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FR&TI NEWSLETTER

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Fisheries Research & Training Institute, Manawan
Lahore, Pakistan

R&T NEWSFEED

Observance of Anti-Dengue Day at FR&TI

An Anti-Dengue Day was observed at Fisheries Research & Training Institute (FR&TI), Lahore, on July 2, 2022, in line with the directions of Government of the Punjab. Awareness seminar was also organized on this occasion to educate public about the causes and prevention of Dengue fever. Addressing the seminar, Dr. Kashifa Naghma Waheed, Principal Chemist (R&T), highlighted the practices that lead to spread of Aedes mosquito; the carrier of dengue virus. Mr. Yasir Ali, Assistant Director Fisheries (Training), delivered a comprehensive presentation on transmission modes of dengue virus and diagnosis & treatment of the dengue fever. Chief Guest of the seminar, Dr. Anser Mahmood Chatta, Director Fisheries (R&T), in his address, emphasized that prevention of dengue fever depends on effective vector control measures. He advised that everyone should play his part effectively for its control. An awareness walk was also organized from the Main Building of FR&TI to QCL. Staff of the Institute and Central Fish Seed Hatchery, Lahore, participated in the walk carrying posters and banners highlighting the need for control of Aedes mosquito.

Special Training Course for QCL Staff Got Organized at Bahria University, Karachi

A special one-week training course on "Microbiological Techniques" was organized for QCL staff at Aquatic Diagnostic & Research Center (ARDC) of the Department of Maritime Sciences, Bahria University, Karachi from July 25-29, 2022. Ms. Zahra Khatoon, Principal Chemist, Ms. Sana Saleem (Technical Manager), Mr. Mudassar Hanif (Deputy Technical Manager), Mr. Shahroz Maqsood and Ms. Amina Tariq (Analysts) attended the course. Training modules were based on demonstration and hands on training on the detection and enumeration of different anaerobic pathogenic bacteria. Field visits for the QCL staff to the seafood processing plant in Korangi and Sindh Govt. Hatchery were also arranged as part of their training. Ms. Sana Saleem, Technical Manager, commented that anaerobic bacteriology is a vital component of food testing for microbial contamination and this training will help to boost their proficiency.

QCL staff during hands on training on "Microbiological Techniques"

QCL staff with Dr. Asif Inam, Head of the Department and Dr. Yasmeen Zamir, Senior Assistant Professor, School of Maritime Sciences, Bahria University, Karachi

From L to R: Mr. Shahroz Maqsood, Ms. Amina Tariq, Mr. Mudassar Hanif, Ms. Sana Saleem and Ms. Zahra Khatoon receiving training certificates from Vice Admiral (R) Khawaja Ghazanfar Hussain, Director General, Bahria University, Karachi,

FR&TI Organized One Day Workshop on "Presentation Skills"

FR&TI organized a one-day workshop on "Presentation skills" on August 5, 2022 to train the participants about the features of an effective presentation. Dr. Anser Mahmood Chatta, Director Fisheries (R&T), graced the event as Guest Speaker. Personnel from FR&TI, Directorate of Extension and Directorate of Administration (Department of Fisheries, Punjab) attended the workshop. Candidates of Pre-Promotion class for Fisheries Research Assistant/ Assistant Warden Fisheries were also invited to attend the event.

Discussing the need for an effectual presentation, Dr. Anser said that even the best idea or concept can be lost due to poorly organized information. At the start of his lecture, he guided about the collection of constructive content for presentation. He, then, talked about organization and design of presentation and effective delivery strategies. To conclude his lecture, Dr. Anser discussed the challenges that a speaker can face during his presentation and gave ideas to deal with them. Participants of workshop thanked him for conducting such a useful training session that was a perfect blend of information and interaction.

Upgradation of Soil and Water Analysis Lab and Quality Control Labs under the Development Scheme ""Punjab Integrated Conservation and Rehabilitation Programme (PICRP)"

The Punjab Provincial Development Working Party (PDWP) has approved a development scheme titled "Punjab Integrated Conservation and Rehabilitation Programme (PICRP)" with a cost of Rs. 2,628.970 million (2022-24) to be funded by World Bank under a National Disaster Risk Management Fund (NDRMF) Programme of Ministry of Climate Change, Islamabad. A component of the development scheme is based on upgradation of Soil and Water Analysis Lab and Quality Control Labs at FR&TI for the future planning of ecosystem restoration. The scheme has been approved in the 4th meeting of PDWP of current fiscal year 2022-23 presided over by Chairman, Planning & Development Board, Abdullah Khan Sumbal. The Punjab Integrated Conservation and Rehabilitation Programme (PICRP) has three-dimensional approach to protect and conserve wildlife biodiversity, improve ground water table and conservation and rehabilitation of fish biodiversity. Earlier this year, Mr. Mujahid Afzal, Consultant, National Disaster Risk Management Fund (NDRMF), visited the Soil and Water Analysis Lab and Quality Control Labs at FR&TI on July 6, 2022 to assess their existing potential for testing services and evaluate the need for upgradation. Both the labs will, now, be equipped with state-of-the-art latest equipment to strengthen their existing testing capacity for which Rs. 97.119 million are reserved in this scheme. Successful implementation of the project will not only enhance the working capacity of FR&TI Labs but also facilitate the students and researchers of public and private sector.

