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# Effect of Different Crop Residues on Growth and Flowering of Dahlia *dahliahortensis* under Agro- Climatic Conditions of Layyah

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## I. Introduction

Dahlias are a diverse and popular class of plants grown for winter flowers in beds or containers in Pakistan. Cultivars are available in a wide range of plant heights, colors, and flower forms to suit almost every need and have been used as bedding plants, garden plants, and cut flowers for many years.

Growing media plays an important role in the growth and productivity of plants by providing them nutrition, anchoring and providing minerals to plants. A good growing medium would anchorage and support to the plant, serves as source for nutrients and water, allowing oxygen to diffusion to the root zoon and permit exchange of gases between the roots and external atmosphere (Argo, 1998 and Abad et al., 2002).

Soil mixes are the most important potting Medias for the quality production of cut flowers in floriculture. In the last few years, floriculrist and nursery men have been very concerned about potting mixes. Research suggested that peat has been replaced satisfactorily with some organic waste materials in container media including wood fiber and bark, coconut coir, and compost etc. Sewage sludge from municipal wastewater has extensively been used as soil base growing medium (Vendrame et al., 2005). Peat and natural soil are the most used growing media for the container growing of ornamental plants. Peat is widely used for potted plant production in nurseries and accounts a significant portion of the potted material used to grow plants (Marfa et al., 2002; Ribeiro et al., 2007).

Different types of waste materials offer a potential alternate for peat in horticulture production. There is a continuous attention in using various agricultural crop residues byproducts as nutritional source for plants because of rising consciousness of environmental issues, including the need for managing and making use of bulk quantities of agricultural waste (Grigatti, 2008; Riaz et al., 2008). In recent years, researchers have shown an interest in reducing the use of crop residues as growing media in pot production (Abad et al., 2001; Khan et al., 2012).

Crop residues play important roles in nutrient cycling, erosion control and the maintenance of favorable soil physical properties (Pichot et al., 1981;Power et al., 1986; Bationo and Mokwunye, 1991; Unger et al., 1991). They protect the soil surface from wind and water erosion, provide favorable seedbed conditions and conserve soil water. The magnitude of the beneficial effects associated with returning crop residues to fields depends on the quantity and quality of the residue, the subsequent crop to be grown, edaphic factors, topography, climate and soil management.

Crop residues retained on the surfaces provide soil and water conservation benefits. These resultsare benefited mainly from their naturalpresence that moderated the forces of wind as well as water; reducing the potential for erosion (Usman et al., 2012).Conservation of water resources is of supreme importance for nourishing crop productivity. Most benefits from residues include greater soil organic matter concentrations, moderation of soil temperature and increased biological activity, all of which are also important for crop production (Kashihara et al., 2011).

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The present research project focused, in particular, flower size, flower quality, to increase its aesthetic beautification in Pakistan by using different crop residues as media.

## II. Materials and Methods

This experiment was carried out on crop residues as growing media, to evaluate their effects on dahlia growth and flowering parameters in College of Agriculture Bahadur sub-campus BZU Multan during winter 2013. Dahlia seeds were purchased from a well reputed seed agency and seedlings were raised in the pots containing silt. 20 days old seedlings were planted in pots. The experiment was performed in the pots under field conditions. A Completely Randomized Designs (RCBD) was established, including Silt as control FYM+Silt (1:3), FYM+Silt (1:3) Maize crop residues and FYM+Silt (1:3) Cockscomb, effects on dahlia flowers agronomic traits. The residues were obtained from freshly harvested crops of maize and cockscomb in the pots, each treatment comprised of five pots in each replicate and repeated thrice with 3 plants each pot. Observations on each plant were made and their averages were taken for plant height (cm), total number of leaves, total number of branches, total number of flower, fresh weight (g), and dry weight (g) total number of bulbs, bulb diameter and flower diameter. All the parameter was recorded at blooming stage.

The data were statistically evaluated by analysis of variance according to a RCBD and means were calculated using the program Statistica. Differences between the treatments were determined using LSD test.

## III. Results and Discussions

*a) Plant Height (cm)*

Each treatment produced varying heights in response. Treatment consisting of Silt resulted in maximum plant height 49.33 cm followed by FYM+Silt40.66 cm and Maize residues 34.66 cm while, 26.66 plant heights was observed in Cockscomb residues. The performance of cockscomb residues was not satisfactory as it resulted in minimum plant height 34.66 cm from Table 1. Results have indicated that silt have better qualitative and quantitative effects on plant height as compared to the crop residues. This may be due to excessive nutrients in crop residues which may reduce the crop productivity. These results are in line with the studies of (Fred et al.,1997) where they noted that chrysanthemum showed maximum plant height when it was grown in compost mixes. Our findings are also in agreement with (Yusef, 1997) 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 (*Tageteserecta* L.) and increased plant height, number of flowers and flower diameter.

