

STAGE 2 - ABSTRACT

At the level of the **Complex Project INNOVATIVE TECHNOLOGIES FOR IRRIGATION OF AGRICULTURAL CROPS IN ARID, SEMIARID AND SUBHUMID-DRY CLIMATE (SMARTIRRIG)**, stage 2, the planned activities were fully realized, the objectives degree of achievement being 100%.

The result indicators are: 1 new technology; 7 manufacturing documentation; 1 significantly improved product (underground irrigation / fertirigation system); 6 new products (technical equipment for grounding irrigation / fertirigation hoses based on GPS technology; innovative mechanical support system for photovoltaic and wind power source; photovoltaic and wind energy source with controlled storage in batteries; mobile irrigation system precision; modular wastewater treatment plant; primary solution injection device); 1 improved technology (advanced wastewater treatment technology from livestock farms); 3 methods of experimentation; 1 computer product; 6 patent applications filed with OSIM; 4 articles published in ISI Indexed Proceedings; 17 articles published in BDI Indexed Proceedings; 1 article accepted for publication in ISI indexed magazine; 3 articles published in BDI journal; 1 workshop on the partial results of the Complex Project.

Within the **component project 1 - Innovative technology for underground irrigation / fertilization of hoeing crops specific to arid areas**, the innovative technology for underground irrigation / fertilization of crops was developed; the experimental field from SCDCPN Dăbuleni was evaluated in terms of topography and the quality and availability of water for irrigation; the manufacturing documentation of the underground irrigation / fertirigation system was elaborated and the physical model was partially realized; the manufacturing documentation of the technical equipment for the placement in the soil of the irrigation / fertirigation hoses equipped with GPS system was developed and the physical model was manufactured; experimentation of the technical equipment for the placement in the soil of the irrigation / fertigation hoses under laboratory-field conditions; OSIM registered two patent applications; two articles were published in ISI Indexed Proceedings and 3 articles in BDI Indexed Proceedings.

Within the **component project 2 - Innovative mobile system for powering irrigation and fertilization installations using photovoltaic and wind power**, a technological study of the solutions for the development of an innovative mechanical support system for the photovoltaic and wind energy source was performed; the manufacturing documentation of the innovative mobile mechanical system that ensures the rapid mounting and dismantling of the photovoltaic and wind energy source in the open field was developed and the physical model was manufactured; the manufacturing documentation of the photovoltaic and wind energy source with controlled storage in the batteries was elaborated and the physical model was manufactured; one patent application.

Within the **component project 3 - Innovative system for precision mobile irrigation of leguminous crops and hoeing plants**, the manufacturing documentation of the mobile precision irrigation system was developed and the physical model was manufactured; a patent application has been registered with OSIM; participated in two International Inventory Exhibitions where a Silver Medal and a Diploma of Excellence were obtained; two articles were published in ISI Indexed Proceedings and two articles in BDI Indexed Proceedings.

Within the **component project 4 - Innovative technological solutions for utilization of waste water for irrigation of energy crops**, the technological solution was tested and the parameters of operation of the wastewater treatment process were optimized; elaborated the technical specification for the realization of the experimental model; the technical documentation for manufacturing of the experimental model was elaborated and the experimental model of a modular wastewater treatment plant was physically manufactured; a patent application has been registered with OSIM; ten articles were published in BDI Indexed Proceedings and three articles in BDI Indexed Journal.

Within the **component project 5 - Innovative fertilization technology in fruit and vine plantations specific to arid and subhumid-dry climate**, the manufacturing documentation of the primary solutions injection device was elaborated and the experimental model was physically manufactured; the mathematical model and the simulation of the injection device of the primary solutions were realized; a software test application was developed under laboratory conditions of the motor piston from the injection device; the injection device was tested in the laboratory; a patent application has been registered with OSIM; an article in the ISI indexed journal was accepted for publication; two articles were published in Proceedings indexed BDI.