Bioristor: an in-vivo Organic ElectroChemical Transistor for precision agriculture

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In the last years, the demand for a strong improvement of the agriculture sustainability has been driven by the increase of the world population, the request for a reduction in the use of fertilizers, the limited availability of blue water. In this context, we have developed a sensor, called bioristor, that is inserted in the plant stem allowing a continuous measurement of the sap ion concentration, thus a continuous monitoring of the plant physiology and functions. In this talk, it will be reported about the data obtained by the application of bioristor in open fields to different crops such as tomatoes, grapes, actinidia, apple trees. The capability of bioristor to early detect drougth stress will be reported. In particular, the bioristor has been successfully applied in combination with the use of artificial intelligence for reducing, in the tomato season 2023, the irrigation water supply by 45%.