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Assessing the Impact of *Mimosa pigra* – Derived Bio-Fertilizer on Selected Growth and Yield Parameters in MI-2 Chili (*Capsicum annum*)

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Abstract

This study was investigated the effect of *Mimosa pigra* (MP) based fertilizer on the selected growth and yield parameters of MI-2 chili. This organic fertilizer was produced by cutting *Mimosa pigra* into smaller pieces during its vegetative stage and kept them into separate pits for six months until they decompose. The manure produced from the decomposed of MP was extracted from the pit, and used to form several distinct piles with specific compositions. One treatment was produced by incorporating with MP. Another treatment was consisted by incorporating with MP and $CaCO_3$ (MPC). The third treatment was made by combining with MP and Inorganic fertilizer (MPIF). A negative control treatment was prepared for comparison and each mixture consisted of combination of garden soil, goat manure and sand in a 2:2:1 ratio. ANOVA test and Duncan's multiple range analysis were exploited using Minitab 17 software at 95% confidential interval. According to the findings, crops treated with MP showed a significantly high mean number of branches (23.89) , mean number of pods (10.17) , mean number of harvested pods (4.62), high mean weight of pods (8.28 g), pods length (4.38 cm), diameter of pods (0.8540 cm), and the number of seeds per pod (38.00), but there was no significant difference in the height of the plants (P=0.694) and mean number of flowers (P=0.48) which were treated with MP. In conclusion, the MP derived fertilizer has the potential to promote more sustainable and environmentally- friendly agricultural practices in Sri Lanka by providing a practical solution for managing and controlling invasive plant species through their effective utilization as a valuable resource for producing an alternative to traditional fertilizer.

Keywords: *Mimosa pigra*, Organic fertilizer, Vegetative stage

1. Introduction

Organic agriculture is gaining popularity as a sustainable alternative to traditional methods, with many countries actively working reduce the use of agrochemical and promote environmentally friendly practices like organic fertilizers derived from natural sources, which enhance soil fertility and crop growth while minimizing environmental impacts [3]. Organic fertilizers, derived from natural sources, play an important role in maintaining soil fertility by improve structure, aeration and texture, while also enhancing water retention and promoting healthy root development, ultimately fostering resilient and eco-friendly agricultural practices [1]. To obtain a more responsive and safer organic material for improving soil fertility, the composting process is generally considered the most effective pre-treatment method before application [12]. Invasive plants can displace native species, leading to a loss of biodiversity [9]. Invasive plant species can be effectively managed and utilized to create organic fertilizers, offering a sustainable and eco-friendly solution by converting them into compost or mulch, which provides valuable organic matter and nutrients for agricultural soil, enhancing soil health and fertility while addressing the issue of invasive species and promoting environmentally friendly agricultural practices [5]. The use of organic fertilizer derived from invasive species plant has been investigated as a sustainable alternative to synthetic fertilizer [11]. *Mimosa pigra* (MP) commonly referred to as the giant sensitive plant and it is a leguminous shrub that has originated from tropical America [8]. In Sri Lanka, *Mimosa pigra* poses a significant challenge and one promising biological control method involves efficiently converting this plant in to organic fertilizer, which is environmentally friendly compared to chemical fertilizers, making it a key component of the management strategy. This study aims to mitigate the issue of *Mimosa pigra* invasion by investigating its potential conversion into organic fertilizer and evaluating its effectiveness in enhancing the selected growth and yield parameters of MI-2 chili crops in an environmentally sustainable manner.

2. Materials and Methods

2.1 Experiment location

The experiment was conducted at Vavuniya in Sri Lanka. The Vavuniya district is situated in the dry zone region of the North Province. The annual rainfall of this district is 1399.8 mm and average temperature is 28.5 ^{0}C.

2.1.1. Preparation of raw materials

This organic fertilizer was prepared by fragmenting *Mimosa pigra* plant in their vegetative stage and subjecting them to decomposition in designated pits for six months. One sample was mixed with $CaCO_3$ in a1:1 ratio, while the other was allowed to decompose without the addition of $CaCO_3$ [2].

