BIBLIOGRAPHY

ZAPARITA, CAROLYN I. APRIL 2011. Varietal Response of Minature Roses (Rosa cheninsis minima) to Different Potting Media Formulations. Benguet State University, La Trinidad. Benguet.

Adviser: Araceli G. Ladilad, PhD.

ABSTRACT

The study was conducted to determine the effect of different potting media mixtures on the growth and flowering of potted miniature roses; and to determine the interaction and economics of using the different potting media compositions (using sandy loam soil, alnus compost, rice hull, sawdust, BSU compost and mushroom compost) on the growth and flowering of the six varieties of potted miniature roses namely: 'Joycie', 'Teddy Bear', 'Cupcake', 'Rainbows End', 'Fragrant Cloud' and 'Marie Shields'.

Results showed that cv. 'Teddy Bear' had significantly faster growth and had produced the biggest flowers at full-bloom stage. On the other hand, cv. 'Fragrant Cloud' had significantly produced higher number of leaves and flowers compared to the other rose cultivar used. Cv. 'Cupcake' produced flowers significantly earlier, followed by the cv. 'Teddy Bear'.

With regards to the effect of the different growing media formulations used, a mixture of 1:1 alnus compost + sandy loam soil had significantly affected the flower quality of the plants, promoting the production of higher numbers of flowers per plant and had the biggest flowers at full-bloom stage. In terms on the vegetative growth; a mixture of 1:1 rice hull + sandy loam soil had promoted the production of higher number of leaves per plant and had the tallest plants at calyx-flex stage.

Growing miniature roses in a media of 1:1 BSU compost + sandy loam soil, and 1:1 sawdust + sandy loam soil only resulted to slowed vegetative growth and had the longest duration to reach reproductive growth and flowering.

Based on the results of the study, the mixture of 1:1 alnus compost + sandy loam soil and 1:1 rice hull + sandy loam soil were the best media compositions for the culture of potted miniature roses.

TABLE OF CONTENTS

INTRODUCTION

Rose is a perennial flower shrub or a shrubby vine of the genus Rosa within the family Rosaseae that contains approximately 2000 species and more than 20,000 varieties. Roses are grown the whole year not only because it is one fo the world's favorite flower but also because it serves a s a symbol of perfection, elegance, romance and love. Roses are generally produced by specialized growers in large greenhouse and are utilized in landscape gardening (Allan, 1999).

Rose plant range in size from compact, climbers to miniature roses. Miniature roses (*Rosa cheninsis minima*) came originally from China and are a form of Rosa *cheninsis* and there are hundreds of different varieties of miniature roses and new ones are appearing each year like Red ace, Snow bride, Yellow sin blaze, Minnie pearl and many more Swayne (1994).

Potted miniature roses are available in almost every color of the rainbow except blue. They range from six inches to eighteen inches in height. They perform best in sunny location with rich and well drained soils.

Roses are useful for many purposes, the climbing forms serves as screen on porches and against buildings but more frequently on posts, fences and arbors. Certain types are useful for mass planting and foundation borders.

The newer hybrids are adopted for the production of colorful effects in the garden and for cutflower purposes. Among flower growers, Rose is becoming very popular. The useful, of this flower has greatly increased. New varieties are developed with greater hardiness, as well as variety of color and forms.

This study aimed to determine the response of miniature rose to different potting media formulations to guide growers on the best growing media to use in the miniature rose production. Specifically, the study aimed to determine the varietal response and effect of potted miniature roses; and to determine the interaction and economics of using the different potting media formulations for the culture of miniature rose.

The study was conducted at the Ornamental Horticulture Research Area, Benguet State University, La Trinidad, Benguet from October 2010 to January 2011.

REVIEW OF LITERATURE

Culture of Miniature Roses

Roses are propagated by sexual or asexual methods such as cuttings; marcotting and budding are used if the roses are to be culture as pot plants. Roses that are propagated by cuttings are preferred to as "own root" plants. They are acquired from mature stem or from mature laterals or shoots of current year growth. They should be cut at about 5 to 8 inches long with thickness of an ordinary pencil or smaller (Janick, 1972).

He stated that the production of rose plants for garden cultivation uses a very specialized operation. To achieve rapid and economical increase or new selection to meet the market demands. Production of roses requires skilled hand labor in budding operation and expensive field maintenance.

Mattock and *et al* (1994) stated that the species of miniature roses are such adaptable little plants that they can be grown in a variety of situation. He stated that true miniature roses a re obtained from plants raised from cuttings. Select from plants having firm shoots and have finished flowering and make the cuttings about 15 cm long or 6 inches long. Laurie and Ries (1950) added that rose bed should be placed in an open location that gets at least a day of sunlight. Proximity to trees should eb avoided because of the loss of nutrients and moisture from the soil.

