



## LETTER OF INTENT

### 1. BACKGROUND:

#### *1.1. Short presentation of INMA*

The National Institute of Research-Development for Machines and Installations designed to Agriculture and Food Industry-INMA, from Bucharest/Romania has an experience of about 80 years and it is the unique Romanian institute in the field. The main activities performed within the institute are *research-development* and *scientific services*.

*The research-development activities* comprise in elaboration of diagnoses, prognoses and strategies in the domain of technologies and technical equipment designed to agriculture and food industry, research and development of the processes, technologies and technical equipment for agriculture and food industry, performing of experimental models and prototypes, testing in laboratory and operating conditions of the machines and installations designed for agriculture and food industry in compliance with the UE procedures, norms and directives, standardization in the domain of technical equipment and activities of professional training, specialization and staff certification in the domain of mechanization technologies.

*The scientific services* comprise in testing of technical equipment, certifying the product conformity, performing technical inspections for tractors, lorries, trailers and cars, technological transfer and innovative business through the accredited incubator INMA-ITA.

*The main Research Directions* are:

- Fundamental research of interaction phenomena of biological, soil and technological factors on the technical equipment in the processes of mechanization and automation of works in agriculture;
- Scientific substantiation of the processes in agriculture, food industry and creating of new innovative technologies, instruments and technical equipment designed to soil works, establishing, maintaining and harvesting agricultural crops, horticultural cultures, as well as, agricultural and livestock and agro-forestry works; in compliance with environment preserving and fighting against draught phenomena and desertification;
- Renewable power sources: biomass, bio-fuels, biogas (from animal dejections and vegetal wastes), technologies and technical equipment for their use in conditions of efficiency, life, health and environment protection;
- Rural development and raising of life quality by technological transfer and demonstrations of the research results performed by the Institute;
- Strengthening the research basis (human resources, logistics, research equipment) and performing some partnerships for connecting to ERA, including the integration within the technological platforms at the European level;
- Substantiating and achieving new mechanizing and automating technologies designed to agricultural and food industry processes, such as: conditioning, processing, stocking and storing primary agricultural products, non-agricultural products and aquaculture in conditions of efficiency, security and safety.

#### *1.2. INMA achievements*

Modern aquaculture represents a major innovation in the production of fish and aquatic food and food production sector with the fastest growing, reaching an average global growth rate of 6-8% per year. As aquaculture production continues to experience tremendous growth in the world, in

Europe it is stagnating for over 10 years.

The European Union is one of the largest markets in the world of aquatic food that depends increasingly on imports to meet a growing demand.

Communication from the Commission to the Council and the European Parliament - *Building a sustainable future for aquaculture - A new impetus for the Strategy for the Sustainable Development of European Aquaculture* - COM(2009)162 final, predicts among other things that the future of the EU aquaculture sector will have to be in a top position in terms of sustainable development. Have to be implemented appropriate measures to ensure that our industry a leading role in the "blue revolution", both in terms of aquatic food production, the technology and the innovation, and regarding the elaboration of some standards and certification processes at EU and international level.

In the Commission Communication to the Council and the European Parliament - COM (2011) 417 final it is stated: As part of the **Reform of the Common Fisheries Policy (CFP)**, EU wants to give new impetus to sustainable European aquaculture production, „*The EU should promote sustainable aquaculture, competitive and diversified research support and the latest technology and able to overcome the problems of access and administrative barriers*”.

INMA as a research and development institution in Romania, with a constant concern for research and achievement of technological installations in the field of fisheries, designed, developed and tested technologies and technical equipment for fish farming in recirculating acvacol system. Through the information held, the experience gained through its own achievements and by the endowments available (database, execution sector of experimental models and prototypes, certified laboratories to carry out of tests and equipped with measuring and control devices and ultra-modern stands for testing) INMA can approach projects at quality parameters in accordance with the current requirements in the field.

The Institute has a long experience in the field of fisheries and aquaculture and, lately, has coordinated or collaborated on ten topics of research in the aquaculture in acvacole recirculating systems for intensive farming of fishes with the optimization of the technological parameters and insuring of sanitary-veterinary protection and the use of alternative energy sources (heat pumps, solar panels, photovoltaic panels, crop residues).

Within a national consortium consisting of two research institutes (INMA as the coordinator of work), a university and a commercial company it was achieved an experimental hall for growing of fishes in recirculating system. Within a contract with the same commercial company, INMA has elaborated the technology and the project of the technological installations *of a hall for sturgeon rearing in the Herneacova area, Timis County*. Within the CBC Programme Hungary-Romania was performed the work regarding „*Breeding of sturgeons and other freshwater predatory fish species in cages*” and within of another project was performed a „*Joint Research Center for fish hydrobiology and biology in Szarvas and Timisoara*”. Within a national consortium consisting of a research institute and three universities was developed and optimized a technology for intensive farming of pikeperch in recirculating water systems and it was implemented some biotechnologies of perch reproduction, in order to increase the productive potential of this species.

For achieving an ecosystem and economic efficiency in aquaculture the next concern is to develop a technology and of an installation for the production of denitrifying plants from the aquaponic crops, integrated into a recirculating acvacol system (RAS) for rearing of fishes. In this way will be improved the water quality within the recirculating systems intended for fishes rearing, through the aquaponic crops, a larger production, a greater food security, a better use of natural resources, as well as the minimization of the effects that may be harmful to the environment. Within the aquaponic crops are integrated the technologies for plant growing with a denitrification potential (eg. lettuce, spinach) with the technologies of fish rearing, so that to capitalize the resulting nitrates in the water recirculating system.

### **1.3. INMA infrastructure**

In terms of recognition of technical and scientific capabilities by accreditation, the research infrastructure of INMA consists in research, testing and experimenting laboratories, accredited in accordance with the rules and directives of EU, which verifies the technical and scientific competence of certain ideas, solutions, equipment and new products having a state-of-the art technical endowment and high qualified personnel.

The institute has a Testing Department for Tractors and Technical machinery for agriculture

and food industry which has in subordinate 2 equipped laboratories performing similar to EU laboratories level, accredited in accordance with standard SR EN ISO / IEC 17025: 2005:

- DITRMA - Testing Laboratory for Tractors and Technical Equipments for Agriculture and Food Industry;
- LIMS – Testing Laboratory for Spraying Machines.

## 2. DIRECTION AND OBJECTIVES OF RESEARCH:

We are open for any collaboration in order to continue and develop our research on improving the existing recirculating acvacole systems and developing of new systems integrated with environmental impact assessment, implementation of strategic guidelines for the sustainable development of European aquaculture and delivery of a framework for a sustainable growth.

## 3. COLLABORATION PROPOSAL:

Programme: Horizon 2020

Pillar no. 3: Societal Challenges

Objective no. 9: Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

Call: Call for Sustainable Food Security - *Sustainable food production systems*

Topic: SFS-11-2014/2015: Implementation of an Ecosystem-based approach for European aquaculture  
B. [2015] Consolidating the environmental sustainability of European aquaculture

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