2.1.2. Preparation of pot mixture

The manure produced from the decomposed MP was extracted from the pit, and used to form several distinct piles with specific compositions. One pile, MP- based organic fertilizer, was composed of *Mimosa pigra* (MP), Ground soil (GS), Goat manure (GM) and Sand (S) in a 2:2:2:1 ratio. Another pile, known as MPC fertilizer, was produced by combining $CaCo_3$, GM, GS, and S. Similarly, a third pile was denoted as MPIF and it was made by mixing MP, GS, GM, S and Inorganic fertilizer (IF) in the same 2:2:2:1 ratio. A negative control (NC) was produced by using GS, GM, and S in a 2:2:1 ratio [2] MP, whereas the positive control (PC) included GS, GM, S and IF. All treatment piles were kept for an additional week with daily water sprinkling. Because, to maintain optimal moisture level in each fertilizer piles.

2.2. Experimental design and statical analyse

The field experiment was conducted using a Randomized Complete Block Design (RCBD) model. Pot mixtures were prepared, and two seeds (*Capsicum annum*) were planted per pot, with the most vigorous plant selected after 14 days. The field experiment included five treatments, each with nine replicates, and data analysis was performed using ANOVA and Duncan's multiple range test in Minitab 17 software at a 95% confidence interval.

2.3. Evaluation of growth and yield parameters

Two growth parameters and seven yield parameters were selected to evaluate the efficiency of MP, MPC, MPIF, NC, and PC treatments. Selected two growth parameters and seven yield parameters were selected to evaluate the efficiency MP, MPC, MPIF, NC and PC treatments. Growth parameters were evaluated by measuring plant height (cm) using measuring tape and counting number of primary branches at every week. Yield parameters were assessed by counting number of flowers daily, while number of pods per plant, number of harvested pods per plant, weight of total pods per crop (g) using analytical balance, pods length (cm), diameter of pods (cm) using ruler, and number of seeds per pods through counting were recorded at every week (Table 1). Chili pod diameter was measured at the widest point just below the calyx, while pod length was measured from the shoulder to the apex [7].

3. Result and Discussion

3.1 Height of the chili crops

The figure 1 shows the mean heigh t of chilli crop for each treatment. The mean height of the plants increased across all treatments as the study progressed. The result indicate that the height of chilli crops did not vary significantly among treatments (P=0.694 at 95% CI). However, after 9^{th} week PC treated plant showed the highest mean height compared to the other chilli plants (Table 2,3) (Figure 1).

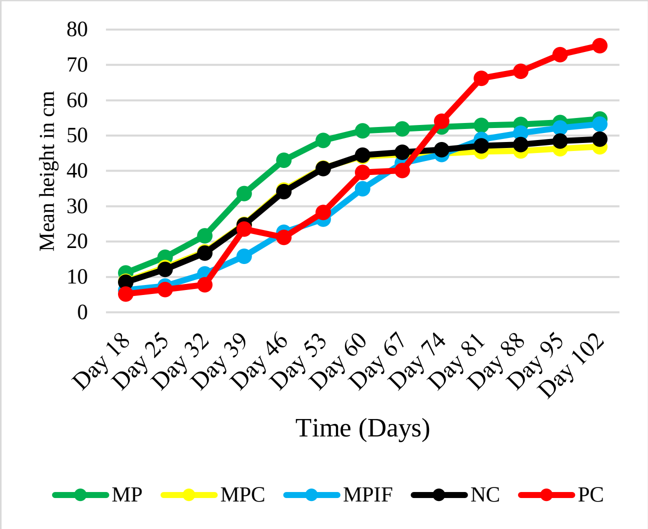

Fig. 1. Mean height of the chili crops with time

2.4. Number of primary branches per plant

Chilli crops (*Capsicum annum*) were started branching during 32^{rd} to 102^{rd} days after being planted in the field. The results emerged from ANOVA analysis at 32^{th} (P=0.022), 39^{th} (P=0.003), 46^{th} (P=0.000) and 53^{th} (P=0.030) days showed that highest mean number of branches on the chili plants were significantly different from each treatment. From 60^{th} (P=0.054) to 102^{nd} (P= 0.541) there was no any significant difference observed in the mean number of branches (Figure 2) (Table 4,5).

