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A Review Study on Weed Plants Found in Crop Fields of Gahora Jaunpur

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ABSTRACT

Weeds have a substantial impact on crop growth, productivity, and quality and are one of the main biological restrictions in agricultural production systems. Weed infestation is still a major problem in rural agricultural areas like Gohara because of ideal weather, ongoing farming, poor field hygiene, and insufficient weed control techniques. The diversity, prevalence, ecological relevance, and management of weed plants frequently found in Gohara's agricultural areas are the main topics of this review work. Weed species, both annual and perennial, cause significant financial losses by competing with farmed crops for nutrients, water, light, and space. Cyperus rotundus, Cynodondactylon, Parthenium hysterophorus, Amaranthus viridis, Chenopodium album, Phalaris minor, Echinochloa crus-galli, and Convolvulus arvensis are common weeds found in cereal, pulse, vegetable, and oilseed fields.The categorization of weeds according to their morphology, life cycle, habitat, and season of occurrence is also covered in this review. The effects of weeds on soil fertility, the spread of pests and diseases, and the preservation of biodiversity have received particular attention.

KEYWORDS

Parthenium hysterophorus, Phalaris minor, Cyperus rotundus, weeds, crop fields, Gahora, agricultural production, integrated weed management, Jaunpur

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1. Introduction

The majority of the rural population in India makes their living from agriculture, which is the foundation of the country's economy. Agriculture is the main industry in eastern Uttar Pradesh, particularly in villages like Gahora in the Jaunpur district. The main crops grown there are rice, wheat, mustard, gram, lentil, arhar, sugarcane, and vegetables.However, a number of biotic and abiotic factors frequently have an impact on agricultural output, with weed infestation being one of the most significant biological limitations.

undesirable plants that grow organically in undesirable areas are known as weeds. Robert L. Zimdahl (2018) defines weeds as plants that obstruct human activity, especially in agricultural systems, by competing with crops for sunshine, water, nutrients, and growth space. They hinder harvesting processes and lower crop quality and output. Certain weeds increase crop damage by acting as substitute hosts for nematodes, insect pests, and plant diseases.

Since every plant might become a weed if it develops in an unwanted area, the idea of weeds is not set in stone.Perennial weeds live for many years and reproduce through subterranean vegetative structures such rhizomes, tubers, stolons, and bulbs, whereas biennial weeds finish their life cycle in two years. Cynodondactylon and Cyperus rotundus are two examples of perennial weeds. Weeds are categorized morphologically as sedges, broadleaf weeds, and grassy weeds. Monocotyledonous plants with thin leaves, like Phalaris minor and Echinochloa crus-galli, are known as

grassy weeds. Dicotyledonous plants with broader leaves, including Parthenium hysterophorus and Amaranthus viridis, are known as broadleaf weeds. Cyperus rotundus, one of the most troublesome weeds in Indian agriculture, is one of the sedges, which are primarily members of the Cyperaceae family. Due to irrigation-based farming, fertile alluvial soils, ongoing cropping, and a lack of scientific weed control, weed infestation is a significant problem in Gahora village.

For efficient weed control, farmers frequently rely on antiquated manual weeding techniques and inappropriate pesticide use. Weeds thus develop quickly and result in significant yield losses. In many developing nations, weeds result in higher output losses than insects and diseases combined, according to Bhagirath Singh Chauhan Chauhan (2020). Weeds cause a 30–35% decrease in crop productivity in India. In cereal-based cropping systems, where weeds appear concurrently with crops and fiercely compete during crucial crop establishment stages, this is especially dangerous. Broadleaf weeds predominate in wheat and pulse crops, while grassy weeds are more prevalent in paddy ecosystems, according to S. K. Tripathi Tripathi's (2017) study on weed flora diversity in Uttar Pradesh's agricultural fields.While Echinochloa crus-galli, Cyperus iria, and Amaranthus viridis predominated during the Kharif season, species including Chenopodium album, Phalaris minor, Anagallis arvensis, and Melilotus indica were found to be significant Rabi season weeds.

According to A. Singh Singh and R. P. Singh Singh (2019), Phalaris minor is the most dangerous weed in eastern Uttar Pradesh's wheat fields. In the early phases of growth, it closely resembles wheat seedlings, making identification challenging and delaying treatment. They discovered that a severe Phalaris minor infection can lower wheat production by 25–50%.

In a similar vein, Cyperus rotundus has been identified as one of the challenging perennial weeds to control. According to Patel et al. (2021), this weed persists even after repeated mechanical removal and spreads quickly through underground tubers and rhizomes.Congress grass, or Parthenium hysterophorus, is one of the most harmful invasive plants in India. In grazing areas, wastelands, roadsides, and agricultural fields, it grows quickly. According to Shabbir et al. (2018), parthenium releases allelopathic compounds that reduce surrounding plants and produces a lot of seeds. Additionally, it causes toxicity in livestock, respiratory problems, and skin sensitivities.

