



WORLDFISH TAAT AQUACULTURE COMPACT TRAINING

QUALITY FISH SEED PRODUCTION & HATCHERY MANAGEMENT



TRAINING REPORT

25TH-27TH, NOVEMBER 2020
IWO, IBADAN

Introduction

The steadily growing importance of fish farming has compelled improvements in the technologies necessary for securing the initial and basic requirements for production which lies on availability of good fish seed for stocking. Fish culture today is hardly possible without the artificial propagation of fish seeds of preferred cultivable fish species. The need for the production of quality fish seed for stocking the fish ponds and other culturing environments has indeed increased steadily. Artificial propagation methods constitute the major practicable means of providing enough quality seed for rearing in confined fish enclosure waters such as fish ponds, reservoirs and lakes.

TAAT Aquaculture Objective

The goal of TAAT Aquaculture Compact is to create an enabling environment for technology adoption by facilitating effective deployment of appropriate technologies to aquaculture value chain actors. This is in order to raise fish production and productivity for increased



Group Picture

consumption of fish with competitive domestic, and export market. Working with this goal, there is a need to equip actors in the value chain with the appropriate skills in order to update their production skills in line with the new technology in the sector. In view of this, WorldFish in partnership with the IITA Youth Agripreneurs organized a training for catfish breeder under the Catfish and Allied Fish Farmers Association of Nigeria (CAFFAN). The breeders were selected across 15 states in Nigeria (South-west, South-south/east, and North central).

This report summarizes the TAAT Aquaculture compact training on Catfish breeding and management practices held at Great Aquaculture Limited, Iwo on the 25th -27th November, 2020.

The training objective is to equip the participants (Catfish breeders) with skills on the Best Management Practices - BMPs and techniques on quality seed production of Catfish towards increasing their productivity and profitability.

The training methodology used includes lectures and presentation, practical demonstration, use of case study, group discussion, individual task appointment, and learning visit.

Scope of Work

Pre-spanning Preparation

- Use of Chlorine

All hatchery materials are washed thoroughly in water containing chlorine to kill all forms of bacteria that will affect the eggs/larvae. The incubators are washed, trays mounted and filled with water prior to the spreading of eggs.

Every six (6) months, 2-4 table spoons of chlorine is added to the overhead tank and water allowed to pass through the pipes. This is to ensure that all sediment and bacteria build up in the pipes are killed.

- Sex Identification of Catfish (Brood-stock)

Male Catfish

The male genital papilla of a ready to spawn mature catfish has its genital papilla more elongated towards the anal fin (almost touching the anal fin). Premature males have their organs shrunk, and can almost be mistaken for a female.



Catfish Sex Identification and Separation

Female Catfish

The female is identified by the shape of the head and mouth part; some have their head sloping down and pointed mouth while others have their head completely flat. There is also different number of bones on the head region of the fish. This means of identification can prevent inbreeding in farms.

The female is selected based on the head characteristics but the reddish genital papilla is also a good sign that indicates sexual maturity. The practices of pressing egg to check for readiness of female only stress the fish before use.

Injecting of female

The female was injected by 10pm using ovaprim (synthetic hormone) to facilitate the ovulation and reproduction of the fish. The pituitary of fish and ovaprim have been the best type of hormone to use for this inducement; other type of hormone although do give good results but not as compared to the aforementioned.

Reason for injection female in the night

The catfish species are nocturnal and are more active at night; they release their eggs easily compared to the fish injected in the day time. In nature, mating is done usually at night and fertilization start at the early hours of the day (4am-5am), the female releases their eggs during the early hours of the morning and fertilization occurs immediately.



Weighing of female Catfish

In order to mimic the natural environment, injecting is done at night so the eggs can be collected in the morning.

NOTE: A female fish that has been injected with hormone can be reused again after two months with proper maintenance. The use of Skretting Repro can help fish develop more eggs within this period. During the rainy season, the female fish has more eggs as compared to the dry season. However, spent fish (already used fish) with proper care have eggs.

