



**COMMON CARP HATCHERY TECHNIQUES (*CYPRINUS CARPIO*) AT THE FISH SEED CENTER (BBI) CIBIRU, WEST JAVA**

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**ABSTRACT**

Field Work Practice (PKL) was conducted at Fish Seed Center (BBI) Cibiru, West Java on November 16<sup>th</sup> to December 17<sup>th</sup> 2020. The aim of this Field Work Practice is to know directly and also gaining experience about fish hatchery techniques of Common Carp (*Cyprinus carpio*) in BBI Cibiru, West Java. The method used in this PKL is descriptive method, with the techniques of data collection that includes the primary data and secondary data. Data collection was conducted by observations, interviews, and active participation. Common carp Hatchery in BBI Cibiru include maintenance of Common carp broodstock, draining ponds, filling water, selecting broodstock, spawning, breeding or raising the larvae or seeds, harvesting, sorting common carp seeds, packing, distributing, and maintaining facilities and infrastructure. The Common carp spawning techniques is using natural spawning technique. Comparison of the weight of the male and female broodstock are 3:1. The feed that is given during the maintenance is natural feed, powder feed and sink feed. Common carp seeds are in great demand by the local community for fish cultivation and students as research test materials.

Keywords : Common carp, *Cyprinus carpio*, hatchery techniques, seeding technique, Carp larvae, Carp seed, fish feed center cibiru

## 1. INTRODUCTION

Fieldwork Practices (PKL) are activities carried out by students to go directly to work fields in both industry and government and field work practice is one of the compulsory courses to be taken by all students of the Faculty of Fisheries and Marine Sciences, Padjadjaran University.

Common carp is a commodity in the freshwater fishery sector which continues to grow rapidly from time to time one of the reasons is because Carp fish are easy to cultivate and have promising business opportunities (Cahyoko et al., 2011). Fish seeds that produced from BBI Cibiru are usually bought by local community for fish cultivation or students around Bandung for research test materials because common carp can be used as water biological parameter and can be maintained on a laboratory scale with an aquarium (Leuwol et al., 2018).

The high demand for common carp in Bandung requires BBI Cibiru to produce superior seeds. That is why hatchery activities play an important role in producing superior Common carp seeds in quality and quantity and can meet market demand continuously.

Therefore, this study aims to determine the technicalities of Common carp hatchery at fish seed center (BBI) Cibiru, West Java. Starting from maintenance of Common carp broodstock, draining ponds, filling water, selecting broodstock, spawning, breeding or raising the larvae or seeds, harvesting, sorting common carp seeds, packing, distributing and maintaining facilities and infrastructure.

## 2. RESEARCH METHODS

### 2.1 Time and Place

Field Work Practice was conducted at Fish Seed Center (BBI) Cibiru, West Java on November 16<sup>th</sup> to December 17<sup>th</sup> 2020. Java.

### 2.2 Methods

The method used is descriptive method, with the techniques of data collection that includes the primary data and secondary data. Primary data collection was conducted by observations, interviews, and active participation and secondary data was obtained from literature.

### 2.3 Research Site

Fish Seed Center (BBI) Cibiru is located at Jalan Jatikaler RT. 2 / RW. 8, Pasir Biru, Kec. Cibiru, Bandung City, West Java 40615, Indonesia. Geographically, Cibiru Fish Seed Center is located at 6°55'36.2"S and 107°43'23.1" E. Fish Seed Center Cibiru stands on an area of 14,580 m<sup>2</sup>. The water source comes from 2 small rivers which are first treated through 6 settling tanks / ponds to then enter the pond area channel.

## 3. RESULT AND DISCUSSION

### 3.1 Maintenance of Common carp broodstock

The common carp broodstock are kept separately or kept in different nets even though they are in the same pond. The separation of male and female parents is done to avoid unwanted spawning. Brood fish are given high quality and protein feed by 26% to accelerate the maturation of the gonads. Protein is needed for growth and energy. The amount of protein required for fish is differentiated based on the type and

age of the fish. But generally the protein needed by fish is around 20-60% and the optimum is 30-36% (Frikardo 2009 *in* Putranti et al., 2017). The feed that given to the brood fish is sinking pellet. The sinking pellet will immediately sink after spread in the pond, so it is suitable for fish that active at the bottom of the pond like common carp. Adult common carp have a habit of rummaging through the bottom of the waters or pond bottom in search of food (Susanto 2007).