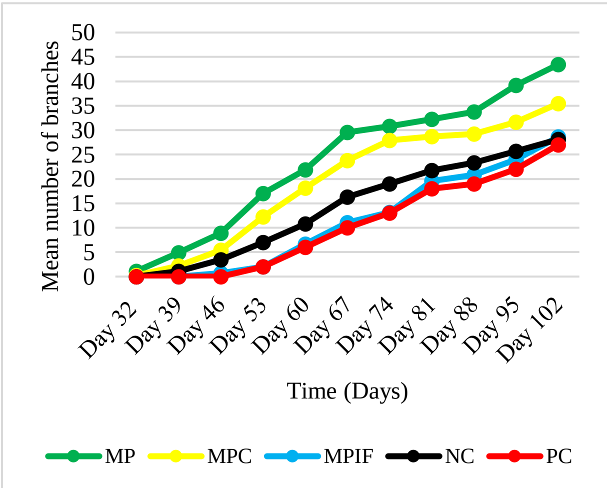

Fig. 2. Mean number of primary branches per plant with time

Table 1:
Evaluation method of selected growth and yield parameters.

	Parameters	Evaluation method of selected growth and yield parameters	
		Method	Time interval
1.	Plant height (cm)	Measuring tape	At every week
2.	Number of primary branches	Counting	At every week
3.	Number of flowers	Counting	Daily
4.	Number of pods per plant	Counting	At every week
5.	Number of harvested pods per plant	Counting	At every week
6.	Weight of total pods per crop (g)	Analytical balance	At every week
7.	Pods length (cm)	Ruler	At every week
8.	Diameter of pods (cm)	Ruler	At every week
9	Number of seeds per pods	Counting	At every week

Table 2:
Mean number of heights per plant

Treatment	Height of Chilli plant (cm) ± SD						
	18^{th} day	25^{th} day	32^{nd} day	39^{th} day	46^{th} day	53^{rd} day	60^{th} day
MP	11.16 ± 1.41^{a}	15.58 ± 1.72^{a}	21.69 ± 2.55^{a}	33.64 ± 4.73^{a}	43.03 ± 5.12^{a}	48.66 ± 4.55^{a}	51.37 ± 5.10^{a}
MPC	8.77 ± 0.76^{ab}	12.69 ± 1.55^{ab}	17.10 ± 1.88^{ab}	24.96 ± 2.60^{ab}	34.58 ± 3.71^{ab}	40.82 ± 2.69^{ab}	44.13 ± 2.27^{a}
MPIF	6.30 ± 2.40^{b}	7.40 ± 3.25^{b}	10.90 ± 4.81^{b}	15.87 ± 6.26^{b}	22.68 ± 11.04^{b}	26.39 ± 8.53^{b}	34.93 ± 11.02^{a}
NC	8.51 ± 1.16^{ab}	12.16 ± 1.53^{ab}	16.72 ± 2.18^{ab}	24.70 ± 2.66^{ab}	34.19 ± 5.95^{ab}	40.69 ± 7.37^{ab}	44.48 ± 7.32^{a}
PC	$.20 \pm 0.00^{b}$	6.400 ± 0.00^{b}	7.800 ± 0.00^{b}	12.90 ± 0.00^{b}	21.20 ± 0.00^{ab}	28.30 ± 0.00^{ab}	39.60 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 3:
Mean number of heights per plant

Treatment	Height of Chilli plant (cm) ± SD					
	67^{th} day	74^{th} day	81^{nd} day	88^{th} day	95^{th} day	102^{rd} day
MP	51.93 ± 5.37^{a}	52.48 ± 5.44^{a}	52.88 ± 5.69^{a}	53.20 ± 5.73^{a}	53.74 ± 5.95^{ab}	54.71 ± 6.15^{ab}
MPC	44.64 ± 1.88^{a}	44.91 ± 1.93^{a}	45.51 ± 2.16^{a}	45.70 ± 2.20^{a}	46.30 ± 1.95^{b}	46.88 ± 1.92^{b}
MPIF	42.18 ± 11.48^{a}	44.66 ± 11.16^{a}	48.94 ± 7.81^{a}	50.75 ± 8.72^{a}	52.22 ± 9.64^{ab}	53.24 ± 10.21^{ab}
NC	45.33 ± 7.46^{a}	46.04 ± 6.59^{a}	47.09 ± 6.11^{a}	47.49 ± 5.92^{a}	48.47 ± 5.58^{ab}	48.98 ± 5.80^{ab}
PC	40.10 ± 0.00^{a}	54.10 ± 0.00^{a}	66.20 ± 0.00^{a}	68.20 ± 0.00^{a}	72.90 ± 0.00^{a}	75.50 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 4:
Mean number of primary branches per plant

