

## **BIBLIOGRAPHY**

ABAWA, JULICIA S. May 2013. Growth and Flowering of Benguet Lily, (*Lilium philippinensis*), as Affected by Different Bulb Sizes and Organic Fertilizers Application at Two Locations, Benguet State University, La Trinidad, Benguet.

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## **ABSTRACT**

The study was conducted at the Ornamental Horticultural Research Area, Benguet State University, La Trinidad and Baculungan Sur, Buguias, Benguet, from September 2012 to determine the response of the Benguet Lily grown from different bulb size applied with different kinds of organic fertilizers and to determine the best organic fertilizer/s for the optimum growth and flowering of Benguet Lily grown from various bulb sizes at two different locations.

Results showed that the final height at flowering of Benguet Lily, number of days from transplanting to flower bud formation, stem thickness at harvest and stem length of cutflowers were comparable in all plants grown from different bulb sizes and applied with different organic fertilizers. However, results showed that Benguet Lily grown in mountain soil applied with cattle manure as organic fertilizer had the best growth and was the best organic fertilizer for the production of Benguet Lily cutflowers since it promoted the production of the longest cutflower stems. Benguet Lily grown from 1.5 cm bulb size had the tallest plants but had significantly delayed flowering. Benguet Lily grown from 3 cm



bulb sizes had the shortest stems but had the thickest stem diameter and were the earliest to produce flowers.

Bulbs with 1.5 cm in diameter are therefore recommended for better cutflower quality and 3 cm in diameter bulbs can be used as planting materials for earlier flowering of Benguet Lily plants at both locations in BSU-Cabanao, La Trinidad and Baculungan Sur, Buguias, Benguet.



## RESULTS AND DISCUSSION

### Initial Height of the Plant One (1) Month After Transplanting

Effect of organic fertilizer. Results showed that there were no significant differences on the plants as affected by different organic fertilizers grown at BSU-Cabanao area. However, there were significant differences on the plants as affected by different organic fertilizers grown under Baculungan Sur, Buguias condition. Benguet lily plants grown in mountain soil+ alnus leaves compost were the tallest with a mean of 10.47 cm followed by Benguet lily plants grown in mountain soil+ cattle manure with a mean of 8.56 cm. Benguet lily plants grown in mountain soil+ horse manure were the shortest with a mean of 7.72 cm.

Effect of bulb size. Results showed that there were highly significant differences observed on the plants as affected by different bulb sizes grown on station. Benguet lily plants grown from bulb size of 1.5 cm were the tallest with a mean of 9.33 cm followed by Benguet lily plants grown from bulb size of 3 cm with a mean of 7.83 cm. Results further showed that Benguet lily grown from bulb size of 2.5 cm had the shortest plants with mean of 5.33 cm. However, results showed that there were no significant differences on the initial heights of Benguet lily plants as affected by different bulb sizes grown under Baculungan Sur, Buguias condition.

Interaction effect. Results show that there were no significant interaction effect obtained between the three different organic fertilizers and the three different bulb sizes used with regards to the initial height of the plant 1 month after transplanting grown at both locations at Cabanao, BSU and Baculungan Sur, Buguias.



Table 1: Initial height of the plant 1 month after transplanting (cm)

TREATMENT	INITIAL HEIGHT OF THE PLANT (cm)	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic Fertilizer</u>		
Alnus leaves compost	7.28	10.47 <sup>a</sup>
Cattle manure	7.67	8.56 <sup>ab</sup>
Horse manure	7.56	7.72 <sup>b</sup>
<u>Bulb Size at Planting (cm)</u>		
1.5	9.33 <sup>a</sup>	8.83
2.5	5.33 <sup>b</sup>	8.39
3	7.83 <sup>a</sup>	9.52
CV (%)	28.38	21.94

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

### Final Height at Flowering

Effect of organic fertilizer. Table 2 shows that there were no significant differences observed on the plants as affected by different organic fertilizers grown at BSU-Cabanao area. However, results show that there were significant differences on the final height of plants as affected by different organic fertilizer grown under Baculungan Sur, Buguias condition. Benguet lily grown in mountain soil+ horse manure were the tallest at flowering with a mean of 41.76 cm followed by Benguet lily plants grown in mountain soil+ cattle manure with a mean of 39.83 cm. Results show that Benguet lily plants grown in mountain soil+ alnus leaves compost were the shortest at flowering with a mean of only 35.28 cm.



