BIBLIOGRAPHY

ANDRES, REALIZA S. MARCH 2006. Growth and Flowering of Angel's Wing (*Spathiphyllum kochii*) as Affected by Different Potting Media Mixtures. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was conducted at the Ornamental Horticultural Research Project Area of the Benguet State University, La Trinidad, Benguet from Semptember 2005 to January 2006 to determine the effect of different potting media mixture on the growth and flowering of *Spathiphyllum kochii* and to determine the effect of different potting media mixes with regards to cutflower yield, cutflower quality and vaselife of cutflower.

Plants grown in compost (alnus) had significantly longer cutflower stems, had the longest and widest spathes; while cutflowers of plants grown in a media mixture of 1:1:1 ricehull + garden soil + chicken manure had the longest vaselife under ambient conditions, and the shortest vaselife was observed from cutflowers of plants grown in 1:1:1 ricehull + sawdust + pig manure. Final height, final number of leaves per plant, average number of suckers produced per plant, number of days from transplanting to flower bud formation, days from transplanting to fully opened spathe and cutflower yield per plant were not significantly affected by the different growing media composition used in the study.

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INTRODUCTION

Nature of the Study

Spathiphyllum *(Spathiphyllum kochii L.)* is a herbaceous perennial plant that belongs to the family Araceae. There are five species of *spathiphyllum* and these are the: *Spathiphyllum cannifolium L.* originated from South America; *Spathiphyllum commutatum schott L.* endemic in the Philippines but it is also found in Borneo, Sumatra and Java; *Spathiphyllum kochii L.* originated from tropical America; *Spathiphyllum phyniifolium schott L.* from Nicaragua and Panama; and *Spathiphyllum clevalandii L.* of unknown origin (www.yahoo.com).

In the Cordillera region particularly in Benguet, *Spathiphyllum kochii L.* is the common species being cultivated. Farmer's locally know this plant as Angel's Wings (Personal Communication with Dr. Araceli G. Ladilad, 2005).

Spathiphyllum kochii L. is characterized as leafy, ground aroid that is 50cm tall with long leaves, petiole lanciolate to 40 cm long, entire margin with flowers cream to almost white in color erect and rigid (Madulid, 1995).

Unlike other cutflowers such as anthurium whose flowers are readily available in the market every time it is needed. Angel's wing is rarely seen in the flower shop and if available the quantity is limited. This is attributed to the few number of growers who ventured in the production of this potential Cutflower crop. This will also explain why it is sold from pay 40 to 60php which is consider higher per dozen. Related to this, observations had shown that the vase life of spathiphyllum is very short compared to anthurium and chrysanthemum.

Furthermore, *spathiphyllum* is grown around the world. It is usually used as both as a flowering and as a foliage plant. Since it is one of the best indoor plants and holds up very well in the interior escape and provides tropical beauty for long a period of time.

Importance of the study

Growing *Spathiphyllum kochii* can be developed as a profitable business in Baguio, Benguet. Production of Spathiphyllum Cutflower and potted plants could also provide a good source of income.

Due to the economic potential and aesthetic value of potted plants, it is important to study the appropriate potting media for the growth and flowering of *Spathiphyllum kochii L.* grown in container.

Objectives of the study

1. To determine the effect of different potting media mixtures on the growth and flowering of *Spathiphyllum kochii L.*
2. To identify the best potting media mixtures for the culture of potted *Spathiphyllum kochii L.*
3. To determine the effect of different potting media mixes with regards to cutflower, yield and cutflower quality.

Time and place of the study

The study was conducted at Benguet State University Floriculture Research Area, La Trinidad, Benguet under greenhouse condition from September 2005 to January 2006

REVIEW OF LITERATURE

Description of Spathiphyllum kochii L.

Spathiphyllum is a member of the Araceae that also includes Aglaouema, Anturium, Caladium, Dieffenbachia and Philodendron. During the early 70's only two varieties of hybrids grown, "clevalandii" and "mauna loa". Since the 1970's the selection, production and popularity of *Spathiphyllum* has grown (Anonymous, undated).

Even though spaths originated in South and Central America mainly in Columbia and Venezuela they are today the most popular indoor plant in the US and U.K.

Madulid (1975) reported that *Spathiphyllum kochii* originated from tropical America, it is characterized as leafy, ground aroid that is 50 cm tall with long leaves, petiole lanciolate to 40 cm long entire margin, with flowers ream to almost white in color erect and rigid.

Spaths grow not higher but wider as they age. New leaves appear among and around the base of old leaves, coming straight out of the soil. Its flowers are very similar to calla flowers. They are large in various tones of white from snow white to very pale green and they appear on top of thin long branches in the same way as the leaves. In reality they are not flowers but differentiated leaves that surround the stamen (Anonymous, 2005).

