

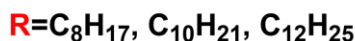
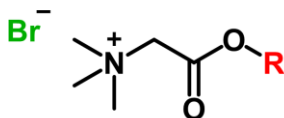
## Glycine Betaine Alkyl Esters as Promising Agrochemicals for Controlling Growth of Common Weeds

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Glycine betaine, a natural, cost-effective, and environmentally safe compound, is widely recognized for its ability to enhance plant tolerance to environmental stresses and regulate growth under adverse conditions. Given these beneficial properties, the following study focuses on glycine betaine derivatives – specifically alkyl esters containing 8, 10, and 12 carbon atoms in their alkyl chains – as potential agrochemicals with enhanced biological activity. The objective was to evaluate their phytotoxic effects and potential application as eco-friendly weed control agents. Phytotoxicity tests were conducted in accordance with OECD guidelines, using the Phytotoxkit system to evaluate seed germination and early growth of selected plants in model and commercial soil. The study included white mustard (*Sinapis alba*) and rapeseed (*Brassica napus*) as representatives of dicotyledonous plants, and amaranth (*Amaranthus retroflexus*), maize (*Zea mays*), and wheat (*Triticum aestivum*) as representatives of monocotyledonous plants. These species were selected due to their diverse growth dynamics, agricultural importance, varied physiological responses and metabolic pathways, providing a robust model for assessing compounds' selectivity and efficiency. The obtained results offer valuable insights into the differential responses of these plant groups to glycine betaine alkyl esters, indicating their potential utility as selective and sustainable herbicides. Such findings contribute to the development of innovative, environmentally friendly solutions for modern agriculture, emphasizing both crop productivity and ecological balance.<sup>1,2</sup>

### Glycine Betaine Alkyl Esters



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