Effect of bulb size. Results show that there were significant differences on the final height of plants as affected by different bulb sizes grown on station. Benguet lily plants grown from 1.5 cm of bulb size were the tallest at flowering with a mean of 37.28 followed by Benguet lily grown from 3 cm of bulb size with a mean of 33.28. Benguet lily plants grown from 2.5 cm bulb size were the shortest at flowering with a mean of 33.00. Results show that there were significant differences on the final heights of Benguet lily plants at flowering as affected by different bulb sizes grown under Baculungan Sur, Buguias. Benguet lily plants grown from 1.5 cm of bulb size were the tallest at flowering with a mean of 41.68 cm followed by Benguet lily plants grown from 2.5 cm of bulb size with a mean of 39.092 cm. Benguet lily plants grown from 3 cm of bulb size were the shortest at flowering with a mean of 36.11 cm and grown under Baculungan Sur, Buguias condition.

Interaction effect. Results show that there were no significant interaction effect obtained between different organic fertilizers and different bulb sizes used with regards to the final height at flowering of Benguet lily grown on station. However, there were highly significant interaction effect obtained between different organic fertilizers and different bulb sizes with regards to the final height of Benguet lily at flowering grown under Baculungan Sur, Buguias condition as shown in Figure 3. Results show that Benguet lily plants with a bulb size of 1.5 cm grown in mountain soil and applied with horse manure were the tallest with a mean of 49.167 cm with regards to the final height at flowering. These were followed by Benguet lily plants grown in mountain soil applied with cattle manure with a bulb size of 2.5 cm, mean was 46.17 cm. Benguet lily grown in mountain soil+ alnus leaves compost had a mean of 41.17cm. The other fertilizer treatments means



ranging from 31.67 cm to 38.67 cm with regards to final height at flowering grown under Baculungan Sur, Buguias condition.

Table 2: Final height at flowering (cm)

TREATMENT	FINAL HEIGHT AT FLOWERING (cm)	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	34.44	35.28 <sup>b</sup>
Cattle manure	32.67	39.83 <sup>a</sup>
Horse manure	36.44	41.76 <sup>a</sup>
<u>Bulb Size at Planting (cm)</u>		
1.5	37.28 <sup>a</sup>	41.67 <sup>a</sup>
2.5	33.00 <sup>b</sup>	39.09 <sup>ab</sup>
3	33.28 <sup>b</sup>	36.11 <sup>b</sup>
CV (%)	9.83	10.32

