Reg. No: L 8988 Act No. 63 of 1947

BACTERIAL LEGUME INOCULANT FOR THE EFFECTIVE NITROGEN FIXATION ON SOYBEAN (*GLYCINE MAX*)

Active Ingredient: *Bradyrhizobium japonicum*
Minimum 6.5x10⁹ cfu/ml

SIGNAL GENERATION | OSMO PROTECTION | **N-Factor 4**

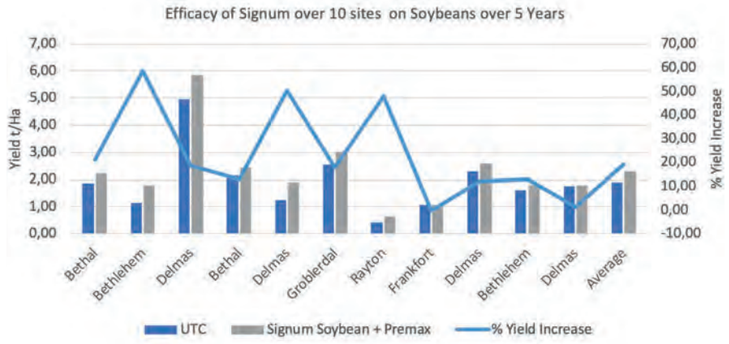
SIGNUM SOYBEAN LIQUID INOCULANT contains two very advanced technologies – **Signal Generation** and **OSMO Protection**. Signum contains a high concentration of *Rhizobium* bacteria and multiple signaling molecules to increase the infection process of the bactria into the plant, which increase the nitrogen fixation process. The signaling molecules also stimulate the defense mechanisms of the soybean plant against disease and climatic stress.

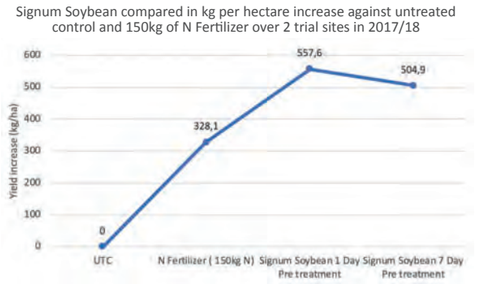
Flavonoids secreted by the host plant roots activate in *Rhizobia* the expression of nodulation genes necessary for the synthesis and secretion of lipochitooligosaccharides (LCO), named Nod factors (NFs). These Nod factors are responsible for successful nodulation of soybean roots. With the production of Signum, flavonoids and higher levels of LCO's being produced, an increased rate of nodulation of the *Rhizobium* takes place. Faster and better quality nodulation ensures the *Rhizobium* is removed faster from harsh environmental conditions in the soil and that nitrogen can be fixed from an earlier stage.

TRIAL RESULTS STRAIGHT FROM THE FIELD

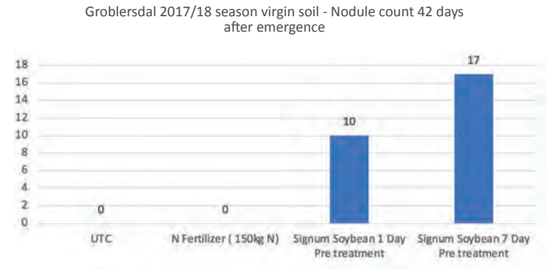
SIGNAL GENERATION
Deals with several management concepts regarding plant-microorganism interaction. It acts as an elicitor to multiple signals in the interaction between plant and bacteria.
- Contains more than 10 Billion CFU/ml at manufacturing
- At expiry date of 18 months Signum contains a min of 6.5 Billion CFU/ml
- 21 Day Pre-treatment of the seed
- Signaling molecules, activating the Nod Factors
- Stimulating the defence mechanism of the plant against diseases and climatic stress
- Accelerated nodulation process and increased biological nitrogen fixation
- Leading to higher yield potential

Graph 1: At 10 trial locations Signum has proven its efficacy in promoting nitrogen fixation on soybeans. In a large variety of climatic conditions in the most important soybean producing regions Signum increased yield with an average of 368kg/ha.





Graph 2: The results from two locations shows that Signum at 300ml is more beneficial than nitrogen fertilizer application on soybeans. Signum increased yield by an average on 558kg/ha over the untreated control on same day treatment and planting and by 505kg/ha with a 7 day pretreatment.



Graph 3: Active nodule count in Groblersdal. Signum showed an average nodule count of 10 nodules per plant with same day treatment and planting, and 17 nodules with a 7 day pretreatment, whereas the nitrogen fertilized treatment and untreated control showed no nodulation.

Graph 4: Effect of Signum on flower and pod numbers. At the Groblersdal location the results show that increased nitrogen fixation leads to bigger better functioning plants, increasing flower and pod counts that ultimately leads to increase in yield. Signum with same day treatment and planting increased the flower count over 6 plants by 539 and 181 flowers over the untreated control and 150kg N/ha. With 7 day pre-treatment of Signum increased flower count over the untreated control and 150kg N/ha by 533 and 175 flowers respectively. Total pod count was increased by 540 pods over the untreated control and with 176 over 150kg N/ha for same day treatment and planting. With 7day pretreatment with Signum pod count was increased by 534 and 170 pods over the untreated control and 150kg N/ha fertilizer control.