Knowledge Management on Flowering Plants: Growth Performance of Different Varieties of Chrysanthemum Under WVSU-CAF Climatic Condition

Victoria S. Lastimoza and Mariano Rene F. Bales

West Visayas State University, Philippines

ABSTRACT

The study was focused on management of flowering plants, more specifically on the different chrysanthemum varieties growth performance. Result of the study revealed that through knowledge management techniques and skills in chrysanthemum production, the survival rate of plant and plant height on the different varieties of chrysanthemum revealed significant result. It is also noted that different varieties of chrysanthemum used in the study were significantly different in terms of diameters of flowers and average number of flowers produced. It is further observed that chrysanthemum performed well in the different places with the same climatic condition.

Key words

Knowledge management, management of flowering plants

I.0. INTRODUCTION

Chrysanthemum, scientifically known as *Chrysanthemum spp*. of the daisy family composotiae, is a large genus annual and perennial plant native to temperate regions mostly in Europe and Asia. It is also known as mums. It has an alternate, strongly scented leaves and flower heads consis ting of fertile disk flowers in the center and petal like rays flower at the outside. There are many factors affecting its growth, existence and most of all adaptability. Their existence depends on places, climate, and weather and soil conditions. The mums are considered as an easy plant to grow. The growing schedule is largely dependent upon the variety grown. Some varieties are grown in eight weeks after the start of the short day; others bloom in ten, twelve and fourteen weeks. This is known as response time. It is necessary that growers, florists and cultivators should know the appropriate flowers to be planted on their areas depending on their suitability to weather condition. This study pertains to the production performance of chrysanthemum under the West Visayas State University, College of Agriculture and Forestry, Lambunao, Iloilo climatic condition.

1.1. Objectives of the Study

The study was conducted to find out what variety of chrysanthemum would have better growth performances under WVSU-CAF climatic condition using knowledge management on chrysanthemum production.

1.2. Significance of the Study

Low production is usually caused by the environmental factors, agronomic characteristics of chrysanthemum as well as the appropriate management, but the failure may also be due to inadaptability of the plants.

The study was conducted to provide information to the florists as well as to growers as to what variety of chrysanthemum perform best under WVSU-CAF Lambunao, Iloilo climatic condition

If found productive, florists and growers would be encouraged to plant chrysanthemum in addition to the flowers commonly grown in the backyard or in the farm. This may even open the possibility of planting chrysanthemum on commercial scale and would serve as an added source of income to farmers.

2.0 REVIEW OF LITERATURE

The study conducted by Arconada (2002) showed that interrupting a long dark period with light causes plants to respond as though they were experiencing long days instead of short days.. For example, it was discovered that the intensity of light required producing this effect varies from species to species.

According to Hilario (2000) the most important in production of crop is market analysis. Especially for garden mums for market varies from year to year. Ten years ago, garden mums were relatively new to many Kentucky growers and the market was wide open.

Laurie and Kiplinger (l998) noted that the leaf was the part of the plant that best responded to the length of the day or night. If the leaf of a short day plant is covered with a black bag, for example, the plant will flower, even though the stems and buds (which will become flowers) remain under long day condition. Long day plants will not flower when their leaves are covered with black covering long enough to detect the day length and send a signal to the bud where flowers actually form.

In study conducted by Mendoza (2000) he stated that one of the imitations of the growth of the ornamental is the problem of limited spaces of the backyard entrepreneur

who makes up the bulk of the industry. Few are able to avail themselves of the loans to expand their operations or hesitate to do so because large-scale flower cultivation requires high capital investment. Moreover, the limited access to the new technology and planting materials, high cost of equipment and inputs, like fertilizer and chemicals, disorganized marketing and distribution system, inadequate transportation and handling freight cost are some of the reasons why there is a poor expansion of the said business. As the flower industry was hurt by the financial crisis and sales deadlines, customers opted to spend their money on basic needs instead of luxuries like flowers. Mendoza added, "Producers of better quality flowers are still experiencing increase demand despite the financial crunch.

Peter (1999) revealed that he has made new crosses that are excellent as pot plants and cut foliage to have great potentials both locally and for export. The pot plants were chrysanthemum, orchids, anthurium, carnation and lilium. For the cut foliage, these are dracaena, margarita, song for India, song for Korea, Anton and calathea. He further stressed that the cut flowers dominated the market as indicated by the trend of increasing demand for this commodity. However, the cut foliage requirement will also increase, as this is complementary product of cut flowers.

The study was conducted with four treatments,.An area of 40 square meters excluding alleyways was utilized. The area was divided into 16 replicates each replicates has dimension of 1x2.5 meters. The treatment was replicated four times following the Randomized and Complete Block Design (RCDB). The experimental area was divided into 4 blocks which were equally subdivided into four plots representing a treatment which was replicated four times with 15 pots for each replicate making a total 240 pots for all treatments.

