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Parthenium hysterophorus (congress grass) a unwanted plant & its uses

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Abstract
In right now we are confronting the pervasion of *Parthenium hysterophorus* all over the place. It is accessible in stocks around the rail route tracks, in exposed lands, in farming fields, in plantations and in backwoods, it attacks significant part of Indian mainland. We are knowing all about *Parthenium hysterophorus* poisonous properties and need to control its invasion. Nonetheless, just controlling its isn't an answer eliminate it however it very well may be overseen by means of its use for various purposes. As of late a ton of exploration has been proceeding to investigate the use properties of Parthenium. This survey article presents a few properties and utility capability of Parthenium finished up by different scientists.

Keywords: Weed administration, Allelopathy, intrusion, herbicides

Introduction
Weeds in routine are known to be undesirable in a given circumstance and these are hurtful, perilous or monetarily impeding having serious danger to essential creation and biodiversity. Obtrusive Outsider Species are known to be the species which are presented from outside from its starting point spot to different nations either by purposely or accidental human exercises. They have laid out self-duplicating populaces in the wild and have caused apparent changes in adjacent, reproduced as well as natural frame works. Intrusion is known as vital danger to biodiversity. They lessen ranch and woodland efficiency. *Parthenium hysterophorus* is the really obtrusive outsider weed which rules over the local species and antagonistically influences the biodiversity. The word Parthenium is taken from the Latin word parthenice which implies for restorative purposes *Parthenium hysterophorus* is an intrusive weed plant of family Asteraceae. This erect, brief plant known for its flourishy development and its overflow remarkably in blistering environments. Parthenium is local plant of north-east Mexico and was endemic to America however presently it is broadly dispersed in all nations of Asia and Europe. Parthenium (*Parthenium hysterophorus* L.) is known with various names in various nations, for example, carrot weed, star weed, congress grass, wild feverfew, ragweed, harsh weed, white top, and the "Scourge of India". This weed with useful seed age affects adjoining plants and seriousness with monetarily significant yields.

Beginning and Appropriation of Parthenium
Spread of *Parthenium hysterophorus* has been recorded to make tremendous misfortune the biodiversity by supplanting local species in the normal biological systems, now and again causing complete territory adjustment. To be aware of *Parthenium hysterophorus* impacts, living space and its science have monstrous importance in farming. Just with Nitty gritty information on this poisonous weed, it will be feasible to controlled and deal with the weed in various ways. Present survey investigates the chance through knowing environment, circulation, science and substance properties of *Parthenium hysterophorus*.

In India
Parthenium hysterophorus potentially entered India in 1910 (with contaminated grains germplasm) be that as it may, went unrecorded until 1956. The weed was first uncovered in Quite a while in 1955 and presently happens wherever the in around 35 million hectares of land. In India, this weed has difficult issue in surmised all states like Karnataka, Andhra Pradesh, Haryana, Bihar, and Madhya Pradesh and Uttar-Pradesh. *Parthenium hysterophorus* happened in all conditions of nation and introducing a serious danger in many states those have huge areas of farming area, non-editing regions and touching area. At present time India has becomes one of the most plagued nations of world.

The spread of *Parthenium hysterophorus* has been accounted for from all provinces of India with various power. By and large, generally speaking spread with regards to Parthenium thickness and scattering level is most extreme in Andhra Pradesh, Maharashtra, Bihar, Punjab, Chhattisgarh, Delhi, Haryana, Karnataka, Madhya Pradesh, Tamil Nadu and Uttar Pradesh; medium in Jharkhand, Assam, Gujarat, Rajasthan, Himachal Pradesh, Jammu and Kashmir, Uttarakhand, Orissa, and West Bengal; low in Andaman and Nicobar, Arunachal Pradesh, Goa, Kerala, Lakshadweep, Manipur, Mizoram, Meghalaya, Nagaland, Sikkim and Pondicherry. Anyway its pervasion fluctuated in various states and various locales of states:

