

The effect of corm planting date and depth on *Acidantha bicolor* Hochst. cormel yield

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ABSTRACT

Corms of *Acidantha bicolor* var. *murielae* Perry were planted at three depths (4, 8, and 12 cm) and at four spring dates (the third and fifth week of April, the second and third week of May). The number and weight of cormels was examined in the total and marketable yield. The highest total and marketable yield of cormels was obtained from planting in the fifth week of April at a depth of 8 or 12 cm, and in the second week of May at a depth of 12 cm.

INTRODUCTION

Acidantha bicolor is an interesting perennial plant which does not winter in the field. Its flowers are white and fragrant with crimson lines inside, and they appear

in the second half of summer. Its natural environment is the tropical regions of middle and southern Africa (Grabowska et al. 1987, Bryan 1989).

Most experiments with *Acidanthera bicolor* were made in the greenhouse (Zalewska 2000) so that it was necessary to develop the optimal agrotechnical measures for the plants in the field. The aim of the present work was to examine the effect of corm planting date and depth on *Acidanthera bicolor* Hochst. cormel yield.

MATERIAL AND METHODS

The experiments were carried out at the Department of Ornamental Plants in the University of Agriculture in Lublin in 2000 and 2001. The plant material was the corms of *Acidanthera bicolor* var. *murielae* Perry with a circumference of 8-9 cm. Thirty corms were planted on a plot of 1 m², at the depths: 4, 8, and 12 cm, at various fixed dates: I – in the third week of April, II – in the fifth week of April, III – in the second week of May, and IV – in the third week of May.

The experiment was established on the basis of random blocks in five repetitions. At the end of the growing period the plants were dug up and the total and marketable yields of cormels were estimated. The marketable yield was the 1st and the 2nd choice cormels with a circumference over 10 and 8-10 cm, respectively (the norm PN-92/R-67030). The effect of the date and depth of planting on the total and marketable yield of cormels was presented as means of 2000 and 2001. The method of a three-factor variance analysis for the orthogonal data was used and differences were verified using Tukey's test at 0.05 level of significance.

RESULTS AND DISCUSSION

The investigations showed that the total and marketable cormel yield of *Acidanthera bicolor* depended on the date and depth of planting the corms. The best results were obtained when the corms were planted in the fifth week of April at a depth of 8 and 12 cm and in the second week of May at a depth of 12 cm (Table 1). At that time a visible increase in the number of cormels of the total yield was observed by 48 and 41%, respectively as compared with a IV date of planting (third week of May) at a depth of 4 cm. A positive effect on the weight of total and marketable cormel yield was obtained when the corms were planted at I, II, and III dates at a depth of 12 cm. An increase in the weight of total cormel yield was gained respectively by 161, 173, and 121% and a marketable yield by 192, 211, and 149% in comparison with the IV date of planting corms at a depth of 4 cm. The tendency to an increase in the number of marketable yield of cormels planted in I

date at a depth of 8 cm and in III date (all depths) was noted respectively by 24% and by 18-15% as compared with the IV planting date at a depth of 12 cm.

Table 1. The effect of date and depth of planting on the total and marketable yield of cormels of *Acidanthera bicolor* Hochst. (means of 2000 – 2001)

Date of planting (week/month)	Depth of planting (cm)	Total yield			Marketable yield				
		number of cormels per m ²	increase (%) [*]	weight of cormels (g m ⁻²)	increase (%) [*]	number of cormels per m ²	increase (%) ^{**}	weight of cormels (g m ⁻²)	increase (%) [*]
I (3/April)	4	1255 ab	3	970 cd	56	36	9	721 b	57
	8	1328 abc	9	1318 f	113	41	24	1060 d	130
	12	1629 d	34	1619 g	161	35	6	1345 e	192
II (5/April)	4	1470 c	20	1000 de	61	37	12	718 b	56
	8	1801 e	48	1346 f	117	37	12	1068 d	132
	12	1752 de	44	1692 g	173	37	12	1430 e	211
III (2/May)	4	1332 abc	9	845 bc	36	39	18	629 b	37
	8	1627 d	33	1133 e	83	39	18	876 c	90
	12	1723 de	41	1370 f	121	38	15	1146 d	149
IV (3/May)	4	1220 a	-	620 a	-	35	6	460 a	-
	8	1261 ab	3	790 b	27	36	9	630 b	37
	12	1377 bc	13	925 bcd	49	33	-	756 bc	64

