

HARDY AMENITY PLANT INTRODUCTION AND EVALUATION SCHEME

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Abstract. A vast gene pool of ornamental plant material exists around the world for nurserymen to exploit. New uses will be developed for many existing plants as physiological manipulation becomes more sophisticated. Several schemes which aim separately at more intensive use of current nursery plants, conservation of diminishing genotypes, and the exploitation of plant breeding techniques are described. The Hardy Amenity Plant Introduction and Evaluation Scheme (HAPIE Plants) aims to identify under-utilised plant material in botanical collections and subject this to commercial evaluation. Over a period of 18 months since the scheme was conceived 50 plant types with possible commercial potential have been identified. Batches in excess of 500 plants have been propagated of four types and distributed to cooperating nurseries. Another 8 to 10 types are in the process of large scale propagation.

INTRODUCTION

All industries require new products which interest customers, causing them to return and make further purchases. The nursery stock industry is no exception to this form of marketing. A continuing need for the industry is the introduction and promotion of novel plants which intrigue and excite the increasingly sophisticated and educated gardening public. Novel plants may arise from selection within existing types. However, this approach is only likely to give marginal but nonetheless often useful changes. In this manner many improvements to foliage shape, intensity of flower colour, or improved growth habit have been achieved.

Plant breeding programmes, depending on their size and intensity, can effect larger changes. These occur by hybridisation within species, across species and other genetic barriers, and can be achieved by conventional crossing or mutation breeding and, more recently, by genetic engineering. Such programs are expensive, long term, and require well-defined objectives in order to succeed. Breeders dealing with nursery stock subjects are more likely to succeed because their objectives need to be far less specifically targeted than is the case with food crops.

Alternatively, novel plants may be introduced from the wild or be rediscovered in existing plant banks such as those in botanic gardens and other collections. The United Kingdom is particularly rich in its heritage of extensive plant collections. These should not be stagnant gene pools but constantly growing and being replenished by the addition of plant material from all over the world. Within these collections exist a wide range of plant types including trees, shrubs, herbaceous plants, and alpinists which have enormous potential for commercial exploitation. From these

genetic banks a vast range of plant material can be made available to the industry relatively quickly. For this to succeed introductions to the nursery stock industry have to be managed by a properly established plant introduction and evaluation scheme. Such schemes should select types with commercially desirable characteristics in terms of growth habit, leaf colour and shape, flower and fruit colour, and ensure that each introduction will fit satisfactorily into current nursery stock production programmes.

Ideally introductions should be capable of being propagated in sufficiently large quantities to permit wide scale distribution in response to public demand stimulated by a national publicity campaign. On this basis the Hardy Amenity Plant Introduction and Evaluation (HAPIE) Scheme has been conceived.

PLANT INTRODUCTION SCHEMES

In the UK and Europe numerous collections of plant material are available. Most have been established over centuries of colonial activity by specialist nurseries and private and public bodies. In the latter group the most notable would be The Royal Botanic Gardens at Kew and Edinburgh (10). A fine example of a private collection would be Jermyns Gardens and Aboretum at Ampfield, Hampshire, started by the Hillier Family. From this collection a commercial nursery has thrived on the introduction of unusual garden plants. The nursery stock industry in Europe has used this collection for many years as a basis for reference (11).

Concern over the high level of growth variation within cultivars of nursery stock and possible implications regarding disease status led to plant health schemes being suggested for ornamentals (4). Studies showed that virus and mycoplasma infections were important factors in the growth characteristics of hardy ornamentals (7, 8, 13). Disease indexing would be a difficult and time consuming process for much of nursery material because of the vast diversity of types used. Micropropagation may be of some assistance in improving the health status of a selected number of plants, but it cannot be assumed to be effective for all viruses or virus strains (16). Indeed micropropagation has also revealed new problems. Endogenous and previously apparently symptomless microorganisms have been revealed by *in vitro* culture. The significance of losses to nursery stock caused by pests and pathogens has only recently begun to be assessed (9). Selection schemes which improved the health status of top fruit planting material are well documented (1). A similar UK scheme was initially launched by Long Ashton Research Station (5). Its main aim was to upgrade the general quality of nursery "bloodstock" by selecting within a cultivar (12). This is a plant improvement scheme, not an introduction scheme, and its success depends greatly on support provided by

nurseryman who donate plant material for growth comparisons (2). The Clonal Selection Scheme has now been transferred to East Malling Research Station, Mainstone, Kent (3).

