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Modern agriculture increasingly relies on herbicides, including glyphosate. Glyphosate is a widely used non-selective herbicide that lethally inhibits the shikimate pathway in plants. Glyphosate can reduce organismic biodiversity and deplete soil nutrients. Research shows that glyphosate may inhibit growth in some soil bacteria and fungi, while other microbes use compounds within glyphosate as a growth medium. This experiment examined the effects of glyphosate on symbiotic soil bacteria *Rhizobium leguminosarum* (an important nitrogen fixer) and *Chaetomium globosum*, and the fungi *Streptomyces griseus* and *Phycomyces blakesleeanus* when grown in culture. Pure cultures were streaked onto appropriate media under sterile conditions. Paper discs containing drops of six concentrations of glyphosate solution (0, 1, 10, 100, 1,000 and 10,000ppm) were placed within petri plate sectors. After seven days "lawns" developed and any zones of inhibition were measured. The bacteria *Rhizobium leguminosarum* showed greatest sensitivity with wide zones of clearing at concentrations of 10ppm and above (10ppm can be found in soils receiving regular glyphosate application). The endophytic fungus *C. globosum* was much more tolerant, with inhibition only at 1,000 and 10,000 ppm. *Streptomyces griseus* and *P. blakesleeanus* had no zones of clearing except at 10,000 ppm concentration. When glyphosate-saturated paper disks were allowed to dry for 24 hours before use, they resulted in larger zones of clearing than when the drying period was only 30 minutes, suggesting a concentration effect. Further research is needed to determine if the sensitivity shown by *R. leguminosarum* to glyphosate in lab conditions is also present in farm soils.