

**Contract Report for the
Horticultural Development Council**

HDC PROJECT PC44a

**TO EVALUATE NEW HYDRANGEA
CULTIVARS FOR GROWTH, HABIT,
MARKETABILITY AND SHELF LIFE FOR MARKETING
FROM THE END OF FEBRUARY TO THE
END OF MARCH**

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January 1996

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FINAL REPORT (December 1995)

Project Number	PC44a
Title	To evaluate new Hydrangea cultivars for growth, habit, marketability and shelf-life for marketing from the end of February to the end of March.
Project leader	H M Kitchener, ADAS Huntingdon
Other staff	A Fuller, HRI Efford
Project Co-ordinator	C Benson, HDC Co-ordinator
Location of Project	Ivanda Nursery, Spalding Europa Nursery, Hadlow H Gimmler Ltd, New Milton Keston Nursery, Spalding HRI Efford
Date project commenced	April 1994
Date project completed	January 1996
Key Words	Lace cap Mop head Shelf-life Hydrangea

APPLICATION

The object of the project was to provide information on cultivars of Lace cap and Mop head Hydrangeas for the UK market grown under commercial conditions to assess their marketability and shelf life.

SUMMARY

The plants prior to forcing showed a good flower bud number for both Lace caps and Mop heads. Botrytis bud numbers were high for Fazem, Möve, Flieder, Paris and Cote d'Azur.

Both leaf buds and botrytis buds will reduce the final number of flowerheads.

The temperature at forcing influenced harvest date. Higher temperatures gave earlier harvesting. There was little difference in the mean number of flowering and bud shoots between the four sites for either Lace caps or Mop heads.

Flower or head size was little affected by temperatures, but plants were taller when grown cooler.

Although production practices produced different plants at marketing in terms of size and maturity, trends were apparent for varieties regardless of production conditions. A summary table is given on page 42 for plants from two nurseries assessed in shelf-life.

The varieties Berlin, New Friesdorf, Snow, Hermann Dienemann, Heinrichsberg, No 15 Blue and Blue Sky were considered as good quality plants at the end of shelf-life (and after a further observation at 35 days in shelf-life). All other varieties were considered average with poorest plants; Kardinal, Zaunknoig and Paris from Nursery One and the same varieties from Nursery Two plus the varieties Mucke, Fazem, Schneeball, Munchen, and Move although Paris, Zaunknoig and R Zwerg showed damage in transit at receipt which was reflected throughout shelf-life assessments.

INTRODUCTION

There has been an increase in the interest in new Lace cap and Mop head Hydrangea cultivars. These cultivars have been sold as a finished product in the UK by continental competitors. No previous UK trial had covered these cultivars for forcing for the UK market.

The work described here covers the production of plants from storage to forcing and harvest. It also indicates the results of shelf life assessment of Hydrangeas for the first time.

The plants were grown prior to forcing on Ivanda Nursery Spalding.

Although the tables indicate the colour of each cultivar when grown commercially, all were grown as 'pinks' to remove the variable of low pH and low phosphate etc required normally for the blue and white cultivars.

The commercial objective was to identify cultivars which would be suitable for the UK market which also had a short production period and long shelf life.

Lace caps are cultivars with bracts held on the circumference of the head. Bracts may be 1 or more deep but inside the head to the centre will be just flowers on the pedicels of the corymb.

Mop heads have bracts and flowers on each pedicel of the corymb.

ACTION POINTS FOR GROWERS

1. Of the new cultivars Blue sky and LK49 were the most vigorous cultivars prior to cool store.
2. The highest number of botrytis buds were seen on the cultivars Möve, Fasen, Rosalie and Zurich.
3. The cultivars Berlin, New Friesdorf, Snow, Hermann Dieneman, Heinrichsburg, No 15 Blue and Blue Sky gave the best shelf life.
4. Different production systems may affect shelf life as much as cultivar variation.
5. Newer cultivars may supersede the present ones.

MATERIALS AND METHODS

Plants were obtained from suppliers of material to the UK in week 22 year 1994.

Cultivars		Normal Colour	
Lace caps	Messalina	Pink	
	Mücke	Pink	
	Munchen	Pink	
	Zaunkonig	Pink	
	Fasen	Red	
	Kardinal	Red	
	Möve	Red	
	Snow	White	
	Blauling	Blue	
	Bläumeise	Blue	
	Bluesky	Blue	
	Mop heads	Berlin	Pink
		Flieder	Pink
Rosalia		Pink	
Roter Zwerg		Pink	
LK 49		Red	
New Friesdorf		Red	
Paris		Red	
Red Baron		Red	
Schneeball		White	
Cote d'Azur		Blue	
Heinrichsburg		Blue	
Hermann Dienemann		Blue	
No.15 Blue		Blue	
Zürich		Blue	

Plants for the trial were obtained from

Royal Eveleens BV, Hollyacre, Rampp

The authors of the report are grateful for these companies help in supplying plants.

CULTURAL DETAILS

Ivanda Nursery, Spalding

Prior to forcing

Plants potted	wk 22	Held under protection
Pinched 1	" 24	
Pinched 2	" 29	
Placed outside	" 32	Ambient temperature
Placed in store < 6°C	" 43	
Ex store	" 48	

Forcing commenced

		Ivanda Nursery Wk 1	Europa Nursery Wk2	Helmut Gimmler Ltd Wk2	Keston Nursery Wk1
		Started at 18° C			
Temperature	Day	12°C	21°C	18°C	16°C
	Night	12°C	19°C	18°C	16°C
	Vent	16°C	23°C	20°C	18°C
Harvest date		24 March	20 March	27 March	24 March

Alar was applied 1500 mg/l at H & H when required

EXPERIMENTAL DESIGN

2 replicates

Assessments

Prior to forcing:

15 December	Height No of Shoots No of Flower buds No of Leaf buds No of Botrytis buds
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At harvest	Height Width No Flower heads No Flower buds No Foliage Shoots Corymb diameter
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Shelf-life	Flower head number Flower head drop number Leaf drop number Quality score 3 plants each cultivar
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RESULTS

TABLE 1

Plants prior to forcing and after cool storage 15 December 1994.

Lace caps

Variety	Normal Colour	Height	No Shoots	No Flower Buds	Leaf Buds	Botrytis Buds
Messalina	Pink	8.1	6.3	5.2	1.6	0.3
Mücke	Pink	7.2	6.6	5.1	1.7	1.5
Munchen	Pink	5.4	4.7	8.1	0.8	0.4
Zaunkönig	Pink	8.3	5.3	7.2	2.4	0.3
Fasen	Red	9.8	6.6	5.6	1.9	2.2
Kardinal	Red	7.3	3.8	4.9	1.0	1.2
Möve	Red	9.0	6.6	5.7	1.2	2.4
Snow	White	8.9	7.3	7.2	1.6	0.0
Bläuling	Blue	7.4	7.0	6.6	2.3	0.5
Blaumeise	Blue	10.5	5.4	6.1	0.9	0.4
Bluesky	Blue	10.6	5.6	6.0	2.3	0.2
Mean		8.6	5.9	6.2	1.6	0.8

TABLE 2

Mop heads

Variety	Normal Colour	Height	No Shoots	No Flower Buds	Leaf Buds	Botrytis Buds
Berlin	Pink	8.0	10.9	5.7	2.1	0.5
Flieder	Pink	8.1	5.1	6.2	1.7	0.2
Rosalia	Pink	8.3	5.5	4.2	2.9	2.0
Roter Zwerg	Pink	7.3	6.4	5.3	3.2	1.6
K49	Red	9.4	6.3	6.8	1.1	0.0
New Friesdorf	Red	7.6	4.6	5.4	1.4	1.4
Paris	Red	5.8	4.1	4.8	2.4	0.9
Red Baron	Red	8.5	6.9	7.0	1.8	0.8
Scheeball	White	9.1	8.0	9.3	1.1	0.8
Cote D Azur	Blue	6.8	4.2	4.6	2.1	0.5
Heinrichsburg	Blue	5.6	4.5	4.7	1.3	0.8
Hermann	Blue	8.4	4.8	6.3	1.7	1.3
Dienemann						
No 15 Blue	Blue	7.1	4.7	5.4	1.9	0.5
Zürich	Blue	6.8	7.0	6.2	1.9	2.0
Mean		7.6	5.9	5.9	1.9	1.0

The total number of buds may be underestimated as some buds are below the compost surface at the lowest node on the original cutting and therefore not visible.

TABLES 1 AND 2 Summary of growing prior to forcing and storage

Tables 1 and 2 indicate the height, number of shoots and buds with and without flowers on the plants prior to forcing after they come out of store on the 15th December of Lace caps and Mop heads respectively.

There is little difference in the mean height of the plants, number of flower buds, leaf buds and botrytis buds between Lace caps and Mop head Hydrangea's.

Heights within each group vary and Munchen at 5.4 cm was half the size of Bluesky a more vigorous cultivar at 10.6 with Lace caps and in the Mop heads, Heinrichsburg was the shortest cultivar, whilst LK 49 is the tallest.

The number of shoots which bore flower buds had little effect on flower bud number. The number of flower buds were counted as those invisible. The flower and leaf bud number is also similar between Lace caps and Mop heads.

The incidence of Botrytis buds was very low, although Möve and Fasen in the Lace caps had the highest number Botrytis buds in the Mop heads Rosalie and Zürich were the highest number of botrytis buds. Botrytis buds do not normally grow away to form flower heads or leaf shoots. The levels may be affected by season and/or storage conditions.

At this stage of growth there was little green colour on the plants apart from leaf curl at bud breaking. No bud burst or premature budding was noticed on any of the cultivars.

TABLE 1 - LACE CAPS/VARIETY 15 DECEMBER 1994

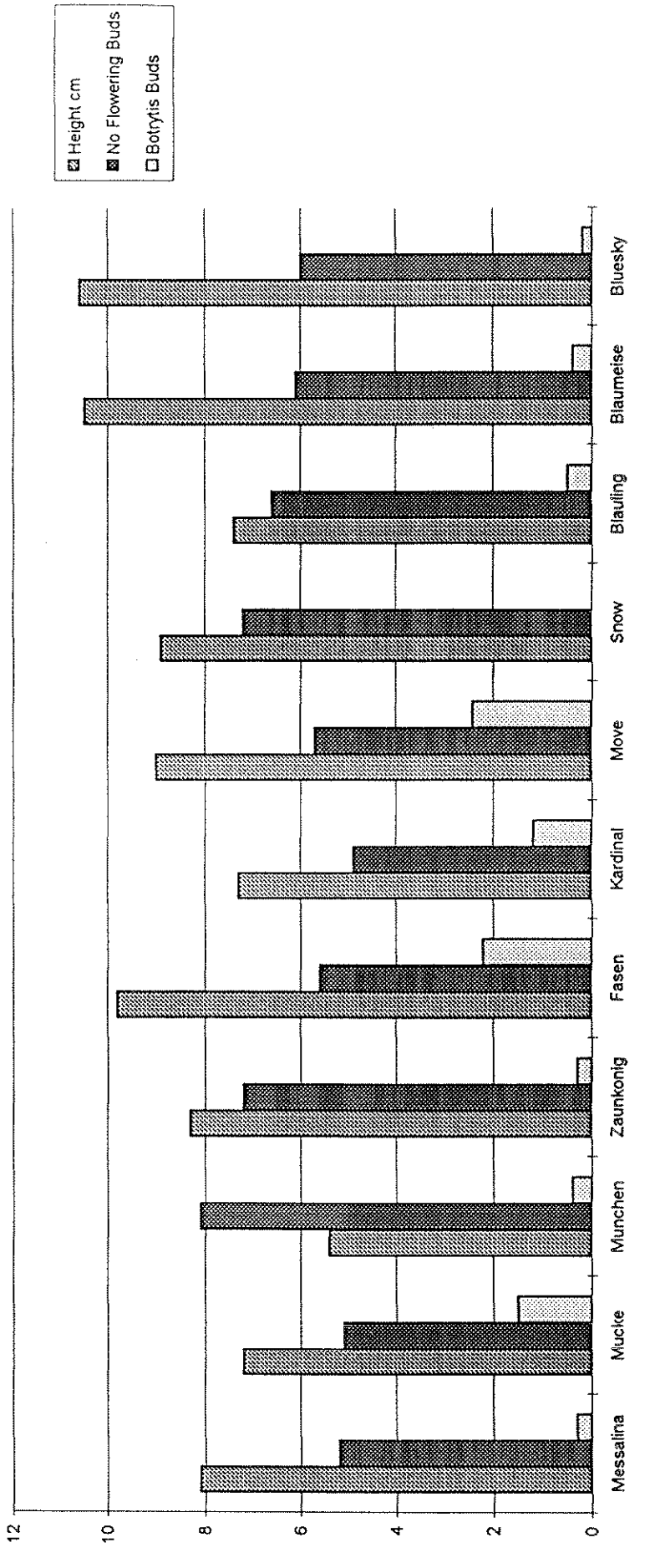


TABLE 2 - MOP HEADS/VARIETY 15 DECEMBER 1994

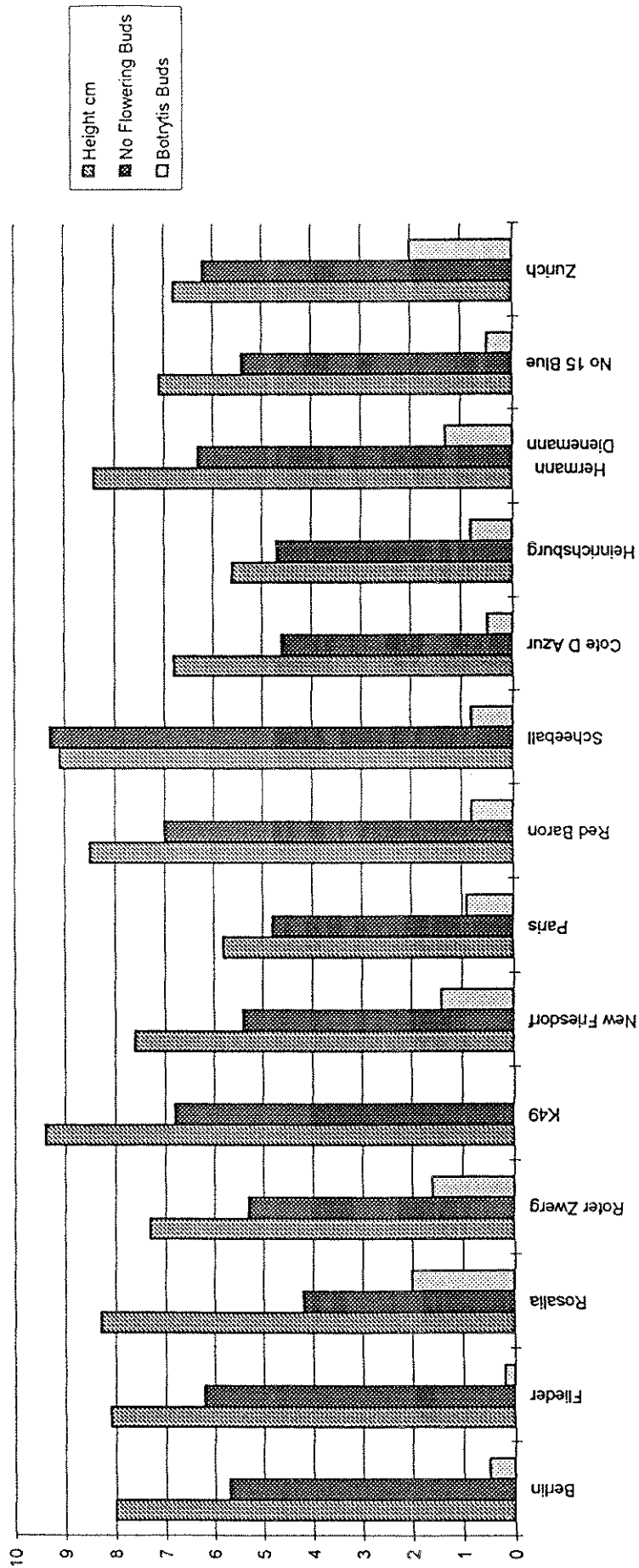


TABLE 3

Results

Plant size, number of flower heads and head size, Ivanda Nur. 24 March in cms.

Lace cap Varieties

Variety	Normal Colour	Height	Width	No Flower Heads	No Flower Shoots in Bud	Non Foliage Shoot	Corymb dia cm
Messalina	Pink	36.8	42.6	2.6	1.8	0.2	15.2
Mücke	Pink	33.8	37.6	3.2	0.0	0.2	18.0
Munchen	Pink	36.6	41.8	0.2	4.8	0.0	12.0
Zaunkonig	Pink	42.2	44.6	3.0	1.8	0.0	18.9
Fasen	Red	39.0	41.8	3.0	1.2	0.4	17.2
Kardinal	Red	36.6	39.2	1.4	2.8	0.0	15.6
Möve	Red	44.2	44.0	2.6	1.2	0.0	18.6
Bläuling	Blue	35.4	41.2	2.6	1.6	0.2	15.6
Blaumeise	Blue	41.2	46.2	2.0	1.8	0.0	16.8
Bluesky	Blue	36.4	42.4	2.4	1.4	0.2	15.2
Mean		34.7	38.3	2.1	1.8	0.1	14.8

TABLE 4

Plant size, number of flower heads and head size, Ivanda Nur. 24 March in cms.

Mop heads

Variety	Normal Colour	Height	Width	No Flower Heads	No Flower Shoots in Bud	Non Foliage Shoot	Corymb dia cm
Berlin	Pink	41.8	40.2	1.2	2.6	0.2	15.8
Flieder	Pink	46.4	46.0	1.2	3.8	0.2	14.4
Rosalia	Pink	44.2	42.4	3.0	1.6	0.0	18.4
Roter Zwerg	Pink	33.6	38.8	2.0	2.0	0.6	14.0
LK 49	Red	33.8	34.2	3.2	2.4	0.0	13.2
New Friesdorf	Red	42.8	42.6	2.2	2.6	0.2	16.6
Paris	Red	27.2	34.4	1.8	1.8	0.8	14.6
Red Baron	Red	37.2	40.6	2.8	3.8	0.0	19.8
Schneeball	White	37.2	42.0	3.8	2.0	0.8	16.8
Cote D Azur	Blue	39.2	35.8	0.6	2.8	0.0	10.0
Heinrichsburg	Blue	47.3	44.3	2.0	2.3	0.0	19.3
Hermann	Blue	40.0	34.0	2.2	1.0	0.6	20.2
Dienemann							
No 15 Blue	Blue	42.6	43.8	2.5	3.23	0.5	17.1
Zürich	Blue	37.6	40.8	2.6	2.6	0.8	17.0
Mean		39.4	40.0	2.2	2.5	0.3	16.2

TABLE 3 - LACE CAPS/VARIETY IVANDA NURSERY24 MARCH 1994

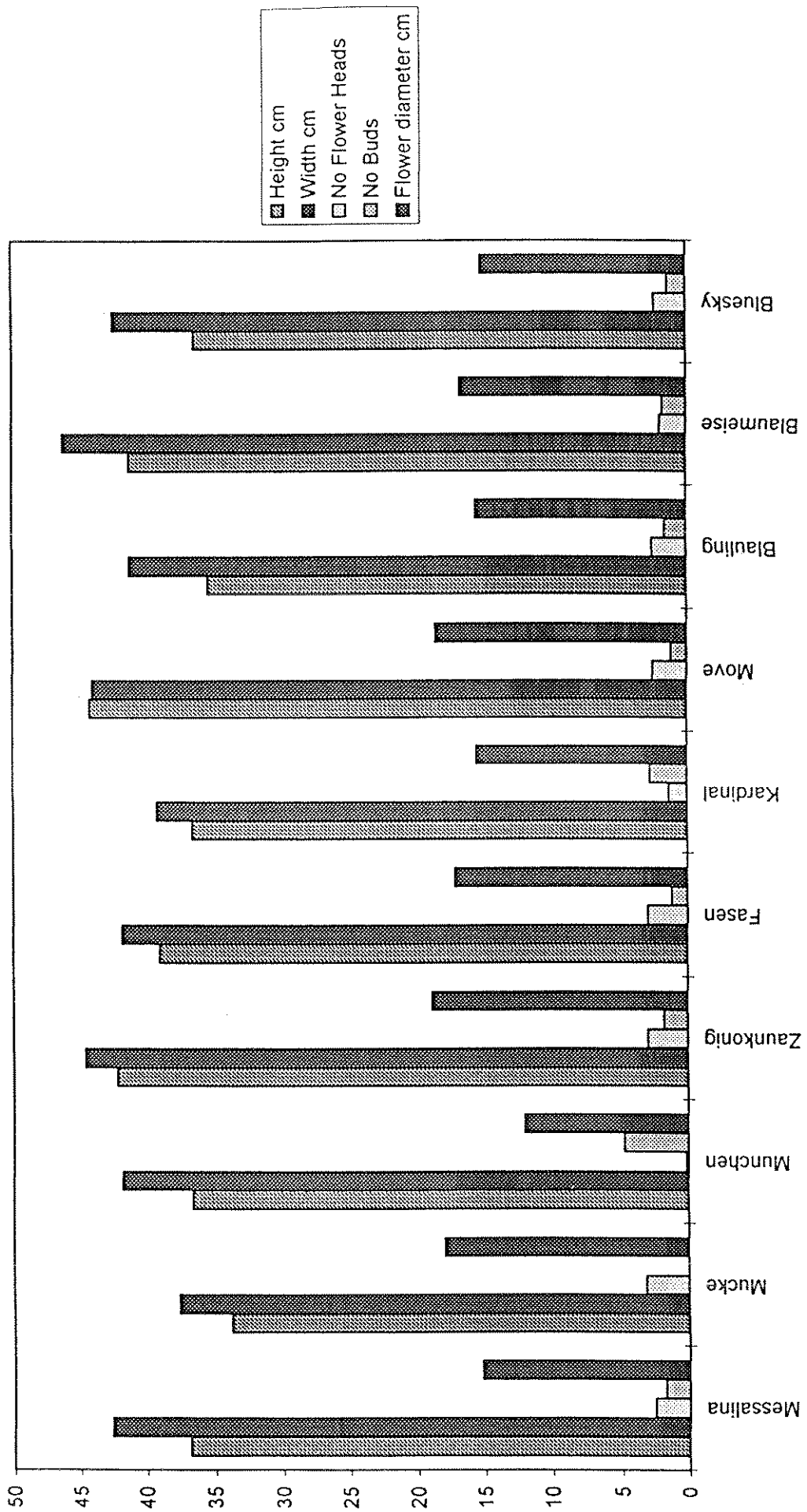


TABLE 4 - MOP HEADS VARIETY IVANDA NURSERY 24 MARCH 1995

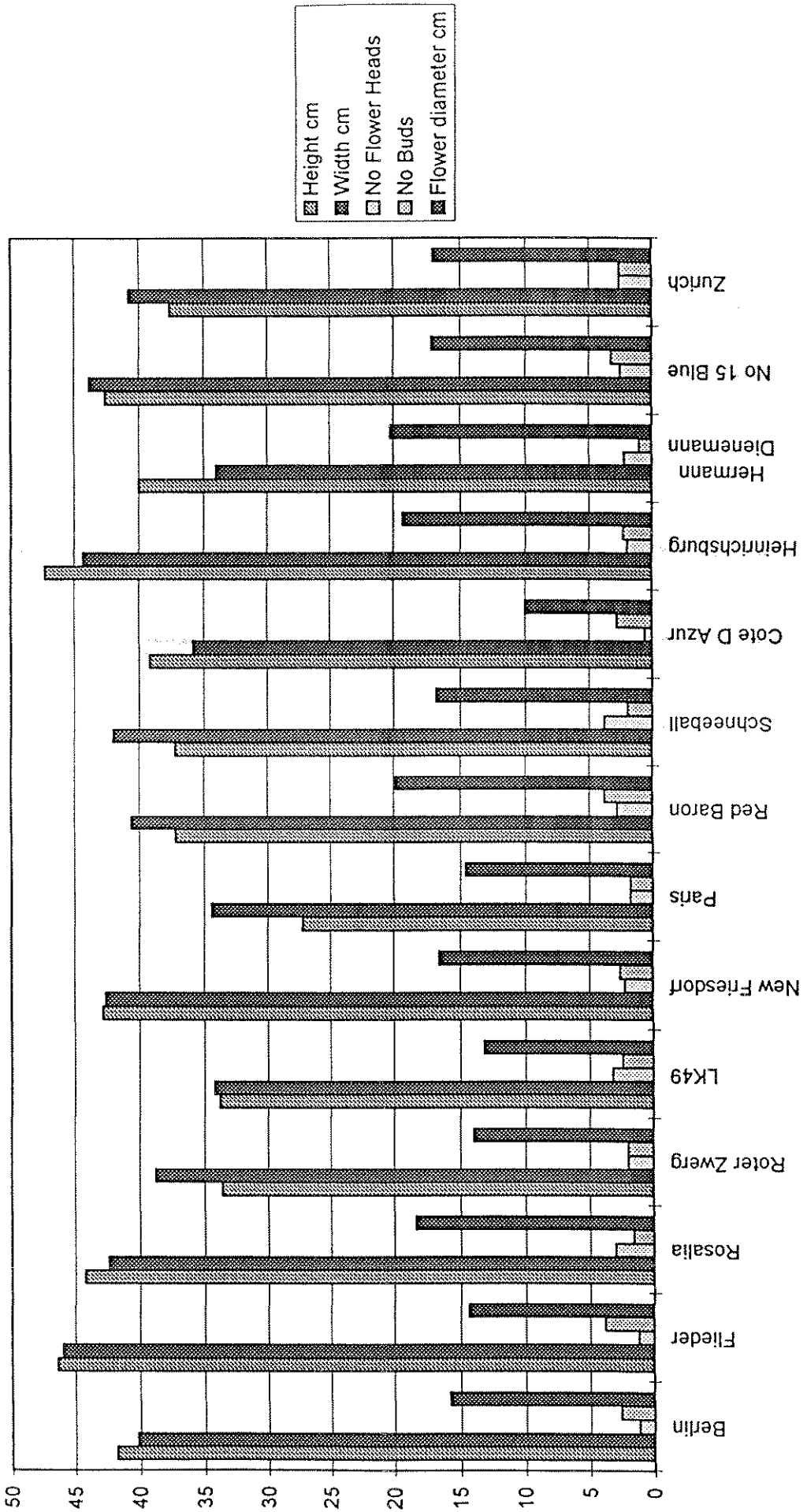


TABLE 5

Results

Plant size, number of flower head number and head size, Europa Nur. 20 March in cms.

Lace Cap Varieties

Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower dia cm
Messalina	Pink	27.8	40.6	3.2	1.4	0.0	16.7
Mücke	Pink	27.2	35.6	3.0	0.6	0.2	15.6
Munchen	Pink	27.6	43.0	3.4	2.0	0.0	12.9
Zaunkönig	Pink	not	grown	on this	nursery		
Fasen	Red	36.7	43.8	4.4	0.2	0.0	16.1
Kardinal	Red	32.0	40.0	2.2	0.6	0.0	14.8
Möve	Red	40.2	54.4	4.2	0.6	0.2	20.4
Snow	White	25.7	40.0	5.4	0.8	0.0	15.0
Bläuling	Blue	28.0	44.8	2.4	2.0	0.2	15.9
Blaumeise	Blue	33.1	46.3	2.6	0.6	0.0	16.3
Bluesky	Blue	27.9	43.0	3.4	0.2	0.0	17.2
Mean		30.6	43.2	3.4	0.9	0.1	16.1

TABLE 6

Plant size, number of flower heads number and head size, Europa Nur. 20 March in cms.

Mop heads Varieties

Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower dia cm
Berlin	Pink	32.2	43.8	2.2	2.6	0.0	16.3
Flieder	Pink	36.4	46.6	3.8	1.6	0.0	15.0
Rosalia	Pink	37.2	41.4	2.4	0.8	0.0	18.2
Roter Zwerg	Pink	27.2	39.8	4.6	0.8	1.0	12.6
LK49	Red	26.6	39.4	5.2	0.0	0.6	14.6
New Friesdorf	Red	31.6	37.6	4.0	0.6	0.6	16.0
Paris	Red	20.2	27.2	1.8	0.8	0.8	12.0
Schneeball	White	30.0	44.8	5.2	0.4	0.6	15.2
Cote d Azur	Blue	29.3	37.8	1.6	1.4	0.0	13.0
Hermann	Blue	32.6	38.4	1.8	2.8	0.2	16.3
Dienemann							
Zürich	Blue	24.0	36.4	5.2	0.6	0.2	15.0
Mean		29.8	39.4	3.4	1.1	0.4	15.0

TABLE 5 - LACE CAP/VARIETY EUROPA NURSERY 20 MARCH 1995

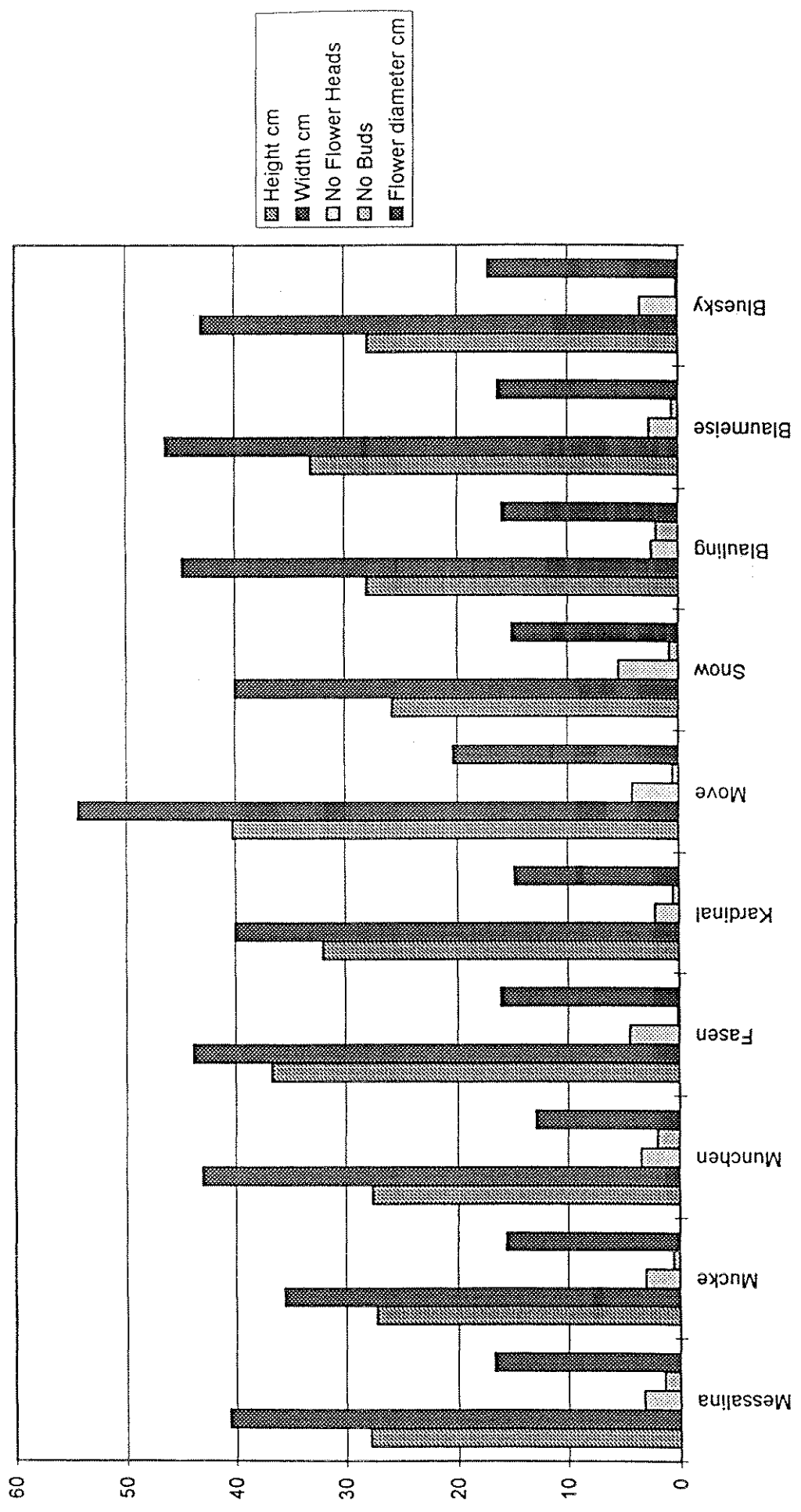


TABLE 6 - MOP HEADSVARIETY EUROPA NURSERY 20 MARCH 1995

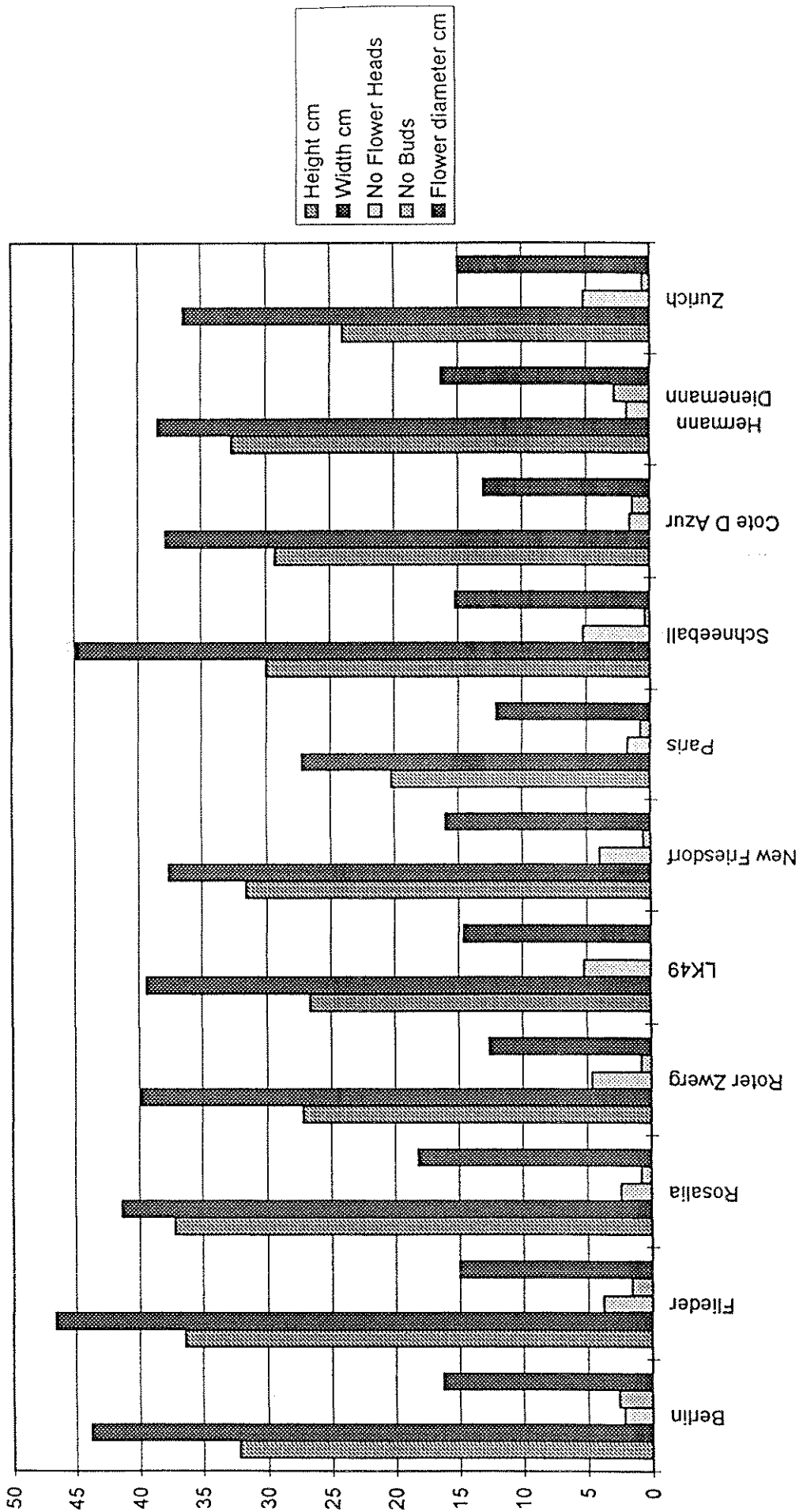


TABLE 7

Results

Plant size, number of flower heads and head size, H Gimmler Ltd., 27 March in cms