According to R. Kumar Kumar (2020), Echinochloa crus-galli is the predominant weed in rice fields that have been transplanted because of its quick growth and fierce rivalry with rice seedlings. Control is challenging because of its early physical resemblance to rice plants.

Precision agriculture has been the focus of recent developments in weed research.

After reviewing deep learning methods for weed identification, Hu et al. (2021) came to the conclusion that image-based weed detection systems can enhance field monitoring and reduce needless herbicide application.

Techniques

Area of Study

Gahora hamlet is situated in the eastern Gangetic plains of Uttar Pradesh's Jaunpur district. The region is ideal for researching weed flora because of its rich alluvial soil, moderate rainfall, and intense agriculture.

Type of Study

The current study was carried out as a descriptive and analytical research project based on reviews. It concentrated on gathering and analyzing current scientific data about weed plants that are present in agricultural fields.

Data Gathering

Research papers, books, dissertations, agricultural reports, and government publications were the sources of secondary data.A thorough compilation of data on weed species, occurrence, detrimental impacts, and control strategies was conducted.

Compilation of Data

For ease of comprehension, the gathered data was organized topic-wise into major areas. Weeds were appropriately categorized by their scientific titles, colloquial names, crop affected, season, and type.

Weed Species Classification

Weed species were categorized according to their morphology, ecological behavior, and seasonal occurrence.

Classification by Season

Weeds were separated into four categories: perennial, Zaid, Rabi, and Kharif. The predominant weeds during several crop seasons were identified with the aid of this classification.

Morphological Categorization

Weeds were divided into three categories: sedges, broadleaf weeds, and grassy weeds. Because different weed groups call for different control strategies, this classification is crucial.

Classification of Ecosystems

Weeds were divided into four categories: invasive, perennial, biennial, and annual. Their life cycle, dispersal, and persistence in agricultural fields were all explained by this.

Analysis of Data

Qualitative comparative review techniques were used to examine the gathered data. Based on results from earlier research, major dominating weeds and their detrimental impacts were compared.

Identification of Major Weeds - Dominant weeds like Parthenium hysterophorus, Phalaris minor, Cyperus rotundus, and Chenopodium album received particular attention.

Framework for Integrated Weed Control

A variety of weed management techniques, including biological control, mulching, crop rotation, and manual weeding, were investigated collectively. This assisted in determining the best and most sustainable weed control techniques for the area.

Methodology's Conclusion

The right identification, categorization, and comprehension of weed issues and management techniques were made possible by methodology.

Result

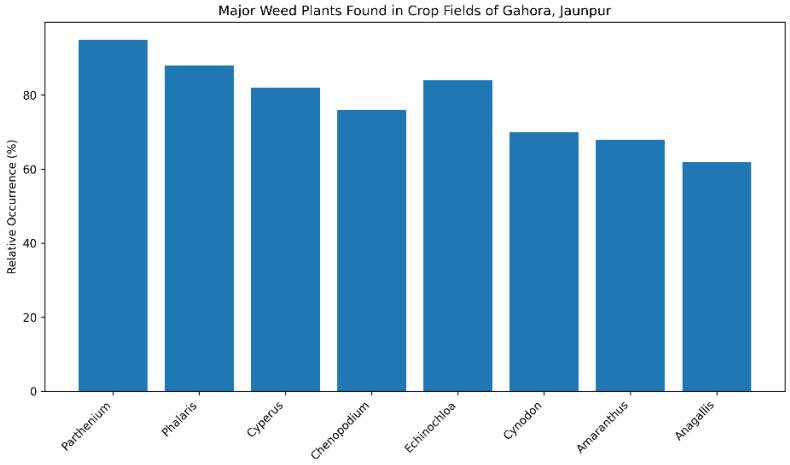
According to the current review study, one of the main factors limiting agricultural productivity in Gahora, Jaunpur's crop fields is weed infestation. According to the study, a combination of sedges, broadleaf weeds, and grassy weeds primarily impact the fields. The most prevalent and dangerous weeds among these were Parthenium hysterophorus, Phalaris minor, Cyperus rotundus, Chenopodium album, Echinochloa crus-galli, Cynodondactylon, Amaranthus viridis, and Anagallis arvensis.It was evident that weed occurrence varied seasonally. Weeds like Echinochloa crus-galli, Cyperus iria, Amaranthus viridis,

and Commelina benghalensis predominated throughout the Kharif season, particularly in damp paddy and maize fields. Phalaris minor, Chenopodium album, Anagallis arvensis, and Melilotus indica were more prevalent in wheat, mustard, and gram crops during the Rabi season. Because of their robust vegetative proliferation, perennial weeds like Cyperus rotundus and Cynodondactylon were prevalent all year round.

