

# Metos® NPK

## MEASURE YOUR FERTILIZER REQUIREMENTS AND SAVE MONEY AND THE ENVIRONMENT

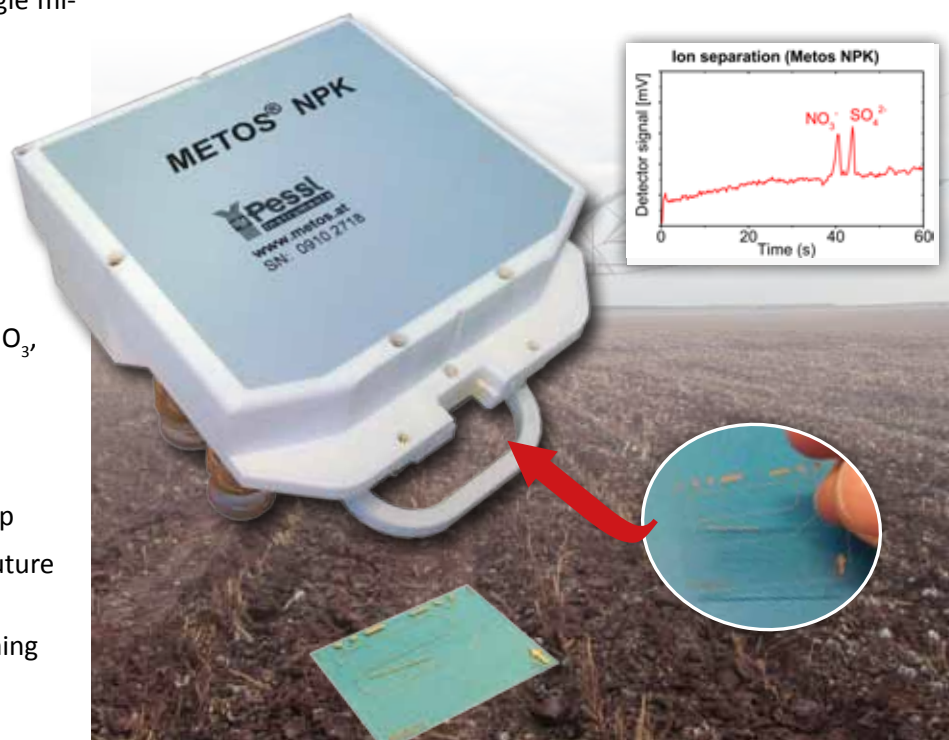
**Metos®NPK: the innovative lab-on-a-chip analyzer that supports your decisions on how much and where to fertilize.**

Metos®NPK is a simple and innovative soil macro-nutrients analyzer based on capillary electrophoresis, which gives you quick and precise indications on the level of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , K and  $\text{PO}_4^{3-}$ . Data measured can relate to GPS positioning and therefore can support precision farming systems.

Crop macro-nutrient needs are easily satisfied with pre-drilling or post-emergence fertilization. Adequate fertilization should not be based on empirical evaluation; plant needs are dependent on the presence of chemical elements in soil. Fertilizers cost money as well as the cost of distribution in the field. The risk is to over-fertilization without any needs from the crop and with the risk to damage the environment. Measuring nutrient level in the soil is the answer. A laboratory measurement gives the highest precision but takes time before results are delivered and is expensive. Some small field test kits are available but most of them are not highly precise, too complicated to use or give results only for some nutrient. Metos®NPK is the simple answer that integrates soil nutrient analysis into a single microchip.

**Metos®NPK is the result of a pan-european project that features:**

- Laboratory precision analysis for  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ , K and  $\text{PO}_4^{3-}$
- Results availability in minutes
- GPS-geo referencing of samples
- Multiple sample analysis on a single chip
- Results are store on web platform for future use
- Possible integration with precision farming systems





# Metos<sup>®</sup> NPK

## How does Metos<sup>®</sup> NPK work?

After the soil samples are extracted in a traditional way from the field the sample preparation is done directly in the field, car or office. The filtered sample solution is simply injected into a capillary to which a high electric voltage is applied. Many of the extracted chemical compounds are electrically charged and therefore start to migrate in the electric field. Every molecule type migrates at an individual speed through the liquid medium, according to its molecular size and charge. The sample ingredients are separated and reach a detector at different migration times so the concentration of each sample compound can be measured individually. This technology works with on-site measurements in field conditions and can be operated by users without laboratory knowledge. The measurement data is related to GPS coordinates and is sent via telecommunication to our web-cloud (FieldClimate.com), where it is saved and can be accessed by multiple users. The results are also shown in GIS maps in graphical mode where the user can see actual nutrient status of the fields. The possibility of transferring the data to machine-readable formats is under development and will allow the automatic site-specific variable rate application with precision farm machinery (e.g. fertilizer spreaders, sprayers etc).

## What is the benefit for me?

A more rational approach to soil fertilization will result in a maximization of investment; the crop will have the right nutrient where it is needed.

Consequently, fewer fertilizers will be used with a saving that goes into the pocket of the farmer and also for the environment, thanks to a reduction of the level of inputs.

## Technical details

- Minimum sample volume: 0,250 ml
- Measurement range: 5-1000 ppm (0,01-0,5 g/kg)
- Resolution: 0,5 ppm (1 mg/kg)
- Accuracy: for measurement of liquid concentrations (ppm):  $\pm 10\%$ .  
For measurement of soil concentrations (mg/kg):  $\pm 15\%$
- Chip life time: 12 hours after braking of the sterile package
- Battery capacity: 12 hours measuring time; 3 months standby time
- Duration of measurement: 5 minutes

All technical data is not binding and can be changed any time without prior notice.