Farewell Ceremony on Completion of Six-Months Pre-Promotion Training Course for Fisheries Watchers

A farewell ceremony for Fisheries Watchers, who completed their six-months Pre-Promotion training course at FR&TI, was arranged on August 04, 2022. Dr. Anser Mahmood Chatta, Director Fisheries, (R&T), chaired the ceremony and congratulated the Fisheries Watchers on completion of their training course. He expressed hope that the expertise they acquired during this six-months training will help them to cope with the challenges at their workspace. Hafiz Muhammd Javed, a representative from the trainees, said that this course has not only improved their technical skills but has also helped them in their personality development. He thanked the training wing for their cooperation and assistance and appreciated the competence of teaching faculty at FR&TI.

Certificate Distribution Ceremony on Completion of 12 Week Internship Programme

A certificate distribution ceremony was organized at FR&TI on August 12, 2022, on completion of 12 week internship programme for graduate students from University of Veterinary and Animal Sciences, Lahore. The ceremony was organized under the chairmanship of Dr. Anser Mahmood Chatta, Director Fisheries (R&T). Ms. Yashfa Arshad, on behalf of all internees, presented a vote of thanks and said that this internship programme was a unique learning opportunity in an interactive environment. Expressing his valuable insights, Dr. Anser Mahmood Chatta, Director Fisheries (R&T), said that FR&TI's internship programmes intend to integrate classroom knowledge with the technical expertise related to diverse fields of Fisheries & Aquaculture. The ceremony concluded with distribution of certificates among the internees.

Tree Plantation Ceremony Organized on Pakistan's 75th Independence Day

A tree plantation ceremony was organized at FR&TI on August 14th, 2022, on the occasion of 75th Pakistan Independence Day. The ceremony was held to join hands with Government of the Punjab's Tree Plantation Campaign. Dr. Sikender Hayat, Director General Fisheries, Punjab, was the chief guest of the ceremony. Expressing his views, Dr. Sikender Hayat said that Pakistan, with only five percent forest cover over its land, is among the six countries that are most vulnerable to climate change. In this scenario, tree plantation and preservation are our weapon against climate change. Dr. Anser Mahmood Chatta, Director Fisheries (R&T), commented that trees not only improve air quality but also serve as a barrier against natural calamities like landslides and floods. Director General Fisheries, Punjab, Director Fisheries (R&T) and senior officers of FR&TI and Central Fish Seed Hatchery, Lahore, planted tree saplings at FR&TI.

Visit of Director, University Diagnostic Laboratory, UVAS, to FR&TI

Professor Dr. Amir Ghafoor, Director, University Diagnostic Laboratory, University of Veterinary and Animal Sciences (UVAS) paid a special visit to FR&TI, on September 12, 2022, to evaluate the fish disease diagnostic services offered by the Institute. During discussion with Dr. Anser Mahmood Chatta, Director Fisheries (R&T), Professor Dr. Amir Ghafoor said that there is an urgent need for implementation of new diagnostic tools to address infectious diseases in aquaculture. Later, he visited Aquaculture & Pathology Lab where Mr. Zulfiqar Ahmed, Deputy Director Fisheries, gave him briefing about the current status of fish disease diagnostic facilities available in the Lab.

Dr. Muhammad Yaqub Javed Memorial Library at FR&TI: Pakistan's Largest Library with huge collection of books on Freshwater Fisheries & Aquaculture

The library at FR&TI has become the largest library in Pakistan on Freshwater Fisheries with enormous collection of books on Fisheries, Aquaculture and allied fields. Library with limited stock of books was established in 1986 at FR&TI. Later, it was named as Dr. Muhammad Yaqub Javed Memorial Library in honor of Ex-Director General Fisheries, Punjab, to acknowledge his tremendous services for promotion of Fisheries and Aquaculture in the province. Dr. Muhammad Yaqub Javed Memorial Library was inaugurated by Dr. Nasreen Javed, respectable wife of Dr. Muhammad Yaqub Javed (Late), on August 25, 2015. At present, there are about 17000 books, periodicals and journals available in the library including books on Animal Life, Aquaculture, Fish Biology, Biotechnology, Microbiology, Fish Disease and Fishery Sciences. Library is open for students and researchers from public and private sector institutes. Library stock of books is continuously increasing and The Management is also working on digitalization of the library books.

Inauguration Ceremony of Dr. Muhammad Yaqub Javed Memorial Library at FR&TI (August 25, 2015)

OUR SERVICES

Training & Capacity Building

Training Courses

- Six Months Pre-Promotion Training Course for Fisheries Watchers (February-August, 2022)

- Five Months Pre-Promotion Training Course for Fisheries Research Assistant/ Assistant Warden Fisheries (May-September, 2022)

Internship Opportunities

FR&TI offers Internship Programmes for graduate and post graduate students of different universities and educational institutes of the Punjab to provide them the opportunity to gain direct practical experience in the field of Fisheries & Aquaculture. Nine graduate students from the University of Veterinary and Animal Sciences (UVAS), Lahore, have successfully completed their internship at FR&TI in August 2022. At present, three students from University of Okara and one student from University of Lahore are doing their internship at FR&TI.

Students from UVAS, Lahore, working in different labs at FR&TI

A student from University of Lahore working in Tilapia Research Center

Students from University of Okara working in different labs at FR&TI

Exposure Visits/ Study Tours of FR&TI

Study Tour of Students from University of Okara

A group of fifty one (51) students and faculty members from Department of Fisheries and Aquaculture, University of Okara, visited FR&TI on July 23, 2022. Mr. Zulfiqar Ahmed, Deputy Director Fisheries (Aquaculture & Pathology) welcomed the students at the Institute and briefed them about services and research activities of FR&TI. The students visited different installations and laboratories at FR&TI where they were briefed about the research activities of the Institute. Dr. Muhammad Saleem Khan, Assistant Professor, University of Okara, thanked the Department of Fisheries, Punjab and FR&TI for facilitating the students and familiarizing them with the working environment outside of classrooms.