Spaths will survive at low interior light but would prefer bright filtered light. Ideal temperature for spaths is between 21-24 degrees celcius during the day and night while fluctuating temperatures will harm the plant.

To keep the plants in shape, all purpose fertilizer can be used.

Growing/Potting Media Mixture

Organic matter (OM) in the soil perform several functions such as prevention of the loss of nutrient by forming complexes with the nutrient element, facilitates absorption and perculation of water into and through the soil. Thus increasing water holding ability and reducing erosion also source of nutrient element and improves the penetration of roots through the soil by good structure by its decomposed (Bautista *et. al*., 1994).

Brady (1984) stated the organic matter is composed of living or dead plants and animal's residues, which are very active and important portion of the soilage. They protect soil against erosion; supplies cementing substance for desirable aggregation formation and it loosen the soil to provide better aeration and water movement.

Ware (1937) as cited by Sumakey (2004) added that OM improves the physical condition and chemical properties of the soil. Chemical properties may include the following materials depending on the kind of plant and its state of decomposition, carbohydrates, sugars, starch, cellulose, lignin, tannin, fats, oil, waxes, resin, portions, pigments, and minerals such as calcium (Ca), phosphorus (P), Sulfur (S), Iron (Fe), Magnesium (Mg), and Potassium (K). These properties of the soil raise the capacity of heavy soil and lessens surface run-off, leaching and erosion. It also enhances the porosity of the soil OM like compost, which contains 25% N, 0.03% Mg, and OM content of 5.6%.

Compost is used as mulches in vegetable or flower gardens. This practice provides not only nutrients for the plant but soil cover for moisture conservation as well. Indoor potted plants also thrive on a mixture of high-composted material (Brady, 1984)

Jankowiak (1978) stated that compost encourages the formation of vigorous roots,

which in turn produce a healthy plant, one, which is capable of taking in more food and water.

Thompson and Troeh (1978) claimed that the nutrients release from well rotten compost is probably better balanced and regulates than that from fresh manure whereby gardeners can therefore apply larger amounts of compost than the use of fresh manure, without danger of injuring plants. They added that the use of compost also results in humus information and promotes good soil structure. Composts also supply nutrients such as nitrogen, phosphorous and sulfur which are essential for plant growth.

Acop (1987) recommended that plants grow from media in consisting of 1:1 part horse manure + garden soil and 1:1:1 horse manure + compost + garden soil were the tallest had higher leaf count at anthesis and initiated flowers the earliest in Chrysanthemum.

Diaz (2000) recommended that a mixture of 1:1:1 ricehull + compost + sand could be recommended for the growing of "Non stop Rose Peticoat (*Begonia* sp.) under La Trinidad Benguet condition.

Einert (1972) stated that ricehull provides high to medium texture with good drainage and aeration and does not affect soil pH. He further stated that maximum effectiveness obtained when ricehull is not more than 20% by volume of potting mixture.

Whole ricehull are moderately resistant to decomposition. They hold little water and improve aeration. They are useful lightweight component of mixes for orchids and are also to increase the porosity of bedding mixture based on peat (Hhandreck and Black, 1994).

Cabalo (2001) recommended that a mixture of 1:1:1:1 sand + sawdust + ricehull +

cow manure will promote thicker stems, bigger cyme diameter, longer aesthetic duration and high return on investments in Milflores

Donahue (1979) stated that sawdust is a good bedding mixture material since it absorbs liquid and is good soil condition. The greatest resistant of lignin of decomposition offers intriguing possibilities in horticulture and the use of sawdust a common surplus material, which frequently is obtained free of change.

He furthered that sawdust is composed of 4lbs.Nitrogen, 2lbs.Potassium and 4lbs.phosphorus per ton of sawdust on an over dry weight basis.

Baldwin and Weslh (1997) as cited by Aladog (2005) found that the use of organic mulches such as untreated sawdust or straw will aid in controlling weeds and conserve soil moisture and texture.

Sumakey (2005) found that a media composition 1:1:1:1 garden soil + cocofiber + coco soil + horse manure as a growing media for white calla recommend for improved growth, earlier flowering and higher quality Cutflowers and big sized corms with a return on investments of 213.11%.

Allan (1999) recommended that potted roses grown in media consisting 1:1:1 horse manure + compost + garden soil, or 1:1:1 sand + garden soil + horse manure were the best potting mixtures; they promoted compact growth and profuse flowering in potted roses.

Handreck and Black (1994) mentioned that many grades of sand are available. Those with mainly medium to very coarse sizes (0.25-2mm) are generally preferred finer grades can be used to increase water holding capacity of mixes hose other component are coarser.

Gerald (1970) as cited by Allan (1999) stated that the usage of sterilized mixture of 1/3 loam, 1/3 drainage material such as sand and gravel and 1/3 moisture retaining materials such as peat moss and sphagnum mosses with small amount of fertilizer added was found satisfactory.

