sulting in damaged plants at the destination.

Inspection by a Ministry of Agriculture Field Officer should be made at this stage and, if necessary, depending upon the size of the shipment, several inspections may be required. Early advice to the M.A.F. is necessary and where weekly consignments are being shipped, a schedule of times and dates for inspection should be made available to the Field Officers as early as possible.

Packing Media: Generally accepted world-wide is sphagnum moss and, in some countries, peat. Whichever medium is used, it must be free of foreign material and be of a very high quality. If countries such as Japan are receiving the goods, it is advisable to fumigate the moss or peat first so that any organism is destroyed. In recent tests large numbers of saprophytic nematodes were found in moss and peat, although we are aware that they cause no harm to the plants, they can be confused with other parasitic nematodes and, if this is the case, the receiving Authorities can and will fumigate without question. It is essential that every factor be considered when shipping as delays can cause losses as well as loss of goodwill. The use of woodwool should be avoided as this is forbidden in many countries; clean shredded newsprint is recommended.

Cartons: Strong waxed boxes with adequate ventilation are recommended. The plants are stood upright and held firmly into position by each other. At no stage should the plants be covered with plastic as this causes overheating and sweating.

What I have covered here are only a few of the important considerations required for exporting. Before involving oneself to any great financial cost a thorough examination should be made covering all aspects from growing to marketing as one weak link can result in losses to all parties. Growing for export can only be considered a challenging and rewarding market.

NITROGEN RESPONSE OF PROTEACEOUS SHRUBS AND OTHER NURSERY PLANTS GROWN IN CONTAINERS

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Abstract. A range of proteaceous shrubs and other nursery plants were grown in containers with soilless media and various N levels primarily supplied from Osmocote (26 percent N). Plants demonstrated a range of responsiveness. *Grevillea robusta* was the most responsive but required an optimum near to 120g N/m^3/month; two *Eucalyptus* species showed a smaller response than *G. robusta* but required an N optimum of 97g N/m^3/month.

Camellia japonica and *Erica herbacea* (Syn.: E. *carnea*) 'Springwood White' responded best to the range 57 to 121 g N/m^3/month. *G. rosmarinifolia* and *Leucadendron adscendens* were the next most responsive species, then *Hakea laurina* and *Dryandra formosa*. *Leucospermum candicans*, *Protea repens*, *P. scolymocephala* could grow satisfactorily on very low N levels, amounting to just over 5g N/m^3/month from Osmocote 18/2.6/10. Optimum N rates for all these species are discussed.

REVIEW OF LITERATURE

Optimum growth of container plants requires a fairly uniform and continuous supply of N but with slightly greater levels in spring (7). Bunt (3) stressed the relatively greater importance of a continuous N supply for pot plants grown in loamless composts compared with crops grown in borders or the open ground. This was because of inherently low levels of available N, roots restricted to a relatively small volume, and the need for frequent watering of plants in containers. Soilless media rich in N would be unsuitable because of difficulties of standardization, and the need to continually monitor N levels to maintain an optimum N supply. The total N requirement and the rate at which it is required depends on the vigour of the species and the manner in which the plant is grown. Temperature, light, water availability, and size of container are the most important factors controlling the rate and amount of growth.

Boyd and Needham (2) discussed different approaches to the interpretation of data from N experiments and emphasized the value of multi-level tests with from 6 to 9, rather than only 2 to 4, N levels. They also stated their preference for the use of linear segments to describe the quadratic N response rather than a smooth curve, since a curve was said to often encourage an over-estimation of crop requirements due to the economic optimum being placed on the crest of the curve rather than on a flat plateau.

Knowledge of the desirable N rate is important. Lack of nitrogen will give rise to plants with low growth rates and often a spindly weak foliage growth, while excessive levels can yield hard stunted plants (3). The use of nitrogen in container mixes was reviewed by Thomas and Spurway (19). It is clearly the single most important factor to consider when examining the nutrition of container grown plants since a continuous supply is required. The rate of supply has a dominant control over plant growth and is influenced by many factors such as fertilizer type, N losses and growing conditions. Furuta (7) indicated that a theoretical requirement of 3g of 14 month Osmocote is required to raise a marketable plant in a one gallon container. In practice this becomes a 9g basal application because of severe N leaching losses over the production time. Immobilization of N and denitrification can also account for poor N recovery rates with container-grown plants (8,9).

Potted chrysanthemums were shown to have an N uptake rate, and total N demand, over 10 weeks in summer which greatly exceeded the requirements of cyclamen over one year (3). This illustrates the importance of comparative nutrition and, in previous work (19,20), N requirements have often been shown to contrast strongly among species. The objective of the experiences discussed here is to examine several different species (many in the Proteaceae) and to compare their responses to a range of N levels and, in one case, to compare different fertilizer sources, with other inputs being kept relatively constant.

MATERIALS AND METHODS

Plant Species and Growing Conditions. Six experiments were run with 1 to 5 species in each experiment as follows:

Experiment A.	*Grevillea rosmarinifolia* and *Protea scolymocephala* bagged on 4.10.73 and lifted on 16.9.74.
Experiment B.	*Camellia japonica*, *Erica herbacea* (*E. carnea*) 'Springwood White' and *Hakea laurina* bagged on 8.10.73 and lifted on 2.12.74 and 23.9.74 for latter two.
Experiment C.	*Grevillea* 'Olympic Flame' and *Dryandra formosa* bagged on 9.10.73 and lifted 10.6.76.
Experiment D.	*Grevillea robusta* bagged on 28.1.74 and lifted 12.8.74.
Experiment E.	*Grevillea robusta*, *G. rosmarinifolia*, *Leucadendron adscendens*, *Leucospermum candicans*, *Protea repens* and *P. scolymocephala* bagged on 28.1.74 and lifted on 28.1.75.
Experiment F.	*Eucalyptus nicholii* and *E. notabilis* bagged on 13.6.74 and lifted on 20.11.74.