Treatment	Number of primary branches (cm) ± SD					
	32^{nd} day	39^{th} day	46^{th} day	53^{th} day	60^{th} day	67^{th} day
MP	1.11 ± 077^{a}	4.89 ± 2.14^{a}	8.89 ± 2.22^{a}	17.00 ± 7.00^{a}	21.89 ± 5.30^{a}	29.56 ± 6.74^{a}
MPC	0.22 ± 0.39^{ab}	2.22 ± 1.39^{ab}	5.44 ± 1.50^{ab}	12.22 ± 5.00^{ab}	18.11 ± 6.41^{a}	23.78 ± 5.97^{a}
MPIF	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	0.67 ± 1.16^{c}	2.00 ± 2.00^{b}	6.67 ± 5.03^{a}	11.06 ± 11.37^{a}
NC	0.00 ± 0.00^{b}	1.11 ± 0.77^{b}	3.44 ± 2.50^{bc}	7.00 ± 3.67^{ab}	10.78 ± 6.17^{a}	16.33 ± 7.75^{a}
PC	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	0.00 ± 0.00^{c}	2.00 ± 0.00^{ab}	6.00 ± 0.00^{a}	10.00 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 5:
Mean number of primary branches per plant

Treatment	Mean number of primary branches ± SD				
	74th Day	81st Day	88th Day	95th Day	102nd Day
MP	1.11 ± 077^{a}	4.89 ± 2.14^{a}	8.89 ± 2.22^{a}	17.00± 7.00^{a}	21.89 ± 5.30^{a}
MPC	0.22 ± 0.39^{ab}	2.22 ± 1.39^{ab}	5.44 ± 1.50^{ab}	12.22 ± 5.00^{ab}	18.11 ± 6.41^{a}
MPIF	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	0.67 ± 1.16^{c}	2.00 ± 2.00^{b}	6.67 ± 5.03^{a}
NC	0.00 ± 0.00^{b}	1.11 ±0.77^{b}	3.44 ± 2.50^{bc}	7.00 ± 3.67^{ab}	10.78 ± 6.17^{a}
PC	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	0.00 ± 0.00^{c}	2.00 ± 0.00^{ab}	6.00 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

3.3 Number of flowers per plant

The study showed that mean number of flowers were not significantly differ from each other (P= 0.479). The highest mean number of flowers were showed by MP treatment plants (8.01). Analysis of Variance (ANOVA) revealed significant differences in mean flower numbers among treatments on days 46 (P=0.044), 67 (P=0.007), 88 (P=0.002), and 95 (P<0.001). However, no significant differences were observed on days 74 (P=0.054), 81 (P=0.625), and 102 (P=0.104) (Table 6) (Figure 3).

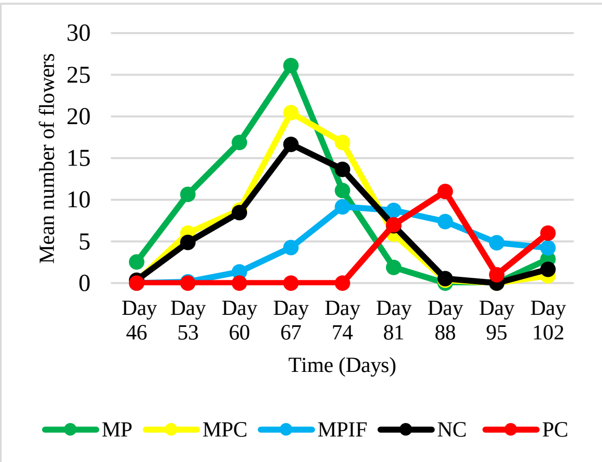

Fig.3. Mean number of flowers with time

3.4 Number of pods per plant

The mean number of pods per plant showed a significant difference among the treatments, with MP treated chili crops showing the highest number of pods (P=0.000). But 81st to 102nd days no significant difference was observed in the number of pods between each treatment. MP treated plant were emerged the highest number of pods per plant in 81th day. From 88th to 102nd day, the maximum number of pods per plant was showed in MP treated plant compare to other treated plants. As well as minimum number of pods per plant was revealed in PC treated plant at 67th to 102nd day (Table 7) (Figure 4).