Oryan (1994) recommended that media composition 1:1:1:1 part of weight of garden soil + horse manure + sand + compost greatly improved the vegetative growth and flowering of African Violets grown in pots under partial shade.

Manure it stimulates the work of soil microbes that unlock plant food held in soil borne mineral compounds. It adds nutrients and humus to the soil aids composting operations and in the green state provides heat for cold frames as it decomposes. Lastly it improves the physical condition of heavy soil (Jankowiak, 1978).

Brady (1984) mentioned that farm manure is degraded plant material and they tend to increase the yield crops. The nutrient elements taken by animals are found on the voided element for this reason; animal manures are valuable sources of both macro element and microelement.

Foth and Turk (1972) noted that rotten manure is a rich food constituent. This concentration of plant nutrient is due to shrinkage in dry weight, which would automatically raise the level of plant food.

Christopher (1958) stated that fresh manure is relatively higher in nitrogen and potassium than in phosphorus. He further that manure may increase water holding capacity, improve structure and provide a satisfactory medium in which various desirable bacteria may develop. It supplies a great many of the chemicals recognized as minor element and in all probability some other elements and possibly, hormones which as yet

not recognized.

Jankowiak (1978) stated that chicken manure is generally the highest in all levels of plant nutrients, some times up to four times as rich as cow manure, but it contains far less humus. Horse manure is a little higher in most nutrients than cow and has the advantage along with chicken and sheep of being “hotter” that is, it decomposes faster and generates a higher composting temperature. Cow and hog manure are cool these wetter and don’t have as much nitrogen.

He further stared that compost, manure’s and most mulches are both humus builders and excellent sources of macro and micro nutrients and there make excellent natural fertilizers.

Gawaban (1999) recommended that a media of 1:1:1 alnus + compost + garden soil, significantly improved the vegetative growth of impatiens and produced taller plants.

Micklay (1990) found that 1:1:1:1 part of weight of garden soil + horse manure + sand + compost had greatly improved the vegetative growth and reproductive ability of geranium plants

Laurie (1950) stated that humus increase the power of the soil to hold water and soluble materials in water. Its colloidal properties permit absorption of gases and their retention these colloidal properties improve the structure, making it granular.

Further humus aids in the absorption of gases and their retention of soil heat (Laurie, 1950). It also makes potassium and phosphorus compounds are available through the acids that are formed in the process of decomposition. Soil nitrogen normally is derived from the decomposition of humus and it helpful in the growth or organism

needed in the soil.

In corporation of these different organic matters in the soil is very important especially in florist crops since they enhance the growth of flowers (Laurie, 1956).

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MATERIALS AND METHODS

Materials

To successfully carry-out the activities in this study, the following materials will be used: Angel's Wings (*Spathiphyllum kochii L.)* plants at flowering stage, polyethylene bags 15 x 20 cm. Animal manure (cattle, pig, chicken) media and labeling materials.

Methods

The study was laid-out following the Completely Randomized Design (CRD) with four (4) replications. Each replication will have two sample plants per treatment.

The different potting media mixtures will be as follows:

T_0 – Garden soil (control)

T_1 – Compost (ALNUS)

T_2 – Compost + chicken manure + sawdust (1:1:1)

T_3 – Compost + rice hull + garden soil (1:1:1)

T_4 – Compost + sawdust + cattle manure (1:1:1)

T_5 – Sand + rice hull + sawdust (1:1:1)

T_6 – Rice hull + sawdust + pig manure (1:1:1)

T_7 – Rice hull + garden soil + chicken manure (1:1:1)

The different potting media was mixed following the indicated ratio and will be placed in black plastic bags, where the angel's wing will be planted.

The study was conducted under greenhouse conditions with a temperature range of 19-22^{o}C. Recommended cultural practices such as weeding, irrigation and crop protection were applied uniformly to all test plants.

The data gathered, were statistically analyzed using the analysis of Variance for Completely Randomized Design (CRD). Significance of differences between treatments was tested using the Duncan's Multiple Range Test (DMRT).

Data Gathered

A. Vegetative Growth

1. Final height of plant (cm) at flowering. This was obtained by measuring the plant height at flowering stage.

2. Final number of leaves per plant at flowering stage. This was obtained by counting the leaves produced per plant at flowering stage.

3. Number of suckers produced per plant at flowering. The number of suckers was recorded at flowering.

B. Reproductive Growth

1. Number of days from transplanting to 1 cm flower bud size. This was obtained by counting the number of days from transplanting until 1 cm flower bud size observed.

2. Days from transplanting to fully opened spathe. This was obtained by counting the number of days from transplanting to flowering (fully opened spathe).

a. Vaselife. The number of days from harvesting at fully opened spathe and holding in tap water until the onset of senescence.

b. Length of spathe (cm). This was obtained by measuring the length o f the spathe after harvesting.

c. Width of spathe (cm.) This was obtained by measuring the width of spathe

after harvesting.

d. Stem length (cm). This was obtained by measuring the stem length after harvesting.