Table: Major Weed Plants Found in Crop Fields of Gahora, Jaunpur

Weed Name	Common Name	Crop Affected	Season	Nature of Weed
Parthenium hysterophorus	Congress Grass	All crops, fallow land	All seasons	Invasive broadleaf
Phalaris minor	Gulli Danda	Wheat	Rabi	Grassy weed
Cyperus rotundus	Nut Grass	Vegetables, pulses	All seasons	Sedge
Chenopodium album	Bathua	Wheat, mustard	Rabi	Broadleaf weed
Echinochloa crus-galli	Barnyard Grass	Paddy	Kharif	Grassy weed
Cynodondactylon	Doob Grass	Wheat, orchards	Perennial	Grassy weed
Amaranthus viridis	Green Amaranth	Vegetables, pulses	Kharif	Broadleaf weed
Anagallis arvensis	Blue Pimpernel	Wheat, mustard	Rabi	Broadleaf weed

Graph



Parthenium hysterophorus is the most troublesome invasive weed in the area, according to the research. It produces a lot of seeds and suppresses surrounding flora by allelopathic effects as it spreads quickly in wastelands, roadsides, and agricultural areas. In people and animals, it also results in breathing issues, skin irritation, and allergic reactions.

According to the findings, Phalaris minor is the most dangerous weed in wheat fields because it resembles wheat seedlings and is challenging to remove by hand. Similarly, because of its quick growth and fierce competition with rice plants, Echinochloa crus-galli was discovered to be the main weed in paddy fields.

The study also showed that the best approach to weed control was integrated weed management, which included crop rotation, mulching, biological control, mechanical tillage, hand weeding, and appropriate herbicide use. Successful weed management was also found to depend on farmer awareness and scientific

training.

Discussion

The results of this review study unequivocally demonstrate that weed infestation is a significant issue restricting agricultural productivity in Gahora, Jaunpur. The prevalence of weeds like Parthenium hysterophorus, Phalaris minor, Cyperus rotundus, and Chenopodium album suggests that both annual and perennial weeds have a significant impact on the agricultural ecology. These results are consistent with earlier research carried out in eastern Uttar Pradesh.The impact of agricultural patterns and climate on weed growth is reflected in the seasonal distribution of weeds.Rabi weeds thrive in colder climates with irrigation, but Kharif weeds predominate in warm, high-moisture environments. This validates the findings of Kumar (2020) and Tripathi (2017), who noted comparable seasonal weed trends in North Indian agriculture.

Due to its rapid growth, high seed production, and allelopathic effects, Parthenium hysterophorus was determined to be the most harmful invasive weed species. It causes major health issues for farmers and cattle in addition to lowering crop yield. Shabbir et al. (2018) observed similar findings and identified it as one of the most damaging invasive weeds in Indian agriculture.

Phalaris minor also had a major negative impact on wheat fields.Due to its resemblance to wheat seedlings, early identification is challenging, which delays weed removal and results in significant crop losses. Similarly, due to its quick expansion and fierce competition, Echinochloa crus-galli was discovered to be the predominant weed in paddy fields.

The greatest strategy for long-term weed control, according to the study, is integrated weed management. Relying solely on herbicides could result in environmental issues and resistance. Consequently, better long-term outcomes are obtained when traditional and scientific procedures are combined. For better weed control and higher agricultural productivity, farmer education and awareness are equally crucial.

In conclusion

Weed infestation is one of the most significant issues influencing agricultural output in the crop fields of Gahora, Jaunpur, according to the current review study.Crop output, soil fertility, and overall farm productivity are all greatly reduced by dominant weeds like Parthenium hysterophorus, Phalaris minor, Cyperus rotundus, Chenopodium album, Echinochloa crus-galli, Cynodondactylon, and Amaranthus viridis.

For vital resources like nutrients, water, sunlight, and space, these weeds compete with crops. Certain invasive weeds, such as Parthenium hysterophorus, pose major risks to human and animal health as well as the environment. The prevalence of seasonal weeds varies depending on the type of crop and the climate; broadleaf weeds and grassy weeds like Phalaris minor primarily impact Rabi crops, whereas grassy weeds primarily affect Kharif crops.

The best and most sustainable method for managing weeds in the area is integrated weed management, according to the study. Long-term agricultural productivity is increased and crop losses are decreased by combining traditional and scientific methods.Effective weed control requires accurate weed identification, prompt intervention, and farmer awareness.In order to increase crop productivity and guarantee agricultural sustainability in Gahora village, Jaunpur, scientific and sustainable weed management techniques must be adopted.

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