

Technical, Economics, and Information Efficiency of Using Unmanned Aerial (UAVs) Vehicles System for Fodders Production Under Limited Irrigation in the United Arab Emirates

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The goal of this research is to explore advantages and limitations of using Unmanned Aerial Vehicles System (UAVs) as part fodder production under limited irrigation system. The aim of the research is to optimize experimental fodders production plots output received subject to the limited irrigation conditions. This research tested three different levels of irrigation in relation to the differences in efficiency obtained with and without utilization of monitoring three types of fodder (i.e. Alfalfa, Bermuda grass and native grass) production. Factors of the analysis that are considered in the trials include water using Sprinklers irrigation system and six levels of fertilization frequencies. The data collected and analyzed is essential to produce guidelines and recommendation in regard to the selected UAVS under small-scale trials to fulfill the plants Irrigation Water Requirements (IWRs) and in order to achieve the technical, economic, and information efficiency. The research used incomplete block designed trials (repetitive trials for the same grass at the same time) to retrieve the inputs amounts used and the yields of the fodders output side to measure technical efficiency. Costs of inputs as well as yields of the products and market prices of output are considered to measure the economic efficiency. The study used partial budgeting technique to measure the difference of net benefits (after operational costs is deducted) before and after UAVs technology adoption. The study also tested the validity and accuracy of selected wireless sensors systems installed on the UAVs to measure information effectiveness and summarize the lessons learned from the experiment.

Keywords: Emerging/Digital Technologies, Unmanned Aerial Vehicles System (UAVs), Limited Irrigation, Fodder Production