C. Cutflowers yield per plant. Yield per plant for four months duration was recorded.

D. Documentation. Pictures were taken during the conduct of the experiment.

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Plate 1. Newly Transplanted

Plate 2. One month from transplanting

Plate 3. Flowering stage

RESULTS AND DISCUSSION

Table 1. Final height of plant at flowering (cm)

TREATMENT	MEAN
Garden soil (control)	34.750 a
Compost (alnus)	40.000 a
Compost + chicken manure + sawdust (1:1:1)	29.125 a
Compost + ricehull + garden soil (1:1:1)	33.125 a
Compost + sawdust + cattle manure (1:1:1)	33.375 a
Sand + ricehull + sawdust (1:1:1)	27.625 a
Ricehull + sawdust + pig manure (1:1:1)	38.750 a
Ricehull + garden soil + chicken manure (1:1:1)	19.625 a

Means with a letter are not significantly different at 5% level by DMRT

Final Height of Plants at Flowering (cm)

Results showed no significant differences on the final height of *Spathiphyllum kochii* at flowering stage as affected by different growing media. However plants grown in compost (alnus) was the tallest with a mean of 40.000 cm and was followed by plants planted in a media grown in consisting 1:1:1 ricehull + sawdust + pig manure. Results, further showed that the shortest plant at flowering were observed in plans planted in media consisting 1:1:1 ricehull + garden soil + chicken manure with means of 19.625 cm. Gawaban in 1999 however found that 1:1:1 alnus compost + garden soil + ricehull and 1:1:1 alnus compost + ricehull + sand had significantly promoted taller plants at flowering in Impatience.

Table 2. Final number of leaves per plant at flowering stage

TREATMENT	MEAN
Garden Soil (control)	10.125 a
Compost (alnus)	12.625 a
Compost + chicken manure + sawdust (1:1:1)	7.375 a
Compost + ricehull + garden soil (1:1:1)	10.750 a
Compost + sawdust + cattle manure (1:1:1)	9.500 a
Sand + ricehull + sawdust (1:1:1)	6.500 a
Ricehull + sawdust + pig manure (1:1:1)	11.375 a
Ricehull + garden soil + chicken manure (1:1:1)	6.250 a

Means with the same letter are not significantly different at 5% level by DMRT

Final Number of Leaves per Plant at Flower Stage

The different growing media used did not significantly affected the final number of leaves per plant at flowering stage (Table 2). However, plants grown in compost (alnus) had the highest number of leaves at flowering with an average leaves of 12.625 while the lowest was from 1:1:1 ricehull + garden soil + chicken manure with a mean of 6.25.

Daiz (2000) on the other hand found that media composition of 1:2 sawdust + compost promoted the production of more leaves in *Begonia sp*.

Table 3. Average number of sucker produced per plant

TREATMENT	MEAN
Garden Soil (control)	2.000 a
Compost (alnus)	3.250 a
Compost + chicken manure + sawdust (1:1:1)	2.250 a
Compost + ricehull + garden soil (1:1:1)	1.500 a
Compost + sawdust + cattle manure (1:1:1)	2.125 a
Sand + ricehull + sawdust (1:1:1)	1.875 a
Ricehull + sawdust + pig manure (1:1:1)	1.500 a
Ricehull + garden soil + chicken manure (1:1:1)	1.750 a

Means with the s ame letter are not significantly different at 5% level by DMRT

Average Number of Suckers Produced per Plant

Table 3 shows no significant differences among the different potting media mixtures used on the number of suckers produced per plant. However, plants grown in compost (alnus) tended to produced more suckers that the other mixtures used.

In a related study of Thompson and Troeh (1978) they claim that the nutrients released from well-rotted compost is probably better balanced and regulated from fresh manure whereby gardeners can therefore apply larger amounts of compost than the use of fresh manure, without the danger of injuring plants. They added that the use of compost also resulted in humus formation and promoted good soil structure.

Table 4. Number of days from transplanting to 1 cm flower bud size

TREATMENT	MEAN
Garden Soil (control)	50.500 a
Compost (alnus)	38.250 a
Compost + chicken manure + sawdust (1:1:1)	36.500 a
Compost + ricehull + garden soil (1:1:1)	43.125 a
Compost + sawdust + cattle manure (1:1:1)	37.875 a
Sand + ricehull + sawdust (1:1:1)	47.250 a
Ricehull + sawdust + pig manure (1:1:1)	41.375 a
Ricehull + garden soil + chicken manure (1:1:1)	53.125 a

Means with the same letter are not significantly different at 5% level of DMRT

Number of Days from Transplanting to 1 cm Flower Bud Size

The number of days from planting *Spathiphyllum kochii* to visible flower buds at 1 cm size is shown in Table 4. Results showed no significant differences on the growing media used. However, plants grown in media mixture 1:1:1 ricehull + garden soil + chicken manure showed earlier flower bud formation with a mean of 53.125 while the latest was 1:1:1 compost + chicken manure + sawdust with a mean of 36.500.