How to inject the female Catfish

In order to know the exact quantity to use, the prescription is always stated in the bottle of the hormone, the fish is weighed to determine the dosage to use. When the hormone to be used in fish is above 1ml, the fish should be injected in multiple places (2-3 spots).



Inject close to the head

- The bevel (pointed part) of the needle should face down to prevent swelling of the injected area.
- The fish should be injected above the lateral line.
- After injecting the female gently massage the area to aid the movement of the hormone into the body

Latency Period

After the injecting of a female, it takes 10 hours for the ripening of the ovary. Immediately after injecting, the fish is placed inside a bowl or gallon, preferable a gallon cut open on the side to prevent excess movement of the female that may lead to loss of egg before stripping. This gallon is cover with tarpaulin to increase the temperature of the water in the gallon



Injected Catfish confined in bowls for egg ripening

Incubation of Sperm

Since the natural procedure of spawning will not be done, the collection of milt often comes with impurities. These impurities are separated from the milt during incubation and milt are kept active and ready to fertilize. This sperm incubation is of great essential to commercial fish breeder, this will prevent the use of multiple male.



Incision of Male Catfish for milt sac collection

A drop of a milt contains a million of active sperm; this drop can fertilize the egg of a female if missed properly.

The material to be use are: scissors, cup, cloth material. These materials should be sterilized using chlorine and cup rinse with saline water before use.



Rinsina of milt sac with saline solution

Use normal saline water (0.9% saline solution) for the procedure.

The incubation is usually done two (2) hours before the expiration of latency period of the female catfish. The procedure for the incubation of milt is as follow:

- Cut the male open from the ventral side.
- Detach the milt sac from the other organs of the body
- Use saline water to rinse sac to prevent impurity
- Cut the milt sac with scissors into the incubating container
- Rinse sac with saline water
- Neatly wrap the container inside a bowl with cloth for a minimum of one hour and a maximum of 3 hours. Store under room temperature for effective incubation

In a situation where a milt cannot be used immediately, the milt in the saline water can be stored in the refrigerators for 24 hours before use.

Stripping of Female

The female is stripped after the latency period of 10 hours. This is done by covering the head region with a clean towel; this helps to keep the fish in a calm state as the stripping takes place.

Spawning

After stripping of the eggs, the egg is weighed and the total quantity of eggs is recorded. Thereafter:

- Add incubated milt to the eggs
- Mix the milt(sperm) and egg using a spoon
- Add more saline water to ensure the milt is properly mixed with egg for fertilization

For fertilization to take place, water is added to the egg. This triggers the opening of the micropyle for fertilization within seconds.

When the fertilized eggs are kept in a bowl for too long, coagulation of eggs occurs; this stickiness of eggs together can lead to the death of eggs. To prevent this, sodium bicarbonate is dissolved in water and added to the eggs. The water added to the eggs is reduced.

The quantity of saline solution, water and sodium bicarbonate solution is based on the quantity of eggs spawned.



Incubation of sperm



Catfish egg collection



Mixing of catfish egg and sperm

Incubation of eggs

After spawning, the eggs are spread immediately and evenly in the hatching net already mounted in the incubators. The required temperature during incubation is 30°C - 32°C and there has to be continuous flow through of fresh water into the tanks



Mixing of catfish egg and sperm

At temperature range of 30°C - 32°C total hatching is usually achievable at 13-15 hours. During cold weather, it is essential that a heat source is provided for incubated egg to prevent death of larvae due to prolonged hatching time.

With the challenges of electricity supply, gas cylinder can be used to heat the water from underneath the tank. The base of the incubator is made aluminum sheet and covered with tarpaulin. This helps to ensure even temperature all through the incubating time.

Transfer of larvae

During the incubation period, the eggs are kept in a small tank, but immediately after hatching the larvae are transferred to a bigger tank where they grow into fry.

The transfer of fry should be done in the early hours of the morning to reduce the stress of fry. The fry are carefully siphoned from the tanks into the containers used for transport



Siphoning the larvae from the hatching unit

Siphoning is the removal of materials (either wanted or unwanted) from a particular space to another unit. This is achieved through the use of rubber hose, filled with pressure from a higher region to a lower region.