Andaman & Nicobar Islands	Low
Kerala	Low
Andhra Pradesh	High
Madhya Pradesh	High
Arunachal Pradesh	Low
Maharashtra	High
Assam	Medium
Manipur	Low
Bihar	High
Meghalaya	Low
Chhattisgarh	Medium
Mizoram	Low
Chandigarh	Medium
Nagaland	Low
Pondicherry	Medium
Gujarat	Low
Punjab	High
Haryana	High
Rajasthan	Medium
Himachal Pradesh	Medium
Sikkim	Low
Jammu & Kashmir	Medium
Tamil Nadu	High
Jharkhand	Medium
Uttar Pradesh	High
Karnataka	High
Uttarakhand	Medium
Orissa	Medium
Goa	Low
Delhi	High

In U.P. prior this weed was seen at Pantnagar inverse to the railroad station and has spread to a couple of farming grounds and furthermore in Raebareli locale and Jhansi regions. It fills most richly in certain regions particularly 00around western U.P. Weed is tracked down in a lot in the close by horticultural terrains, deserted land and on the bank and the bowl of streams.

Happening in Western U.P is very much announced. like Pilibhit, Puranpur Tehsil, Bisalpur Tehsil, Shahjahanpur, Mala and Deoria woods (Pilibhit) Badaun, Bareilly, Etah, Aligarh, Hathras, Firozabad, Mainpuri, Mathura, Moradabad, Meerut, Bijnor, Rampur, Jyotiba-Phule Nagar, Baghpat, Muzaffarnagar, Saharanpur, and different pieces of the state There are less information accessible on the wealth of Parthenium hysterophorus in Meerut region because of less exploration, however there are a lot of Parthenium found filled in the uncovered regions, railroad stages and in horticulture lands.

Habit & Habitat

There are less data open on the abundance of *Parthenium hysterophorus* in Meerut district as a result of less investigation, but there are a ton of Parthenium found filled in the uncovered locales, railroad stages and in cultivation lands.

This weed is described by its thickness and biomass fluctuating with soil type. It favors basic dirt, soil to weighty dark earth soils to develop extravagantly [3]. Parthenium attacked destinations for the most part have sandy soil with pH going from 5.4 to 7.4, water holding limit 16.8 to 63%, absolute nitrogen 0.055 to 0.206%, natural matter 1.134 to 4.24%, phosphorus 31.86 to 69.93 kg/ha, potassium 74.72 to 746.5 kg/ha [15]. Parthenium has capacity to can develop over many dampness, pH and temperature conditions anyway it requires high soil dampness for its seed germination. Purportedly it is a photoperiod and thermo-period obtuse and can bloom all year. Seed germination can occur over a broad scope of temperature and soil pH. Further, it is exceptionally cutthroat to rival various harvests including vegetables and cereals.

Infestation of parthenium hysterophorus

Before 1980 this week was only from time to time saw filling in crop lands however presently it has spread a lot of degree into practically a wide range of farming harvests, woodlands and manor biological systems. In Uttar-Pradesh, Uttarakhand, Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra and so on, Parthenium is known as unsafe weed of agribusiness lands. In crop fields, where just a single harvest is filled in a year, it fills richly in the neglected period following the event of gentle downpours. Its pervasion is extreme in the field where water system channels are utilized. On the bank of restricted, human-made stream systems (water trench or trench), *Parthenium hysterophorus* weed becomes plentifully because of the great accessibility of dampness and its seeds being conveyed by water system water channel.

Plantations and timberlands environments

Prior, it was not known for its pervasion in nurseries and woods yet at present time it spread energetically into these areas. This weed fills richly in plantations on account of low weeding rehearses in such environments. Mango plantations in Uttar Pradesh, Madhya Pradesh and Maharashtra are oftentimes attacked by Parthenium weed making a disturbance producer. In Himachal Pradesh, this weed has spread in most of apple plantations filled in the lower rises. Comparatively in Maharashtra, orange plantations have been attacked with Parthenium weed creating some issues to producers. Parthenium can develop luxuriously in uncovered lands/badlands and in woods, it restrains the development of different plants by which nearby bio-variety being compromised. Parthenium weed has attacked various Public Parks of India including Pench, Rajaji, Kanha, Bandhavgarh and so on.