*b) Total Number of Leaves*

Table 1indicated that the maximum number of leaves 53.00 were counted in control (Silt) followed by (FYM+Silt) and crop residues Maize and cockscomb producing 32.33, 31.33 and 19.00 leaves and were statistically at par each other. These results indicate that silt has nutritional balance for maximum number of leaves whereas crop residues have malnutrition effects on number of leaves production. These findingswere supported by the findings of (Raiz et al., 2008). They also counted more number of leaves in mixture of leaf compost.

*c) Total Number of Branches*

Comparison of means regarding total number of branches produced in different crop residues showed that Maize residues (14.66) and silt (13.33) produced almost same number of branches followed by (FYM+Silt) and cockscomb residues having 10.00 number of branches However, control is at par with maize residues whereas (FYM+Silt) is at par cockscomb residues. The possible reason may due moisture and organic matter status of different crop residues. These finds are in accordance with the results of (Riaz et al.,2008) who recorded highest number of branches in coconut medium when it was combined with silt + leaf manure.

*d) Total Number of Flowers*

Means comparison of crop residual effect regarding number of flowers depicted same number of flowers in each treatments, which mean that all the treatment have same effect or no effect on total number of flowers. This can correlated with genetic factor of the crop.

*e) Flower Diameter (cm)*

Comparison of different potting media showed that silts has maximum flower diameter (11.66 cm) followed by (FYM+Silt) having 10.33 cm and Maize residues (9.00 cm) flower diameter and were statistical at par. However, cockscombs produced (7.66 cm) with minimum flower diameter. These results are in comparison to the findings of (Tailin et al.,2003) who also obtained highest flower diameter of Dahlia in leaf manure + sand as media.

*f) Plant Fresh Weight/Dry Weight (g)*

Plants with maximum increase in fresh weights showed the nutrient rich growing media. Analysis of fresh weight of plant showed highly significant positive results. Maximum increase in fresh weight was found in plant (76.03 g) in control followed by (FYM+Silt) and maize residues with 49.33 and 39.33 g. On the other hand, plants grown cockscombs residues presented

marked reduction fresh weight (25.76 g) (Table. 1). A significant positive increase (14.00 g) in dry weight of plant was recorded in Silt. While, decrease in dry weight in (FYM+Silt), Maize Cockscomb which was statistically at par with each other at 8.10, 6.96 and 6.76 g.

*g) Total Number of Bulbs*

The results for total number of bulbs were statistically significant but plants produce same number bulbs (1.66) and statistically at par with each other. These conditions indicate genetic make of plant has significant role in number of bulbs production.

*h) Bulb Diameter*

Bulb size was increased with silt (control). Maximum bulbdiameter was observed (8.3 cm) in silt medium and minimum bulbs size was recorded in all crop residues (5cm) and were statistically at par. This increase in diameter is concerned with nutritional status of slits as well its porosity. Same results were found in gladiolus crop (Kareem et al., 2013).

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*Table 1 :* Effect of different crop residues on flowering and bulb formation of dahlia.

| Media (1:3) | Plant height (cm) | Total leaf | Total branches | Total flower | Fresh Weight(g) | Dry weight (g) | Total bulbs | Bulb diameter | Flower diameter |
|---|---|---|---|---|---|---|---|---|---|
| Control | | | | | | | | | |
| Silt | 49.33A | 53.00 A | 13.33AB | 4.66 A | 76.03 A | 14.00 A | 1.66 A | 8.33 A | 11.66 A |
| Crop Residues | | | | | | | | | |
| FYM+Silt | 40.66 B | 32.33 B | 10.00 B | 4.33 A | 49.33 B | 8.10 B | 1.66 A | 5.00 B | 10.33AB |
| Maize (FYM+Silt) | 34.66 B | 31.33 B | 14.66 A | 4.33 A | 39.33 B | 6.96 B | 1.66 A | 5.66 B | 9.00 AB |
| Cockscomb (FYM+Silt) | 26.66 C | 19.00 C | 10.66 B | 4.00 A | 25.76 C | 6.76 B | 1.66 A | 5.00 B | 7.66 B |