All plants were seedlings with the exception of *G. rosmarinifolia* (Experiment A), *E. herbacea* Springwood White', *G.* 'Olympic Flame' and *Leucopsermum candicans*, which were propagated by semi-ripe tip cuttings under mist.

Rooted cuttings or young seedlings were potted up individually into tubes containing a medium with little or no nutrients. All experiments (except B) were run in a heated glasshouse equipped with automatic fan ventilation. The minimum glasshouse temperature was 15°C while the maximum was close to 5°C above ambient temperature. Experiment B was carried out in a shadehouse covered with 50% polypropylene shadecloth (Sarlon). Hand watering was done when required and no additional fertilizer application was made following laying-down.

Experimental Design. Experiments A, B, D, E, and F were simple designs based on several levels of nitrogen for a range of species which were mostly in the Proteaceae. Experiment C was the only one with a factorial design and involved 2 N levels × 2 N sources (Uramite and Osmocote 26% N). All were randomized block designs.

Data Collection and Analysis. Visual ratings were used with a score of 0 = dead, to 5 = very vigorous, high quality plants. On completion of each experiment the plants were cut off just above the top of the medium and the foliage was oven dried. All ratings and dry weights were statistically examined using the Teddybear (now Crypto/Teddybear) computer programme for analysis of variance and F test.

Media and Fertilizers. The medium for all experiments was equal parts (1:1, vv) Mataura sphagnum peat and fine grade perlite. The physical and chemical properties of Mataura peat were described by Goh and Haynes (9) and perlite by Morrison *et al.* (16).

The levels of nitrogen in the media varied from 0 to 900g N/m³ (Tables 2 to 5) and were supplied predominantly from Osmocote (26% N). A basal dressing of 8-9 months Osmocote (18/2.6/10) supplying 45g N/m³ was used in all experiments except those with nil N treatments. Total N was then made up from 3-4 month Osmocote (26% N) except for half the treatments in Experiment C, where Uramite (38% N) was used. Base dressings of Osmocote 18/2.6/10 supplied 6.5g of P/m³ and this was supplemented with superphosphate (9% P) to give a total of 30g P/m³ in Expts. A and B and 60g P/m³ for F. All other experiments were at the base level of 6.5g P/m³ from Osmocote 18/2.6/10, or supplied from superphosphate in the nil N treatments. The 8-9 month Osmocote yielded 25g K/m³ and this was made up to 125g K/m³ in all trials, except Experiment C, with sulphate of potash (39% K).

The levels of P and K were therefore as follows:

		P	K
Experiments	A & B	30 g/m³	125 g/m³
	C	6.5	25
	D & E	6.5	125
	F	60	125

A base dressing of the following was also used in all experiments: 4.5 kg/m³ dolomite lime, 1.5 kg/m³ agricultural lime ($CaCO_3$), 75g/m³ 'Sequestrene' iron chelate (Na EDTA Fe with 12% iron) and 'Sporumix A' (150 g/m³ containing 1.14% B, 0.62% Zn, 1.27% Cu, 5.46% Mn, 0.06% Mo. 0.05% Co. 9.78% Mg). The media and fertilizers were well mixed and then transferred to PB5 (2½l) 'Plantabags' just prior to potting.

RESULTS

Experiment A. Lack of added N had no unfavorable effect compared with other treatments on the growth of *Grevillea rosmarinifolia* and *Protea scolymocephala* 3 months after bagging of the plants (Figures 1 and 2). However 340-450g N/m³ appeared to be the upper limit for both species and very severe