Exposure Visit of staff from Saline Water Aquaculture Research Center, (SWARC), Muzaffargarh

A group of six staff members from Saline Water Aquaculture Research Center (SWARC), Muzaffargarh, visited FR&TI to receive hands on training on laboratory techniques. Two- days field visit of the staff from SWARC was organized on August 31-September 1, 2022 under collaboration of FR&TI and Directorate of Saline Water Aquaculture Research Center, Muzaffergarh. The group including two Assistant Director Fisheries and four Fisheries Research Assistants was led by Dr. Noor-ul-Huda, Assistant Director Fisheries (SWARC). Special training sessions were organized for the trainees at FR&TI and QCL in which they received hands on training on water & soil quality analysis, indoor algae culture system and microbiological techniques. The trainees were also familiarized with the Laboratory Management System in compliance with ISO 17025: 2017. Dr. Noor-ul-Huda said that this multi-modal training course will be very helpful for them in conducting research activities and setting testing protocols at SWARC.

Exposure Visit of Trainees from Fisheries Development Board

A field visit of trainees enrolled in a training course based on Cage Culture in Aquculture, offered by Fisheries Development Board (FDB), was arranged under collaboration of FR&TI and FDB on September 26, 2022. Mr. Bilal Ahmed, Deputy Director Fisheries (Principal) welcomed the honorable guests at the Institute and gave them briefing about the ongoing research & training activities and testing services of the Institute. During the formal welcome address, Dr. Anser Mahmood Chatta, Director Fisheries (R&T) said that FR&TI is committed to the capacity building of personnel and strives hard to equip the trainees with essential skills and abilities required for fish farming. Dr. Kashifa Naghma Waheed, Principal Chemist, delivered a detailed presentation on water and soil quality management in aquaculture. The participants of the class, then, visited Soil and Water Analysis Lab and Aquaculture & Pathology Lab where they were given hands on training on analysis of water and soil quality for aquaculture and fish disease diagnosis.

Testing and Diagnostic Services

Soil & Water Analysis

Water & Soil Testing Laboratory at FR&TI provides water and soil testing services to the valued fish farmers for site suitability assessment and fish farm management. Seventy nine (79) water samples received from potential sites and fish ponds in Punjab have been analyzed in the Lab from July-September, 2022, through one thousand and twenty seven (1027) chemical tests. Twenty four (24) soil samples received in the Lab during this period were also analyzed through one hundred and forty four (144) mechanical and chemical tests to determine soil suitability for construction of fish ponds in Punjab.

Fish Disease Diagnosis

Dedicated staff at Aquaculture & Pathology Section of FR&TI diligently provides fish disease diagnosis services free of cost to facilitate the farmers. Eight (08) diseased fish samples brought to the Aquaculture & Pathology Section were analyzed during July-September, 2022. Recommendations for appropriate treatments were also provided to the concerned farmers on the basis of diagnosis of fish disease.

Biological Analysis of Water

Biology & Ecology Section at FR&TI deals with analysis of planktonic profile of water bodies. Competent staff of the section has immense expertise in plankton identification and enumeration for thorough assessment of the biological quality of water samples. Biological analysis of fifty (50) pond water samples received at the Biology & Ecology Section has been conducted from July-September, 2022. In addition to quantitative analysis of phytoplankton and zooplankton in the water samples, their dominant genera are also identified and reported.

Testing Services at Quality Control Labs

QCL is devoted to provide reliable chemical and microbial testing services for its values customers in confirmation with the requirements of ISO/IEC 17025: 2017. During July-September, 2022, sixty one (61) samples of water, twenty (20) samples of fish/food items and eighteen (18) samples of fish feed have been analyzed at QCL through three hundred and eighty five (385) chemical tests. One hundred and twenty seven (127) microbial tests were also conducted for fifty one (51) samples of water and twelve (12) samples of fish/food items.

RESEARCH & DEVELOPMENT

Research Activities

Annual Research Plan 2022

Eight research projects for Annual Research Plan (ARP) 2022 were approved in the meeting held on March 25, 2022 by the Departmental Technical Research Review Committee, chaired by Dr. Sikender Hayat, Director General Fisheries, Punjab. Implementation of all the approved research projects was initiated under the kind supervision of Dr. Anser Mahmood Chatta, Director Fisheries (R&T) and respective sectional heads. A brief description of activities being executed for implementation of each project is presented below.

Evaluation of Growth Performance of Tilapia (GIFT) and *Pangasius* Fish Seed with Varied Stocking Densities using Biofloc Technoloy

This project is conducted under the supervision of Mr. Zulfiqar Ahmed, Deputy Director Fisheries, (Aquaculture & Pathology Section) and Dr. Kashifa Naghma Waheed, Principal Chemist (Chemistry Section). Biofloc tanks installed at FR&TI are supplied with air blower and aero tubes for efficient aeration of water. Fermented Carbon Organic (FCO) is used in the tanks as biofloc inoculum. In order to maintain the carbon source, molasses is regularly added according to the quantity of ammonia produced in the tanks. GIFT seed has been stocked in Biofloc tanks and their growth is being monitored at regular intervals. A fixed amount of probiotic is being added in the tanks on weekly basis. Physico-Chemical parameters of water in the biofloc tanks are checked regularly and are being maintained within suitable range.

