

The influence of the planting material quality on the quantity and quality of the flowers of *Freesia hybrida*

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Abstract *Freesia hybrida* is one of the most important species cultivated for cut flowers. One of the biggest problems in cultivating *Freesia* is the degeneration of the planting material in few years so that the bulbs have to be renewed. The degeneration of the bulbs has many causes of which the essential ones are the presence of the viruses in the culture as well as *Fusarium* and unfulfilling the cultivation needs of the cultivars used. In the present paper the aim was to determine if there is a strong influence of the planting material quality on the quantity and quality of the flowers of *Freesia hybrida*. The results have revealed that the bulbs quality influence the quantity and quality of the flowers but also the temperature does. Even though there were clear differences between the cultivars, we recommend taking them all into culture as all of them have great qualities that might not be presented in this paper or related to this paper subject.

Key words

Freesia, flowers, quality, quantity

Freesia hybrida is a very beloved cut flower species, due to the special perfume of the flowers and their beauty [(12),(13)]. It is one of the most valuable cut flowers worldwide providing important incomes on the flower market every year. It is believed that from its discovery to our days almost 800 cultivars have been created (7).

Everyone knows that in horticulture, in order to obtain quality products you need to use quality seeds and planting material. Of course the producing potential of the cultivars is shown and reaches maximum only if it benefits of their specific needs and the cultivation technology is followed[(5),(9)]. The species that we did our research on makes no exception of the things mentioned before.

The *Freesia* bulbs have to be healthy, virus free and have to be homologated [(1),(4),(9),(11)]. Not always big bulbs give great flowers, mostly, in order to have great results in matter of production and quality, middle size bulbs have to be used for planting [(2),(6)]. Few of the quality aspects of the flowers that are followed by a producer are: total height of the plant, stem length, stem length to the first ramification, number of ramifications, inflorescence length, number of flowers in the inflorescence, diameter of the flowers, etc. [(3),(8)]

Material and Method

The experience has been made on 20 new *Freesia* cultivars (Albatros cv., Algarve cv., Blue

Bayou cv., Blue Sky cv., Calgary cv., Cascade cv., Figaro cv., Galaxi cv., Honeymoon cv., Mosella cv., Medeo cv., Pink Fountain cv., Purple Rain cv., Santana cv., Santiago cv., Santorini cv., Striped Sun cv., Texas cv., Troubadur cv., Yvonne cv.), cultivated in modern greenhouse conditions at the Didactic Base of the Faculty of Horticulture and Forestry in Timisoara, Romania. The bulbs were bought from Holland, Penning *Freesia* Company, being certified.

The setting of the crop in 2008 and 2009 was done at the beginning of October and the observations were made during the vegetation period of the plants and on the bulbs after harvesting them. Each year, the inside temperature of the greenhouse during the vegetation period was different as it follows: in 2008 the minimum was 15° and the maximum 20°, in 2009 the minimum was 12° and the maximum 17°. The planting scheme and treatments were made after the classic technology. The experience has been done for each variety individually, being monofactorial. The number of plants taken in research for each variant was 20 respectively 80 for each cultivar.

The results were statistic interpreted by using variant analysis. The control was constituted by the average of the experience and by Yvonne cv. The reason of choosing Yvonne cv. was that it is the oldest cultivar created, from the whole cultivars used in the research and it is most likely that it is used on a larger scale than the other cultivars, recently created and introduced on the market.

In order to show the influence of the bulbs quality on the productivity and quality of flowers, a

series of determinations have been made: weighting and measuring the diameter.

Results and Discussions

1. Results regarding the quality and quantity of bulbs obtained after the first 2 years of culture (Table 1)

In October 2008 there were initially planted 250 bulbs of each cultivar. After one cycle of vegetation, after harvesting the bulbs, the results revealed that some of the cultivars have increased the number of bulbs while others have decreased. The greatest number of bulbs was obtained by Santana cv. (505 bulbs) and the lowest number of bulbs by Algarve cv. (159 bulbs). The negative difference to the initially planted bulbs and the harvested ones is represented by

plants eliminated during the vegetation period that presented different diseases.

The total weight of the bulbs had the greatest value in the case of Striped Sun cv. (5720g) and the lowest value by Honeymoon cv. (2810g). Reported to this, the average weight of bulb was 19.12 g in case of Cascade cv. and only 7.35g in case of Santiago cv. In connection to the average weight of a bulb reported to 100 bulbs weight the best variant was Cascade cv. (19.9g) and the worst Santiago cv. (7.56g).

