# Possible application of Parthenium (*Parthenium hysterophorus L.*) in composting

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Abstract—Parthenium hysterophorus L., being a declared invasive weed is threatening the biodiversity and human health in several areas of India. Several researchers have documented the allelopathic effect of this weed. Therefore, Parthenium management would remain a great concern of the century. However, several studies proposed that Parthenium can be used as a green manure, compost, soil ameliorate that may improve physical, chemical and biological properties of the soils and is a source of readily available plant nutrients. To assess the manurial value of Parthenium and its composting value, a composting experiment was conducted and compared with other organic wastes. Appreciable quantity of nutrients in Parthenium can be utilized to nourish the crops after composting. Hence besides burning or destroying Parthenium, it's a better way of eradicating is through exploit utilization for better crop production.

*Keywords* - Compost, FYM, Parthenium, Green mannure, Bio-diversity.

### I. INTRODUCTION

Congress grass (Parthenium hysterophorus L.) is an exotic weed comes under Asteraceae family, accidently introduced in India, in 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, growing near to it. It is known to cause asthma, bronchitis, dermatitis, and hayfever in man and livestock (Narasimhan et al., 1977). At present it is one of the most troublesome and obnoxious weed of waste- land, forest, pasture, agricultural lands in India and spreading rapidly in India (Bakthavathsalam and Geetha, 2004). Several attempts have been made for its 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 compost contains two times more nitrogen, phosphorus and potas- sium 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 betterway of eradicating it by utilizing for better crop production.

# **II. MATERIALS & 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 Trichoderm aviride was used as inoculants for hastening the process of composting. The unflowered plants of Parthenium hysterophorus were uprooted from road side near to Motipur block campus, Muzaffarpur, India. Wheat straw was collected from nearby field while sugarcane trash was taken from nearby sug- arcane juice centre. Trichoderma viride cultures were prepared in our Department.

The heap method of composting was used for compost preparation. The pit of size  $1m \times 2m \times 0.75m$  was prepared in Botanical Garden of our College. 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. 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 (100-200 g) taken and collected in plastic bag. The sample then analysed for organic carbon, total N, P and K per- centage in Krishi Vidyan Kendra, Muzaffarpur. Organic carbon content was determined by wet oxidation method (Walkley and Black, 1934). Nitrogen, Phosphorus and Potassium content were analyzed by using the method of Toth et al. (1948).

# **III. RESULTS & 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.

Table 1. Manorial value of FYM and Parthenium compost

Types	Nitroge	Phosph	Potassiu	Organ
of	n (%)	orus	m (%)	ic
organic		(%)		Carbo
manure				n (%)
Compo	1.06	0.94	1.21	14.68
st from				
Parthen				
ium				
FYM	0.6	0.4	0.6	4.6

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 by Gupta et al., 1986; Biradar et al., 2006; 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 Sivakumar et al., 2009. 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 a good source of employment and income for villagers.

# IV. CONCLUSION

Parthenium hysterophorus L., a 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, 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. Up- rooting of the plant in early stage, i.e. before flowering from field and burning it in soil produce superior quality organic manure.

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