<u>Lace cap Varieties</u>							
Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower dia cm
Messalina	Pink	27.8	40.4	1.4	3.2	0.2	15.6
Mücke	Pink	25.4	36.8	1.2	2.0	0.2	13.6
Munchen	Pink	23.0	40.8	1.2	3.2	0.2	8.8
Zaunkonig	Pink	33.2	42.6	4.2	0.6	0.2	18.8
Fasen	Red	29.8	42.6	2.0	3.0	0.2	13.2
Kardinal	Red	25.8	37.0	0.6	3.4	0.4	13.4
Möve	Red	30.2	46.8	1.8	2.0	1.2	15.8
Snow	White	24.8	36.0	2.2	1.1	0.8	13.0
Bläuling	Blue	27.0	41.4	3.0	2.4	0.6	14.0
Blaumeise	Blue	28.2	44.2	1.4	1.8	0.0	14.0
Mean		27.5	40.9	1.9	2.3	0.4	14.0

TABLE 8

Plant size, number of flower heads and head size, H Gimmler Ltd., 27 March in cms

<u>Mop head Varieties</u>							
Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower Dia cm
Berlin	Pink	33.4	44.0	1.0	3.6	0.2	11.0
Flieder	Pink	37.0	42.8	0.0	5.6	0.0	14.4
Rosalia	Pink	31.8	44.6	2.4	2.6	0.4	17.6
Roter Zwerg	Pink	26.4	39.6	2.2	2.4	0.6	13.2
New Friesdorf	Red	29.2	44.2	1.6	2.4	1.0	16.6
Paris	Red	22.5	34.5	0.0	4.3	0.0	2.5
Schneeball	White	28.6	42.2	1.6	4.0	1.0	12.8
Cote d'Azur	Blue	29.4	34.6	0.0	3.8	0.0	0.0
Hermann	Blue	28.6	40.0	1.8	1.4	1.0	12.8
Dienemann							
No 15 Blue	Blue	35.0	43.2	1.2	3.0	0.0	17.8
Zürich	Blue	24.8	37.2	0.2	3.8	0.0	14.0
Mean		29.7	40.6	1.1	3.4	0.4	12.1

TABLE 7 - LACE CAPS VARIETY HELMUT GIMMLER LTD 27 MARCH 1995

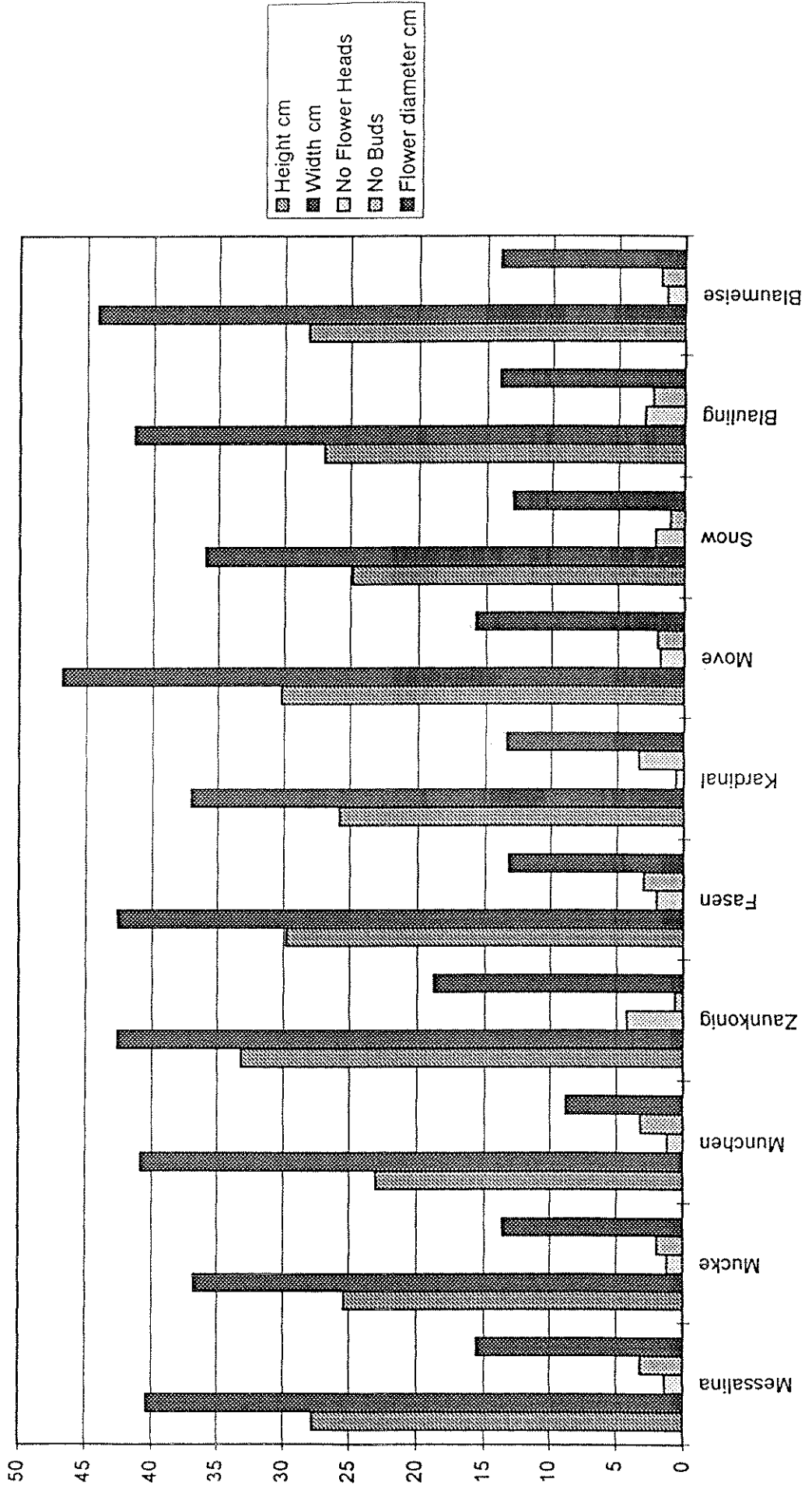


TABLE 8 - MOP HEADS/VARIETY HELMUT GIMMLER 27 MARCH 1995

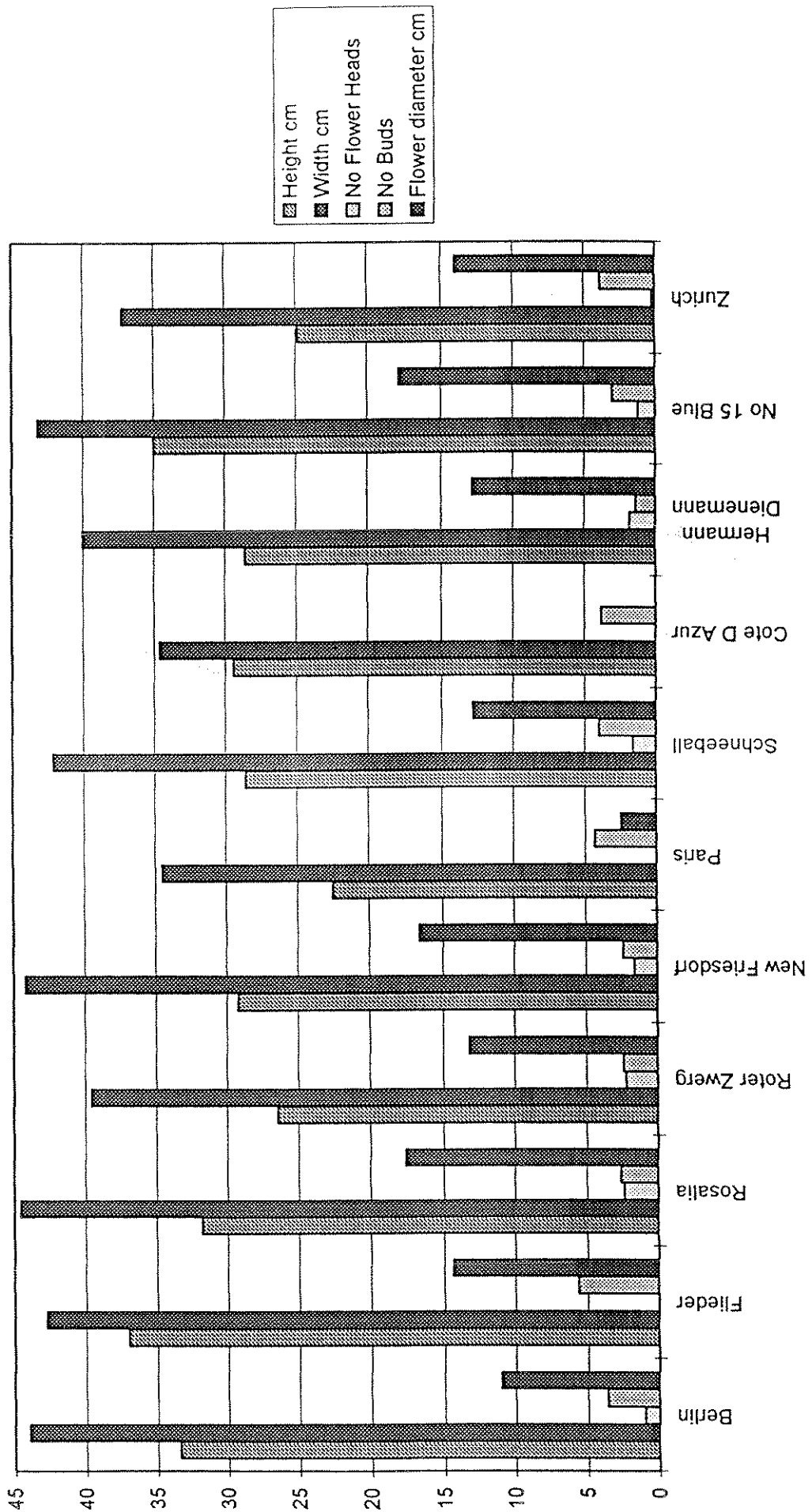


TABLE 9

Results

Plant size, number of flower heads and head size, Keston Nursery 24 March in cms.

Lace caps

Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower Dia cm
Messalina	Pink	29.0	44.8	2.6	1.4	0.4	17.2
Mücke	Pink	27.2	38.4	3.2	0.0	0.0	18.4
Munchen	Pink	29.4	45.2	2.8	1.0	0.2	16.4
Zaunkönig	Pink	33.0	48.4	4.2	0.6	0.6	16.8
Fasen	Red	36.0	43.3	3.6	0.2	0.4	16.8
Kardinal	Red	31.4	37.4	3.2	0.4	0.0	15.6
Möve	Red	32.8	48.4	4.4	0.2	0.4	17.8
Snow	White	28.2	45.8	3.2	3.0	0.0	18.6
Bläuling	Blue	30.2	44.6	3.2	1.4	0.0	16.8
Blaumeise	Blue	31.6	46.4	2.6	1.0	0.2	15.8
Bluesky	Blue	30.2	50.4	2.2	1.0	1.0	18.4
Mean		30.8	44.8	3.2	1.0	0.3	17.1

TABLE 10

Plant size, number of flower heads and head size, Keston Nursery 24 March in cms.

Mop heads

Variety	Normal Colour	Height	Width	No Flower Heads	No Buds	Non Flower Shoot	Flower Dia cm
Berlin	Pink	31.2	41.8	2.4	0.8	0.20	15.4
Flieder	Pink	38.2	44.2	3.6	0.6	0.0	16.3
Rosalie	Pink	35.4	42.6	3.4	0.2	0.8	18.2
Roter Zwerg	Pink	26.8	39.8	4.0	0.8	2.2	12.8
L K 49	Red	26.0	39.2	3.8	1.8	0.0	15.6
New Friesdorf	Red	31.8	47.6	2.4	1.6	0.6	17.0
Paris	Red	19.0	30.8	2.4	1.0	0.4	13.2
Red Baron	Red	29.0	48.8	2.8	3.3	0.2	14.5
Schneeball	White	27.2	47.0	4.4	1.2	1.2	16.4
Cote d'Azur	Blue	24.8	35.6	2.2	1.4	0.4	13.8
Heinrichsburg	Blue	37.4	43.8	2.8	0.8	0.0	18.6
Hermann	Blue	22.8	34.0	2.8	0.6	0.4	13.0
Dienemann							
No 15 Blue	Blue	34.6	44.4	2.2	1.4	0.4	16.6
Zürich	Blue	26.4	41.6	3.0	1.4	0.4	16.6
Mean		29.3	41.5	3.0	1.2	0.5	15.6

TABLE 9 - LACE CAPS/VARIETY KESTON NURSERY 24 MARCH 1995

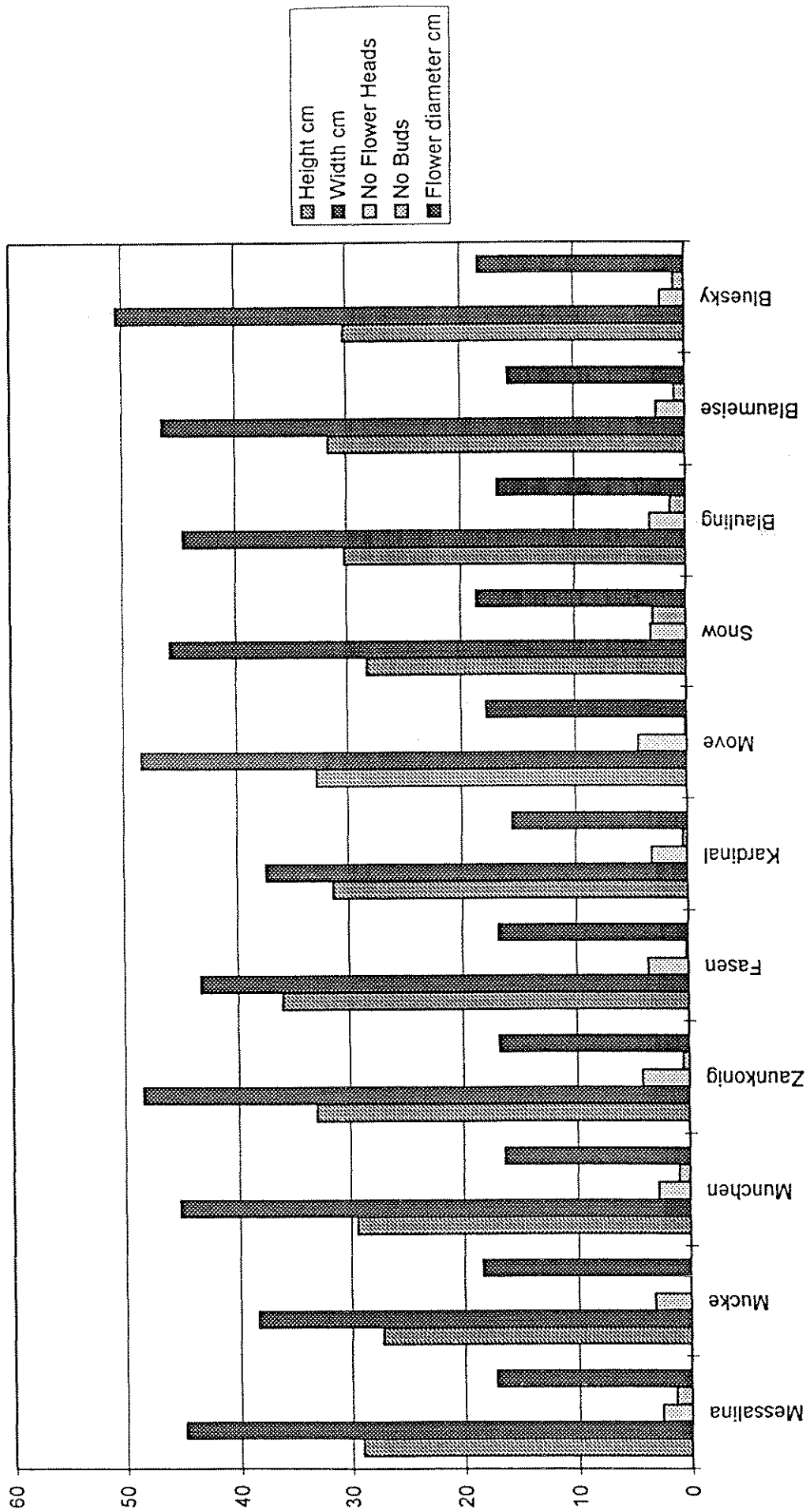
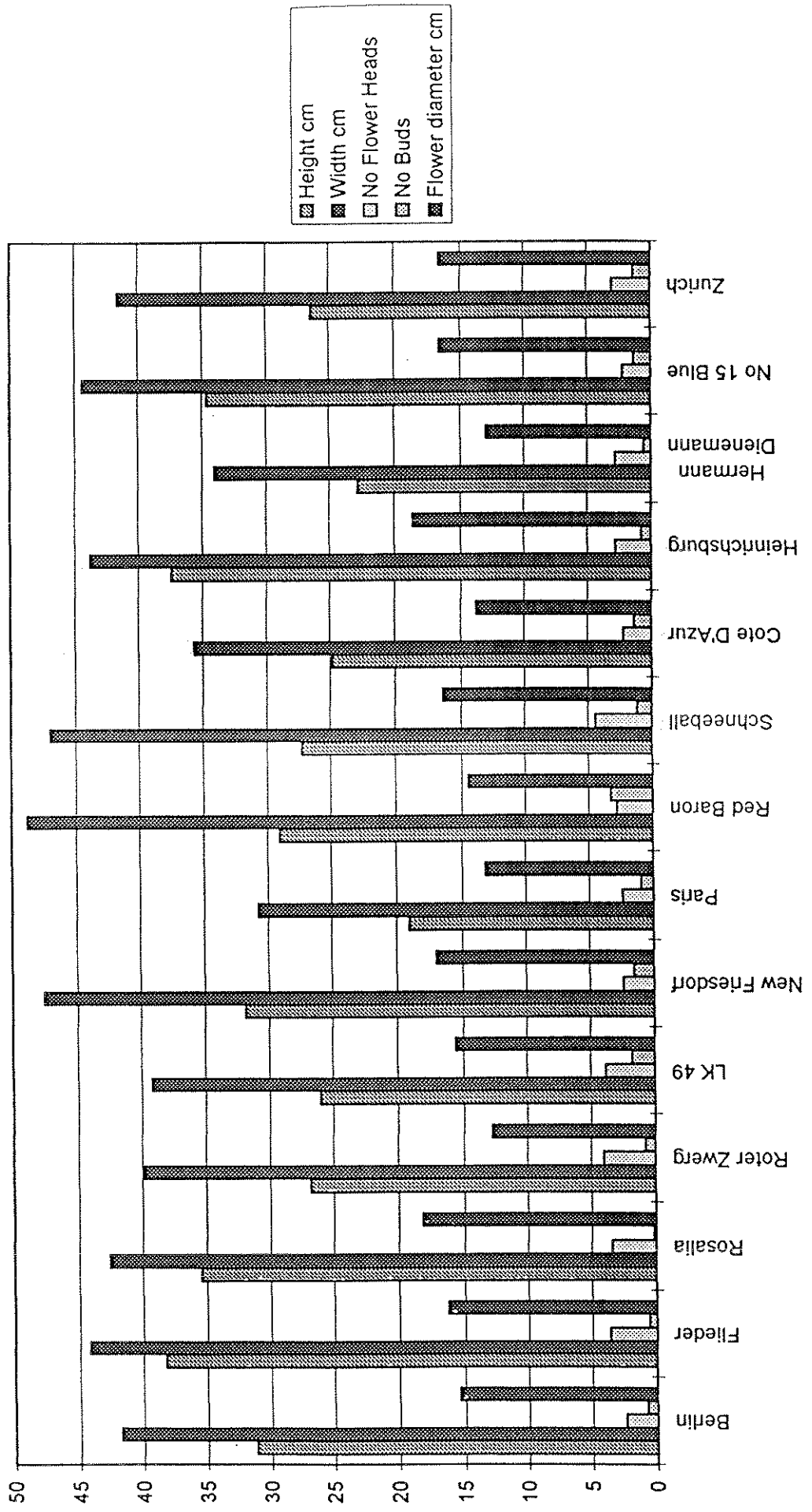


TABLE 10 - MOP HEADS/VARIETY KESTON NURSERY 24 MARCH 1995



Tables 3 to 10 Summary of forcing

Tables 3 to 10 and graphs cover the harvest dates 20 March-6 April from the 4 nurseries which forced the plants in 1995.

The four nurseries had similar harvest dates from the crops.

The two nurseries growing hydrangeas at the warmest temperatures, Europa Nursery and Keston Nursery, show similar height and width of plants to both Lace caps and Mop heads, whilst H Gimmler Ltd shows slightly smaller Lace cap varieties, probably due to lower temperatures during production and the use of plant growth regulator.

The number of flowering shoots added to that of buds were similar on each nursery and approximately 4.2 to 4.4. Flower diameter was similar on three nurseries, Ivanda Nursery, Europa Nursery and Keston Nursery. Ivanda had the coolest finishing regime whereas at H Gimmler Ltd., cooler growing may have restricted its size or the head were small due to the plants being less advanced in growth.

All hydrangeas met crop specification and number of flowers, ie. 4 to 5 heads per pot.

CULTIVAR FEATURES (AT HARVEST)

LACE CAPS

Messalina

Bracts pink heart shaped and placed mainly round the outside of the head. Some central development but these bracts are lighter in colour. There was some variability in head definition from Lace cap type to near Mop head, leaves oval and serrated.

Mücke

Bracts pink, serrated shell shape, flowering in bracts well spaced around head, plants sturdy. Leaves oval with small serration.

Munchen

Bracts pink with creamy streak, flowers beginning to form open heads. Bracts held unevenly on head, form tending to be weak. Foliage oval, serrated. Slight delay in flowering possible 11cm product.

Zaunkonig

Pink, bracts circular, even, no flower fall, heads dome shaped. Some unevenness of colour of bracts between heads. Leaves oval serrated.

Fasen

Deep cerise, heart shaped bracts, some development of bracts in the centre of the head. Flower fall, leaves oval and serrated. Could be a 11cm product.

Kardinal

Bracts cherry pink. Development uneven, some flower fall, sturdy, no need to stake. Leaves oval and serrated. Possibly 11cm product.

Möve

Cerise pink bracts which are heart shaped but not covering completely the outside the circumference of the head, flower drop. Leaves oval, serrated, stems weak needs staking.

Snow

Bracts round with a tendency to develop within the centre of the head. Leaves oval, smooth, minor serration, stands well could be 11 cm product.

Bläuling

Bracts light pink, tendency for centre bracts/florets to develop and could fill the whole head. Individual bracts rounded, leaves oval, serrated. Possible 11cm product.

Blaumeise

Deep pink, bracts all around outside of flower head. Pollen drop, bracts on long pedicel, heart shaped. Leaves oval, serrated. All shoots carrying flowers.

Bluesky

Bracts pink/purple. Bracts heart shaped of good size. Bracts held on the outer circumference of head, uniform. Leaves oval, serrated.

PLANT CULTURAL FEATURES (AT HARVEST)

MOP HEADS

Berlin

Bracts pink, heart shaped. Head dome shaped, some variation ie. 14 days between first flower and bud development. Leaves oval, serrated. Growth vigourous.

Flieder

Bracts light pink/purple, cupped with a marbled effect. Bract size means the head is only half the size of normal. Leaves oval, slight serration. Heads even and generally marketable. Stems weak and needs staking. Lilac in colour.

Rosalia

Bracts shell pink, delicate, colour deepens with age. Bracts appear to increase in size and enlarge at maturity. Form, upright habit. Heads large, foliage oval, serrated, stands well.

Rote Zwerg

Bracts deep pink, serrated, rippled, low number of bracts and flowers per head. Heads dome shaped. Flower fall. Leaves oval, serrated. Heads small and compact. A 11-12cm product.

LK 49

Brick red bracts, young bracts lighter in colour to white, then colour. Heads small, good shape. Bracts spade shaped, little or no flower drop. Leaves oval. 11-12cm product.

Paris

Bracts deep cerise to red. Small, poor in trial. Possible virus in variety. Not good. 11cm product in this trial.

Red Baron

Deep cerise red. Individual bracts serrated. Heart shaped. Heads goods shape, domed. Tendency to turn green as they age. Plants sturdy. Leaves oval, serrated, attractive foliage. 11-12- 13cm product.

Schnee-ball

Bracts dull pink. Spade shaped. Heads floppy. Leaves oval serrated. Needs support. Untidy appearance but high number of heads mainly flowering at the same time.

Cote d Azur

Bracts dull pink, heart shaped. Foliage oval crinkled serrated, upright. Plants tendency to be small.

Hermann Dienemann

Bracts pink, small, heads dome shaped. Little or no flower form. Stems stiff and support may not be necessary. Leaves oval, serrated, but heads and shoots appear uneven.

New Friesdorf

Rose red bracts, head domed. Bracts generally even. Individual bracts heart shaped. Leaves oval, serrated.

Hienrichsburg

Bracts pink rose, soft colour, rounded. Flower heads upright, although a little loose. Leaves oval, serrated.

No 15 Blue

Bracts deep pink, serrated. Heads good, round, held well. Leaves oval, slightly serrated.

Zürich

Bracts deep rose pink, small with white flecks. Heads small, held on loose short stems. Leaves oval, serrated.

Harvest Dates

Europa Nursery. All Lace caps apart from Muchen and Cote d Azur were marketable on the 20 March. The latter needed 7 to 10 days more before marketing.

At Ivanda Nursery, on 24 March, Kardinal, Mücke, Messalina, Munchen, Cote d Azur all Lace caps, Berlin New Friesdorf and Zürich required a further 5 to 10 days to full bract development.

Keston Nur all cultivars were marketable on 24 March.

H Gimmler Ltd on 27 March, most cultivars could have been given 5-10 days to full bract development.

HRI EFFORD - SHELF-LIFE EVALUATION

Method

Plants from each cultivar, which had met market specifications, from two commercial holdings were evaluated in shelf-life at HRI Efford.

Nursery One

Mr Gary Shorland
Helmut Gimmler Ltd
Gore Road
New Milton
Hants

Nursery Two

Mr Clive Benson
Ivanda Nursery
Monkshouse Lane
Spalding
Lincs

After final records were completed (at marketing), 3 plants of each cultivar were selected for shelf-life.

Plants from Nursery One, 21 cultivars, were placed into trays (6 per tray), not sleeved, and immediately despatched to HRI Efford. Plants upon receipt were placed directly into shelf-life and watered from below by hand and thereafter as necessary. First records were taken upon receipt.

Plants from Nursery Two, 23 cultivars, were sleeved (perforated polythene sleeve) and boxed, 6 per box. Plants were transported for a 48 hr period in an uncontrolled environment. Upon receipt at HRI Efford, plants were taken out of the boxes and placed into shelf-life. Plants were immediately watered from below by hand and thereafter as necessary. Plants remained sleeved for a further 5 days. On the sixth day, plants were unsleeved and first records taken.

Shelf-life environment

The simulated shelf-life environment was controlled to achieve minimum temperature 18°C day/night, not rising above 22°C. Relative humidity fluctuated between 60-70%. Strip lighting provided 1000 lux light level at plant canopy. Lighting period was from 06.00 hrs until 18.00 hrs, 12 hours.

Assessments

Plants were recorded upon receipt (except Nursery Two where plants had first records immediately after sleeve removal), and at 7, 14 and 21 days in shelf-life.

Records included:

Flower head number.

Flower head drop number.

Leaf drop number.

Quality score.

Photographs as appropriate.

Results

Results for each cultivar/nursery are presented in graphical form on pages 43 to 84, and further observations for each cultivar are recorded on the following pages.

N.B. No records of flower head drop number were taken as *complete* head drop did not occur for any cultivar.

Discussion

All plants received were in good condition, with the exception of three varieties, Zaunknoig, Paris and R. Zwerg from Nursery Two, which upon receipt showed signs of transit damage, mostly flower/petal browning thought to be caused by abrasion and/or temperature.

Plants received from Nursery One were not as 'mature' as those from Nursery Two. Flower size and flower colour were reduced in comparison, and plants were generally smaller although all plants from Nursery Two were staked and tied giving the appearance of larger plants.

Plants which entered shelf-life 'immature' did not develop as large or as well coloured flower heads, as plants which were in full flower at the start of shelf-life.

Major factors causing plant deterioration of quality were: flower colour loss and bracts/petals turning green/brown; Lace cap flower heads not opening properly; few bracts on Mop head varieties; complete flower head decay (but not drop). Although leaf drop and leaf yellowing were apparent these factors were not seen as important as the deterioration of flowers and overall plant appearance.

NURSERY ONE - PLANT OBSERVATIONS IN SHELF-LIFE

LACE CAPS

Messalina

Attractive full head Lace cap - distinct darker purple veins in bracts - open, small/medium size holding colour fairly well - some bract edge browning and greening after 3 weeks. Medium sized plant - foliage showing edge chlorosis on lower leaves. Average/poor.

Mücke

Small plant, leathery looking leaves. About 8-12 outer bracts open - pretty pink holding colour well, but buds in centre not opening properly. Some lower leaf yellowing. Average/poor.

Munchen

Good 20-25 outer bracts open with many buds in the centre, however these are going brown and not opening properly. Some of the younger shoots are fine, buds are clean but not open. Main heads, the bract edge is fading and turning brown. Foliage is good. Some slight yellowing on lower leaves with odd leaf dropping. Bract colour could be better but plant habit good. Overall - average/poor. No flowers present at end of shelf-life - all buds shrivelled and fallen off.

Zaunknoig

Pretty flower - good colour at receipt. Slight purpling, but little browning on flowers with few medium/large open bracts (8-10) surrounding buds which are not opening properly in centre. foliage good - no yellowing but canopy is a little sparse. Good shape and level heads. Very little colour towards end of shelf-life and bracts all brown. Poor.

Kardinal

Many buds in centre are turning brown looking unsightly, and some total heads are rotting - botrytis infection. Flower colour is good - 12-16 medium/large bracts on each head. Smaller plant habit, with good shape and size.. Some leaf edge chlorosis on lower leaves. Overall poor, brown buds let it down.

Möve

Pale colour small number of medium outer bracts (8-10) - petal edge browning apparent and overall heads look sparse. Bud drop apparent from centre. Foliage poor - sparse - with lower leaf drop. Average/poor.

Snow

Very good colour - snow white and very large heads which still look excellent. Fairly small height plant - with large diameter. Bract deterioration - some greening. Majority of inner buds are opening to full head - flat top (these plants were more mature when entering SL). Some later shoots are higher than the flower heads. Good foliage, no yellowing or drop. Good.

Blauling

Pale pink, greater number of open bracts which tend to hide centre buds which are browning and falling off. There is some colour loss and odd large green shoots detract from appearance. Some petal edge browning. Lower foliage showing edge chlorosis. Average. Visible new shoots present.

Bläumeise

Bigger plant generally than Munchen, larger leaf and lower leaves turning 'necrotic' (purple patches turning brown.) Bract colour good, large bracts, but only 10-12 per head with inner buds browning, randomly across head. The bud petals tend to turn brown and fall off revealing stamens underneath, ie. petals do not open properly. Overall average/poor.

