GreenariA
Go Green, Learn Green
An Agricultural Monthly e-Magazine
Volume 02, Issue 08, 2024
ISSN: 2584-153X
Article ID: G-24-0806

PHANEROGAMIC PARASITES IN AGRICULTURE: UNDERSTANDING THE IMPACT ON CROP HEALTH AND YIELD

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INTRODUCTION

Phanerogamic parasites, also known as flowering plant parasites, are a type of parasitic plant that obtains their nutrients by attaching themselves to the roots, stems, or leaves of host plants. These parasites can significantly impact agricultural productivity and crop yield, causing economic losses and affecting food security. Phanerogamic plant parasites are a fascinating and intriguing group of organisms that have evolved to live on or in other plants, often forming a symbiotic relationship with their hosts. These parasites are found in almost every part of the world and can infect a wide range of plant species in crop plants such as cereals, legumes, vegetable and plantation crops including. Despite their complex and intricate biology, phanerogamic plant parasites have evolved unique strategies to obtain the nutrients they need to survive, often at the expense of their host plants. These parasites can be categorized into three main types: root parasites, stem parasites, and leaf parasites. Examples of phanerogamic parasites include dodder (*Cuscuta spp.*), mistletoe (*Viscum album*), broomrape (*Orobanche spp*.) and witch weed (*Striga spp.).* In this article, we will delve into the world of phanerogamic parasites, their effects on agriculture, and the measures taken to mitigate their impact.

IMPACT ON AGRICULTURE

Phanerogamic parasites can cause significant harm to crops by:

1. Reducing yield: Parasites can reduce the growth rate and yield of their host plants by stealing nutrients and water.

2. Decreasing plant vigor: Parasites can weaken the host plant's immune system, making it more susceptible to diseases and pests.

3. Disrupting soil ecosystems: Root parasites can alter the soil microflora, affecting the nutrient cycling and overall soil health.

4. Increasing pesticide use: The presence of phanerogamic parasites can lead to increased use of pesticides to control other pests and diseases.

5. Evolving crop diversity: The occupied conditions of phanerogamic parasites may be causes crop diversities and genesis of new crop species at certain conditions on distributions.

TYPES OF PHANEROGAMIC PLANT PARASITES

Phanerogamic plant parasites can be classified into three main categories based on their host-parasite interaction:

1. Root parasites: These parasites infect the roots of their hosts, often forming haustoria (root-like structures) that absorb nutrients from the host's vascular tissue (*Cuscuta spp*.). Except in Antarctica region.

2. Stem parasites: Stem parasites infect the stems of their hosts, often using tendrils or twining structures to attach themselves (V. album) – more than 200 plant spp. economically viable in apple, pear, oak, grape and pine.

3. Leaf parasites: Leaf parasites infect the leaves of their hosts, often using specialized structures like spines or scales to attach themselves (Indian mallow – *Sphaerophysa salsula*).

EXAMPLES OF PHANEROGAMIC PARASITES IN AGRICULTURE

1. Dodder (*Cuscuta spp*.): Dodder is a root parasite that infects over 100 plant species worldwide, including important crops like soybean, corn, and wheat.

2. Mistletoe (*Viscum album*): Mistletoe is a stem parasite that affects a wide range of tree species, including apple, pear, and grape.

3**. Broomrape (*Orobanche spp*.):** Broomrape is a root parasite that infects legume crops like soybean, peanut, and clover.

4. Witch weed (*Striga spp.):* Commonly known as witchweed, is a genus of parasitic plants that occur naturally in parts of Africa, Asia, and Australia. It is currently classified in the family Orobanchaceae. They are obligate hemiparasites of roots and require a living host for germination and initial development, though they can then survive on their own. Mostly affected rice, maize, sorghum, barley, wheat and sugarcane.

MANAGEMENT STRATEGIES

To mitigate the impact of phanerogamic parasites in agriculture, several management strategies can be employed:

1. Cultural practices: Proper crop rotation, sanitation, and weed management can reduce the spread of parasites.

2. Chemical control: Herbicides can be used to control phanerogamic parasites, but this approach often has environmental concerns.

3. Biological control: Natural enemies of phanerogamic parasites can be introduced to control their populations.

4. Genetic resistance: Breeding crops with resistance to phanerogamic parasites is a promising approach (Ex. Orobanche resistant gene (HaOr5 & HaOr7) inserted lines in sun flower).

CONCLUSION

Phanerogamic parasites are a significant threat to agricultural productivity worldwide. Understanding their impact on crop health and yield is crucial for developing effective management strategies. By adopting integrated pest management approaches that combine cultural practices, chemical control, biological control, and genetic resistance, farmers can reduce the economic losses caused by these pests and ensure a more sustainable food supply.