### **3.2 Pond Preparation**

The pond used for spawning is a concrete pond with a size of  $30 \times 30 \times 0.7$  m with a ground base. Pool preparation that is carried out is draining the pond and filling the water.

#### **3.2.1 Draining pond**

Draining the pond is carried out so the pond that will be used for spawning is free from predators or parasites that will become a source of disease and interfere the fish growth. Soil processing is done by hoeing the entire bottom of the pond. After soil processing, the pond is dried for 3-7 days. At BBI Cibiru liming is not carried out because there are not many pests and the pH of the pond is already neutral.

#### **3.2.2 Filling water**

The pond is filled with water by opening the inlet channel and limiting the outlet channel so that larvae do not get out of the pond. Pool water is filled until it reaches a height of 70 cm from the bottom of the pool. After the pond is filled with water, followed by the installation of spawning media which is kakaban and nets. The installation of the kakaban is intended as a place for common carp sticking their

eggs. This is because common carp's eggs are sticky (adhesive) so they need a place to attach the eggs or a good substrate (Setyaningrum & Wibowo, 2016).

### **3.3 Parent Selection**

Parent selection aims to increase seed production that is why the superior broodfish is needed. Some aspects that are considered in selecting broodstock at the BBI Cibiru are the morphology, sex, and the weight ratio of broodfish.

Morphology for broodstock are having complete limbs, relatively long body, large stomach, full and regular scales, normal fin shape and free from disease or parasites.

Selection of broodstock based on the sex of the fish by stripping the belly of the fish. Male fish that secrete thick milk-white sperm while the female which swell in the abdomen to the urogenital and secrete a yellow discharge when stripping indicates the level of gonad maturity.

Selection of the parent based on the ratio of the weight of the parent to be spawned. Comparison of the weight of the male and female broodstock are 3:1 which is 1 kg of female requires 3-4 kg of male common carp.

Age of broodfish that used for spawning at the Fish Seed Center Cibiru is since the gonads mature until the maximum age of 2 years and weight 2 kg for female parent and the male parent weight comparing the ratio of 6-7 kg.

Female fish can used as broodstock is at least 18 months old with a minimum weight of 1.5 kg while male goldfish are at least 8 months old with a minimum weight of 0.5 kg (Prakosa & Ratnayu, 2016).

### 3.4 Spawning

The Common carp spawning techniques is using natural spawning technique. Spawning is carried out using 2 kg female fish (one fish) and for goldfish adjusting the weight ratio, with a weight of 6-7 kg (more than one fish).

Spawning occurs around 22.00 - 03.00 which is marked by the sound of water splashing due to the chasing process of male fish against female fish. The eggs will be issued by the female parent and stick to the substrate (kakaban) at midnight and will be fertilized by the male parent's sperm (Ramadhan & Sari, 2019). After spawning for 24 hours, broodfish are transferred back to the rearing pond.

### 3.5 Breeding and Maintaining the larvae/seed

The eggs will hatch into larvae in  $\pm$  48 hours. After the eggs hatch, the kakaban is lifted and cleaned. Newly hatched larvae do not need to be given additional feed because there are still food reserves from the egg yolk (yolksac) as a source of nutrition. After the yolk is completely absorbed, the larvae must immediately be given additional feed as a source of nutrition to prevent death in larvae. Egg yolk is used by larvae as the main energy source for efficient growth and helps in tissue making and organ perfection (Wulandari et al., 2018).

At the BBI Cibiru, additional feed is given after 2-3 days of eggs hatching or after the yolks run out and the feed given is powder feed to match the mouth openings of the larvae. The egg yolk is completely absorbed for 36-46 hours and additional feeding is carried out after the egg absorption process ends (Dharma, 2015).

