, strict control of any movement of water or shrimps, even of human movements. Destruction of the infected shrimps (incinerating them), minutely disinfections and cleaning of the infected pools, this disinfections can be done with formalina (20ppm), green malaquita (0.01ppm) aureanicina (0.01%) and the cleaning of the pools and reservoirs with nitric acid (10% – 30%). Also is strongly recommended to quarantine new species introduced in the shrimp pools, for avoid any decease.

Shrimp exportations

Ecuador is the first country in exportations of captive shrimp with a production of 120000 tons of shrimp, which have produced earnings of lots of money only defeated by the petroleum. Approximately 120000 hectare of shrimp pools and more than 200 laboratories generates work sources for more than 500000 Ecuadorian people in direct and indirect way. World consume of shrimp has been duplicated in the last 20 years and have grew up hardly in the U.S.

The process of exporting our shrimp

After the whole process of seeding the shrimp into the fatten pools, feeding them and taking care of them for 4 to 8 months the shrimp is ready to be commercialized. This process starts with the crop, first the shrimp farmers start drying the pools until the deepness of the water turn to 20 – 30cm, then they start fishing the shrimp with nets depending on the shape of the bottom of the pool there can be several types of nets used for fishing the shrimp, the properly size of the shrimp for exporting it is (26 –30 shrimps for pound) so 15 to 17 gr for each shrimp. When the crop is already fished, it is sent to a packager company where the shrimp is cleaned and packaged in boxes and frozen, ready to be sold or exported. The mayor percentage of the shrimp exported is frozen with shell (shell on) , it can be entire(with head) or only tails(peeled and cleaned), also PUD shrimp (peeled but not cleaned and tail on (shrimp with tail) and other presentations, the shrimp is packaged in small boxes of 5 lbs each and usually the freight is made by sea but sometimes by air. There are also innovating presentations like cooked shrimp with and without shell usually sold in supermarkets.

Principal buyers of Ecuadorian shrimp

The principal buyer of Ecuadorian shrimp is The United States with a 42%, also other important buyers are: Spain, France, Italy, Netherlands, Belgium etc.

V) Conclusions

Ways of getting a better shrimp production

For getting a better and more convenient shrimp production this tips should be followed:

- Improve physic system of the laboratories : filters, water distribution, air, heating, reservoirs, cleanness, disinfections and a properly stock of materials for an efficiently maintenance and reparation
- Efficiently operation of the maturity departments
- Great stock of seaweeds and NAUPLIOS of great quality
- Alimentation great in lipids and others nutritional requirements, naturals as artificial
- Constantly Studies and analysis bacteriologist and pathogenic for preventing y controlling deceases and virus
- Constantly Analysis of water quality
- Constantly Analysis of larva qualities trough biochemist studies
- The shrimp farm biologist should be updated every day with the last information about deceases and news about shrimps

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David Castro Pacheco

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