TRAINING COURSE SERIES • COURSE 2

AQUA EXCEL 2020

Ifremer

WAGENINGEN UR For quality of life

DATE 24 – 28 OCTOBER 2016 • **LOCATION** SÈTE, FRANCE

COURSE 2

TITLE: RECIRCULATING AQUACULTURE SYSTEM (RAS) TECHNOLOGY

COURSE DESCRIPTION

Traditionally, recirculating aquaculture systems (RAS) were mainly developed in Europe to grow out freshwater species and produce marine fingerlings. However, they have become increasingly used for the on-growing of a wide variety of fish (including marine species) and shellfish. They can be operated irrespective of the target temperature and salinity, and the annual production capacity of some industrial systems can now amount to thousands of tons. RAS allow a constant and adjustable quality of the rearing water (i.e. temperature, oxygen, nitrogen and pathogens) to be maintained, therefore contributing to a more intensive and reliable production and substantial energy savings.

The objectives of this course are to review the basics of RAS and examine the different systems, designs, operations and applications.

Participants will:

- Gain solid knowledge about the principles of RAS
- Become familiar with different types of RAS, their specificities, capabilities and limitations
- Understand the advantages of RAS and the necessary conditions for optimal use and operation
- Master the basics of RAS design and sizing
- Become aware of the ongoing research to increase the efficiency and acceptability of RAS

COURSE CONTENT

Basics of RAS:

- Water quality and fish requirements/accumulating substances
- Water quality optimisation using oxidation-reduction potential (ORP)
- Fish, consumption and production: nutrient balance and models
- Soluble and particulate matter quantifications
- Suspended solids characterisation and control/removal
- Small solid removal processes
- Mass balance basics and nitrification kinetics
- Basics of gas transfer and oxygenation/degassing
- Biofiltration and bacterial environment

Design and management of RAS and examples:

- Bacterial control and bio-security
- Low energy RAS
- Energy control in RAS design
- Biofilter types – economic considerations
- Monitoring, alarm and emergency systems in aquaculture
- Practical exercises on RAS design (i.e. treatment chain organisation, sizing of the components, etc.)

Sustainability, waste treatment and valorisation:

- Waste treatment and valorisation
- Environmental impact, integrated multi-trophic aquaculture (IMTA) and risk assessment

Technical visits:

- Palavas Aquaculture Research Infrastructure and RAS farms

RAS INDUSTRY MINI SEMINAR (Friday 28 October 2016, 08.30 – 13.00)

INDUSTRY STAKEHOLDERS WELCOME

A half day industry mini seminar on RAS evolution and new RAS uses, involving RAS farmers and engineering companies, will give the course participants an opportunity to exchange with industry professionals.

Industry stakeholders are also invited to attend the seminar to hear the latest discussions and scientific advances in the RAS sector, and exchange with the course participants to gain information on RAS development and needs for sustainable development in other countries within and outside the EU.

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TARGET AUDIENCE:

The full course is designed for aquaculture professionals with a university degree (e.g. engineers, researchers, etc.) interested in the potential applications of RAS (i.e. controlled intensive fish farming, water reuse, use of environmentally friendly technologies, etc.).

Interested industry stakeholders who are not involved in the full course are welcome to take part in the industry mini seminar.

LOCATION: Ifremer Sète research station, Avenue Jean Monnet, 34203 Sète, France

TIME: Monday 24 (08:30) to Friday 28 (12:45) October 2016

COURSE ORGANISERS: Institut Francais de Recherche pour L'Exploitation de la Mer (Ifremer) (France) and Wageningen University (the Netherlands)

REGISTRATION:

Register online at: www.aquaexcel.eu/index.php/aquaexcel-courses/h2020-training-courses

Participants taking part in the full training course are requested to submit their CV and a brief letter of motivation by **9 September 2016**. Places will be confirmed, at the latest, one month before the start of the training course.

Industry participants attending the industry mini seminar only (Friday 28 October, 08.30 – 13.00) are requested to register by submitting their affiliation and contact details.

FEES: Course attendance is FREE, thanks to EC Horizon 2020 funding. Participants are expected to cover their own travel, subsistence and accommodation costs.

MAXIMUM PARTICIPANTS: 30 people

LANGUAGE OF INSTRUCTION AND MATERIAL: English

COURSE TUTORS:

K Attramadal
PostDoc, Department of Biotechnology
Norges Teknisk-Naturvitenskapelige Universitet (NTNU)
kari.attramadal@ntnu.no

B Barrut
Research and Development Director
Coldep
bertrand.barrut@coldep.com

★ **JP Blancheton (Local Organiser)**
Researcher
Ifremer
jean.paul.blancheton@ifremer.fr

J Bosmans
Engineer
IDEE aquaculture
jbosmans@ideeaquaculture.com

P Cacot
Engineer
Les Poissons du Soleil
philippe.cacot@cirad.fr

M Callier
Researcher
Ifremer
myriam.callier@ifremer.fr

E Eding
Researcher
Wageningen University, Aquaculture and Fisheries Group (AFI)
ep.eding@wur.nl

L Labbé
Director
Institut National de la Recherche Agronomique (INRA)
laurent.labbe@rennes.inra.fr

D Leclerc
Director
Acui-T
contact@acui-t.com

V Mota
Scientist
Nofima AS
vasco.mota@nofima.no

JM Moulin
Engineer
Les Poissons du Soleil

PB Pedersen
Head of Section for Aquaculture
Danmarks Tekniske Universitet (DTU)
pbp@aqua.dtu.dk

RH Piedrahita
Professor Emeritus, Department of Biological and Agricultural Engineering
University of California
rhpiedrahita@ucdavis.edu

O Valdstein
Professor, Department of Biotechnology
NTNU
olav.vadstein@ntnu.no

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