Growing Media/Potting Media

Bautista (1993) as cited by Pakias (2008) Organic matter in the soil perform several functions such prevention of the loss of nutrients by forming complexes with the nutrient elements, facilities absorption and perculation of water into through the soil.

Thus, increasing water holding ability and reducing erosion also source of nutrient elements and improves the penetration of roots through the soil by good structure brought by its decomposition.

Parnes (1986) stated that composting is an excellent way of using a combination of organic residues which might otherwise be nuisance or having a little value. The product has a high concentration of minerals with an ideal carbon and nitrogen balance. The successful production of compost depends primarily on physical factors such as moisture content, aur supply and the quantity of material. Compost also supplies nutrients such as nitrogen, phosphorus and sulfur which are essential for plant growth.

Mushroom compost is the growing medium that results from the mushroom growing process. It is made from agricultural materials, such as hay, straw and cocoa shells. Mushroom compost has high water and nutrient holding capacity. As a fertilizer and soil amendment for farming mushroom compost supports plant growth and inhibits artillery fungus.

Sawdust is a good potting media in foliage plants. However, it should not be more than 25 percent by volume of potting mixture. Sawdust is compost of 5 lbs of nitrogen, 2 lbs of potassium and 4 lbs of phosphorous per ton of sawdust, on an oven dry weight bases (Adamson and Maas, 1971).

Einert (1972) stated that rice hulls are good as soil amendments especially in heavy clay soils. He reported that maximum effectiveness is obtained when rice hull is not more than 20 percent by volume of potting mixture. Rice hull provides a light to medium texture with good drainage and aeration and does not affect the soil pH.

Cabalo (2001) mentioned that media compositions of 1:1:1 sand + sawdust + rice hull + cow manure will promote thicker stems, bigger cymes diameter, larger aesthetic duration and high return on investment in milflores.

As recommended by Diaz (2000) a mixture of 1:1:1 rice hull + compost + sand could be recommended for growing of “non-stop rose petticote” (Begonia sp.) under La Trinidad, Benguet condition.

MATERIALS AND METHODS

Materials

The materials used in this study were potted miniature roses of cultivars 'Teddy Bear', 'Joycie', "Rainbow's End', 'Cupcake', 'Fragrant Cloud', 'Marie Shields', BSU compost, Mushroom compost, Alnus compost, sandy loam soil, sawdust, burnt rice hull, polyethylene plastic bags and labeling materials.

Methods

The study was arranged in factorial design completely randomize design (CRD) with the six varieties of miniature roses as Factor A and; the different potting media as Factor B. There were three sample plants per treatments, replicated four times. The treatments were as follows:

Factor A (Miniature Rose Variety)

V_1 = Teddy bear (brown)

V_2 = Joycie (light orange)

V_3 = Cupcake (forsting pink)

V_4 = Fragrant cloud (dark orange)

V_5 = Marie shields (pink)

V_6 = Rainbow's end (yellow)

Factor B Potting Media

T_0 = 1:1 Sandy loam soil + alnus compost (farmers practice)

T_1 = 1:1BSU compost + sandy loam soil

T_2 = 1:1 Burnt Rice hull + sandy loam soil

T_3 = 1:1 Mushroom compost + sandy loam soil

T_4 = 1:1 Sawdust + sandy loam soil

T_5 = 1:1:1 Rice hull + BSU compost + sandy loam soil

All routine management practices for the maintenance of the potted miniature roses were uniformly applied to all test plants. Watering was done every other day.

The data gathered were the following:

1. Initial height of the plant at transplanting (cm). The heights were measured from the base to the tip of the plants at transplanting.

2. Plant heights at flowering Calyx-flex stage (cm). This were obtained by measuring the height of the plant from the base to the tip of the flower in cm at flowering.

3. Initial number of leaves per plant at transplanting.

4. Final number of leaves. The number of leaves were recorded at full bloom stage.

5. Number of days from transplanting to flower bud formation. These were obtained by counting the number of days from transplanting until flower buds were formed.

6. Number of days from transplanting to Calyx-flex stage. These were taken by counting the days from transplanting until Calyx-flex stage.

7. Number of flowers produced per plant. The numbers of flowers produced per plant were recorded for the whole duration of the cropping period.

8. Flower diameter at full bloom stage (cm).

9. Flower length at full bloom stage (cm).

10. Occurrence of insect pest and diseases. The insect pest and diseases were identified and recorded during the conduct of the study.

11. Cost and return analysis.

12. Documentation of the study in pictures.

RESULTS AND DISCUSSION

Vegetative Growth

Initial Height

Effect of variety. Table 1 show that there were significant variations on the different miniature rose varieties on the initial height at transplanting. Cultivars 'Teddy bear', 'Joyce' and 'Cupcake' were the tallest with the means of 14.51, 14.34 and 13.84 cm while cultivar 'Rainbows end' was the shortest with a mean of only 10.73 cm.

