Alfalfa interseeding at maize planting requires specific measurements

Alfalfa interseeded at maize planting could serve as a cover crop to reduce soil and nutrient losses during maize silage production. Interseeded alfalfa has also potential to enhance productivity by bringing this leguminous forage crop into full production the following year. In the U.S. state Wisconsin, interseeded maize silage and alfalfa reduced runoff of nitrogen and phosphorus by 23-82% and soil erosion by 45-87% compared to conventional maize silage, according to researchers at the University of Wisconsin-Madison and the U.S. Dairy Forage Research Center. However, alfalfa stand frequently failures during interseeding. Research results suggest the maize-interseeded alfalfa production system could be reliably implemented if an appropriate alfalfa variety is sown and treated the with plant growth regulator prohexadione-calcium. The researchers reflect on this approach in a presentation at at the 2017 ASA-CSSA-SSSA Annual Meeting.

Seed treatment with chelates

Application of chelates to seeds can enhance the uptake of some micronutrients in seedlings growing from these seeds. Researchers at the Pennsylvania State University and the University of Minnesota have found this in greenhouse studies with maize, soybean and hard red spring wheat. Seedlings growing from chelate-treated seeds are cultured in acidic, near neutral and alkaline soils. The chelates used are citric acid, DTPA, EDDHA, EDTA and oxalic acid. Results of these experiments have been presented at the 2017 ASA-CSSA-SSSA Annual Meeting.

Decomposing tea bags reflect soil health

The difference in decomposition rate of small bags filled with green tea or rooibos is a promising indicator for the health of cultivated soil. Researchers at the Iowa State University Department of Agronomy conclude this from measurements of the decomposition rate of buried Lipton tea bags and comparisons with other biological characteristics, along with chemical and physical health measurements. The green tea bag represents relatively fast decomposing plant debris, whereas the rooibos bag is representive for plant material with a relatively slow decomposition rate. By using tea types with contrasting decomposability, one can construct a decomposition curve using a single measurement in time. The researchers presented their approach at the 2017 ASA-CSSA-SSSA Annual Meeting. They say to hope to validate the use of a tea bag-based soil decomposition index as a cheap, scientifically-robust method for farmers to assess their soil's health.

Involve the public

The soil decomposition index is an adapted version of the original tea bag index developed by an international team of European scientists (see paper). With their website Teatime 4 Science they try to involve the public to use the tea bag method to collect data on decay rates from all over the world. With these data they will make a global soil map and consequently improve global climate models that use these maps. Unilever crossed this plan by changing the fabric of the Lipton tea bags, from woven, nylon into nonwoven, polyethylene terephthalate bags; the tea inside has remained the same. The Teatime 4 Science researchers therefore launched TBI 2.0, where they collect data from the nonwoven bags and perform additional measurements to clarify the effect of this change on the decomposition rates measured.

Improving the sensitivity for ionic solutes analysis

Researchers from Kumamoto University in Japan have developed a new method to improve the sensitivity of analytical systems for various ionic solutes in a water sample. There are several different enrichment methods that can be used to increase ionic solute levels in a sample. The researchers used the electrodialytic ion transfer enrichment method since quantitative ion transfer can be achieved and the transferred ions become enriched if the sample solution flow rate is higher than the acceptor solution. They found that if the flow rate for the sample solution (Fs) was higher than that of the acceptor solution (Fa), the enrichment effect became equivalent to the ratio of the two flow rates (when Fa is not 0), and ion enrichment could be performed in just a few seconds. Upon testing this method, researchers found that ion chromatography system detection limits were improved by a factor of ~10 for inorganic cations and ~50 for heavy metal ions, which follows the flow rate ratios of Fs/Fa = 10 and 50 respectively. Similar detection limit results were received in a flow injection analysis (FIA) system. With the present method, the sensitivity of any analytical system can be improved. The researchers published their method in the scientific journal *Talanta*.

Simultaneously estimation of some nutrients and CEC of soil

Japanese researchers have developed a method to simultaneously estimate the cation exchange capacity (CEC) and several elements in soil with an electromagnetic sensor. In a recently published study they have attempted to estimate CEC and the amounts of chemical elements that constitute the clay in the soil (total carbon, total nitrogen, aluminium, calcium, iron, magnesium, potassium, silicon, sodium, phosphorus and "available phosphoric acid"). For this purpose they analysed the responding spectra to the applied low-frequency electromagnetic wave with an alternating current electromagnetic sensor. The researchers considered that both the CEC and some clay-constituting elements can be quickly estimated by low-frequency spectroscopic analysis using the alternating current electromagnetic sensor. The researchers shared the results of this study at the International Plant Nutrition Colloquium (see Proceedings Book XVIII IPNC p. 842-843).