



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 (www.inma.ro) 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

The technologies for conditioning, processing, stocking and storing primary agricultural products represent one of the main directions of research performed in our institute. In the field of preservation technologies of agro food products, INMA has performed scientific researches and has obtained results regarding various methods for the drying of fruits, vegetables and medicinal herbs.

Within a national consortium, consisting of two national research institutes, an academy of sciences and a decontamination products manufacturer, has been addressed the issue regarding post-harvest treatments of horticultural products in order to obtain a bigger acceptable duration for the storage of the horticultural products consumed in fresh-state, while maintaining their organoleptic and nutritional qualities. In this regard, it is proposed a method of pre-treatment using an unconventional method based on radio-abiosis (non-ionizing ultraviolet radiation UV-C), which will enhance the bacteriostatic effect, partially provided by refrigeration. It aims to develop an experimental model of decontamination installation of exterior surfaces of horticultural products. The project was submitted in a national competition of research projects and currently is in the evaluation stage.

In the field of temporary storage of horticultural products consumed in fresh-state, we have in view the development of automated installation for storage of horticultural products, which will ensure their preservation in optimal conditions of temperature and relative humidity, through refrigeration in cold chambers with atmosphere decontaminated using non-ionising ultraviolet radiation UV-C. This issue is currently being approach in our institute.

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 / CEI 17025: 2005:

- DI - Testing Department for Tractors and Technical Equipments for Agriculture and Food Industry.

2. DIRECTION AND OBJECTIVES OF RESEARCH:

We are open to collaborate in scientific research activities regarding the agricultural and food industry processes, such as: conditioning, processing, stocking and storing primary agricultural products.

3. COLLABORATION PROPOSAL:

It is a fact that fruits and vegetables are one of the indispensable components of rational human consumption. The need for fresh products is maintained not only in the optimum period for its capitalisation but also in extra season. Of particular importance in order to obtain a bigger acceptable duration for the storage of the horticultural products consumed in fresh-state, is to provide a low microbiological load at the beginning of the refrigeration process. This requires to minimize the possibility of microbiological contamination of the products in all stages prior to the refrigeration stage itself. In this context, as an alternative method to fungicide treatments, we propose an integrated approach consisting in using non-ionizing radiation UV-C as postharvest treatment of the outer surfaces of horticultural products combined with refrigeration in unmodified atmosphere but decontaminated also with UV-C. We have identified the following call that supports our scientific approach in order to promote its market application:

Programme: Horizon 2020

Pillar no. 3: Societal Challenges

Objective no. 2: Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

Call: Sustainable Food Security

Topic: SFS-17-2014: Innovative solutions for sustainable novel food processing

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