

# Tulip Varieties for 41°F Storage

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Growers have shown great interest in the forcing of tulips that have been stored at 41°F for approximately 10 weeks before planting and forcing. This method saves considerable labor and growers who have forced 41°F treated bulbs have been very pleased with the results.

The storage temperature has to be accurately controlled at 41°F for the 10 week period for best results. The bulbs remain in the cases as they come from Holland during the storage period and are not removed until time of planting. These bulbs should be planted very soon after removal from controlled storage temperatures. One week is the maximum allowable time at higher temperatures before planting.

There is considerable variation between the suitability of varieties for this type of culture. Ground beds give the best quality but take longer than raised beds which give good results if the soil is 5" deep or more. A good moisture supply is essential. The soil should be sterilized before each crop or use new soil that has not previously been used to grow tulips. The benches can be covered with black cloth the first week or two to lengthen the stems if greater stem length is desirable. This did not seem necessary where a commercial grower used ground beds in plastic houses as stem length was quite ample.

This past year's experiments were primarily a comparison of varieties grown as cut flowers or pot plants. Top size tulip bulbs were received from Van Eeden Bros., on October 1, 1966 and from A. Nyssen & Sons on September 24, 1966 and held until December 22-23 when all bulbs for cut flowers were planted in steam sterilized soil in raised benches in a 62°F greenhouse (62°F night 72°F days). After planting the tops of the bulbs were just under the soil surface. Benches were hand watered each day. Samples of the same lots of bulbs were planted December 24, 5 in a 6 inch bulb pan, 2 pots per variety. The bulbs for cut flowers from Van Eeden Bros., were planted in a row of 12 replicated once in each of 3 benches. The bulbs from Nyssen were all planted in 1 bench. In the tables the varieties are listed in alphabetical order with the tulip type listed after the name.

In some commercial plantings the bulbs were planted with one inch of soil over the tulip bulb. This takes a little longer for flowering and it is more difficult to re-

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move the bulbs after flowering for observing rooting.

At time of flowering, data were taken on number of flowers, average height, flower size, weeks to flower, condition of roots in bulbs planted for cut flowers and uniformity of pot plants. Number of flowers picked is the average for 12 bulbs planted for cut flowers and 5 in a

pot for pot plants. Where replicates were not 3 for cut flowers or 2 for pot plants, the number of replicates is indicated by ( ) after the number of flowers. Average height is the average of replicate averages. Flower size is indicated by L for large, M for medium and S for small as flower size is too dependent upon time of measurement for more accurate results. The flowering of cut flowers

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Table 1. Forcing of 41°F stored tulips for cut flowers. Figures are for averages of 3 lots of 12 bulbs stored October 1, 1966 planted December 22 in raised benches at 62°F. Source Van Eeden Bros.

Variety	Type*	No of flowers	Height in inches	Flower size**	Days to flower	Conditions of Roots***				O
						E	G	F	P	
Arabesque	T	11	14	M	32		9	2	1	1
Arabian Mystery	T	8	14	S	38		8	2		2
Aristocrat	D	11	12	S	41		10	2		
Apricot Beauty	M	11	21	M	47		9	2	1	
Beauty of Dover	D.H.	11	17	L	39		8	3	1	
Bellona	S.E.	13	13	M	34		10	2		
Bestseller	M	11	14½	M	32		12			
Blizzard	T	8	13	M	44		4	4	3	
Christmas Marvel	S.E.	11	11	S	31		8	2	3	
Crater	T	7	15	S	45		7	3	1	1
Dover	D.H.	11	17	L	35		9	2	1	
Franklin D. Roosevelt	D.H.	11	17	L	36		12			
Gander	D	16	18	M	36		11	1		
Golden Springtime	D.H.	12	13	L	36		3	9		
Gudoshnik	D.H.	12	22	L	40		11	1		
High Society	M	3	13	M	36		4	2	2	4
James V. Forrestal	P	13	16	L	41		9	2		
Jewel of Spring	D.H.	12	21	L	41		12			
Klaas Hommes	P	12	16	L	41	1	5	5		
London	D.H.	11	17	L	33		11	1		
Montparnasse	S.E.	12	13	M	34		10	2		
Orange Kennedy	D.H.	6	18	M	37		7	2	1	1
Orange Sun	T	10	11	L	44	4	8			
Orange Wonder	M	2	12	S-M	33		4	4	1	3
Queen of Night	D	9	18	M	50		10	2		
Rosy Parrot	P	11	12	L	39	1	8	3		
Sjoukje	T	10	16	M	34		8	3	2	
Topscore	T	8	13	M	34		4	1	3	
Wildhof	T	5	14	S	40		5		1	5
Yellow Dover	D.H.	10	16	L	35	1	10	1		

