

ETHYLENE MODULATES THE HERBICIDAL ACTIVITY OF PARAQUAT

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Paraquat is a bipyridilium free radical-generating herbicide that inhibits electron transport through photosystem I. Sodium salicylate (NaSA) is an inducer of plant defenses and inhibitor of ACC oxidase, the enzyme that catalyzes the terminal step of ethylene biosynthesis. Simultaneous application of NaSA and paraquat decreased tobacco leaf area damage by 60 percent. Ethephon, an ethylene-releasing agent, significantly protected tobacco from paraquat. In contrast, inhibition of ethylene biosynthesis by aminoethoxyvinylglycine or aminoxyacetic acid did not affect paraquat activity. We observed that 1-methylcyclopropene and silver thiosulfate, inhibitors of ethylene perception, also did not affect NaSA protection from paraquat. NaSA protected both *Arabidopsis* wild type and the ethylene-insensitive mutant *ein2-1* from paraquat. We conclude that although, ethylene modulates paraquat activity, its perception is not essential for NaSA protection.