Effect of media. There were no significant differences observed among the six media formulation of miniature roses on the initial height. However, plants grown in a 1:1 mushroom compost + sandy loam soil were the tallest with a mean of 13.55 cm while the shortest was obtained from the plants grown in BSU compost with a mean of 12.69 cm.

Interaction effect. There were no significant interaction effects between the different varieties of the miniature roses and the different media formulations on the initial heights of the rose plant.

Height at Calyx-flex Stage

Effect of variety. Statistical analysis showed highly significant differences on the height of miniature rose plants at calyx-flex stage as affected by the variety used. Cultivars 'Teddy Bear' and 'Joycie' produced the tallest plans with means of 27.08 and 25.07 cm from the date of transplanting, respectively; cultivar 'Rainbows End' was the shortest with plant height at calyx-flex stage of 21.58 cm (Table 2).

Table 1. Initial height of the plant at transplanting

TREATMENT	MEAN
Variety	
Teddy Bear	14.51[a]
Joycie	14.34[a]
Cupcake	13.84[a]
Fragrant Cloud	13.36[b]
Marie Shields	12.49[c]
Rainbows End	10.73[d]
Media	
1:1 Alnus compost + sandy loam soil	13.09[a]
1:1 BSU compost + sandy loam soil	12.69[a]
1:1 Rice hull + sandy loam soil	13.09[a]
1:1 Mushroom compost + sandy loam soil	13.55[a]
1:1 Sawdust + sandy loam soil	13.42[a]
1:1:1 Rice hull + BSU compost + sandy loam soil	13.44[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Effect of media. Table 2 shows the height at calyx-flex stage of miniature rose plants from transplanting date as affected by the different potting media formulations. The tallest miniature roses at calyx-flex stage were recorded from plants grown in a mixture of 1:1 rice hull + sandy loam soil with a mean of 25.20 cm. Plants grown in 1:1 sawdust + sandy loam soil were the shortest with a mean of 22.08 cm.

Table 2. Plant height at calyx-flex stage

TREATMENT	MEAN
Variety	
Teddy Bear	25.08[a]
Joycie	25.07[a]
Cupcake	22.47[bc]
Fragrant Cloud	23.38[abc]
Marie Shields	23.84[ab]
Rainbows End	21.58[c]
Media	
1:1 Alnus compost + sandy loam soil	24.58[ab]
1:1 BSU compost + sandy loam soil	23.84[abc]
1:1 Rice hull + sandy loam soil	25.20[a]
1:1 Mushroom compost + sandy loam soil	22.58[bc]
1:1 Sawdust + sandy loam soil	22.08[c]
1:1:1 Rice hull + BSU compost + sandy loam soil	23.13b[c]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Interaction effect. Results show that there were no significant interaction on the combined effects between the six varieties of miniature roses and the six different potting media formulations with regards to the height of the plant at calyx-flex stage.

Initial Number of Leaves per Plant

Effect of variety. Results show highly significant variations on the initial number of leaves produced per plant as affected by the miniature rose cultivars. The variety 'Teddy bear' had the highest number of leaves produced per plant with a mean of 17.11 while 'Rainbows End' had the lowest mean with only 8.61 leaves per plant at flowering.

Table 3. Initial and final numbers of leaves per plant

TREATMENT	INITIAL NUMBER	FINAL NUMBER OF LEAVES
Variety		
Teddy Bear	17.11[a]	61.89[c]
Joycie	13.33b[c]	61.72[c]
Cupcake	15.06[ab]	74.00[b]
Fragrant Cloud	12.67[bc]	111.11[a]
Marie Shields	11.89[c]	54.06[c]
Rainbows End	8.61[c]	17.56[d]
Media		
1:1 Alnus compost + sandy loam soil	12.39[a]	69.50[a]
1:1 BSU compost + sandy loam soil	13.72[a]	59.39[a]
1:1 Rice hull + sandy loam soil	12.28[a]	64.11[a]
1:1 Mushroom compost + sandy loam soil	13.44[a]	58.94[a]
1:1 Sawdust + sandy loam soil	13.67[a]	65.00[a]
1:1:1 Rice hull + BSU compost + sandy loam soil	13.17[a]	65.39[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Effect of media. Results showed that there were no significant effects of the different potting media mixture used in terms of the initial numbers of leaves at transplanting.

Interaction effect. Again, the statistical interaction between the six different varieties of miniature rose and the six different growing media composition obtained on the number of leaves per pot at transplanting were not significant.

Final Number of Leaves

Effect of variety. Cultivars 'Fragrant cloud' had highly significant higher leave counts with a mean of 111.11 leaves per plant. Cultivars 'Rainbows end' had significantly lesser number of leaves with a mean of only 17.56 leaves.