Monitoring of fish growth in biofloc tanks

Studies on Effect of Probiotics on Water, Plankton Profile and Fish Growth in Pond Aquaculture

This project is conducted by the researchers at Aquaculture & Pathology Section under the supervision of Mr. Zulfiqar Ahmed, Deputy Director Fisheries. Six earthen ponds at FR&TI are used for the experiment and stocked with fingerlings of Major Carps. Ponds are regularly fertilized with cow dung and inorganic fertilizers. Fish is fed with commercial feed at the rate of 3% of fish biomass in each pond. Probiotics are regularly supplied in the ponds. Fish growth, chemical and microbial quality of pond water and its planktonic profile are regularly monitored.

Monitoring of fish growth being reared in ponds supplied with probiotics

Comparative Study of Sex Reversal Methods of Genetically Improved Farmed Tilapia (GIFT) under Local Conditions

Researchers at Breeding & Genetics Section are conducting this research project under the supervision of Mr. Tariq Mahmood, Deputy Director Fisheries (Instructor/ Breeding & Genetics Section) to identify a suitable method for sex reversal of Tilapia. Tilapia eggs were collected from brooders, stocked in happas installed in earthen ponds. Duplicate trials of hormonal feed, egg immersion and fry immersion methods for tilapia sex reversal have been completed. At present, treated tilapia fish fries are being grown in hapas and fed with pelleted feed. Growth of tilapia fry being reared in hapas is regularly monitored. Physico-Chemical parameters of water in the hapas are checked regularly and kept within suitable range.

Rearing of sex reversed tilapia in happas and monitoring of fish growth

Development of White Worms (*Enchytraeus albidus*) Culture System and its Effect on Fish Growth as a Feed Supplement

This project is conducted at Chemistry Section (R&T) under the supervision of Dr. Kashifa Naghma Waheed, Principal Chemist. White worms have been cultured using five different diet combinations to find the optimum media for their culture. Production of white worms has also been monitored at different temperatures. At present, white worms are being fed to tilapia kept in glass aquaria to monitor their effect on fish growth.

Culture of white worms and their use as fish feed

Comparative Studies on Effectiveness of Various Hydrophytes for Phytoremediation of Sewage Water

Researchers at Chemistry Section (R&T) are working on this project under the supervision of Dr. Kashifa Naghma Waheed, Principal Chemist. The project is based on the phytoremediation of sewage water using different hydrophytes. Hydrophytes that showed optimum growth in sewage water in a preliminary study were cultured in sewage water filled in fiber glass tanks. Different chemical quality parameters of sewage water cultured with hydrophytes were regularly monitored. Experimental work of the project is completed and its data is being compiled for preparation of completion report.

Hydrophytes grown in sewage water

Breeding and Rearing of Ornamental Fish to Promote it as a Viable Cottage Industry

This project is also conducted by the researchers at Chemistry Section (R&T) under the supervision of Dr. Kashifa Naghma Waheed, Principal Chemist. Successful breeding of glodfish has been achieved under captive conditions in earthen ponds of FR&TI. Currently, the goldfish seed is being reared in ponds and supplied with supplementary feed. Water quality of pond water and growth of fish is regularly monitored.

Rearing of goldfish in earthen ponds and monitoring of fish growth

Installation of Small Scale Aquaponics System for Demonstration at FR&TI, Manawan, Lahore

Researchers at Nutrition Section are working on this project under the supervision of Mr. Bilal Ahmed, Deputy Director Fisheries (Principal). Nutrient Film Technique (NFT) based aquaponic system is installed at Shed No. 2 (FR&TI). Lady finger, gourd and lettuce seedlings have been planted in the system. Tilapia fingerlings are stocked in the fish tank. Nutrient rich water from fish tank is circulated in shallow streams through the horizontal pipes with suspended pots with plants. Plants are showing efficient growth due to continuous supply of nutrient rich water. Tilapia fingerlings stocked in the fish tank are also showing efficient growth.

Aquaponics system installed at FR&TI

Effects of Varied Feeding Regimes, Photoperiod and Light on the Survival of *Wallagu attu* Post-Larvae

This project is also conducted at Nutrition Section under the supervision of Mr. Bilal Ahmed, Deputy Director Fisheries (Principal). Different trials are being run for sustainable culture of Moina and it is found that luxuriant growth of Moina can be obtained using *Chlorella vulgaris* as natural food. *Wallago attu* seed has been procured from Fish Seed Hatchery, Balloki and shifted to FR&TI where it is being acclimatized in cemented tanks and fed with boiled chicken liver.

Rearing of *Wallago attu* seed in cemented tanks

Trials for optimum production of *Moina* to be used as *Wallago attu* fry feed

Development Projects

Ongoing Project

Department of Fisheries, Punjab is establishing a Fish Seed Hatchery at Bhaseen under the Development Project titled as "Establishment of Fish Seed Hatchery and Creation of Research Facility at Bhaseen" (Gestation Period; 2019-20 to 2021-22). FR&TI is establishing a Research Facility at Bhaseen under this project that will comprise of a thermo-controlled Wet Lab and a pond complex. Construction of eighteen (18) earthen ponds is about to complete and the infrastructure for the Wet Lab has also been erected. In order to complete some pending civil works, the Department has proposed project extension. Extension of the project for six months (July - December 2022) is principally approved in the meeting of Departmental Development Sub-committe (DDSC) held on September 15, 2022. Final administrative approval for project extension is awaited.