BLOCK	TREATMENT			
I	C	B	A	D
II	C	A	B	C
IV	D	C	B	A
V	A	D	C	B

Figure 1. Experimental Layout

Legend:

Treatment A- Floret Yellow Variety
Treatment B- Floret Pink Variety
Treatment C- Button Pink Variety
Treatment D- Floret White Variety

Making of Nursery Shed and Preparation for Bagging

Before planting, a propagating shed was constructed using bamboos and fish net with the height of 9 feet above the ground level, and below the shed was a base structure for each replicate.

3.0. MATERIALS AND METHODS

3.1. Materials

The materials were four varieties of rooted chrysanthemum cuttings, sprinkler, knife, spade, meterstick, ruler, 240 pieces 5 inches pots, soil media, fertilizers, (Osmocote, Triple 14 and Bayfolan Foliar Fertilizer) insecticides, (Bulldock) fungicides (Folicur) bamboo poles, fish net, 18 meters wirings and 60 watts bulbs, knife switch micro caliper, and water hose.

3.2. Preparation of Soil Media and Source of Planting Materials

The soil media used were composed of ½ humus 1/4 alluvial soil and ¼ rice hulls, thoroughly mixed and sterilized to prevent the occurrence of soil diseases.

The 240 hundred potted plants were laid out adjacent to the nursery of the College of Forestry. Typical cuttings of Chrysanthemum were taken from a commercial grower of Purog Salngan, Pototan, and Iloilo.

3.4. Field Layout

Different soil media were thoroughly mixed and placed in the pots. Mixing and bagging of the soil media materials were done simultaneously in all treatments.

3.7. Planting of Plants

The same size of Chrysanthemum cuttings were planted in 5 inches pots with 3 rooted cuttings in each pot. The pots were filled with planting medium for about 1 inch below the tip of the pots. The pots were raised 2 ½ feet above the ground using the designed bamboo bed to serve as a base.

3.8. Construction of Regulating Lights

Two 1x10 meters beds were lighted with 60 watts bulbs with space of 6 feet apart and 5 feet above the beds coming up to for all replicates. This activity was done from planting up to 21 days with 4 hours every night starting 10:00 p.m. to 2:00 o'clock in the morning to lengthen the day length.

3.9. Pinching of Plants

Twenty two days after planting pinching was done by simply breaking or pinching off the tip of the plant stem from ¼ to ½ inch of the growth to let the side shoots to develop, thereby resulting branches to set flowers.

3.10. Care of the Plants

After planting the plants were watered, to maintain sufficient amount of moisture for plant growth and development. In hot dry weather the plants was watered every day using water hose with sprinkler at the tip.

3.11. Weeding and Cultivation

Weeds that grow in the pots uprooted while grasses surrounding the experiment were under brushed. Weeding operations was done at 25 days interval after planting or as often as necessary to prevent competition of nutrients and moisture to the plants.

3.12. Control of Pest and Diseases

Emulsifiable concentrate (Bulldock) was applied 10 to 15 days interval to prevent insect infestation while Folicur fungicide was applied to control the occurrence of fungal diseases at 10 to 15 days interval or particularly after the occurrence of heavy rain. Spraying of insecticide was based to the rate of recommendation on the level.

3.13. Application of Fertilizer

Ten grams slow released fertilizer (Osmocote) was applied during planting and Urea 45 at the rate of 62.5 grams was applied at 7 days interval until 45 days in form of solution to 12.5 liters water at approximately 250 ml fertilizer solution per pot. Triple 14 was also applied using the same rate as of urea at 45 days after planting up to flowering stage then foliar fertilizer was applied 10 days interval after planting up to flowering stage with 30 ml per 16 liters of water.

3.13. Method of Gathering Data

3.13.1. Survival Percentage of Planting Materials

The survival rate of planting materials was gathered 15 days after planting to 30 days. Using the formula: Survival rate= Number of plant survived divided by Total number of a plant used. Multiplied by 100

3.13.2. Plant Height.

Plant height was gathered every fifteen days starting 30 days after transplanting up to flowering stage. Height measurements were from the base up to the tip of the highest branch using ruler.

3.13.4. Pest Infestation and Fungal Infection

Pest damage was collected 20 days after planting with 15 days interval until flowering stage while fungal infestation was gathered 20 days after planting and it was done at 15 days interval until flowering stage.

3.13.5. Number and Diameter of flowers

The number of flowers was gathered in 10 sample pots during its blooming stage including flower buds while the diameter of the biggest full bloom flowers was measured in centimeters using micro caliper.

3.13.6 Analysis of Data

Data collected were tabulated and statistically analyzed using the analysis of variance for the Randomized Complete Block Design (RCBD).

4.0. RESULTS AND DISCUSSION

4.1. Plant Height

Significant differences on height were observed at 30, 45, 60 and 75 days after planting. In 30, 45, 60 after planting Button Pink Variety was the tallest among the varieties planted but at 75 days after planting. The data therefore indicate that different varieties of Chrysanthemum significantly vary in terms of height.

Table 1. Summary table on average height (cm) of plants.

