

Editorial

In Agro-Ecosystems, Long-term Weed Control

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Accepted 16 December, 2021

EDITORIAL

Weeds are the major cause of possible crop losses globally (representing 34% on average), regardless of the fact that they are typically overlooked because more attention is devoted to hazardous insects or viruses. As a result, agricultural techniques that are capable of performing effective and responsible management of these undesired plants that naturally occur in agro-ecosystems must be prioritized. As the subject area ranges from ecological to agronomical inquiries, a wide range of scientific concerns should be investigated to achieve this goal. Environmental factors, accessible scientific information, available instruments, economics, and farmers' experience all influence the methods currently used to manage weeds and their efficacy; as a result, it is impossible to design a standard strategy that can be used effectively under all conditions.

Chemical energy has replaced human, animal, and mechanical energy since the introduction of synthetic chemical substances throughout herbicide application. On the one hand, the use of herbicides assures high efficacy and reduces the need for labor better than any other technique; on the other hand, the use of herbicides ensures high efficacy and reduces the need for labor better than any other way.

The primary goal of weed management nowadays is to provide the most appropriate methods for ensuring a sustainable agro-ecosystem and the least amount of nuisance plant influence in various situations; thus, the primary goal should be to improve our understanding of the relationship between weeds and crops. The main difficulty is the concept of weeds, which should be regarded as an inextricable part of agro-ecosystems that cannot be eradicated. As a result, each weed management strategy should provide a systematic approach targeted at minimizing weeds' undesirable effects and maximizing land usage by integrating prevention and control practices. These problems necessitate the development of novel weed-control strategies.

As a result, we must transform our “agro-industry” techniques to weed control into more sustainable agro-ecosystem management. This shift has been sparked by a combination of environmental, social, and economic pressures brought on by rising production costs, soil erosion, water quality degradation, and concerns about the quality of rural life. Researchers can assist growers in meeting stakeholder requirements. Only in this way will practical solutions for long-term weed management be possible. Supports innovation in agricultural systems, which are defined by continual actions to alter and control the environment, is based on crop yield, but each adjustment serves as a catalyst for a new succession. Abiotic factors such as climate and soil qualities, as well as biotic factors such as crop or other weed species competition, agricultural methods, and landscape heterogeneity, all influence the establishment of weed communities. Weed control is a never-ending task since a few weeds often dominate farmed fields, and their eradication provides open spaces for other species to grow.

Agriculture can be thought of as a method of managing plant communities with the goal of extracting useable biomass from a limited number of plant species. Weeds are included in the other group of plant species that can be found in agro-ecosystems in this context. Despite the fact that weeds are not purposefully cultivated, they are well adapted to human-dominated areas and have long been related with crop production. For weed science researchers and producers, integrating ecological principles into weed management decision-making is a key difficulty. Weed science must play a larger role in leading ecological research in agricultural systems, allowing for new and innovative approaches to the problem of weed management that are both environmentally and economically viable in the long run.

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