Popular Article

Trends in Agriculutre Science (ISSN:2583-7850)

Vol.2, Issue 5, May, 2023, Page: 365-366

Parthenium and its management

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https://doi.org/10.5281/zenodo.7990127

Abstract

Parthenium (*Partheniumhysterophorus* L.) also known as star weed, carrot weed, white cap, white top, congress weed, vishapoondu, poisonous weed etc. has been found growing naturally since centuries in Mexico, North and South America, Australia, China, Pacific islands, East and South Africa and Canada. Till 1977, the weed did not find any place in the list of world's worst weeds. But, within the last decade, it has become one of the seven most dreaded weeds of the world. It comes under the family Asteraceae. Parthenium can germinate, flower and set seeds within four weeks. Once established, it can survive even severe drought and frost conditions. Integrated Parthenium Weed Management (IPWM)" involving the various methods could be effective in controlling Parthenium.

Introduction

In India, it is noticed only from mid-fifties and is presumed to have been accidentally introduced by the import of wheat in Maharashtra during 1956. However, it's spread throughout the country has been very rapid with abnormal density. Further, factors such as (i) the absence of natural agents that restrict the spread of this plant, (ii) high fecundity, (iii) efficient seed dispersal mechanisms, (iv) Allelopathy impact on other plant species, (v) unsuitability for grazing because of the presence of anti-feedants in the plant system and (vi) wide adaptability to varying soil and agro climatic conditions have enabled this plant to invade a variety of growing environments particularly in situations associated with human activities.

Biology

Seedlings of Parthenium with egg-shaped leaves and covered in fine, white hairs. Older leaves become increasingly lobed and deeply divided and young plants develop into a rosette with a deep taproot system. Stems and leaves are covered in short, white hairs. Plants develop a bluish or greyish appearance. The flower heads are white and occur in clusters at the top of the plant, borne on short stalks, arising from the leaf forks. Flower heads become hard and brown as they mature. The seeds are striped

grey to black and a narrow diamond shape, 2 mm long and flattened. Generally, only 4 seeds develop in each head. Parthenium can germinate, flower and set seeds within four weeks. Once established, it can survive even severe drought and frost conditions.

Harmful effect of Parthenium

Though cattle do not eat Parthenium, its effects were observed on them when they walk by or graze through patches of this weed. Such cattle had inflamed udder and subsequently suffered from fever and rashes. It is reported that feeding the weed to buffalo and bull calves at different levels causes both acute and chronic forms of toxicity. Ulcerations were caused both in the mouth and digestive tract. Autopsy of the dead animals showed punched cut ulcers on the esophagus and the obosomal folds. Histopathology of the kidney and liver revealed degenerative changes and necrosis. Consumption of milk from the livestock grazing around Parthenium invaded grazing land could be hazardous to man.

Parthenium pollens were observed in the atmosphere throughout the year and that the pollen of Parthenium showed marked positive skin reactions and are in abundance in the month of June and August. Parthenium causes asthma and dermatitis. The pollen of this weed has been observed to cause allergic rhinitis. Parthenium to produce an average of 624 million pollens per plant and these were carried to distant places.

Parthenium management

Integrated Parthenium Weed Management (IPWM)" involving the various methods could be effective in controlling Parthenium. If a concerted effort is made to adopt IPWM, the results will be visible in the second year and by the third year the Parthenium will come down to a negligible level. The newly suggested IPWM envisages five steps *viz*.,

- Maintenance of natural biodiversity without disturbing the existing flora to the extent possible under non crop/ public utility areas
- Sowing of *Cassia sericea, Cassia tora, Abutilon indicum, Gynandropsis pentaphylla,* and *Tagetus sp* at the start of rainy season. The growth of such plants can insulate opened up soils against invasion by Parthenium. In already infested areas, planting of botanical agents may be taken up at the start of rainy season and there will be no need to plant botanical agents again as it will perpetuate on its own.
- To watch for the commencement of rains and buildup of Mexican beetles (*Zygogramma*) and when the beetles become available in large numbers, they have to be collected and released in Parthenium-invaded areas.

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Published: 30 May 2023

- In case of gardens, flowers beds, lawns intensively cultivated agricultural fields; manual removal has to be taken up. In the manual method, it should be noted that the persons chosen for uprooting the weed should not be allergic to *Parthenium*.
- In vast stretches of already *Parthenium* invaded areas and where immediate relief is needed, herbicides such as Atrazine (pre-emergence), 2,4-D, Glyphosate and Metribuzin can be used.
- Application of Common salt (200g) with teepol (2 ml) in one litre of water before flowering of Parthenium.

Parthenium vermicomposting

Before flowering parthenium plants are collected and the materials are to be chopped into 5-10 cm length and spread into 10 cm height above the surface with the circle radius of 1.0 m diameter. Above this weed materials layer, 10 % of cow dung slurry at semisolid condition (10 % of weed materials weight) is sprinkled evenly and the sequential process is repeated for 5 layers. These weed materials are to be kept as such for 10 days for decaying purpose. After 5 days earth worm at 250-300 numbers are to be introduced into this decayed material. The compositing process to be continued up to 45 to 60 days for complete decomposition of parthenium.

Conclusion

Effective parthenium management is crucial for mitigation the harmful impacts of this invasive weed on the environment, human health and agriculture. Integrated management approaches is vital for long-term control. This includes combination of cultural, mechanical, biological and chemical methods. Raising awareness among farmers and promoting best practices in parthenium weed management.

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