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POSSIBLE USES OF *PARTHENIUM* - AN AGRICULTURAL WASTE

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ABSTRACT

Parthenium hysterophorusa perennial weed commonly called as carrot weed, congress grass, etc.and one of the ten feared noxious weed species in the world. It is considered as extremely prolific weed and worst in crop cultivation. It is harmful to all the living beings; it has nearly destroyed all the useful crops and plants, even though growing near to it. It is known to cause asthma, bronchitis, dermatitis, and hay fever in man and livestock. Besides damaging properties it can be used in favour of human beings. The *Parthenium* has medicinal value viz. Homeopathic, Allopathic and some traditional. As a weed crop it has a property to absorb more and more nutrients from the soil and hence, it is rich in nutrients. Uprooting of the plant in early stage i.e. before flowering from field and burying it in soil produce superior quality organic manure.To assess the manurial value of *Parthenium* and its composting value, a composting experiment was conducted and compared with other organic wastes, it proved its superiority. Some insecticidal and pesticidal properties have also been reported. The sub-species of *Parthenium* are also found beneficial in various ways. Hence besides burning or destroying *Parthenium*, it's a better way of eradicating it and utilize for better crop production.

INTRODUCTION

Congress grass (*Partheniumhysterophorus* L.) is an exotic weed comes under Asteraceae family, accidently introduced in India, 1955 in Pune through the imported foodgrains (Dhawan and Dhawan, 1996). It has become naturalized and is spreading at an alarming rate all over India (Sivakumar *et al*. 2009) and can adopt any climate very easily.

It is one of the ten feared noxious weed species in the world. It is a defamed plant in view of its toxic and allergic properties, since it causes health problems to man and domestic animals (Sivakumar *et al*. 2009). It is harmful to all the living beings; it has nearly destroyed all the useful crops and plants, even though growing near to it. It is known to cause asthma, bronchitis, dermatitis, and hay fever in man and livestock (Narasimhan *et al*. 1977). At present it is one of the most troublesome and obnoxious weed of wasteland, forest, pasture, agricultural lands in India and spreading rapidly in India (Bakthavathsalam and Geetha, 2004). Several attempts have been made for its

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prevention, eradication and control, but to date without success (Kavita and Nagendra, 2000) and hence attracting the attention of all. The economic use is impaired by its toxic effect that is why the composting from rich nutrient content of Parthenium plant might be a useful alternative to be used as a soil conditioner. The *Parthenium hysterophorus* compost contains two times more nitrogen, phosphorus and potassium than Farm Yard Manure (FYM) (Channappagoudar 2007, Angiras 2008). In spite of enough quantity of various essential macro and micro plant nutrients, composting of *Parthenium* is not practiced by farmers.

Composting cannot be considered a new technology, but amongst the waste management strategies it is gaining interest as a suitable option for manures with economic and environments profit (Kishor *et al*. 2010). Hence in present work we tried to use huge amount of locally available Parthenium as a source of composting to make it suitable for agriculture and tried for a better way of eradicating it by utilizing for better crop production.

Possible uses:

1. Green manuring value:

For the main crop of rice, the effect of parthenium green leaf manure on plant height was comparatively less as compared to other green manures like lantana and sunhemp. Whereas, in the ratoon rice crop parthenium green leaf manure was superior in influencing the plant height (Sudhakar, 1984). Similarly in the main crop, parthenium green leaf manure produced less number of filled grains while it produced the highest number of filled grains in the ratoon crop. Among the green leaf manures tried, the residual effect for dry matter production was the highest with parthenium as green leaf manure. In the ratoon crop, parthenium recorded the highest grain yield at 100 Kg N per ha level.

2. In biogas it can be used as slurry.

3. MEDICINAL USE

a. Traditional medicinal use

i. Root extracts are useful in dysentery (Singh *et al.* 1996).
ii. It is used as folk remedies in West Indies and Central America (Nabie *et al.* 1996).
iii. It is applied externally on skin disorders and decoction of the plant is often taken internally as a remedy for a wide variety of ailments (Dominguez and Sierra 1970; Morton 1981)
iv. In Jamaica the extracts are used as a flea repellant for dogs and other animals (Morton 19810).

b. In Homeopathy system the allergies caused by *parthenium* can be treated with the drug extracted from itself.
c. American Indian uses a decoction of roots to cure amoebic dysentery.
d. *Parthenium* is also reported as promising remedy against hepatic amoebiasis (Sharma and Bhutani, 1988).