This may be explained by the varietal differences as well as the inherent characteristics of the different miniature rose varieties grown.

Effect of media. Statistical analysis shows that there were no significant effects of the different growing media formulations on the final number of leaves at full bloom stage. Although, plants grown in a miniature of 1:1 Alnus compost + sandy loam soil produced the highest number of leaves. Final numbers of leaves counted were significantly comparable with a means ranging from 69.50 to 58.94 at full bloom stage.

Interaction. There were no significant interaction effects between the six miniature rose varieties grown and the different media mixtures in terms on the final number of leaves at full bloom stage.

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Days from Transplanting
to Flower Bud Formation

Effect of variety. Significant differences with regards to the number of days from transplanting to flower bud formation were obtained on the six varieties of miniature roses grown.

Table 4. Number of days from transplanting to flower bud formation

TREATMENT	MEAN
Variety	
Teddy Bear	24.58[ab]
Joycie	23.84[abc]
Cupcake	25.20[a]
Fragrant Cloud	22.58[bc]
Marie Shields	22.08[c]
Rainbows End	23.13[bc]
Media	
1:1 Alnus compost + sandy loam soil	30.78[a]
1:1 BSU compost + sandy loam soil	33.33[a]
1:1 Rice hull + sandy loam soil	32.00[a]
1:1 Mushroom compost + sandy loam soil	32.89[a]
1:1 Sawdust + sandy loam soil	32.17[a]
1:1:1 Rice hull + BSU compost + sandy loam soil	32.78[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Cultivar 'Marie Shields' had bloomed earlier with a mean of 22.08 days from transplanting, while cultivar 'Cupcake' flowered later with flower buds visible after a mean of 25.20 days from transplanting.

Effect of media. Statistical analysis showed that there were no significant effects on the different growing media mixtures on the duration of days from transplanting to flower bud formation. Although, plants grown in a mixture of 1:1 Alnus compost + sandy loam soil showed the earliest flower buds formed; while the longest durations to form flower buds were obtained from plants grown in the mixture of 1:1 BSU compost + sandy loam soil.

Duration of days from transplanting to flower bud formation counted was significantly comparable with a means ranging from 33.33 to 30.78 days from transplanting to flower bud formation.

Interaction effect. Significant interaction effects were obtained between the varieties of miniature roses and the different media formulation on the number of days from transplanting to flower bud formation. Plant of cultivar 'Marie Shields' grown in 1:1 Alnus compost + sandy loam soil showed the earliest flower buds formed; while the longest durations to form flower buds were obtained from the plant of cultivar 'cupcake' grown in 1:1 BSU compost + sandy loam soil.

Days from Transplanting
to Calyx-Flex Stage

Effect of variety. Significant differences with regards to the number of days from flower bud formation to calyx flex stage were obtained in the six cultivars grown (Table 5). Cv. 'Teddy Bear' had the longest duration of flower development from 0.5 cm bud

Table 5. Numbers of days from transplanting to calyx-flex stage

TREATMENT	MEAN
Variety	
Teddy Bear	43.33[a]
Joycie	42.28[ab]
Cupcake	36.89[c]
Fragrant Cloud	37.78[bc]
Marie Shields	41.49[abc]
Rainbows End	40.28[abc]
Media	
1:1 Alnus compost + sandy loam soil	38.22[a]
1:1 BSU compost + sandy loam soil	42.47[a]
1:1 Rice hull + sandy loam soil	40.00[a]
1:1 Mushroom compost + sandy loam soil	40.11[a]
1:1 Sawdust + sandy loam soil	41.00[a]
1:1:1 Rice hull + BSU compost + sandy loam soil	40.44[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

size to reach calyx flex stage only after a mean of 43.33 days; while Cv. 'Cupcake' showed the shortest time to reached calyx-flex stage after a mean of only 36.89 days from transplanting.

Effect of media. Statistically, results showed no significant differences on the duration of days from transplanting to calyx-flex stage as affected by the different potting

media formulations used. Calyx-flex stage was reached simultaneously by all rose plants grown in the different media formulation after 38.22 to 42.47 days from transplanting.

Interaction. Significant effects were obtained between the different miniature rose varieties and the different growing media formulations. Plant of cultivar 'Teddy Bear' grown in a media of 1:1 BSU compost + sandy loam soil showed the longest duration of flower development from 0.5 cm bud size; while the shortest time to reach calyx-flex stage were obtained from the variety 'Cupcake' grown in a media of 1:1 alnus compost + sandy loam soil.

Numbers of Flowers Produced Per Plant

Effect of variety. The number of flowers produced per plant is presented in Table 6. Statistically, results showed significant varietal differences. Cultivar 'Fragrant Cloud' produced significantly more flowers having a mean of 1.522 flowers per plant followed by Cvs. 'Teddy Bear' with a mean of 11.78 flowers and by Cvs. 'Cupcake' with a mean of 10.00 flowers. Cvs. 'Joycie', 'Marie Shields' and 'Rainbows End' had produced the least number of flowers per plant which ranged from 3.89 to 15.22.