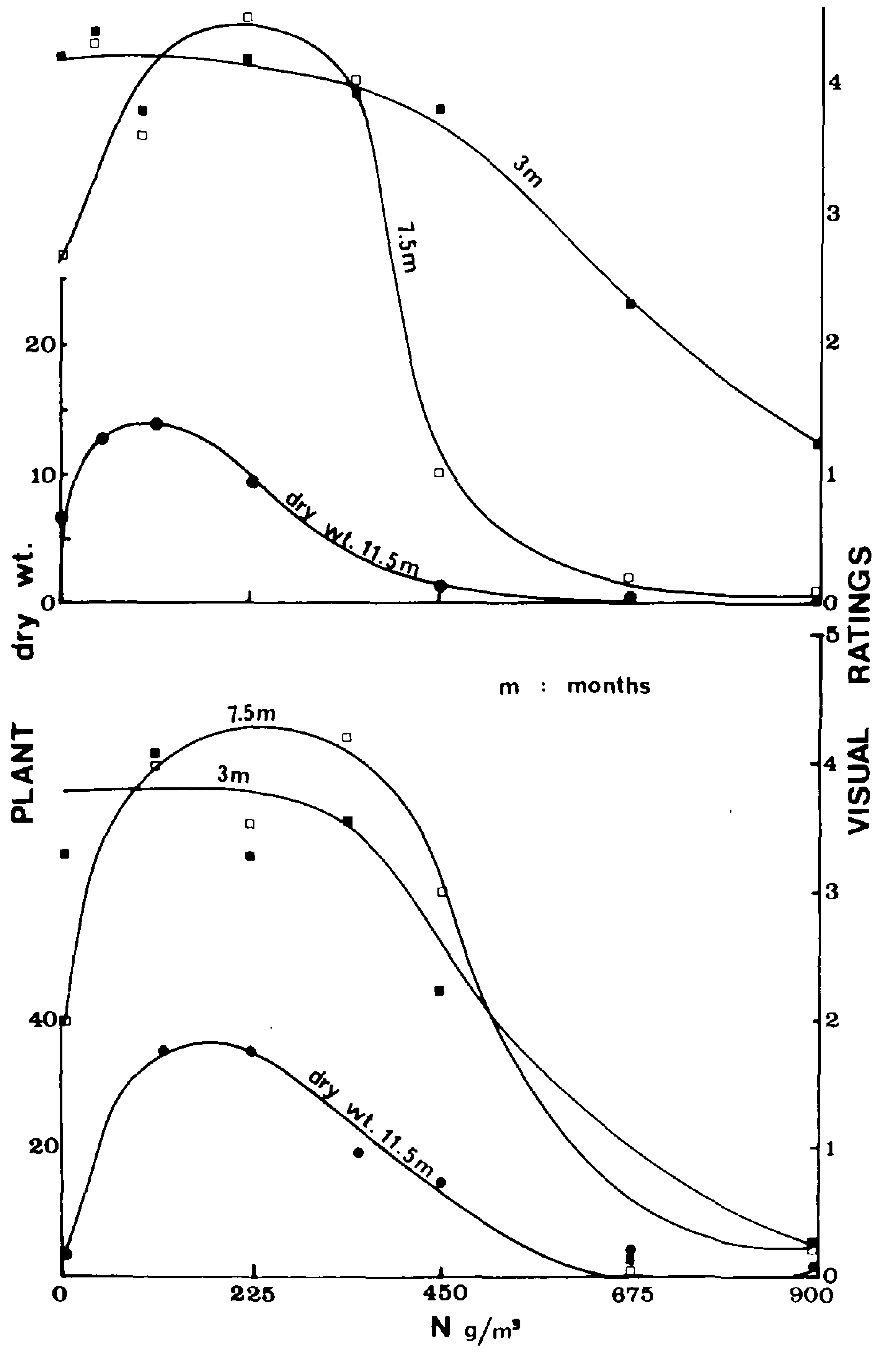

Figure 1. (below): Expt. A. The influence of N levels on foliage growth of *Grevillea rosmarinifolia* plants. Visual ratings and dry weight (g/plt.).

Figure 2. (above): Expt. A. The influence of N levels on foliage growth of *Protea scolymocephala* plants. Visual ratings and dry weight (g/plt.).

Figure 3. Influence of N levels on growth of *Protea scolymocephala* plants. *Left to right:* 0, 225, 450, 675, 900 g N/m^3. Photo taken just before completion of experiment.

damage was evident after 3 months and death of most plants by harvest time in the 2 highest N treatments. Optimum N levels could not be accurately evaluated in these experiments because N was predominantly applied as 3-4 month Osmocote for an experiment which was run for nearly a year. It was noticeable, however, that a total of 225g N/m^3 for grevillea and 100g N/m^3 for protea appeared to be the optimum N level. These rates would amount to an optimum theoretical release rate of 57 and 24g N/m^3 per month respectively with only 5.5 g N/m^3/month supplied from the 8-9 month Osmocote after 3½ months. Protea was therefore more sensitive than grevillea to increasing N levels although there was a strong similarity in the response of the 2 species to added N and the onset of toxicity at 3 months. This is shown in a comparison between Figures 1 and 2. Figure 3 illustrates the importance of the correct level of N fertilization, with severe deficiency symptoms at nil N and death of the plant at 900gN/m^3.

Experiment B. Foliage of plants in the three species in this experiment was visually rated at approximately 2, 7 and 11 months. There was no apparent response to increasing N levels after 2 months but at 7 months *Camellia japonica* in the nil and 45g N/m^3 treatments were showing N deficiency and there was a similar effect in *Erica herbacea* 'Springwood White' and in *Hakea laurina*, but only with nil N. The growth responses for the 3 species are depicted in Figures 4, 5 and 6.