MOP HEADS

Berlin

Good shape plants, large full heads - 3/4 per plant. Colour of flowers beginning to fade, darker in centre and browning on flower edge with loss of colour. More obvious lower leaf yellowing and drop. Later heads not developing colour. Although colour faded towards end of shelf-life, overall plant quality good.

Fleider

Untidy, too heavy plant. Lower foliage paling . Average/poor.

Rosalia

Similar plant size/habit to Berlin - good size heads. Petal tip/edge browning more obvious. Younger buds remain paler in colour/green. Plants a little top heavy. Foliage remained good - only 1 plant with some leaf drop. Average.

Roter Zwerg

Large bract size, colour good, bright and rounded shape heads. All fully developed. 3-4 heads per plant. Some browning/darkening of the older flowers. Few lower leaves yellowing. Average/Good.

New Friesdorf

Holding colour well, little browning. Medium size. All heads are at the same open stage - middle stamens opening okay. Dark leaf colour with some lower leaf yellowing. Flower Heads are showing their `age' towards end but colour and overall plant quality good.

Paris

Plant habit is small and plants were not mature when they entered shelf-life, therefore colour has not developed properly. About 3-5 heads per plant,, small size. No leaf yellowing or drop - fairly hard looking/dark foliage. Poor.

Schneeball

Colour not good - washed out and unattractive. Some later developing heads are paler not developing colour properly. Head size variable. No petal browning. Leaf colour ok/good. Average.

Cote D'Azur

Upright habit. About 10-12 outer medium bracts - petals curling upwards - not opening fully. Buds in centre browning and not opening. Sparse looking. Some lower leaf yellowing. Average.

Hermann Dienemann

Medium size heads - good shape and colour holding well. Some brown patches/colour loss developing on petals. Fairly small plant habit - well proportioned. Spiky/serrated leaf edge - attractive. Good healthy clean foliage - little/no leaf yellowing or drop. Good.

No. 15 Blue

Large plants - with 4 good heads each - good shape, full, and little browning. Some lower leaf yellowing but overall Good.

Zurich

Habit is poor, misshapen, smaller heads not opening properly and petals remain green. Small sized plant with large leaves. Head shape and size is good. Heads which are open maintained colour well -slight tip browning to petals. (Lower leaves show necrotic patches/purpling). Average.

NURSERY TWO - PLANT OBSERVATIONS IN SHELF-LIFE

LACE CAPS

Messalina

Similar colour to Blauling. Maybe slightly darker pink and smaller petal flower/size. Habit similar. Colour fades towards end, foliage colour paling/browning. Average.

Mücke

Little sparse and foliage not healthy looking, but is not paling. Looks hard. Inner buds are opening well. Little petal browning, but a tendency to turn green in shelf-life. Poor/average.

Munchen

Some petal damage/browning in transit. Quite attractive with inner buds - majority opening well. Pale foliage colour throughout. Poor/average.

Zaunknoig

Major petal damage in transit and loss of colour - browning. Leaf colour ok with little leaf loss. Complete loss of colour at 3 weeks. Poor.

Fasem

Petal browning and little colour showing at 3 weeks. Large outer bract size covers inner buds opened to an attractive pale pink before fading. Foliage showing purple patches. Poor.

Kardinal

Outer petals suffered with browning in transit unfortunately as plants look good otherwise although edge of large leaves are turning purplish. Inner flower buds opening well - colour o.k. Poor due to earlier damage.

Möve

Good colour at start, but quickly faded. 14-16 bracts per head with inner buds opening pale pink/cream 'starry appearance'. Slight outer petal browning. Foliage mid-green and suffering from large purple patches on lower leaves. Poor.

Blauling

Good - full flat heads with good colour if only slight browning on older petals. Inner buds are opening but are covered over by outer flowers/petals. Good even habit and foliage remains green and healthy. Average.

Bläumeise

Slight petal damage in transit. Few outer flowers (8-10) but buds opening well in centre. Slightly paler foliage throughout. Colour faded by week 3. Average.

Blue sky

Medium sized plant - large bright blue bracts 10-14 on outer edge. Buds in centre have opened well. Can't fault colour, after 3 weeks overall remains good. Leaves -showing purplish spotting on all, nearer to leaf tip. No yellowing. Good.

MOP HEADS

Berlin

Similar habit to Heinrichsburg - heads not as large or full and flower size smaller (plain edged rather than serrated). Colour good. Very large flowers/bracts - little lower leaf yellowing. Good.

Fleider

Larger plants than Nursery One - top heavy. Large heads. Large leaves, rounded and mid green - little lower leaf drop or yellowing. Average. Novell variety like Ayesha.

Rosalia

Large/medium heads - pale pink colour showing loss of colour/browning in centre of petals. Foliage remains good. Average.

Roter Zwerg

Foliage is yellowing showing chlorosis throughout plant and heads showing major petal damage from transit - colour is good though. Good sized/colour plant. Poor/average - let down by petal damage.

LK 49

Small/medium plant size. Medium sized full heads. Good colour, dark with slight petal damage in transit. Foliage good - no leaf yellowing or drop. Average/Good.

New Friesdorf

Some variability in petal shape from plain edge to serrated edge. Heads - medium/large - good shape and colour, holding colour well. Leaves are rounded, fairly thick, very little leaf yellowing. Good.

Paris

Smaller plants - smaller heads. Suffering major petal damage in transit. Leaves showing purpling/hard looking, little yellowing but browning obvious at 3 weeks. Poor/average.

Schneeball

Colour little washed out - heads medium and well shaped with medium sized petals. Plants suffering from later shoots growing up around plant - untidy and detracting, although flower colour ok. Foliage - some lower leaf yellowing. Poor/average.

Cote D'Azur

Attractive Lace cap with inner buds opening to purple in colour - only few outer flowers and these are curling upwards a little. Bract colour remained good but heads began to droop. Foliage good. Average.

Heinrichsburg

Very large true pink heads - held colour very well - large flowers. Some lower leaf yellowing - nothing too bad. Very good.

No. 15 Blue

Large plants with large full size heads. Slight petal edge browning but colour good overall. Even habit of heads. Foliage mid-green. Good.

Zürich

Large number of heads, medium size. Range of colour from darker more mature heads, to paler but coloured immature heads. Some petal edge browning and a tendency for petals to curve upwards - detracting from appearance. Leaf size medium and good colour. Average.

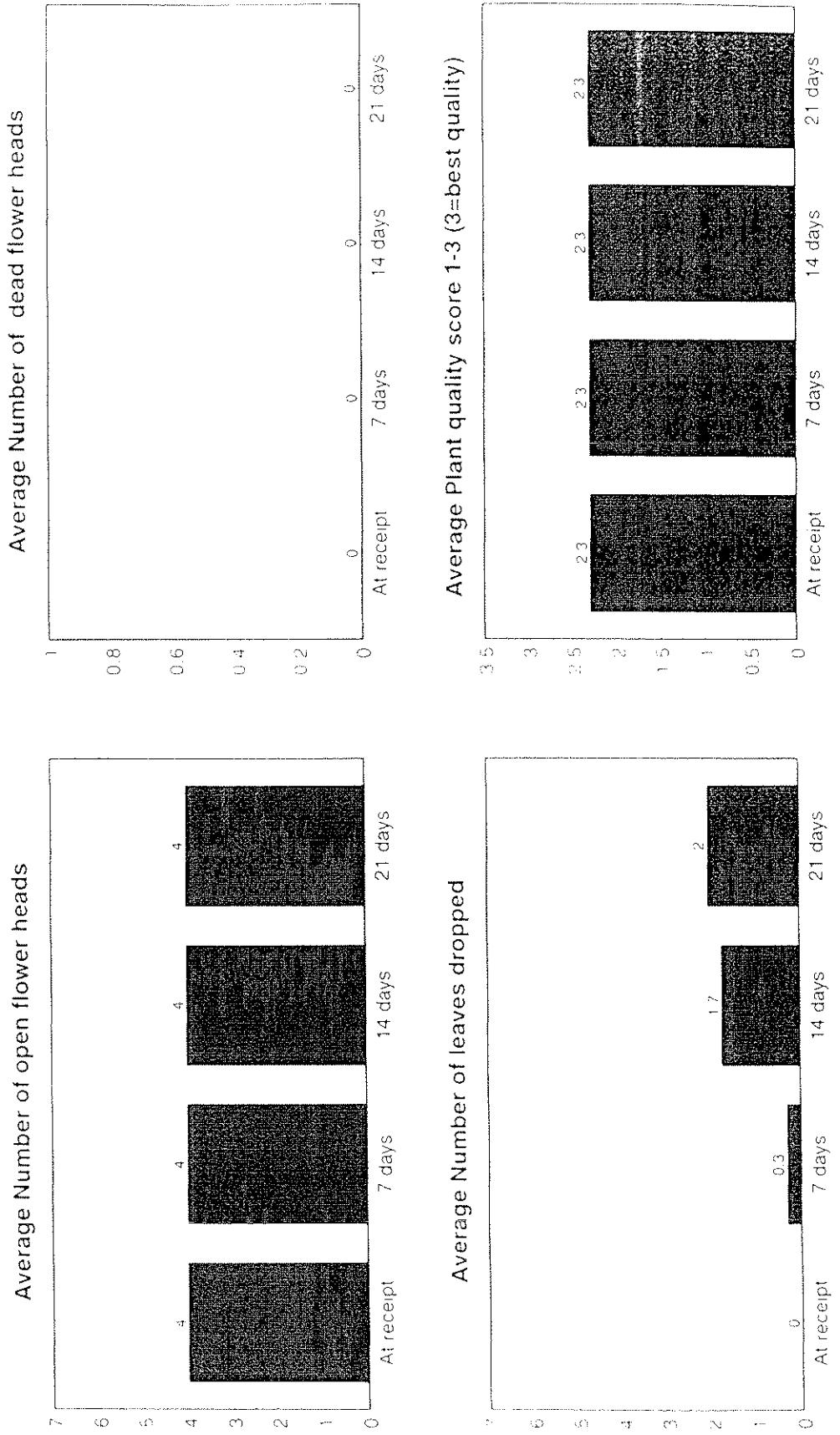
SUMMARY TABLE

	Good	Average	Poor
Nursery 1	Berlin	Zurich	Kardinal
	N. Friesdorf	Bläumeise	Zaunknoig
	Snow	Blauling	Paris
	Hermann D	Möve	
	No. 15 Blue	Cote D'Azur	
		Schneeball	
		Mücke	
		Messalina	
		R. Zwerg	
		Rosalia	
		Munchen	
		Fleider	
Nursery 2	Berlin	Zurich	Paris*
	Heinrichsburg	LK 49	Möve
	No. 15 Blue	Messalina	Mücke
	Blue Sky	Blauling	Kardinal
		Bläumeise	Fasem
		Cote D'Azur	Schneeball
		Rosalia	R. Zwerg*
		N. Friesdorf	Munchen
		Fleider	Zaunknoig*

* Damaged in transit

Hydrangea Shelf-life

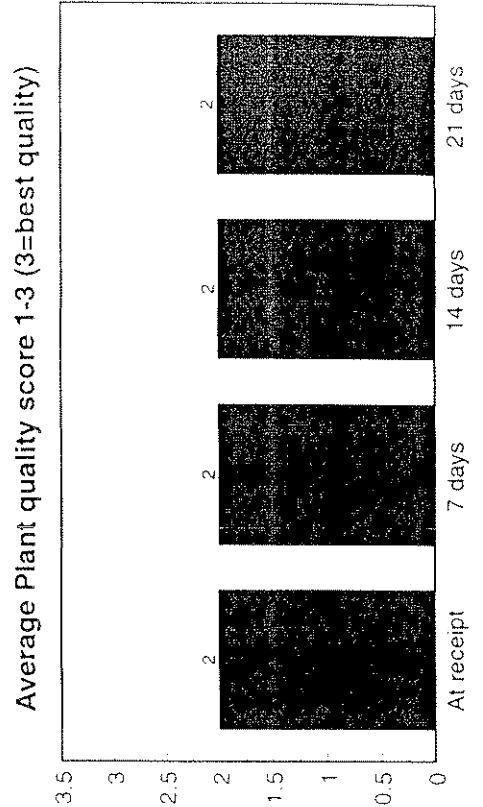
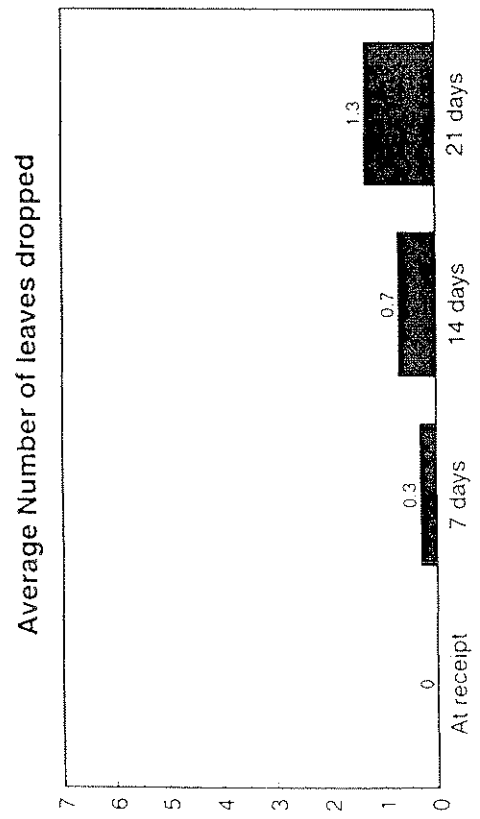
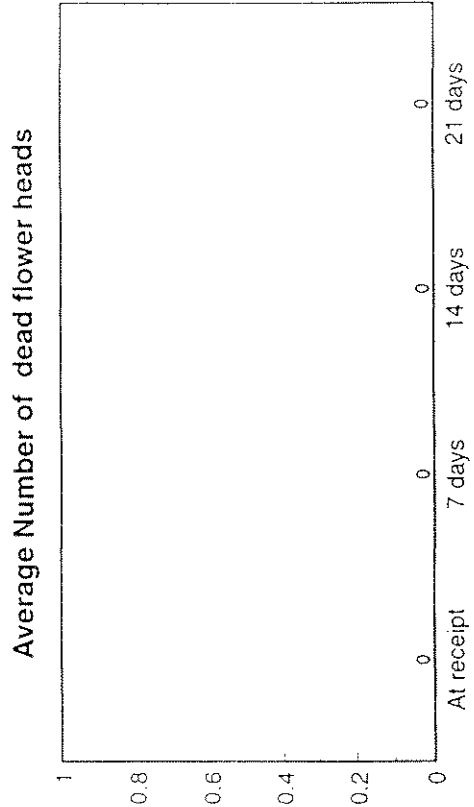
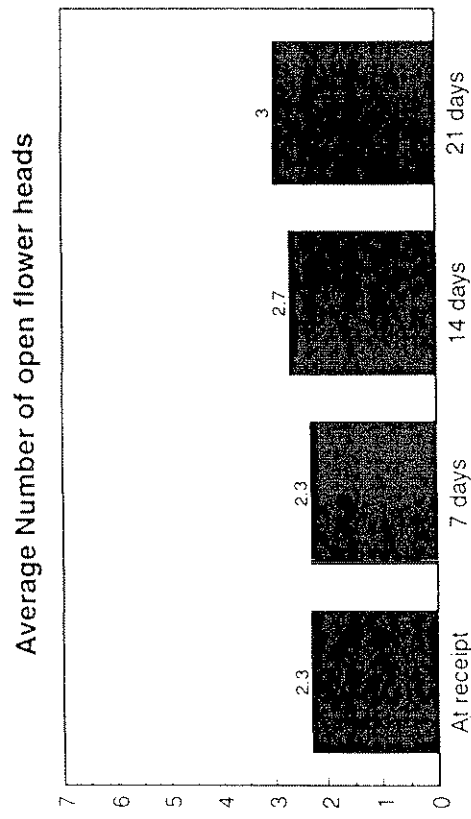
Variety: Messalina (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

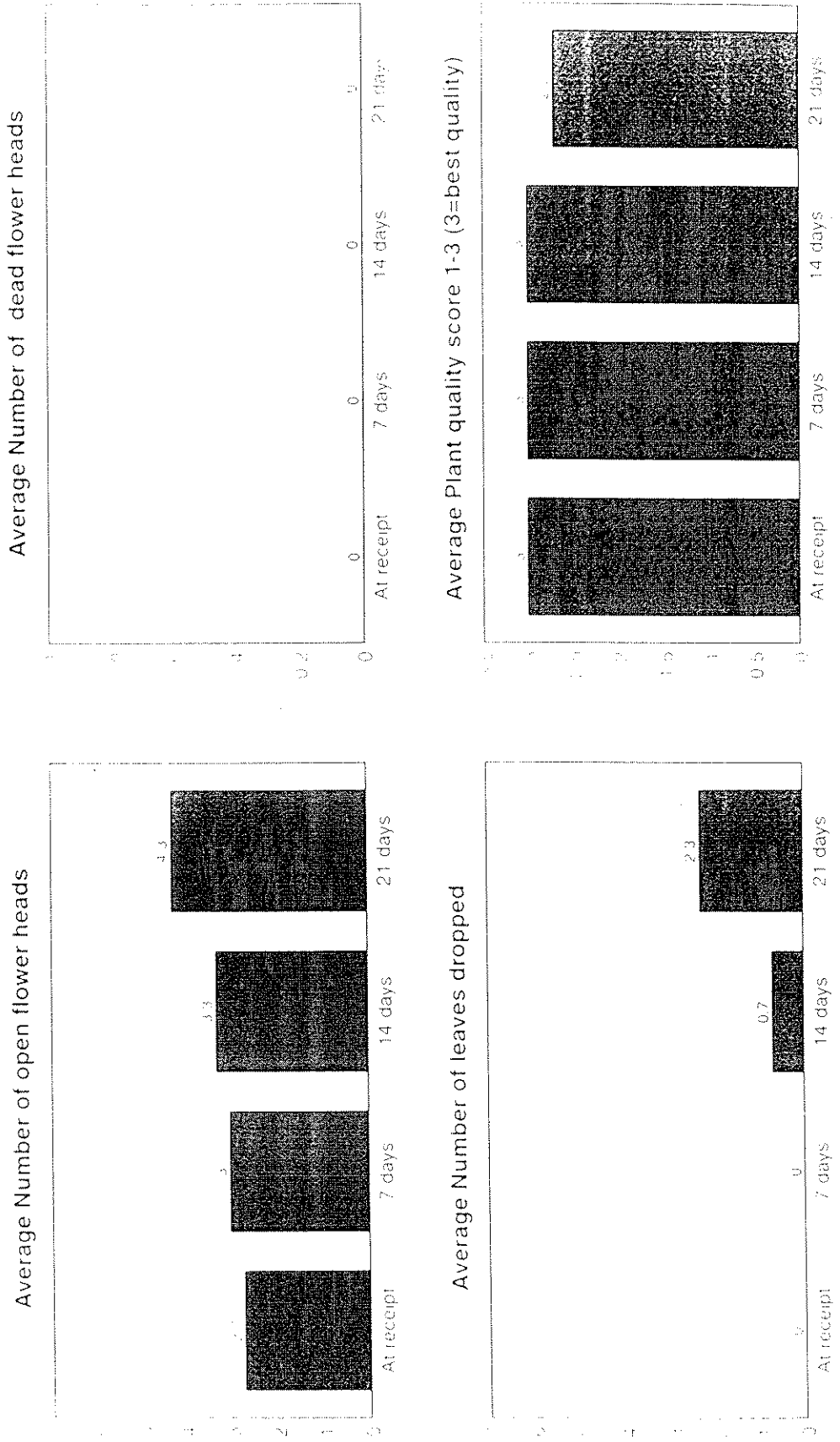
Variety: Mucke (Nursery 1)

(Mean of 3 plants)



Hydrangea Shelf-life

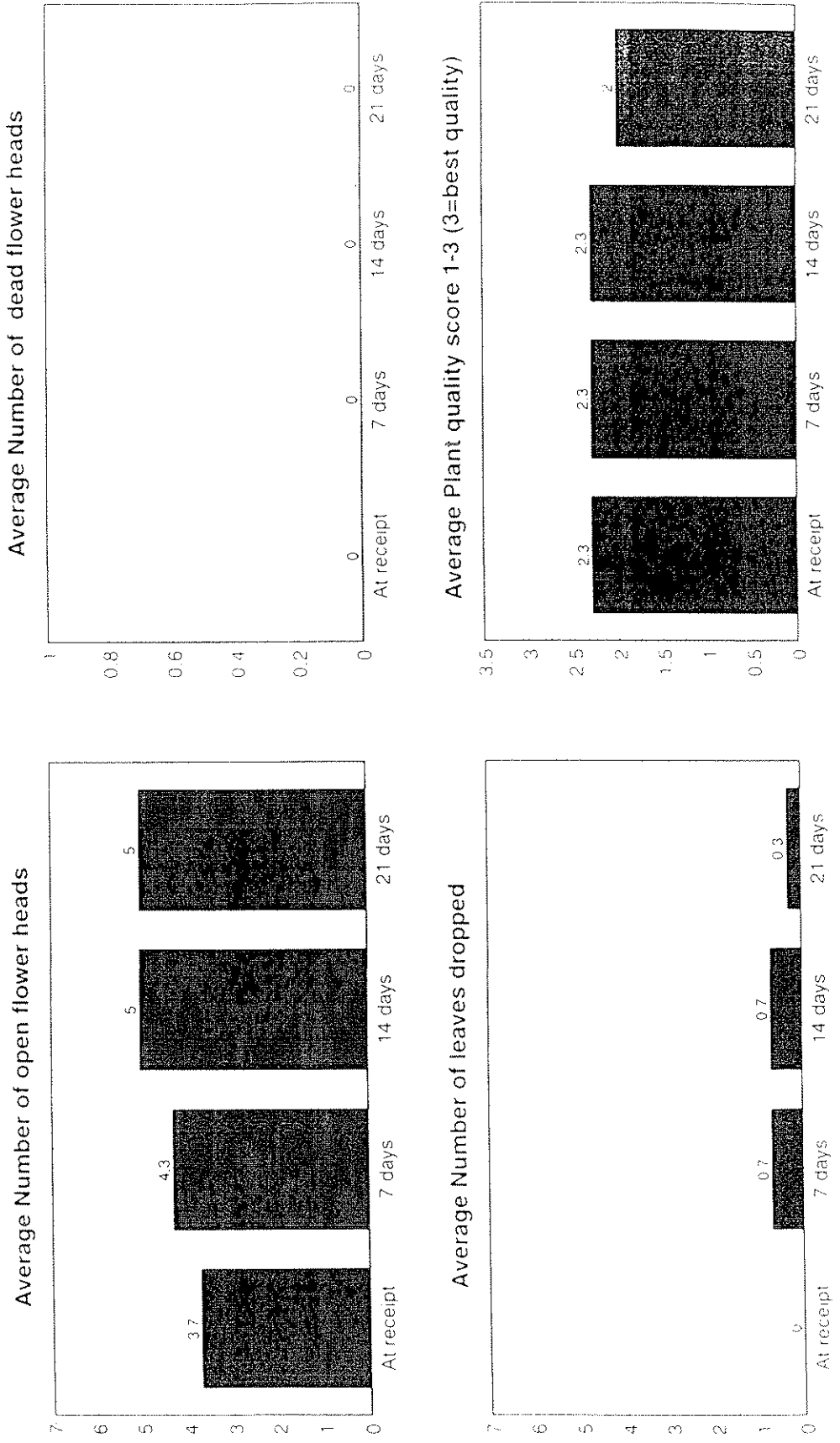
Variety: Munchen (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

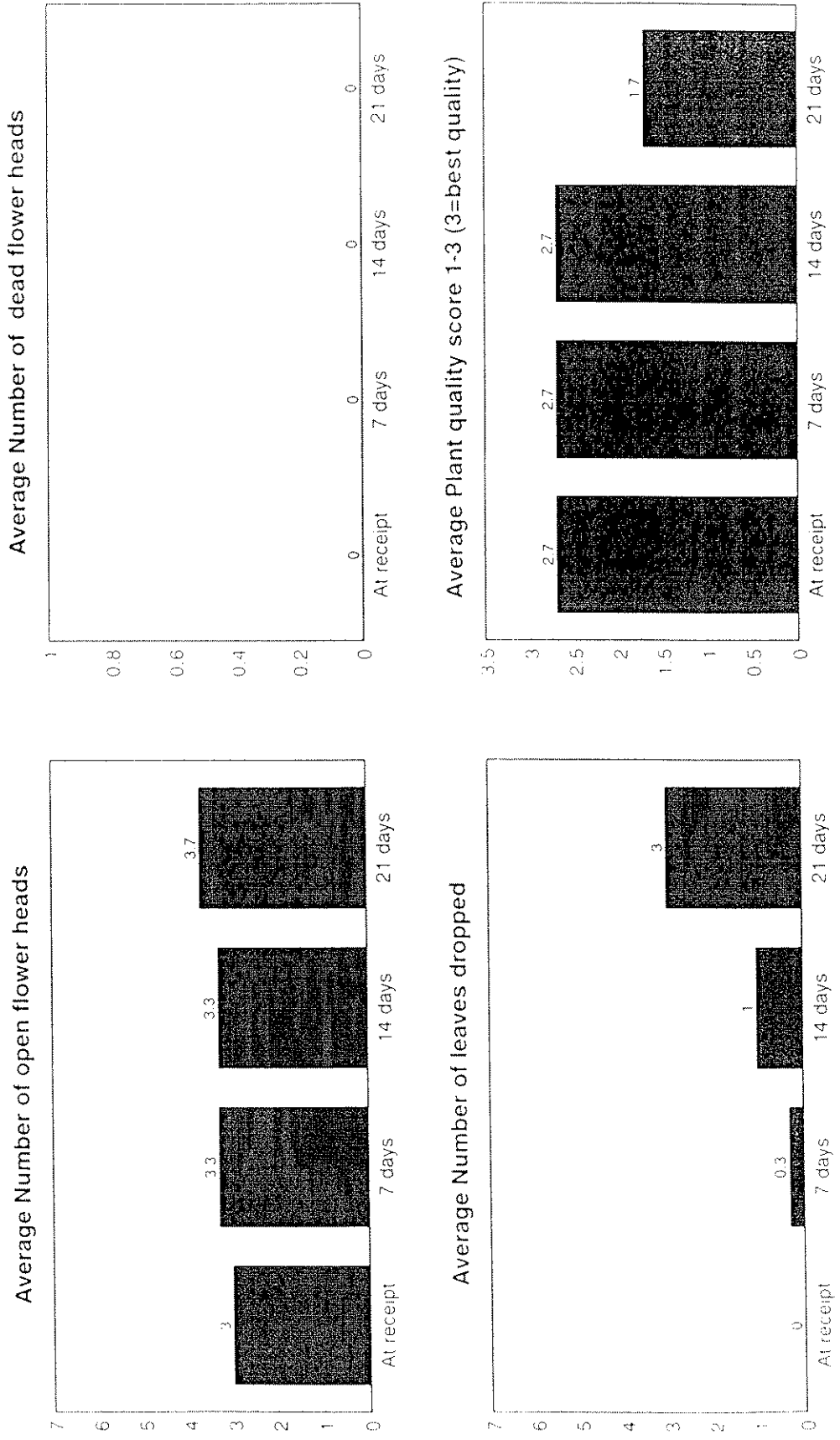
Variety: Zaunknoig (Nursery 1)

(Mean of 3 plants)



Hydrangea Shelf-life

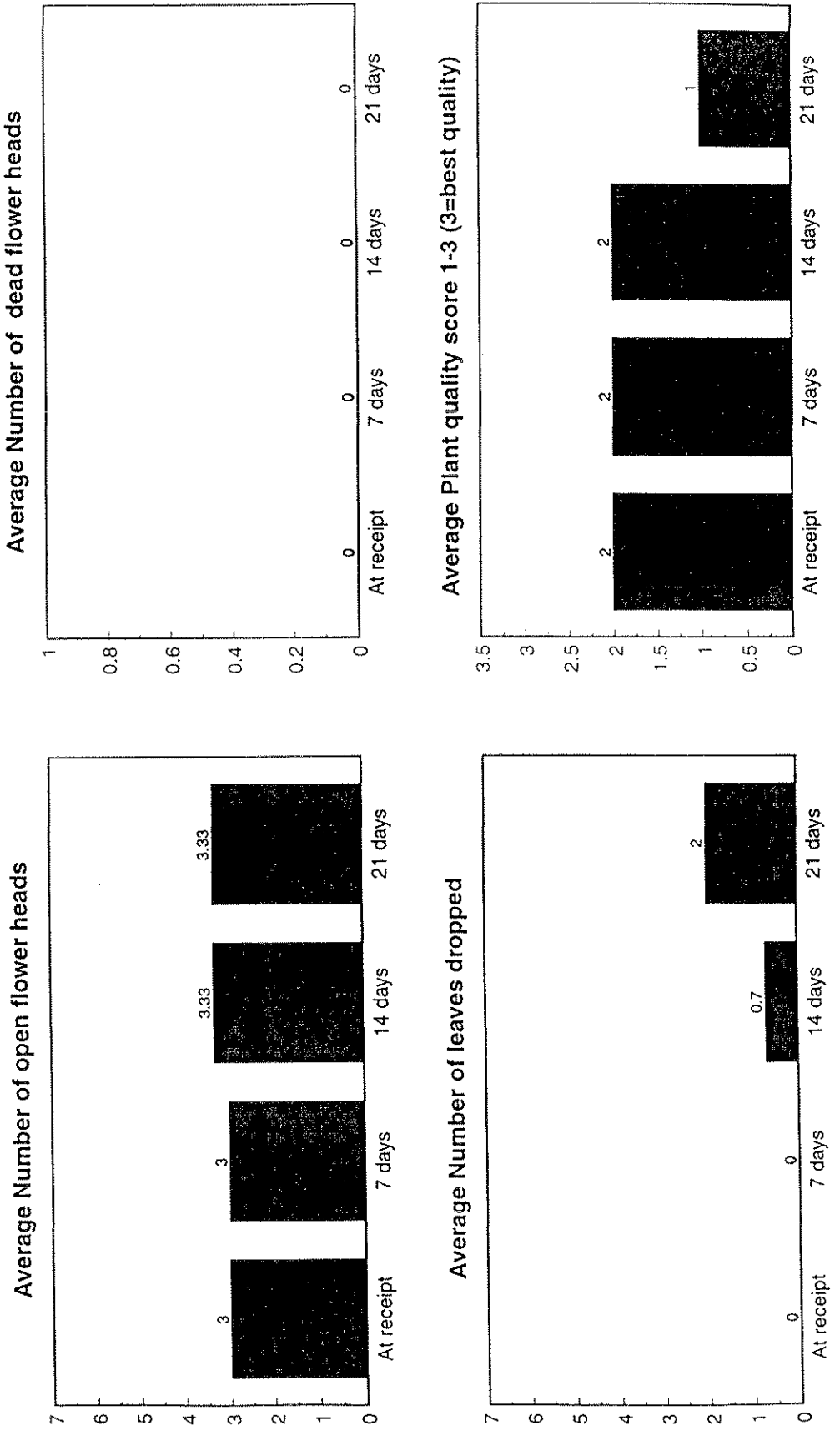
Variety: Cardinal (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

Variety: Move (Nursery 1)

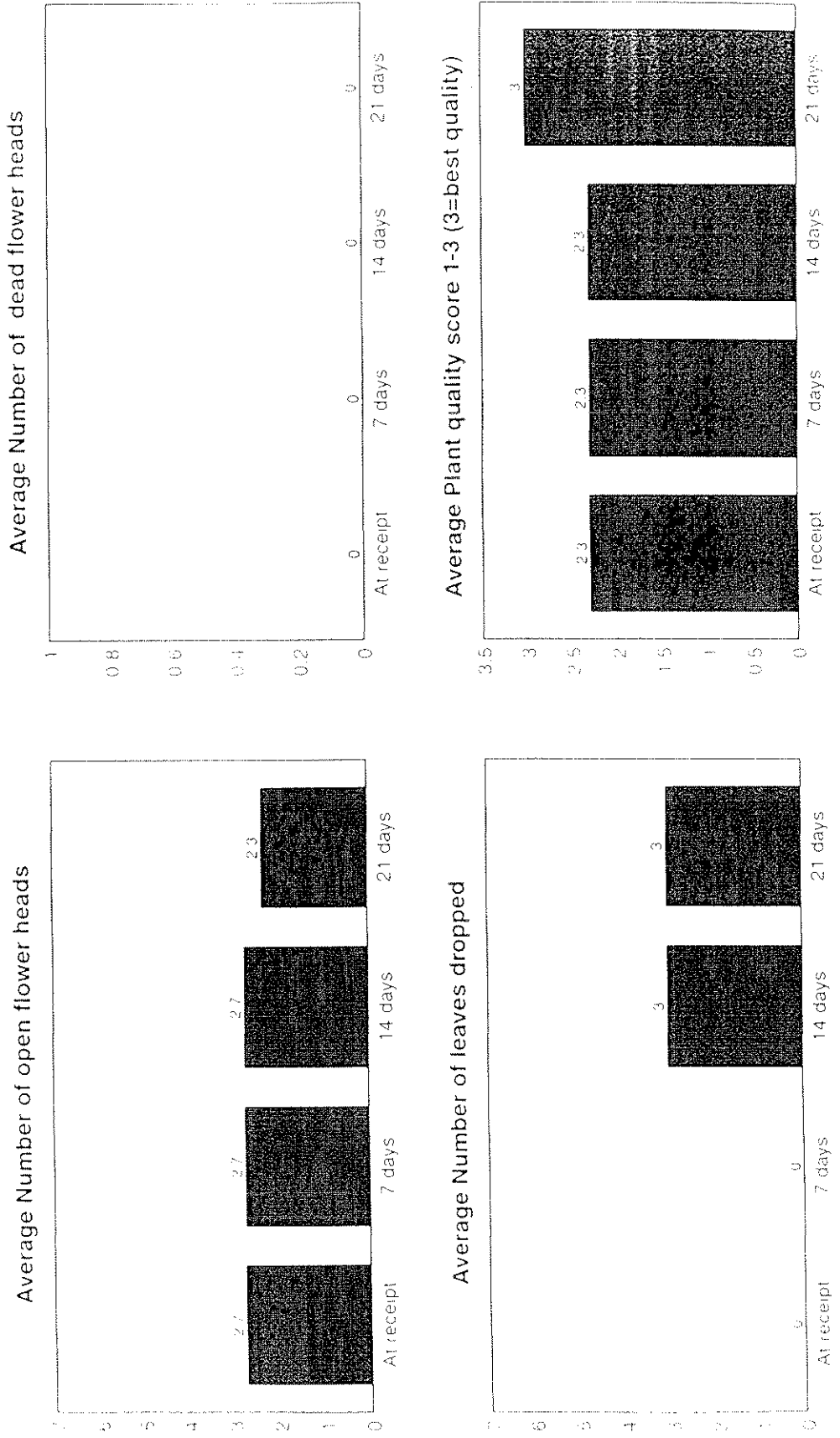
(Mean of 3 plants)