Effect of media. Differences observed on the effect of the different media formulations on the number of flowers produced per plant were likewise, significant. The highest number of flowers were counted on the plant grown on a media of 1:1 Alnus compost + sandy loam soil with a mean of 11.50 flowers per plant. The lowest number of flowers per plant were counted from those grown on a media of 1:1 of BSU compost + sandy loam soil with only a mean of 8.44 flowers; followed by those plant grown on a media of 1:1 mushroom compost + sandy loam soil with a mean of 9.00 flowers per plant.

Table 6. Number of flowers produced per plant

TREATMENT	MEAN
Variety	
Teddy Bear	11.78[b]
Joycie	9.33[a]
Cupcake	10.00[c]
Fragrant Cloud	15.22[a]
Marie Shields	8.11[d]
Rainbows End	3.89[c]
Media	
1:1 Alnus compost + sandy loam soil	11.50[a]
1:1 BSU compost + sandy loam soil	8.44[a]
1:1 Rice hull + sandy loam soil	9.50[bc]
1:1 Mushroom compost + sandy loam soil	9.00[bc]
1:1 Sawdust + sandy loam soil	9.44[bc]
1:1:1 Rice hull + BSU compost + sandy loam soil	10.44[ab]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Interaction. Results show that there were no significant interaction effects between the different cultivars of miniature roses and different media formulations in terms of the number of flowers produced per plant.

Flower Diameter at Full Bloom Stage

Effect of variety. The different miniature rose varieties had significantly affected the flower diameter measured at full bloom stage. Cv. 'Teddy Bear' produced the biggest blooms with a mean of 5.37 cm among the varieties tested. The smallest bloom was obtained from Cv. 'Rainbows End' with a mean of 3.79 cm across, at full bloom stage.

Table 7. Flower diameter at full bloom stage

TREATMENT	MEAN
Variety	
Teddy Bear	5.37[a]
Joycie	4.27[b]
Cupcake	4.13[b]
Fragrant Cloud	4.10[b]
Marie Shields	4.23[b]
Rainbows End	3.79[c]
Media	
1:1 Alnus compost + sandy loam soil	4.45[a]
1:1 BSU compost + sandy loam soil	4.07[b]
1:1 Rice hull + sandy loam soil	4.38[a]
1:1 Mushroom compost + sandy loam soil	4.39[a]
1:1 Sawdust + sandy loam soil	4.25[ab]
1:1:1 Rice hull + BSU compost + sandy loam soil	4.36[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Effect of media. Significant differences were obtained from the different media formulations used with regards to the diameter at full bloom stage. Plant grown in a mixture of 1:1 Alnus compost + sandy loam soil had produced the biggest blooms with a mean of 4.45 cm followed by plants grown in the mixture of 1:1 mushroom compost + sandy loam soil with a mean of 4.39 cm. Followed by plants grown in a mixture of 1:1:1 Rice hull + BSU compost + sandy loam soil with a mean of 4.36 cm. Plants grown in a mixture of 1:1 BSU compost + sandy loam soil produced the smallest blooms with a mean of only 4.07 cm.

Interaction. The interaction effects between the different variety of miniature roses and different media compositions on the flower diameter at full bloom stage were not significant.

Final Height of the Plant at Full Bloom Stage

Effect of variety. Statistical analysis showed significant differences on the final height of the miniature rose plants as affected by the variety used. Brown cultivar 'Teddy Bear' was the tallest with a mean of 35.48 cm while the shortest were obtained from the cultivar 'Rainbows Eng' with a mean of 21.03 cm.

Effect of media. Statistically, results showed that there were no significant effects of the different media formulations on the final height of the miniature roses at full bloom stage. Although, plants grown in a media of 1:1 alnus compost + sandy loam soil produced the highest mean in terms of the final height at full bloom stage.

Interaction. Interaction effects between the different miniature rose cultivar and different media formulations on the final height at full bloom stage were not significant.

Table 8. Final height of plants at full bloom stage

TREATMENT	MEAN
Variety	
Teddy Bear	35.48[a]
Joycie	30.87[b]
Cupcake	29.33[bc]
Fragrant Cloud	27.53[cd]
Marie Shields	25.83[d]
Rainbows End	21.03[c]
Media	
1:1 Alnus compost + sandy loam soil	29.47[a]
1:1 BSU compost + sandy loam soil	27.17[a]
1:1 Rice hull + sandy loam soil	28.36[a]
1:1 Mushroom compost + sandy loam soil	28.85[a]
1:1 Sawdust + sandy loam soil	27.07[a]
1:1:1 Rice hull + BSU compost + sandy loam soil	29.17[a]

Within a column, means with the same letter are not significantly different at .05 level DMRT.