Bare lands

Parthenium hysterophorus enthusiastically fills in uncovered lands. It very well may be seen developing wherever either on side of the road, around the plants or factories, stages and, surprisingly, the terrains which are not appropriate for crop creation because of their high metal harmfulness or shortage of the mineral supplements. It is the significant component of Parthenium weed that it has an extensive variety of living space and it tends to be get by in unforgiving circumstances in which other typical plants

can't get by. It is a significant explanation of the fast pervasion of Parthenium in India and different nations as outsider weed.

Morphology

Parthenium hysterophorus is exceptionally extended, fleeting (yearly), upstanding (erect) herbaceous plant that structure a rosette living space during the beginning phase of life. At development, yet sometimes can arrive at up to 2m or much more in level.

Stem

Stem is barrel shaped, strong, pretty much fluted with longitudinal queues comparing to the augmentation of the midrib of the leaves. Mature stems are greenish and covered with little delicate hairs which are known as hirustle, stems become a lot harder as reach to development.

Leaves

The leaves are on the other hand organized and followed (petioles) upto 2 cm long establishes in two unique structures. During the beginning phases of life, it structures rosette environment. Leaves are substitute, straightforward and profoundly pinnate fid. The cutting edge is 11 to 15 cm long and 6-10 cm wide, the cutting edge of lower leaves are expansive and seriously partitioned in contrast with upper leaves. Abaxial surface of leaves are covered with short, solid hairs that falsehood near the surface.

Flowers

Various little bloom heads commonly known as capitulum are coordinated in groups at the highest point of the branches (in terminal panicles). Each bloom head (capitulum) is borne on a tail (pedicel). Capitulum (3-5 mm across) are grayish or white in variety containing beam florets (0.3-1 mm long). They additionally have different (15-60) little blossoms (cylindrical florets) in the middle encompassed by two columns of little green bracts (an involucre). It can have bloomed whenever of the year, yet regularly happen during coming down season.

Seed

Five little 'seeds' for the most part known as achenes are created in each bloom head. Seeds are dark obovoid, 2 mm long and 1.5 mm wide comprising a few little scopes known as pappus around 0.5-1 mm in level, two straw colored papery designs (dead cylindrical florets), and a level bract.

Seed biology, germination

Following 24-48 days of germination blossoming happens in Parthenium. This can occur whenever of the year. The best rotating temperature system for its weed seed germination is 16/21 ºC (day/night). Further its seeds can live for between 4-6 years in the dirt as seed bank. Studies have additionally shown their covered seeds to live significantly longer than seeds on the dirt surface.

How it is spreads

Parthenium hysterophorus hold a remarkable ability to spread develop and laid out well in extensive variety of natural circumstances (Monika, 2014). It finishes life-cycle 90-120 days which helps in speedy spreading. Its seeds can be scattered through different techniques like water ebb and flow, creatures, development of vehicles, hardware, animals and the grains or seeds of harvests. Further Parthenium has a somewhat short life cycle, develops rapidly and makes due under various territories. By and large for significant distances it spread through vehicle, farming instruments and with water stream. Parthenium created huge number of minuscule seeds which are light weight and can make due as seed bank in soil for long time. These a few capacities of Parthenium hysterophorus assists with spreading quickly brought about invasion of Parthenium all over the place.