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



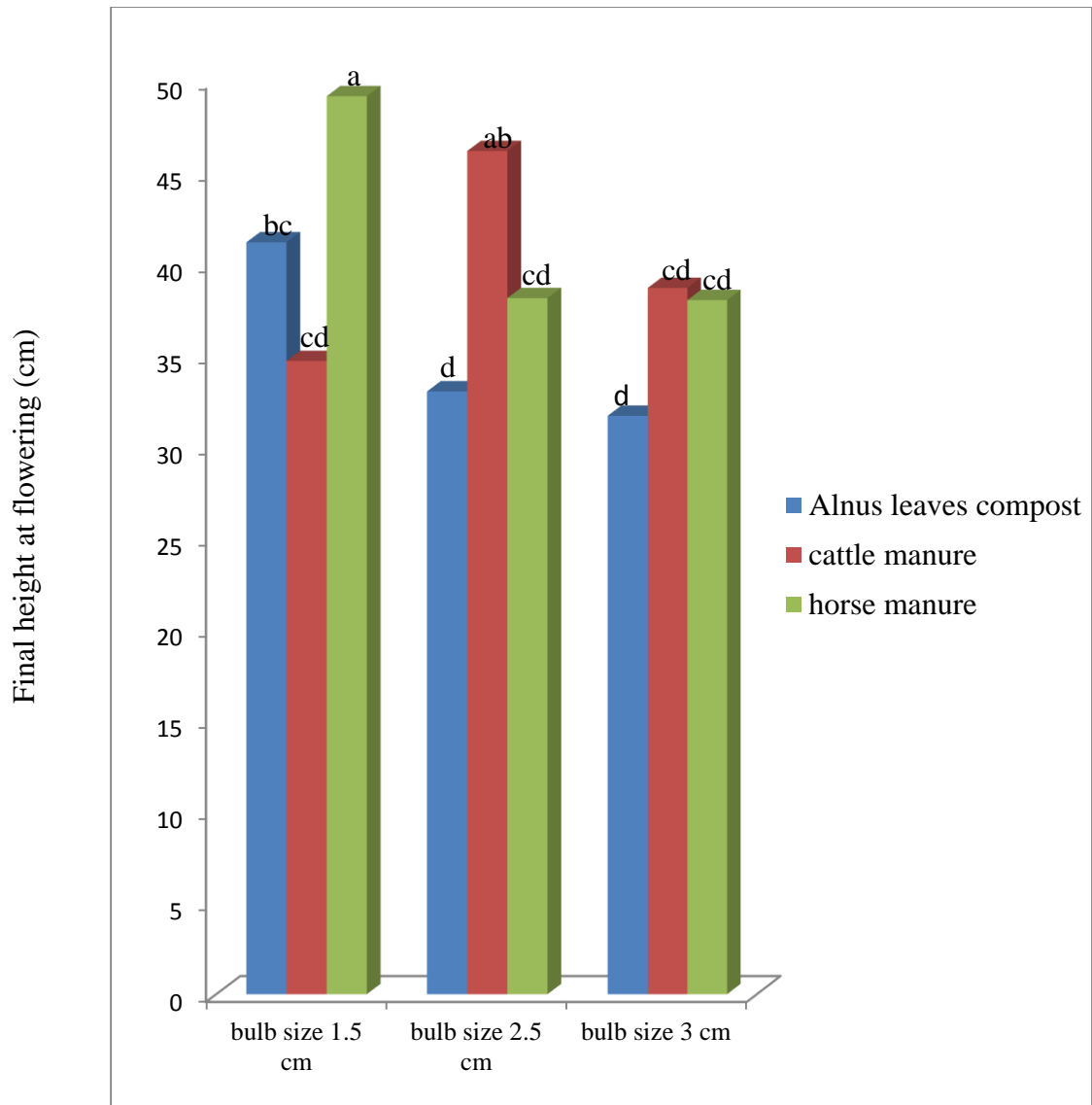


Figure 3. Final height at flowering (cm) as influenced by different bulbs sizes and different organic fertilizers grown under Baculungan Sur, Buguias. (Mean with a common letter is not significantly different at 5% level by DMRT)



### Stem Diameter at Flowering (6 cm above ground)

Effect of organic fertilizer. Table 3 shows that there were no significant differences on the stem thickness of Benguet lily plants grown at both locations as affected by different kinds of organic fertilizers applied.

Effect of bulb size. Results showed that there were highly significant differences on the stem thickness of plants as affected by different bulb sizes used as planting materials for plants grown at BSU-Cabanao area. Benguet lily plants grown from bulb size of 3 cm had the thickest stems with a mean of 1.46 cm. This was followed by Benguet lily plants grown from 2.5 cm bulb size which had a mean of 1.16 cm. Results showed that Benguet lily plants grown from bulb size of 1.5 cm had the thinnest stems which had a mean of 0.86 cm. Results showed that there were highly significant differences on the stem thickness of plants at flowering as affected by different bulb sizes for plants grown at Baculungan Sur, Buguias. Benguet lily plants grown from bulb size of 3 cm had the thickest stem diameter with a mean of 2.84 cm and was followed by Benguet lily plants grown from bulb size of 2.5 cm with a mean of 1.79 cm. Benguet lily plants grown from bulb size of 1.5 cm had the thinnest stem diameter with a mean of 1.58 cm which were grown under Baculungan Sur, Buguias condition.

Interaction effect. Results showed that there were no significant interaction effects obtained between different organic fertilizers and different bulb sizes used with regards to stem diameter at flowering and were grown at both locations, at BSU-Cabanao and at Baculungan Sur, Buguias.





Table 3. Stem diameter at flowering (cm)

TREATMENT	STEM DIAMETER AT FLOWERING (cm)	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	0.86	1.90
Cattle manure	1.16	2.19
Horse manure	1.00	2.12
<u>Bulb Size at planting (cm)</u>		
1.5	0.76 <sup>b</sup>	1.58 <sup>b</sup>
2.5	0.80 <sup>b</sup>	1.79 <sup>b</sup>
3	1.46 <sup>a</sup>	2.84 <sup>a</sup>
CV (%)	29.32	22.26

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

Number of Days from Transplanting  
to Flower Bud Formation

Effect of organic fertilizer. Results showed highly significant differences on the flowering of Benguet lily plants as affected by different organic fertilizers for those grown at BSU-Cabanao area. Benguet lily plants grown in mountain soil and applied with horse manure had the longer duration of days to form flower bud with a mean of 173.00 days followed by Benguet lily plants grown in mountain soil and applied with cattle manure which had a mean of 168.78 days. Benguet lily plants grown in mountain soil and applied with alnus leaves compost were the earliest to form flower buds which were observed after a mean of 149.67 days. Results showed that there were highly significant differences on



the flowering of plants as affected by different organic fertilizers grown under Baculungan Sur, Buguias condition. Results showed that Benguet lily plants grown in mountain soil and applied with horse manure were the latest to form flower buds with a mean of 163. 78 days from planting of the bulbs. This was followed by Benguet lily plants grown in mountain soil and applied with cattle manure with a mean of 161. 56 days. Benguet lily plants grown in mountain soil and applied with alnus leaves compost had significantly flower bud formation with a mean of 153. 56 days from planting in those grown under Baculungan Sur, Buguias condition.

