— but other sources of programmes exist. Universities are an obvious place to look — if an interest can be created there, then both University and nurserymen can benefit. The Government itself has launched the MAPCON scheme, which in some cases gives grants for both development of microprocessor-based systems and consultations by possible users of such systems — this area should be exploited to the full by the nursery industry.

Fears are often expressed about cuts in employment where computers "take over" jobs previously carried out by the labour force. So far in horticulture, we have not seen this happen. In the office, the computer allows some areas to become more efficient and less arduous, or else accomplishes things that were not previously possible, and in the control field the computer replaces either eletronic or mechanical devices, work that was not done manually anyway.

To sum up, the commercial plant propagator must now consider the use of computers for both office and control applications, and must exert pressure on the relevant institutions or industries to produce more specific computer-based products for his own needs. Whatever happens, the computer will continue to infiltrate the industry, and the plant propagator must take advantage of this versatile and useful tool.

T. WOOD: You were speaking of rooms full of equipment being reduced to a desk console. Does one still need clean air? We, in the nursery industry, work in a very dirty environment and could not get away from dust and sand.

J. VARLEY: It can be a problem. In the Wye glasshouse unit we have built a small room, which is isolated but not air-conditioned. The dust does not affect the computer, but does the data storage facilities such as disc storage. While not actually needing air conditioning, it does need a relatively dust-free environment. This does not apply to the control equipment.

A COMPARISON OF CONTROLLED AND SLOW RELEASE FERTILISERS FOR THE ESTABLISHMENT OF LINERS UNDER GLASS.

PAUL M. UNDERHILL

Wardington Nurseries,
Banbury, Oxon.

This trial, winner of the Student Project Award 1981, was carried out at Hadlow College, Kent.

Subject:	*Skimmia japonica*
Propagated:	21st October, 1980
Potted·	2nd February, 1981
Compost mix	75% Irish moss peat (Medium grade)
	25% sand ($CaCO_3$ content above 1%, therefore no ground limestone was added)

Rates of commercial products used:

Mix 1. Osmocote 18:11:10 (9 month 'standard').

1.8 kg/M^3	Osmocote	90 g/50 litres
2.4 kg/M^3	magnesium lime	120 g/ " "
0.3 kg/M^3	W.M. 255	15 g/ " "

Mix 2. Osmocote 17:11:11 (9 month 'fast start').
as above.

Mix. 3 Sierrablen 19.6.10 (plus iron)

1.8 kg/M^3	Sierrablen	90 g/50 litres
2.4 kg/M^3	magnesium lime	120 g/ " "
0.3 kg/M^3	W.M. 255	15 g/ " "

Mix 4. Nutricote 16·10·10 (180 day formulation)

2.73 kg/M^3	Nutricote	137 g/50 litres
2.04 kg/M^3	superphosphate	102 g/ " "
0 33 kg/M^3	255 W.M.	17 g/ " "
2.4 kg/M^3	magnesium lime	120 g/ " "

Mix 5 Ficote 16:8:7

4 kg/M^3	Ficote	200 g/50 litres
0.75 kg/M^3	superphosphate	38 g/ " "
2.4 kg/M^3	magnesium lime	120 g/ " "
0.33 kg/M^3	W.M. 255	15 g/ " "

Mix 6. Vitax Q.S.2,12:6:6:6 plus trace elements

4.5 kg/M^3	Vitax	225 g/50 litres,
2.4 kg/M^3	magnesium lime	120 g/50 litres

Mix 7. Plantasan 4D,20:10.15.6 plus micronutrients

3 kg/M^3	Plantasan	150 g/50 litres
1.2 kg/M^3	ground lime	60 g/ " "

In the case of controlled release fertilisers the release rate is based on temperature. Most of the companies which market these products publish release curves based on 25°C. Measurement showed that the compost temperatures were not above this level until April. This implied that nutrients were being used as they became available, as was further indicated by compost analysis.