This findings conforms with earlier study where plants are grown in medium consisting 1:1:1:1 of wood shaving + sawdust + cow manure + sunflower leaves showed the earliest flower buds in anthurium as reported by Cais (1996).

Table 5. Days from transplanting to fully opened spathe

TREATMENT	MEAN
Garden Soil (control)	78.500 a
Compost (alnus)	69.875 a
Compost + chicken manure + sawdust (1:1:1)	61.500 a
Compost + ricehull + garden soil (1:1:1)	76.000 a
Compost + sawdust + cattle manure (1:1:1)	64.375 a
Sand + ricehull + sawdust (1:1:1)	80.875 a
Ricehull + sawdust + pig manure (1:1:1)	73.625 a
Ricehull + garden soil + chicken manure (1:1:1)	61.250 a

Means with the same letter are not significantly different at 5% level by DMRT

Days from Transplanting to Fully opened Spathe

Table 5 shows that there was no significant difference among the different media used in growing *Spathiphyllum kochii*. However, plants grown in 1:1:1 sand + ricehull + sawdust + flowered earlier than other treatments which mean of 80.875 days.

Aladog in 2005 however found that plants planted in a medium mixture of garden soil + chicken manure and 1:1:1:1 sand + sawdust + ricehull + alnus compost flowered slightly earlier than plants grown in the other treatment in Zinnia.

Table 6. Length and width of spathe

TREATMENT	MEAN	
	LENGTH	WIDTH
Garden Soil (control)	10.750 abc	4.375 ab
Compost (alnus)	13.625 a	5.375 a
Compost + chicken manure + sawdust (1:1:1)	6.750 cd	3.250 bc
Compost + ricehull + garden soil (1:1:1)	11.250 ab	4.875 ab
Compost + sawdust + cattle manure (1:1:1)	9.500 abc	4.250 abc
Sand + ricehull + sawdust (1:1:1)	9.250 bc	4.250 abc
Ricehull + sawdust + pig manure (1:1:1)	10.500 abc	5.000 a
Ricehull + garden soil + chicken manure (1:1:1)	4.625 d	2.625 c

Means with the same letters are not significantly different at 5% level by DMRT

Average Length and Width of Spathe

Table 6 shows the length and width of *Spathiphyllum kochii* cutflowers as affected by the different growing media composition. Longest spathe were significantly measured in cutflowers harvested from plants grown in compost (alnus) with a mean 13.625 cm. However, it was comparable with plants grown in garden soil 1:1:1 compost + ricehull + garden soil, 1:1:1 compost + sawdust + cattle manure and 1:1:1 ricehull + sawdust + pig manure which range from 11.250 cm to 9.500 cm. The smallest spathes were measured with a mean 4.625 cm in plants grown in 1:1:1 ricehull + garden soil + chicken manure.

Cutflowers from plants grown in compost and 1:1:1 ricehull + sawdust + pig manure had significantly wider spathe with a mean 5.375 and 5.000 cm which was

comparable with the spathe width from plants grown in garden soil, 1:1:1 compost + ricehull + garden soil, 1:1:1 compost + sawdust + cattle manure and 1:1:1 sand + ricehull + sawdust which range from 4.875 to 4.250 cm. The shortest width was obtained from 1:1:1 ricehull + garden soil + chicken manure with only mean 2.625 cm spathe at 50% anthesis.

Sumakey (2004) on the other hand found that longest and widest spathe were measured in cutflowers harvest from plants grown in 1:1:1:1 garden soil + coco fiber + coco soil + horse manure in white calla.

Table 7. Stem length (cm)

TREATMENT	MEAN
Garden Soil (control)	22.125 ab
Compost (alnus)	24.875 a
Compost + chicken manure + sawdust (1:1:1)	12.625 cd
Compost + ricehull + garden soil (1:1:1)	22.000 ab
Compost + sawdust + cattle manure (1:1:1)	19.125 abc
Sand + ricehull + sawdust (1:1:1)	16.375 bc
Ricehull + sawdust + pig manure (1:1:1)	22.125 ab
Ricehull + garden soil + chicken manure (1:1:1)	7.625 d

Means with the same letter are not significantly different at 5% level of DMRT

Average Length of Stem at Harvestable Stage

Table 7 shows that plants grown in compost (alnus) had significantly longer stem length with a mean of 24.875 cm. However, it was comparable with those obtained from cutflowers harvested from plants grown in garden soil, 1:1:1 compost + ricehull + garden soil, 1:1:1 compost + sawdust + cattle manure and 1:1:1 ricehull + sawdust + pig manure which range from 22.125 cm to 19.125 cm. On the other hand, shortest stem were observed from plants grown in 1:1:1 ricehull + garden soil + chicken manure with a mean of only 7.425 cm at 50% flower opening stage.