The artificial feed given was fengli powder size 0 with  $\pm$  40% protein content. Powder feed is given for two weeks and after that, it is replaced with sinking pellets with  $\pm$  30% protein which was previously diluted with water to match the mouth openings of the seeds. Protein is an indicator of feed quality and serves to increase growth, health and improve the quality of fish seed production.

Feed is given twice a day, in the morning and evening. Apart from artificial feed, larvae and seeds can also eat natural food that comes from organic fertilizers. The nursery at BBI Cibiru is carried out for 2 months before harvesting fish seeds. However, the seeds are not transferred to the nursery pond, so the nursery is carried out in the same pond as the spawning pond. Based on the results of interviews with expert officers, the activity of moving ponds during nursery can increase mortality in seeds, thereby reducing production targets.

### 3.6 Harvesting the Seeds

2 kg of female common carp could produce around 30.000 seeds per spawning. Harvesting the seeds is carried out in the morning at 10.00 WIB by capturing fish seeds to be sorted according to size first because the fish are not transferred to the nursery pond.

### 3.7 Sorting the Seeds

The seeds to be harvested are sorted based on the same size. Sorting at BBI Cibieu is done using nets. The two ends of the nets are tied to the pool and the other two ends are tied to the bamboo that is stuck in the middle of the pond. Before sorting, the fish seeds are fed in the middle of the nets so that the fish gather in one place.

Then using a long bamboo, the bamboo is placed under the nets which is tied to the bamboo in the middle of the pond and slowly the bamboo is pulled towards the end of the pond which has been tied to the nets so it would be easier to collect the fish

Fish seeds are sorted according to size, namely 1–3 cm, 3–5 cm, 5–7 cm, 7–9 cm, and 9–12 cm. The sorted seeds are separated from the pond for packaging. The size and number of fish seeds that are sorted are usually adjusted to the number of orders.

### 3.8 Packing

Packing the sorted fish seeds using clear white polyethylene (PE) plastic which is doubled and tied the plastic tip in round shape. the media used for packing are water and oxygen. The ratio between water and oxygen is 1: 3.

### 3.9 Distributing

Distributing of fish seeds can be done with two system, first is open system that uses water and aeration media that is given continuously for oxygen supply, while a closed system uses plastic and limited oxygen provision which is tailored to the needs of the fish (Ismi, 2017).

The limited oxygen supply in a closed system can only be used for transportation over short distances and short times.

The transportation of fish seeds at the BBI Cibiru is usually carried out with a closed system, this is because most of the buyers of fish seeds are local residents for cultivation as well as students from nearby university who use fish seeds as research test materials so that the distance is not too far and does not takes a long time.

### 3.10 Maintenance of Facilities and Infrastructure

The facilities and infrastructure in BBI Cibiru are land with an area of 14,580 m<sup>2</sup>, office building, catfish hatchery, production pond, main pond, collection pond, sedimentation pond, fiber tub, nursery tub, warehouse, gazebo and guard house. Maintenance is carried out so that facilities and infrastructure can be used for a long time and reduce the risk of problems in the operation process.

## 4. CONCLUSION

Based on the implementation of Field Work Practices (PKL) at the Cibiru Fish Seed Center (BBI), West Java, the conclusion are :

1. Hatchery techniques for goldfish begin with the maintenance of the parent, draining the pond, filling water, selecting broodstock, spawning, nursery or larval / seed rearing, harvesting, grading / sorting seeds, packing, distributing and maintaining facilities and infrastructure so that it can be used as a basic for knowledge for student to know carp hatchery techniques.
2. The Common carp spawning techniques is using natural spawning technique. Comparison of the weight of the male and female broodstock are 3:1. The eggs will hatch into larvae for 48 hours, the larvae will grow into seeds and then nursery is carried out without moving the pond to reduce mortality of the seeds.
3. The process of harvesting seeds is carried out by sorting the seeds according to the size and quantity needed. Put the fish seeds in a plastic

bag filled with water and add oxygen with a ratio of water and oxygen, which is 1: 3.

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