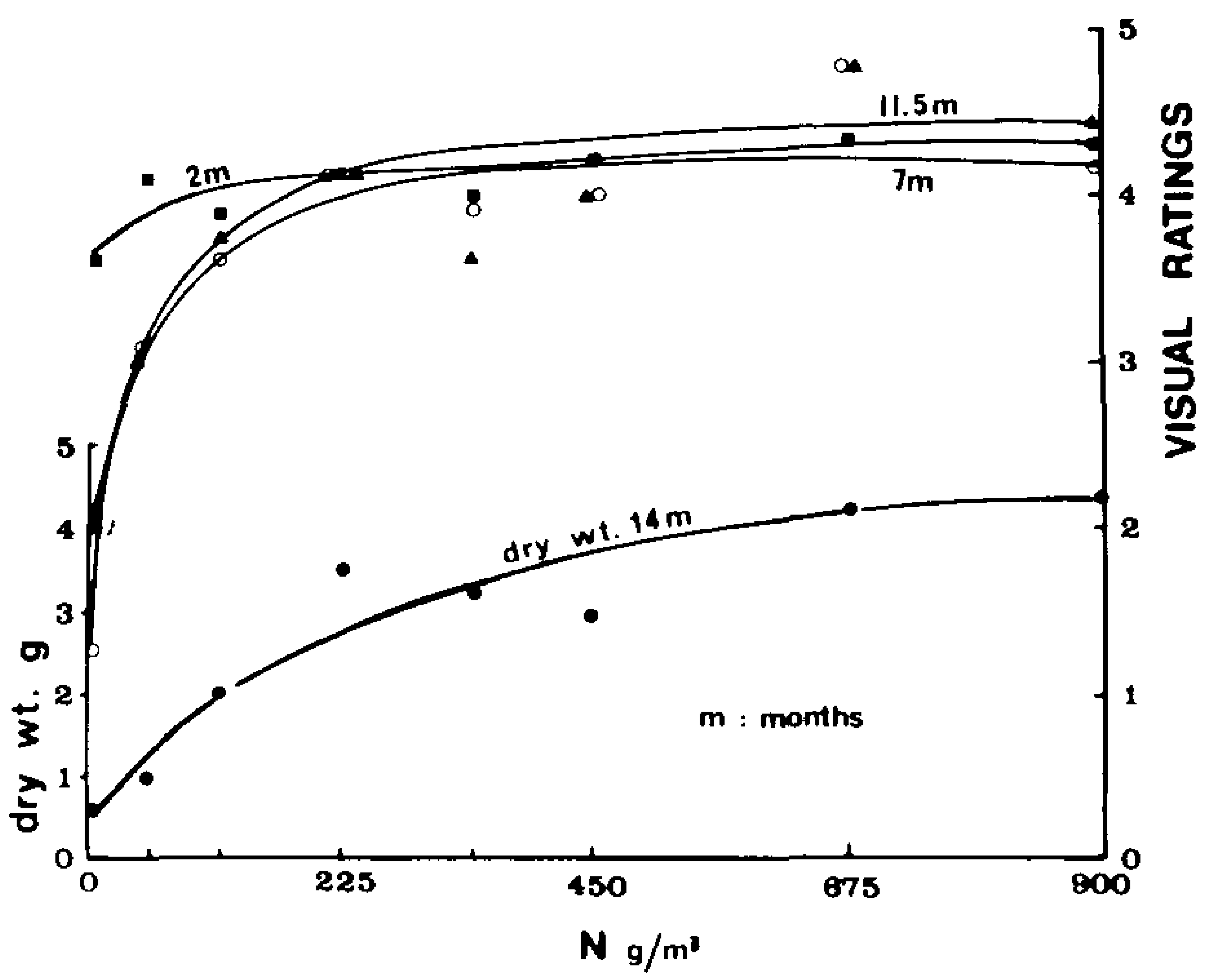

Figure 4. Expt. B. The influence of N levels on foliage growth of *Camellia japonica* plants. Visual ratings and dry weight (g/plt.).

Key to Ratings
■ = 2m
○ = 7m
▲ = 11.5m

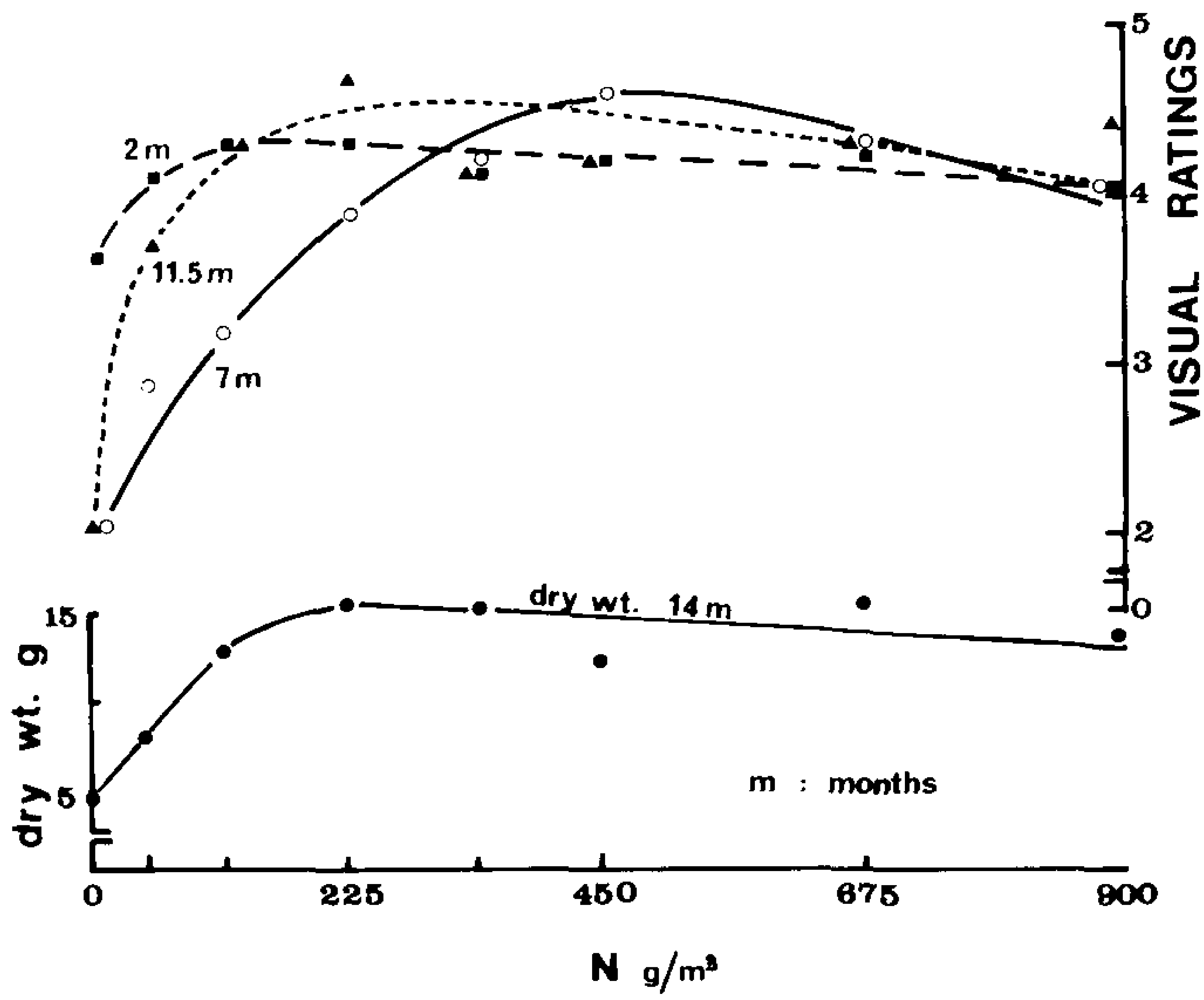

Figure 5. Expt. B. The influence of N levels on foliage growth of *Erica herbacea* 'Springwood White' plants. Visual ratings and dry weight (g/plt.).