In 2010 the greatest number of bulbs was again obtained by 'Santana' cv. (520). The average weight of a bulb reported to the total weight of the bulbs was 15.87g in case of 'Texas' cv. and only 7.35g in case of Medeo cv. The average weight of 100 bulbs was 1775g (Cascade cv.) and 990g (Santiago cv.).

Table 1

The quality indexes of the bulbs used in the experience

CULTIVAR	AFTER THE 1 st YEAR OF CULTURE						AFTER THE 2 nd YEAR OF CULTURE					
	Number of bulbs	Total weight (g)	Average weight/bulb (g)	100 bulb weight (g)	Average weight (g)	Bulblets weight (g)	Number of bulbs	Total weight (g)	Average weight/bulb (g)	100 bulb weight (g)	Average weight (g)	Bulblets weight (g)
ALBATROS	275	3710	13.49	1580	15.8	2650	298	2620	8.79	1100	11	2450
ALGARVE	159	2940	18.49	1980	19.8	1280	132	1325	10.04	1125	11.25	350
BLUE BAYOU	271	3970	14.65	1560	15.6	1910	370	3275	8.85	1050	10.5	2100
BLUE SKY	315	4735	15.03	1555	15.55	3450	360	4620	12.83	1400	14	2980
CALGARY	269	3150	11.71	1190	11.9	2150	289	3425	11.85	1520	15.2	2260
CASCADE	210	4015	19.12	1990	19.9	1200	199	2730	13.72	1775	17.75	950
FIGARO	273	3605	13.21	1435	14.35	3650	460	4720	10.26	1090	10.9	4050
GALAXI	405	3990	9.85	1110	11.1	2350	340	3735	10.99	1220	12.2	2700
HONEY MOON	227	2810	12.38	1470	14.7	2250	150	1830	12.2	1430	14.3	740
MEDEO	331	3025	9.14	1240	12.4	2350	432	3175	7.35	1100	11	2365
MOSELLA	273	4230	15.49	1780	17.8	3540	431	5120	11.88	1230	12.3	4120
PINK FOUNTAIN	298	3300	11.07	1290	12.9	2150	250	3780	15.12	1605	16.05	2400
PURPLE RAIN	432	3770	8.73	960	9.6	2900	429	3710	8.65	1105	11.05	2800
SANTANA	505	3980	7.88	980	9.8	2750	520	5930	11.4	1260	12.6	3580
SANTIAGO	396	2910	7.35	756	7.56	2500	420	3680	8.76	990	9.9	2700
SANTORINI	262	2920	11.15	1135	11.35	2220	458	3950	8.62	1075	10.75	3050
STRIPED SUN	482	5720	11.87	1390	13.9	4050	485	5220	10.76	1410	14.1	4375
TEXAS	305	4355	14.28	1490	14.9	2100	300	4760	15.87	1600	16	1880
TROUBADUR	298	4005	13.44	1545	15.45	3250	318	3410	10.72	1270	12.7	2900
YVONNE	307	3745	12.2	1455	14.55	2000	345	3710	10.75	1370	13.7	1750
AVERAGE	314.65	3744.25	12.53	1394.55	13.95	2535	349.3	3734.75	10.97	1286.25	12.86	2525

2.Results regarding the diameter of the harvested bulbs in the first 2 years of culture

In 2009, after the first year of culture, Cascade cv. had the average diameter of the bulbs of 36.95 mm while Santiago cv. had only 25.6 mm.

In 2010, 11 cultivars had bulbs with the average diameter of over 30mm, of which, Cascade cv. had 36.6 mm. Opposite, Santiago cv. had the smallest diameter of 24.85mm.