Conditioning of Brood-stock

The brood-stock used for production has a different feeding pattern from table size fish. They are fed once daily to ensure survival of fish, maintenance and production of healthy eggs.

After stripping of female, the females are injected with oxytetracycline 20% LA to reduce the risk of infection and stress. The dosage of this injection is 0.1ml per kg; after the injection is given the fish is allowed to rest for a period of 5 hours, a second stripping is done to remove the spent eggs and a second dose of injection is administered.

Water treatment in the hatchery

Soda ash is one of the several ways used to treat the water, this helps to regulate the pH. The measurement is a tin cup to 5000 liters of water. After the treatment, the water is pumped into the overhead tanks that supply the farm. Before the water gets into the incubators, it passes through a water filter that helps to reduce the iron content of the water.



5000ltrs tank filled with water and soda ash to regulate PH

- Nursery

The nursery section has three (3) sub unit;

- tank with no water inlet(flow) (Stagnant water),
- tank with flow-through connection unit and
- earthen ponds



The nursery section without flow-through

It takes three (3) days for newly hatched larvae to absorb the yolk sack. During this period, it is important to note that the larvae require a calm environment and therefore have no need for continuous flow of water. The continuous flow of water causes stress and shock to fish that can lead to death of fry.

During the absorption of the sac, the toxic waste that is released builds up ammonia causing the bottom of the tank to be slimy. The fish is transferred out of the tank to prevent death of fry due to toxic waste build up. In cases where the culture tanks are limited, the fry can be transferred out of the tank; the tank can be washed before the fry is transferred back into it.

The larvae stay in this section till they mature into fry; this takes a period of 3 days. The feeding of fry starts when the fry has been transferred or after the tank containing toxic waste has been washed.

The water level should be at one (1) feet or one and half feet.

The nursery section flow-through

The fries are transferred to this section immediately after the complete absorption of their yolk sac. The fry will be fed in these tanks for a period of five (3) days before they are transferred to the earthen ponds



Nursery Glass Fibre tanks with no inlet

In this section, the newly hatched fries are kept in the tank for a period of five (5) days during normal atmospheric temperature and ten (10) days in cold seasons. In the day time (Afternoon period), fresh water can be added to the tanks; there can be a flow through for the period of 3-5 hours



Earthen pond

The earthen pond is efficient for the mass production of fingerling with numerous advantages such as:

- provision of supplementary feed that improves the growth,
- Higher survival rate and,
- Good bacteria in the soil that help to reduce the toxicity of ammonia that pollutes the water and leads to fish kill.

Although there are benefits from the use of the earthen pond, proper pond preparation and maintenance has to be done on the ponds to prevent predators and disease infestation. To prevent the occurrence of predators such as toads and birds the pond a fenced is constructed round and a roofing above the pond with the use of net.

- **Pond Preparation**

After sale of fingerlings or juvenile, the pond is prepared for the next stocking season. The following should be done before stocking

1. The pond is drained completely allow to dry
2. Disinfect ponds
3. Lime and fertilizer applied together with the mixed probiotics. Water can be added to the ponds afterwards

- **Use of Probiotics**

Probiotics are useful in the hatchery to prevent bacteria diseases and improves larvae yield. There are two types of probiotics; the S-Probiotics (used to enrich soil) and the H-Probiotics (used to enrich water).

The S-probiotic is activated with the use of Sugar and water.



Nursery earthen pond



The probiotics is mixed with water for 15-30 min before spraying in the pond. After which fertilization of pond is done and water added to the ponds.

The H-probiotics is a living bacteria and it is activated by water. The probiotics is added to the water in the culture tank and fish can be added to the tank afterwards.

H-Probiotics is added to the water from larvae to fingerling stage.

- **Fertilization**

Fertilization of pond promotes plankton growths. The newly hatched fry feeds on planktons as supplementary feed for their growth.