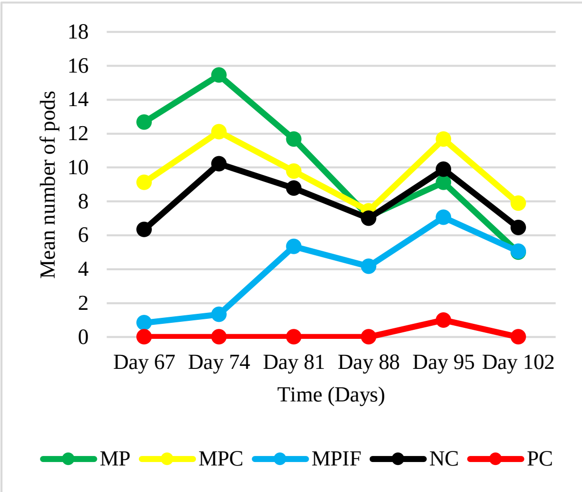

Fig.4. Mean number of pods per plant with time

3.5 Number of harvested pods per plant

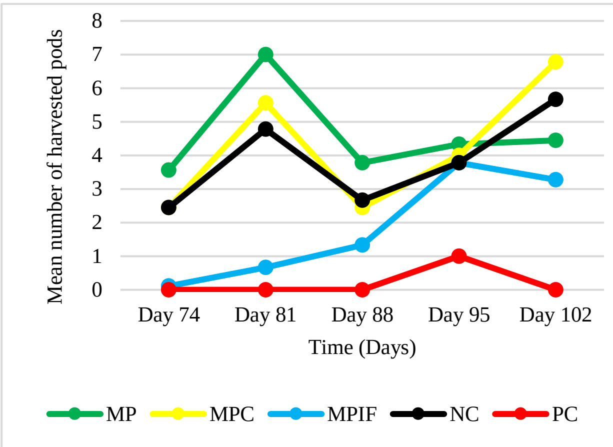

Fig.5. Mean number of harvested pods per plant with time

When consider about mean number of harvested chilli pods per plant, the result showed a significant difference between each treatment from 74th (P= 0.011) to 88th day (P= 0.027) of the study. But 95th (P= 0.630) and 102nd (P= 0.330) days, there was no significant difference from each treatment.

Specifically, MP treated plants showed the highest mean number of harvested pods on 95th day while MPC treated plant was expressed showed highest mean number of harvested pods on 102nd day. Notably, PC treated plant emerged minimum number of harvested pods throughout the entire study period (Table 8) (Figure 5).

Table 6:
Number of flowers per plant

	Mean number of flowers per plant (cm) ± SD								
	46th day	53th day	60nd day	67th day	74th day	81rd day	88th day	95th day	120nd day
MP	2.56±1.68^{a}	10.6 ±2.03^{a}	16.89±4.22^{a}	26.11±4.00^{a}	11.11 ± 3.56^{a}	1.89 ± 2.14^{a}	0.00 ±0.00^{b}	0.00 ±0.00^{b}	2.89 ± 1.64^{a}
MPC	0.22±0.39^{a}	6.00±3.38^{ab}	8.78 ±2.80^{b}	20.44±8.38^{ab}	16.89 ± 4.60^{a}	5.89 ± 2.91^{a}	0.33 ± 0.33^{b}	0.00 ±0.00^{b}	0.89 ± 0.51^{a}
MPIF	0.00±0.00^{a}	0.17±0.29^{ab}	1.33 ±1.16^{b}	4.28 ± 3.64^{b}	9.17 ± 8.01^{a}	8.72 ± 9.89^{a}	7.39 ± 3.78^{a}	4.83 ±1.60^{a}	4.22 ± 2.80^{a}
NC	0.33±0.58^{a}	4.89 ±1.84^{b}	8.44 ±1.64^{b}	16.67±5.75^{ab}	13.67± 1.76^{a}	6.89 ± 1.17^{a}	0.56 ± 0.69^{b}	0.00 ±0.00^{b}	1.78 ± 0.51^{a}
PC	0.00±0.00^{a}	0.00± 0.00^{b}	0.00 ±0.00^{b}	0.00 ± 0.00^{b}	0.00 ± 0.00^{a}	7.00 ± 0.00^{a}	11.00 ±0.00^{a}	1.00 ±0.00^{b}	6.00 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 7:
Mean number of pods per plant