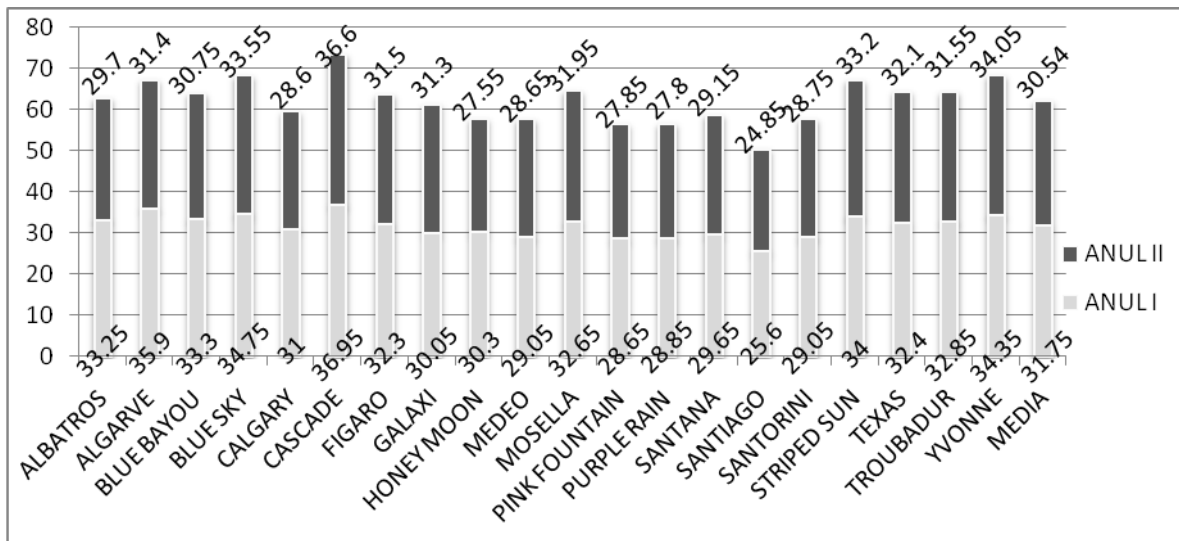


Fig.1 The diameter of the bulbs (mm) in the first two years of culture (2008-2009; 2009-2010)

3.Results regarding the number of floral stalks/bulb of the researched Freesia cultivars

In 2008-2009 the average number of stalks /bulb (Table 2) was 1.41, to which Galaxi cv., Purple Rain cv. and Santana cv., Santiago cv. and Striped Sun cv. were very significant positive. Except Blue Sky cv., Medeo cv. and Pink Fountain cv. that didn't show any significance to the average of the experience, all the others were negative to it. To Yvonne cv. , cultivars Cascade cv. and Honeymoon cv. were significant negative and the rest of the cultivars had positive significance or didn't show any significance.

In the second year of culture, the best results to the average of the experience (1.34), were given by cultivars Blue Bayou cv., Figaro cv. and Mosella cv. which were very significant positive, while the worst results were given by cultivars Santana cv., Santiago cv. and Texas cv. which were very significant negative to it. As Yvonne cv. had weak results, all the researched cultivars were positive or didn't show any significance to it.

4.Results regarding floral stem length of the researched Freesia cultivars

In table 3 the results regarding the floral stem length in the first 2 years of experience are published.

In 2008-2009 the average length was 45.33 cm to which cultivars 'Algarve', 'Blue Sky', 'Galaxi' and

'Medeo' were very significant positive. Opposite, cultivars 'Figaro', 'Mosella' and 'Purple Rain' were very significant negative to the average of the experience. As Yvonne cv. didn't show any difference to the average of the experience we can conclude that it had one of the best results concerning the floral stem length, to which Blue Bayou cv., Cascade cv., Calgary cv., Figaro cv., Honeymoon cv., Mosella cv., Pink Fountain cv., Purple Rain cv. and Santana cv. had negative differences.

In the second year 2009-2010, the best results were given by cultivars 'Blue Sky', 'Calgary', 'Galaxi', 'Honeymoon', 'Striped Sun', 'Texas', 'Troubadur' and 'Yvonne' which were positive to the average of the experience (43.89cm). Except Calgary cv., the other cultivars were negative or didn't show ant difference to Yvonne cv.

5.Results regarding inflorescence length of the researched Freesia cultivars (table 4)

In the first year the average length of the inflorescence was 9.18 cm, to which the inflorescence length of the researched cultivars have varied a lot. The best results were given by Calgary cv., Honeymoon cv., Medeo cv., Mosella cv. and Pink Fountain cv., which were positive to the average, the rest of the cultivars being negative or showing no difference to the average. To 'Yvonne' cv. the cultivars have shown the same differences as to the average of the experience.

In the second year, the average of the experience was 8.4 cm. Cultivars 'Honeymoon', 'Mosella', 'Pink Fountain', 'Santana' and 'Texas' were very significant positive to the control while 'Blue Sky', 'Cascade', 'Figaro' and 'Purple Rain' were very significant negative. As 'Yvonne' had weak results, except 'Cascade' which was very significant negative, all the researched cultivars were positive or didn't show any difference to it.

