

Effect and Integrated Mangement of *Parthenium hysterophorus*. L.

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SUMMARY

Parthenium hysterophorus L. is a herbaceous, erect, annual plant in the Asteraceae family that is also known as carrot weed, white top, or congress grass in India. It is commonly known as gajar ghas because it resembles a carrot plant. Parthenium is thought to have originated in Mexico, America, Trinidad, and Argentina. Parthenium, in general, is a poisonous, pernicious, problematic, allergic, and aggressive weed that poses a serious threat to humans and livestock. Since the weed became a problem in India and other countries, efforts have been made to manage it using various methods. However, no single method has been proven satisfactorily so far because each method has one or more limitations such as impracticability, temporary relief, environmental safety, high cost, and so on. Integrated parthenium management is cost effective and easy to adopt, it is also suited for resource-poor marginal farmers and need to be popularized among farming community.

INTRODUCTION

Parthenium hysterophorus L., also known as carrot weed, white top, or congress grass in India, is a herbaceous, erect, annual plant in the Asteraceae family. Because it resembles a carrot plant, it is commonly referred to as gajar ghas. Parthenium is thought to have originated in Mexico, America, Trinidad, and Argentina. Parthenium first appeared in Pune (Maharashtra) in 1956 and has since spread like wildfire throughout India. It has currently infiltrated approximately 35 million hectares of land in India. Aside from invading agricultural crops, it is a nuisance on road sides and railway tracks, vacant lands, wastelands, industrial areas, and the sides of open drainage systems and irrigation canals.

How to identify it?

Parthenium leaves resemble carrot leaves, so it is also known as carrot weed or gajar ghas. It can reach heights of 1 to 1.5 meters. It has several branches. Fine hairs cover the stems and leaves. White flowers are used.

How Parthenium spreads?

It primarily spreads via seeds. The weed has the potential to produce up to 154,000 seeds per m², and a single plant can produce between 15000 and 25,000 seeds. The seeds are extremely light and can be carried or transported by wind, water, or various human activities. Parthenium has the ability to regenerate from cut or broken parts. Its allelopathic effects, combined with the lack of natural enemies such as insects and diseases, are two major reasons for its rapid spread in India.



Fig-1 *Parthenium hysterophorus*



Fig -2 Harmful effect on human

Harmful effects of Parthenium?

Parthenium, in general, is a poisonous, pernicious, problematic, allergic, and aggressive weed that poses a serious threat to humans and livestock. This weed has been identified as a major source of dermatitis, asthma, nasal-dermal, and nasal-bronchial diseases in India and Australia. Aside from the negative effects, it also causes

a number of other issues, such as the obstruction of common pathways and the reduction of the aesthetic value of parks, gardens, and residential colonies. Parthenium infests all crops, orchards, plantations, and forests. It severely reduces crop productivity while also harming biodiversity and the environment.

Integrated management of Parthenium

Since the weed became a problem in India and other countries, efforts have been made to manage it using various methods. However, no single method has been proven satisfactorily so far because each method has one or more limitations such as impracticability, temporary relief, environmental safety, high cost, and so on. As a result, there is an urgent need to adopt an integrated Parthenium management approach that incorporates all applicable methods.

Mechanical and manual methods

When the soil is wet during the monsoon, uproot the parthenium before it blooms. Because sensitive people may be allergic to this weed, it is best to wear gloves or use polythene bags in your hands when uprooting the Parthenium. Parthenium is not just a problem for one person; it is a problem for the entire community. As a result, there is a need to motivate colony residents, workers in industry, and large farms to collectively uproot the Parthenium.

Cultural management

By use of chemicals to suppress the growth of Parthenium in their field, farmers should plant fast-growing crops such as sorghum, jowar, and daincha.

Legal and extension management.

Parthenium management was also tried in India under the legal act, first in Karnataka State. To prevent the spread of Parthenium, this act can be implemented at the municipal or state level.

By use of chemicals

Parthenium in waste land can be controlled with glyphosate (1 to 1.5%) for total vegetation control, but metribuzin (0.3 to 0.5%) or 2,4-D (2-2.5 kg a.i.) can be used to save grasses. Herbicides should be used in different crops only after consulting weed scientists because different herbicides are required for different crops. Alachlor (2.0 kg a.i.) can be used as a pre-emergence herbicide in soybean, rajmaha, banana, and tomato crops to control Parthenium. Metribuzin (0.50 to 0.75 kg a.i.) can be used as a pre-emergence herbicide just after sowing in potato, tomato, and soybean crops to control Parthenium.

By use of biological control agent

Man's intentional manipulation of natural enemies for the purpose of controlling harmful weeds is known as biological control. Natural enemies of Parthenium include insects, fungi, nematodes, snails, slugs, and competitive plants. Biological control is cheap and poses no risk to non-target organisms, the environment, or biodiversity. It is self-sustaining and can spread on its own, whereas other control measures require periodic inputs. It is simple to combine with other control measures. Under the biological control program, host-specific bio agents from the weed's native habitat are imported into other countries where the weed has become invasive. Based on the well-documented success of the Mexican beetle, *Zygogramma bicolorata* Pallister (Coleoptera: Chrysomelidae), in other countries where it was introduced, the beetle was introduced to Mexico.

Use of competitive plants

Parthenium can also be controlled by competing plants such as *Cassia tora*, *Cassia sericea*, *Tephrosia purpurea*, *Achyranthes aspera*, and others. However, *Cassia tora* or *C. sericea* are commonly used to replace Parthenium. Cassia seeds can be collected in October-November and should be broadcasted on the predetermined area to be replaced in April-May before monsoon.

CONCLUSION

The noxious *P. hysterophorus* grows in a wide range of habitats, causing changes in both aboveground vegetation and belowground soil nutrients. It has the potential to outcompete both native and nonnative palatable plants that are important to livestock. Furthermore, changes in vegetation and soil nutrients may result in changes in other trophic levels, altering the ecosystem's function. Appropriate management methods for *P. hysterophorus* are required to avoid potential threats to biodiversity and economic losses. Integrated parthenium management is cost effective and easy to adopt, it is also suited for resource-poor marginal farmers and need to be popularized among farming community.

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