Key to Ratings
■ = 2m
○ = 7m
▲ = 11.5m

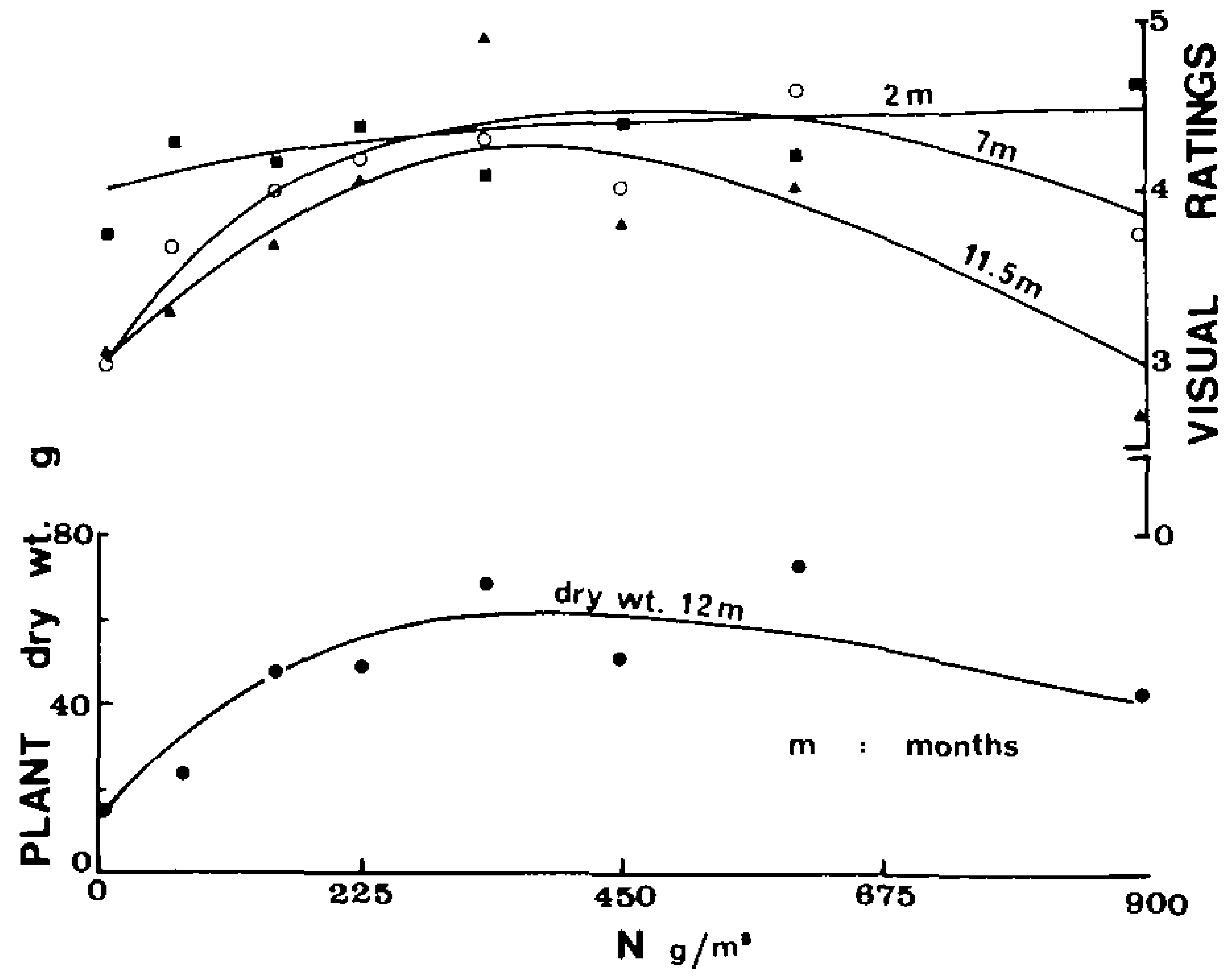

Figure 6. Expt. B. The influence of N levels on foliage growth of *Hakea laurina* plants. Visual ratings and dry weight (g/plt.).

Key to Ratings
■ = 2m
○ = 7m
▲ = 11.5m

There was little N toxicity apparent and in fact the camellias and ericas showed no significant growth depression at any stage even with the highest level of 900 g N/m³ (theoretically amounting to 250g N/m³/month for the first 3½ months). Some growth depression would have been expected for camellia and erica, however hakea showed severe toxicity symptoms at 11½ months. In all 3 species a total level of between 225 to 450g N/m³ appeared to be the most desirable. This would amount to between 57g N/m³/months for hakea and 121g N/m³/month for the other 2 species for the first 3½ months. Figure 7 shows the growth response of *Hakea laurina* to a range of N levels. This plant appeared quite tolerant of very low N rates while growth suppression was apparent at high levels.

Figure 7. Influence of N levels on growth of *Hakea Lurina* plants. *Left to right:* 0, 45, 110, 225, 340, 450, 675, 900 gN/M³. *Photo taken just before completion of experiment.*

Experiment C. This experiment involved *Grevillea* 'Olympic Flame' and *Dryandra formosa* plants supplied with nitrogen at two rates combined in a factorial design with Uramite and Osmocote. The lower rate of nitrogen appeared quite adequate for *Dryandra* (Table 1) and growth of this species in the 225g N/m³ rate was almost significantly ($P = 0.07$) higher than in 450 g N/m³ when measured by visual ratings. Uramite produced higher dry weight yield than Osmocote for *Dryandra*.

The *Grevillea* plants responded quite strongly to varied N rates and to the type of fertilizer. Osmocote at 450g N/m³ was superior to the lower rate and to both levels of Uramite (Table

Table 1. Experiment C — Effects of N levels and type of fertilizer on the foliage growth (visual ratings and dry weight) of two container-grown nursery plants.

