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Growth and Performance of Stock (*Matthiola incana* L.) Affected by Different Crop Residues

[1]Abdul Kareem, [1]Shuaib Raza, [2]Abdul Manan, [2]Shafqat Saeed and [3]Shoaib Ur Rehman

[1]Ghazi University, Dera Ghazi Khan
[2]Collage of Agriculture, Bahadur Sub-campus Layyah, Bahauddin Zakariya University, Multan, Pakistan
[3]Institute of Horticultural Sciences, University of Agriculture, Faisalabad 38040-Pakistan

Abstract: Growth and performance of stock flower was assessed on various crop residues as potting media. A pot experiment was conducted by transplanting 4 leaf stage (30 days) old seedlings on different crop residues, Silt potted as control, FYM and Silt (1:3), cockscomb grown residues (FYM and Silt) (1:3) and FYM and Silt (1:3) Maize (grown) crop residues as treatment. Completely Randomized Design was applied to test the significance and to compare means. All the results were statistically significant for all the parameters studied. Plant growth indices indicated that the maximum values for plant height (32.66 cm), number of branches (20.66), fresh weight (49.56 g) and dry weight (16.33 g) were found in maize crop residues. The silt and combination of Slit + FYM has little effect on all the parameters studies.

Key words: Stock · Crop Residues · Silt · Maize · FYM · Cockscomb

INTRODUCTION

Stock is an outstanding cut flower. Good flower production usually depends upon various facts including i.e. use of hybrid seed, nutrient availability andcultural practices. Nutrient availibity plays an important role in good flower production and thus its provision is prerequisite for better production of floriculture crops. For better flowering in our origin, noalternateis given to the provision of nutrients to the flowering plants.

Crop residues as growing medium have a greater effect on valued potted plants [1] and plays substantial role in morphological parameters such as plant height, number of flowers, number of leaves and yield etc. A good source of nutrition is provided by different kinds of manures when applied to plants alone or in combination with soil less substrates [2]. Different growing medium have best results as were observed in tuberose [3].

Most suited growing medium are most important for quality improvement of foliar and flower production as these maintained plant rooting system [4]. Moreover, growing medium are essential for sufficient quantity of water absorption, nutrients provision, as well as exchange of gases between roots in growing medium and outside the atmosphere [5]. The topsoil of garden has been normally used by the growers for raising floricultural crops, though, it is a non-renewable resource, so sustainable flower production cannot rely on non-renewable resource natural resources [6]. Materials such as peat and natural soils are common for the production of substrates for floricultural crops [7].

Up till now no extensive work has been done on crop residues as growing media in Pakistan. Therefore, keeping in view, this study was design to determine the effects of different crop residues as media on the growth andperformance of stock.

MATERIALS AND METHODS

An experiment was carried out in the pots (24 inches) under field conditionsin College of Agriculture Bahadur sub-campus Bahauddin Zakariya University, Multan during winter 2013.30 days old seedlings were planted in pots. Experiment was laid out according to Completely Randomized Designs (RCBD) arrangement, Siltas control, FYM+Silt (1:3), FYM+Silt (1:3) Maize crop residues and FYM+Silt (1:3) Cockscomb crop residues.Each treatment was comprised of five pots in each replicate and repeated thrice with 3 plants each pot.

Corresponding Author: Abdul Kareem, Ghazi University, Dera Ghazi Khan, Pakistan.

Crop Residues: The residues were obtained from freshly harvested crops of maize and cockscomb in the pots in an agronomic and horticulture trails of NPK fertilizer trails. Different doses of fertilizer were given with different interval. The whole experiments were kept for 6 months.

Plant Characteristics: Data pertaining to all the growth and flower characters were collected during the study period. Observations were made on each plant and averages were taken for following indices: Plant height (cm), number of Leaves, number of long leaves, number of branches, total clusters, number of flowers in clusters, plant total weight, dry weight. All the parameter was recorded at blooming stage.

Statistical Analysis: The data were statistically analyzedforAnalysis of Variance (ANOVA)using, Statistica. Differences between the treatments were calculated using Least Significant Test (LSD) test.

RESULTS AND DISCUSSION

Plant Height (cm): Varying response was noted for heights in each treatment. Treatment consisting of FYM+Silt with maize residues' resulted in maximum plant height 32.66 cm followed by Silt 24.66 cm while FYM+ Silt and FYM+ Silt with cockscomb residues were at par each other. The performance of cockscomb residues was unsatisfactory as it resulted in minimum plant height 21.66 cm from Table 1. Results indicated that FYM+ Silt with maize have better qualitative effects on plant height as compared to other crop residues. This may be due to availability of nutrients in crop residues which may reduce the crop productivity. These results are in line with those obtained by Fred *et al*. [8] where they noted that chrysanthemum showed maximum plant height when it was grown in compost mixes. Our findings are also in agreement with Yusef [9] and Kareem *et al.* [10] who reported that growing of flowers on organic manures had the best effects on growth of annual flowers like petunia (*Petunia hybrida* L.), snapdragon (*Antirrhinum majus* L.) and marigold (*Tagetes erecta* L.) and increased plant height, number of flowers and flower diameter.

