



The EU Aquaponics Hub is a four year networking Action that unites a heterogeneous group of scientists, researchers and SMEs from across the EU and around the globe to better understand the state of knowledge in aquaponics in Europe and around the world and to facilitate innovation and education in this field of sustainable fish and vegetal food production.

COST FA1305 Training School 2 Essential Aquaponics

15 – 19 June 2015

University of Ljubljana, Biotechnical faculty, Slovenia

Background

Aquaponics is an emerging method of local food production in the EU and worldwide, using closed integrated production systems to grow vegetables and fish at large and small scales of production and in urban contexts. The EU Aquaponics Hub aims to lead the research agenda through the creation of a networking group of expert researchers, industry scientists, engineers, economists, aquaculturists and horticulturalists, and contribute to the training of young aquaponic scientists. Despite the recent growth and interest in aquaponics, considerable efforts are still required in order to understand and optimise the science of combining aquaponic fish production with vegetal production.

This training school will consist of a number of lectures and practical classes on the key principles of aquaponic systems and aquaponic food production. Participants will be introduced to the historical background of aquaponics and the various types of aquaponic systems currently operating around the world. Topics will include aquaponic system configurations, practical calculations of aquaponic system units, the suitability of different fish and plant species, and pest and disease management, as well as economic considerations in aquaponic system design and operation. The trainees will be divided into 5 working groups and will actively participate in different workshops which will facilitate the application of theoretical knowledge to the practice of aquaponic food production systems.

The training school will be delivered by dr. Vesna Miličić, University of Ljubljana, Mr Matej Leskovec, Ponika Company, Mrs. Urška Kleč, Biotechnical centre Naklo, Mr Michael Adrian Barnes, Desert Aquaponic Company, dr. Tom Beyers, Provinciaal Proefcentrum voor de Groenteteelt Oost-Vlaanderen and Mr. Rob van de Ven, LandIng Aquaculture. The lectures and practical classes will be mainly conducted at the University of Ljubljana and Biotechnical centre Naklo in their Experimental Aquaponic Unit located at the Biotechnical Centre Naklo experimental station.

Programme

Sunday 14th of June 2015

Arrival of trainers and trainees to Ljubljana

Monday 15th of June 2015

- 8:00-8:30 Transport by public bus from hostel to Biotechnical faculty
- 8:30 Registration
- 9:00-11:30 Welcome and introduction to the programme of training school
dr. Vesna Miličič (Local Organizer)
prof.dr. Davorin Gazvoda (Dean of the Biotechnical Faculty)
prof. dr. Metka Hudina (Vice dean of the Agronomy Department)
The trainees will present themselves, their background and their research interests
- 11:30-12:00 Refreshments
- 12:00-13:00 Introduction to aquaponics
dr. Vesna Miličič (University of Ljubljana, Biotechnical faculty)
- 13:00-14:00 Aquaponic System Configurations – Structure and Function
- Conventional fish farming and vegetable production, RAS and hydroponics, aquaponics
 - System components, fish tanks and ponds, reservoirs, canals NFT and gravel beds. Filtration.
 - Balanced aquaponic systems. Semi natural, ebb and flow and deep water.
 - Cascade systems. Semi closed soil production
 - Decoupled systems
- Mr Michael Adrian Barnes (Desert Aquaponic Company)*
- 14:00-15:30 Lunch break
- 15:30-17:30 Practical workshop (calculations of aquaponic system units: biofilter, pumps, fish: plant ratio)
Mr Matej Leskovec (Ponika Ltd)
dr. Vesna Miličič (University of Ljubljana, Biotechnical faculty)

Tuesday 16th of June 2015

- 8:00-8:30 Transport by public bus from hostel to Biotechnical faculty
- 9:00-11:00 Fish in Aquaponics – Science Production and Processes
- Major aquaculture species by territory and market
 - Species applicability to aquaponics
 - Production considerations and risk factors. Water quality, hatchery and larval nutrition, feeds and feeding, fish handling, health and disease and use of treatments in aquaponics
 - Economic considerations in aquaponic system design and operation. Market, cost of inputs, sustainability
- Mr Michael Adrian Barnes (Desert Aquaponic Company)*
- 11:00-11:30 Refreshments
- 11:30-13:30 The Science of Plants in Aquaponic Systems
Dr Tom Beyers (Provinciaal Proefcentrum voor de Groenteteelt Oost-Vlaanderen)
- 13:30-15:00 Lunch break
- 15:00-17:30 Setting up an Aquaponic System – Small Scale and Big Scale: Theoretical background.
Mr Matej Leskovec (Ponika Ltd)