	Dryandra formosa			*Grevillea* 'Olympic Flame'		
N levels (N)	Visual ratings		Dry Wt.	Visual ratings		Dry Wt.
(g/m³)	2 months	7 months	(g/plt.)	2 months	7 months	(g/plt.)
225	4.0 #	4.0 #	15.1 –	3.8 –	3.9 *	14.4 ***
450	3.7	3.7	14.3	4.0	4.3	22.2
Fertilizer (F)						
Uramite	4.3 ***	4.3 ***	19.6 ***	3.9 –	3.8 ***	15.0 ***
Osmocote	3.4	3.4	9.8	3.9	4.4	21.6
LSD (5%)	0.3	0.3	4.0	0.4	0.4	3.3
(P)			Significant Interactions			
NF	–	–	–	–	–	**
CV (%)	11	11	42	18	14	28

2). This was probably because Uramite can have an N mineralization rate of less than 60% of 3-4 month Osmocote (3) and thus the high N requirements of grevillea compared with *hakea* could not be met with that fertilizer.

Table 2. Experiment C — Interaction of nitrogen rate and type of fertilizer on the foliage growth (dry weights) of *Grevillea* 'Olympic Flame'.

	Uramite	Osmocote
N g/m³		
225	14.0	14.9
450	16.0	28.3
LSD (5%)		4.6

Experiment D. The experiment with *Grevillea robusta* was similar to Experiments A, B and F in that it involved several levels of nitrogen. The nil and 45g N/m³ treatments quickly became inadequate as shown by visual ratings at 3½ months (Figure 8) while the 110g N/m³ rate was inferior to the highest level of 675g N/m³ at 3½ months. The optimum rate appeared to be close to 450g N/m³ or 120g N/m³ per month.

Experiment E. A very low, plus two medium rates, of N addition were used for six proteaceous shrubs (Table 3). The foliage growth of *Grevillea robusta* plants in the 45g N/m³ showed the effect of insufficient N after 3½ and 8 months and in final dry weights. *Leucadendron adscendens* was the only other species with a depression in yield with the 45g N/m³ rate. This occurred only for foliar dry weights and it is noticeable that the other four species showed no ill effects or deficiency symptoms when receiving 0.25 kg/m³ of 8-9 month Osmocote. A rate of 45g N/m³ would amount to only slightly over 5g N/m³/month. The 450g N/m³ rate appeared toxic on *G. rosmarinifolia* at 3½ months and *Protea scolymocephala* at 8 months while *Leucospermum candicans* and *P. repens* were similarly unaffected by increasing N levels. This indicates that no serious de-

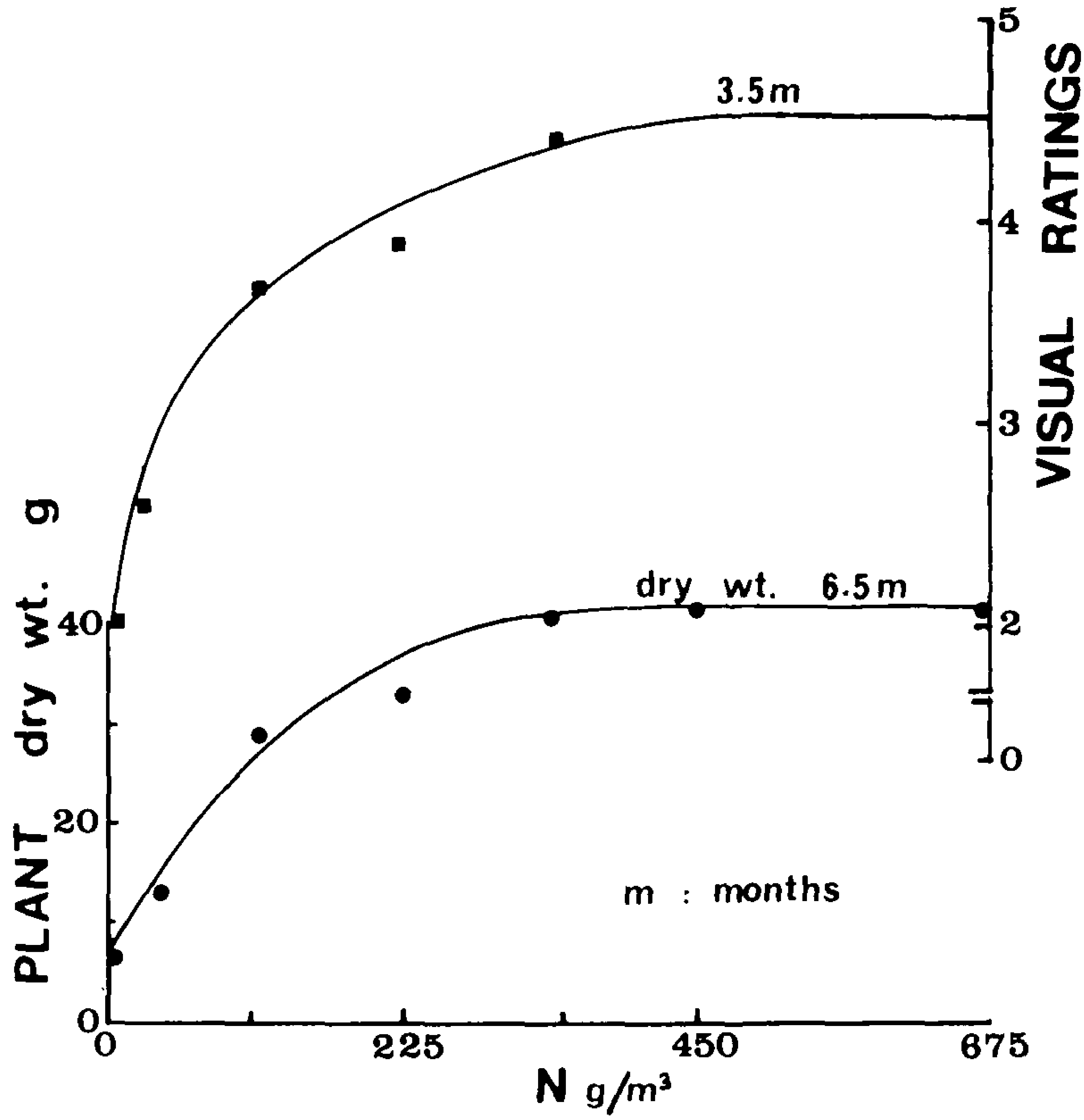

Figure 8. Expt. D. The influence of N levels on foliage growth of *Grevillea robusta* plants. Visual rating and dry weight (g/plt.).

ficiency was occurring. A lack of N response was most apparent with the proteas where the 45g N/m^3 treatment for *P. scolymocephala* rated significantly higher than the other treatments after 8 months. In addition, the dry weights for *P. scolymocephala* plants at the very low N treatment were high, although not significantly greater than others probably because of the high variability (CV = 110%).