\*M—Mendel, T—Triumph, S.E.—Single Early, P—Parrot, D.H.—Darwin Hybrid, D—Darwin

\*\* L—large, M—medium, S—small

\*\*\*E—excellent, G—good, F—fair, P—poor, O—none

Table 2. Forcing of 41°F stored tulip bulbs for cut flowers. Figures are for single lots of 12 bulbs stored September 24 planted December 22 for cut flowers. Source Anthony Nyssen & Sons.

Variety	Type*	No of flowers	Height in inches	Flower size**	Days to flower	Conditions of Roots***				O
						E	G	F	P	
Appledorn (a)	D.H.	5	7	S	39			2	7	2
Appledorn (b)	D.H.	11	17	M	39		12			
Auriola	T	12	19	M	51		12			
Bashful	T	12	15	M	34	6	2	1	3	
Dover	D.H.	10	17	L	34		6	6		
Emmy Peck	T	11	19	M	32		3	5	4	
Gudoshnik	D.H.	11	21	M	38		8	4		
Jewel of Spring	D.H.	10	19	L	35		7	5		
Lavender Lady	D	11	16	M	31		4	8		
Majoram	T	11	12	S	33		5	3	3	1
Merry Widow (a)	T	12	18	M	32	2	4	1	3	
Merry Widow (b)	T	12	14	M	34	10	1	1		
Most Miles	D	12	18	M	33		8	4		
Pax	T	12	14	S	33		6	5	1	
Paul Richter (a)	D	15	17	M	33		4	8		
Paul Richter (b)	D	12	16	M	34	6	6			
President Kennedy	D.H.	11	17	S	35		6	6		
Snow Star	T	12	14	S	32	12				
Yellow Sun		11	9	M	33					

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from time of planting to flowering is recorded in days for cut flowers and weeks for the pot plants. The root condition was observed after flowering when the old bulbs were removed. There is usually close correlation between good flowering and good root systems. The uniformity of height and time of flowering were used as the bases for an index of 1 for uniform to 5 very uneven for pot plants. Table 1 and 2 shows the results of forcing tulips for cut flowers with data given for average numbers of flowers from 12 bulbs, height when picked, flower size, days to flower and condition of roots. Tables 3 and 4 give the results when the same varieties were used as pot

plants. The data are for number of flowers from 5 bulbs per pan, height in inches, flower size, weeks to flower and uniformity.

An average value of 11 or 12 for the number of flowers for flowers cut and a height of over 16 inches indicate good cut flower varieties such as Appledoorn, Aristocrat, Beauty of Dover, Dover, Franklin D. Roosevelt, Gander, Gudoshnik, President Kennedy, Jewel of Spring, London, Klaas Hommes, Merry Widow, Most Miles and Paul Richter. Variety Gander had side shoots resulting in average of 16 flowers from 12 bulbs. Unsatisfactory varieties would be the ones with few flowers or short stems. (President Kennedy may have weak necks if forced too quick-

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Table 3. Forcing of 41°F stored tulips in 6 inch clay bulb pans. Figures are for average of 2 pans of 5 bulbs stored October 1 planted December 24, 1966 grown at 55°F for 1 week and then 62°F until flowering.

