Maize white spot (MWS) caused by the bacterium Pantoea ananatis is economically important disease in all producing regions of Brazil. The initial foliar symptoms of the disease include water-soaked lesions that subsequently develop into gray necrotic and coloring straw, varying to elliptical and circular shapes. Currently, the use of pesticide is the most effective strategy to control this disease. There is no information available about the biocontrol of MWS. Actinomycetes are a major source of new compounds with biotechnological applications, including bioactive metabolites against various phytopatogenic microorganisms. The aim of this work was to search actinomycetes with antagonist activity against Pantoea ananatis for developing biocontrol strategies for MWS disease. We evaluated 83 actinomycetes strains of the Microorganisms Multifunctional Culture Collection of the Embrapa Maize and Sorghum previously isolated from different tropical environment. Antagonist propagule suspension were deposited approximately equidistant on the plates containing solid selective medium for actinomycetes. After 72 hours incubation at 30°C, all strains were treated with and without UV irradiation for 15 minutes to inactivation of actinomycetes. Thereafter, an aliquot of TSB semi-solid medium containing P. ananatis cells was added and the zone of inhibition that that show antibiosis was measured. The results demonstrated that 6.0% and 14.5% of the strains exposed or not to UV light, respectively, showed antagonistic activity against Pantoea ananatis. The isolates A470 and ACT86, identified as Streptomyces sp. by 16S rDNA partial sequencing, showed the biggest zone of inhibition. The identification of actinomycetes strains with antibiosis activity against Pantoea ananatis can be applied in designing control strategies for maize white spot disease in Brazil.