4. INSECTICIDAL PROPERTIES :

In a field study water extracts from shade dried *Parthenium* leaves have been applied to *Brassica juncea*, for controlling mustard aphid, *Lipaphiserysimi* (Kaltenbach). Population density was noted three days after extract application. The extract of Parthenium exhibited a tremendous reduction (down to 29% of the initial infestation) in the number of *L. erysimi*, one of the most important pests of *B. juncea*, may be due to the effect of phenolic acids (Sohal, 2002).

5. INDUSTRIAL USES :

a. Remove of basic dye.
Absorbents prepared from *Parthenium hysteriophours* – unwanted weed – were successfully used to remove methylene blue from an aqueous solution in a batch reactor. The absorbents included sulphuric acid treated *parthenium* (SWC) and phosphoric acid treated Parthenium (PWC).
b. ***Parthenium argentatum*** a species of parthenium can yield rubber which can substitute Hevea rubber and can be used commercially.
c. It can be used to prepare some antibiotic drugs.
d. Preparation of paper and card boards.
e. It can be used to prepare some Herbicides, insecticides, etc.

MATERIALS AND METHODS

To assess the manurial value of parthenium and its composting value, a composting experiment was conducted. The organic wastes tried were *parthenium,* wheat straw and sugarcane trash. Composite culture consisting of *Trichodermaviride* was used as inoculants for hastening the process of composting.

The unflowered plants of *Parthenium hysterophorus* were uprooted from road side and experimental field of Shree Shivaji Agriculture College Amravati, Maharashtra, India. Wheat straw was also collected

from same field while sugarcane trash was taken from nearby sugarcane juice centre. *Trichodermaviride* cultures were procured from Department of Plant Pathology, Shree Shivaji College of Agriculture, Amravati.

The heap method of composting was used for compost preparation. Thepit of size 1m × 2m × 0.75mwas prepared at Shree Shivaji College of Horticulture farm. The modified protocol from Patil and Jadhav (2008)was used. Firstly the wastes were chopped into bits of about 10cm length. One layer of the waste was spread above which the inoculum was spread. Another layer of waste was spread above which one kg of urea was spread. The organic waste was spread and the process of layering was repeated till a minimum of 1 m height was reached. Water was sprinkled in the stacking process to maintain 60 per cent moisture. The heaps were kept under semi aerobic condition and plastered with paste of wheat straw, dung and soil (1:1:10 kg) at the top. After one month, a turning was given and the moisture content maintained. In about 45 to 50 days, good quality compost was obtained.

For the assessment of the manurial value of parthenium and its composting value the sample (100-200 g) taken and collected in plastic bag. The sample then analysed for organic carbon, total N, P and K percentage in Department of Soil Science, Shree Shivaji College of Agriculture Amravati. The di-acid mixture was used for other element except nitrogen. Nitrogen (N) content was determined by Kjeldahl method; Phosphorous (P) was estimated by vanadomolybdate yellow colour method (Jackson 1973). Potassium (K) estimated by flame photometrically while organic carbon (OC) content by wet oxidation method (Walkley and Black, 1934).

RESULT AND DISCUSSION

The compost from Parthenium showed higher N, P and K percentage when compared to farm yard manure (FYM) values. The calculated manorial value is shown in Table 1.

The inorganic nutrients in *Parthenium* plants exhibited its significance of its utilization as compost in agriculture. The total N, P and K content of *Parthenium* compost was higher than farm yard manure. Similar result was also observed and by Gupta *et al.* 1986, Channappagoudar 2007; Angiras, 2008 and Kishor *et al.* 2010.

The Organic Caron content was also found to higher when compared with that of farm yard manure. A similar result was also reported by Sivakumaret al. 2009.

Accidently or by mistakably while collecting the Parthenium plants some flowered plants were collected which resulted into the occurrence of Parthenium plants growing after 30 days on pit soil. The growing of Parthenium was also observed by many workers but they give various reasons viz. involvement of heat shock protein (HSPs) which do not get denatured by heat (Vierling 1991; Hurkman, 1998), Seed Viability (Kishoret al. 2010)

Beside burning or destruction of this agricultural waste the composting of Parthenium serves for a dual purpose of eradication of the weed as well as for a better utilization as compost for better crop production and can be good source of employment and income for villagers.

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Types of organic manure	Nitrogen (%)	Phosphorus (%)	Potassium (%)	Organic Carbon (%)
Compost from *Parthenium*	1.05	0.84	1.11	12.68
FYM	0.5*	0.2*	0.5*	3-5**

*Referred value from Organic Manures (April 1971 ed.) by Garg A. C., Idnani M. A and Abraham T. P.
**Referred value from 'Krushisavadani 2010' – Dr. PDKV Diary.

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