Hydrangea Shelf-life

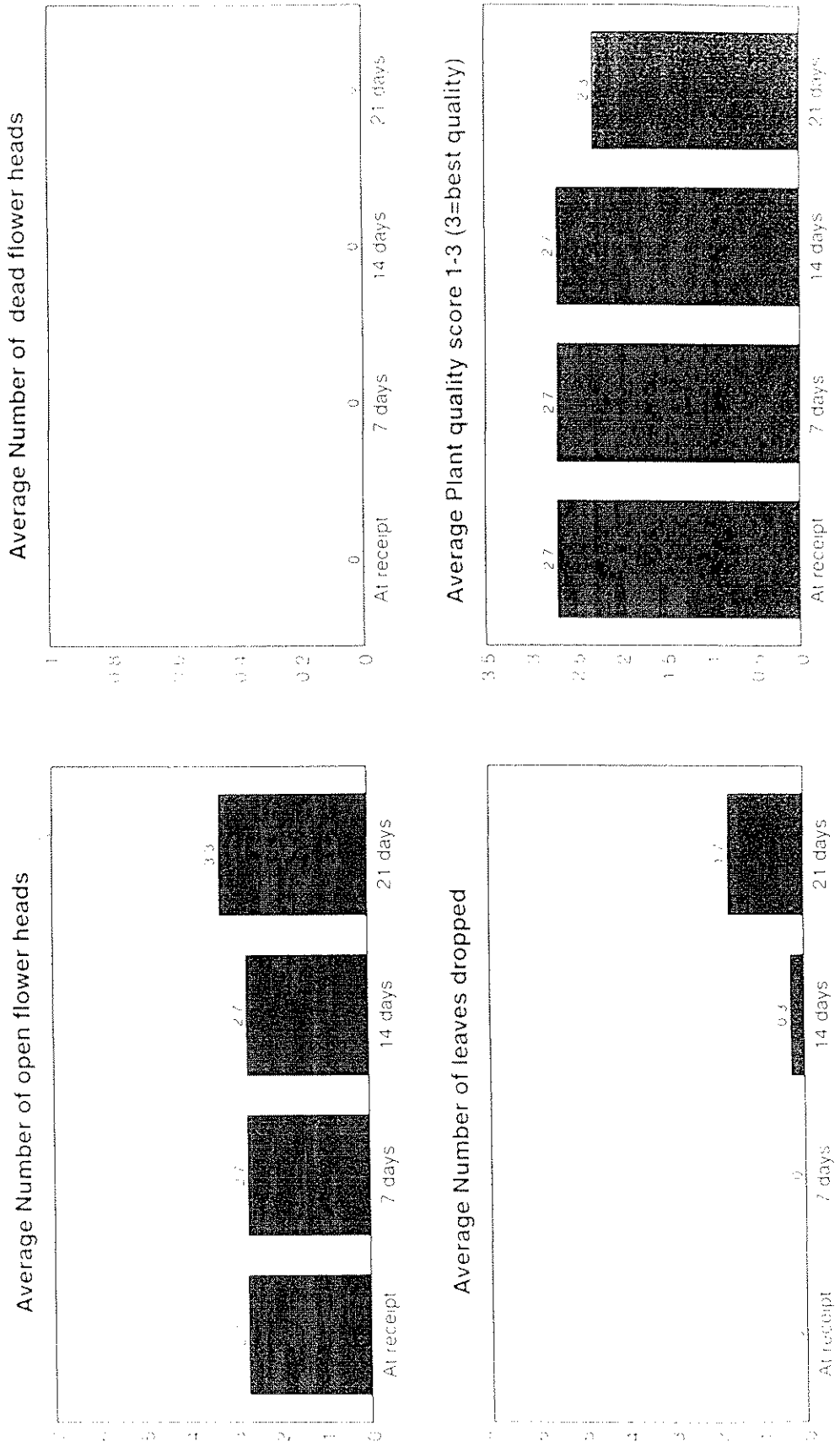
Variety: Snow (Nursery 1)

(Mean of 3 plants)



Hydrangea Shelf-life

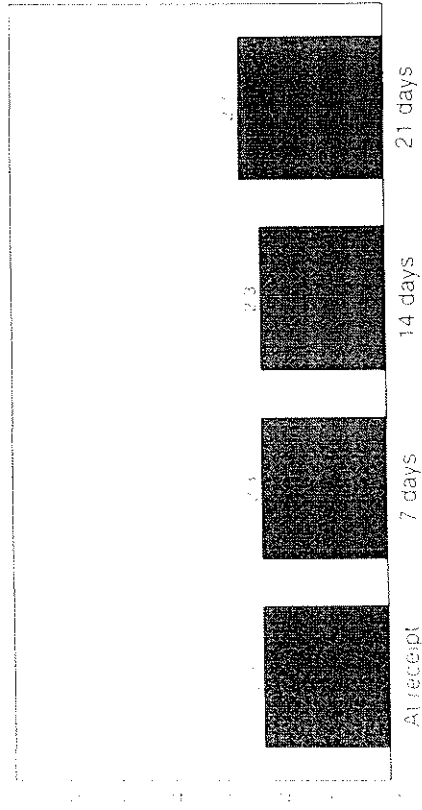
Variety: Blauling (Nursery 1)
(Mean of 3 plants)



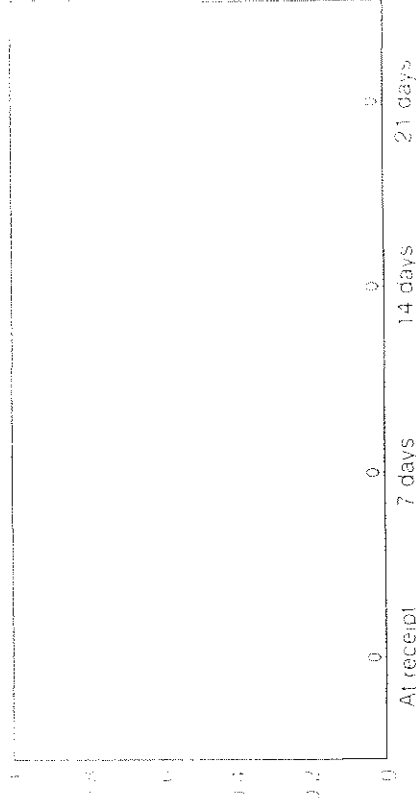
Hydrangea Shelf-life

Variety: Blaumeise (Nursery 1)
(Mean of 3 plants)

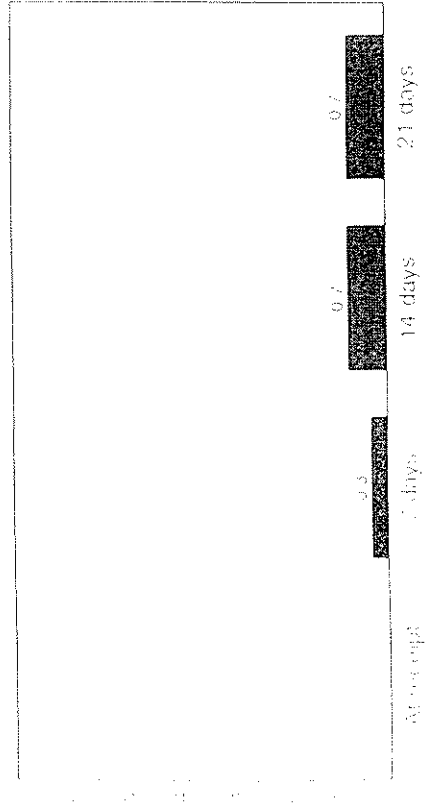
Average Number of open flower heads



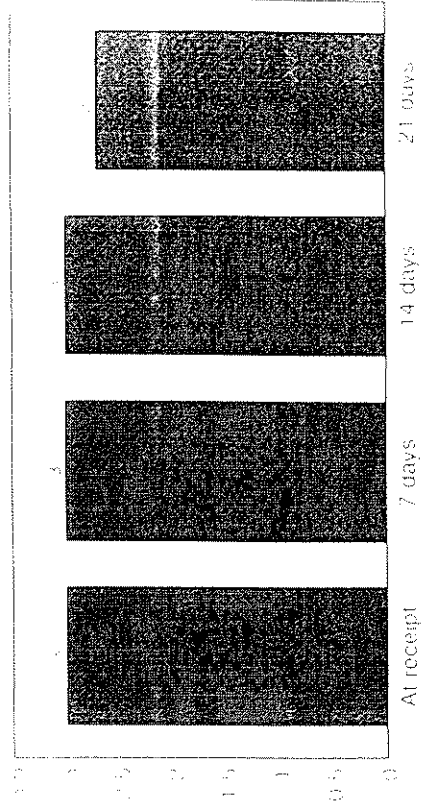
Average Number of dead flower heads



Average Number of leaves dropped

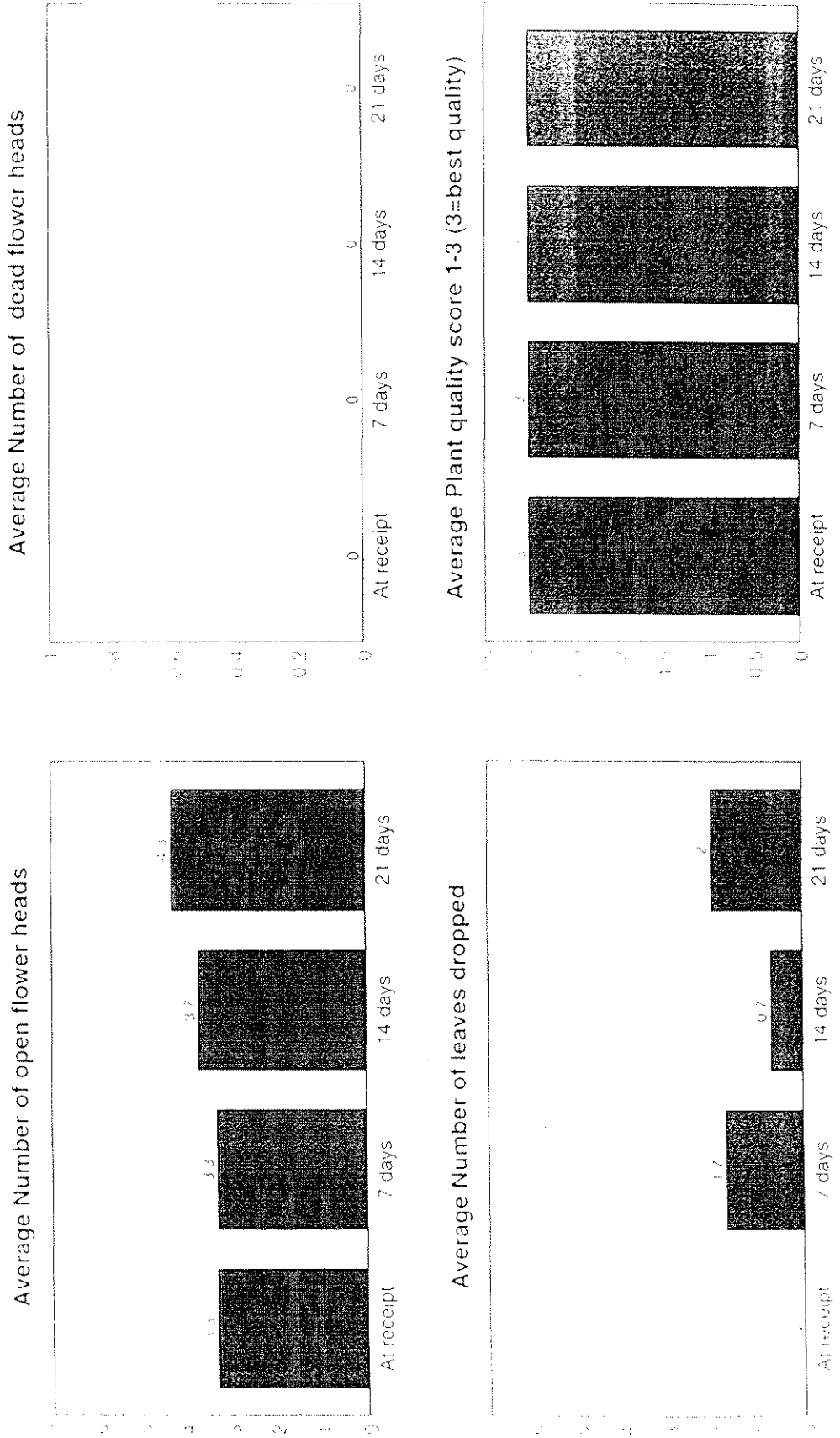


Average Plant quality score 1-3 (3=best quality)



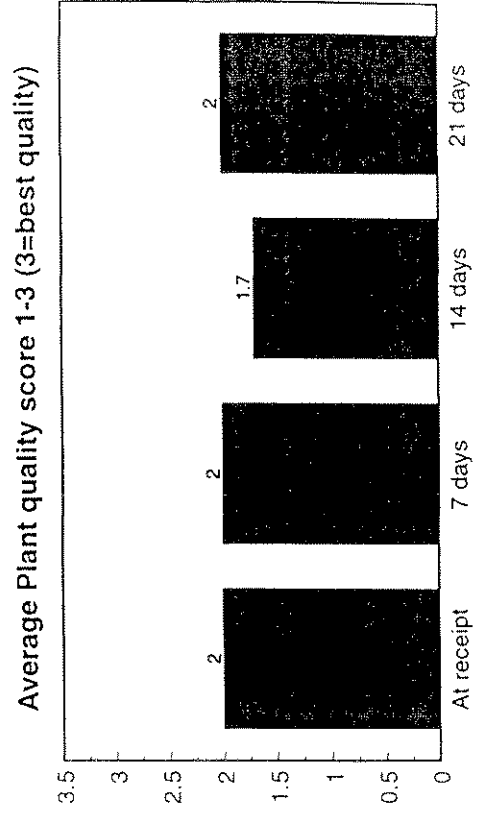
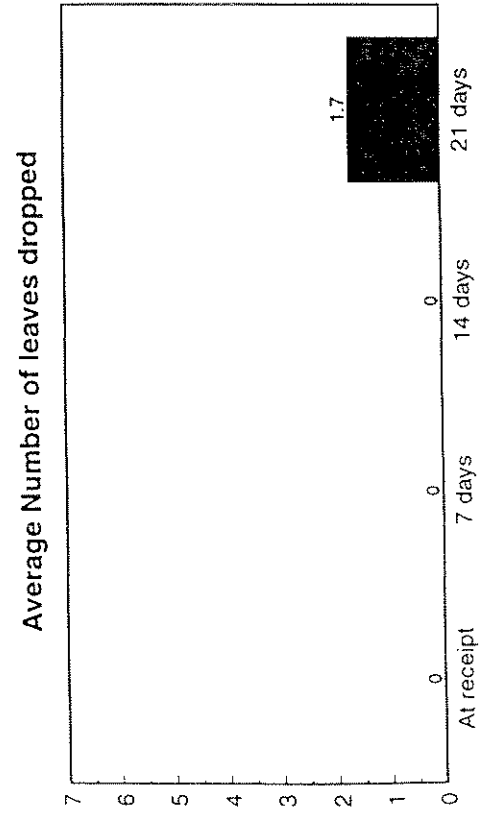
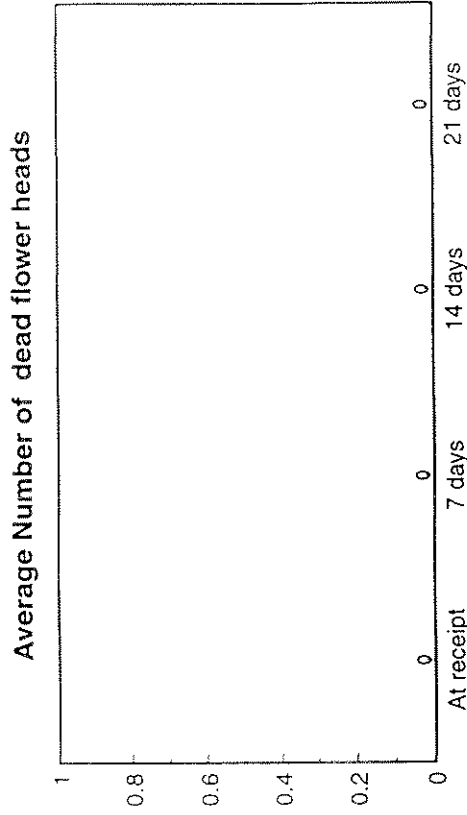
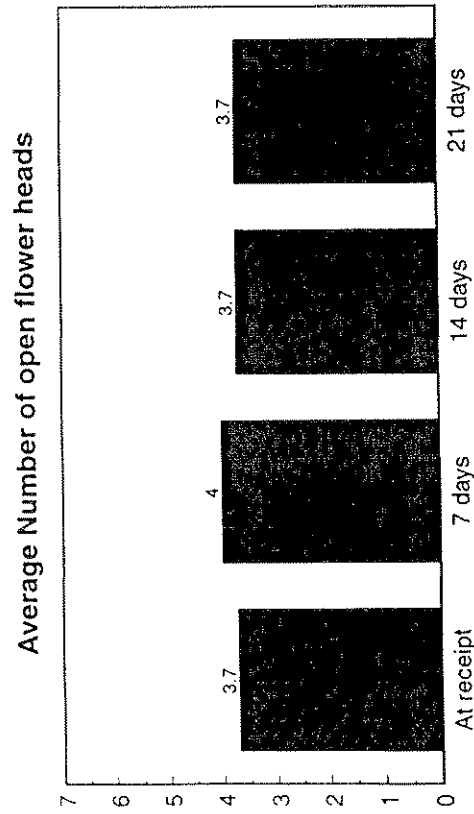
Hydrangea Shelf-life

Variety: Berlin (Nursery 1)
 (Mean of 3 plants)



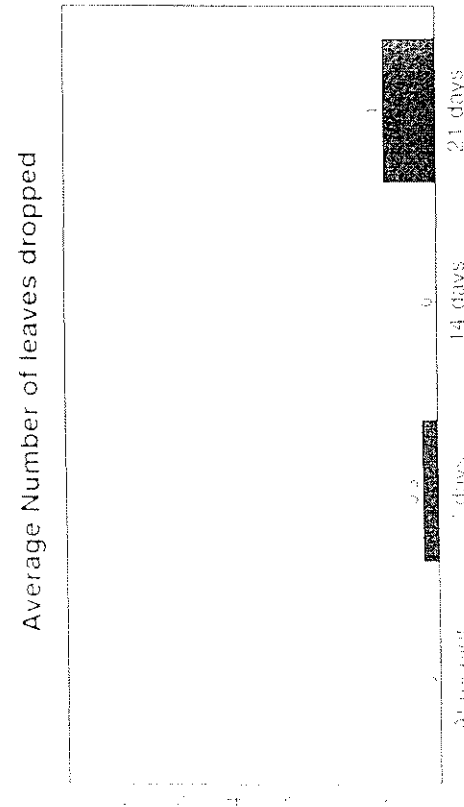
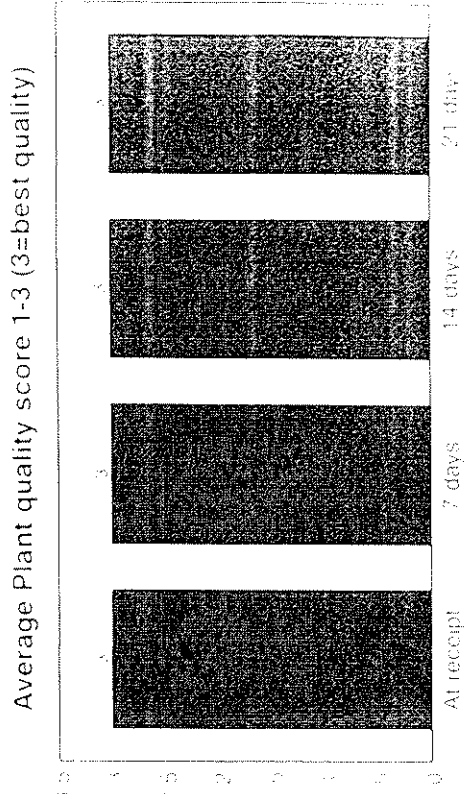
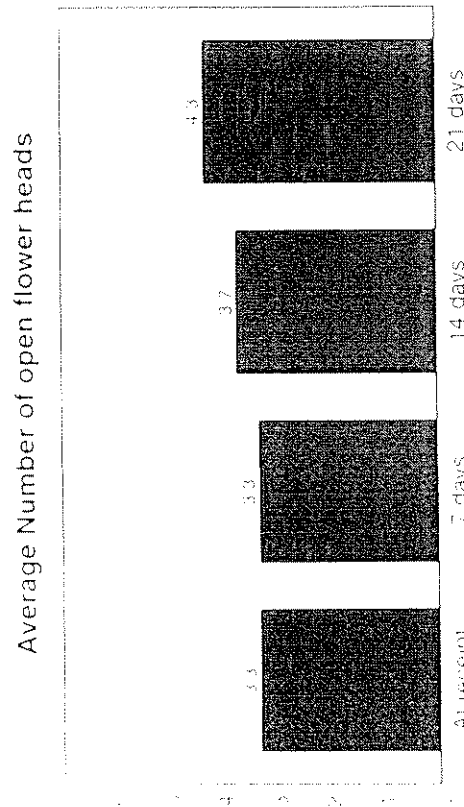
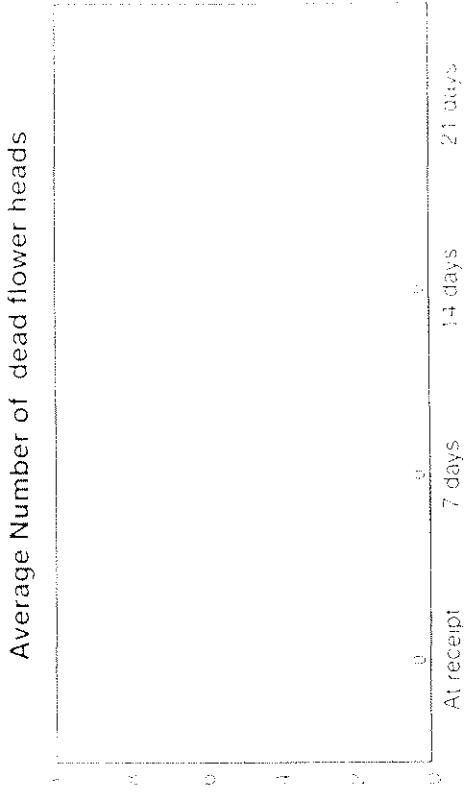
Hydrangea Shelf-life

Variety: Fleider (Nursery 1)
(Mean of 3 plants)



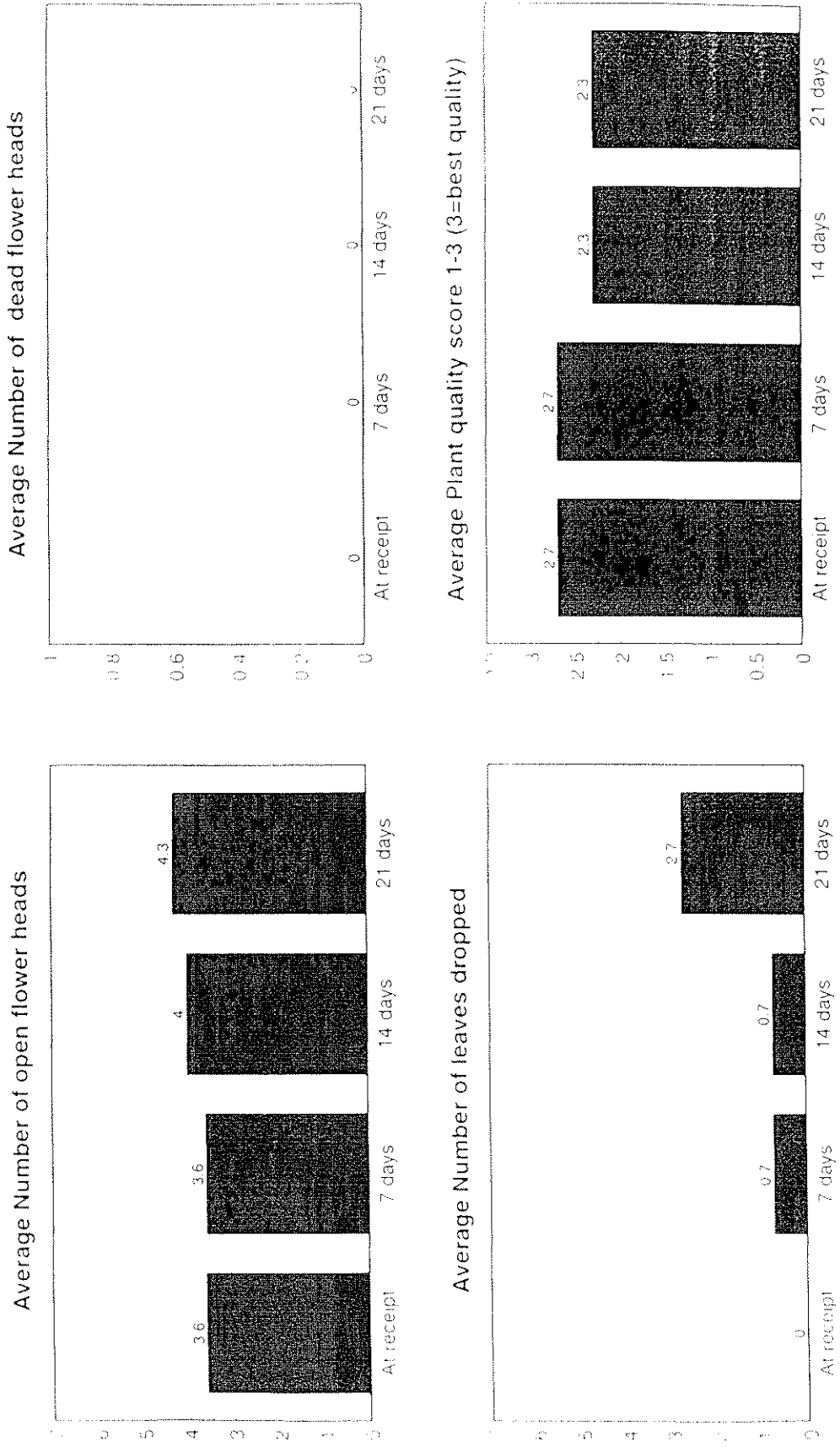
Hydrangea Shelf-life

Variety: Rosalia (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

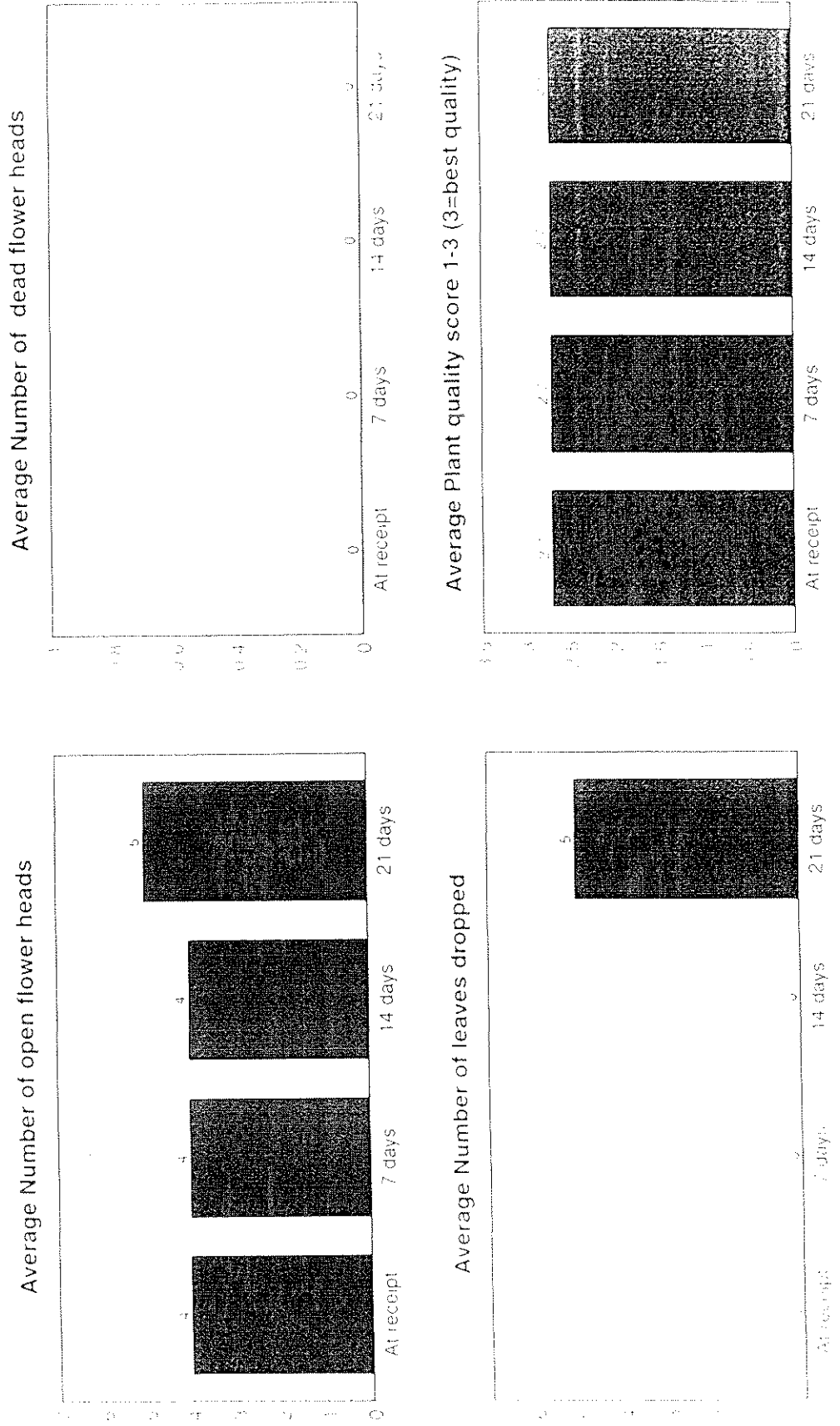
Variety: Roter Zwerg (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

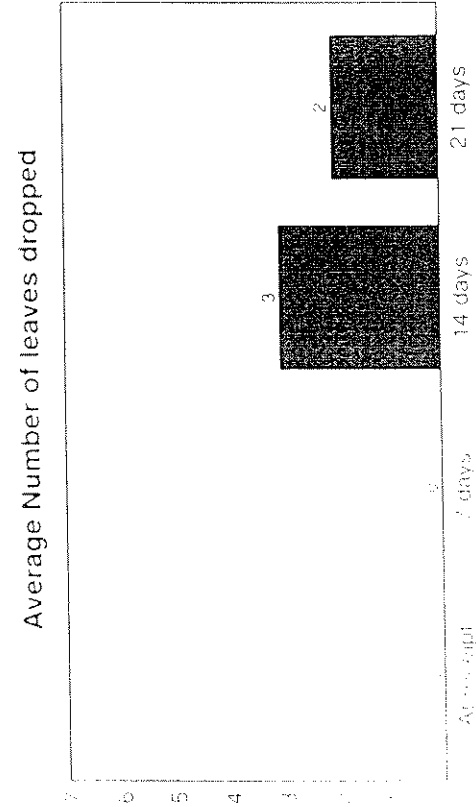
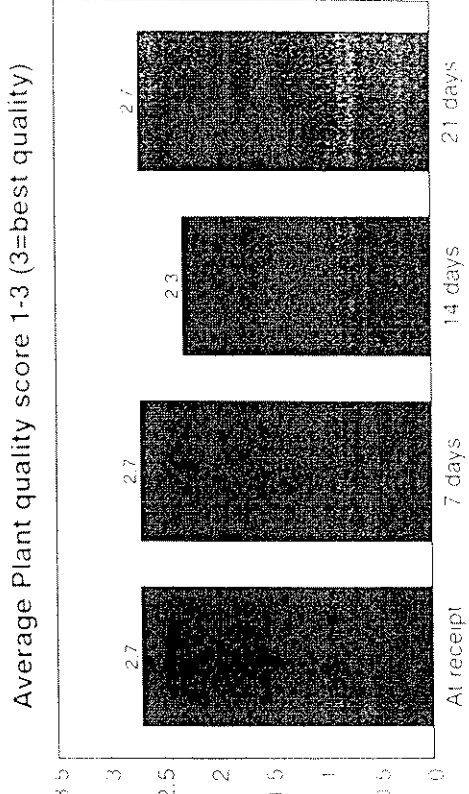
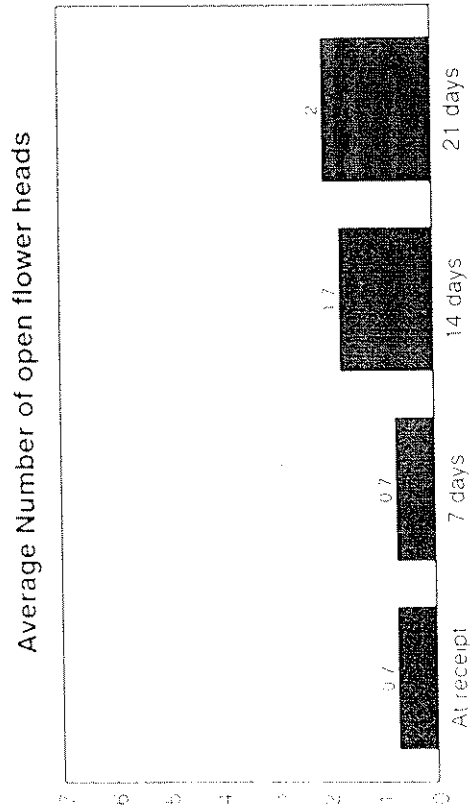
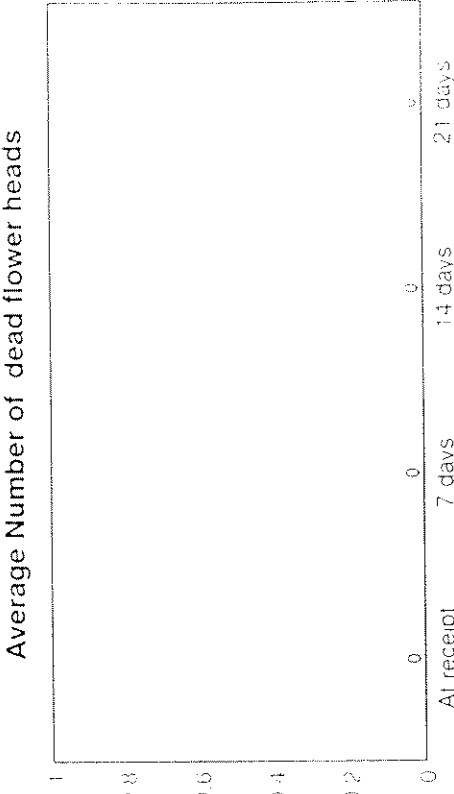
Variety: New Friesdorf (Nursery 1)