Acop (1987) however found that 1:1:1 part of horse manure, garden soil and compost gave the tallest and highest leaf count at anthesis and initiated flowers earlier in chrysanthemums.

Table 8. Cutflower yield per plant (4 months)

TREATMENT	MEAN
Garden Soil (control)	1.500 a
Compost (alnus)	1.500 a
Compost + chicken manure + sawdust (1:1:1)	1.125 a
Compost + ricehull + garden soil (1:1:1)	1.375 a
Compost + sawdust + cattle manure (1:1:1)	1.250 a
Sand + ricehull + sawdust (1:1:1)	1.125 a
Ricehull + sawdust + pig manure (1:1:1)	1.500 a
Ricehull + garden soil + chicken manure (1:1:1)	0.625 a

Means with same letter are not significantly different at 5% level by DMRT

Cutflower Yield per Plant (4 months)

Results show no significant differences on the number of flowers produced per plant (Table 8). However, plants grown on potting media of garden soil, compost (alnus) and 1:1:1 ricehull + sawdust + pig manure had produced more cutflower with a mean of 1.500 on the 4 months duration of the study.

In a related study Diaz (2000) found that potted roses grown in media consisting 1:1:1 horse manure + compost + garden soil or 1:1:1:1 sand + compost + garden soil + horse manure were the best potting mixtures, they promoted compact growth and profuse flowering in potted roses.

Table 9. Vaselife

TREATMENT	MEAN (days)
Garden Soil (control)	6.667 bc
Compost (alnus)	12.000 ab
Compost + chicken manure + sawdust (1:1:1)	11.000 ab
Compost + ricehull + garden soil (1:1:1)	9.667 ab
Compost + sawdust + cattle manure (1:1:1)	11.333 ab
Sand + ricehull + sawdust (1:1:1)	11.333 ab
Ricehull + sawdust + pig manure (1:1:1)	4.333 c
Ricehull + garden soil + chicken manure (1:1:1)	13.000 a

Means with the same letter are not significantly different at 5% level of DMRT

Vaselife

Significant difference were noted on the effect of different potting media on the vaselife of *Spathiphyllum kochii* cutflowers observed at ambient as conditions shown in Table 9.

Cutflowers of *Spathiphyllum kochii* plants growth with a potting mixture of 1:1:1 ricehull + garden soil + chicken manure had the longest vaselife with a mean of 13.000 days from holding in tap water at ambient condition were comparable with compost (alnus), 1:1:1 compost + sawdust + cattle manure, 1:1:1 sand + ricehull + sawdust and 1:1:1 compost + chicken manure + sawdust which ranged from 12.000 to 11.000 days. Shortest vaselife of cutflower was obtained from plants grown in 1:1:1 ricehull + sawdust + pig manure with means of 4.333 days.

Results showed that plants that produces short stemmed cutflowers with small-sized tended to have shorter vaselife from those with long stem and long size spathe because of higher stored food that leads to longer vaselife.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study was conducted at the ornamental Horticulture Research Project Area of Benguet State University, La Trinidad, Benguet from September 2005 to January 2006 to determine the effect of different potting media mixture on the growth and flowering of *Spathyphyllum kochii*, identify the best potting media mixtures for the culture of potted *Spathyphyllum kochii*, and to determine the effect of different potting media mixes with regards to cutflowers yield, cutflower quality and vaselife of cutflowers.

Results show that there were no significant differences on the vegetative growth in terms of final height of plant at flowering (cm), final number of leaves per plant at flowering stage and average number of suckers produced per plant at flowering as affected by different media used among the eight potting media mixtures used, compost (alnus) tended to improved the vegetative growth of *Spathiphyllum kochii* l. plants by producing taller plants, higher leaf count and more suckers produced on the termination of the study.

