

# Zinc measurements in agricultural field by means of electronics and nuclear instrumentation

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**Abstract:** Electronics and computers are rapidly advancing into agricultural systems management. Silicon and software now impact strongly production agriculture as well as industry in general. In the next few decades electronics and computer applications in agriculture will be as significant as were materials and fluids technologies in industrialized economies over the last ten years. A measure of this shift is that the electronics content of agricultural machinery and products used in agriculture will represent a multibillion-dollar market worldwide by the year 2000. For agriculture of the most significant opportunities and solutions lie within the domain of instrumentation applications. The scope and importance of technical developments in the last five years amply demonstrate this benefit. This paper presents the suitability of PIXE to study the trace metal Zinc in soil, showing additionally that many solutions in agriculture lie within the domain of instrumentation development. So far, processes involved in Zn adsorption, as well as for many other elements, are not completely understood. Soil samples were analyzed using both PIXE and the classical procedure of INAA technique for comparison. Results showed that there is a good linear relationship for Zn concentration obtained using these techniques.

**Key-Words:** Agricultural Instrumentation, PIXE, INAA, Micronutrient, Soil Analysis, Zinc, Heavy metal, Trace-elements

## 1 Introduction

In the near future, developing and successfully commercializing new agricultural products and services, including those associated with site-specific agriculture, will require organizing increasingly complex partnerships. These partnerships will bring together specialists with many different perspectives and kinds of expertise. The success of agricultural initiatives will depend on the capability of these specialists and the degree to which their activities are coordinated, integrated, and focused. Research and development (R&D) efforts enabling and supporting complex commercial initiatives in agriculture will also be organizationally complex. They will require unusually close relationships in which public institutions and agencies are full partners in commercialization efforts. Like other suppliers and partners in

these efforts, public institutions and agencies will provide unique capabilities and facilities. Differences in organizational characteristics however may make it difficult for some groups to work well together. Like the collective memory of networked computers, partners in the complex value-added partnerships of the future, including those with responsibility for research and technology transfer, must to function as one. This virtual agriculture will depend heavily on networked computers. At present, agriculture is driven by the logistical demands of serving large urban populations. Made up of many highly specialized activities, it involves many different individuals and groups, conceiving, designing, developing, implementing and managing activities once carried out almost entirely by farmers. Farmers themselves are

