COST EU AQUAPONICS HUB ACTION 1305

TRAINING PERIOD – LA CANOURGUE (FRANCE) 24-28/04/17

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The 6th training school in aquaponics of action FA1305 took place within the LEGTPA LOZERE. It is a public highschool of the French Ministry of Agriculture, located in south of France between Clermont-Ferrand and Montpellier cities. This institute prepare diplomas of higher technician in aquaculture and in water management and treatment. The La Canourgue site is part of a larger scale : the EPLEFPA of La Lozère with different places around the department. The other agricultural training sites precede diplomas in agriculture, hippology, production of vegetables, beekeeping, agri-food, management and protection of nature for young students and adults.There are 5 training centers throughout the department including La Canourgue ; each of them having a specialty of agricultural training. To illustrate the different training channels, the EPLEFPA of Lozère has a dairy farm, an equestrian center, an agri-food processing unit for farm products, an aquaculture farm (production and processing of trout) and an aquaculture experimental station containing the aquaponic units.

There are different sectors in this rural campus of La Canourgue : Administrative buildings, classrooms, rooms for 80 students, self, videoconferencing room, laboratory for water analysis, laboratory for biology, mechanical workshop, hydraulic and electrotechnical laboratories. Especially for training in aquaculture, the school has a trout farm of 30 tons per year, allowing to conduct 3 reproductions per year in photoperiodic program. The 4 fish farm workers produce 15 tons of fish living in other fish farms and 15 tons in the processing plant to sell fresh fillets, smoked fillets, eviscerated fish and terrines, for local sale.

Since 2011, the school has conducted experimentation programs in aquaponic, notably in a system recirculated with tilapia and aromatic plants. Since 2015, the Regional Council and Europe have financed a new experimental aquaculture station to conduct research programs with the largest French institutes in aquaculture and horticulture: INRA, CIRAD, ITAVI and ASTREDHOR. The research and operating costs of the experimental units are covered by the French Ministry of Agriculture and european funds.

The two aquaponic units were used by the trainees during the COST training. The first unit in hot water comprises about 4 m^3 of livestock and 20 m^2 of horticultural production (aromatic herbs, young shoots of barley as fodder for farm animals). The second unit consists of a recent recirculated

system of 16m^3 of breeding (6 tanks) and a thermally insulated greenhouse of 400m ² for about 160 m² in experimentation. In this new unit, different species of fish have been tested: carp, trout and for training period, Siberian sturgeon.

The aquaculture loop consists of fish tanks (600 kg of fishes) , a drum filter, a sedimentation filter for extracting faeces, a UV unit, a biological filter (agitated bed on plastic media) and bioblocks for oxygenation and degassing CO_2. The greenhouse is equipped with 8 tables to tide of 10m² unit and 4 ponds in deep water of 20m² unit. In 2016, suspended gutters were installed to produce strawberries like private companies. The horticultural loop is provided by a recovery sump coupled with the aquaculture recovery sump and 2 pumps to transport the water to the large horticultural tanks (DWC) and to the horticultural tables.

The water returns from the greenhouse to the aquaculture sump by gravity. The entire process comprises about 65 m^3 of water and the volume of spring water brought in per day is less than 2 m^3. The crops studied are : salads, aromatic and medicinal plants, strawberries, zucchini, tomatoes and edible flowers. Three important axes of the national research program (APIVA) are : the technico-economic feasibility study of a commercial scale aquaponic unit, the biotization of growing substrates, the treatment of fish sludges by lumbrifiltration cpupled or not with gravel filter and biological filter.

The training took place from 24 to 28 April on the theme: *"Design, mlaintenance and risk management of aquaponics systems, animal-plant production and fish processing"*

It enabled 14 trainees to study in a theoretical and practical way on the 2 aquaponics units. They came from differents countries around Europe : Bosnia, Croatia, UK, Romania, Deutchland, Hungary, Turkey, Belgium, France, Netherlands, Serbia.

After a general presentation of the aquaponics systems around the world (Mr. Pierre FOUCARD, engeneer - ITAVI Institute ROUEN), its strengths and weaknesses, the trainees benefited from knowledge transfer on the following points:

-Recirculated systems – The different parts and the mode of operation (Mr Sebastien STOLL – Cost Member - aquaculture engeneer)

-Climate management of greenhouses - Explanation and calculation of the heat transfers according to the equipment of a greenhouse, illustrating with concrete examples (prescribed by a

researcher of the CTIFL NIMES, specialist in greenhouse energy – Mrs Ariane GRISEY)

-Biocontrol of pests and fish production - Recognition of pests, selection of crop aids, monitoring of fish growth, health risks, prophylaxis (by the teacher-researcher Dr Catherine LEJOLIVET, responsible for the experimental units – Cost Member)

-The different types of aquaculture and horticultural facilities, their management and maintenance, their risk management with the two local trainers (Mr Pierre HERRGOTT and Dr Catherine LEJOLIVET).

-The water quality in recirculated and aquaponics system - the different parameters, the optimum for fishes and plants, the measurements and the understanding of the values (with a local trainer, Mrs Marine DESAPHY)

-The sludge treatment associated with an aquaponics system - the technical and biological desing for wormfilter, gravel filter and biological filter (with Mr. Pierre Herrgott and an engineering student trainee studying for the APIVA program, Mr. Quentin MASSIQUET)

-The trainees were also able to visit the school's trout farm with Mr Philippe LEROY director, to discover the different stages of production, and also the different equipment necessary to transform the fish inside the building to the European standards designed, few years ago to prepare different fish products with Mr. Amic MAUREL, employee of fish farming.

Several sessions of theoretical and most of the time, practical work allowed to illustrate very concretely these different themes. Trainees from different backgrounds were able to share their questions and experiences, in a very friendly and productive atmosphere.

The trainees lunch at the school restaurant. In the evening they can discover different restaurants of the village and their specialties. Most of them were accommodated in a comfortable hotel in the heart of the village of La Canourgue, 10 minutes walk from the school.

The trainee group was very involved and voluntary throughout this training and an excellent working and convivial atmosphere was recognized by all.

It will be a real pleasure to welcome a group of European trainees or a workshop to continue exchanges on processes as innovative and agro-ecological as aquaponics systems.