Conclusions

Regarding the research that has been made during 2008-2011 we can conclude:

- The greatest number of bulbs after the first year of culture was harvested from 'Santana' (505 bulbs), while the smallest number was obtained by 'Algarve' (159 bulbs);
- The greatest weight of bulbs after first year of culture was obtained by 'Striped Sun' (5720 g);
- The average weight of a bulb was 19.12g in case of Cascade cv. in 2009 and 15.87g in 2010 by Texas cv.;

- 'Cascade' had the largest diameter of the bulbs in 2009 (36.95mm) and (36.6 mm) in 2010;
- In 2009 the number of the floral stalks had the greatest value in case of Striped Sun cv. (2.86) while in 2010 the same character had the highest value in case of Figaro cv.(1.89);
- Algarve cv. had the longest stem length in 2009 (53.8cm) and Calgary cv. had the greatest index of the same character in 2010 (56.99cm);
- The biggest inflorescences were produced by Pink Fountain cv. (12.25cm) in 2009 and by Texas cv. (10.23cm) in 2010.

Concerning the present paper content, we can see clearly that the material used for planting has a great influence on the quality and quantity of the flowers. Also, we mention that the temperature has a great influence on the quality and quantity of the flowers.

As compared to the average of the experience many have shown great differences to it, positive or negative but we recommend the cultivation of all the cultivars presented in this paper as all of them have valuable characters that were presented in the previous paper and will follow to be presented in further papers.

Table 2

Number of floral stalks/bulb

1 st year of experience												2 nd year of experience										
TO THE AVERAGE OF THE EXPERIENCE								TO 'YVONNE' CV.				TO THE AVERAGE OF THE EXPERIENCE								TO 'YVONNE' CV.		
	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.
ALBATROS	1.2	1.1	1.1	1.1	1.13	79.79	-0.29	ooo	96.77	-0.04	-	1.8	1.4	1.35	1.1	1.41	106.2	0.08	-	128.41	0.31	***
ALGARVE	1.05	1.2	1.15	1.15	1.14	80.67	-0.27	ooo	97.85	-0.03	-	1.2	1.25	1.3	1.1	1.21	91.17	-0.12	-	110.23	0.11	-
BLUE BAYOU	1.25	1.25	1.2	1.3	1.21	88.65	-0.16	oo	107.53	0.09	-	1.55	1.65	1.75	1.55	1.63	122.18	0.3	***	147.73	0.53	***