The optimum levels of N for *G. robusta* and *L. adscendens* appeared higher than those for other species at between 225 and 450g N/m^3. The protea species and leucospermum appeared least demanding, requiring only 45g N/m^3 (from slow release Osmocote only). *G. rosmarinifolia* from this work and from Experiment A would probably be intermediate between the two groups.

Table 3. Experiment E — Effects of 3 levels of N on the foliage growth (visual ratings and dry weights) of six container grown nursery plants.

Species	N Levels (g/m³)		Visual ratings 3½ months	Visual ratings 8 months	Dry Wt. (g/plt.)
Grevillea robusta	45		2.8 B b	2.9B b	24.7Bb
	225		4.2 ABa	4.6 A a	61.6Aa
	450		4.6 A a	4.2ABa	55.3Aa
		(P)	*	*	*
		CV(%)	22	17	27
Grevillea rosmarinifolia	45		4.2 A a	4.2a	16.6a
	225		3.8 A a	3.2a	17.8a
	450		3.0 A b	3.4a	18.8a
		(P)	0.10	–	–
		CV(%)	21	22	41
Leucadendron adscendens	45		3.4 a	3.2a	14.6Ab
	225		3.8 a	3.8a	20.2Aab
	450		4.4 a	4.0a	23.2Aa
		(P)	–	–	0.06
		CV(%)	28	42	25
Leucospermum candicans	45		4.0 a	4.6a	31.9a
	225		3.4 a	3.8a	25.2a
	450		4.4 a	4.0a	32.6a
		(P)	–	–	–
		CV (%)	26	33	53
Protea repens	45		3.8a	4.6a	15.1a
	225		3.4a	3.0a	19.5a
	450		3.2a	2.0a	11.5a
		(P)	–	–	–
		CV (%)	37	60	118
Protea scolymocephala	45		4.2a	4.4Aa	23.5a
	225		4.0a	1.0Ab	6.3a
	450		4.0a	0.8Ab	8.1a
		(P)	–	*	–
		CV (%)	19	80	110

Experiment F. Plants of two *eucalyptus* species were grown in media with a range of N levels. There was little difference among plants in all treatments after 2½ months except that plants without added N were noticeably deficient (Table 4). The highest dry weights in plants of both species occurred with the 340 to 675g N/m³ treatments. The 110g N/m³ treatment was in-

Table 4. Experiment F — Effects of a range of N levels on the foliage growth (visual ratings and dry weights) of two container grown nursery plants.

	Eucalyptus nicholii		*Eucalyptus notabilis*	
N Levels (g/m³)	Visual ratings 2½ months	Dry Wt. (g/plt.)	Visual ratings 2½ months	Dry Wt. (g/plt.)
0	2.2Bb	1.8Ac	1.5Bb	0.6Bc
110	3.2ABa	11.4Ab	2.9Aa	11.6Bb
225	3.7A a	17.4Aab	–	–
340	3.7A a	20.8Aa	3.1Aa	30.0Aa
450	3.4ABa	21.4Aa	–	–
675	3.5A a	21.3Aa	2.9Aa	31.5Aa
(P)	*	***	**	***
CV (%)	30	50	40	65

ferior to these. There was no apparent toxicity and the optimum rate appeared to be fairly close to 340g N/m^3 for both species. This would be equivalent to 97g N/m^3 per month from 3-4 month Osmocote.

DISCUSSION

Higgs (10) noted that *G. rosmarinifolia* could be damaged by high fertilizer rates that did not affect other plants and this was also noted in Experiment A where foliage growth was severely depressed in N additions above 450g N/m^3 (Figure 1). A linear response to N rates from split applications of N has been found in other work (20) using a maximum application of 86g N/m^3/month. The work reported here indicates that 121g N/m^3/month may be too high for *G. rosmarinifolia*. The optimum is therefore about 100g N/m^3/month. *G. robusta* responded well up to 450g N/m^3 and since this appears to be a robust rapid growing species it is reasonable to assume that the optimum is higher than for *G. rosmarinifolia* and could be placed at 120g N/m^3/month.

Proteas can tolerate very low nutrient levels (8) as found in Experiments A and E. These findings indicate that proteas require only low N rates and probably 5 to 60g N/m^3/month would be quite adequate, particularly if a soil mix was used. Initial propagation would probably need to be done without added fertilizers and using a mix such as equal parts peat and soil. Experiment E indicated that leucospermums are likely to have a similar treatment.

Leucadendron adscendens (Experiment E) *Dryanda formosa* (Experiment C) and *Hakea laurina* (Experiment B) plants appear to require N levels which are intermediate between proteas and *Grevillea rosmarinifolia* for optimum growth. Hakea was more sensitive to high N levels than *G. rosmarinifolia*, camellia and erica (Experiment B). A rate of 80g N/m^3/month is probably the upper limit for plants of the former three species.

Camellias have a relatively slow growth rate and respond unfavorably to moderate salinity levels (6) or high fertilizer rates (17,21). Earlier work (20) indicated that *Camellia* has not more than medium N requirements. In Experiment B, *Camellia* and *Erica* responded similarly and both responded to higher N levels than hakea. Carter (4) stated that ericas only require low liquid feed rates and others have found them subject to chlorosis with certain fertilizers (15) or media (1). Klougart and Bragge Olsen (12) stated that plants in the Ericaceae and Theaceae are very sensitive to salt damage. It appears from Experiment B and earlier work on erica (20) that a level of approximately 80g N/m³/month would appear to be a suitable general optimum for both genera.