Treatment	Mean number of pods per plant (cm) ± SD					
	67th day	74th day	81nd day	88th day	95th day	102rd day
MP	12.67 ±1.53^{a}	15.44 ±2.22^{a}	11.67 ±1.33^{a}	7.11 ± 1.39^{a}	9.11 ± 1.90^{a}	5.00 ±0.58^{a}
MPC	9.11 ± 2.91^{ab}	12.11 ±2.22^{a}	9.78 ± 1.17^{a}	7.44 ± 2.22^{a}	11.67 ±5.03^{a}	7.89 ±4.86^{a}
MPIF	0.833 ±1.44^{c}	1.33 ± 2.31^{a}	5.33 ± 6.11^{a}	4.17 ± 5.20^{a}	7.06 ± 5.18^{a}	5.06 ±3.47^{a}
NC	6.33 ±3.18^{abc}	10.22 ±1.95^{b}	8.78 ± 0.51^{a}	7.00 ± 0.58^{a}	9.89 ± 2.67^{a}	6.44 ±2.50^{a}
PC	0.00 ±0.00^{bc}	0.00 ± 0.00^{b}	0.00 ± 0.00^{a}	0.00 ± 0.00^{a}	1.00 ± 0.00^{a}	0.00 ±0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 8:
Mean number of harvested pods per plant

Treatment	Mean number of harvested pods plant (cm) ± SD				
	74th day	81th day	88th day	95th day	102th day
MP	8.77 ± 0.67^{a}	13.82 ± 2.51^{a}	5.37 ±1.30^{a}	6.37 ± 0.74^{a}	7.10 ± 2.17^{a}
MPC	6.27 ± 2.89^{ab}	10.75 ± 1.39^{a}	3.87 ± 0.91^{ab}	3.94 ± 0.80^{a}	9.81 ± 6.10^{a}
MPIF	0.38 ± 0.66^{b}	1.38 ±1.42^{b}	2.14 ± 2.08^{ab}	5.21 ± 3.67^{a}	4.32 ± 1.50^{a}
NC	6.37 ± 4.08^{ab}	10.45 ± 2.45^{a}	3.68 ± 0.51^{ab}	5.49 ± 0.58^{a}	8.46 ± 2.70^{a}
PC	0.00 ± 0.00^{ab}	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	1.39 ± 0.00^{a}	0.00 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 9:
Mean number of lengths of the chili pods

Treatment	Mean number of pods length per plant (cm) ± SD				
	74th day	81th day	88th day	95th day	102th day
MP	5.20 ± 0.10^{a}	4.76 ± 0.48^{a}	4.27 ± 0.35^{a}	3.67 ± 0.32^{a}	4.02 ± 0.21^{a}
MPC	4.60 ± 1.08^{ab}	4.66 ± 0.09^{a}	3.73 ± 0.79^{a}	3.48 ± 0.88^{a}	3.40 ± 0.83^{a}
MPIF	0.80 ± 1.39^{b}	2.19 ± 2.25^{ab}	2.28 ± 2.35^{a}	4.28 ± 0.32^{a}	3.89 ± 0.81^{a}
NC	4.56 ± 2.52^{ab}	4.687±0.184^{a}	3.59 ± 0.61^{a}	3.94 ± 0.23^{a}	3.97 ± 0.33^{a}
PC	0.00 ± 0.00^{ab}	0.00 ± 0.00^{b}	0.00 ± 0.00^{a}	3.7 ± 0.00^{a}	0.00 ± 0.00^{b}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

3.6 Lengths of chili pods

In here, chilli pods were harvested from each plant from each plot. Mean length of the chilli pods showed significant difference in 74th (P= 0.022), 81th day (P= 0.020) and 102nd day (P= 0.004) between each treatment. But, on the 88th (P= 0.114) and 95th (P= 0.421) days, there was no significant difference in pod length observed across the treatments. Throughout the entire study period, PC treatment plants displayed the minimum mean pod length per plant except the 95th day (Table 9) (Figure 6).

