PEAT AS A FORCING MEDIUM FOR TULIPS

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Abstract

The suitability of peat as a forcing medium for tulips was investigated. The advantage of peat lies in its light weight and its freedom from pathogens.

During three years tulips were forced 2-3 times a winter in sand/peat mixtures and in a peat moss/"frozen" sphagnum peat mixture. In the first case the treatments were combined with four methods of watering, in the last one seven lime levels were applied.

The development of the plant and the quality of the cut tulip were as good on sand/peat and on peat as on sand, the usual growing medium, and in two forcings, with a moderate quality of the flower, the development of the plant was even better. Flower bud blasting decreased by more frequent watering. Differences in flower quality between the methods of watering only occurred in the late forcing. The optimum frequency of watering was once a day, independent of the kind of medium. Rooting of the bulbs was almost entirely prevented in unlimed peat; a dose of 2-4 kg calcium carbonate per m^3 was found to be necessary for a good development.

Introduction

For tulip forcing in The Netherlands calcareous dune sand is mostly used. The weight of the boxes with tulips and sand, however, is rather high and handling efficiency requires light-weight material. For this purpose, peat with its low bulk density is very suitable. Moreover, peat is free from pathogens and this is a big advantage on holdings with a restricted area of clean soil. Introduction of a new material demands careful testing in experiments with early and late forcing during several years. As small, but important differences in flower quality cannot be detected by visual inspection, extensive measurements are necessary.

Materials and methods

During three winters experiments were conducted with the tulip, cv. 'Lustige Witwe' for cut flowers. In the winter 1971/1972 the effect of four watering methods was studied with only calcareous dune sand as the growing medium (experiment VP 1060; see table 1). In the subsequent experiments (VP 1096 in the winter 1972/1973 and VP 1141 in 1973/1974) the four water rates were factorially combined with four different forcing media, composed of dune sand and peat (table 1). Wooden boxes, used in the first experiment, were replaced by plastic boxes in the succeeding years, to avoid evaporation through the sides. Three forcings were employed. In the last two winters the lime requirement of tulips growing in pure peat was investigated in an early and a late forcing (VP 1097 in the winter 1972/1973 and VP 1142 in 1973/1974; see table 1). The forcing medium was lightly dressed with 0.25 kg NPK-fertilizer ($N:P_2O_5:K_2O$ = 16:10:20) per m^3 and a mixture of trace elements. In the sand/peat media the peat was limed, before mixing, with 8 kg limestone per m^3 in VP 1096 and with 4 kg in VP 1141.

A summary of planting dates, rooting room temperatures and dates of the transfer to the glasshouse and of the first cutting are given in table 2. The bulbs of the first forcing were treated in the precooling stage in such a way, that the flowers were susceptible to flower bud blast, a condition in which there are only shrivelled buds or no flower buds at all. In the wooden boxes of 20 × 20 × 9.5 cm, 16 bulbs were placed on a layer of 8 cm of the growing medium, and in the plastic boxes, having a depth of 8.5 cm, on a layer of 7 cm. Sand/peat mixture and peat were compressed to the compactness of lightly pressed sand. After the planting of the bulbs the boxes were filled up with their own testing material. In the rooting room a layer of 3 cm sand was used as a cover. During forcing the temperature in the glasshouse was held at 18-20°C, and relative humidity between 70 and 80%.

To determine the development of the plant during forcing the total height from the nose of the bulb to the end of the longest leaf, vertically held, was measured every three days, as well as the lower part of the stam between the nose of the bulb and the lowest leaf. For determining the quality of the cut flower various characteristics were measured (table 3). Not only the mean of these characteristics per 16 bulbs was used to estimate the treatment effects, but also the standard deviation as a measure of the uniformity of cropping.

Experiment VP 1060 was laid out in four replications, the other experiments in three replications.

Results

The substitution of sand for peat with its lower volume weight (table 4) means indeed an easier handling of the boxes with tulips. Even in case of a normal moisture level of the growing medium, e.g. at a water tension of pF=1.0, the weight of the boxes is lower with more peat, in spite of the higher water holding capacity. A pure peat substrate then weighs 40% less than sand.

