

## Measuring Nutrients in Soil using the HI 83225 Photometer

**AN #:** 14\_001\_07\_001

**Market:** Agriculture

**Subcategory:** Nutrient Measurement

**Product:** HI 83225

### Description:

Nutrient availability is an essential soil characteristic that should be continually monitored in agricultural applications. The most essential nutrients necessary for optimum plant growth are nitrogen (N), phosphorus (P) and potassium (K). Nitrogen is necessary for the vegetative plant growth phase since it is a primary element for proteins, DNA, and hormones. The growth phase is characterized by the lengthening of the trunk and an increased production of foliage. Phosphorus is also found in DNA and is responsible for many physiological and biochemical processes. Furthermore, phosphorus stimulates root growth, blooming, and is necessary in the formation of seeds. Specifically, plants uptake phosphorus in the form of phosphate, while potassium is taken up by the plant in its elemental form. Potassium is used in protein synthesis and improves the quality of the fruits and flowers. Maintaining the proper balance of these nutrients at different stages of plant development is a key component in farming applications and can be found on a variety of packaging of fertilizers labeled as NPK. For example, a growth stage fertilizer will have a high nitrogen number, while a fruit/flowering fertilizer will have a high phosphorous content number.



### Application:

An agronomist working in a greenhouse approached Hanna Instruments looking for a way to measure a variety of nutrients in soil. The **HI 83225** nutrient analysis photometer was recommended since it is specifically designed to measure the most important parameters for plant growth. The HI 83225 measures ammonia, nitrate, phosphorus, and potassium in three ranges (low, medium, and high). Besides the primary nutrients, the HI 83225 also measures calcium, magnesium and sulfate. The customer appreciated that only one meter, which operates on either a supplied 12 VDC adapter, or internal rechargeable battery, was necessary to measure all the parameters, limiting the space necessary to conduct the testing. The customer also appreciated that the meter was very intuitive with simple navigation through the various parameters to be measured and specific instructions to perform each test. The HI 83225 is supplied with the HI 83225-100 sample preparation kit that contains all the necessary materials, including carbon powder and filter discs, to remove color and turbidity from the soil extract solution that could potentially cause an interference. With proper treatment the measurements performed by the photometer are highly accurate and allow for better crop management by establishing trends as to when and how much fertilizer needs to be used at different stages of development. These trends are easier to manage by a logging feature within the meter and downloading to a PC for record keeping by using a USB cable and HI 92000 PC compatible software.