(Mean of 3 plants)



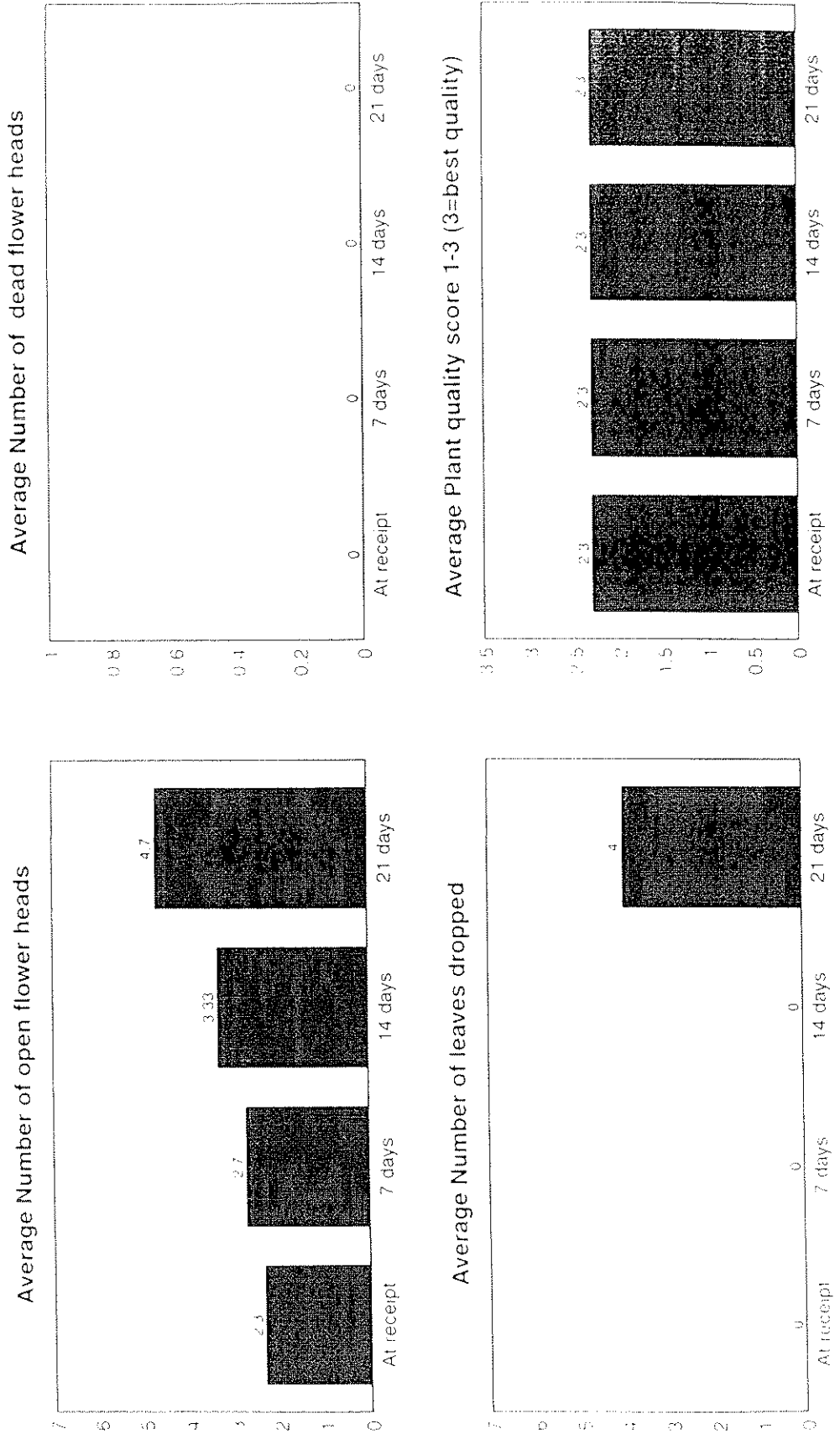
Hydrangea Shelf-life

Variety: Paris (Nursery 1)
 (Mean of 3 plants)



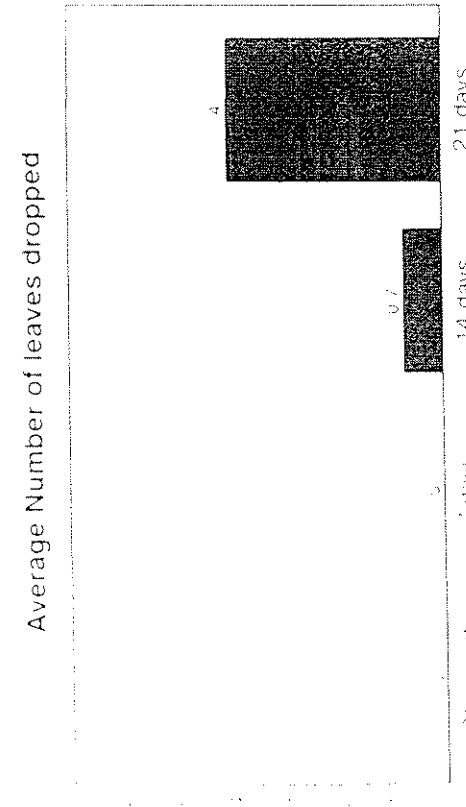
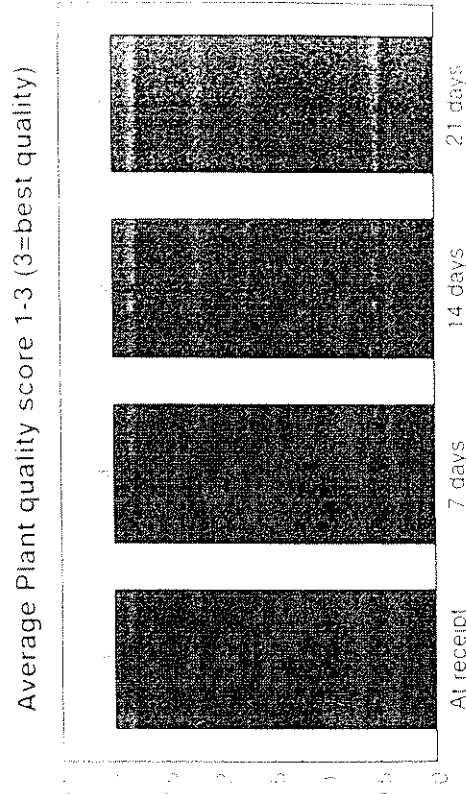
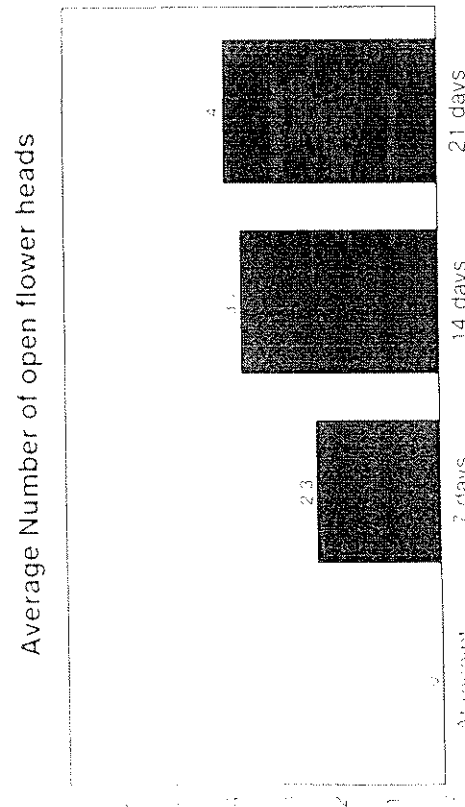
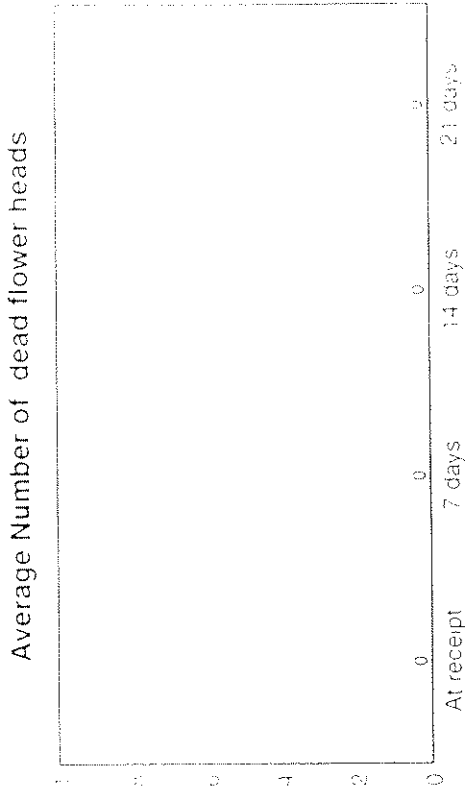
Hydrangea Shelf-life

Variety: Schneeball (Nursery 1)
(Mean of 3 plants)



Hydrangea Shelf-life

Variety: Cote D'Azur (Nursery 1)
 (Mean of 3 plants)



Hydrangea Shelf-life

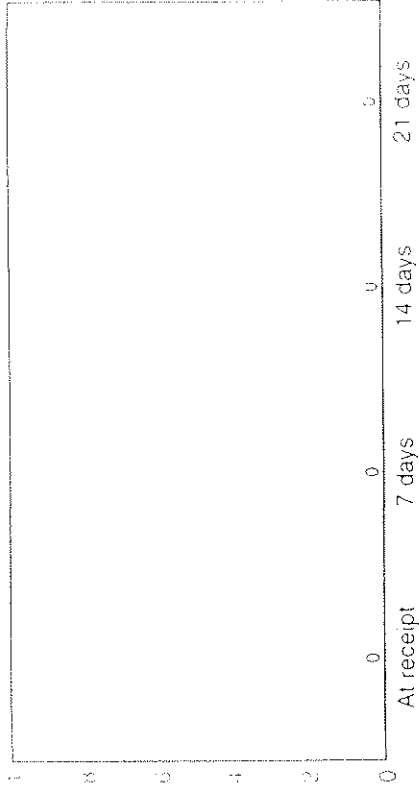
Variety: Hermann Dienenmann (Nursery 1)

(Mean of 3 plants)

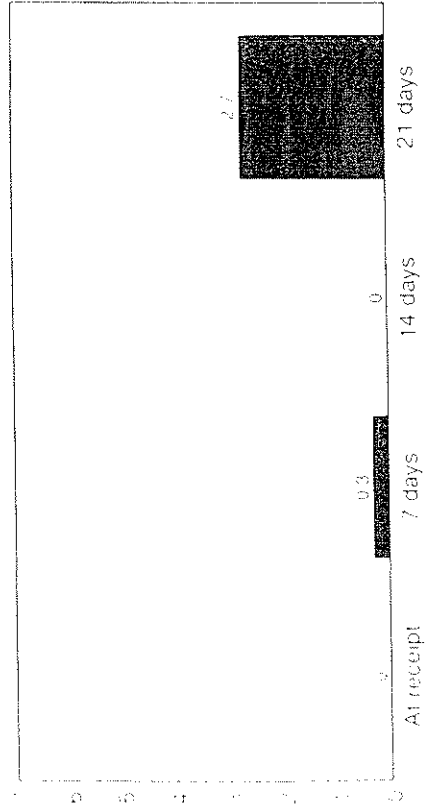
Average Number of open flower heads



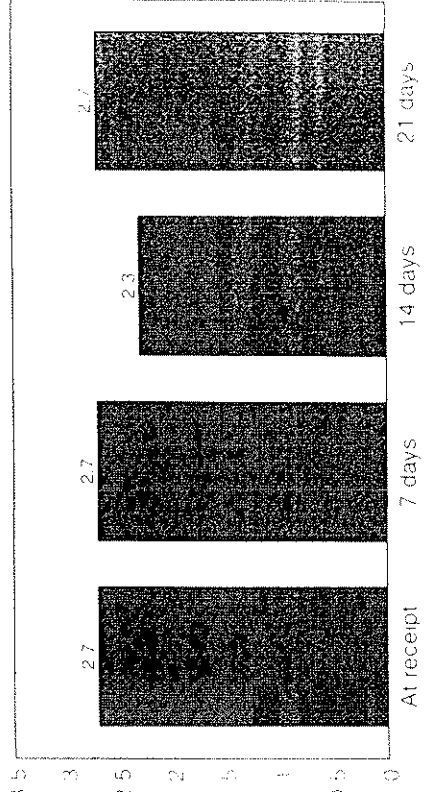
Average Number of dead flower heads



Average Number of leaves dropped



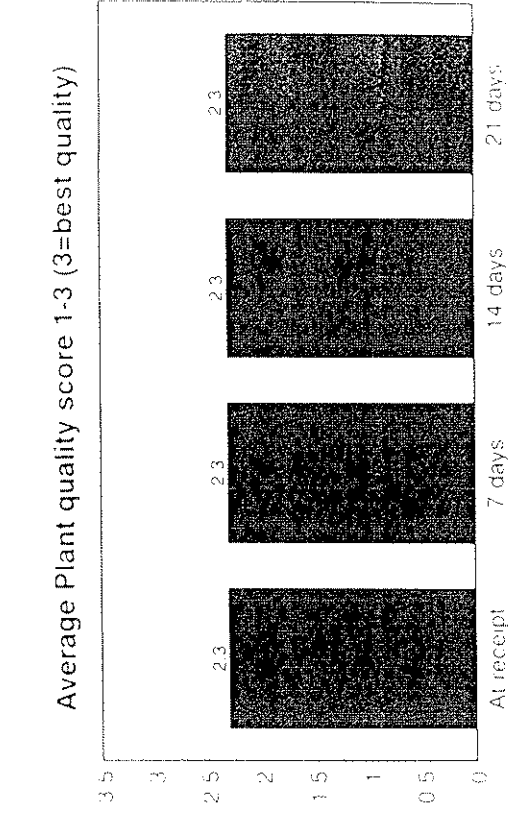
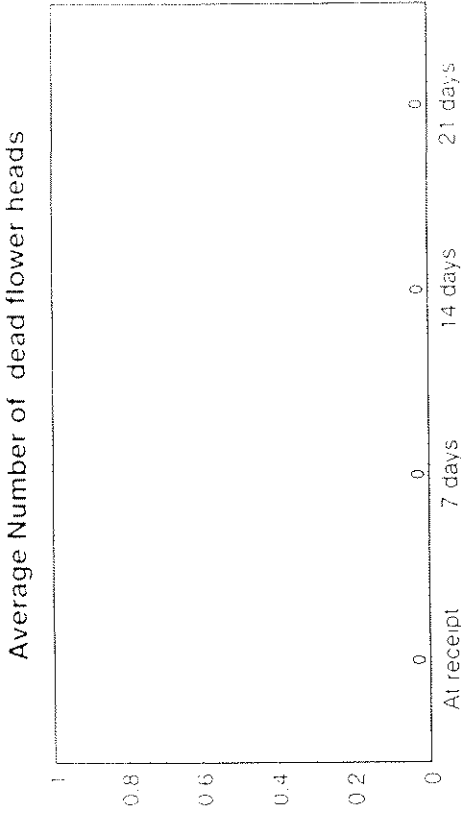
Average Plant quality score 1-3 (3=best quality)



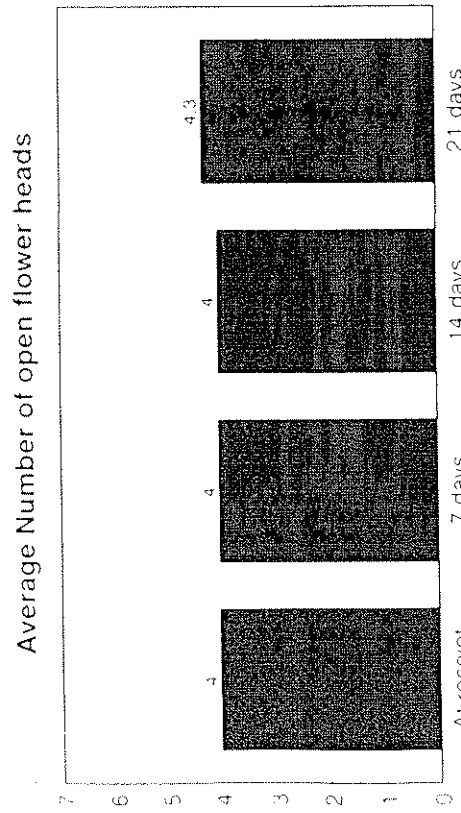
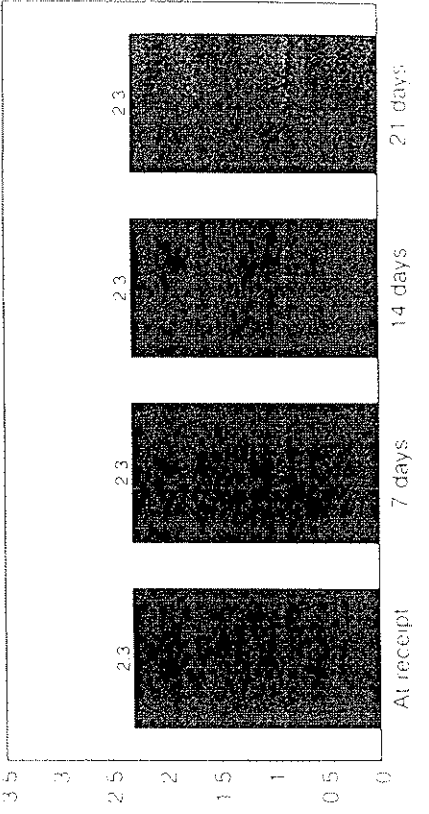
Hydrangea Shelf-life

Variety: No 15 Blue (Nursery 1)

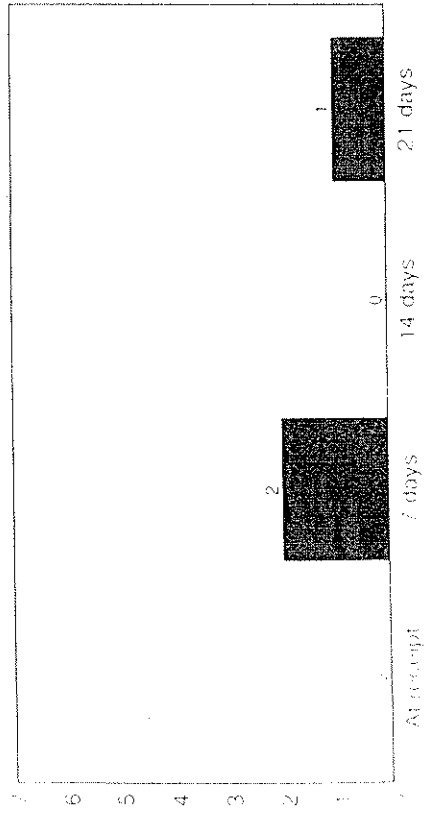
(Mean of 3 plants)



Average Plant quality score 1-3 (3=best quality)

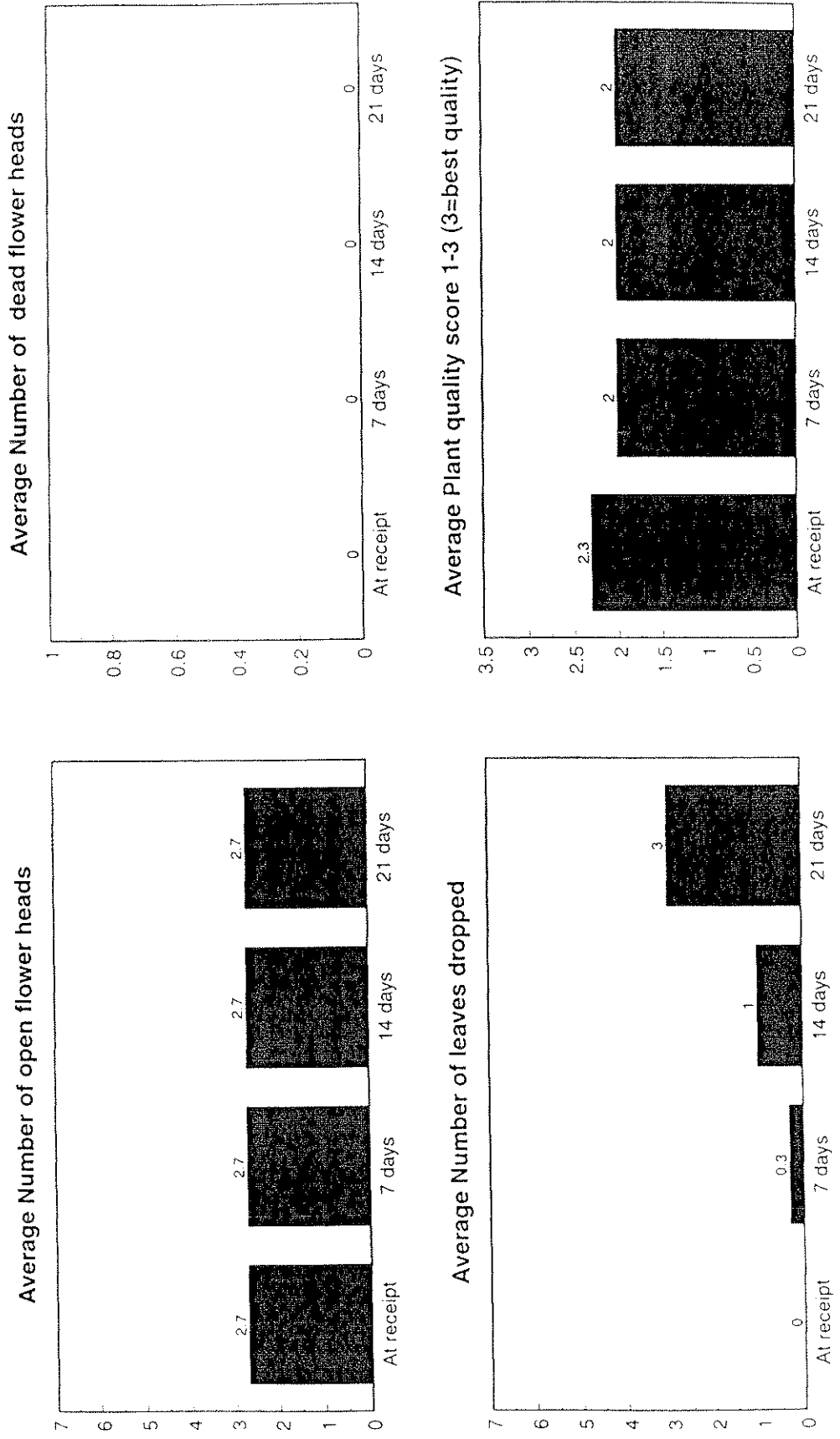


Average Number of leaves dropped



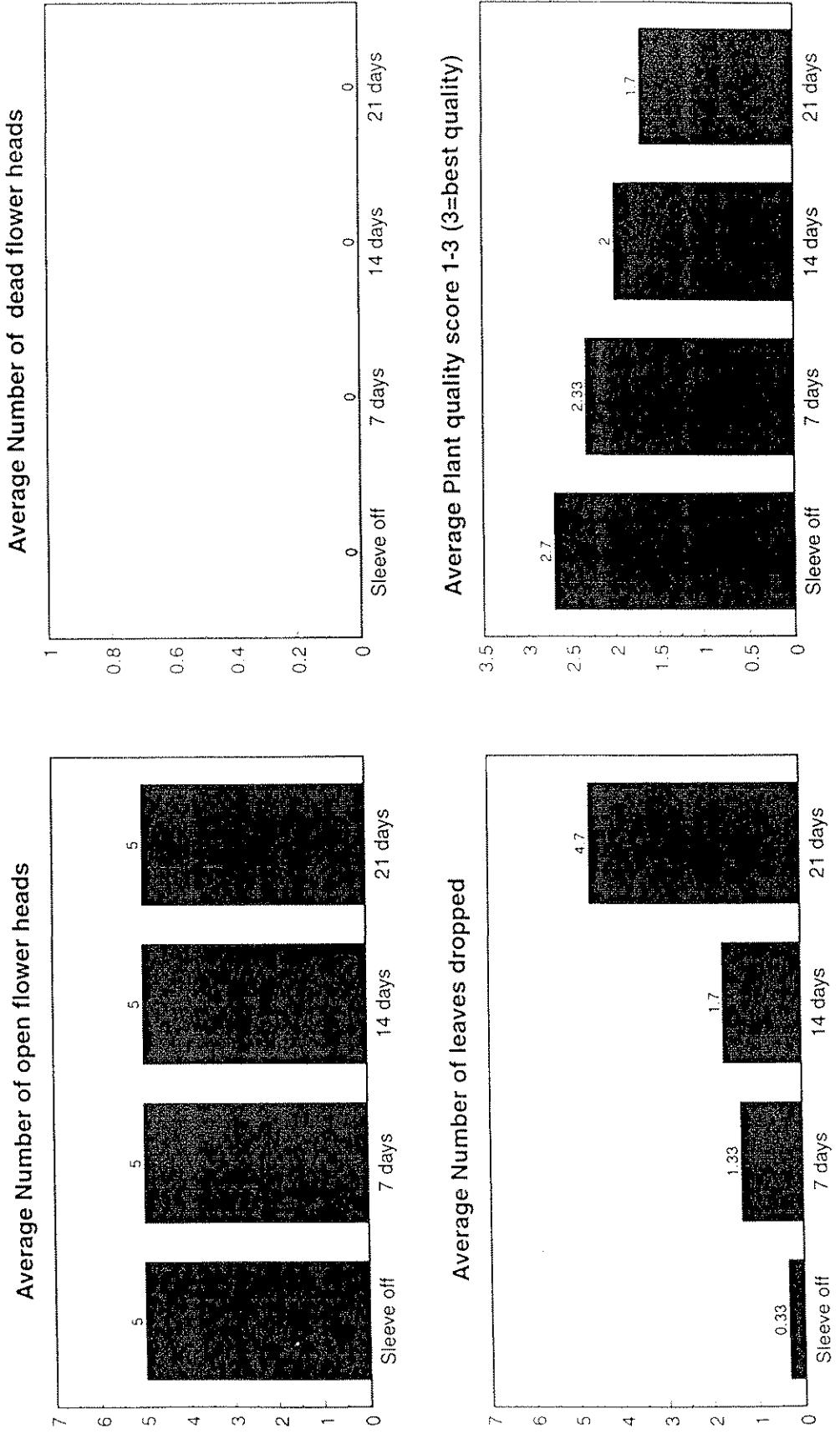
Hydrangea Shelf-life

Variety: Zurich (Nursery 1)
(Mean of 3 plants)



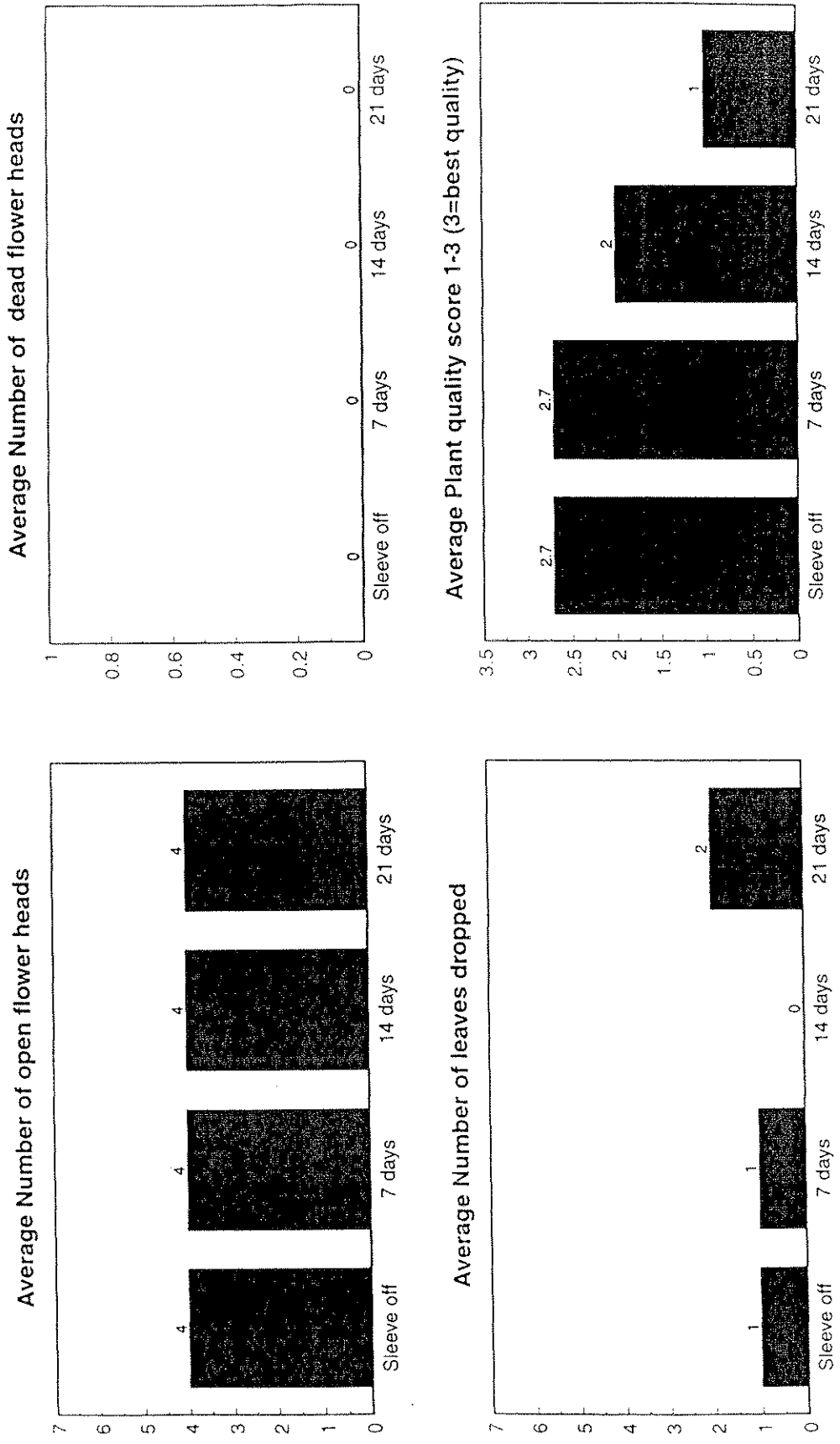
Hydrangea Shelf-life

Variety: Messalina (Nursery 2)
 (Mean of 3 plants)