Adding of peat to the sand substrate or using a pure peat growing medium means a modified air and water content during the growing period. This can have its consequences for frequency and quantity of watering. In the first experiment the water requirement of forced tulips was studied on a pure sand medium, to determine the importance of the water supply for the quality of cut flowers. In the two subsequent trials the kind of substrate and the frequency of watering were varied.

The determination of the pF-curve gives an insight into the air and water contents, which occur at various moisture tensions in the sand, sand/peat and peat substrate (table 4). With increasing additions of peat to the sand, the pore volume of the mixture and the water-holding capacity increased. The volume of water in a sand/peat mixture of 1:20 at pF = 1.0 was twice as high as that in sand. Pure peat contained at this tension another 8% (by volume) more water than sand/peat 1:20. The air content at this moisture tension was almost the same for the four mixtures, viz. 9-12% by volume, and for peat almost 7. This implies that after saturation the tulips had more water at their disposal as more peat was present in the growing medium. So the quantity of available water (moisture content at pF 0.65 minus that at pF 4.2), expressed as the height of a water column, could be estimated in the 9 cm thick layer of the four mixtures with increasing peat content at 36, 54, 57, and 60 mm and for peat at 68 mm.

In the experiments the amounts of water used were recorded to see if there were differences due to the kind of growing medium, and if recommendations for watering of forced tulips could be to given to growers. The water consumption was determined by weighing the boxes before watering and after allowing them to drain freely for half an hour after watering. The weight difference is a measure of the water used in the preceding period. However, a general rule for the daily water consumption of forced tulips could not be laid down, as the results of the three experiments differed considerably (table 5). Yet some systematic differences could be noted. The higher figures for VP 1060 can partly be ascribed to the evaporation through the sides of the wooden boxes. A higher frequency of watering resulted in a higher consumption. More water had to be given to the mixtures containing much peat. In the last forcing in January and February the amount of water used was, with a maximum of 5.4 mm per day in the plastic boxes, distinctly higher than that in the early forcing in November and December with a maximum of 3.6 mm. However, as the development in the late forcing passed more quickly than that in the early one, the total water uptake was not greatly different. The three successive forcings on the sand/peat mixture 1:20 used 59, 51, and 62 mm, respectively. During the forcing the daily water consumption increased with the development of the tulip, e.g. in the second forcing of VP 1141 from 1.6 mm at the beginning to 4.4 mm at flowering time. Only in the third forcing a relation was found between water use and the radiation energy of the preceding day: an evapotranspiration of 0.12 and 0.24 mm per 100 Joule/cm^2 in the two experiments with plastic boxes (correlation coefficients = 0.61).

The influence of the frequency of watering was checked during the development of the plant by periodical measuring as well as by determining the quality of the cut tulip by means of an extensive number of characteristics (table 3). No systematic differences in growth and in regularity of growth were found between the four treatments of watering. There is some evidence that in the early forcing of tulips, susceptible to flower bud blast, growth increased with a higher frequency of watering. Except a distinct influence on flower bud blast in the first forcing and on the total length of the tulip in the third forcing, there was no difference in quality of the cut flower between the four methods of watering. Nor was there any systematic influence of the kind of substrate on the effect of watering. No clear influence on blooming date could be found. More frequent watering decreased the number of blasted flowers (tabel 6: two out of three experiments with a statistically significant effect). In the third forcing, during which a high daily water consumption occurred and for which a relation was found between this water consumption and solar radiation, the total length of the cut tulip increased with the frequency of watering (table 7). A watering frequency of once a day was optimum. There is some evidence that this frequency of watering is also the best for the flower height. In seven out of the nine experiments flower height at once a day watering is greater than at watering once every three days (one experiment statistically significant, table 7). The fact that results of watering failed to materialize, and that the kind of substrate did not influence these results, may be ascribed to the low moisture tension, which continued to exist at the bottom of the boxes, although water was given only once every three days. An estimation from the pF-curve shows that even for sand in case of a daily water consumption of 4.4 mm (VP 1141, third forcing, table 5) only 40% of the available water was used after three days. In this case the pF rose to 1.3. This means that an inhibition of growth is not likely. A water shortage on peat and on peat-enriched mixtures is even more improbable.