Effect of bulb size. Results showed that there were highly significant differences in the Benguet lily plants as affected by different bulb size in those grown at BSU-Cabanao area. Benguet lily plants grown from 1.5 cm bulb sizes were the latest to form flower buds with a mean of 176. 89 days; followed by Benguet lily plants grown from bulb sizes 2.5 cm with a mean of 164. 33 days. Benguet lily plants grown from bulb size of 3 cm were the earliest to form flower buds with a mean of 150. 22 days. Results further showed that there were highly significant differences on the flowering of Benguet lily plants as affected by different bulb sizes for those grown under Baculungan Sur, Buguias. Benguet lily plants grown from bulb size of 1.5 cm were the latest to form flower buds with a mean of 176.44 days followed by Benguet lily plants grown from bulb size of 2.5 with a mean of 157.56 days. Benguet lily plants grown from 3 cm of bulb size were the earliest to form flower bud with a mean of 144.78 days.

Results show that in both locations, significantly earlier flowering were recorded in plants grown from 3 cm bulb sizes and the duration to flowering was significantly longer with the corresponding reduction in the bulb size of the planting materials used.



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

TREATMENT	DAYS FROM TRANSPLANTING TO FLOWER BUD FORMATION	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	149.67 <sup>c</sup>	153.56 <sup>b</sup>
Cattle manure	168.78 <sup>b</sup>	161.56 <sup>a</sup>
Horse manure	173.00 <sup>a</sup>	163.78 <sup>a</sup>
<u>Bulb Size at Planting (cm)</u>		
1.5	176.89 <sup>a</sup>	176.44 <sup>a</sup>
2.5	164.33 <sup>b</sup>	157.67 <sup>b</sup>
3	150.22 <sup>c</sup>	144.78 <sup>c</sup>
CV (%)	2.51	3.21

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

Interaction effect. There were highly significant interaction effects obtained between different organic fertilizers applied and different bulb sizes used in planting with regards to the number of days from transplanting to flower bud formation in plants grown at BSU-Cabanao area as shown in Figure 4. Benguet lily plants grown in mountain soil and applied with horse manure with a bulb size of 1.5 cm had significantly longer days from transplanting to flower bud formation with a mean of 182.33 days. This was followed by Benguet lily plants grown in mountain soil applied with cattle manure with a mean of 178.33 days to flowering. Benguet lily plants grown in mountain soil and applied with horse manure with a bulb size of 2.5 cm had the mean of 174.00 days to flowering followed by



Benguet lily plants grown in mountain soil applied with cattle manure with a bulb size of 2.5 cm with a mean of 173.33 days from transplanting to flower bud formation. Benguet lily grown in mountain soil and applied with alnus leaves compost with a bulb size of 1.5 cm flowered after a mean of 170.00 days from transplanting followed by Benguet lily grown in mountain soil and applied with horse manure with a bulb size of 3 cm with a mean of 162.67 days as compared to Benguet lily grown in mountain soil and applied with cattle manure with a bulb size of 3 cm which flowered after a mean of 154.67 days. Results showed that Benguet lily grown in mountain soil and applied with alnus leaves compost with a bulb size of 2.5 cm flowered significantly earlier with a mean of 145.67 days from planting. Benguet lily grown in mountain soil and applied with alnus leaves compost with a bulb size of 3 cm had the least number of days from transplanting to flower bud formation. Significant delay was noted in the bud formation in Benguet lily plants grown in mountain soil and applied with cattle manure with a bulb size of 1.5 cm and the earliest to form flower buds was recorded in Benguet lily plants grown in mountain soil and applied with alnus leaves compost with a bulb size of 3 cm. However, results showed that there were no significant effects noted on the plants with regards to the number of days from transplanting to flower bud formation for those grown under Baculungan Sur, Buguias condition.