Skimmia usually makes only one flush of growth in a season. This was completed by the 4th April, when the total number of shoots was recorded (Table 1).

Table 1: Effect of fertiliser treatment on shoot number in *Skimmia*

Fertiliser mix	Shoot numbers					
	1	2	3	4	5	6
	Number of plants					
Mix 1	7	30	44	15	4	—
Mix 2	10	24	46	15	5	—
Mix 3	12	22	38	24	4	—
Mix 4	11	33	40	13	4	—
Mix 5	11	16	59	13	—	1
Mix 6	12	30	47	11	—	—
Mix 7	13	28	38	19	2	—

Conclusion. Type of fertiliser had little or no effect on the amount of branches produced.

The total extension growth was also recorded (Table 2).

Table 2: Effect of fertiliser treatment on extension growth in *Skimmia* (Average of 100 plants per treatment)

Fertiliser mix	Extension growth (cm)
Mix 1	13.4
Mix 2	13.9
Mix 3	12.9
Mix 4	13.0
Mix 5	12.9
Mix 6	6.8
Mix 7	11.3

Conclusion: Most of the resin-coated types showed similar extension growth, and the slow-release types showed less growth.

At the end of the season the plants were graded. Grade 1 plants had two or more even shoots, Grade 2 being plants with one shoot or two uneven shoots (Table 3).

Table 3: Effect of fertilizer treatment on grading of *Skimmia* plants

	Number of plants per grade		
Fertiliser mix	Grade 1	Grade 2	Waste
Mix 1	73	27	0
Mix 2	80	20	0
Mix 3	64	36	0
Mix 4	54	46	0
Mix 5	72	28	0
Mix 6	33	67	0
Mix 7	69	31	0

Conclusion: The mix which gave the highest percentage of Grade 1 plants was Osmocote 17:11:11 (fast start).

The Nutricote plants (94% chlorotic) were generally poor, attributable to the high level of superphosphate recommended. The Vitax QS plants showed poor growth with 24% chlorosis. Plantasan gave 18% chlorotic plants. The healthiest looking, greenest, and most attractive looking plants were those in the Ficote mix.

Nurseries should try out these products under their own conditions to ascertain which gives the best quality liners for potting on.

PROPAGATION OF MARGINAL AND AQUATIC PLANTS.

GRAHAM BURGESS

Artscapes Aqua,
Church Street, Whitchurch, Hampshire

Aquatics are a very specialised group of plants so first I will describe the natural conditions under which such plants grow. One word, WET. The degree of wetness will vary from moist soil or mud to several metres of fairly clear water.

It is obvious to anyone that there is a marked change in the vegetation at the edges of ponds and lakes. As the soil above the water table becomes shallower the moisture content increases and oxygen levels drop. The first indication is that the only trees that thrive are those that need lower levels of oxygen, e.g. willow, alder, etc. Such vegetation is called "carr" vegetation. The highly variable flora of drier land gives way to sedges, rushes kingcups, and water docks.

Some plants are adapted to grow with their roots rooted below the water. Above the water their aerial stems photosynthesise as normal terrestial plants. These plants, sometimes half in and half out of the water, are called EMERGENT PLANTS.

As we move further away from the bank and, if the water becomes deeper, these plants cannot grow and we come to a zone of plants which are THE FLOATING-LEAVED PLANTS. They are rooted in the bottom but they send up stems and/or leaves (sometimes different types of leaves above and below the water) and these photosynthesise above and below the water.

Some of these plants hang in the water, preferring to drift about drawing nutrients directly from their watery surroundings. The floating leaved plants grow best in still waters.

In amongst these plants, and in the deeper parts of the water, we find another zone of SUBMERGED PLANTS. The submerged plants rely on the light penetrating the upper horizons of the water, and on the nutrients in the water for photosynthesis. Like the sea weeds they have little need of strong stems — the water buoys them up. One can find a degree of internal strengthening in species adapted to growth