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Improving Cultural Management Practices of High Valued Variety of Malaysian Mums

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Abstract

The growth and floral yield parameters of Malaysian mums was significantly influenced by different organic soil amendment both in two cropping. Mums grown in 1 part garden soil and I part plant mate + carbonized rice hull and FPJ was the tallest plant, early to initiate bolting resulting to earlier flower initiation and harvesting , higher dry matter yield , numerous petals, bigger flower size and longer shelf life but statistically at par to 1 part garden soil and I part chicken dung + carbonized rice hull and FPJ and recommended slow release fertilizer while garden soil alone obtained the shortest, delayed floral opening and harvesting due to late bolt initiation, few petals and smaller flower head both in two cropping season. The floral color of Malaysian mums was rated 2 classified as good color dominated red orange based on color chart in 1st cropping but dominated yellow with red strip in second cropping.

Keywords: Plantmate; vermicast; slow release; malaysian mums; organic soil amendments.

1. Introduction

Malaysian mum is one of the leading cut flowers in both international and domestic market. In 2015 increase demand of mums estimated to 1.8 million dozens brought about by increasing population and the rising number of institutional buyers like hotels, restaurants, banks, park establishments and various land development for an increasing demand triggered more production [3].

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The demand for the domestic market is so huge that the domestic production cannot cope with the demand and still short to fill in the supply. However, no local growers of mums in the province were able to fill this demand due to some factors like poor access to improved production technologies and insufficient information as to proper cultural management practices and its adaptability.

One of the important challenges to the ornamental industry is to develop a production system that will adequately meet the need for year-round production of cut flowers and potted plants. Production of potted Malaysian mums stood out in the last few years as one of the main ornamental plants grown, with commercialization of the plant in pots having a great deal of market expression and the growing of this crops most likely in the high elevated areas [2].

Venture into cut flower production will fill the supply gap with the use of organic soil amendments as one of agricultural approaches and practices for sustainable crop production that can contribute to climate change adaptation [1] enhancement of soil health (biologically-based phenomenon), productive capacity, and function as the precursors for sustainable production intensification[8].

The study is only limited to the use of organic soil amendments for potted Malaysian Mums under protected conditions for two cropping.

1.1. Objectives

- Assess the growth and floral size of Malaysian mums as influenced by the different organic soil amendments in two cropping using the same organic soil amendments
- Determine the floral quality and shelf life of Malaysian mums as influenced by the different organic soil amendments in two cropping using the same organic soil amendments

2. Methodology

2.1. Research Design

The Complete Randomized Design (CRD) with three replication was use to assess the growth and floral size of Malaysian mums as influenced by the different organic soil amendments for two cropping. The treatments were as follows:

T1 – 1 part garden soil + 1 part vermicast +50 g carbonized rice hull + FPJ

T2 – 1 part garden soil + 1 part plantmate + 50 g carbonized rice hull + FPJ

T3 – 1 part garden soil + 1 part chicken dung+ 50 g carbonized rice hull +FPJ

T4 – Garden soil + slow release +50 g carbonized rice hull

T5 – Garden soil + 50 g carbonized rice hull + FPJ

A total of 150 healthy and disease-free rooted stem cuttings of Malaysian mums were used in this study for each cropping. Rooted cuttings of Malaysian mums were set individually to the designated perforated polyethylene bags to ensure proper drainage. Weekly application of fermented plant juice (FPJ) was done to different treatment. Watering was employed early in the morning twice a day in the first month and once daily onward up to harvesting. Horizontal netting was provided using nylon straw as netting materials to support the plants.The experimental plants were protected from any insect pests and diseases. Harvesting was done late in the afternoon at 75 percent flower-opening stage as marketable flower.

Figure 1: Malaysian Mums at Harvest and Color Chart

3. Results and Discussion

3.1. Average Number of Days from transplanting to harvesting in two cropping

Mums grown in 1 part garden soil and I part plant mate + carbonized rice hull and FPJ and 1 part garden soil and I part chicken dung + carbonized rice hull and FPJ, initiated early bolt development (72 days) statistically comparable to garden soil + slow release + 50 g carbonized rice hull (70 days). Both flower initiation and flower buds development occurred more rapidly under short days than in long days with cool nights and low temperature [6,7]. Number of days from transplanting to harvesting significantly influenced by the different organic soil amendments. Mums grown in 1 part garden soil + 1 part plant mate + 50 g carbonized rice hull + FPJ , 1 part garden soil + I part chicken dung + carbonized rice hull and FPJ and Garden soil + slow release + 50 g carbonized rice hull significantly the earliest to harvest in both cropping . On the other hand Garden soil + mixture of 50 g carbonized rice hull + FPJ was late to harvest (132 days). The difference in days to harvest can be attributed to the increased in vegetative growth, higher dry matter accounts more photosynthates and flowering stimulus thus causing early flowering and fruit development, increased reproduction and improved marketable yield quality [4,5]. Soil medium having 1 part garden soil + 1 part plant mate + 50 g carbonized rice hull + FPJ significantly the tallest plants among treatment but did not differ significantly to mixture of garden soil + slow release + 50 g carbonized rice hull in both cropping . The increase in plant height was due to the high nitrogen content, sufficient phosphorous and potassium based on soil analysis.