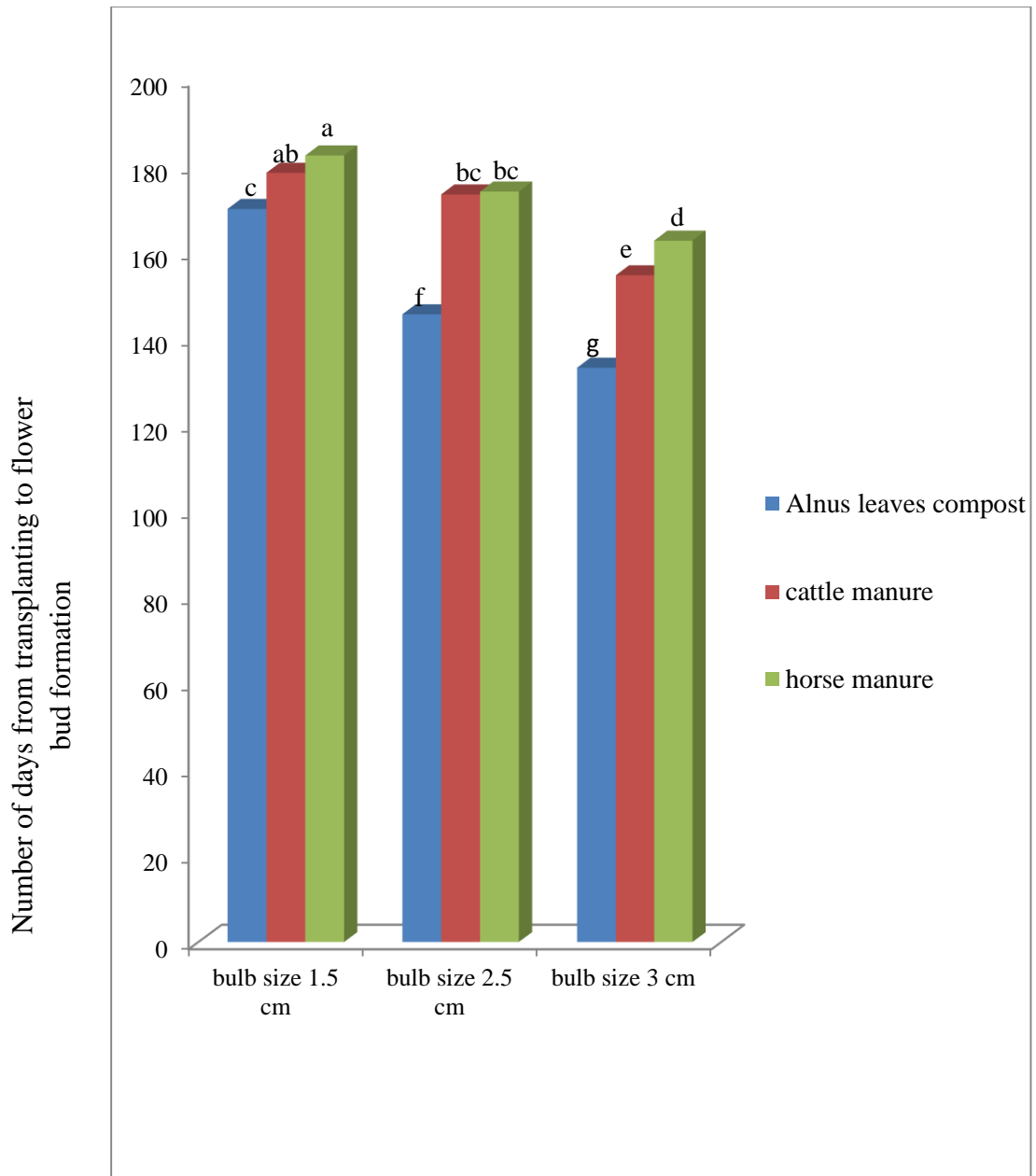


Figure 4. Number of days from transplanting to flower bud formation as influenced by bulbs size and different organic fertilizers for Benguet lily grown at BSU-Cabanao area. (Mean with a common letters is not significantly different at 5% level by DMRT)



## Number of Days from Flower Bud Formation to Tight Bud Stage

Effect of organic fertilizer. Results show that there were no significant differences on the plants with regards to duration of flower development as affected by the different organic fertilizers applied when grown at both locations at BSU-Cabanao and at Baculungan Sur, Buguias.

Effect of bulb size. Results showed that there were highly significant differences on the flower development in Benguet lily plants as affected by the different bulb size used as planting materials for those grown at BSU-Cabanao area. Benguet lily plants grown from bulb size of 1.5 cm had the longest duration of flower development from flower bud formation to tight bud stage with a mean of 29.33 days. This was followed by Benguet lily plants grown from a bulb size of 2.5 cm with a mean of 27.78 days. Benguet lily plants grown from bulb size of 3 cm were the earliest to reach tight bud stage from flower bud formation with a mean of 25.11 days. However, results show that there were no significant differences on the Benguet lily plants as affected by different bulb sizes when grown under Baculungan Sur, Buguias area.

Interaction effect. Results show that there were no significant interaction effects obtained between different organic fertilizers and the different bulb sizes used as planting materials with regards to number of days from flower bud formation to tight bud stage when grown at both locations, BSU-Cabanao and Baculungan Sur, Buguias.