The purpose of these experiments was to investigate whether peat can replace sand as a forcing medium for tulips. As new material can give on the average the same good results, but may not meet the requirements on account of a greater irregularity in the quality of the cut tulips, this irregularity was tested by means of the calculation of the standard deviation of the flower characteristics per box. A new material can also be unsatisfactory if cutting is delayed, which is undesirable in view of the high costs of heating. In the present experiments the periodical measuring of the development of the tulips after housing showed that the growth of the plant in the first forcing was faster on the mixture which was richest in peat. Only at the end of the growing period did the plants on sand do equally well. Also in the second forcing growth was faster on sand with peat. The regularity in development was not related to the kind of forcing medium. The variation coefficient for the lengths of the lower part of the stems was often higher for the sand substrate. Root development was stimulated by peat addition. After cutting no flower quality differences occurred between the four sand/peat mixtures, except in the second and third forcing of VP 1096. These forcings gave in the main a somewhat inferior quality of the cut flowers, but the peat-enriched mixtures were significantly better statistically (table 8). All other flower quality characteristics (table 3) improved with peat addition. The pure peat substrate gave comparable, favourable results. The regularity of some of these properties also increased. Concerning blooming date, an other important characteristic for estimating the value of the newly introduced material, a distinct influence of the growing media did not occur. Flower cutting on sand was later rather than earlier, once with a statistically significant difference. Springer (1963), on the other hand, found that flowering was one day later in peat than on sandy soil. Summarizing the results of the present experiments, it can be concluded that peat is a suitable substitute for sand as the usual forcing medium for cut tulips. Under less favourable forcing conditions it even led to better results in flower quality. The tulips of the early forcing in experiment VP 1096, susceptible to flower bud blast, were less affected, if more peat was added to the sand substrate (table 6). This too is a favourable aspect of peat addition. It can be that this effect has to do with a more constant water supply through the higher water-holding capacity, as the effect of a high watering frequency was also favourable.

Peat has a very low pH. Experiments were carried out to investigate to which level the peat has to be limed. Unlimed peat turned out to be unsuited for growing of tulips. Root development was prevented; after a growth of about 1 cm, elongation of the roots stopped. Length and quality of the cut flower fell behind (table 9). A rather small dose, viz. 2-4 kg $CaCO_3$ per m^3, giving a pH-H_2O = 4.5-5.4, was already optimum. The conditions unfavourable for growth on unlimed peat promoted flower bud blast, but high rates of lime also increased this disease (table 10).

On the acid peat, the average blooming date, and thus flower cutting, was delayed by 3.4 days in the early forcings and by 0.6 days in the late forcing.

Discussion

During three experimental years with three forcings each year, sand/peat mixture with a proportion of peat increasing to 1:20 gave as good results as sand. Indeed, in two experiments which showed for some unknown reason a less satisfactory quality of the cut flower, the quality improved as more peat was present in the sand/peat mixture. In another experiment with two forcings during two years a pure peat, a mixture of slightly decomposed peat moss and "frozen", more strongly decomposed sphagnum peat in a 1:1 ratio by volume gave comparable favourable results. In the beginning of the forcing the development was sometimes faster on peat, but ultimately the same result was obtained. The use of peat as a forcing medium seems justified. Others also found peat suitable, as a preliminary experiment showed at the Kirton Research Station (Anonymous, 1974) and as Sandved (1966) found. Loeser and Essig (1967) obtained the highest plant height on fertilized peat moss and perlite. Peat may be used not only as substrate, but also as cover in cool storage (Springer 1963). Flowering was one day later in peat than on sandy soil. According to Stoffert (1966) good results are obtained with peat, the admissible minimum depth of the boxes for peat being, however, larger than for sand, so that a part of the advantage of the lower volume weight is lost.

In the present experiments no special requirements for watering on peat were indicated. In the late forcing, daily watering to saturation seems to be best, regardless of the type of material used.

It is known that the tulip grows well on calcareous soil. The question arises whether peat as growing medium also must be limed to a high pH. In the present experiments a relatively low lime application was already sufficient, 2-4 kg $CaCO_3$ per m^3 peat. This means a pH-H_2O of the peat moss/"frozen" sphagnum peat mixture of 4.5-5.4 or a pH-KCl of 3.9-4.8. This dose agrees rather well with the experience of other research workers with peat moss. Strømme and Øydvin (1964) found good results with 6 kg lime. A higher dose of 12 kg did not give an improvement. Springer and Voigt (1962) and Springer (1963) advise 3 kg $CaCO_3$ per m^3, the next higher level in their experiments did not increase flower quality. Härig (1971) views 3 kg calcium carbonate as optimum, which amounts to a pH of about 5.2. All agree that liming is necessary for good rooting. The risk of toppling in case of no liming should not be overlooked (Koutepas and Boodley, 1966).