Occurrence of Insect Pest and Diseases

The occurrence of insect pest and diseases observed during the conduct of the study. Symptoms of insect pests that infest the plants during the reproductive growth flowering stages were white thrips, green aphids and spotted beetles that causes the wilting, yellowing of leaves and black spot on the leaves of the plant.

Cost and Return Analysis

As shown in Table 9, rose plants grown in a potting media of 1:1 alnus compost + sandy loam soil obtained the highest return on investment (ROI) with 80%. This was followed by plants grown in a media mixes of 1:1 rice hull + sandy loam soil with ROI of 79%; and 1:1:1 rice hull + BSU compost + sandy loam soil with an ROI of 78%; and of 1:1 sawdust + sandy loam soil had an ROI of 77%; media mixes 1:1 mushroom compost + sandy loam soil and 1:1 BSU compost with an ROI of 60% which was the lowest ROI in the production of miniature roses in the study. With regards to the expenses, the different miniature rose cultivar were bought with the same prize, and in terms to the treatments used, BSU compost was the most expensive among the six media formulation used.

Table 9. Cost and return analysis

TREATMENT	MARKETABLE YIELD (NO.)	GROSS SALE (PhP)	EXPENSES (PhP)	NET (PhP)	ROI (%)	RANK
1:1 Alnus compost + sandy loam soil	18	1440	800	640	80%	1
1:1 BSU compost + Sandy loam soil	14	1120	750	450	60%	6
1:1 Rice hull + sandy Loam soil	16	1280	860	685	79%	2
1:1 Mushroom compost + sandy loam soil	18	1440	800	610	76%	5
1:1 Sawdust + sandy loam soil	15	1200	720	560	77%	4
1:1 :1 Rice hull + BSU Compost + sandy Loam soil	18	1440	715	560	78%	3

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted at the Ornamental Horticultural Research Area of Benguet State University, La Trinidad, Benguet from November 2010 to February 2011 to determine the effect of different potting media mixtures on the growth and flowering of potted miniature roses and to identify the interaction and economics of using the different potting media compositions potted miniature rose production.

Results show that among the six varieties of miniature roses grown, cultivar 'Teddy Bear' produced plants that were significantly taller, produced the biggest flowers in terms of flower diameter and had the shortest duration to reached calyx-flex stage. Cultivar 'Fragrant cloud' had produced the highest leaf count and had produced significantly more flowers.

Plants of cv. Rainbow End' were the shortest and had the smallest blooms in terms of diameter, had smallest number of flowers per plant and had the least number of leaves at full bloom stage.

With regards to the effect of different growing media mixture used; a media of 1:1 Alnus compost + sandy loam soil showed the shortest time to reached flower bud formation and calyx-flex stage and had promoted production of more leaves.

Plants g rown in a media of 1:1 Rice hull + sandy loam soil had significantly produced the tallest plants at calyx-flex stage.

Observations showed that among the six media used mixture of 1:1 alnus compost + sandy loam soil and 1:1:1 rice hull + BSU compost + sandy loam soil had produced the highest number of flowers per plant.

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APPENDICES

Appendix Table 1. Initial height of transplanting

TREATMENT	REPLICATION I	II	III	TOTAL	MEAN
V_1T_0	15.80	14.50	13.00	43.30	14.43
V_1T_1	15.00	15.00	14.00	44.00	14.67
V_1T_2	13.60	14.20	14.50	42.30	14.10
V_1T_3	14.00	15.00	15.20	44.20	14.93
V_1T_4	15.00	14.80	14.00	43.80	14.60
V_1T_5	14.30	15.00	14.30	43.60	14.53
V_2T_0	14.50	13.00	15.00	42.50	14.17
V_2T_1	15.00	14.00	13.00	42.00	14.00
V_2T_2	14.30	13.80	15.00	43.10	14.37
V_2T_3	14.00	14.50	15.20	43.70	14.57
V_2T_4	15.00	14.20	15.00	42.20	14.07
V_2T_5	14.30	14.60	15.00	44.60	14.86
V_3T_0	14.50	14.00	13.50	42.00	14.00
V_3T_1	14.00	13.80	12.80	40.60	13.53
V_3T_2	13.80	14.00	12.00	39.80	13.23
V_3T_3	14.00	15.00	13.50	42.50	14.17
V_3T_4	15.20	13.50	14.00	42.70	14.23
V_3T_5	18.30	14.00	14.30	41.60	13.87
V_4T_0	13.00	12.00	12.50	37.50	12.50
V_4T_1	11.50	12.40	11.20	35.10	11.70
V_4T_2	12.50	13.00	14.50	40.00	13.33
V_4T_3	13.70	14.00	14.00	41.70	13.90
V_4T_4	15.50	15.00	14.60	45.10	15.03
V_4T_5	13.00	13.80	14.30	41.10	13.70
V_5T_0	13.50	13.00	11.80	38.30	12.77
V_5T_1	12.00	11.00	13.50	36.50	12.17
V_5T_2	13.80	13.40	11.20	38.40	12.80
V_5T_3	14.50	12.50	13.00	40.00	13.33
V_5T_4	11.40	10.00	12.00	33.40	11.33
V_5T_5	13.30	13.00	12.00	38.30	12.77
V_6T_0	10.00	10.30	11.80	32.10	10.70
V_6T_1	9.00	13.00	8.20	30.20	10.07
V_6T_2	12.00	11.00	9.00	32.00	10.67
V_6T_3	11.80	11.00	9.00	31.80	10.60
V_6T_4	10.30	11.50	12.20	34.00	11.93
V_6T_5	11.30	9.50	12.00	32.80	10.93