New Projects

Following two development projects reflected in Annual Development Programme (2022-23) of Department of Fisheries, Punjab, comprising FR&TI component have been approved by the Departmental Development Sub-Committee (DDSC) in its meeting held on September 15, 2022:

- "Rehabilitation and Upgradation of Fisheries Infrastructure/ Installation in Punjab" (PC-I Cost: Rs. 128.394 million, Gestation Period; 2022-23 to 2023-24). The cost of FR&TI component is Rs. 32.955 million. Main objectives of the project are renovation and repair of residential buildings for welfare of serving human resource and rehabilitation / repair of office complex for smooth functioning of the department.
- "Creation of Bachelor Hostel and Office Facility at Lahore, Chenawan and Hafizabad" (PC-I cost: Rs. 103.113 million, Gestation Period; 2022-23 to 2023-24). In this project, an amount of Rs. 49.883 million is provided for the construction of bachelor hostel over an area of 6516 Sq. ft. for provision of accommodation facilities to enhance the working efficiency of departmental officers/ officials and for the capacity building & skill development of trainees at FR&TI.

POSTINGS & TRANSFERS

- Mr. Muhammad Naeem, Assistant Director Fisheries, has been transferred from the o/o Director Fisheries (R&T) and posted as Assistant Director Fisheries, Lahore district , in July, 2022.
- Mr. Tayyab Rizwan, Assistant Director Fisheries, has been selected as Deputy Director Fisheries through Punjab Public Service Commission (PPSC) and posted as Deputy Director Fisheries (H), Fazilpur, District Rajanpur, in August, 2022.
- Mr. Sana-ul-Haq, Deputy Director Fisheries (QCL), has been transferred from the o/o Director Fisheries (R&T) and posted as Deputy Director Fisheries (H), Ghazanfer Garh, district Muzaffargarh, in August, 2022.
- Mr. Sajid Mahmood, Deputy Director Fisheries (Directorate of Hatchery Management), has been posted as Deputy Director Fisheries (QCL), in August, 2022.

STAFF STORIES

Mr. Abdul Rehman, Laboratory Supervisor at FR&TI, retired on September 29, 2022, after serving the Department for 38 years. Since his appointment in 1984, Mr. Abdul Rehman has served the Department with dedication and a sense of passion for his work. During the farewell party arranged by the FR&TI staff, the Director Fisheries (R&T) and all the staff members wished him success and prosperity in future.

FR&TI NEWSLETTER (EARLIER ISSUES)

Earlier issues of Volume 1 (2022) of FR&TI online Newsletter can be retrieved from following links.

Volume 1. Issue 1 (January - March)

Volume 1. Issue 2 (April - June)

GLIMPSES OF ACTIVITIES AT FR&TI

Dr. Sikender Hayat, Director General Fisheries, Punjab, planting a sapling at FR&TI (August 14, 2022)

FR&TI staff participated in awareness walk on Anti-Dengue Day (July 2, 2022)

Dr. Anser Mahmood Chatta, Director Fisheries (R&T), giving certificate to Mr. Hafiz Sameer Ali, (UVAS), on completion of his 18 Week Internship at FR&TI (August 16, 2022)

Ms. Abida Saeed, Deputy Director Fisheries and Mr. Tariq Rasheed, Botanist giving practical demonstration to participants of pre-promotion training course for FRA/ AWF Warden Fisheries (September 13, 2022)

Briefing given to Dr. Anser Mahmood Chatta, Director Fisheries (R&T), about 5 days training course organized for QCL analysts at Bahria University, Karachi (August 4, 2022)

Netting in research pond at FR&TI to monitor fish growth (August 30, 2022)

Trainees from Fisheries Development Board visiting Fish Museum at FR&TI (September 26, 2022)

Dr. Anser Mahmood Chatta, Director Fisheries (R&T), delivering lecture on "Presentation Skills" during one day workshop organized at FR&TI (August 5, 2022)

Participants of Pre-Promotion class for FRA/ AWF during hands-on-training on netting in fish pond (September 6, 2022)

Dr. Anser Mahmood Chatta, Director Fisheries (R&T) and senior officers monitoring aquaponics system at FR&TI (August 23, 2022)

Students from University of Okara visiting biofloc culture system at FR&TI (July 23, 2022)

Trainees from Saline Water Aquaculture Research Center (SWARC), Muzaffargarh, getting hands-on-training on microbiological techniques at QCL (September 1, 2022)

FARMER'S CORNER

Clay Turbidity in Ponds; Causes and Treatment

Clay turbidity or muddiness in ponds is a frequently encountered problem in freshwater aquaculture. Extremely small size of clay particles (<2.0 µm) as well as their negative surface charge keep them suspended in water and cause turbidity. Sources of clay turbidity in pond water are high clay content in pond bottom soil and dikes, turbid source water and turbid rainwater runoff entering the ponds. Clay turbidity reduces light penetration in pond's water column and limits the algal growth. Low primary productivity of ponds leads to reduced fish growth. Moreover, suspended clay particles can clog fish gills causing respiratory impairments.

Prevention is the best control method

Most effective way to prevent clay turbidity in fish ponds is to avoid pond construction on soil with high clay content. Clay turbidity can also be prevented from occurring by covering the pond dikes and watershed with vegetation, minimizing the free board area of pond edges and increasing pond water depth.

Treatment of clay turbidity by flocculation

Clay turbidity in pond water can be removed by addition of substances that help in settling of the suspended particles. Two types of substances; organic matter and chemical substances, can be used for this purpose. Organic matter such as hay, powder of plant materials or animal manures can reduce clay turbidity in ponds. However, substantial amount of organic matter must be added to the pond for effective turbidity removal. Use of large amount of organic matter in ponds may deplete the water dissolved oxygen to critical levels. Moreover, control of turbidity by organic matter may take several weeks.