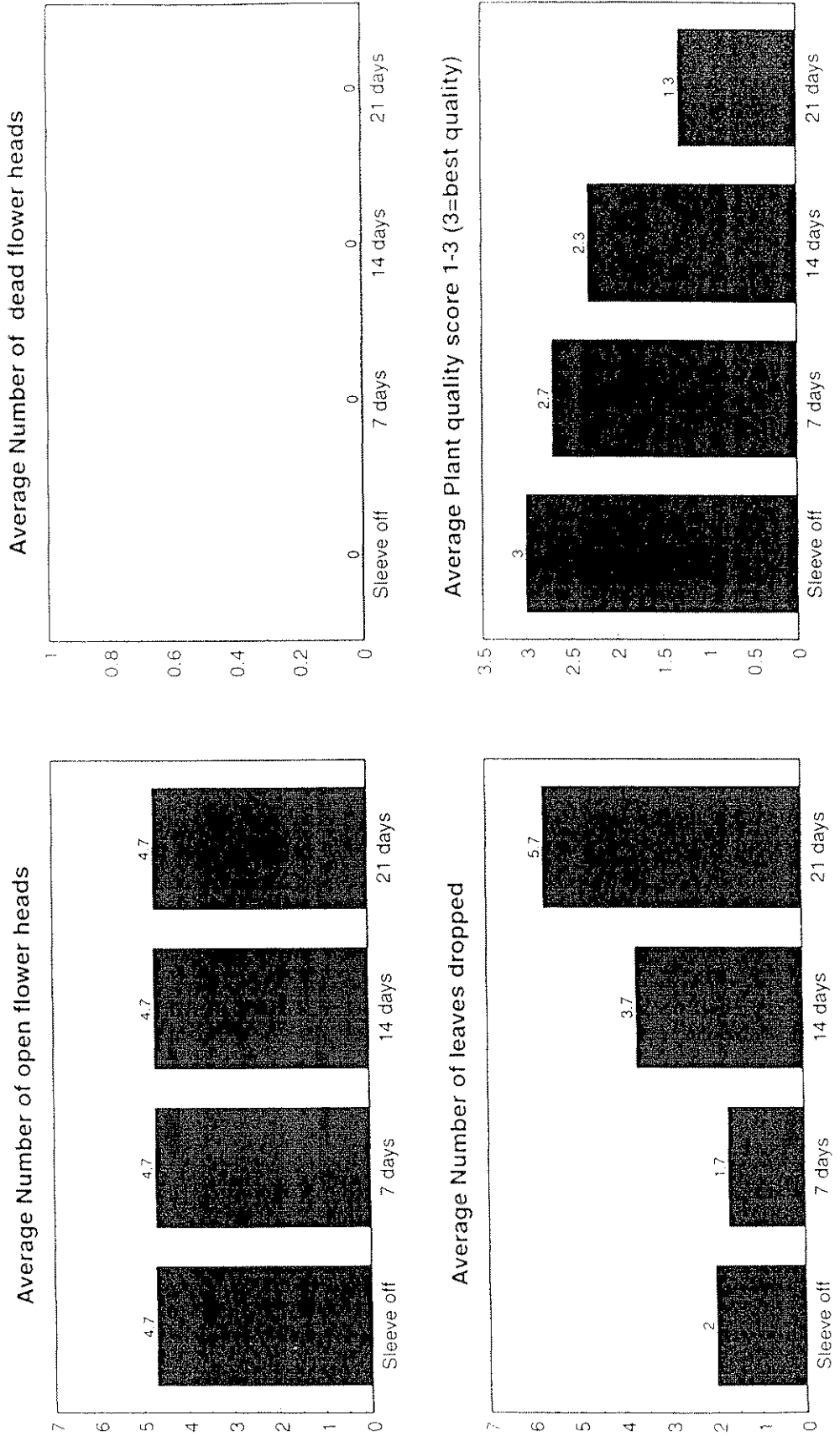
Hydrangea Shelf-life

Variety: Mucke (Nursery 2)
 (Mean of 3 plants)



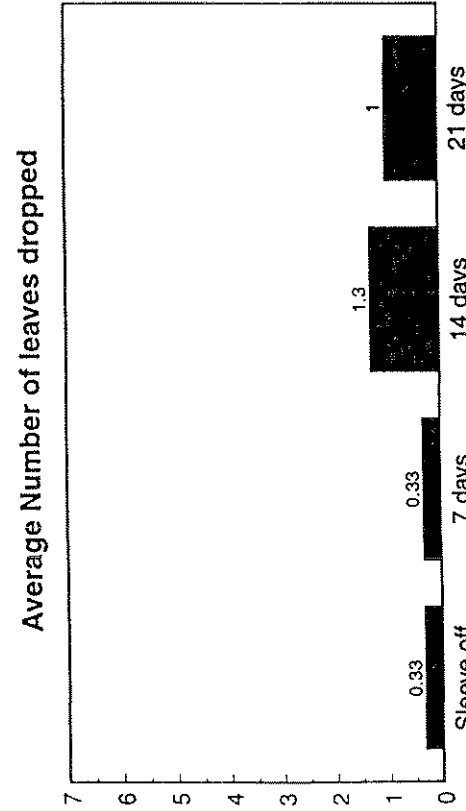
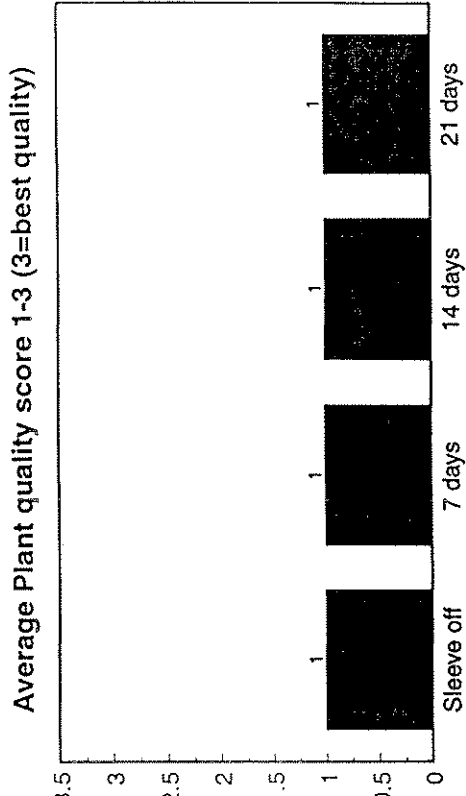
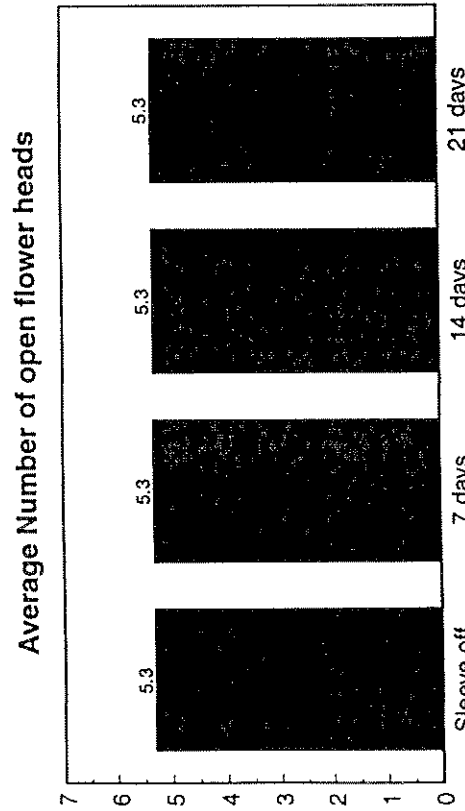
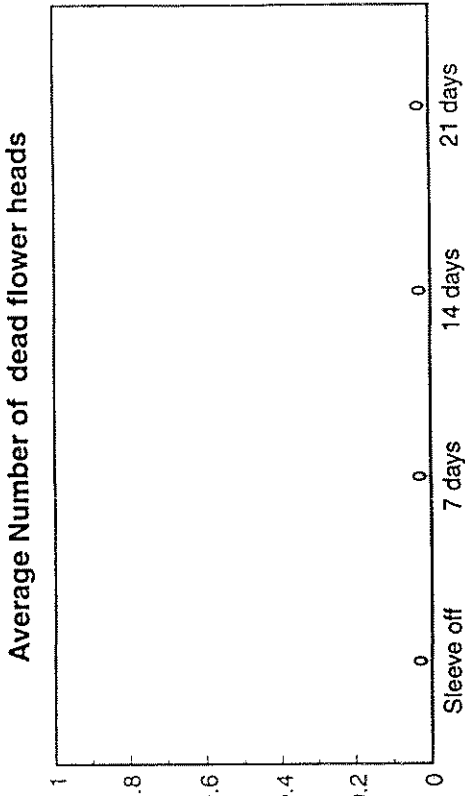
Hydrangea Shelf-life

Variety: Munchen (Nursery 2)
 (Mean of 3 plants)



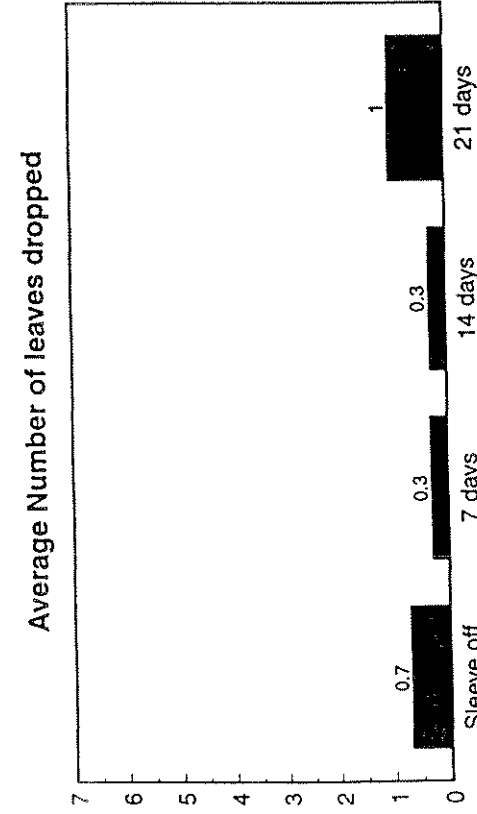
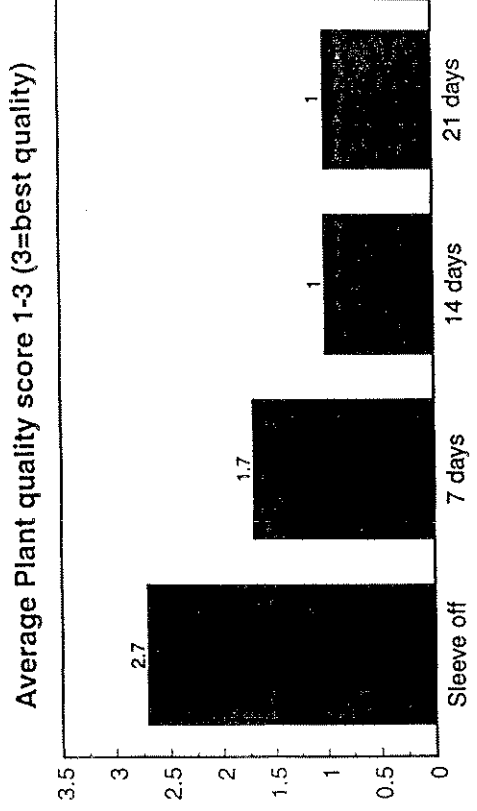
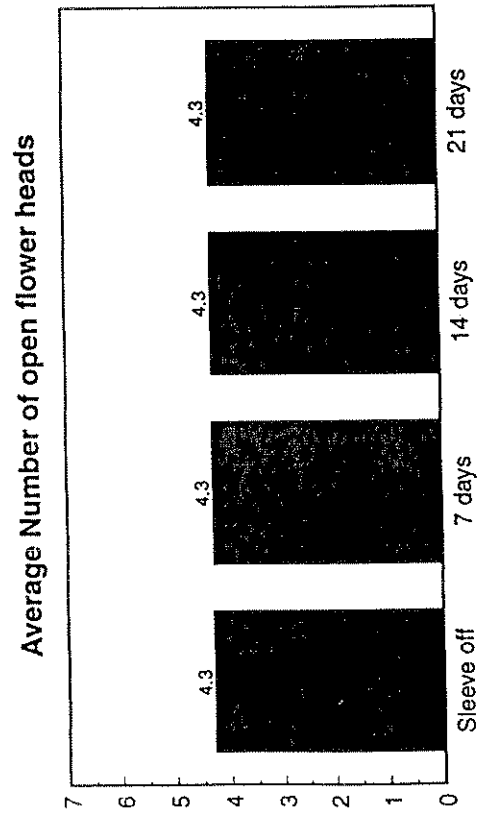
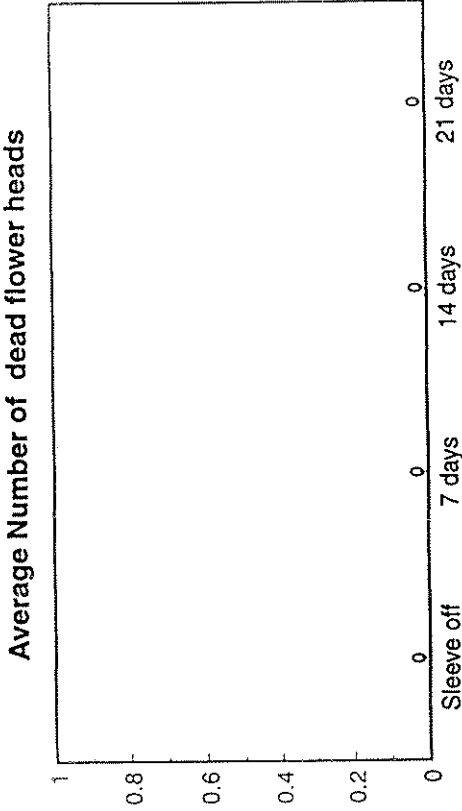
Hydrangea Shelf-life

Variety: Zaunknoig (Nursery 2)
 (Mean of 3 plants)



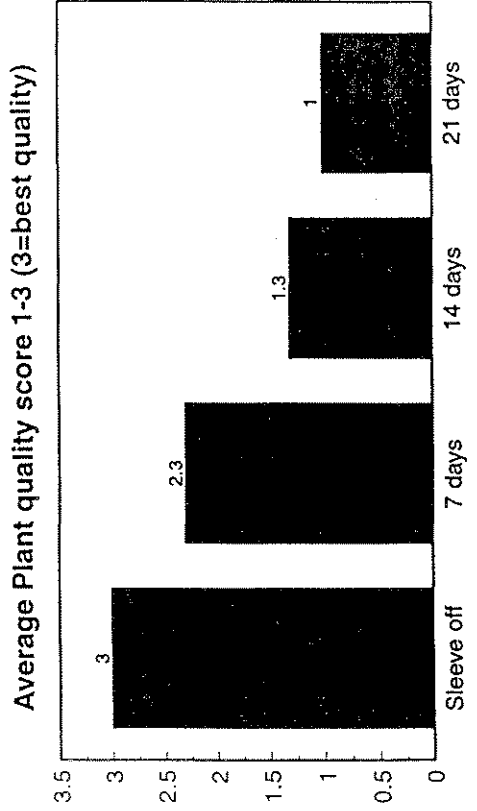
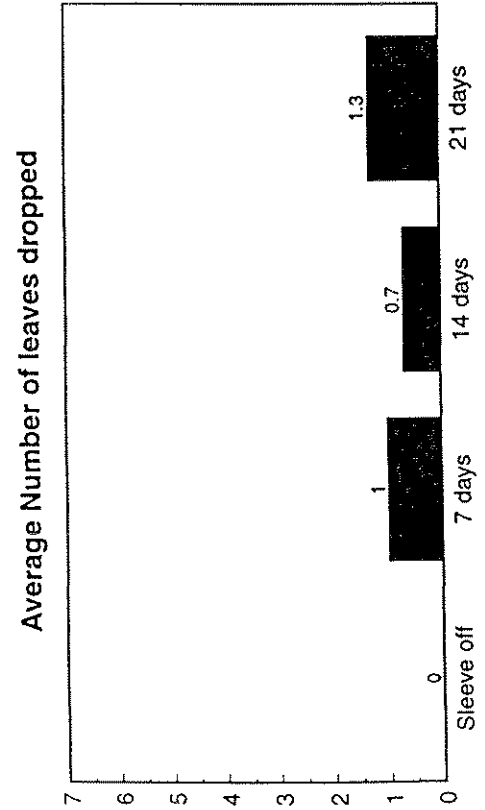
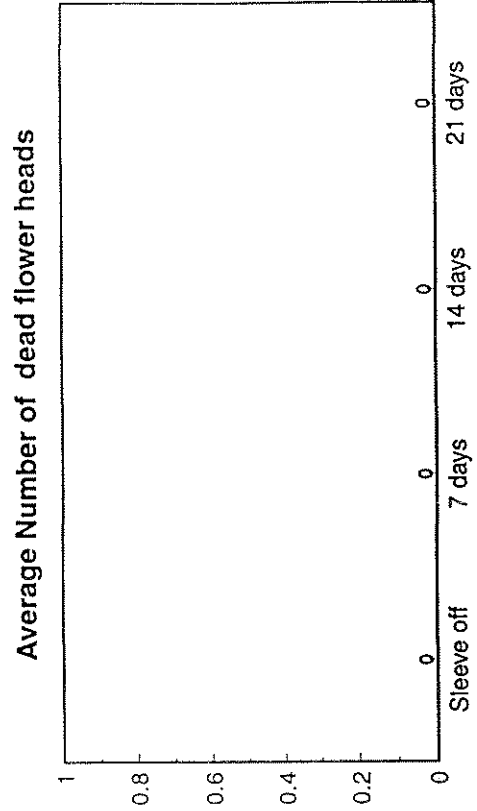
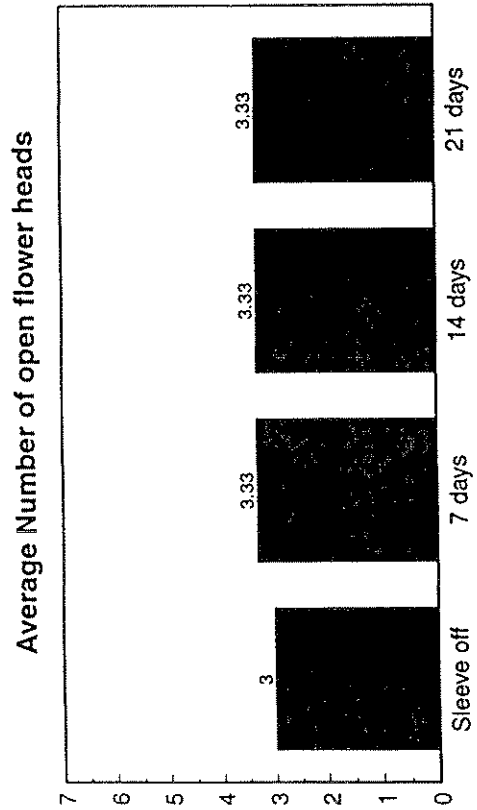
Hydrangea Shelf-life

Variety: Fazem (Nursery 2)
 (Mean of 3 plants)



Hydrangea Shelf-life

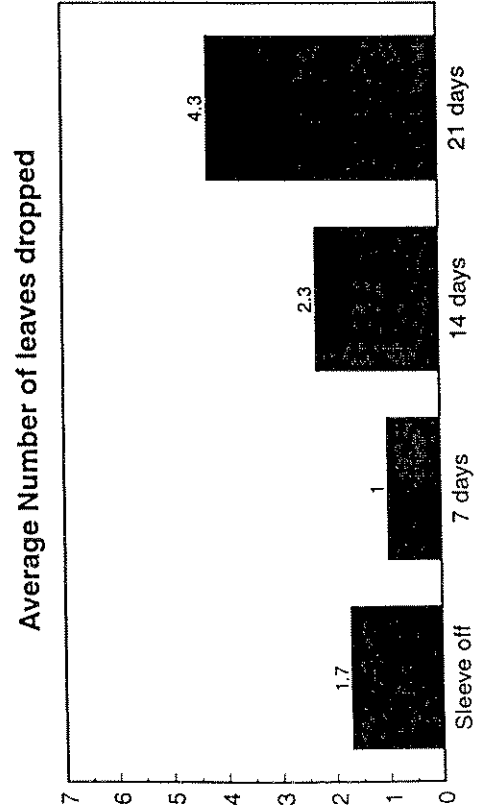
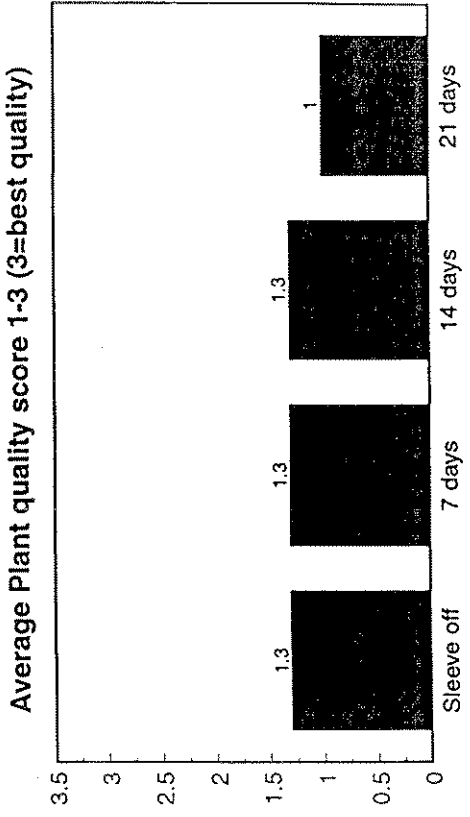
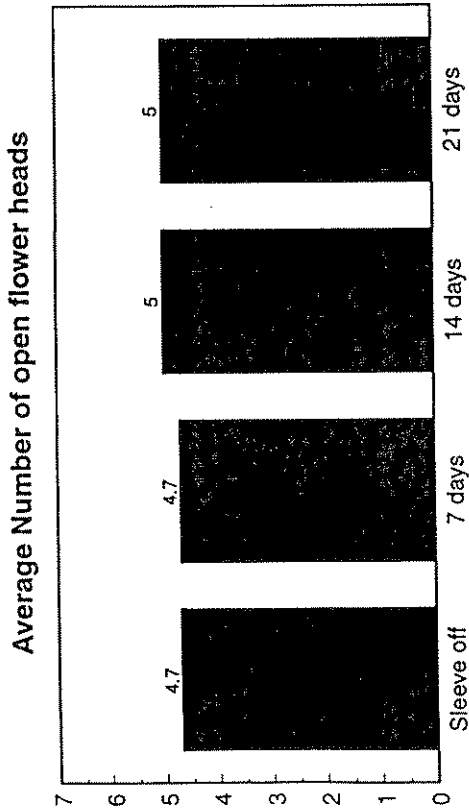
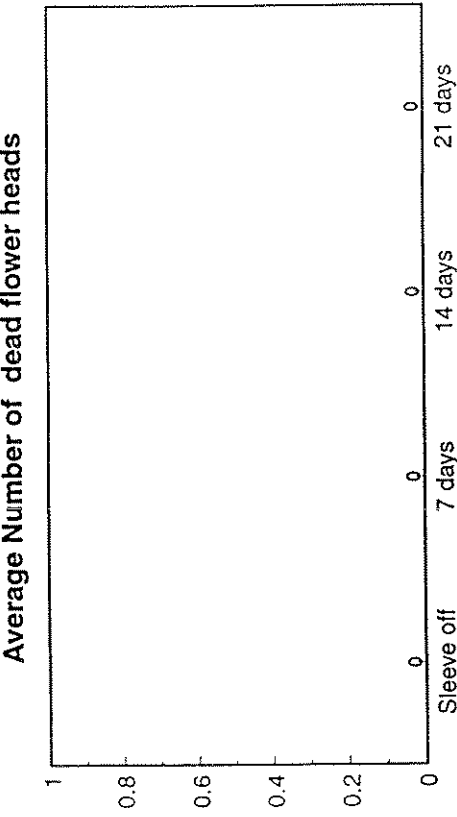
Variety: Cardinal (Nursery 2)
 (Mean of 3 plants)



Hydrangea Shelf-life

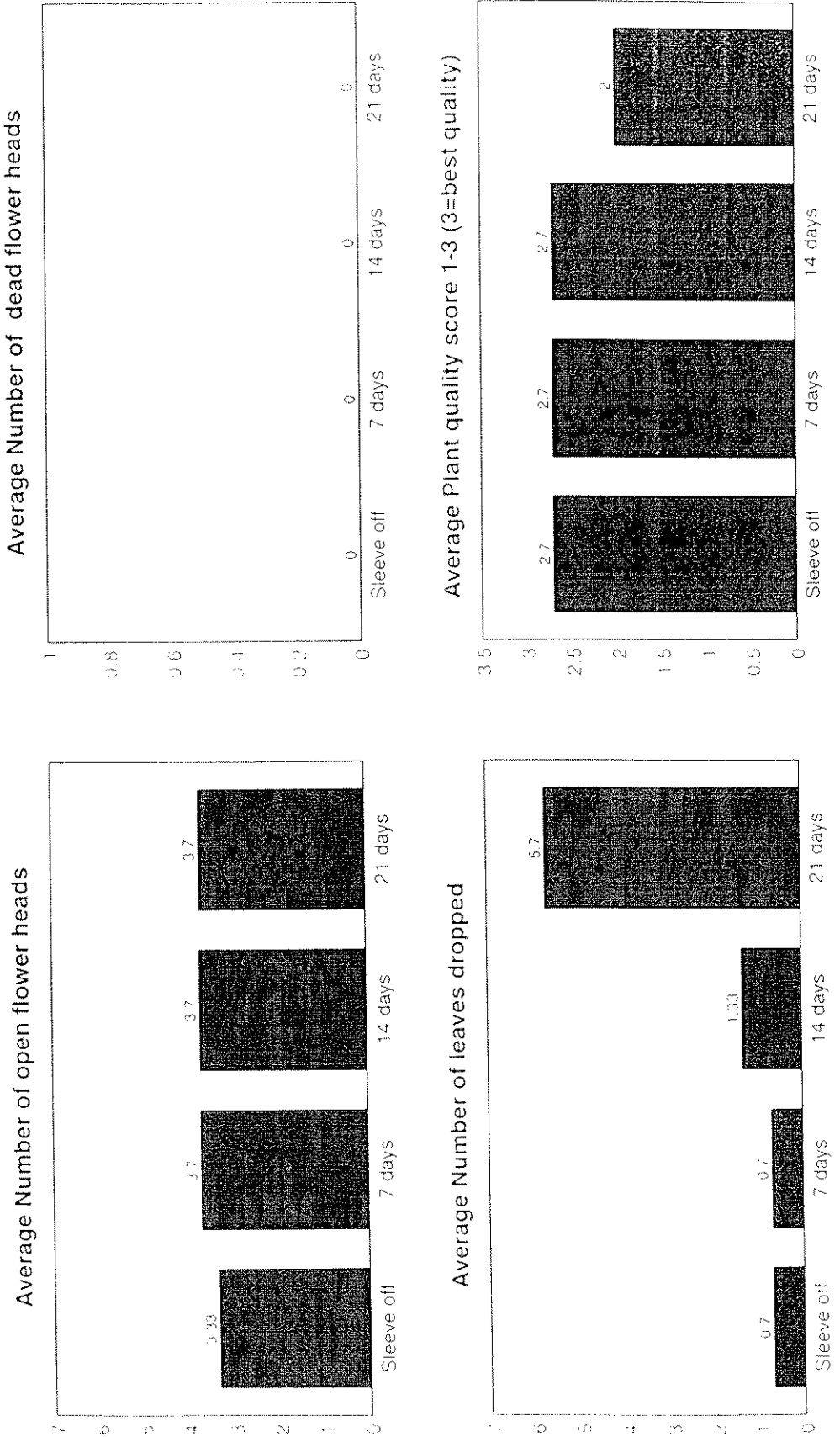
Variety: Move (Nursery 2)

(Mean of 3 plants)



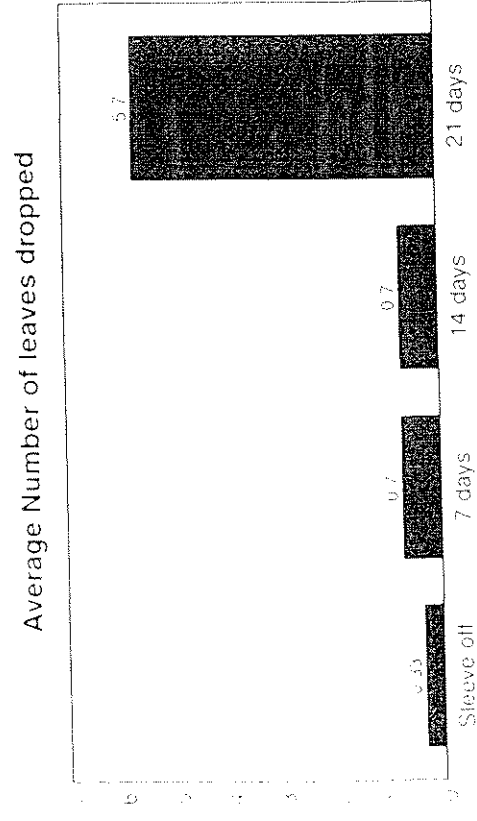
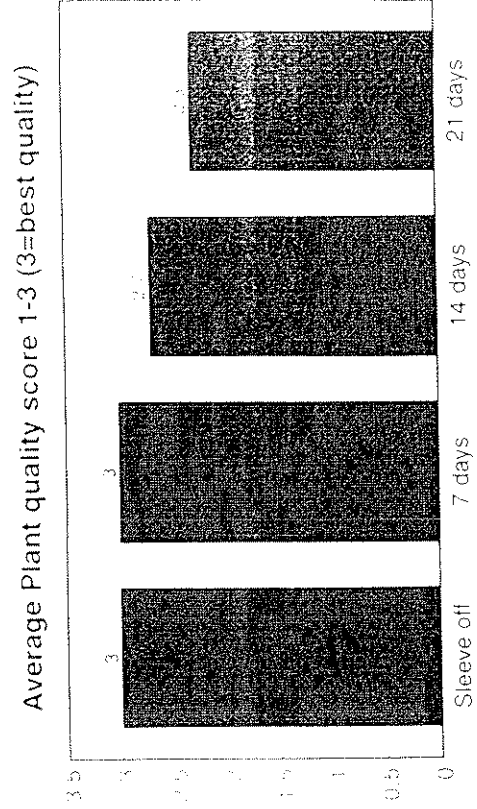
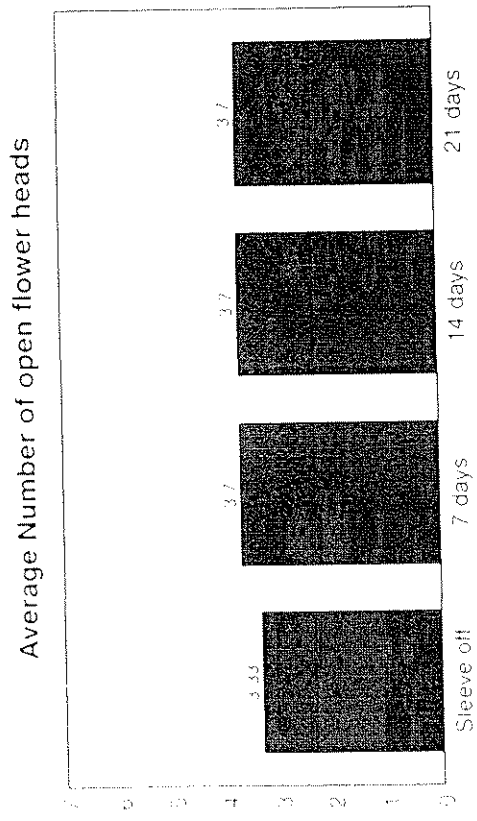
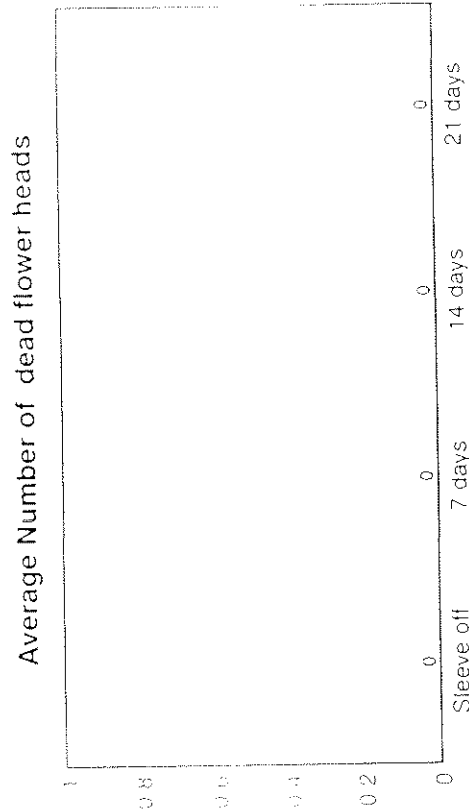
Hydrangea Shelf-life

Variety: Blauling (Nursery 2)
(Mean of 3 plants)