* as compared with yield from IV date (third week of May) at the depth 4 cm

** as compared with yield from IV date (third week of May) at the depth 12 cm

The highest increase in the number of total yield of cormels by 33 and 28% was obtained when planting corms in 2000 at II and III date as compared with the number of cormels from the IV date (Table 2). In the second year of the experiment the highest total and marketable yield was noted when planting corms on the II date (Table 3). An increase in the total yield of 120% and an increase in the marketable yield of 107% compared with the IV planting date in 2000 was also obtained under those conditions.

The relevant increase in the number of cormels in the total yield of about 26% was obtained in 2000 when corms were planted at a depth of 12 cm as compared with the corms planted at the smallest depth 4 cm (Table 4). A tendency to increase the weight of the total and marketable cormel yield was observed in 2001, while corms were planted at a depth of 12 cm (Table 5). At that time an increase in the cormel weight, was noted respectively by 96 and 105% in comparison with corms planted at a depth 4 cm in 2000.

Table 2. The effect of date of planting on the number of cormels of *Acidanthera bicolor* Hochst.

Date of planting (week/month)	Total yield					Marketable yield				
	2000		2001		Mean	2000		2001		Mean
	number of cormels per m ²	increase (%)*	number of cormels per m ²	increase (%)*		number of cormels per m ²	increase (%)*	number of cormels per m ²	increase (%)*	
I (3/April)	1448 bc	14	1360 ab	7	1404 b	33	3	41	28	37 ab
II (5/April)	1686 d	33	1663 d	31	1674 d	34	6	40	25	37 ab
III (2/May)	1620 d	28	1501 c	18	1561 c	35	9	42	31	39 b
IV (3/May)	1270 a	-	1302 a	3	1286 a	32	-	38	19	35 a
Mean	1506 b		1457 a			33 a		40 b		

* as compared with yield from IV date (third week of May)

Table 3. The effect of date of planting on the weight of cormels of *Acidanthera bicolor* Hochst.

Date of planting (week/month)	Total yield					Marketable yield				
	2000		2001		Mean	2000		2001		Mean
	weight of cormels (g m ⁻²)	increase (%)*	weight of cormels (g m ⁻²)	increase (%)*		weight of cormels (g m ⁻²)	increase (%)*	weight of cormels (g m ⁻²)	increase (%)*	
I (3/April)	1290 ef	84	1315 f	87	1302 c	1082 de	86	1002 cd	72	1042 c
II (5/April)	1150 cd	64	1542 g	120	1346 c	940 bc	62	1205 e	107	1072 c
III (2/May)	1049 c	49	1184 de	69	1116 b	850 b	46	917 bc	58	884 b
IV (3/May)	702 a	-	856 b	22	779 a	582 a	-	649 a	12	615 a
Mean	1047 a		1224 b			863 a		943 b		

* as compared with yield from IV date (third week of May)

Table 4. The effect of depth of planting on the number of cormels of *Acidanthera bicolor* Hochst.

Depth of planting (cm)	Total yield					Marketable yield				
	2000		2001		Mean	2000		2001		Mean
	number of cormels per m ²	increase (%)*	number of cormels per m ²	increase (%)*		number of cormels per m ²	increase (%)*	number of cormels per m ²	increase (%)*	
4	1310 a	-	1328 a	1	1319 a	33	-	40	21	37 ab
8	1555 c	19	1454 b	11	1504 b	34	3	42	27	38 b
12	1652 d	26	1588 cd	21	1620 c	33	-	39	18	36 a
Mean	1506 b		1457 a			33 a		40 b		

* as compared with yield from the depth of 4 cm

Table 5. The effect of depth of planting on the weight of cormels of *Acidanthera bicolor* Hochst.