Among the chemical substances, alum (aluminum sulfate) is most effective in removing clay turbidity of water. In general, a dose of 18 to 31 kg/ acre-foot can be sufficient to remove clay turbidity from pond water. However, use of alum can decreases water pH and, therefore, should be applied with hydrated lime to maintain pH**.** Gypsum can also be used to remove clay turbidity; however, it is much less effective compared to alum and is generally required at the rate of 120 – 370 kg/ acre-ft for water clarification. Gypsum does not reduce the water pH and can be used without application of lime. Pond water with calcium hardness > 50 mg/L are already saturated with calcium and use of gypsum will be ineffective to control clay turbidity.

Both alum and gypsum have the tendency to remove phosphorus from water. As phosphorus is an essential nutrient for algal growth, ponds should be treated with phosphorous fertilizer after use of a coagulant for removal of clay turbidity.

Application of coagulants in ponds

Chemical coagulants should be applied in calm weather as excessive water turbulence due to wind/ storm will slow the settling of the floc. Coagulant should be thoroughly and quickly mix with water and resulting slurry can be spread over the pond surface. In ponds equipped with aerators, releasing a slurry of water and coagulant in front of the aerator will distribute it quickly. The person, mixing the coagulant with water, should wear a dust protection mask. With suitable application rate of coagulant, there should be noticeable water clarity within hours. However, it may take several days for complete removal of turbidity from the pond.

Finding suitable dose of alum

Effective dose of alum to remove clay turbidity depends on the amount and type of suspended clay particles and chemical composition of pond water. Appropriate dose of alum for removal of clay turbidity from pond water can be determined using following steps.

Arrange four buckets and fill 5-gallon (~19 Liter) turbid pond water in each bucket. Weigh 0.2, 0.3, 0.4 and 0.5 gram alum and add in bucket No. 1 - 4 respectively. Stir water in each bucket vigorously for 1 to 2 minutes. Continue stirring after every 5 minutes for up to 30 minutes and observe the clarity of the water. Select the minimum dose of alum that clears the water. For example, if alum removed turbidity in bucket No. 3 and 4, its dose added to bucket No. 3 (0.4 gram) would be appropriate for treatment of pond water. Get the estimate of water volume in the pond that needs to be treated for removal of turbidity. Dose of alum that should be applied in that pond can be found from following table.

Dose of alum for control of turbidity in pond water

Pond water volume	Dose of alum found suitable in bucket test			
	0.2 g	0.3 g	0.4 g	0.5 g
One acre-ft.	13.0 kg	19.5 kg	26.0 kg	32.5 kg
Two acre-ft.	26.0 kg	39.0 kg	52.0 kg	65.0 kg
Three acre-ft.	39.0 kg	58.5 kg	78.0 kg	97.5 kg
Four acre-ft.	52.0 kg	78.0 kg	104.0 kg	130.0 kg
Five acre-ft.	65.0 kg	97.5 kg	130.0 kg	162.4 kg
Six acre-ft.	78.0 kg	117.0 kg	156.0 kg	195.0 kg

Precautionary measures

For each 1.2 kg/ acre-foot alum used , 0.49 kg/ acre-foot hydrated lime should be used to keep pond water pH within optimum range for fish. Apply phosphorous fertilizer in the pond after treatment with alum to maintain optimum nutrients for algal growth.

فارمرز کا صفحہ

تالاب میں چکنی مٹی کے سبب گدلا پن اور اس پر قابو پانے کے طریقے

فریش واٹر ایکوا کلچر میں چکنی مٹی کے ذرات کی وجہ سے تالاب کے پانی کا گدلا پن ایک اہم مسئلہ ہے۔ چکنی مٹی کے ذرات کا انتہائی کم سائز اور ان کی سطح پر موجود منفی چارج ان ذرات کو پانی میں معلق رکھتا ہے اور پانی میں گدلے پن کا سبب بنتا ہے۔ تالاب کے پانی میں گدلے پن کے اسباب میں تالاب کی مٹی میں چکنی مٹی کے ذرات کی زیادہ مقدار، تالاب میں استعمال کیے جانے والے پانی میں چکنی مٹی کی موجودگی اور بارش کے گدلے پانی کا تالاب میں شامل ہونا ہے۔ تالاب میں گدلے پن کی وجہ سے پانی میں روشنی کی ترسیل محدود ہو جاتی ہے جس سے الجی، جو کہ مچھلیوں کی قدرتی خوراک ہے، کی نشوونما کم ہو جاتی ہے۔ قدرتی خوراک میں کمی سے مچھلیوں کی نشوونما پر منفی اثر پڑتا ہے۔ علاوہ ازیں، چکنی مٹی کے ذرات مچھلیوں کے گلپھڑوں پر جم جاتے ہیں اور ان میں سانس کی بیماریوں کا سبب بنتے ہیں۔

تالاب میں چکنی مٹی کے گدلے پن سے بچاؤ کے لیئے ضروری ہے کہ جس مٹی میں چکنی مٹی کے ذرات کی مقدار زیادہ ہو، وہاں تالاب بنانے سے گریز کیا جائے۔ علاوہ ازیں، تالاب کے بند اور قریبی واٹرشیڈز کو پودوں سے ڈھانپ کر اور تالاب کے پانی کی گہرائی میں اضافہ کر کے کسی حد تک گدلے پن پر قابو پایا جا سکتا ہے۔