BLUE SKY	1.3	1.35	1.35	1.3	1.31	93.97	-0.09	-	113.98	0.16	**	1.5	1.5	1.5	1.45	1.49	111.84	0.16	*	135.23	0.39	***
CALGARY	1.15	1.1	1.15	1.15	1.14	80.67	-0.27	ooo	97.85	-0.03	-	1.15	1.05	1.1	1.1	1.1	82.71	-0.23	oo	100	0	-
CASCADE	1.05	1.05	1	1	1.03	72.7	-0.39	ooo	88.17	-0.14	o	1.2	1.05	1.2	1.15	1.15	86.47	-0.18	oo	104.55	0.05	-
FIGARO	1.15	1.2	1.25	1.15	1.19	84.22	-0.22	ooo	102.15	0.03	-	1.95	1.85	1.95	1.8	1.89	141.92	0.56	***	171.59	0.79	***
GALAXI	1.65	1.95	1.8	1.85	1.81	128.55	0.4	***	155.91	0.65	***	1.15	1.15	1.2	1.15	1.36	87.41	-0.17	o	105.68	0.06	-
HONEYMOON	0.85	1.1	1.05	1.1	1.03	72.7	-0.39	ooo	88.17	-0.14	o	1.35	1.35	1.2	1.35	1.31	98.68	-0.02	-	119.32	0.21	**
MEDEO	1.35	1.35	1.35	1.25	1.33	93.97	-0.09	-	113.98	0.16	**	1.3	1.25	1.3	1.4	1.31	98.68	-0.02	-	119.32	0.21	**
MOSELLA	1	1.1	1.1	1.05	1.06	75.35	-0.35	ooo	91.4	-0.1	-	1.55	1.95	1.7	1.75	1.74	130.64	0.41	***	157.95	0.64	***
PINK FOUNTAIN	1.35	1.5	1.35	1.45	1.41	100.18	0.003	-	121.51	0.25	***	1.4	1.45	1.25	1.25	1.34	100.56	0.01	-	121.59	0.24	**
PURPLE RAIN	1.65	1.8	1.75	1.8	1.75	124.11	0.34	***	150.54	0.59	***	1.25	1.25	1.25	1.15	1.23	92.11	-0.11	-	111.36	0.13	-
SANTANA	2	1.9	1.75	1.65	1.83	129.43	0.42	***	156.99	0.66	***	1.05	1.05	1	1.05	1.04	78.01	-0.29	ooo	94.32	-0.06	-
SANTIAGO	1.85	2.25	2.3	1.9	2.08	147.16	0.67	***	178.49	0.91	***	1	1.05	1.05	1.1	1.05	78.95	-0.28	ooo	95.45	-0.05	-
SANTORINI	1.3	1.3	1.35	1.2	1.29	91.31	-0.12	o	110.75	0.13	*	1.5	1.3	1.35	1.3	1.36	102.44	0.03	-	123.86	0.26	***
STRIPED SUN	2.75	2.85	3	2.85	2.86	203.01	1.45	***	246.24	1.7	***	1.6	1.35	1.35	1.5	1.45	109.02	0.12	-	131.82	0.35	***
TEXAS	1.3	1.25	1.15	1.2	1.23	86.88	-0.19	oo	105.38	0.06	-	1.1	1.05	1.15	1.05	1.09	81.77	-0.24	ooo	98.86	-0.01	-
TROUBADUR	1.15	1.1	1.1	1.2	1.14	80.67	-0.27	ooo	97.85	-0.03	-	1.45	1.5	1.7	1.45	1.53	114.66	0.2	**	138.64	0.43	***
YVONNE	1.15	1.2	1.1	1.2	1.15	82.45	-0.25	ooo	100	-	-	1.1	1.15	1.1	1.05	1.1	82.71	-0.23	oo	100	-	-
Average	1.38	1.45	1.42	1.39	1.41	100	-	-	DL 5% - 0.12	DL 1% - 0.16	DL 0.1% - 0.21	1.36	1.33	1.34	1.29	1.34	100	-	-	DL 5% - 0.14	DL 1% - 0.19	DL 0.1% - 0.25
DL 5%- 0.12			DL1%-0.16			DL 0.1%-0.21			DL 5%- 0.14				DL 1% - 0.18			DL 0.1% - 0.24						

