Soyabeans responds to rhizobium inoculation in DR Congo

In South Kivu of DR Congo, on-farm trials have been ongoing for three seasons to ascertain the response of soyabean to rhizobium inoculation and phosphorus fertilizers. Trials were established in three zones of South Kivu namely the southern zone (sites Mulamba and Ikoma, Mushinga), the northern zone (sites Bughore, Karehe and Birava) and the south-east zone (sites Mumosho and Nyangezi). Testing was done with BIOFIX, a commercial rhizobium inoculant from MEA-Kenya, two P-fertilisers (DAP and TSP), K-fertiliser (muriate of potash – KCl). Small quantities of urea were used a sowing in some experiments to test the effect of a 'starter' dose of N.

In the five out of seven sites that provided yield data, we observed a yield range of 1.1 to 2.6 t/ha with an average yield of 1.5 t/ha. Inoculation with BIOFIX gave a small but consistent yield increase of between 9-10% (0.1-0.25 t/ha). BIOFIX was more effective especially where a combination of TSP and KCl were applied. It appears that in South Kivu, there is no need of using starter nitrogen if rhizobium inoculants are available. The relatively small, but consistent, soyabean yield increases caused by inoculation highlight the need for accurate yield assessments and relatively homogenous trial fields in order to observe these differences. Given the small costs associated with inoculation, also a yield increase of 9-10% make the investment in inoculation worthwhile for farmers. Much larger yield increases have been observed in many of the numerous demonstration plots that are scattered across the landscape. Farmers have expressed interest in using BIOFIX. In addition, they would like to increase the number of trials and size of plots in the upcoming season. N2Africa has responded to this request by providing farmers with 75 kg of inoculants, enough to establish 1,500 ha of soyabean.

Photo 1: These plants are showing symptoms that are typical of magnesium deficiency: yellowing between the veins of the *young* leaves (inter-veinal chlorosis). The problem is more pronounced where K fertilizer is added – a well-known phenomenon due to imbalances in the availability of cations. Potassium deficiency can look rather similar but tends to be seen on the older leaves and, of course, is not seen when K fertilizer is used.

Generally, the trials are showing clear responses of bean and soyabean to P and K application. Especially in the southern zone, where soils are particularly depleted, other nutrient deficiencies

appear to be constraints. Also in the northern zone, visual observations of plants on some soils show deficiency symptoms that are induced when K fertilizers are added. The symptoms are typical of magnesium deficiency – which can be induced by addition of K fertilizer when there is little available magnesium in the soil. The agronomy team in DR Congo is now testing a new legume fertiliser blend called SYMPAL to address the possible magnesium problem. Moreover, the team is developing a plan to investigate thoroughly the factors limiting soyabean growth. This includes studies to unlock the interactions between legume genotypes, rhizobium and management and this is a study topic of one

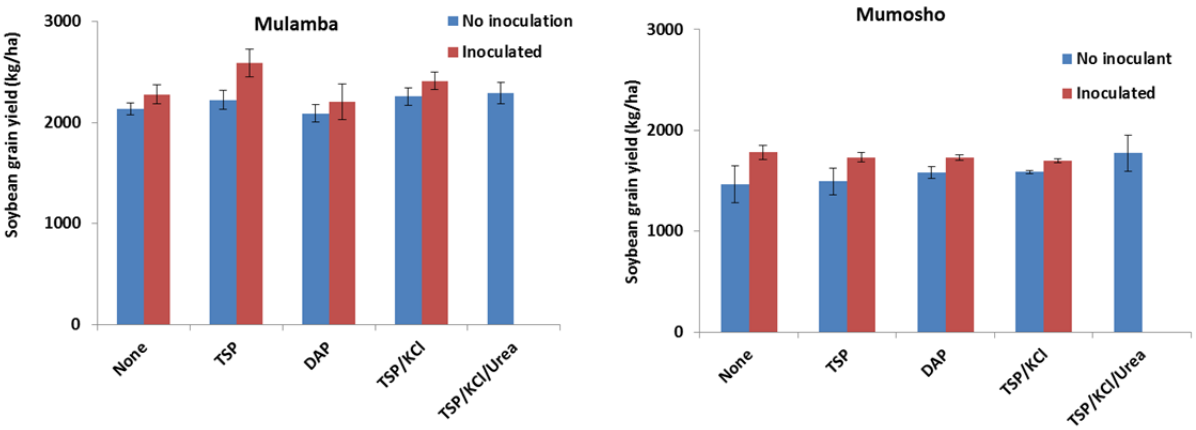

Figure 2: Response of soyabean to rhizobium inoculation and application of P, K and Urea as observed at Mulamba and **Mumosho sites in DRC Congo. The trend is similar to other sites.**

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