

# Effects of application of *Bradyrhizobium japonicum*, phosphorus and potassium fertilization on soybean bacterial leaf pustule caused by *Xanthomonas axonopodis* pv. *glycines*

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## 1 ABSTRACT

Bacterial leaf pustule (*Xanthomonas axonopodis* pv. *glycines*), is one of the most devastating diseases in soybean producing areas around the world. In order to effectively control this disease, the effects of *Bradyrhizobium japonicum* inoculation and phosphorus and potassium fertilizer application were tested on the disease. Therefore, two separate experiments were conducted from March to September 2020 under greenhouse conditions at the experimental farm of the Faculty of Agronomy of the University of Parakou. Through the first experiment, the isolated or combined effect of *B. japonicum* with phosphorus and potassium was evaluated using a split plot design in three replications with *Bradyrhizobium* inoculation as the main factor; and mineral fertilizers, the sub-factor. The second experiment was conducted using a Completely Randomized Design (CRD) with three inoculation treatments and nine replications. Disease severity as well as plant height were evaluated according to the experiments. *B. japonicum* and potassium (375mg per plant) taken alone reduced disease severity by 28.77 and 36.39%, respectively. But their combination (coated \* potassium) induces a much more significant effect (reduction of more than 62%). The second experiment reveals a very highly significant difference ( $P = 1.07.10^{-4}$ ) between the two strains of *Bradyrhizobium* tested and the control. These strains reduce the disease severity from 40.58 to 46.05%; with better growth of plants in height. Effective management of soybean bacterial leaf pustule could therefore be achieved by coating the seeds with *B. japonicum* or applying, 375 mg of potassium per plant, or better yet, by combining *B. japonicum* with potassium (375 mg per plant).