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	14.43	14.17	14.00	12.50	12.77	10.70	78.57	13.09
T_1	14.67	14.00	13.53	11.70	12.17	10.07	76.14	12.69
T_2	14.10	14.37	13.23	13.33	12.90	10.67	78.50	13.08
T_3	14.73	14.57	14.17	13.90	12.33	10.60	91.30	13.55
T_4	14.60	14.07	14.23	15.03	11.33	11.33	80.39	13.39
T_5	14.53	14.86	13.87	13.70	10.93	10.93	80.66	13.44
TOTAL	87.06	142.47	83.03	80.16	74.97	64.30	475.56	79.24
MEAN	14.51	23.74	13.33	13.36	12.49	10.71	79.26	13.20

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	180.692	36.138	37.3273	0.0000**
Factor B	5	9.230	1.846	1.9067	0.7038^{ns}
AB	25	27.141	1.086	1.1214	0.3434^{ns}
Error	72	69.707	0.968		
TOTAL	107	286.769			

** = Highly significant
^{ns} = Not significant

Coefficient of variation = 7.45%

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INSTRUCTION
EXTENSION
RESEARCH
PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	25.03	27.00	23.33	22.87	26.33	22.93	147.49	24.58
T_1	25.93	27.83	23.33	21.60	23.27	20.60	143.46	23.91
T_2	24.33	28.50	23.33	25.70	25.83	24.17	151.86	25.31
T_3	26.13	22.63	17.56	24.57	22.06	20.50	135.45	22.57
T_4	24.67	21.40	23.40	21.30	21.33	19.96	132.06	22.01
T_5	25.13	23.03	21.33	23.83	24.20	21.33	118.85	19.80
TOTAL	151.11	150.39	134.78	139.87	143.02	129.49		
MEAN	25.20	22.46	23.31	23.84	21.58			

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	176.125	35.225	4.3308	0.0017**
Factor B	5	128.688	25.738	4.1643	0.0123*
AB	25	204.776	8.191	1.0071	0.4703^{ns}
Error	72	585.620	8.134		
TOTAL	107	1095.209			

** = Highly significant
* = Significant
^{ns} = Not significant

Coefficient of variation = 7.45%

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RESEARCH
PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	73.33	70.67	81.33	132.00	48.67	17.33	423.33	70.55
T_1	69.67	53.00	56.67	118.00	45.33	14.33	357.00	59.50
T_2	55.33	64.67	69.00	118.67	62.33	16.33	386.33	64.38
T_3	61.00	48.67	76.67	96.44	56.00	17.67	356.34	59.39
T_4	61.33	74.00	85.00	125.33	52.67	18.67	417.00	69.50
T_5	55.53	66.00	75.33	109.67	59.33	21.00	386.86	64.47
TOTAL	376.19	386.34	444.00	700.00	324.33	105.33	2326.86	387.79
MEAN	62.66	64.39	74.00	116.66	54.05	17.55		

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	82401.111	16480.222	59.4159	0.000
Factor B	5	1431.889	286.378	1.0325	0.4052
AB	25	5170.000	206.800	0.7456	
Error	72	19970.667	277.370		
TOTAL	107	108973.667			

Coefficient of variation = 7.45%

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RESEARCH
PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	33.33	30.67	27.00	18.67	30.33	30.00	170.00	28.33
T_1	27.67	35.33	30.67	29.00	46.00	31.33	200.00	33.33
T_2	42.00	32.67	30.00	28.33	30.67	28.33	192.00	32.00
T_3	32.33	33.00	28.33	36.67	32.00	35.00	197.33	32.88
T_4	33.33	39.00	30.00	26.00	33.00	34.67	193.00	32.16
T_5	42.67	26.65	31.33	35.67	32.00	28.33	196.67	32.77
TOTAL	211.33	177.33	174.34	201.00	187.66			
MEAN	35.22	32.89	29.55	33.50	31.27			