تالاب کے پانی کے گدلے پن کو دور کرنے کے طریقے

اگر کسی تالاب میں گدلے پن کا مسئلہ درپیش ہو تو قدرتی نامیاتی مادوں یا کیمیائی مرکبات کے استعمال سے اس پر قابو پایا جا سکتا ہے۔ نامیاتی مادے جیسا کہ گھاس، پودوں کے پتوں کا پاؤڈر اور جانوروں کے فضلوں سے تیار کردہ کھادیں پانی میں چکنی مٹی کے ذرات کو تہ میں بٹھانے اور گدلے پن کو دور کرنے میں مدد دیتے ہیں۔ تاہم پانی کے گدلے پن کے مئوثر کنٹرول کے لیئے نامیاتی مادے کافی زیادہ مقدار میں درکار ہوتے ہیں۔ تالاب میں نامیاتی مادوں کی زیادہ مقدار کا استعمال تالاب کے پانی میں تحلیل شدہ آکسیجن کو خطرناک حد تک کم کر سکتا ہے جس سے مچھلیوں کی نشوونما اور پیداوار متاثر ہونے کا اندیشہ ہوتا ہے۔ مزید براں، نامیاتی مادوں کے ذریعے پانی کے گدلے پن پر قابو پانے میں کئی ہفتے لگ سکتے ہیں۔

پانی کے گدلے پن پر قابو پانے کے لیئے استعمال ہونے والے غیر نامیاتی کیمیائی مادوں کو کوا گیولینٹ کہا جاتا ہے۔ پھٹکری، جس کا کیمیائی نام ایلومینیم سلفیٹ ہے، گدلے پن کو دور کرنے کے لیئے سب سے زیادہ مئوثر کوا گیولینٹ ہے۔ عام طور پر تالاب میں 18 تا 31 کلوگرام فی ایکڑ فٹ پھٹکڑی کا استعمال گدلے پن کو دور کرنے کے لیئے مئوثر رہتا ہے۔ تاہم پھٹکڑی کا استعمال تالاب کے پانی کی پی ایچ کو کم کر سکتا ہے۔ پانی کی پی ایچ کو مچھلیوں کے لیئے موزوں حد کے اندر رکھنے کے لیئے پھٹکڑی کے ساتھ چونے کا استعمال ضرور کرنا چاہیئے۔ جپسم بھی تالاب میں گدلے پن کو دور کرنے کے لیئے استعمال کیا جا سکتا ہے۔ تاہم جپسم، پھٹکڑی کے مقابلے میں کم مئوثر ہے اور تالاب میں 120 تا 370 کلوگرام فی ایکڑ فٹ کی شرح سے درکار ہوتا ہے۔ اگر تالاب کے پانی کا کیلشیئم کی بابت بھاری پن 50 ملی گرام فی لٹر سے زیادہ ہو تو جپسم کا استعمال گدلے پن کو دور کرنے کے لیئے غیر مئوثر ہوگا۔

پھٹکڑی اور جپسم تالاب کے پانی میں فاسفورس کی مقدار میں کمی کا سبب بنتے ہیں۔ فاسفورس، چونکہ مچھلیوں کی قدرتی خوراک (الجی) کی نشوونما کے لیئے ضروری ہے، اس لیئے پھٹکڑی یا جپسم کے استعمال کے بعد تالاب میں فاسفورس پر مشتمل کھادوں کا استعمال ضروری ہے۔

تالاب میں کوا یگولینٹ کے استعمال کا طریقہ

تالاب میں کوا یگولینٹ کا استعمال پرسکون موسم میں کرنا چاہیے کیونکہ تیز ہوا یا طوفان کی صورت میں پانی کی زیادہ حرکت چکنی مٹی کے ذرات کے تہ میں بیٹھنے کے عمل کو سست کر دے گی۔ کوا یگولینٹ کو پانی میں ملا کر تالاب کے پانی کی سطح پر پھیلایا جا سکتا ہے۔ کوا یگولنٹ اور پانی کا مکسچر بناتے ہوئے ماسک کا استعمال یقینی بنائیں۔ اگر کوا یگولنٹ کی مناسب مقدار استعمال کی جا رہی ہو تو چند گھنٹوں کے اندر تالاب کے پانی سے گدلے پن کے دور ہونے کے آثار نظر آنا شروع ہو جائیں گے۔ تاہم تالاب کے گدلے پن کے مکمل دور ہونے میں کئی دن لگ سکتے ہیں۔

تالاب میں پھٹکڑی کی مناسب مقدار کے تعین کا طریقہ

پانی کے گدلے پن کو دور کرنے کے لیئے پھٹکڑی کی مناسب مقدار کا انحصار، چکنی مٹی کے معلق ذرات کی مقدار اور قسم اور تالاب کے پانی کی کیمیائی خصوصیات پر ہوتا ہے۔ گدلے پن کو دور کرنے کے لیئے پھٹکڑی کی مئوثر مقدار کا تعین درج ذیل طریقے سے کیا جا سکتا ہے۔