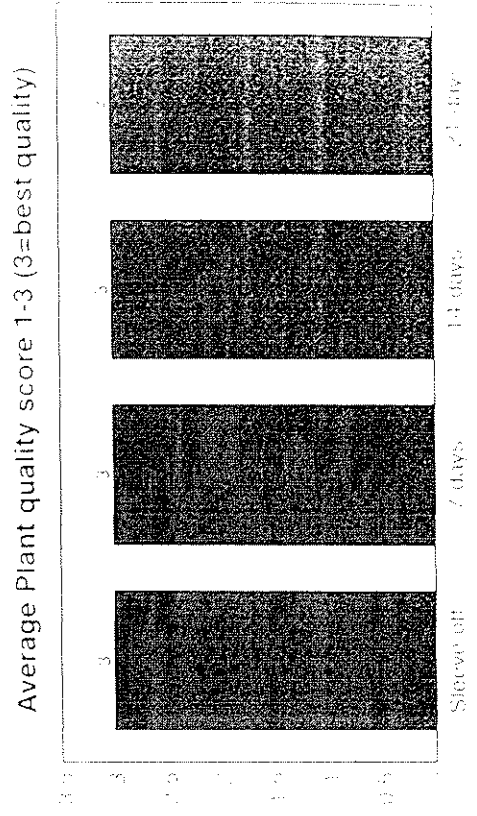
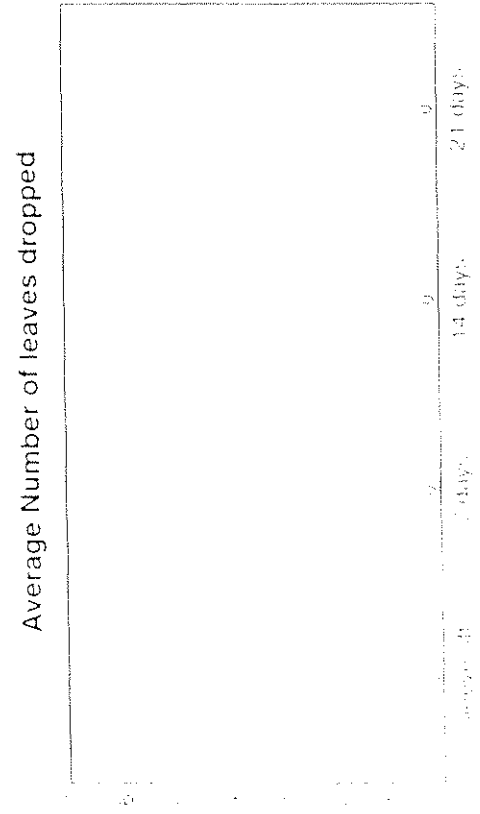
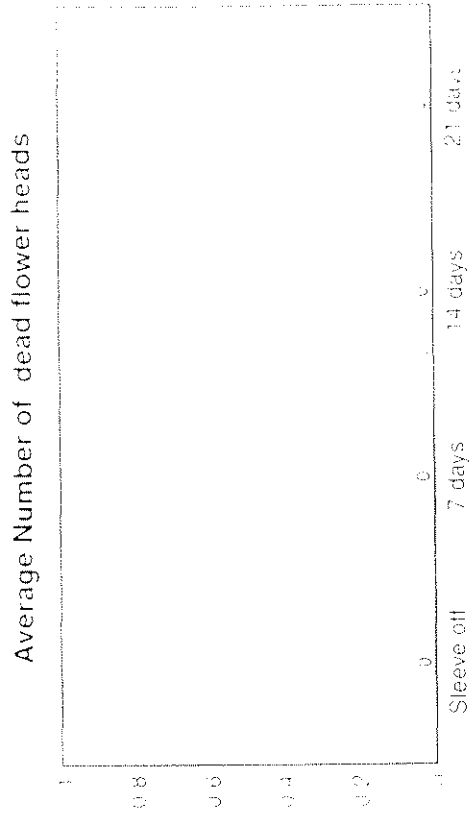
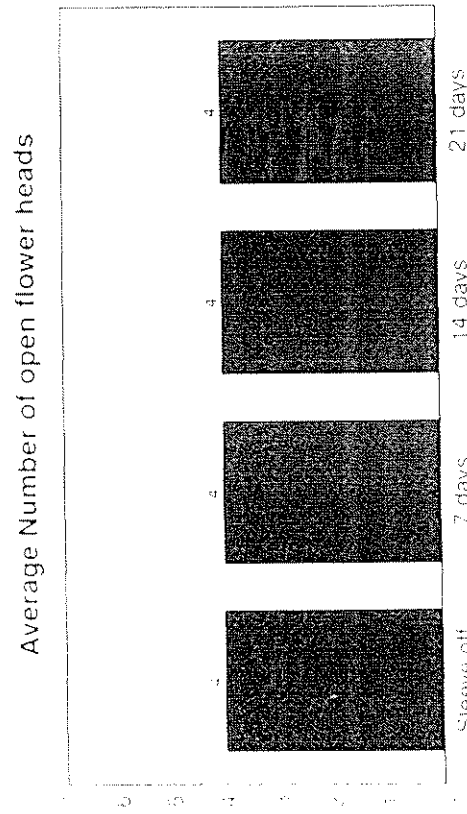
Hydrangea Shelf-life

Variety: Blaumeise (Nursery 2)
 (Mean of 3 plants)



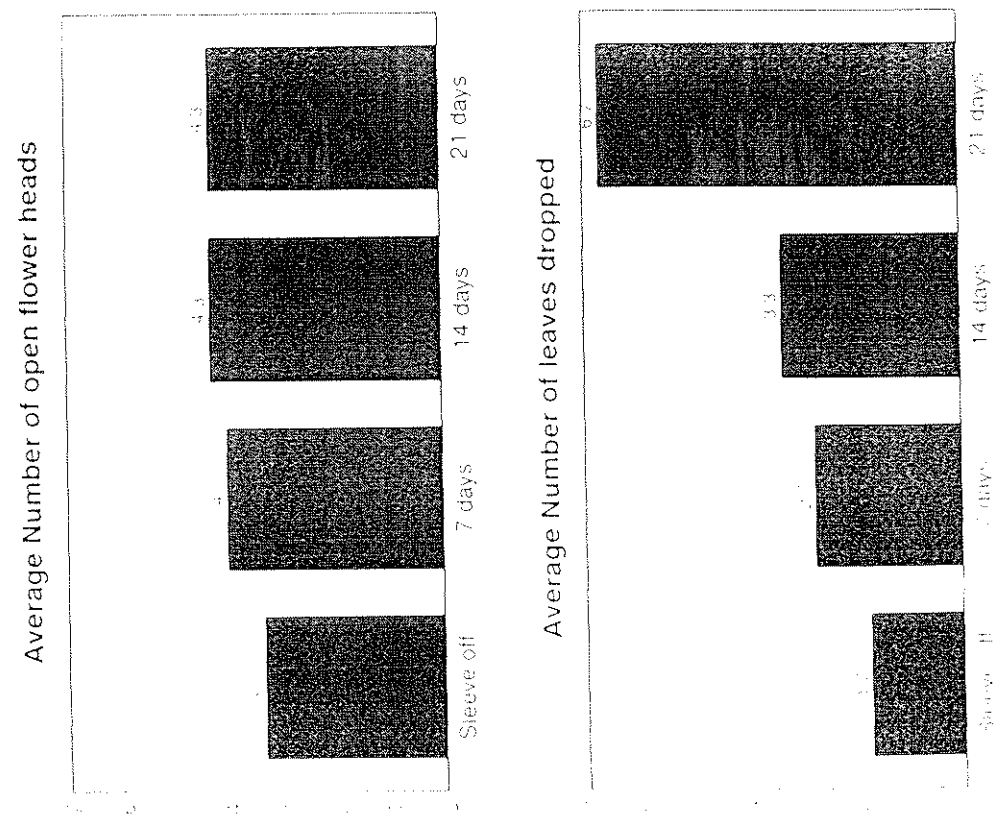
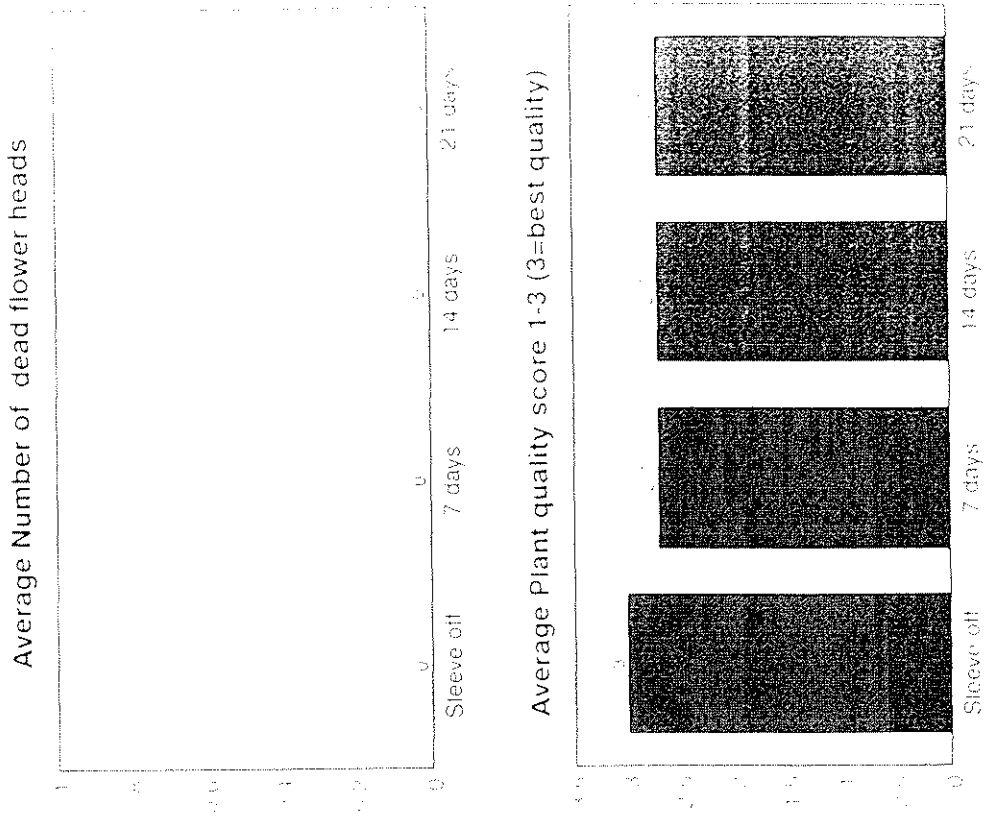
Hydrangea Shelf-life

Variety: Bluesky (Nursery 2)
(1 plant only)



Hydrangea Shelf-life

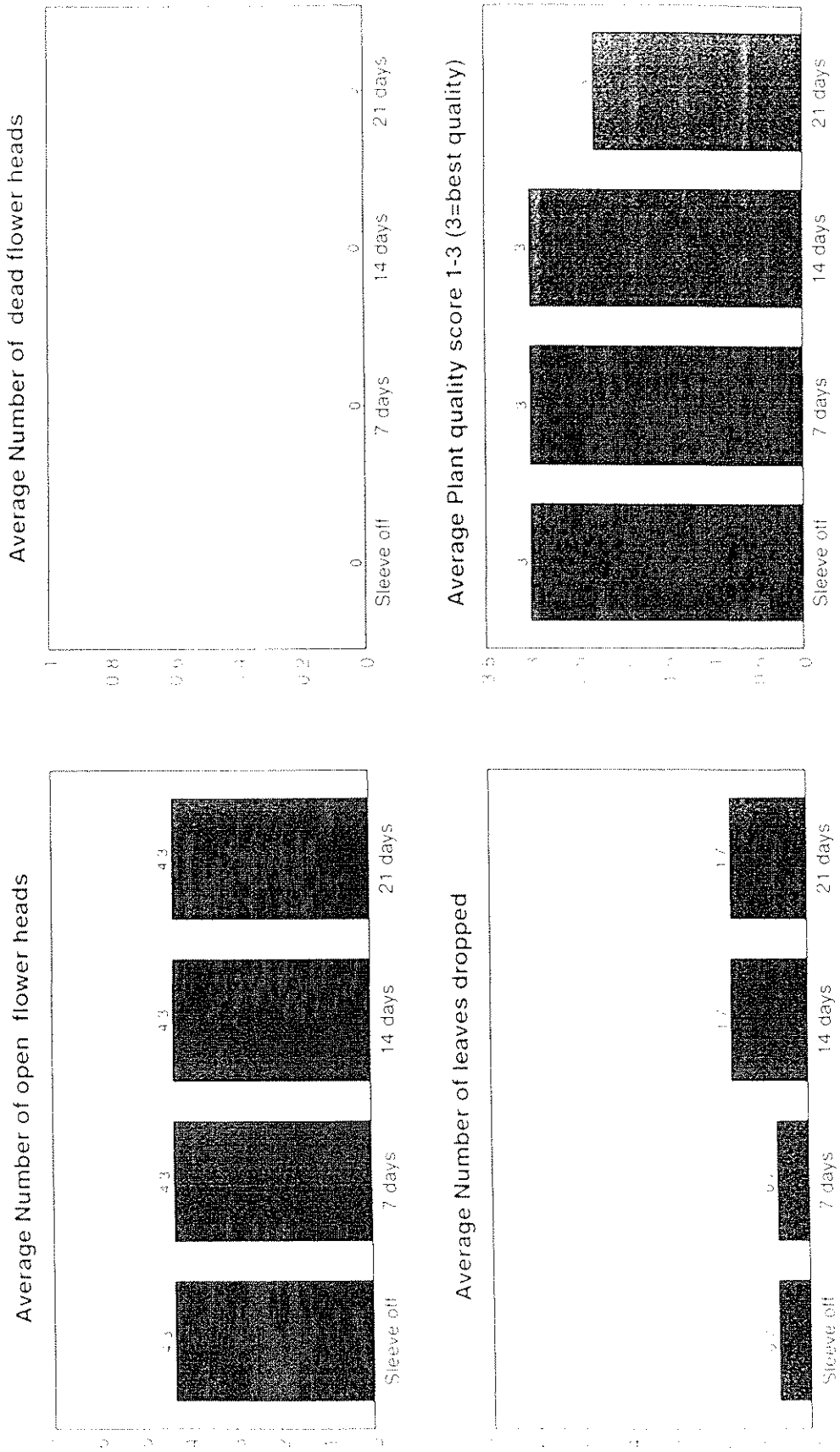
Variety: Berlin (Nursery 2)
(Mean of 3 plants)



Hydrangea Shelf-life

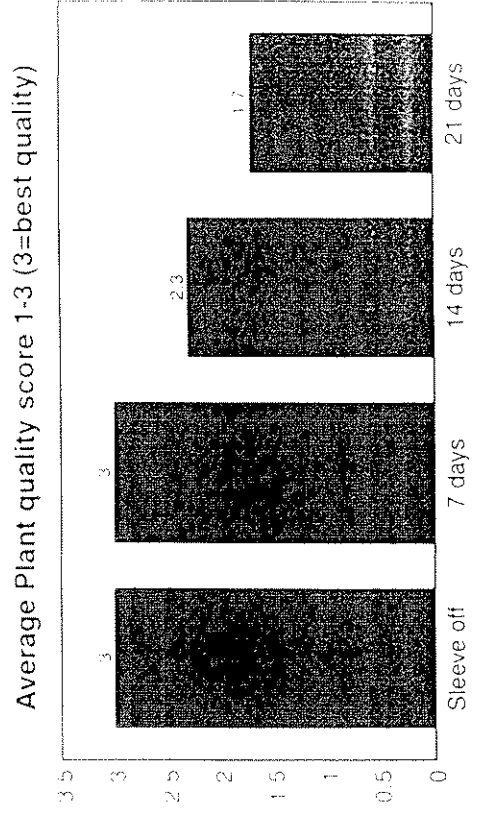
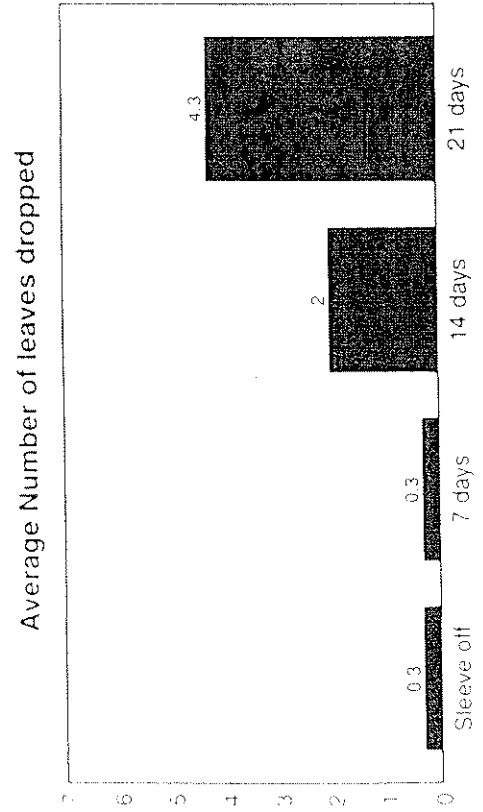
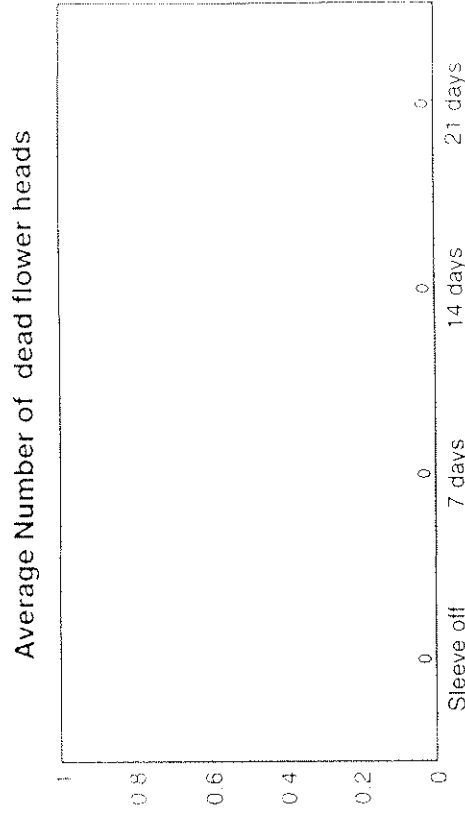
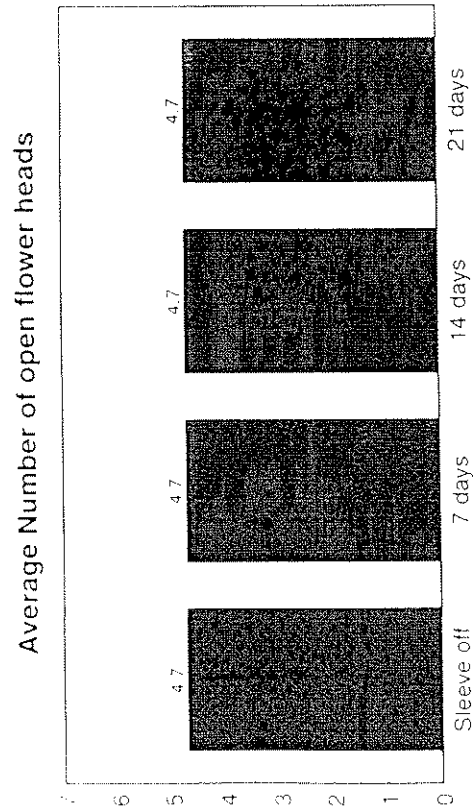
Variety: Fleider (Nursery 2)

(Mean of 3 plants)



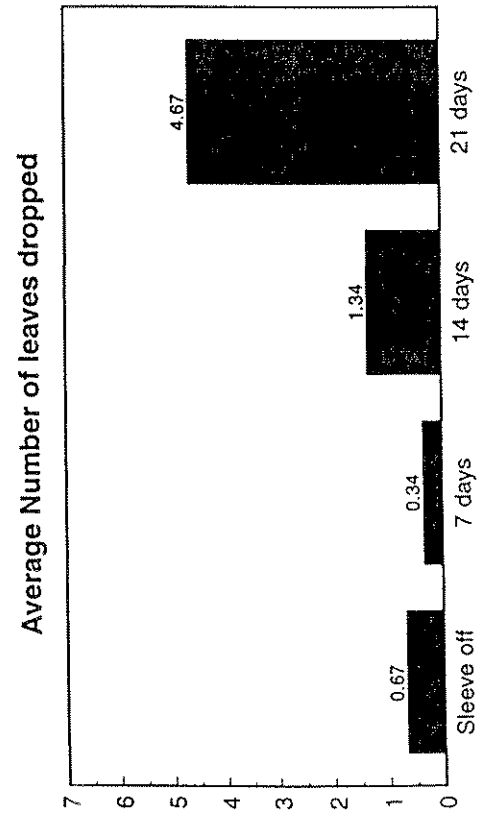
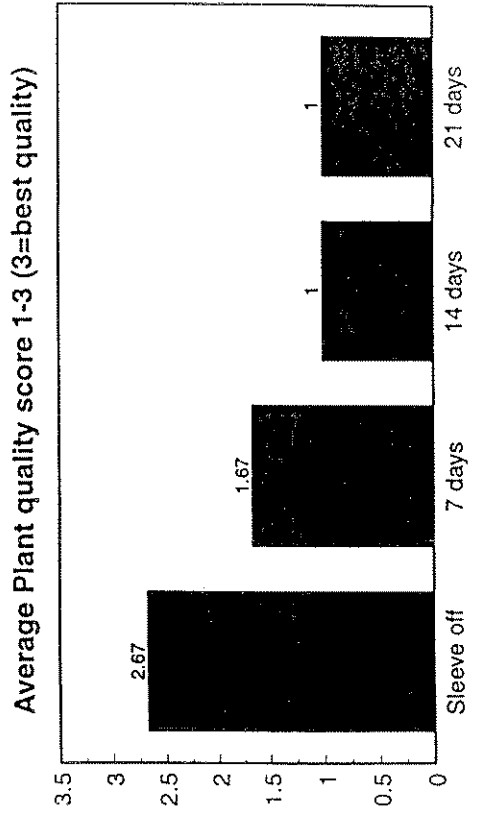
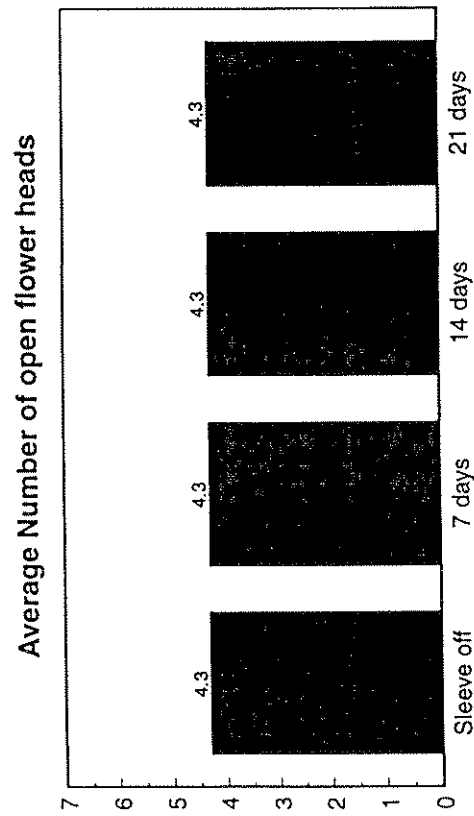
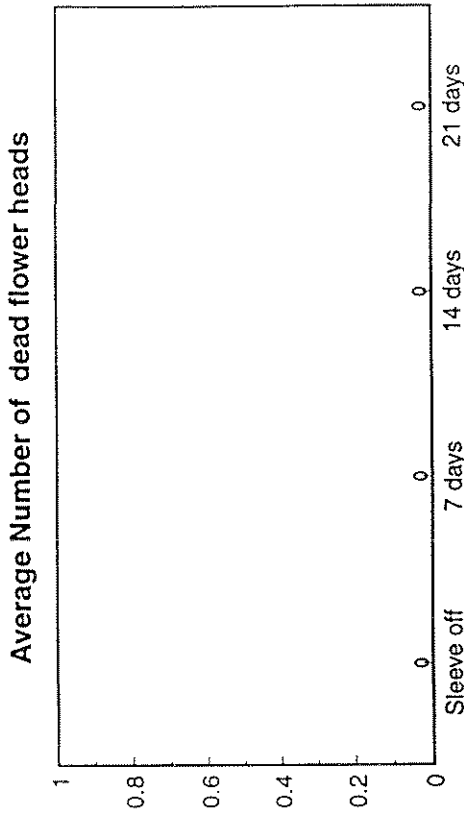
Hydrangea Shelf-life

Variety: Rosalia (Nursery 2)
(Mean of 3 plants)



Hydrangea Shelf-life

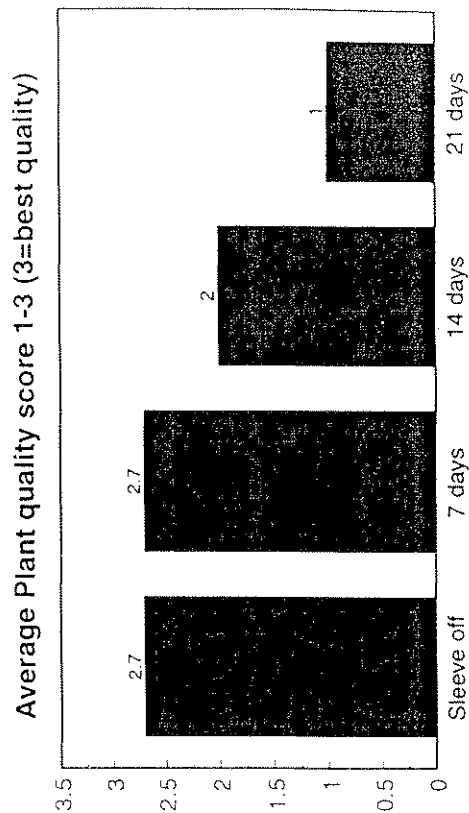
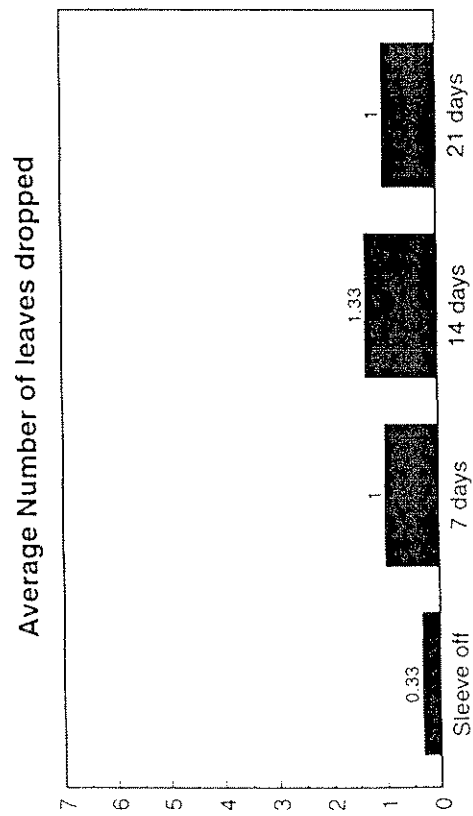
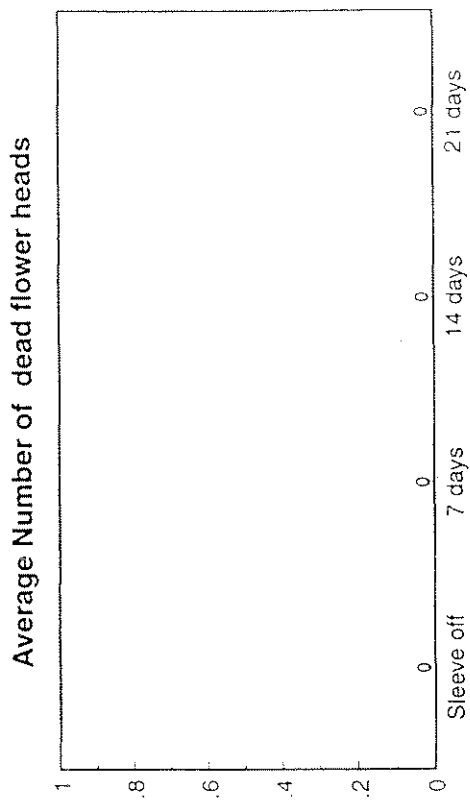
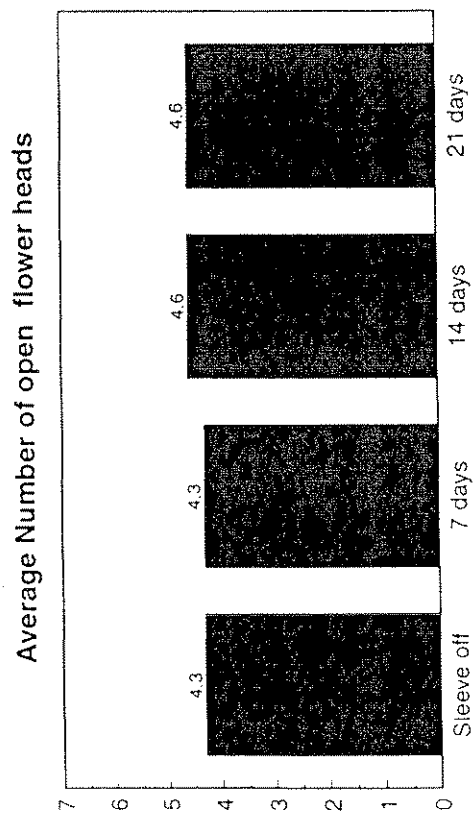
Variety: Roter Zwerg (Nursery 2)
(Mean of 3 plants)



Hydrangea Shelf-life

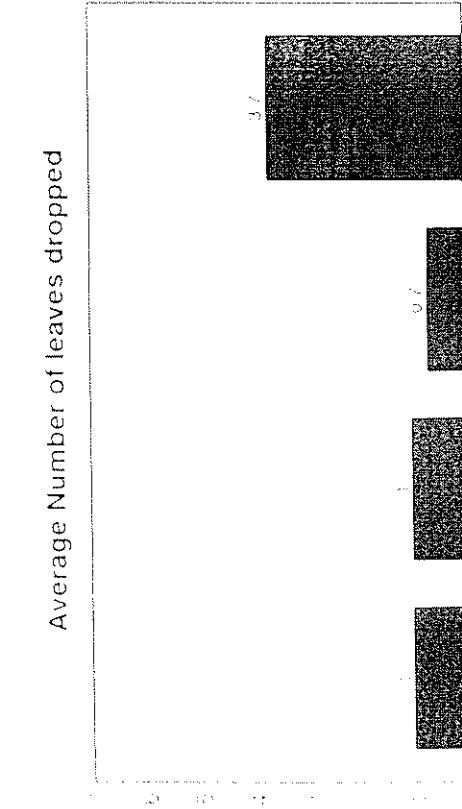
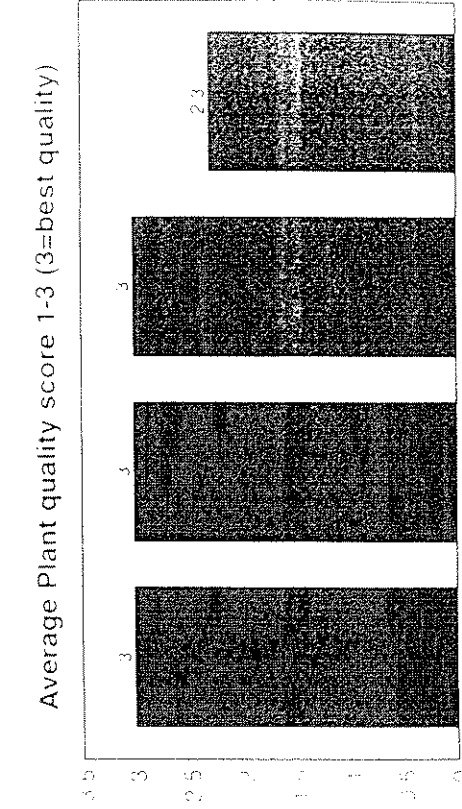
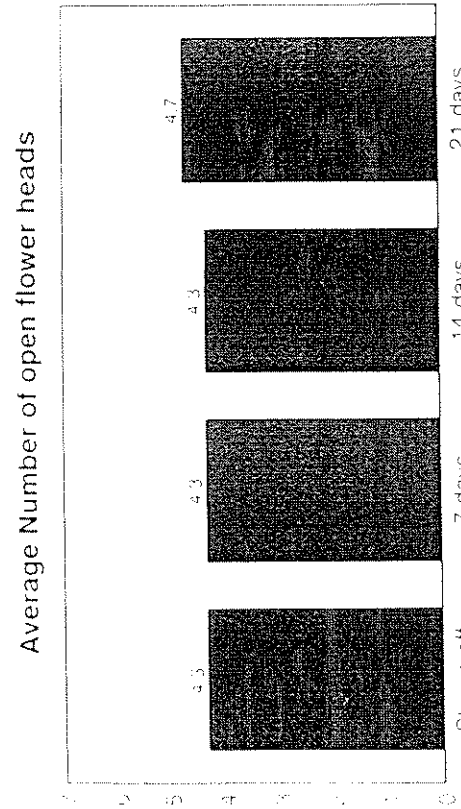
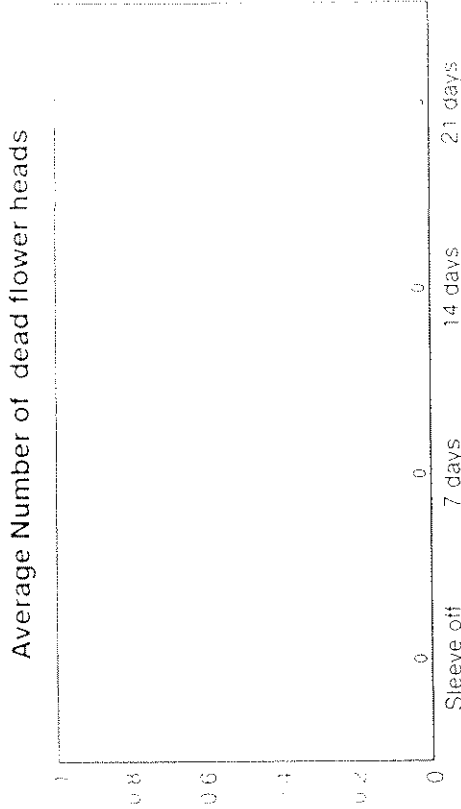
Variety: LK49 (Nursery 2)

(Mean of 3 plants)