High reproductive potential

Parthenium hysterophorus produce a gigantic amount of seeds with up to 15-25,000 seeds for every plant [30] with an enormous seed bank, assessed around 2,00,000 seeds/m2 in uncovered grounds and horticulture field. Seeds of Parthenium can make due under cruel circumstances and stay practical for quite a while period. These characteristics of this weed help in its quick spreading. Seeds of Parthenium can develop any season, when appropriate dampness is free

Fast growth rate

It is enthusiastically developing yearly herbaceous weed. By and large, Parthenium blossomed when it is just 4-multi week old and can bloom for quite a long time. Under horrible circumstances like salt and dry season pressure, the weed can finish its life cycle inside 4-5 weeks.

Impact of Parthenium

Impact on biodiversity

This weed can possibly upset the regular biological system, as it can develop all through the year in practically all exceptional circumstances stifling local vegetation. Owing the shortfall of compelling normal foes, its allelopathic

impact as well as photograph lack of care and thermo obtuseness, it is a danger for regular variety. Quick spread of Parthenium can upset regular environment since it has extremely quick pervasion limit and allelopathic potential which can disturb any sort of normal biological system. Species extravagance, equity a neighborhood biodiversity step by step decline where this plant is available, this present circumstance obviously demonstrates the local biodiversity loss of weeds and other yield plants because of Parthenium pervasion. Its pervasion is combined with its allelopathic potential and the shortfall of its normal inhibitors like microbe, bugs and their hatchlings, these are some significant variable which are the explanation of its rich development and spread [22]. The centralizations of allelochemicals viz. Coronopilin, caffeic corrosive, parthenin, and p-coumaric corrosive which are available in Parthenium have serious allelopathic impacts.

Impact on crop production

The Parthenium hysterophorus weed has plagued in a huge area of India. This plant contains parthenin, hysterin, hymenin, and ambrosin. Due to the presesnce of these allelochemicals this weed affects various harvests and person likewise.

This toxic weed smother the advancement of adjacent plants by allelopathy. Leachate and concentrate of leaves and inflorescence forestall the germination and development of related financially significant harvests. Kumari *et al*. (2014) saw that physiological and biochemical boundaries amazingly decreased when aquous concentrate of Parthenium were straightforwardly showered on the yield plants. Parthenium has solid allelopathic consequences for different plants even it can cause 40-80% yield misfortune in horticultural harvests.

Allelopathic potential

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Unpalatable to animals

Parthenium hysterophorus is unpalatable to the creatures. By and large creatures don't eat *Parthenium hysterophorus* in view of its severe taste and serious scent. Prior examinations in India had uncovered its serious wellbeing perils to the domesticated animals in Parthenium hysterophorus attacked regions. Being unpalatable, it cannot use as creature grub and its populace is expanding step by step except if precisely eliminated.

Antagonistic effects on vegetables by upsetting their advantageous interaction with Nitrogen fixing microbes like Rhizobium, Azotobacter, Azospirillum and Actinomycetes. It produces colossal quantities of dusts (Approx. 700 million), which voyages a significant distance from source plant to other yield plants and restrains the organic product setting in these harvest plants like tomato, brinjal, beans, and ceraels. Parthenium can cause yield misfortune upto 40% in vegetable harvests.

Impact on soil microflora

Parthenium is known to its inhibitory effect on growth and activity potential of different bacterial species related to Nitrogen assimilation such as *Rhizobium* and *Azotobacter* and nitrifying bacteria like *Nitrosomonas*. Aqueous extract of *Parthenium* has detrimental effects on the growth of Rhizobium, *Nitrosomonas* and *Azotobacter*. It reduced the Legheamoglobin content of root nodules by which *Rhizobium*-legume symbiosis is affected. Leaf and root leachates and their chemical component inhibit nitrate production. Besides these it can inhibit the growth of algae and mycorhyzzae associated to crop plants because of its fungicidal property (Megharaj *et al*., 1987).

Effects on animals

Parthenium weed is noxious for livestock, it can cause dermatitis and skin disorders in animals. Loss of skin pigmentation, dermatitis, mouth ulcers with extreme salivation and diarrhoea has been observed in animals. If excess amount of this weed is eaten by the animals, it can cause death. The *Parthenium* extract reduce the total WBC count in animals which results in the weakening of immune system.