Table 5. Number of days from flower bud formation to tight bud stage

TREATMENT	<u>DAYS FROM FLOWER BUD FORMATION TO TIGHT BUD</u>	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	27.22	29.22
Cattle manure	27.78	28.22
Horse manure	27.22	27.89
<u>Bulb Size at Planting (cm)</u>		
1.5	29.33 <sup>a</sup>	29.67
2.5	27.78 <sup>a</sup>	28.00
3	25.11 <sup>b</sup>	27.67
CV (%)	8.15	8.95

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

#### Stem Length of Cutflowers at Harvest

Effect of organic fertilizer. Results showed that there were highly significant differences on the stem length of cutflowers harvested as affected by the different organic fertilizers applied for those grown at BSU-Cabanao area. Benguet lily plants grown in mountain soil and applied with cattle manure were the tallest with a mean of 28.78 cm. This was followed by Benguet lily plants grown in mountain soil and applied with alnus leaves compost with a mean of 25.56 cm. Benguet lily plants grown in mountain soil and applied with horse manure were the shortest with a mean of only 24.22 cm. However, results showed that there were no significant differences on the plants grown under Baculungan Sur, Buguias condition.

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Effect of bulb size. Results show that there were no significant differences observed on the flower development of Benguet lily plants as affected by the different bulb sizes grown when under BSU-Cabanao area. However, significant differences were obtained on plants as affected by the different bulb sizes when grown under Baculungan Sur, Buguias condition. Benguet lily plants grown from bulb size of 1.5 cm were the tallest with a mean of 35.55 cm followed by Benguet lily plants grown from bulb size of 2.5 cm with a mean of 31.89 cm. Benguet lily plants grown from bulb size of 3 cm were the shortest with a mean of 30.78 cm.

Interaction effect. There were significant interaction effects obtained between the different organic fertilizers and the different bulb sizes for plants grown at BSU-Cabanao as shown in Figure 5. Benguet lily plants grown in mountain soil and applied with cattle manure with a bulb size of 2.5 cm were the tallest with regards to stem length of cutflowers at harvest with a mean of 33.00 cm followed by Benguet lily plants grown in mountain soil and applied with cattle manure which had a bulb size of 1.5 cm and a mean of 27.00 cm stems. The other treatments had stem lengths ranging from 23.67 cm to 26.33 cm at harvest. However, results show that there were no significant interaction effects obtained between different organic fertilizers and different bulb sizes used with regards to stem length of cutflowers at harvest grown under Baculungan Sur, Buguias condition.





Table 6. Stem length of cutflower at harvest (cm)

TREATMENT	STEM LENGTH OF CUTFLOWER AT HARVEST (cm)	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	25.56 <sup>b</sup>	31.33
Cattle manure	28.78 <sup>a</sup>	32.22
Horse manure	24.22 <sup>b</sup>	34.67
<u>Bulb Size at Planting (cm)</u>		
1.5	25.67	35.56 <sup>a</sup>
2.5	27.00	31.89 <sup>b</sup>
3	25.89	30.78 <sup>b</sup>
CV (%)	8.32	9.95

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



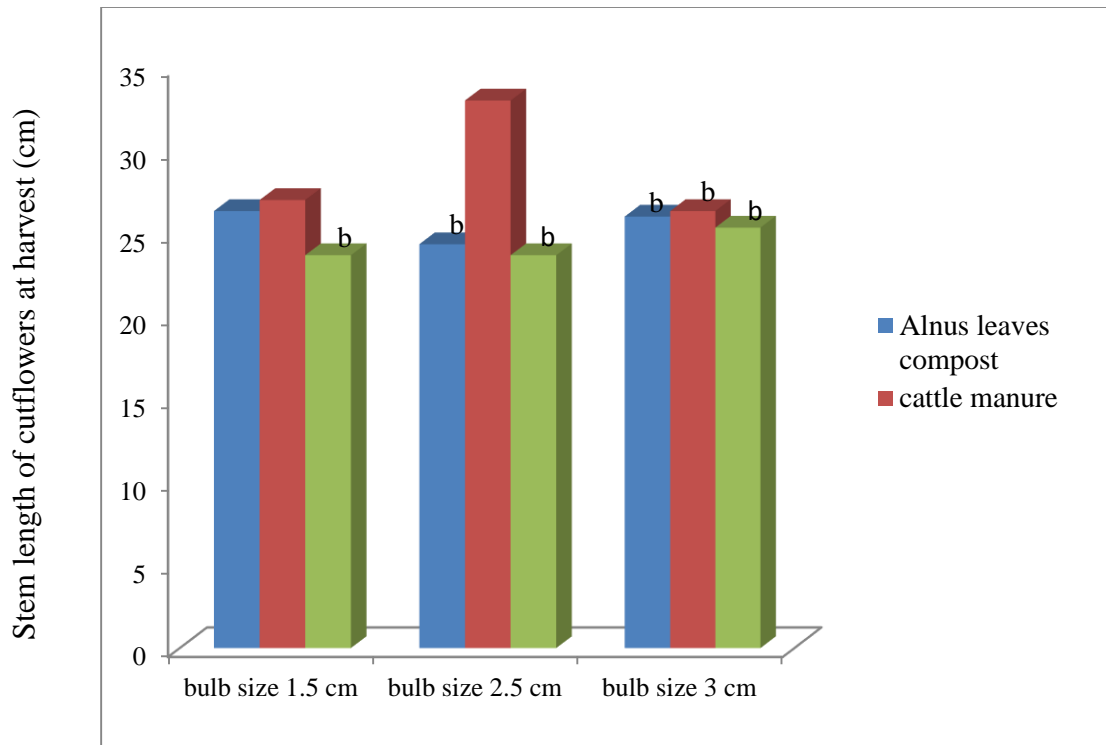


Figure 5. Stem length of cutflowers at harvest (cm) as influenced by bulbs size and different organic fertilizers applied and grown at BSU-Cabanao. (Mean with a common letters is not significantly different at 5% level by DMRT)