Hydrangea Shelf-life

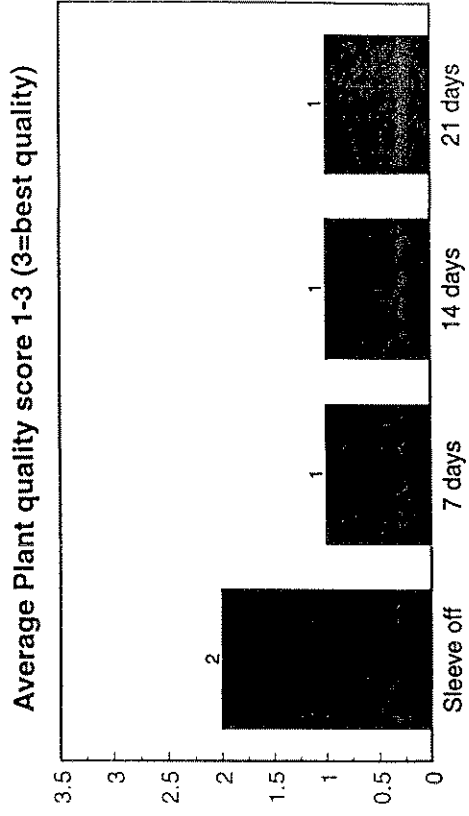
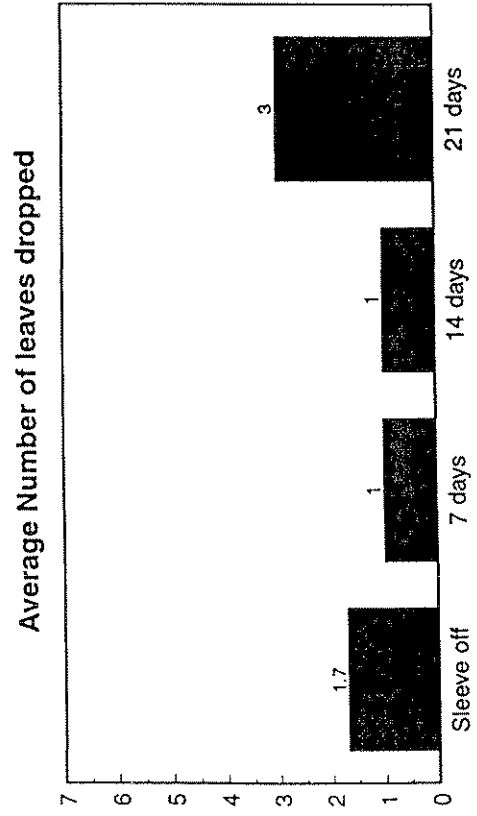
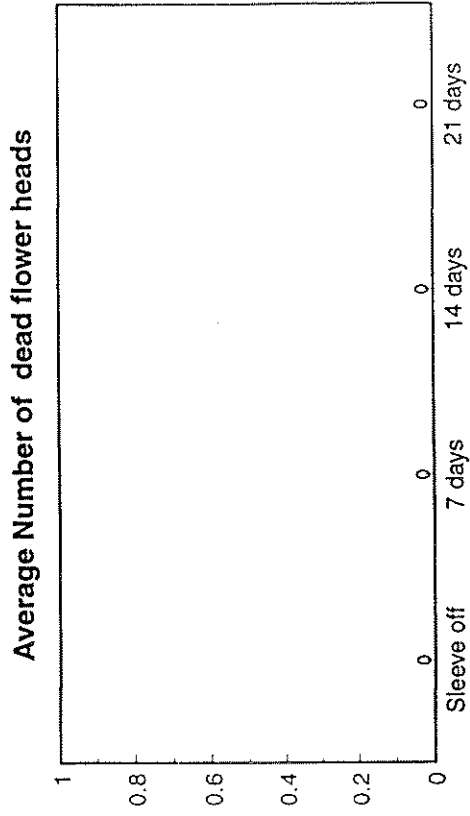
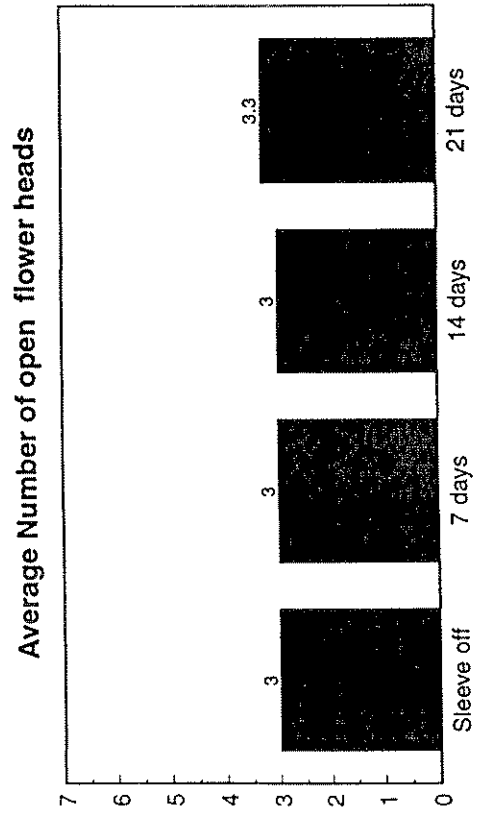
Variety: New Friesdorf (Nursery 2)
 (Mean of 3 plants)



Hydrangea Shelf-life

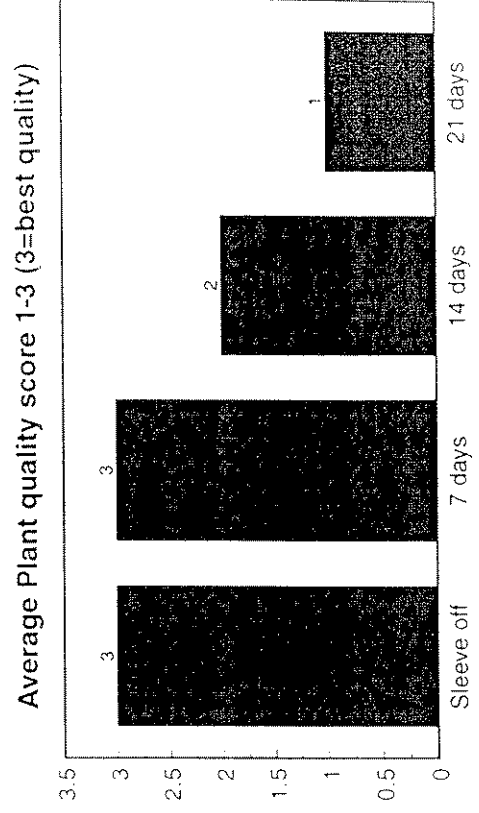
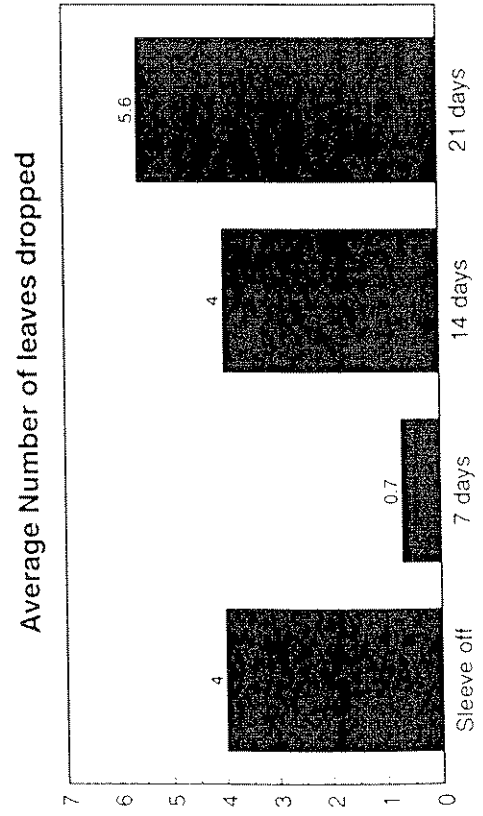
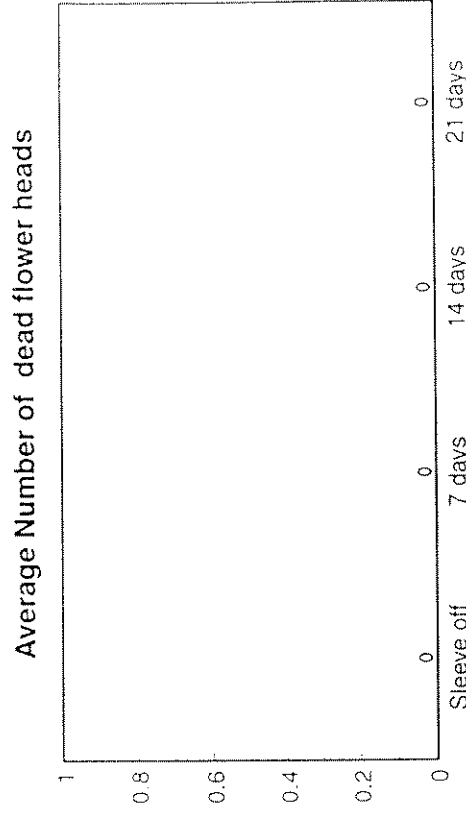
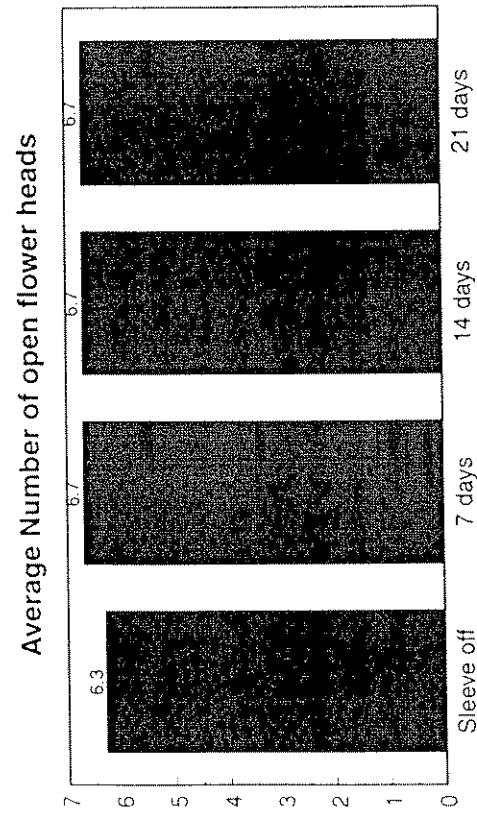
Variety: Paris (Nursery 2)

(Mean of 3 plants)



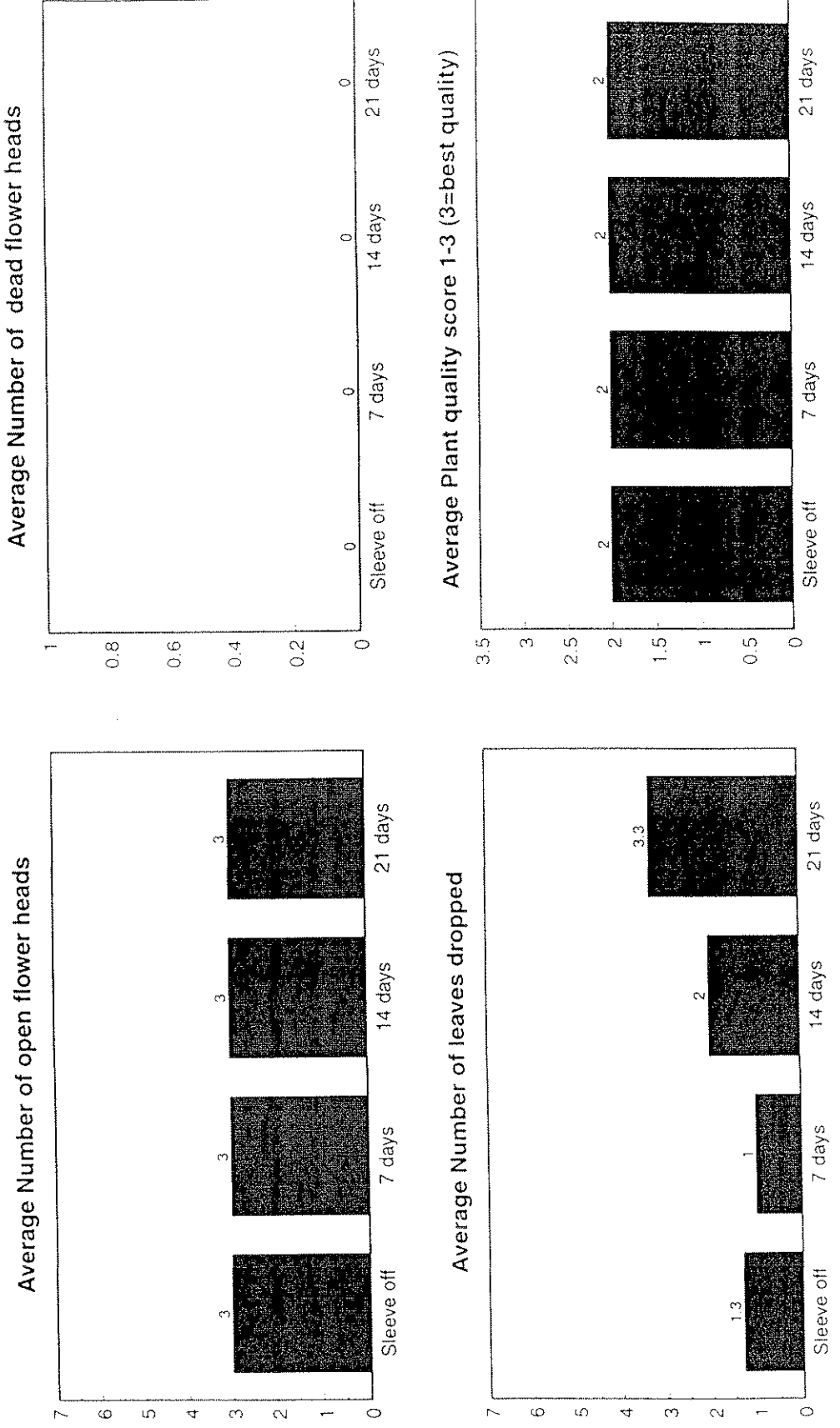
Hydrangea Shelf-life

Variety: Scheeball (Nursery 2)
 (Mean of 3 plants)



Hydrangea Shelf-life

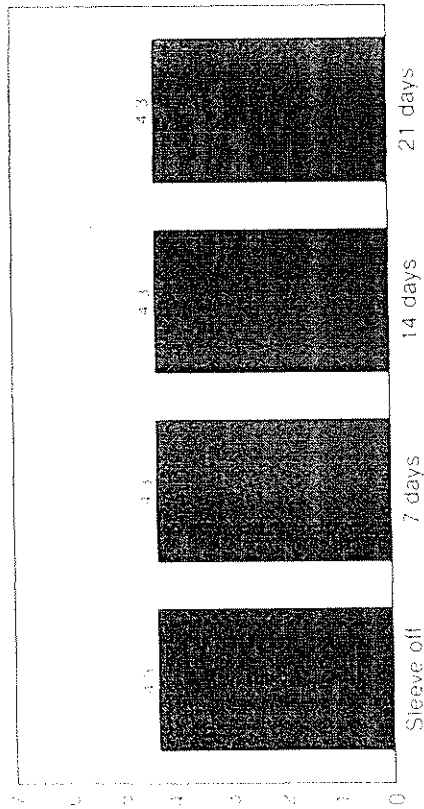
Variety: Cote D'Azur (Nursery 2)
(Mean of 3 plants)



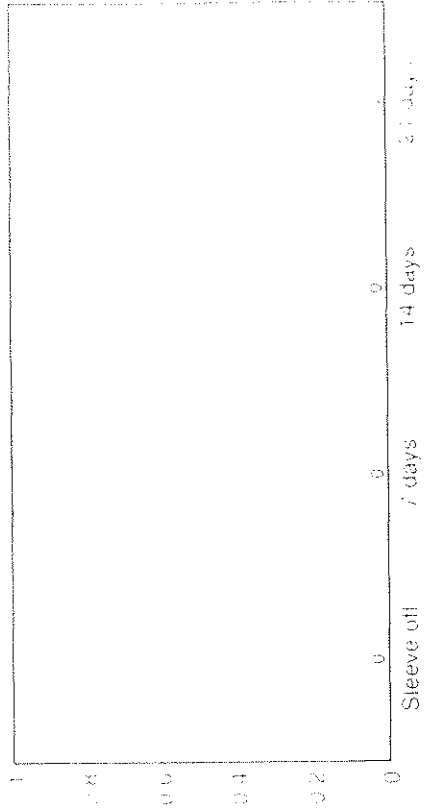
Hydrangea Shelf-life

Variety: Heinrichsburg (Nursery 2)
 (Mean of 3 plants)

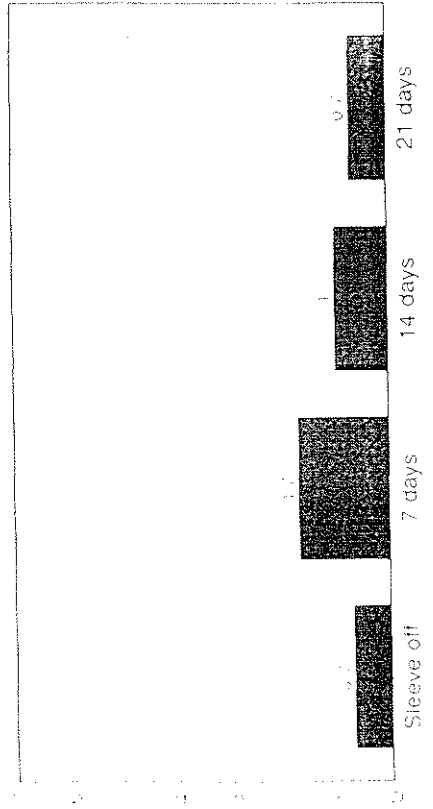
Average Number of open flower heads



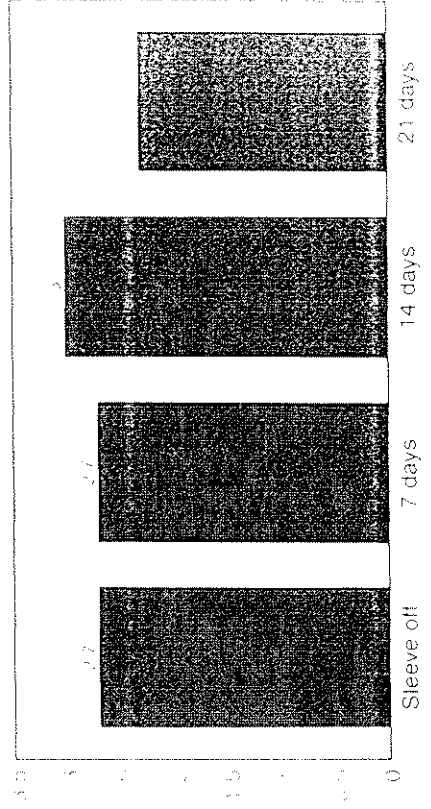
Average Number of dead flower heads



Average Number of leaves dropped

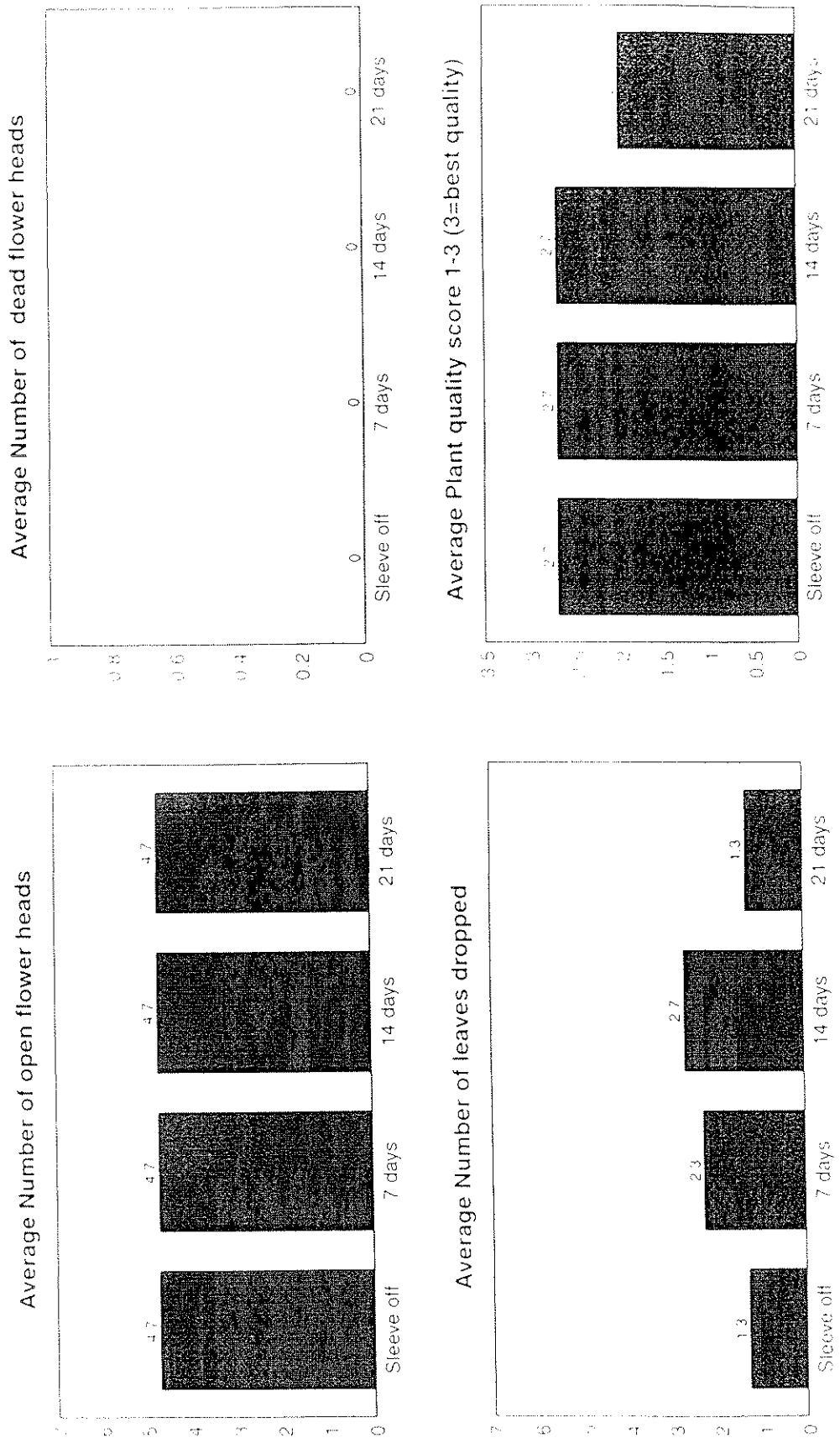


Average Plant quality score 1-3 (3=best quality)



Hydrangea Shelf-life

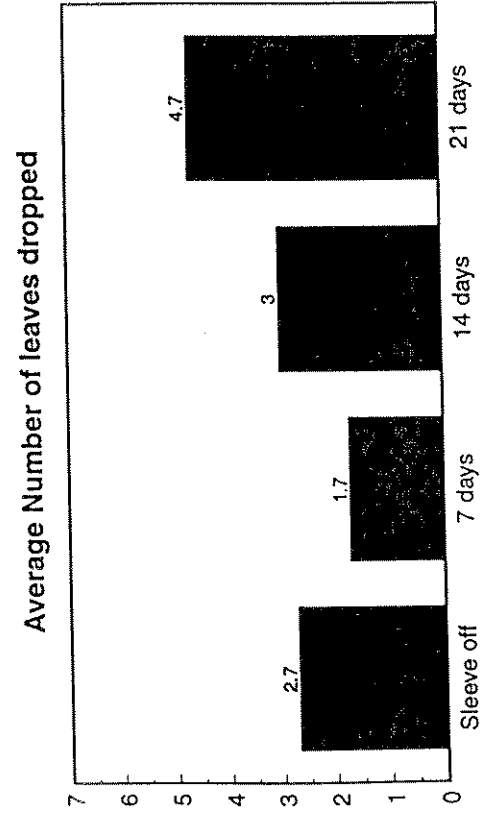
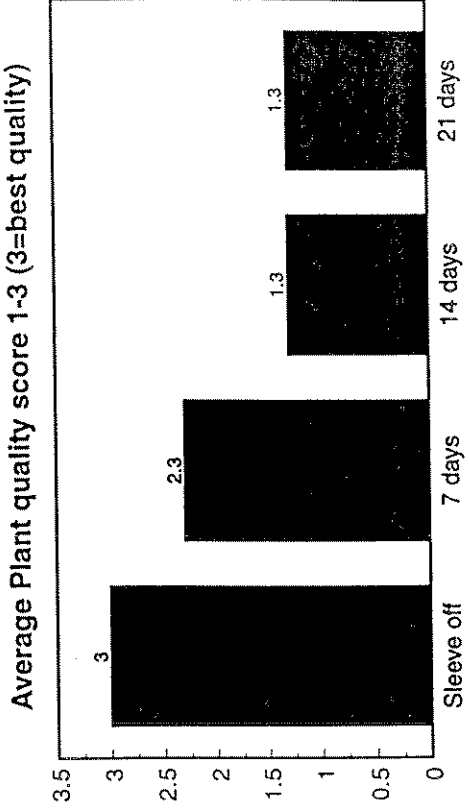
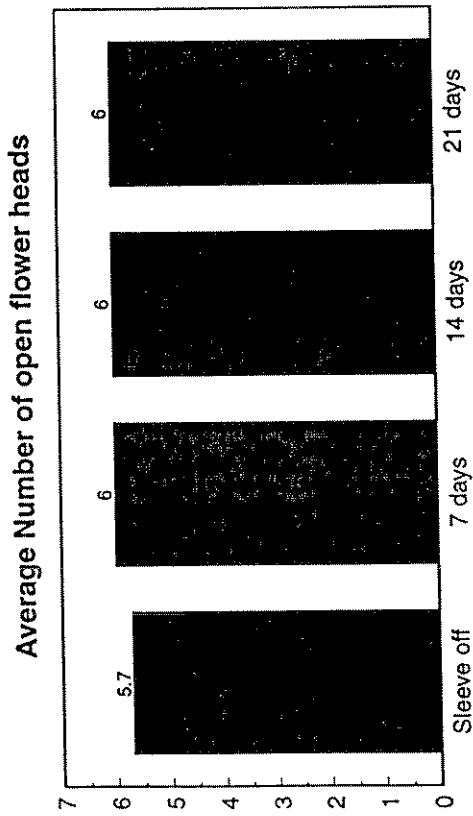
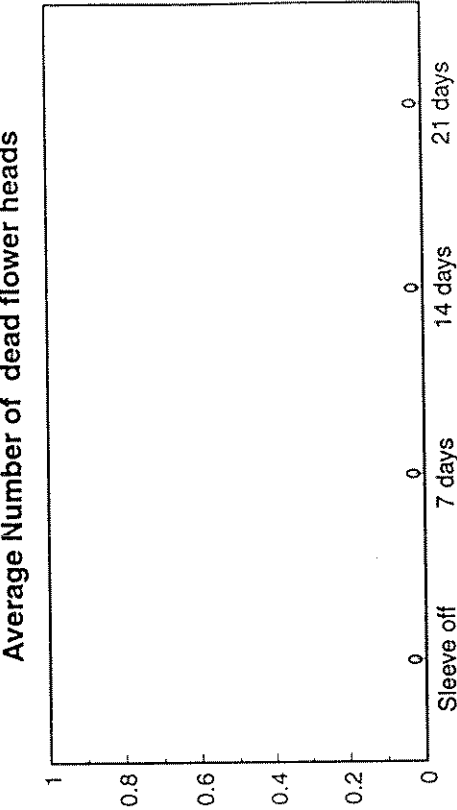
Variety: No. 15 Blue (Nursery 2)
 (Mean of 3 plants)



Hydrangea Shelf-life

Variety: Zurich (Nursery 2)

(Mean of 3 plants)



ACKNOWLEDGEMENTS

The authors of the report wish to thank the suppliers of young plants:-

Royal Eveleens BV
Rampp
Hollyacre Ltd

and those nurseries which provided facilities for the trials:-

Ivanda Nursery, Spalding
Europa Nursery, Hadlow
Helmutt Gimmler Ltd, New Milton
Keston Nursery, Pinchbeck

Contract between ADAS & HRI (hereinafter called the "Contractors") and the Horticultural Development Council (hereinafter called the "Council") and the research/development project.

1. **TITLE OF PROJECT**

Contract No: PC44a

TO EVALUATE NEW HYDRANGEA CULTIVARS FOR GROWTH, HABIT, MARKETABILITY AND SHELF-LIFE, FOR MARKETING FROM THE END OF FEBRUARY TO THE END OF MARCH

2. **BACKGROUND AND COMMERCIAL OBJECTIVES**

A number of new cultivars have recently become available to growers. There has been little or no evaluation of these cultivars for early Hydrangea pot plant production. All Continental work with regard to these cultivars covers main season production and does not include shelf-life or cover their acceptability by the general public.

Little information is available on the range of cultivars grown in the UK. Apart from those imported from Denmark, Belgium, Germany or Holland for forcing and finishing.

The main cultivars grown in the UK have been in commerce for over 20 years. No UK information is available on new cultivars which have recently become available in Europe and are listed for trial.

To date little attention has been given to growing Hydrangeas to a specific size specification of 4-5 heads in a 14cm pot, the effect on production techniques and marketability of those products.

The proposed study will aim to test which cultivars produce good products in the shortest time for forcing and give the consumer the best product with the longest shelf-life. The new cultivars may replace old cultivars or find a niche market.

Two types of cultivar will be examined, Lacecaps and Mopheads. Lacecap types have recently increased in popularity and command a 20-25% of the market. The main colours are white, pink and blue, but there is not a good red.

Of the mopheads, a new blue cultivar may be a better blue than those at present grown.

3. **POTENTIAL FINANCIAL BENEFIT TO THE INDUSTRY**

This is difficult to quantify however, the number of Hydrangeas grown as pot plants in the UK and those imported as finished products from Holland exceed 1 million and it is estimated that up to 2 million plants are sold through retail outlets each year. The number sold through nursery stock outlets is not known.

Farm gate sales of Hydrangeas as pot plants or for patio work, window box, show decoration could exceed £6 million. This does not include miniature Hydrangeas for bowl work or standards.

4. SCIENTIFIC TECHNICAL TARGET OF THE WORK

The study aims to evaluate the new cultivars under UK conditions and to assess plant size and the market acceptability, particularly their shelf-life.

5. CLOSELY RELATED WORK COMPLETED OR IN PROGRESS

Germany

H Loeser 1986/7 LVG Heidelberg, Hortensia cultivar trial for commercial work. Pinching for growing for sale.

Dr K-Strauch 1980/8 Landwirtschaftskanner, Westfalen-Lippe Munster-Wolbeck, forcing Hydrangeas for early production. Supplementary lighting for Hydrangeas.

France

Jean Maillet, National Pot Plant Station, Angers, (CNIH), Hortensia production cultivars bush plants, standards and miniatures.

6. DESCRIPTION OF THE WORK

a) Cultivars to be examined

The plants will be grown outside at ambient temperatures until the autumn and then, after the requisite cool period, they will be forced at 16° - 22°C to flowering.

LACECAP TYPES

Move

Fazem

Kardinel

Bergfink

Munchen

Mucke

Messalina

Blaumeise

Blauling

Bluesky

Snow

Ayesha

Zaunknoig

MOPHEADS

Hermann Dienemann

Roter Zwerg

Paris

Rosalia

Berlin

Fleider

Zurich

Cote D-Azur

Scheeball

LK49

Red Baron

New Friesdorf

Heinrichsburg

No. 15 Blue

b) Design and location

Forty plants of each cultivar will be grown at C Benson's Nursery, Ivanda Nursery, Monkshouse Lane, Spalding until the autumn. Ten plants of each cultivar will then be distributed to the following nurseries before forcing:

C Benson, Ivanda Nursery, Monkhouse Lane, Spalding

H Evans and Co, Europa Nursery, Hadlow

H Gimmler Ltd, New Milton, Hants

D Hull, Keston Nursery, Pinchbeck, Spalding

Each grower will grow the plants in a commercial way.

c) Cultural details

1. The plants will be potted into a 14cm pot.
2. Potting Week 21
3. The compost pH will be adjusted for the colour range of the cultivar ie:

Blue/White	pH 4.5 to 4.8
Pink	pH 6.5
Red	pH 6.8 to 7.5
4. Nutrients will be adjusted to requirements from routine compost analysis.
5. All plants once established will be grown on outside on a cinder bed.
6. Plants to be stored prior to first frost of the Autumn.

7. Storage if required to be at no more than 6°C.
8. Leaves to be removed in the Autumn.
9. Compost analysis prior to forcing.
10. Plants forced to growers needs.

d) **Shelf life**

The plants be given a commercial treatment, harvest to market and then to be returned to shelf-life room at HRI Efford for 4 weeks.

Shelf-life assessment will include all cultivars which reach market specification from each of the four commercial holdings.

Shelf-life assessments at weekly intervals for four weeks to include:

- Flower number
- Flower colour
- Flower drop
- Overall plant quality

Design

27 cultivars * 4 holdings = 108 plots

Four plants per plot to enter shelf-life.

Envisage marketing of plants from end of February 1995 over 6 week period. Therefore, shelf-life to commence in week 7 and to be completed by week 16, end of April.

e) **Records - main trial**

1. Full crop diary.
2. Growth assessment at forcing and harvest to cover.
 - (i) Plant shape
 - (ii) Growth habit
 - (iii) Number of shoots
 - (iv) Number of blind shoots
 - (v) Size and type of head
 - (vi) Amount of pest and disease
 - (vii) Marketability of the plants
 - (viii) Shelf life, longevity of plants

7. COMMENCEMENT DATE, DURATION AND REPORTING

Start date 01.05.94; duration 1 year. Interim results would be available to HDC for visiting groups throughout the season. ADAS in conjunction with the British Bedding and Pot Plant Association would put on a meeting to cover aspects of trial at one or more sites. The final report will be produced by the end of May 1995.

8. STAFF RESPONSIBILITIES

Project Leader:	H M Kitchener, ADAS Huntingdon
Other staff:	A Fuller, HRI Efford
Project Co-ordinator:	C Benson, HDC Co-ordinator

9. LOCATION

C Benson, Ivanda Nursery, Spalding
H Evans, Europa, New Hadlow
H Gimmler Ltd, New Milton
D Hull, Keston Nursery, Spalding
HRI Efford