Effects on human beings

Parthenium plant parts can be toxic to some people it is estimated up to 73% of people living with the weed are sensitive to it. Females are twice more likely to be sensitive than males. Dermatitis, hay fever, asthma, and bronchitis are the major health problems found in human beings caused by the pollen grains and other plant parts of *Parthenium*. The major allergens found in this plant are parthenin, coronopilin, tetraneuris, and ambrosin. Its pollen grains are well known to causing asthma in human beings. Direct contact of this plant can cause dermatitis not only site specific but can spread all over the body. Clinically the *Parthenium* dermatitis can be divided into five types which are-

1. The classical pattern.
2. The chronic actinic dermatitis (CAD).
3. The mixed pattern (classical and chronic actinic dermatitis pattern combination).
4. 4. The photosensitive lichenoid eruption.
5. The prurigo nodularis like pattern.

Control of Parthenium

The control of Parthenium weed is a serious test because of its vivaciously spreading nature. Prompt activities are overall very important to kill the plant since it dangerously affects climate as well as to general wellbeing.

India has extraordinary gamble of quick attack of the weed in agrarian grounds, for which it could offered legitimate consideration towards the solution for control Parthenium. Many explores are happening for tracking down the modest and most ideal way for its control. A portion of the control estimates that can be embraced in India are as per the following-

Grassland management

Touching administration is the most valuable strategy for the control and deal with the Parthenium spread for a huge

scope. Be that as it may, this training has not been executed actually in India. Glade land can be support with developing grasses and spices in them. This may notwithstanding, requires restoration of unfortunate knoll followed by sound brushing upkeep programs. Such a training, in any case, has a great deal of provokes in our country because of financial and social elements.

Controlling overgrazing

Overgrazing might build the *Parthenium hysterophorus* invasion. Control of overgrazing in this manner can limit its pervasion somewhat. Overgrazing because of the unstable expansion in domesticated animal's populaces diminishes the energy and variety of field that empower the spread of *Parthenium hysterophorus* weed luxuriously. So support of right stock number may be productive in the control of Parthenium weed dispersal. On the other hand, field spreading can be useful for recovery of field lands which may be more powerful than just decreasing the weed. Notwithstanding, overgrazing should be abstained from Spring-summer period is found to be very appropriate for field sapling with initial 6 two months being very significant. Touching during winter is by and large protected since the period has okay of Parthenium spread. Notwithstanding, Parthenium might develop and sprout in this time moreover.

Burning

One more ordinarily drilled approach to controlling *Parthenium hysterophorus* weed is consuming. Mass vegetation of the weed can be annihilated by this training. However, it cannot be considered as protected control system for the weed since there is extraordinary gamble to soil, air and existing plant and creature variety. *Parthenium hysterophorus* debris likewise affects crop yield yet yield misfortune is low in contrast with the leachate and dry mass of this weed.

Manual control

Physically, Parthenium weed can be constrained by straightforward hand culling. In any case, this isn't suggested since it could cause serious wellbeing risk. Further, the seeds might drop off and build the area of invasion.

Herbicide control

Synthetic administration or herbicidal control is the most generally used to control the development of *Parthenium hysterophorus* Be that as it may, presently we centers around bioherbicides however it isn't compelling as substance herbicides till now. Synthetic herbicides which are usually utilized are glyphosate @ 2.5 kg/ha-1, atrazine @ 2.6 kg/ha-1, bromoxynil @ 0.56 kg/ha-1, normal salt @ 20%, 2,4-D amine @ 3 l/ha-1, 2,4-D ester @ 4 l/ha-1, Floumeturon @ 2.24 kg/ha-1, Hexazinone @ 3.5 kg/ha-1, Metribuzin @ 0.7 kg/ha-1, Norflurazon @ 2.24 kg/ha-1 and Paraquat 0.5 l/ha-1. These herbicides are notable for their capacity to control this weed [16, 39, 41, 27].