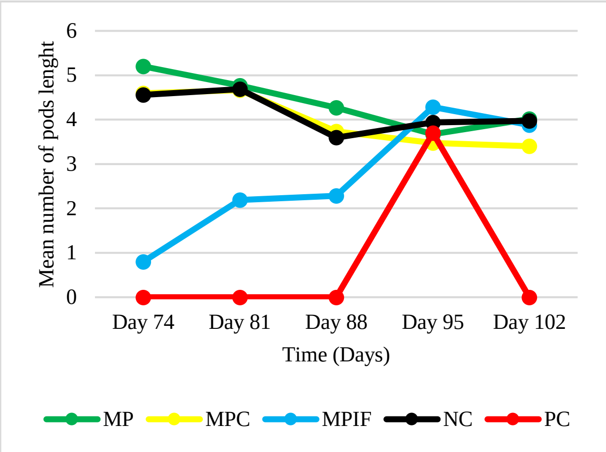

Fig.6. Mean number of pod length of per plant

3.7 Diameter of chili pods

In here also, chili pods were taken from each plant from each plot. The significant different was emerged between each treatment in mean number of diameters of the chilli pods on 74th (P= 0.009), 81st (P= 0.006) and 102nd (P= 0.005) day according to ANOVA analysis.

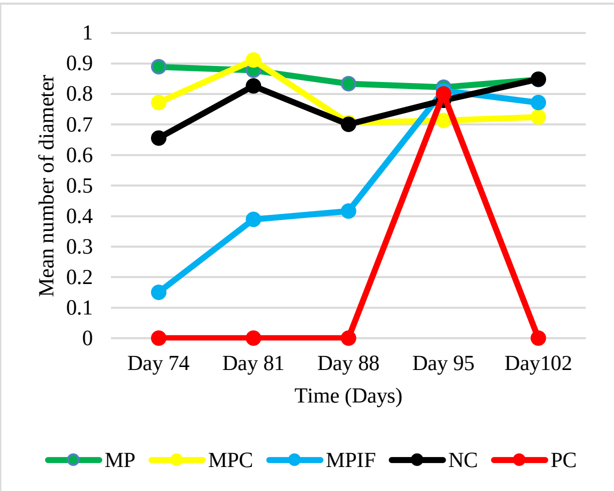

Fig.7. Mean number of pods diameter of per plant

On 88th (P= 0.059), and 95th (P= 0.688) days, there were no significant difference in the mean number of chili pods diameter between the different treatment. The MPC treatment had the lowest mean number of chili pod diameter compared to the other treatments on the 95th day. The PC treated plant was revealed minimum mean number of diameters of the chilli pods except 95th day (Table 10) (Figure 7).

3.8 Weight of total chili pods

The mean weight chilli pods were varied across treatments from the 74th (P= 0.020), to 88th (P= 0.044) day. According to ANOVA analysis, there was no significant difference in the mean weight of chili pods between the treatments on the 95th (P= 0.284) and 102nd (P= 0.196). The maximum mean number of weight of pods per plant was showed MP treated crop from 74th to 95th day. But, MPC treated plants were showed highest mean total weights of chili pods per crop on 102nd day (9.81g) compared to all other treatments (Table 11) (Figure 8).

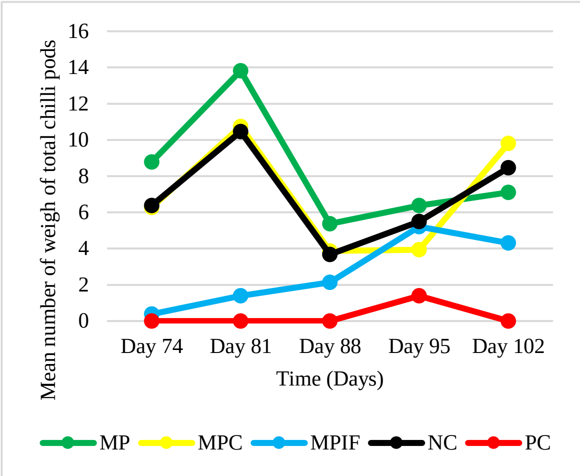

Fig.8. Mean number of weights of total chili pods per plant

3.9 Number of seeds per pods

There was significant different between each treatment in during whole study period except 95th day (P= 0.090). On 81st day, the minimum mean number of seeds per pods were showed MPIF and PC treatment plant and other day when the number of seeds were counted, the lowest mean number of seeds per plant was recorded in PC treatment plants. But, maximum mean number of seeds per plant was emerged in NC (56.33) compare to other treatment only 81st day, but since then the maximum mean number of seeds per pods was recorded in respective days (From 88th to 102nd day) (Table 12).