Number of Leaves: Table 1 showed that the maximum number of leaves 185.33were counted in FYM+Silt with cockscomb and maize crop residues followed by FYM+Silt and Silt producing185.33, 175.0 and 171.67, 146.67 leaves. This indicates that FYM+Silt with crop residues have nutritional balance for maximum number of leaves, whereas FYM+Silt and Silt alone have malnutrition effects on number of leaves production. These findings were supported by Riaz *et al.* [11]. They also counted more number of leaves in mixture of leaf compost.

No. Of Long Leaves: Stock plants grown in the medium Maize (FYM+Silt) had longest leaves (17.00 cm) and were statistically different in this regard from the plants grown in the other crop residues as growing media (Table 1). The plants grown in the other crop residue medium were statistically with par each other. Positive effectsof the growth media containing Maize (FYM+Silt) on foliage abundance were reported in poinsettia [12] and boxwood [13].

Number of Branches: Regarding comparison of means for total number of branches no difference was found which mean different crop residues FYM+Silt and silt produced almost the same number of branches and had no significant on increasing total branches. FYM+Silt with maize crop residue were better than cockscomb residues having 21.00 and 18.00 number of branches. However, control is at par with FYM+Silt and Silt and also at par withcrop residues. The possible reason may due genetic makeup of the stock plant.

Total Flower Clusters: It is evident from Table 1 that maximum number of flower cluster (17.33) was observed in plants Cockscomb (FYM+Silt) while minimum numbers of flower cluster (11.66) were noticed in FYM+Silt media. The higher number of flower clusters might be due to optimum supply of nutrient from medium, Day [14] reported that optimum supply of nutrients stimulated the uptake ofphosphorus by plant roots and might have promoted flower clusters formation, as phosphorus directly promotes flowering Balley [15] also obtained similar results.

Number of Flowers per Clusters: When means for number of flowers per cluster were compared, control alone produces more number of flowers 19.66 and FYM+Silt and Silt 12.33 flowers per clusters. Crop residue depicted same number of flowers in each cluster, which mean that all the treatments have same effect or no effect on number of flowers per cluster. This can be correlated with genetic factor of the crop.

Table 1: Effect of different crop residues as growing media on the growth and performance of stock (*matthiola incana* L.)

Media (1:3)	Plant height (cm)	No. of leaves	No. of long leaves	No. of branches	Total flower clusters	No. of flowers per clusters	Plant fresh weight	Dry weight
	Control							
Silt	24.66 B	146.67C	13.66B	17.66A	15.00B	19.66 A	17.83 C	10.33 C
	Crop residues							
FYM+Silt	21.66 C	171.67B	16.33B	17.66A	11.66C	12.33 B	17.00 C	8.66 C
Maize (FYM+Silt)	32.66A	175.0AB	21.00A	20.66A	16.66AB	12.33 B	49.56 A	16.33 A
	Cockscomb							
(FYM+Silt)	21.66 C	185.33A	16.33B	18.33A	17.33A	12.33 B	28.66 B	13.00 B

Plant Fresh Weight/Dry Weight (g): Analysis of fresh and dry weights showed highly significantly positive results. Plants with increased in fresh weights, showed the nutrient rich growing medium. Maximum increase in fresh weight was found in plant (49.56 g) in maize residues followed by FYM+ Silt with cockscomb residues with 28.66g. Control and FYM+ Silt were at par each other for fresh weight. On the other hand, plants grown cockscombs residues presented marked reduction in dry weight (10.33g) (Table 1). A significant positive increase (16.33 g) in dry weight of plant was recorded in FYM+ Silt with maize residues. While, decrease in dry weight in FYM+ Silt and control which was statistically at par with each other at 8.66 and 10.33g.

CONCLUSIONS

In the present study, crop residue used media Maize (FYM+ Silt) produced significantly effects maximum number of flowers and maximum foliage. However, Cockscomb (FYM+ Silt) was second medium as crop residues while, non crop residue have also effect on growth and flowering of stock plant but not efficient. Therefore, keeping in view, crop residues have significant role growth and performance of stock plant must be considered good candidates as a growth medium for stock (*Matthiola incana* L.).

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