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## Review

# Understanding Mechanisms of Herbicide Selectivity in Agro-Ecosystems: A Review

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**Abstract:** Weeds cause yield losses in desired crops through competition for sunlight, water, and nutrients. It is important to manage weeds in crop fields and aqua bodies using various management strategies. The most effective and efficient ways of managing weeds is through the use of herbicides. However, to understand the effects of these herbicides on the desired plants and/or the environment, herbicide application of herbicides in a field with both the desired crop and weeds. Herbicide selectivity occurs as an application treatment at a given dosage that is toxic to some plant species but does not harm others. However, many herbicides can be toxic at high dose rates even when applied to tolerant crops. This review discusses the mechanisms of herbicide selectivity which are grouped into physiological and physical. Physical selectivity occurs when physical factors such as time, the position of application, plant morphology, and soil conditions aid in selectivity. Physiological selectivity occurs when the plant species affect herbicide uptake, translocation, movement, and detoxification. Herbicide selectivity is known to be a major cause of difficulties in weed management. As a result, there is a need to understand how the environment, herbicides, and plants contribute to herbicide selectivity. Therefore, this review provides insights into herbicide selectivity and how plants escape herbicide injury to maintain diversity.

**Keywords:** selectivity, physical, physiological, herbicides, penetration