Significantly longer cutflower stems of 24.875 at fully opened spathe were recorded in plants grown in a mixture, compost (alnus). However stem lengths were comparable with those obtained from cutflowers harvested from plants grown in garden soil, 1:1:1 compost + sawdust + cattle manure, 1:1:1 ricehull + sawdust + pig manure and 1:1:1 compost + ricehull + garden soil shortest stem were recorded from plants grown in 1:1:1 ricehull + garden soil + chicken manure. Longest spathes were measured in cutflowers harvested from plants grown in compost (alnus) with a mean of 13.625 cm. The other growing media produced comparable spathe length at fully opened spathe is

which range from 1 1.250 cm to 10.500 cm while the shortest length of spathe were measured from plants in 1:1:1 ricehull + garden soil + chicken manure. The widest spathes were recorded in cutflowers from plants grown from the same media composition of compost (alnus) and the other was 1:1:1 ricehull + sawdust + pig manure with a mean of 5.375 cm and 5.000 cm which was comparable with the spathe width of spathiphyllum kochii cutflowers produced by plants grown in garden soil, 1:1:1 compost + ricehull + garden soil, 1:1:1 compost + sawdust + cattle manure and 1:1:1 sand + ricehull + sawdust which ranged from 4.875 cm to 4.250 cm while the shortest width were measured from plants grown in 1:1:1 ricehull + garden soil + chicken manure with mean 4.625 spathes at fully opened spathe. Cutflower yield per plant to 4 months duration was not significantly affected by different growing media composition. Means ranged from 1.500 to 0.625 cm.

The longest vaselife with a mean of 13.000 days from holding in tap water at ambient condition observed in cutflowers planted in a media mixture of 1:1:1 ricehull + garden soil + chicken manure comparable with compost (alnus), 1:1:1 compost + chicken manure + sawdust, 1:1:1 sand + ricehull + sawdust and 1:1:1 compost + sawdust + cattle manure which ranged from 12.000 to 11.000 days. Shortest vaselife was observed from cutflowers grown in 1:1:1 ricehull + sawdust + pig manure with only means of 4.333 days.

Conclusion

Based on the results of the study, it is therefore concluded that a growing medium of compost (alnus) should be used as a potting media in *Spathiphyllum kochii* to produce longer cutflower with bigger length and width of fully opened spathe and longer vaselife.

Recommendation

From the preceeding results of the study, the use of compost (alnus) as growing media for *Spathyphyllum kochii* is therefore recommended for better growth, earlier, flowering, better quality cutflowers for pot culture under greenhouse conditions.

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Appendix Table 1. Final height of plant (cm at flowering)

TREATMENT	REPLICATION I	II	III	IV	TOTAL	MEAN
T_0	40.5	33.5	34.5	30.5	139.000	34.75
T_1	39.5	41	38	41.5	160.000	40
T_2	39	20.5	39	18	116.500	29.125
T_3	40	37	30	25.5	132.500	33.125
T_4	43.5	40	33.5	16.5	133.500	33.375
T_5	34	30.5	15	31	110.500	27.625
T_6	43	41	41.5	29.5	155.00	38.750
T_7	0	34	30	14.5	78.500	19.625
GRAND TOTAL AND MEAN					1025.500	256.375

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	0.01
Treatments	7	1203.242	171.892	1.99^{ns}	2.43	3.50
Error	24	2076.438	86.518			
TOTAL	31	3279.680				

ns = not significant Coefficient of variation = 29.02%

Appendix Table 2. Final number of leaves per plant at flowering

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	8.5	10.5	11.5	10	40.500	10.125
T_1	15	12	14	9.5	29.500	9.875
T_2	10.5	2.5	6.5	10	29.500	7.376
T_3	13.5	11	8.5	10	43.000	10.750
T_4	10.5	13.5	7.5	6.5	38.000	9.500
T_5	8	9.5	3	5.5	26.000	6.500
T_6	11.5	15	11.5	7.5	45.000	11.375
T_7	0	10.5	10.5	4	25.000	6.250
GRAND TOTAL AND MEAN					276.500	71.751

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	156.125	22.304	2.233_{ns}	0.0673	
Error	24	239.750	9.990			
TOTAL	31	395.875				

ns = not significant

Coefficient of variation = 33.94%

Appendix Table 3. Average number of suckers produced per plant

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	1	3	1	3	8.000	2.000
T_1	0	6.5	3.5	3	13.000	3.250
T_2	2.5	1.5	2	3	9.000	2.250
T_3	3	0.5	1.5	1	6.000	1.500
T_4	3	1.5	1	3	8.500	2.125
T_5	1	2.5	3	1	7.500	1.875
T_6	0.5	0.5	2.5	2.5	6.000	1.500
T_7	1.5	3.5	1	1	7.000	1.750
GRAND TOTAL AND MEAN					65.000	16.25

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	8.844	1.263	0.68_{ns}	2.43	3.50
Error	24	44.625	1.857			
TOTAL	31	53.469				

ns = not significant Coefficient of variation = 67.13%

Appendix Table 4. Number of days from transplanting to 1 cm flower bud size

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	43.5	49.5	57	52	202	50.500
T_1	50	30	33	40	153	38.250
T_2	44	25.5	62	14.5	146	36.500
T_3	29	39.5	44	60	172	43.125
T_4	44.5	30	46.5	30.5	151.5	37.875
T_5	60	53	23.5	52.5	189	47.250
T_6	38	43	34.5	50	165.5	41.375
T_7	0	90	61	61.5	212.5	53.125
GRAND TOTAL AND MEAN					1392	348