Before fertilization of pond, the manure is kept in a separate bowl to be activated. The organic manure (poultry waste) and chemical fertilizer (NPK 15: 15 or urea) is mixed in a bowl for a period of five days, the ammonia level is reduced and fertilizer activated for immediate use within these days

Application of Fertilizer: Since the fertilizer have been activated, it can be applied directly into the pond by sprinkling into the ponds

- **Feeding of fry**

At the early stage of fry, feeding is done ad libitum. The fry is fed using artemia cyst for a period of 3- 5 days before the use of formulated feed with high crude protein content such as coppens or gemma wean(skretting).

After an established feeding pattern the quantity to be fed is determined the measurement is noted to prevent under feeding that can lead to stunted growth or over feeding that can cause pollution to the water.

- **Algae bloom**

When there is excess bloom of algae in a pond, it clogs the gills of fish and also compete with the fish for oxygen and other nutrients.

The bloom of algae can be killed using Copper (II) sulfate in the pond.

HARVESTING

There are two categories of stocked supplied in the farm based on the demands of the customers, the fingerling and Juvenile. The catfish fingerlings is harvested 3-4 weeks after hatching while the Juvenile is harvested 6-8 weeks



Harvesting of Catfish juveniles in earthen pond

During harvest, the fingerlings or juvenile are trapped in a particular section using the drag net. The drag net is made up of tiny mesh size to prevent fish from escaping back into the water

These few nuggets can help farmers:

- The newly hatched fry should not be stocked directly in the pond because at this stage insects and tadpoles can easily prey on them.
- The tiny water insects can be killed with the use of diesel. When fry is transferred to the ponds, the diesel should be sprinkled on the water surface; this will trap and kill all insect except the fish. The diesel will evaporate when the water is heated with sunlight.
- In situation where the water source is from a pond. The water can be stored in a particular tank. The water is allowed to settle and probiotics added to the water in the reservoir before filling the tanks to be used.
- Potassium permanganate and formalin are effective to kill bacterial and other parasitic infection
- Fish from the wild (local strain) can be crossed with pure Dutch catfish strain
- When females that are spent (used female) are well taken care of, they produce better eggs in the next cycle.
- Palm kernel oil (PKO) can be used to kill leech in the pond.



WorldFish



Annex – Attendance Sheet

S/N	NAME	LOCATION	SIGN
1.	OHWOFASA FAITH O.	IYA	[Signature]
2.	ADGTOMI CATHERINE F	OSUN	[Signature]
3	ALEX AROJO	Kogi	[Signature]
4	Okwior Christian	Abia	[Signature]
5	Mohammed Olukwo Sale	Kogi	[Signature]
6	Oguzie Chibuekem	Imo	[Signature]
7	Chibuzor C. Udebuani	Anambra	[Signature]
8.	Ucheogu Chinyoke	Imo	[Signature]
9.	Salifu Ajuma Hawa	F.C.T	[Signature]
10	Akinsowon Yetunde Agnes	Ogun	[Signature]
11	Kwankwepu Augustina E.	Ebonyi	[Signature]
12	Godwin Patrick Acheme	Oyo State	[Signature]
13	ESOMONY Eucharis Nonye	Abia	[Signature]
14.	Usman Hashimu MIKAI	NIGER	[Signature]
15	Mangamu Ahmadu Suliman	Kwara	[Signature]
16	Oyeboji Oluwaiyinke O.	Osun state	[Signature]
17	AYOOLA E. OARAMOLA	OGUN STATE	[Signature]
18	KHADRI TAJUDEEN O	ONDO STATE	[Signature]
19	Ahmed Rufayat Iyabo	Lagos State	[Signature]
20	Owooseni Boluwale	Lagos state	[Signature]
21	Igwenome Florence	Ebonyi state	[Signature]
22	Egedu Jennifer Njazi	Anambra State	[Signature]
23	Agiduh Atayo Albert	Delta State	[Signature]
24	Ajibola Olawale	Kwara state	[Signature]
25	M.O. Ansoyoni-Kolade	Oyo state	[Signature]
26	Adedamola Adetola	ondo state	[Signature]
27	JERRY-ALFRED FIFE	Bayelsa state	[Signature]
28	AJIMMY TAMMY	bayelsa state	[Signature]
29			[Signature]