

The Motives for Using Micropropagated Plants and Their Management by the Nursery Stock Producer

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The reasons for using micropropagated plants are explored from a nursery stock producer's point of view. Comments on the suitability of micropropagated material to achieve specific management objectives are made from practical experience of using micropropagated plants. The relationship between the supplier of micropropagated plants and the client nursery is discussed.

MOTIVES FOR USING MICROPROPAGATED PLANTS

- 1) To have available a supply of difficult-to-root plants for production, e.g., *Lithospermum*, *Erigeron aureus* 'Canary Bird'.
- 2) To improve stock health with disease-free or virus-free plants.
- 3) To obtain plants better suited to production. For example: to ensure trueness to name of clones such as *Heuchera micrantha* var. *diversifolia* 'Palace Purple' which is variable from seed; to obtain plants with more bud breaks; or to select specific colour strains, as has been achieved in hellebores.
- 4) To mass-produce new cultivars.
- 5) To obtain better crop schedule management, e.g., *H. micrantha* var. *diversifolia* 'Palace Purple' on week 16, 24, 32, etc.
- 6) To make high value plants, which are expensive because other methods of propagation are slow, more widely available. This can be a disadvantage when trying to maintain good prices.

These are all desirable qualities and justifiable reasons for using micropropagation, and will continue to be so as long as prices are maintained and no variables are introduced to change this.

MANAGEMENT OF MICROPROPAGATED PLANTS

The way micropropagated plants are managed on the nursery depends on whether they are standard stock items produced "off the shelf" by a laboratory or new introductions, perhaps exclusive to an individual nursery.

Standard Stock Items. The price of the propagule is an important consideration. How does the price affect the finished product? For example, *Heuchera* 'Snowstorm' costs 75p as a micropropagule. Finished plants in a 1.5-litre pot fetch £1.75. It costs £1 to produce the plant to liner stage using a micropropagule; 36p to take it on to 1.5 litres. Therefore profit, overheads, delivery, label, despatch, etc. all have to come out of 39p.

The next consideration is availability. When are the plants available to the nursery and does that fit in with the existing production programme? It is no good having the plant offered in December when the nursery needs it in July. Micropropagation is a good tool for batch cropping and suppliers should be able to

offer plants for batch cropping of subjects like *Heuchera*, *Sisyrinchium*, *Scrophularia*, and so on. Reliability of supply allows the grower to forward-plan space requirements, pot deliveries, etc. and releases propagation space for other plants.

Reliability depends entirely on the individual supplier so it pays to obtain evidence of good previous performance. Crop failure through contamination, delays in supply, or sudden decisions to drop particular product lines all make a nursery vulnerable to the possibility of not being able to supply the final customer.

It is important to establish regular communication with the supplying laboratory to check that deadlines are being met and that regular lines are going to continue to be produced. In return the nursery should inform the laboratory if its future plans are likely to affect the laboratory's production levels of particular lines.

Orders should be confirmed in writing with details of price, quantity, delivery schedules, and so on.

New Introductions. My own experience varies from the production of 120,000 plants per year of a single cultivar, such as *Heuchera* 'Snowstorm', to runs of only a few thousand for trials of plants.

One of the most important things is for the nursery to establish it has a cultivar worthy of introducing and of producing by micropropagation. Establish that it does not already exist from another source to avoid losing time and money spent on research.

An exclusive agreement should be made between the nursery and the owners of the plant, between the nursery and the micropropagation laboratory, and between the nursery and any sublicensees. There should be a joint commitment to undertake trials to ensure that the lab can initiate and produce true-to-type stock and that the grower can reliably produce finished plants that will flower if necessary.

The laboratory trials should reveal whether or not the plant is capable of being produced in consistent quantities without deterioration at weaning stage; that they are produced true to type, especially variegated forms; and that good multiplication rates are maintained.

The nursery trials should reveal the success rate of growing on the propagules; the optimum pot size for the finished plants and whether the propagule can be direct-stuck in it; suitable composts and which growing areas on the nursery should be used.

As with standard stock items, communications between grower and laboratory are important. Not only does this help maintain enthusiasm on both sides but allows the grower to obtain regular updates on progress and to discuss a reliable launch date and realistic numbers for a programmed schedule.

Handling and Growing On of Young Plants. The timing of delivery is crucial to achieving saleable plants to schedule but a nursery also needs to ensure availability of its own facilities after delivery. For example, will the plants require heat, shade, or supplementary lighting?

It is now that the attention to detail in pre-production trials pays off. For example, the appropriate choice of compost is crucial—some nurseries had some very bad experiences with *Heuchera* 'Snowstorm', but the high losses were probably a result of using the wrong compost. Micropropagules cannot be treated in the way some nurseries treat liners. They need more careful handling and close attention to watering.

It is important to watch for botrytis in the early stages and pre-potting fungicidal drenches may be needed. The high numbers of plants involved mean potentially high losses if disease goes unchecked.

IMPLICATIONS FOR THE FUTURE OF MICROPROPAGATION

Micropropagation can speed up breeding programmes and make new introductions much more quickly. Conventional breeding programmes take so long that by the time a plant is ready for introduction the market's requirements may have changed. Many excellent cultivars never achieve commercial potential.

The increased use of micropropagated plants for nursery stock production will depend on a number of factors:

- The cost must be competitive with conventional methods of propagation, although some plants may withstand a small premium.
- The finished plants must be adaptable to the cultural practices of the consumer.
- The plants must be genetically stable and identical to the original stock plants.
- Plants must be produced at the proper time and in the correct quantities for the customer.

A number of specific trends may be identified:

- Micropropagation is becoming more integrated with normal production. For example, it is being used for the production of stock plants from which cuttings or budwood are taken for conventional propagation.
- Smaller micropropagation firms are consolidating into larger, more efficient suppliers, linked to geographical areas.
- Laboratories are becoming more specialised, some in research, others in production. This may be linked to differential labour expertise and cost, for example Western European laboratories may offer to research a new product line which could then be produced in Eastern Europe or other low labour-cost countries.
- *Automation of handling and use of new techniques, such as somatic embryogenesis and autotrophic micropropagation, will affect the range and prices of plants offered.*