Table 3

Floral stem length (cm)

1 st year of experience												2 nd year of experience											
TO THE AVERAGE OF THE EXPERIENCE									TO THE 'YVONNE' CV.			TO THE AVERAGE OF THE EXPERIENCE									TO 'YVONNE' CV.		
	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.	
ALBATROS	42.65	45.9	46	50.3	46.21	101.95	0.89	-	97.62	-1.13	-	36.95	40.6	41.05	40.4	39.75	90.57	-4.14	oo	80.04	-9.91	ooo	
ALGARVE	54.11	52.85	52	56.25	53.8	118.7	8.48	***	113.66	6.47	***	37.95	41.25	37.25	38.05	38.63	88	-5.27	ooo	77.77	-11.04	ooo	
BLUE BAYOU	42.8	42.75	42.15	43.9	42.9	94.64	-2.43	-	90.63	-4.44	oo	33.45	33.4	32.6	33.25	33.18	75.59	-10.72	ooo	66.8	-16.49	ooo	
BLUE SKY	52.9	52.1	50.9	52.4	52.08	114.89	6.75	***	110.01	4.74	**	42.45	46.85	48.75	49.15	46.8	106.63	2.91	*	94.24	-2.86	o	
CALGARY	44.7	43	40.2	43.65	42.89	94.62	-2.44	-	90.6	-4.45	oo	58.85	57.75	54.7	56.65	56.99	129.84	13.1	***	114.75	7.33	***	
CASCADE	40.5	41.15	39.1	42.3	40.76	89.93	-4.57	oo	86.11	-6.58	ooo	33.25	41.55	46.25	43.75	41.2	93.87	-2.69	-	82.96	-8.46	ooo	
FIGARO	46.4	38.8	38.85	35.25	39.83	87.86	-5.5	ooo	84.13	-7.51	ooo	35.05	37.4	35.15	34.4	35.5	80.88	-8.39	ooo	71.48	-14.16	ooo	
GALAXI	50	50.4	51.75	50.5	50.66	111.77	5.34	***	107.02	3.33	*	47.35	49.9	47.95	49.95	48.79	111.16	4.9	***	98.24	-0.88	-	
HONEYMOON	38.3	45.05	42.8	44.65	42.7	94.2	-2.63	-	90.2	-4.64	oo	48.9	48.7	47.7	49	48.58	110.67	4.69	**	97.81	-1.09	-	
MEDEO	51.35	49.8	50.95	53	51.28	113.12	5.95	***	108.32	3.94	**	37.95	37.2	41.1	40.65	39.23	89.37	-4.67	oo	78.98	-10.44	ooo	
MOSELLA	39.75	40.4	41.1	40.4	40.41	89.16	-4.92	ooo	85.37	-6.93	ooo	44.75	45.1	42.55	40.4	43.2	98.43	-0.69		86.99	-6.46	ooo	
PINK FOUNTAIN	44.85	43	42.65	42.9	43.35	95.64	-1.98	-	91.58	-3.99	oo	39.15	38.6	34.85	38.45	37.76	86.04	-6.13	ooo	76.04	-11.9	ooo	
PURPLE RAIN	36.9	35.7	35.75	35.35	35.93	79.26	-9.4	ooo	75.89	-11.41	ooo	43.55	45.85	43.8	42.5	43.93	100.08	0.04	-	88.45	-5.74	ooo	
SANTANA	41.75	42.85	41.9	41.65	42.04	92.74	-3.29	o	88.8	-5.3	ooo	42.45	42.3	43.05	42.8	42.65	97.17	-1.24	-	85.88	-7.01	ooo	
SANTIAGO	49.65	53.15	51	46	49.95	110.2	4.62	**	105.52	2.61	-	42.35	43.85	45.05	45.9	44.29	100.91	0.4	-	89.18	-5.38	ooo	
SANTORINI	48.75	48.7	48.5	48.3	48.56	107.14	3.24	*	102.59	1.23	-	36.45	39.25	38.35	41.5	38.89	88.6	-5	ooo	78.3	-10.78	ooo	
STRIPED SUN	47.2	47.6	47.95	47.6	47.59	104.99	2.26	-	100.53	0.25	-	49.1	49.35	48	46.85	48.33	110.1	4.44	**	97.31	-1.34	-	
TEXAS	44.6	45.15	41.8	45.3	44.21	97.54	-1.12	-	93.4	-3.13	o	52.15	53.05	50	51.6	51.7	117.79	7.81	***	104.1	2.04	-	
TROUBADUR	48.8	43.95	42.8	40.8	44.09	97.26	-1.24	-	93.13	-3.25	o	45.75	48.75	51.35	49.35	48.8	111.19	4.91	***	98.26	-0.86	-	
YVONNE	47.9	47.5	48.2	45.75	47.34	104.43	2.01	-	100	-	-	48.5	49.35	50.55	50.25	49.66	113.15	5.77	***	100	-	-	
Average	45.69	45.49	44.82	45.31	45.33	100	-	-	DL 5% - 2.86	DL 1% - 3.81	DL 0.1% - 4.95	42.82	44.5	44	44.24	43.89	100	-	-	DL 5% - 2.8	DL 1% - 3.72	DL 0.1% - 4.84	
DL 5% - 2.79			DL 1% - 3.71			DL 0.1% - 4.83						DL 5% - 2.73			DL 1% - 3.63			DL 0.1% - 4.72					

Table 4

Inflorescence length (cm)