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	1074.250	153.464	0.48_{ns}	2.43	
					3.50	
Error	24	7612.750	317.198			
TOTAL	31	8687.000				

ns = not significant Coefficient of variation = 40.94%

Appendix Table 5. Days from transplanting to fully opening spathe

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	69	78.5	81	85.5	314	78.500
T_1	90.5	59	62.5	67.5	279.5	69.875
T_2	77	45	89.5	34.5	246	61.500
T_3	69.5	67.5	74.5	92.5	304	76.000
T_4	71	59	78.5	48	257.5	64.375
T_5	108	87	43	85.5	323.5	80.875
T_6	76	75	62.5	81	294.5	73.625
T_7	0	92.5	118	34.5	245	61.250
GRAND TOTAL AND MEAN					2264	566

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	1662.500	237.500	0.39_{ns}	2.43	3.50
Error	24	14751.500	614.646			
TOTAL	31	16414.000				

ns = not significant Coefficient of variation = 35.04%

Appendix Table 6. Length of spathe

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	10.5	10.5	10.5	11.5	43	10.750
T_1	12	14.5	16	12	54.5	13.625
T_2	9	4	9	5	27	6.750
T_3	14	12	9.5	9.5	45	11.250
T_4	11	12	10	5	38	9.500
T_5	8.5	13.5	4.5	10.5	37	9.250
T_6	9.5	10	12.5	10	42	10.500
T_7	0	7	7	4.5	18.5	4.625
GRAND TOTAL AND MEAN					305	76.250

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	216.094	30.871	4.71**	2.43 3.50	
Error	24	157.375	6.557			
TOTAL	31	373.469				

** - highly significant Coefficient of variation = 26.87%

Appendix Table 7. Width of spathe

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	5	4.5	4.5	5	19	4.750
T_1	5.5	6	5	5	21.5	5.375
T_2	4.5	2	4	2.5	13	3.250
T_3	5	5.5	4	5	19.5	4.875
T_4	4.5	5	5	2.5	17	4.250
T_5	4	5.5	2.5	5	17	4.250
T_6	4.5	5	5.5	5	20	5.000
T_7	0	4	4	2.5	10.5	2.625
GRAND TOTAL AND MEAN					137.5	34.375

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	24.365	3.481	3.09*	2.43 3.50	
Error	24	27.063	1.128			
TOTAL	31	51.430				

* - significant CV = 24.71%

Appendix Table 8. Stem length

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	22.5	22.5	21	22.5	88.5	22.125
T_1	24.5	25.5	25	24.5	99.5	29.875
T_2	18	6	16.5	10	50.5	12.625
T_3	21.5	24.5	22	20	88	22.000
T_4	25.5	22	20	9	76.5	19.125
T_5	16.5	23.5	8.5	17	65.5	16.375
T_6	21.5	19.5	26	21.5	88.5	22.125
T_7	0	12.5	9.5	8.5	30.5	7.625
GRAND TOTAL AND MEAN					587.5	151.875

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	946.805	135.258	6.74**	2.43	3.50
Error	24	481.813	20.076			
TOTAL	31	1428.617				

** - highly significant

Coefficient of variation = 24.40%

Appendix Table 9. Cutflowers yield per plant (4 months)

TREATMENT	REPLICATION				TOTAL	MEAN
	I	II	III	IV		
T_0	2	1	1.5	1.5	6	1.500
T_1	1	2	2	1	6	1.500
T_2	1.5	.5	1.5	1	4.5	1.125
T_3	2	1.5	1	1	5.5	1.375
T_4	1.5	2	1	.5	5	1.250
T_5	1	2	.5	1	4.5	1.125
T_6	1.5	1.5	2	1	6	1.500
T_7	0	1	1	.5	2.5	0.625
GRAND TOTAL AND MEAN					40	10.125

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	2.500	0.357	1.32_{ns}	2.43 3.50	
Error	24	6.500	0.271			
TOTAL	31	9.000				

ns = not significant Coefficient of variation = 41.63%

Appendix Table 10. Vaselife

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T_0	6	6	8	20	6.667
T_1	14	10	12	36	12.000
T_2	11	11	11	33	11.000
T_3	11	13	5	29	9.667
T_4	5	18	11	34	11.333
T_5	13	10	11	34	11.333
T_6	4	5	4	13	4.333
T_7	14	12	13	39	13.000
GRAND TOTAL AND MEAN				238	79.333

ANALYSIS OF VARIANCE

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Square	Computed F	Tabulated F 0.05	Tabulated F 0.01
Treatments	7	182.500	26.071	3.04*	2.66 4.05	
Error	16	137.333	8.583			
TOTAL	23	319.833				

* - significant Coefficient of variation = 29.54%