

## ABSTRACT

There is a wide application of rhizobia inoculants to legume crops in Africa, irrespective of the soil acidity, though the latter limits the effectiveness of inoculants. Two trials were conducted in a controlled environment to determine suitable soil pH and impact of liming on soybean nodulation and nitrogen fixation to inform proper application of the rhizobia-inoculant technology on acid soils. In the first trial; soil, variety and inoculation had significant influence ( $p < 0.05$ ) on weighed nodule effectiveness (WNE) and N fixation. Strongly acidic soils recorded low WNE and N fixation. In the second trial, WNE and N fixation significantly increased with co-application of lime and inoculation ( $p < 0.05$ ). The results showed that soybean inoculation is effective in increasing nodulation and N fixation in moderate acidic soils, contrarily to strongly acidic soils. Interestingly, co-application of lime and inoculation has potential of increasing nodulation and N fixation in strongly acidic soils. The WNE is recommended as a robust formula to report nodule effectiveness, compared to the current percentage method.

### KEYWORDS:

- **Acidic soils**
- **nodule effectiveness**
- **biological nitrogen fixation**
- **inoculation**
- **nutrients**
- **soybean**
- **soil liming**