Variety	Type*	No of flowers** per pot	Height in inches	Flower size	Weeks to flower	Uniformity***
Apricot Beauty	M	4.5	16	M	4	1
Arabesque	T	2.5	13	S	6	2
Arabian Mystery	T	4	13.5	S-M	6	1
Aristocrat	D	0				
Beauty of Dover	D.H.	4.5	17	M	6	2
Bellona	S.E.	4.5	14.5	M	5	2
Bestseller	M	5	14.5	M	4	1
Blizzard	T	2 (1)	16	M	6	1
Christmas Marvel	S.E.	4.5	13	M	4	2
Crater	T	0				
Dover	D.H.	3	16.5	M-L	4.5	2
Franklin D. Roosevelt	D.H.	3	16	M	6	1
Gander	D	5	20	L	4.5	4
Golden Springtime	D.H.	5	16	L	4.5	3
Gudoshnik	D.H.	5	15	L	6	1
High Society	M	2 (1)	14	M	6	1
James V. Forrestal	P	4 (1)	15	L	6	1
Jewel of Spring	D.H.	3.5	19	L	6	2
Klaas Hommes	P	0				
London	D.H.	5	18	L	4	2
Montparnasse	S.E.	5	16	M-L	6	2
Orange Kennedy	D.H.	0				
Orange Sun	T	3 (1)	14	L	6	1
Orange Wonder	M	0				
Queen of Night	D	0				
Rosy Parrot	P	3.5	11.5	L	6	1
Sjoukje	T	4.5	17	L	5	1
Topscore	T	3	15	S-M	4.5	
Wildhof	T	3.5	14	S-M	6	2
Yellow Dover	D.H.	4	16	L	4	1

\*\*No. of flowers 4 (1) equals 4 flowers per pot 1 replicate otherwise 4.5 is 4.5 flowers average of 2 replicates

\*\*\*Uniformity 1 very uniform to 5 very uneven as to size and/or time of flowering

\*D—Darwin, M—Mendel, T—Triumph, S.E.—Single Early, P—Parrot, D.H.—Darwin Hybrid

Table 4. Forcing of 41°F stored tulips in 6 inch clay bulb pans. Figures are for averages of 1-3 pans of 5 bulbs. Stored September 24 planted December 24, 1966 grown at 55°F for 1 week and then at 62°F until flowering. Source: Anthony Nyssen & Sons.

Variety	Type*	No of** flowers	Height in inches	Flower size	Weeks to flower	Uniformity***
Emmy Peck		5 (1)	21	M	4	1
Lavender Beauty		4 (3)	19	M	4	1
Majorica		4 (1)	14	S-M	6	
Merry Widow	T	5 (3)	14	M	5	2
Most Miles		5 (1)	20	M	4	1
Paul Richter	D	5 (3)	17	M	5	2
Pax	T	4.5 (2)	13	M	6	1
Snow Star		5 (1)	19	L	5	1
Sun Star		5 (1)	16	M	4	1
Yellow Star		4 (1)	11	S	5	1

\*\*No. of flowers 4 (1) equals 4 flowers per pot 1 replicate otherwise 4.5 is 4.5 flowers average of 2 replicates

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\*D—Darwin, M—Mendel, T—Triumph, S.E.—Single Early, P—Parrot, D.H.—Darwin Hybrid

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ly.) The most unsatisfactory would be Blizzard, Crater, High Society, Orange Kennedy, Orange Sun, Yellow Sun, Wildhof. Early flowering would be an advantage as there is more cost in growing Queen of Night at 50.4 days than Emmy Peck at 32.4 days.

For pot plants uniformity, number of flowers, low height and speed of forcing are desirable. Promising varieties are Majorca, Merry Widow, Pax, Yellow Sun, Arabian Mystery, Best Seller and Christmas Marvel. Poor varieties were Aristocrat, Crater, Gander, Golden Springtime, High Society, Klaas Hommes, Orange Kennedy and Orange Wonder.

Further testing is necessary especially with pot plant varieties. Adequate moisture seems most important. This will be carried out in 1967-68.