Depth of planting (cm)	Total yield					Marketable yield				
	2000		2001		Mean	2000		2001		Mean
	weight of cormels (g m ⁻²)	increase (%)*	weight of cormels (g m ⁻²)	increase (%)*		weight of cormels (g m ⁻²)	increase (%)*	weight of cormels (g m ⁻²)	increase (%)*	
4	755	-	963	28	859 a	586	-	678	16	632 a
8	1063	41	1231	63	1147 b	870	48	947	62	908 b
12	1325	75	1478	96	1402 c	1135	94	1204	105	1169 c
Mean	1047 a		1224 b			863 a		943 b		

* as compared with yield from the depth of 4 cm

Piskornik and Koziara (1994) indicated that *Acidanthera bicolor* planted in the field from the second week of March to the second week of April (plants being covered by plastic foil at the beginning) gave the highest yield of cormels. The research carried out by Grabowska (1978) showed that the highest total and marketable yields of gladiolus cormels were obtained in the early date of planting (the second period of March). According to Tonecki (1980), a delay in the planting date of gladiolus corms had a disadvantageous effect on the number and weight of cormels.

CONCLUSIONS

1. The date and depth of planting corms had a relevant effect on the yield of *Acidanthera bicolor* var. *murielae* Perry cormels.
2. The greatest number of cormels in total yield was noted when planting in the fifth week of April at a depth of 8 and 12 cm, and in the second week of May at a depth of 12 cm.
3. The greatest increase in the weight of total and marketable cormel yield was obtained from planting in the fifth week of April at a depth of 12 cm.
4. Planting the corms in the third week of May at a depth of 4 cm caused the decrease in the yield of cormels.

REFERENCES

- BRYAN J.E., 1989. Bulbs. vol. I, Christopher Helm, London: 64.
- GRABOWSKA B., 1978. Wpływ terminów sadzenia przybyszowych bulw mieczyka (*Gladiolus hybr. hort.*) na plonowanie. Prace ISiK Skierniewice, ser. B, 3: 15-22.

- GRABOWSKA B., KRAUSE J., MYNETT K., 1987. Uprawa cebulowych i bulwiastych roślin ozdobnych. PWRiL, Warszawa: 8-11.
- PISKORNIK M., KOZIARA Z., 1994. Plonowanie acidantery dwubarwnej w zależności od terminu i sposobu sadzenia łuskobulw. Materiały IX Ogólnopolskiego Zjazdu Kwiaciarzy, Skierniewice: 79.
- TONECKI J., 1980. Wpływ długości dnia, natężenia światła i terminu sadzenia na wzrost i kwitnienie mieczyka. Ogrodnictwo 1: 16-18.
- ZALEWSKA M., 2000. Wzrost i kwitnienie acidantery dwubarwnej (*Acidantha bicolor* var. *murielae* Perry) w uprawie przyspieszonej w szklarni. Roczn. AR Poznań CCCXVIII, Ogrodnictwo 29: 123-130.

WPŁYW TERMINU I GŁĘBOKOŚCI SADZENIA BULW NA PLON BULW
POTOMNYCH ACIDANTERY DWUBARWNEJ (*ACIDANTHERA BICOLOR*
HOCHST.)

Streszczenie: Bulwy acidantery dwubarwnej *Acidantha bicolor* var. *murielae* Perry sadzono na trzech głębokościach: 4, 8 i 12 cm w czterech terminach: w trzecim i piątym tygodniu kwietnia oraz w drugim i trzecim tygodniu maja. Badano liczbę i masę bulw potomnych w plonie ogólnym i handlowym. Najwyższy liczbowy i wagowy plon ogólny i handlowy bulw potomnych uzyskano sadząc bulwy w piątym tygodniu kwietnia na głębokości 8 i 12 cm oraz w drugim tygodniu maja na głębokości 12 cm.

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