

<b>Biotic or Abiotic Stress Factor</b>	<b>The Role of Bacteria</b>	<b>Result</b>
Lack of bioavailable nutrients	Secrete metabolites to convert complex nutrients to simple form used in uptake by plant roots and synthesize plant growth hormones and enzymes	Delayed aging and enhanced seed germination, plant growth, and yield
Water scarcity and resultant elevated salinity and heavy metal accumulation	Produce substances to regulate the uptake and distribution of nutrients and water, regulate antioxidant, pigment, hormone and stress-responsive genes and proteins, prevent the movement of toxic ions, and solubilize or convert toxic metals to non-toxic forms	Improved plant growth and productivity, increased stress tolerance, mitigation of stress-related damage, and delayed aging
Insect pests	Inhibit the larval growth of insects, increase the uptake and translocation of toxic substances throughout the entire plant, and reprogram the activity of stress-responsive genes and proteins	Systemic resistance to and control of pest infestations and mitigation of stress-related damage
Bacterial disease	Inhibit pathogenic microbial growth, form a biofilm around the root surface that secretes cell-wall-degrading substances and toxins, and reprogram the activity of stress-responsive genes and proteins	Destruction of pathogenic bacterial populations, reduction of disease incidence in plants, and mitigation of stress-related damage
Pathogenic fungi	Control the mycelial growth of fungi by altering cell structure and function and reprogram the activity of stress-responsive genes and proteins	Destruction of pathogenic fungi populations, reduction of disease incidence in plants, and mitigation of stress-related damage
Viruses	Produce antiviral compounds, trigger induced systemic resistance, and reprogram the activity of stress-responsive genes and proteins	Reduction of disease incidence in plants and prevention of viral damage
Pathogenic nematodes	Reduce gall and egg masses in plants, inhibit the growth of pathogenic nematodes, egg hatch, motility, and infection to host tissues, and reprogram the activity of stress-responsive genes and proteins	Destruction of pathogenic nematode populations, reduction of disease incidence in plants, and mitigation of stress-related damage