Young eucalypts can respond strongly to N and P sidedressings in the open ground (5,13) and these elements are important for their container culture (11). A strong nitrogen response was noted in Experiment F up to a level of 340g N/m³. They were tolerant of 675g N/m³ (185g N/m³/month) and because wide variations in nutrient response have been noted between species (14) broad optimum range of 90 to 130g N/m³/month is suggested to allow for individual species' requirements. In general they respond similarly to *Grevillea robusta* and 120g/Nm³/month should be adequate.

CONCLUSIONS

The differing N requirements of plants in a group of species was demonstrated. The range within the Proteaceae was very wide and native habitat was probably the dominant governing factor influencing the N responses. *Grevillea robusta* showed a high requirement (120g N/m³/month) and *Protea* spp. low N needs (50g N/m³/month).

Nitrogen was supplied from different fertilizer sources and it was concluded that Uramite, which is a relatively poor N source in a soilless mix, was more suitable for *Dryandra formosa* than G. 'Olympic Flame', while Osmocote (26 percent N) was the better fertilizer source for *Grevillea*. This was because *Dryandra* is similar to protea in having a low N requirement and therefore a poor fertilizer source or a low rate of a more efficient fertilizer than Uramite is desirable.

Plants of *Hakea laurina* appeared similar to those of *D. formosa* and had a lower N requirement than camellia and erica. *Leucadendron adscendens* plants had similar N requirements to those of *G. rosmarinifolia* but *Leucospermum candicans* plants would appear to grow best with N levels that are intermediate between the optimum for *G. rosmarinifolia* and *Protea* spp.

Camellia japonica and *Erica herbacea* 'Springwood White' are temperate species which were found to have low to medium N requirements with an optimum of approximately 80g N/m³/month. *Camellia japonica* comes from temperate forests which may not be very fertile and this would partly explain this camellia's low to medium N requirement. Growth rate may also be an important factor influencing the nutritional requirements of camellia and erica. They contrast with eucalypts which have a rapid growth rate and were found to grow strongly in response to 90g N/m³/month. However, habitat is usually implicated and other workers have shown that habitat can influence

N utilization in eucalypts (14).

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LITERATURE CITED

1. Anon. 1971. Container grown shrubs. *Luddington Expt. Hort. St. Lft.* 3p.
2. Boyd, D.A. and Needham, P. 1976. Factors governing the effective use of nitrogen. *Span* 19, 2, 68-70.
3. Bunt, A.C. 1976. Modern potting composts. *Allen and Unwin, London,* 227p.
4. Carter, A.R. 1973. The nutrition of container-grown plants. Proc. *8th Pershore Nurs. Ref. Course*: 3-8.
5. Cromer, R.N. *et al.* 1975. Eucalypt plantations in Australia — The potential for intensive production and utilization. *Appita* 29(3):165-73.
6. Furuta, T. 1969. Operations research and ornamental horticulture. *Acta Hort.* 156:47:56.
7. Furuta, T. 1976. Nitrogen fertilization of container-grown ornamentals. *Am. Nurs.* 142:14, 106-9.
8. Goh, K.M. and Young, A.M. 1975. Effects of fertilizer N, and 2 chloro 6 - (trichloromethyl) - pyridine (N-serve) on soil nutrification, yield and nitrogen uptake of 'Arawa' and 'Hilgendorf' wheats. *N.Z. J. Ag. Res.* 18:215-25.
9. Haynes, R.J. and Goh, K.M. 1977. Evaluation of potting media for commercial nursery production of container grown plants. II. *N.Z. J. Ag. Res.* 20:371-81.
10. Higgs, A.L. 1970. The effect of planting depth and fertilizer on survival and growth of *Grevillea* and *Leptospermum* rooted cuttings, *Aust. Pl.* (Dec.) 6:23-5.
11. Kaul, O.M. *et al.* 1966. Nutrition studies of *Eucalyptus* II. N, P, K requirements of *Eucalyptus* hybrid seedlings. *Indian For.* 92(12):772-8.
12. Klougart, A. and Bragge Olsen, O. 1969. Substratum for container grown plants. *Acta Hort.* 15:34-6.
13. McIntyre, D.K. and Pryor, L.D. 1974. Response of Flooded Gum in plantations to added fertilizers. *Aust. J. For.* 37(1):15-23.
14. Moore, C.W.E. and Keraitis, K. 1971. The effect of nitrogen source on growth of Eucalyptus in sand culture. *Aust. J. Bot.* 19:125-41.
15. Morgan, B.J. 1973. Trial of slow release nitrogen fertilizers in container grown nursery stock. *Proc. 8th Pershore Nurs. Ref. Course:* 20-25.
16. Morrison, T.M. *et al.* 1960. Plant growth in expanded perlite. *N.Z. J. Ag. Res.* 3(3):592-7.
17. Pearson, H.E. 1958. Irrigation and soil salinity, p. 360-6. *In* Tourje, E.C. *Camellia culture, MacMillan, New York.*
18. van Staden, J. 1967. Deficiencies of major nutrient elements in *Protea cynaroides* Linn., grown in sand culture. I. Foliar symptoms of deficiencies. *J.S. Agr. Bot.* 33:59-64.
19. Thomas, M.B. and Spurway, M.I. 1975. Nitrogen levels in container mixes, *Roy. N.Z. Instit. Hort. Ann. J.* 3:20-30.
20. Thomas, M.B. 1979. Nutrition of container grown plants with emphasis on the Proteaceae. Ph.D. Thesis, Canterbury University, N.Z. 207p.
21. Wills, R.W. 1971. Delaware nurserymen briefed on camellia culture. *Am. Nurs.* 133:16, 62-64.