جس تالاب کے پانی سے چکنی مٹی کے گدلے پن کو دور کرنا مقصود ہو، اس تالاب کا پانی چار بالٹیوں میں بھر لیں۔ ہر بالٹی میں پانی کی مقدار تقریباً 5 گیلن (تقریباً 19 لٹر) ہونی چاہیئے۔ بالٹی نمبر 1 میں 0.2 گرام، بالٹی نمبر 2 میں 0.3 گرام، بالٹی نمبر 3 میں 0.4 گرام اور بالٹی نمبر 4 میں 0.5 گرام پھٹکڑی شامل کریں۔ ہر بالٹی میں پانی کو ایک سے دو منٹ تک اچھی طرح ہلائیں اور اس کے بعد آدھے گھنٹے تک وقفے وقفے سے پانی کو ہلاتے رہیں۔ اب ہر بالٹی میں پانی کے گدلے پن کا مشاہدہ کریں اور پھٹکڑی کی سب سے کم مقدار جو گدلے پن کو دور کرنے کے لیئے مئوثر نظر آئے اس کو نوٹ کر لیں۔ مثال کے طور پر اگر بالٹی نمبر 3 اور 4 میں پانی کا گدلا پن دور ہوتا نظر آئے تو بالٹی نمبر 3 میں استعمال شدہ پھٹکڑی کی مقدار کو نوٹ کر لیں۔ اب متاثرہ تالاب میں پانی کے حجم کا اندازہ کریں اور مندرجہ ذیل ٹیبل کی مدد سے پھٹکڑی کی مناسب مقدار کا تعین کریں جو اس تالاب کے پانی کے گدلے پن کو دور کرنے کے لیئے مئوثر ثابت ہوگی۔

تالاب میں پانی کے حجم کے مطابق پھٹکڑی کی مناسب مقدار کا تعین

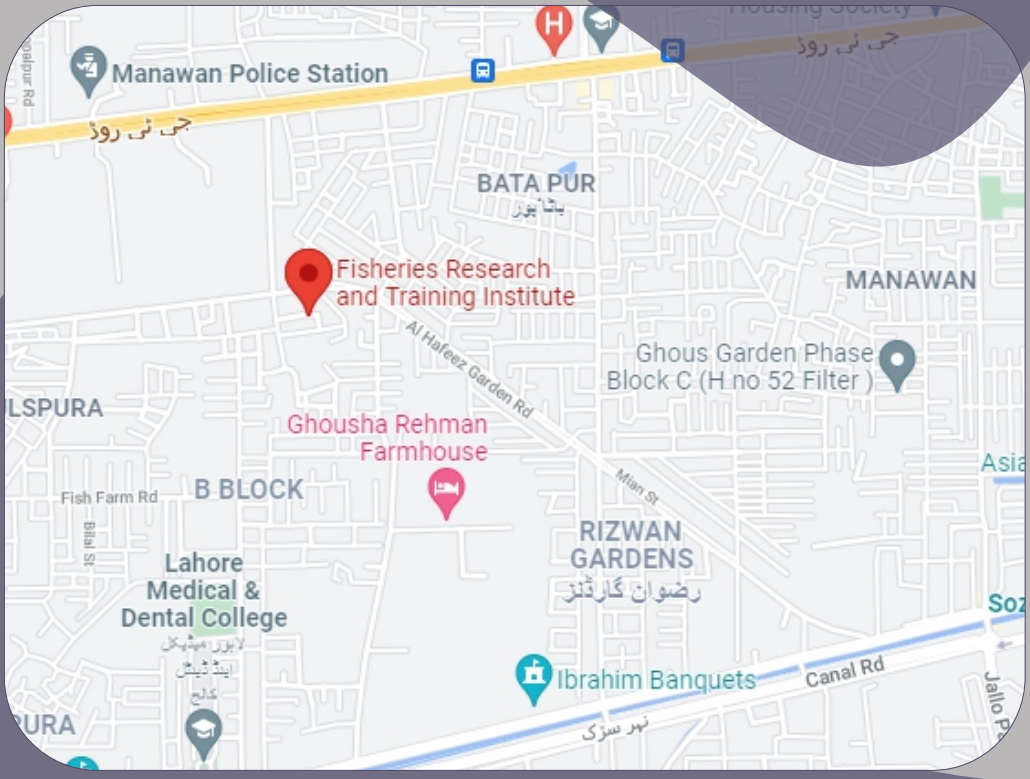
تالاب میں پانی کا حجم	ابتدائی تجربے کے ذریعے پھٹکڑی کی منتخب شدہ مقدار			
	0.2 گرام	0.3 گرام	0.4 گرام	0.5 گرام
ایک ایکڑ فٹ	13.0 کلوگرام	19.5 کلوگرام	26.0 کلوگرام	32.5 کلوگرام
دو ایکڑ فٹ	26.0 کلوگرام	39.0 کلوگرام	52.0 کلوگرام	65.0 کلوگرام
تین ایکڑ فٹ	39.0 کلوگرام	58.5 کلوگرام	78.0 کلوگرام	97.5 کلوگرام
چار ایکڑ فٹ	52.0 کلوگرام	78.0 کلوگرام	104.0 کلوگرام	130.0 کلوگرام
پانچ ایکڑ فٹ	65.0 کلوگرام	97.5 کلوگرام	130.0 کلوگرام	162.4 کلوگرام
چھ ایکڑ فٹ	78.0 کلوگرام	117.0 کلوگرام	156.0 کلوگرام	195.0 کلوگرام

احتیاطی تدابیر

تالاب میں پانی کی پی ایچ کو مچھلیوں کے لیئے موزوں حد کے اندر رکھنے کے لیئے پھٹکڑی کے ساتھ چونے کا استعمال ضرور کریں۔ تالاب میں ہر 1.2 کلوگرام فی ایکڑ فٹ پھٹکری کے ساتھ 0.49 کلوگرام فی ایکڑ فٹ ہائیڈریٹڈ چونا استعمال کریں۔

پھٹکڑی کے استعمال کے بعد تالاب میں فاسفورس پر مشتمل کھاد یں ضرور ڈالیں تا کہ پانی میں مچھلیوں کی قدرتی خوراک، الجی، کی نشوونما کے لیئے درکار غذائی اجزاء کی فراہمی کو یقینی بنایا جا سکے۔

How to Reach FR&TI



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