#### Length of Flowers at Tight Bud Stage

Effect of organic fertilizer. Results showed that there were no significant differences noted on the plants as affected by the different organic fertilizers for Benguet lily plants grown at both locations at BSU-Cabanao and at Baculungan Sur, Buguias.

Effect of bulb size. Table 7, likewise shows that there were no significant differences on the plants as affected by different bulb sizes as planting materials for plants grown at both locations at BSU-Cabanao and at Baculungan Sur, Buguias.

Interaction effect. Likewise, results show that there were no significant interaction effects obtained between the combined effects of the different organic fertilizers and the



Table 7. Length of flowers at tight bud stage (cm)

TREATMENT	LENGTH OF FLOWERS AT TIGHT BUD STAGE (cm)	
	AT BSU-CABANAO	AT BACULUNGAN SUR, BUGUIAS
<u>Kind of Organic fertilizer</u>		
Alnus leaves compost	8.44	10.39
Cattle manure	8.33	10.69
Horse manure	9.11	9.80
<u>Bulb size at Planting (cm)</u>		
1.5	8.28	10.36
2.5	8.72	9.91
3	9.39	10.61
CV (%)	17.83	12.55

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

different bulb sizes with regards to the length of flowers at tight bud stage for the plants grown at BSU-Cabanao and Baculungan Sur, Buguias.

#### Occurrence of Insect Pests and Diseases for the Cropping Period

There were no diseases observed throughout the cropping period but the occurrence of insect pests had greatly affected the growth of Benguet lily. Aphids affected greatly the growth of Benguet lily plants. It devoured some of the leaves of the plants during their vegetative stage.



### Initial Soil Analysis

Table 8 shows that mountain soil applied with alnus leaves compost had the highest pH of 5.68 and 1:1 mountain soil applied with cattle manure was the most acidic with a mean pH of 4.09. Results show mountain soil applied with alnus leaves compost had the highest percentage of organic matter with a mean of 19.97 followed by mountain soil applied with horse manure with a mean of 16.5. Results further show that mountain soil applied with cattle manure had the least organic matter with a mean of 16.38, while mountain soil applied with alnus leaves compost had the highest percentage of Nitrogen with a mean of 0.68, followed by mountain soil applied with cattle manure with a mean of 0.63 and mountain soil applied with horse manure with a mean of 0.58. Mountain soil applied with alnus leaves compost had the highest Phosphorous content with a mean of 689.80 ppm while mountain soil applied with cattle manure had the least Phosphorous content with a mean of 428.15 ppm. The highest Potassium content was obtained on mountain soil applied with alnus leaves compost with a mean of 604.87 ppm; followed by mountain soil applied with horse manure with a mean of 465.495 ppm

Table 8. Initial soil analysis

TREATMENT	Ph	OM%	N%	P (ppm)	K (ppm)
Mountain soil with Alnus Leaves Compost	5.68	19.97	0.68	689.80	604.87
Mountain soil with Cattle Manure	4.09	16.38	0.63	428.15	326.12
Mountain soil with Horse manure	4.88	16.5	0.58	558.975	465.495



## Meteorological Data

BSU-Cabanao. Meteorological data as shown in Table 9 was obtained at the BSU PAG-ASA Balili, La Trinidad, Benguet from September 2012 to April 2013. Relative humidity decreased from October to February and had increased from March to April. The maximum and minimum temperatures were the highest during the month of April while the rest of the growing season experienced low temperatures during the months of October to February. Rainfall was highest during the month of September with 155.92 mm while the month of February had the longest sunshine duration of 6.328 hours.

Table 9. Meteorological data BSU-Cabanao (Data from BSU-PAGASA Station)

MONTHS	TEMPERATURE (°C)		RELATIVE HUMIDITY (%)	RAINFALL (mm)	SUNSHINE DURATION (hours)
	MAXIMUM	MINIMUM			
September	23.98	17.45	88.33	155.96	4.263
October	23.7	15.1	82.13	21	5.685
November	24.2	15.2	80.53	141	6.331
December	24.2	14.5	80.61	1	6.295
January	23.7	12.3	80.45	5	6.0
February	24.3	13.7	80.11	1	6.3283
March	25.5	16.9	83.16	25	5.0766
April	26.3	16.32	83.25	46.5	6.2083



Baculungan Sur, Buguias. The meteorological data from September 2012 to April 2013 as shown in Table 10 shows the maximum and minimum temperatures were the highest during the month of April. Relative humidity had decreased during the month of September and February. January had the shortest sunshine duration of only 2.247 hours while the month of September had the highest rainfall of 9.94 mm.