The stage and season of the rosette stage is the ideal opportunity to apply post emanant herbicides in no man's land, non-trimmed regions, along rail route tracks, water channels and side of the road (Khan *et al*., 2012). Exceptionally viable medicines for P. hysterophorus control were seen glyphosate and metribuzin, having higher impact at 28 after the herbicide application. Uses of herbicides further isolated into two branches which are as per the following-

Non-cropping areas

Parthenium ought to be killed by herbicide treatment right on time before it can set seed. Little and confined areas of pervasions can be dealt with right away. Continued showering is important to forestall seed creation. Showering ought to be finished before the blossoming when the plants are little. Dynamic development of different grasses could be incited for concurrent control of the weed. Some of enrolled herbicides to control Parthenium weed are: atrazine, 2,4-D+picloram (trodon 75D) 2,4-D ester, glyphosate, metasulfuron methyl (for seedlings just), hexazinone, dicomba and so on((CRC 2003). These herbicides in various focuses are viable for spot shower or blast splash or both.

Cropping areas

Synthetic herbicides can be utilized in non-trimming region easily yet it is tad dangerous to practicise these herbicides in editing regions in light of the fact that these can hurt crop plants. So utilization of compound composts in agribusiness land expects precautionary measures to pick the herbicides with the goal that it could not hurt at any point crop plants. The organic or regular herbicides, similar to the unstable oils from fragrant plants in exceptionally low fixation are very useful on such regions to cut short Parthenium seeds. These rejuvenating ointments significantly affect the current vegetation/crops. Perceptions have uncovered that natural oils from various plants, for example, Eucalyptus sp., Ageratum, Lantana camara and so on can be utilized for the control of Parthenium.

Utilization of Parthenium

Parthenium hysterophorus accidently entered India in 1910 with the germplasm of oat grains and is presently thought to be as an unpleasant weed in our country the harmful effects of Parthenium have been factual not so much for human wellbeing but rather likewise for animals and local plant species. It causes serious impacts like asthma, bronchits, dermatitis (hypersensitive response), and roughage fever in person. Notwithstanding this issue it has likewise been utilized in industry for its toxic, insecticidal, nematicidal and herbicidal properties as well with respect to treating the soil (Sastri and Kavathekar 1990). The bisque of root utilized as solution for amoebic looseness of the bowels. The sub-deadly dosages of parthenin remove help in lessening malignant action in the cells of mice. Examinations likewise uncovered that Parthenium can be utilized to fix the hepatic amoebiasis, neuralgia and specific kinds of stiffness [40]. In America, it is applied remotely on skin as solution for a wide assortment of illnesses. In Jamaica, the elixation is utilized to kill the bug in creatures

Antifungal

As referenced before Parthenium antifungally affect different parasitic species. This nature of Parthenium can be utilized to fix the human and creature parasitic illnesses. Antifungal capability of various concentrates of Parthenium hysterophorus against human pathogenic parasites were examined by Rai and Rai. Growths connected with dermititis found delicate to sequestoterpene lactone found in

Parthenium hysterophorus and it can have utilized for the cure of skin sicknesses.

Cancer prevention agent

Parthenium hysterophorus methanolic separates showed high cancer prevention agent impact. Subsequently, it tends to be used as normal cancer prevention agents. It is normally accessible cell reinforcement, assuming it will be industrially accessible it can supplant manufactured cancer prevention agent which hurtfully affect human wellbeing [18]. It is more significant to create cancer prevention agent normally after the exploration that manufactured cell reinforcements have high cancer-causing nature in contrast with normally delivered cancer prevention agent.

Antimicrobial

Parthenium hysterophorus displays solid antimicrobial and antifungal action. It represses the development of rhizosphere greenery like Rhizobium, azotobacter, Rhizospirrilum too as it can hinder bacterial and contagious development, for example, those of *A. niger*, *F. oxysporum*, *C. albicans S. aureus*, and *E. coli* and so on.

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