	Days After Planting (DAP) 1/			
Treatment	30	45	60	75
A- Floret Yellow Variety	7.2b	8.98[c]	9.94 [c]	10.54[c]
B- Button Pink Variety	12.76[a]	18.40 [a]	22.50[a]	26.75[a]
C-Floret Pink Variety	11.86 [a]	18.11 [a]	23.66[a]	25.86[a]
D- Floret White Variety	8.18 [b]	11.63 [b]	14.46[b]	16.79[b]
Level significance 2/	**	**	**	**
CV (%)	6.72	3.51	4.32	4.41

4.2. Survival Rate of Planting Materials

Treatment D got the highest dead planting materials followed by Treatment B, Treatment A and Treatment C got the lowest having zero dead planting materials. Statistical analysis of the data revealed significant result.

Table2. Survival rate of planting materials. (30 days after planting)

Treatment		
	Total	Mean
A-Floret Yellow Variety	388.89	97.22 [a]
B-Button Pink Variety	373.32	93.33[b]
C-Floret Pink Variety	620	155[b]
D- Floret White Variety	600.9	150.23[c]
Block Total	1,493.31	93.33

ANOVA

SV	Block	Treatment	Error	Total
DF	3	3	9	15
SS	36.98	684.2	49.34	
MS	12.33	2.25*	5.48	
Calculated F	12.25*	41.62		
Tabulated F				
5%	3.86	6.99		
1%	3.86	6.99		

ns = significant at 5% level: ** significant at 1% ; cv; 31,11%; S.E. 1.17

4.5. Number of Flowers

Based on Table 4 Treatment A has the highest number of flowers, followed by Treatment B, Treatment C and Treatment D in descending order. Statically analysis of data on the number of flowers per pot showed significant result.

Table 3. Average number of flowers.

Treatment	Treatment	
	Total	Mean
A-Floret YellowVariety	735.3	183.825[a]
B-Button Pink Variety	631.4	157.85[b]
C-Floret Pink Variety	620	155[b]
D- Floret White Variety	600.9	150.23[c]
Block Total	GT = 2,587.6	GM=161.73

ANOVA

SV	Block	Treatment	Error	Total
DF	3	3	9	15
SS	72.77	2,723.60	69.85	
MS	24.26	907.87	7.76	
Calculated F	3.13 ns	116.99 **		
Tabulated F				
5%	3.86	3.86		
1%	6.99	6.99		

ns = significant at 5% level: ** significant at 1% ; cv; 1.72%; S.E. 1.39

Pest and Fungal Infection

Based on the observation there was no symptom of fungal infection was observed due to constant application of Folicur fungicide. Some insect pests attack the plants but they are controlled earlier by spraying Bulldock insecticide to avoid the occurrence of damage.

Diameter of Biggest Full Bloom Flowers

Based on the data shown in Table 4. Treatment A has the biggest diameter of full bloom flowers. Statistical analysis of the data revealed significant results

Table 4. Diameter of the flowers.

Treatment	Treatment	
	Total	Mean
A-Floret Yellow Variety	16.73	4.18a
B-Button Pink Variety	12.65	3.16b
C-Floret Pink Variety	9.35	2.34c
D- Floret White Variety	16.67	4.17a
Block Total	GT=55.4	GM=13.86

ANOVA

SV	Block	Treatment	Error	Total
DF	3	3	9	15
SS	0.69	9.48	0.06	
MS	0.03	3.16	0.006	
Calculated F	3.57 ns	497.42**		
Tabulated F				
5%	3.86	3.86		
1%	6.99	6.99		

ns = significant at 5% level: ** highly significant at 1% ; cv; 2.89 %: SE= 0.05

5. 0 CONCLUSION

Statistical analysis showed that different varieties of Chrysanthemum had significant differences in the number of survival rate on planting materials, plant height, diameter of a flower and number of flowers. It also varies on their height, planting materials, number of flowers, and flower diameter.

6.0. RECOMMENDATIONS

As to the result of the study the researchers recommends the use of growth retardant; double pinching so that the plant stem will develop more branches and compact flowers.

As to the production and performance the same chrysanthemum variety must be conducted by another researcher using the same management techniques with different animal manure as the soil media.

REFERENCES

Arconada, Roberto. B. (2002) "Status of Flower Industry in the Province of Iloilo." (Unpublished Research Paper, College of Agriculture and Forestay, WVSU, Lambunao, Iloilo) .

Hilario,Francisco, Jr. (2001-2002) The Philippine Gardener's Year Book (Volume3) Quezon City: United Garden Clubs of the Philippines, 2001-2002.

Laurie and Kiplinger. (l998) Raising Flowers for Profitability. Washington D.C. Mc Mann Publishing Co.

Mendoza, L.M. (2002) " Growth Performance of Spatiphylum Using Different Soil Media" (Unpublished Research Paper, College of Agriculture and Forestay, WVSU, Lambunao, Iloilo) , 2002

Petter, C.W. (1999) " Selling of Floral Product, " Agricultural Economics Bulletin. Hawaii. University of Hawaii, l999.