In these experiments a low quantity of mixed fertilizer and trace elements was added as a security measure. Earlier forcings on sand in

Lisse have not shown the necessity of fertilization. Springer (1963) concluded from his experiments that there is no need of fertilizing. On the other hand, Härig (1971) obtained a poorer result on peat without the main nutrients and trace elements. Koutepas and Boodley (1966) investigated the question of need for fertilization during forcing. The best results were obtained with a peat-vermiculite mix plus lime, with second best the peat-vermiculite mix plus superphosphate. One variety was the best on unfertilized mixture. Generally, the need for nutrients should be considered as slight.

Anonymous, 1974. Peat promising as forcing medium for both daffodils and tulips - Kirton bulb trials. Grower 81:117.

Härig, H., 1971. Ernährungsprobleme bei der Blumenzwiebeltreiberei. Dtsch.Gärtnerbörse 71:188.

Koutepas, N. and Boodley, J.W., 1966. Lime and phosphorus fertilization on tulips. Bull. N.Y.State Flower Growers No. 253: 1-3, 5.

Loeser, H. und Essig, W., 1967. Verschiedene Substrate in der Tulpentreiberei. Dtsch.Gartnerbörse 67:191-194. (Hort.Abstr. 37, 1967, No. 5358.)

Sandved, G., 1966. Førsøk med kassetyper og rotningsmedia til driving av tulipaner. Gartneryrket 56: 710,711,716. (Hort.Abstr. 37,1967, No.1386.)

Springer, E., 1963. Düngetorf als Pflanzensubstrate in der Blumenzwiebeltreiberei. Torfnachrichten 14: 9-10.

Springer, E. und Voigt, U., 1962. Düngetorf, bzw. Torfkultursubstrat als Pflanzsubstrat und Abdeckungsmaterial in der Blumenzwiebeltreiberei. Torfnachrichten 13: 7-8.

Stoffert, G., 1966. Einfluss von Kistentiefe, Substrat und Giesshäufigkeit im Bewurzelingsraum auf das Wachstum von Treibtulpen. Gartenwelt 66: 498-501.

Strømme, E. and Øydvin, J., 1964. Kvitmosetory og sagflis som rotningsmedium for tulipan. Gartneryrket 54: 1015-1016. (Hort. Abstr. 35, 1965, No.3860.)

Table 1 - Summary of treatment series

Experiment VP 1060	*Experiment VP 1096, VP 1141*	
4 treatments: 4 methods of watering	16 treatments: all combinations of 4 methods of watering and 4 growing media	
methods of watering:	growing media:	
1 × 3 days	sand[†]	
1 × 2 days	sand/peat[††]	1: 5 by volume
1 × day	sand/peat	1:10 by volume
2 × day	sand/peat	1:20 by volume

Experiment VP 1097, VP 1042	
7 limestone levels on peat[††]	0, 2, 4, 6, 8, 10, 12 kg $CaCO_3$ per m^3

† Calcareous dune sand:
in VP 1060 pH-KCl 7.74, 1.5% $CaCO_3$, median 105-150 µm
in VP 1141 pH-KCl 7.50, 2.5% $CaCO_3$, median 210-300 µm

†† A 1:1 volume mixture of slightly decomposed peat moss (Von Post scale: H= 1-4) and so-called horticultural peat, that means "frozen" moderately to strongly decomposed sphagnum peat (H= 6-8)