Table 10:
Mean number of diameters of the chili pods (cm)

Treatment	Mean number of diameters of the chili pods (cm) ± SD				
	74th day	81th day	88nd day	95th day	102th day
MP	0.89 ± 0.02^{a}	0.88 ± 0.02^{ab}	0.83± 0.089^{a}	0.82 ± 0.03^{a}	0.85 ± 0.03^{a}
MPC	0.77 ± .013^{ab}	0.91 ± 0.02^{a}	0.71 ± 0.09^{a}	0.71 ± 0.16^{a}	0.72 ± 0.17^{a}
MPIF	0.15 ± 0.26^{c}	0.39 ± 0.36^{bc}	0.42 ± 0.40^{a}	0.81 ± 0.10^{a}	0.77 ± 0.18^{a}
NC	0.66 ± 0.31^{abc}	0.83 ± 0.03^{ab}	0.70 ± 0.12^{a}	0.78 ± 0.02^{a}	0.85 ± 0.09^{a}
PC	0.00 ± 0.00^{bc}	0.00 ± 0.00^{c}	0.00 ± 0.00^{a}	0.80 ± 0.00^{a}	0.00 ± 0.00^{b}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 11.
Mean number of weights of total pods per plant (g)

Treatment	Mean number of weights of total pods per plant (cm) ± SD				
	74th day	81th day	88nd day	95th day	102th day
MP	8.77 ± 0.67^{a}	13.82 ± 2.51^{a}	5.37 ±1.30^{a}	6.37 ± 0.74^{a}	7.10 ± 2.17^{a}
MPC	6.27 ± 2.89^{ab}	10.75 ± 1.39^{a}	3.87 ± 0.91^{ab}	3.94 ± 0.80^{a}	9.81 ± 6.10^{a}
MPIF	0.38 ± 0.66^{b}	1.38 ±1.42^{b}	2.14 ± 2.08^{ab}	5.21 ± 3.67^{a}	4.32 ± 1.50^{a}
NC	6.37 ± 4.08^{ab}	10.45 ± 2.45^{a}	3.68 ± 0.51^{ab}	5.49 ± 0.58^{a}	8.46 ± 2.70^{a}
PC	0.00 ± 0.00^{ab}	0.00 ± 0.00^{b}	0.00 ± 0.00^{b}	1.39 ± 0.00^{a}	0.00 ± 0.00^{a}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

Table 12:
Mean number of seeds per pods

Treatment	Mean number of seeds per pods (cm) ± SD			
	81th day	88th day	95nd day	102th day
MP	49.56± 5.52^{a}	38.11 ± 12.30^{a}	54.78 ± 3.83^{a}	47.56 ± 2.83^{a}
MPC	48.56±11.97^{a}	37.78 ± 6.52^{a}	45.33 ± 9.33^{a}	37.56 ± 8.83^{a}
MPIF	0.00 ± 0.00 ^{b}	11.67± 13.87^{a}	24.90 ± 21.8 ^{a}	38.50 ± 14.29^{a}
NC	56.33 ± 3.93^{a}	11.67 ± 13.87^{a}	50.11± 5.17^{a}	39.67 ± 2.52^{a}
PC	0.00 ± 0.00^{b}	0.00 ± 0.00^{a}	28.00 ± 0.00^{a}	0.00 ± 0.00^{b}

Each value represents Mean ± SD of replicates (n=9), value represent with the same superscript letter along the column are not significantly different (P< 0.05)

4. Conclusion

From the overall study, *Mimosa pigara* derived fertilizer is emerged a significantly high mean number of primary branches, pods, high mean number of weight of pods, pods length, pods diameter and the number of seeds per pods but there was no significant difference observed in the highest of the chili plants and mean number of flowers which was treated with MP. In conclusion, *Mimosa pigra* derived fertilizer may support eco-friendly agriculture and the effective utilization of invasive alien species, in addition to provide better solution for the current scenario in Sri Lanka as management practice of controlling invasive alien species.

Conflict of Interest

No conflicts of interest to declare.

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