1 st year of experience												2 nd year of experience											
TO THE AVERAGE OF THE EXPERIENCE									TO 'YVONNE' CV.			TO THE AVERAGE OF THE EXPERIENCE									TO 'YVONNE' CV.		
	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.	V1	V2	V3	V4	Average	%	Diff.	Signif.	%	Diff.	Signif.	
ALBATROS	9.4	9.68	9.4	9.85	9.58	104.9	0.45	-	105.62	0.51	*	7.93	8.51	8.25	8.2	8.22	98.38	-0.14	-	109.23	0.7	**	
ALGARVE	8.3	7.95	8.25	9	9.38	91.68	-0.76	oo	92.31	-0.7	oo	7.35	7.63	7.63	7.58	7.55	90.31	-0.81	oo	100.27	0.02	-	
BLUE BAYOU	8.75	8.7	8.33	8.43	8.55	93.62	-0.58	o	94.27	-0.52	o	8.1	7.55	7.73	7.28	7.67	91.71	-0.69	oo	101.83	0.14	-	
BLUE SKY	8.05	7.93	7.83	7.95	7.94	86.92	-1.2	ooo	87.52	-1.13	ooo	6.45	6.85	7.63	7.28	7.05	84.39	-1.31	ooo	93.69	-0.48	-	
CALGARY	9.8	10	9.88	9.75	9.86	107.91	0.72	**	108.65	0.79	**	8.45	8.45	8.25	8.75	8.48	101.41	0.12	-	112.59	0.95	***	
CASCADE	9.13	9.23	9.35	9.92	9.41	102.98	0.27	-	103.69	0.34	-	5.8	6.58	6.33	6.53	7.06	75.5	-2.05	ooo	83.83	-1.22	ooo	
FIGARO	7.48	7.1	7.1	7.23	7.23	79.12	-1.91	ooo	79.66	-1.85	ooo	7.73	7.63	7	7	7.34	87.83	-1.02	ooo	97.51	-0.19	-	
GALAXI	8.03	7.7	7.83	8.4	7.99	87.47	-1.15	ooo	88.07	-1.08	ooo	7.75	8.28	8.3	8.35	8.17	97.76	-0.19	-	108.54	0.64	*	
HONEYMOON	8.73	10.53	9.53	9.9	9.67	105.88	0.54	*	106.61	0.6	*	11.1	10.93	10.83	11.2	11.02	131.8	2.66	***	146.33	3.49	***	
MEDEO	10.28	10.1	10.35	10.33	10.27	112.37	1.13	***	113.14	1.19	***	8.05	8.28	8.7	8.45	8.37	100.15	0.01	-	111.19	0.84	**	
MOSELLA	11.18	11.38	11.18	10.6	11.09	121.35	1.95	***	122.18	2.01	***	10	9.65	9.08	8.78	9.38	112.2	1.02	***	124.58	1.85	***	
PINK FOUNTAIN	12.68	11.85	11.28	13.18	12.25	134.07	3.11	***	135	3.18	***	10	9.53	9.03	9.93	9.62	115.14	1.27	***	127.83	2.1	***	
PURPLE RAIN	7.38	7.7	7.05	7.13	7.32	80.08	-1.82	ooo	80.63	-1.76	ooo	6.88	7.15	7.23	6.95	7.05	84.39	-1.31	ooo	93.69	-0.48	-	
SANTANA	9.2	9.13	9.05	9.15	9.13	99.97	-0.003	-	100.66	0.06	-	9.53	9.63	9.18	9.23	9.39	112.38	1.04	***	124.78	1.87	***	
SANTIAGO	8.48	8.15	8.18	7.9	8.18	89.52	-0.96	ooo	90.14	-0.9	ooo	8.38	9.08	8.65	8.18	8.57	102.57	0.22	-	113.88	1.05	***	
SANTORINI	9.68	9.23	9.05	9.38	9.34	102.19	0.2	-	102.89	0.26	-	7.5	7.5	7.53	8.1	7.66	91.62	-0.7	oo	101.73	0.13	-	
STRIPED SUN	8.83	8.6	8.05	8.6	8.39	93.27	-0.62	o	93.91	-0.55	o	8.6	9.48	9.23	9.1	9.1	108.91	0.75	**	120.93	1.58	***	
TEXAS	10.13	8.78	9.33	9.4	9.41	103.01	0.28	-	103.72	0.34	-	9.63	10.55	10.53	10.2	10.23	122.38	1.87	***	135.87	2.7	***	
TROUBADUR	9.48	9.45	9.43	9.7	9.52	104.16	0.38	-	104.88	0.44	-	8.18	8.43	8.58	8.7	8.47	101.38	0.12	-	112.55	0.95	***	
YVONNE	8.73	9.43	8.9	9.23	9.07	99.32	-0.06	-	100	-	-	7.98	7	8.18	6.95	7.53	90.07	-0.83	oo	100	-	-	
Average	9.19	9.13	8.97	9.25	9.18	100	-	-	DL 5% - 0.5	DL 1% - 0.67	DL 0.1% - 0.87	8.27	8.43	8.39	8.34	8.4	100	-	-	DL 5% - 0.51	DL 1% - 0.68	DL 0.1% - 0.88	
DL 5 % - 0.49				DL 1% - 0.65			DL 0.1% - 0.85					DL 5% - 0.5			DL 1% - 0.66			DL 0.1% - 0.86					

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