Wednesday 17th of June 2015

8:00-8:30	Transport by public bus from hostel to Biotechnical faculty
9:00-10:30	Application and Opportunities of Aquaponic Systems <i>Mr Rob van de Ven (Landing Aquaculture)</i>
10:30-11:00	Refreshments
11:00-16:00	Visit to the G2O Ltd RAS system <i>Presentation by Mr. Danijel Gospič</i>

Thursday 18th of June 2015

7:30-8:00	Transport by public bus from hostel to Biotechnical faculty
8:00-9:00	Departure from Biotechnical faculty to Biotechnical centre Naklo + refreshments
9:00-9:15	Welcome address and presentation of BC Naklo <i>dr. Marijan Pogačnik, Director of BC Naklo</i>
9.15 – 10.15	Presentation of BC Naklo aquaponic system and projects related to aquaponics <i>prof. dr. Tjaša Griessler Bulc, University of Ljubljana, Faculty of Health Sciences</i>
10:15-10:30	Break (formation of workgroups)
10:30-11:30	Workshop 1: Plants in Aquaponic Systems <ul style="list-style-type: none">- Presentation of aquaponic raised beds in BC Naklo aquaponic unit- Choice of substrate, cultivation of seedlings- Demonstration of planting in the aquaponic system
11:30-11:45	Break
11:45-12:45	Workshop 2: Water Analysis in the Aquaponic System and its Importance <ul style="list-style-type: none">- Colorimetric and digital measuring of chemical and physical water parameters- Volume and flow of water in aquaponics and their importance- Biological control of pests
12:45-13:45	Lunch break
13:45-14:45	Workshop 3: Design and Construction of a Domestic Aquaponic Unit
14:45-15:00	Refreshments
15:00-16:00	Workshop 4: Design and Construction of a Domestic Aquaponic Unit
16.00-20.00	Trip to Bled. We will take a walk around Lake Bled, a beautiful glacial lake in the Triglav national park in the middle of the Julian Alps. There is an island in the middle of the lake with a historic church, while the medieval Bled castle overlooks the lake from a nearby hill. Bled is also famous for its vanilla and cream pastry – »kremšnita«.

Friday 19th of June 2015

8:30-9:00	Transport by public bus from hostel to Biotechnical faculty
9:00-11:00	Project work in groups
11:00-11:30	Refreshments
11:30-13:30	Project work in groups
13:30-15:00	Lunch break
15:00-17:30	Project work presentations

Saturday 20th of June 2015

Trainees depart

Eligibility

Applicants must be resident in a COST country: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the former Yugoslav Republic of Macedonia. The nationality of the applicant is not a bar to eligibility. Preference will be given to postgraduate students and postdoctoral researchers. Students from different research backgrounds (agriculture, horticulture, aquaculture, sanitary engineering and landscape architecture) who are interested to move into aquaponics are welcome to apply.

Financial support

COST Action FA1305 is offering **20 places** on the training school on a competitive basis. Successful applicants will be offered a maximum grant of €1200 as a contribution towards the costs of travel, accommodation and meals. The exact award offered will depend on the cost of travel as this differs considerably across eligible countries. Successful applicants from the University of Ljubljana will be offered a maximum grant of €125 as a contribution towards the costs of meals. Please note that the grant will be paid by bank-to-bank transfer **after** the course has been completed.

Logistics

Trainees will be responsible for making their own travel arrangements, and for providing adequate insurance cover (personal, travel and medical) for the whole duration of the training course and travel period.

Hostel rooms have been reserved at a cost of €210 for the week. Trainees must pay for their own rooms upon arrival.

How to apply

Send a letter of application stating your reasons for wanting to take part in this Training School to Vesna Miličić (vesna.milicic@bf.uni-lj.si) and Sarah Milliken (S.Milliken@greenwich.ac.uk) by **Monday 25 May 2015**. The letter should be accompanied by a 1-2 page CV which should include your personal details, education background, current university address (if applicable), training/work experience, publications (if applicable), email address and Skype name.