Table 2 - Rooting room programme and date of first cutting

Experiment	Planting date	Rooting room temperature	Date of transfer to glasshouse	Date of first cutting
1st forcing				
VP 1060	14 Oct	9°C, from 29 Oct 5°C	1 Dec 1971	24 Dec 1971
VP 1096, VP 1097	19 Oct	8°C, from 15 Nov 5°C	23 Nov 1972	23 Dec 1972
VP 1141, VP 1142	9 Oct	9°C, from 1 Nov 5°C	16 Nov 1973	8 Dec 1973
2nd forcing				
VP 1060	14 Oct	9°C, from 29 Oct 5°C	21 Jan 1972	8 Feb 1972
VP 1096, VP 1097	19 Oct	8°C, from 15 Nov 5°C	19 Jan 1973	3 Feb 1973
VP 1141, VP 1142	9 Oct	9°C, from 1 Nov 5°C	14 Jan 1974	29 Jan 1974
3rd forcing				
VP 1060	29 Oct	5°C	4 Febr 1972	18 Feb 1972
VP 1096, VP 1097	9 Nov	8°C, from 15 Nov 5°C	22 Febr 1973	7 Mar 1973
VP 1141, VP 1142	2 Nov	5°C	15 Febr 1974	28 Feb 1974

Table 3 - Measured characteristics of quality of cut tulip

weight
total length (stem + flower)
lower part of stem between nose of bulb and lowest leaf
upper part of stem between upper leaf and bottom of flower
thickness of flower stem between the two lowest leaves
flower height
number of blasted flowers
average blooming date

Table 4 - The moisture tension characteristics of sand, sand/peat and peat, pore volume and volume weight

Growing medium	pF					Pore volume, %	Volume weight, g/cm^3
	1.0	1.5	2.0	4.2	6.0		
	Volume % water						
VP 1141 sand	38.3	22.5	5.1	0.8	0.1	47.3	1.40
sand/peat 1: 5	70.9	52.2	43.5	14.0	2.0	80.0	0.47
sand/peat 1:10	72.2	55.5	47.5	14.1	2.1	84.3	0.34
sand/peat 1:20	75.6	61.2	53.5	14.8	2.2	86.8	0.29
VP 1142							
peat moss/"frozen"							
sphagnum peat 1: 1	83.4	64.6	54.4	11.3	1.3	90.2	0.16

Table 5 - Daily water consumption averaged over the whole growing period at four methods of watering and three kinds of growing media in mm

Method of watering	1st forcing			2nd forcing			3rd forcing		
	VP 1060	VP 1096	VP 1141	VP 1060	VP 1096	VP 1141	VP 1060	VP 1096	VP 1141
	sand								
1 × 3 days	3.3	0.9	2.4	4.4	1.0	1.9	4.1	1.5	2.8
1 × 2 days	3.3	0.9	2.6	6.0	1.3	2.5	5.2	2.0	3.8
1 × day	3.8	1.2	2.6	7.2	1.5	2.8	6.2	2.5	4.4
2 × day	4.4	1.4	3.0	7.6	1.7	2.8	6.4	1.8	4.2
	sand/peat 1:20								
1 × 3 days		1.1	2.8		1.4	1.9		2.2	3.0
1 × 2 days		1.2	2.9		2.0	2.4		3.1	4.3
1 × day		1.2	3.2		2.3	3.2		3.3	5.4
2 × day		1.5	3.5		2.5	3.5		3.6	4.8
	peat moss/"frozen" sphagnum peat VP 1142								
1 × day		1.3	3.6					3.5	5.2

Table 6 - Influence of watering and peat addition on flower blasting in the first forcing (number per 16 bulbs)

Method of watering	Experiment VP 1060	VP 1096	VP 1141	Growing medium	Experiment VP 1096	VP 1141
1 × 3 days	10.8	2.1	5.7	sand	2.0	4.6
1 × 2 days	10.0	1.7	3.2	s/p 1: 5	2.0	3.1
1 × day	7.3	1.2	2.9	s/p 1:10	1.1	3.7
2 × day	4.3	1.5	3.4	s/p 1:20	1.3	3.8
statistical evaluation†						
lin.effect	++	n.s.	+		+	n.s.
quadr.effect	n.s.	n.s.	+		n.s.	n.s.
				peat moss/ "frozen" s.p. VP 1142	2.0	1.6

†n.s. = not significant ++ = significant at P= 0.01
\+ = significant at P= 0.05 +++ = significant at P= 0.001

Table 7 - Influence of frequency of watering upon total length and flower height in cm and mm, respectively