Table 1: Average Number of Days from transplanting to harvesting

Treatments	Days from Transplanting to Bolting Stage	Days from Bolting to Flower Initiation	Days from flower initiation to 75% opening	Days from transplanting to Harvesting
T1 – 1 part garden soil + 1 part vermicast +50 g CHR + FPJ	77[b]	23[a]	10[b]	110[b]
T2 – 1 part garden soil + 1 part plantmate +50 g CHR + FPJ	72[c]	17[b]	8[c]	97[c]
T3 – 1 part garden soil + 1 part chicken dung +50 g CHR + FPJ	72[c]	19[b]	8[c]	99[c]
T4 – Garden soil + slow release +50 g CHR +	70[c]	14[c]	6[c]	90[d]
T5 – Garden soil + 50 g CHR + FPJ	93[a]	25[a]	14[a]	132[a]

Figure 2: Plant Height at Harvest (cm)

3.2. Floral Yield Attributes

Mums grown in 1 part garden soil + I part plantmate + carbonized rice hull and FPJ produced higher dry matter yield, numerous petals and bigger flower size (35 mm) statistically comparable to recommended slow release fertilizer both in two cropping while garden soil alone produced few petals and smaller flower head (27 mm).

Table 2: Floral Yield Attributes

Treatments	Dry Matter Yield (ton/ha)	Number of petals	Color of the Flower	Shelf life (days)
T1 – 1 part garden soil + 1 part vermicast +50 g CHR + FPJ	0.41[b]	21[b]	2	7[c]
T2 – 1 part garden soil + 1 part plantmate +50 g CHR + FPJ	0.51[a]	22[a]	2	9[b]
T3 – 1 part garden soil + 1 part chicken dung + 50 g CHR + FPJ	0.39[b]	20[b]	2	10[b]
T4 – Garden soil + slow release +50 g CHR	0.54[a]	23[a]	2	12[a]
T5 – Garden soil + 50 g CHR + FPJ	0.20[c]	16[c]	1	5[d]

Figure 3: Flower size of Malaysian Mums

4. Summary, Conclusion and Recommendation

4.1. Summary

Complete Randomized Design (CRD) with three replication was used to assess the growth and floral size of Malaysian mums as influenced by the different organic soil amendments for two cropping. The treatments includes; T1 -1 part garden soil + 1 part vermicast +50 g carbonized rice hull + FPJ, T_2 -1 part garden soil + 1 part plantmate + 50 g carbonized rice hull + FPJ, T_3 -1 part garden soil + 1 part chicken dung+ 50 g carbonized rice hull +FPJ, T_4 - Garden soil + slow release +50 g carbonized rice hull, T_5 - Garden soil + 50 g carbonized rice hull + FPJ. The growth and floral yield parameters of Malaysian mums were significantly influenced by different organic soil amendment both in two cropping. Mums grown in 1 part garden soil and I part plant mate + carbonized rice hull and FPJ was the tallest plant, early to initiate bolting resulting to earlier flower initiation and harvesting, higher dry matter yield, numerous petals, bigger flower size and longer shelf life while garden soil alone obtained the shortest, delayed floral opening and harvesting due to late bolt initiation, few petals and smaller flower head both in two cropping season

4.2. Conclusion

1. The different organic soil amendment significantly affects on the growth and floral size of Malaysian mums. Mums grown in 1 part garden soil and I part plant mate + carbonized rice hull and FPJ was the

tallest plant, early to initiate bolting resulting to earlier flower initiation, higher dry matter yield, numerous petals and bigger flower size but statistically at par to recommended slow release fertilizer while garden soil alone obtained the shortest, delayed floral opening due to late bolt initiation, few petals and smaller flower head both in two cropping season.

2. There is a significant difference on the floral quality and shelf life of Malaysian mums Mums grown in slow release fertilizer turned up longer shelf life (12days) but merely comparable to different organic soil amendment.compared to Garden soil shorter shelf life (5 days).

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