Table 10. Meteorological Data Baculungan Sur, Buguias

MONTHS	TEMPERATURE (°C)		RELATIVE HUMIDITY (%)	RAINFALL (mm)	SUNSHINE DURATION (hours)
	MAXIMUM	MINIMUM			
September	24.25	14.01	95.45	9.94	4.9033
October	23.07	12.38	96.03	5.1	3.8783
November	24.66	10.77	98.53	1.14	4.2516
December	23.36	10.90	97.64	0.56	3.4966
January	22.26	9.03	97.74	1.17	2.2466
February	23.88	10.28	95.62	0.42	3.1466
March	24.96	10.96	99.41	8.68	3.87
April	25.96	11.86	99.75	4.55	2.5966



## SUMMARY, CONCLUSION AND RECOMMENDATION

### Summary

The growth and flowering of Benguet Lily as affected by different bulb sizes at planting time were grown at two locations were applied with different organic fertilizers such as alnus leaves compost, cattle manure, horse manure. Bulb sizes used were 1.5 cm, 2.5 cm and 3 cm. These were grown in mountain soil with different organic fertilizers: alnus leaves compost, cattle manure and horse manure. The study aims to evaluate the effectiveness of the different kind of organic fertilizers applied on the growth and flowering of Benguet lily. The study was conducted at the Ornamental Horticulture Research Area, Benguet State University and Baculungan Sur, Buguias, Benguet from September 2012 to April 2013.

Results show that among the three bulb sizes as planting materials of Benguet lily plants grown under BSU-Cabanao and Baculungan Sur, Buguias; bulb size of 1.5 cm had the tallest plant height at flowering but had significantly delayed flowering after 182 days compared to the other bulb sizes used. The shortest cutflowers harvested but had a thicker stem diameter at 164 days from transplanting, were measured from the Benguet lily plants grown from bulb size of 2.5cm. However, Benguet lily grown under Buguias condition had different responses in terms of growth and flowering as compared to those grown under BSU condition. Bulb size 1.5 cm had the tallest plants and longest cutflower stems with a mean of 41.68 cm after 164 days compared to other bulb sizes. The shortest cutflower stems but had the thickest stem diameter were obtained from the bulb sizes of 3 cm with a mean of 36.11 but were the earliest to form flower buds.



With regards to the effect of organic fertilizers applied, the heights of plants measured were significantly increased with the application of the different organic fertilizers. The tallest of the plant were measured in the Benguet lily grown in mountain soil applied with horse manure; while the shortest plants were obtained on the Benguet lily plants grown in mountain soil applied with alnus leaves compost under BSU-Cabanao condition. There were no significant differences noted on the plants with regards to final height when grown under Baculungan Sur, Buguias condition. The differences obtained in the number of days from transplanting to flower bud formation were highly significant on the plants as affected by the different organic fertilizers applied for those grown under BSU-Cabanao. Those grown in Mountain soil and applied with cattle manure had the longest days from transplanting to flowering. The earliest plants to flower were obtained in the plants grown in mountain soil and applied with alnus leaves compost.

Significant interaction effects were obtained on the stem length of cutflowers at harvest. Benguet lily plants grown in mountain soil and applied with cattle manure had the tallest cutflower stems, while the shortest were measured from the Benguet lily grown in mountain soil applied with horse manure under BSU-Cabanao. There were no significant effects on stem length of cutflowers at harvest stage for plants grown at Baculungan Sur, Buguias condition.





## Conclusion

Based on the findings, it is concluded that Benguet lily grown in mountain soil applied with cattle manure as fertilizer is the best organic fertilizer for the production of Benguet lily since it promoted the production of taller plants with long cutflower stems that can demand higher price in the market.

Bulb sizes to be used are based on the purpose of the grower. If the growers wish to produce a longer cutflower stems, 1.5cm in diameter bulb size should be used as planting materials suitable for BSU-Cabanao and Baculungan Sur, Buguias, Benguet condition.

## Recommendation

Application of cattle manure is therefore recommended for better growth and flowering of Benguet lily. If the grower wishes to produce good quality cutflowers with long stems in Benguet lily, it is recommended that bulb sizes of 1.5 cm in diameter should be used as planting materials and Benguet lily bulb size of 3 cm for earlier flowering for Benguet lily cutflower production.



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