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	482.380	96.476	2.5271	0.0365*
Factor B	5	73.157	14.631	0.3833	ns
AB	25	1861.454	74.458	1.9504	0.0149
Error	72	2748.667	38.176		
TOTAL	107				

* = Significant
^{ns} = Not significant

Coefficient of variation = 19.11%

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RESEARCH
PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	41.33	45.67	34.00	32.33	37.67	38.33	229.33	38.22
T_1	36.33	43.44	38.67	36.67	54.00	44.00	253.00	42.16
T_2	51.00	40.33	37.00	30.00	38.67	37.00	234.00	39.00
T_3	39.67	40.67	35.33	44.67	40.00	43.00	243.39	40.55
T_4	41.33	47.67	38.33	34.33	38.00	44.33	243.99	40.66
T_5	50.33	34.00	38.00	42.67	40.00	39.67	242.67	40.44
TOTAL	259.99	253.67	221.33	220.67	248.34	244.33		
MEAN	43.33	42.27	36.88	36.77	41.39	40.72		

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	581.269	116.254	2.8126	0.224*
Factor B	5	151.824	30.365	0.7346	ns
AB	25	1954.565	78.183	1.8915	0.019*
Error	72	2976.000	41.333		
TOTAL	107	5663.657			

* = Significant
ns = Not significant

Coefficient of variation = 15.94%

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PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	5.55	4.42	4.27	4.09	4.82	3.53	26.68	4.44
T_1	5.77	3.94	3.76	4.07	3.76	3.68	24.38	4.06
T_2	5.21	4.33	4.37	4.39	4.06	3.71	26.07	4.34
T_3	5.40	4.57	4.29	3.94	4.27	3.87	26.34	4.39
T_4	4.27	4.07	3.96	3.92	4.27	3.96	25.45	4.24
T_5	5.60	4.24	4.13	4.17	4.03	3.96	26.13	4.35
TOTAL	32.20	28.57	24.78	24.58	25.21	22.71		
MEAN	5.36	4.26	4.13	4.09	4.20	3.78		

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	26.728	5.346	42.4087	0.0000**
Factor B	5	1.757	0.351	2.7886	0.0233*
AB	25	3.121	0.125	0.9904	ns
Error	72	9.075	0.126		
TOTAL	107	40.081			

** = Highly Significant
* = Significant
ns = Not significant

Coefficient of variation = 7.45%

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RESEARCH
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1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	36.73	37.33	31.00	28.97	24.90	19.93	178.86	29.81
T_1	35.33	28.50	29.33	25.43	23.93	20.47	162.99	278.16
T_2	35.67	34.17	27.83	29.27	24.50	20.80	173.67	28.94
T_3	35.00	30.50	28.23	27.30	29.40	22.67	173.10	28.85
T_4	34.50	28.37	27.40	26.50	26.50	19.18	162.40	27.06
T_5	35.67	34.50	28.50	27.33	27.33	23.20	175.03	29.17
TOTAL	212.90	193.37	172.29	165.20	155.06	126.20		
MEAN	35.48	32.220	28.71	27.53	25.84	21.03		

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	21136.747	427.249	47.5944	0.0000**
Factor B	5	93.963	10.793	2/0930	0.0761*
AB	25	235.871	9.435	1.0508	0.4193^{ns}
Error	72	646.487	8.979		
TOTAL	107	3113.069			

* = Significant
^{ns} = Not significant

Coefficient of variation = 19.11%

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EXTENSION
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PRODUCTION
1916

V x T Two Table

TREATMENT	V_1	V_2	V_3	V_4	V_5	V_6	TOTAL	MEAN
T_0	13.37	11.67	11.00	17.33	10.33	5.33	69.33	11.55
T_1	10.33	6.67	9.00	15.33	6.00	3.33	50.66	8.44
T_2	11.67	7.67	9.00	16.33	8.00	3.67	56.34	9.39
T_3	12.00	9.33	9.67	11.67	7.33	4.00	54.00	9.00
T_4	10.67	9.67	9.33	15.00	8.33	3.67	56.67	9.44
T_5	12.67	11.00	11.33	15.67	8.67	3.33	62.67	10.44
TOTAL	71.01	56.01	59.33	91.33	48.66	23.33		
MEAN	11.83	9.33	9.88	15.22	8.11	3.88		

ANOVA TABLE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	PROB
Factor A	5	1283.889	256.778	53.0249	0.0000**
Factor B	5	107.333	21.467	4.4329	0.0014*
AB	25	75.778	3.031	0.6259	ns
Error	72	348.667	4.843		
TOTAL	107	1815.667			

** - Highly significant
* = Significant
ns = Not significant

Coefficient of variation = 19.11%

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1916