Method of watering	1st forcing			2nd forcing			3rd forcing		
	VP 1060	VP 1096	VP 1141	VP 1060	VP 1096	VP 1141	VP 1060	VP 1096	VP 1141
	total length in cm								
1 × 3 days	47.4	32.8	36.9	30.1	25.6	38.5	32.2	25.2	35.4
1 × 2 days	44.9	32.8	37.0	31.9	25.8	37.7	32.6	25.9	37.4
1 × day	46.8	32.7	37.9	31.2	25.9	38.0	33.2	27.3	37.3
2 × day	47.5	32.3	37.5	29.9	25.8	38.3	33.3	24.9	38.3
statistical evaluation									
lin. effect	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	+	n.s.	++
quadr.effect	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	+	n.s.
	flower height in mm								
1 × 3 days	43.1	44.8	46.0	46.7	44.1	48.2	45.8	44.3	46.3
1 × 2 days	43.9	44.7	47.0	46.6	43.3	48.3	45.8	44.7	47.5
1 × day	43.9	44.6	47.8	46.9	44.1	48.5	46.9	45.6	47.0
2 × day	43.7	44.8	52.0	47.8	43.4	48.7	45.8	44.4	47.7
statistical evaluation									
lin. effect	n.s.	n.s.	+	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
quadr.effect	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Table 8 - Composition of forcing medium and total length and flower height in cm and mm respectively

Growing medium	1st forcing		2nd forcing		3rd forcing	
	VP 1096	VP 1141	VP 1096	VP 1141	VP 1096	VP 1141
	total length in cm					
sand	33.2	38.3	21.1	38.8	19.6	36.7
s/p 1: 5	33.8	36.4	26.6	38.2	26.9	37.6
s/p 1:10	31.4	36.5	27.7	36.7	28.0	37.5
s/p 1:20	32.2	38.1	27.7	38.8	28.8	36.7
statistical evaluation						
lin. effect	n.s.	n.s.	+++	n.s.	+++	n.s.
quadr.effect	n.s.	+	+++	n.s.	+++	n.s.
peat moss/"frozen" sphagnum peat	34.2	37.5			29.9	37.1
	flower height in mm					
sand	44.7	48.5	40.6	48.1	41.7	47.2
s/p 1: 5	44.8	48.2	44.3	48.6	45.4	47.4
s/p 1:10	44.8	49.6	44.6	48.2	46.1	47.2
s/p 1:20	44.5	46.5	44.5	48.7	45.8	46.8
statistical evaluation						
lin. effect	n.s.	n.s.	+++	n.s.	+++	n.s.
quadr.effect	n.s.	n.s.	+++	n.s.	+++	n.s.
peat moss/"frozen" sphagnum peat	44.5	47.6			44.8	47.1

Table 9 - Liming of peat medium and total length and quality of flower in cm and mm, respectively

Forcing	Liming with $CaCO_3$ in kg/m^3							Stat. ev.
	0	2	4	6	8	10	12	LSD†
	pH-H_2O							
1972/1973	3.48	4.45	5.25	5.41	6.31	6.45	6.56	
1973/1974	3.57	4.53	5.39	6.12	6.33	6.51	6.61	
	pH-KCL							
1972/1973	2.72	3.92	4.82	4.90	6.08	6.22	6.31	
1973/1974	2.80	3.88	4.78	5.72	6.11	6.26	6.37	
	total length in cm							
1st forcing 1972	21.4	34.6	34.0	32.8	32.8	31.8	30.8	2.8
1st forcing 1973	14.0	37.5	42.3	36.5	36.8	37.0	37.3	3.1
3rd forcing 1972	16.3	29.5	28.7	27.6	29.2	28.4	28.9	6.4
3rd forcing 1973	24.5	37.7	37.3	37.3	37.8	37.9	38.0	2.6
	flower height in mm							
1st forcing 1972	41.4	44.3	44.8	44.3	43.1	43.8	42.0	1.5
1st forcing 1973	43.0	46.7	47.8	48.7	45.9	47.9	47.2	4.7
3rd forcing 1972	39.0	47.3	44.0	45.2	46.4	44.7	46.1	2.9
3rd forcing 1973	41.3	46.8	47.4	46.4	46.5	47.1	45.8	2.0

†LSD = least significant difference at P= 0.05

Table 10 - Liming of peat medium and flower blasting in percentages

Forcing	Liming with $CaCO_3$ in kg per m^3							Stat. ev.
	0	2	4	6	8	10	12	
1st forcing 1972	72	14	12	8	20	8	43	+
1st forcing 1973	100	23	12	25	48	27	32	++