It was originally envisaged that clonal selection could be linked to the establishment of national collections of genera throughout the United Kingdom. Establishment of national collections has now been undertaken by the National Council for the Conservation of Plants and Gardens (NCCPG). Conservation of genetic resources is of prime importance in the NCCPG Scheme (15). An important link should exist between conservation and plant introduction. Groups of plant breeders are actively improving nursery stock subjects at many centres.

Glasshouse Crops Research Institute (GCRI), Littlehampton, Sussex has developed a scheme aiming to introduce recently bred or selected material from world-wide programmes into the United Kingdom trade (D. Whalley, personal communication). By this mechanism important benefits may be derived resulting from research work in Europe, North America, and Australasia.

An industry oriented scheme designed to increase the diversity of commercially available plants, has been developed in Canada. This provides an effective utilisation of botanical gardens and a revenue source through royalties (14). By this scheme nominated plants are thoroughly evaluated by nurserymen with regard to commercial attributes before being subjected to propagation and husbandry tests. Additionally, plants are distributed to eight co-operating research centres throughout North America to provide data relating to growth in differing climatic regions and soil types. The Vancouver Botanic Garden propagates plants into units of fifty plants which are then sold under contract to individual nurseries. Each plant must be capable of giving at least twenty cuttings in the two years after purchase. The aim is to provide a minimum of 10,000 cuttings in two years. This is a *once-only* introduction scheme, although the Botanic Garden retains mother stock. Royalties are administered through the Canadian Ornamental Plant Foundation. Publicity is the responsibility of the Botanical Gardens. It is anticipated that two kinds of plants per year will be marketed under the scheme. Two successful examples so far have been *Genista pilosa* "Vancouver Gold" and *Microbiota decussata*.

HARDY AMENITY PLANT INTRODUCTION AND EVALUATION SCHEME (HAPIE PLANTS)

"HAPIE Plants" aims to identify potentially useful commercial plant types which are currently under-utilised and expose them to industrial evaluation. In proposing a UK plant introduction scheme it was recognized that two factors were crucial for success. Firstly, no commercial scheme could be viable without support

from nurserymen. The general support obtained so far has been highly encouraging and weighed greatly in decisions to continue with the scheme. Secondly, it is extremely important that a close liaison be established at an early date with representatives from botanic gardens, plant propagators, and industry. This was achieved by the formation of a Steering Group representing the interests of research/advisory services, botanic gardens, nurserymen, garden centre trade and landscape sector.

It is the task of the Steering Committee to select plants for preliminary investigation. So far more than 50 plant types have been selected for evaluation. Plants are propagated at the North of Scotland College of Agriculture, Experimental Horticulture Unit (EHU), Craibstone, near Aberdeen. Macro and micropropagation techniques are employed and once sufficient quantities have been produced, batches of uniform plants are despatched to cooperating nurseries for evaluation under commercial conditions. Each nurseryman is asked to report on the plants, and this information will enable the Steering Committee to take decisions on whether or not to proceed with a particular plant.

At the nursery level very simple and direct questions are asked concerning the specific plants as shown by the draft report form as reproduced below. A far greater level of detailed evaluation will be made on plant material retained at Craibstone EHU, in particular studies of propagation, husbandry requirements, and tolerance to herbicides will be made. Once a plant has been evaluated a critical decision on further mass propagation will be made. This will then enable nurseries which are members of the HAPIE scheme to participate in promotion and sales.

Four types have been increased to at least the 500 plant level and are being distributed to cooperating nurserymen for their opinions. A further 8 to 10 types are being increased for further distribution in 1987.

Details of the mechanism for plant release are yet to be finalized. It is anticipated that interested parties may subscribe to the scheme in order to promote specific HAPIE plants. Publicity will be of prime importance in guaranteeing the successful introduction of particular lines.

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HAPIE DRAFT REPORT FORM (CONFIDENTIAL)

You will have received, or be receiving, plants for evaluation in this Scheme). On the basis of your experiences with this material over the next 12 months the Steering Committee would be grateful for the following information:

Assessor's Name

Address.....

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Plant name/code.....

Poor	Good	Excellent
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Overall Plant Quality

Rate of Growth

Overwintering Success

Attractiveness of Foliage

Attractiveness of Flowers

Attractiveness of Berries

Sales Potential

Tick whichever box you feel is most appropriate.

Comments (give your views on the suitability of this material for inclusion in the HAPIE Scheme).

Return this paper to Mr. A. Blain, The North of Scotland College of Agriculture, 581 King Street, Aberdeen AB9 1UD by 1 June 1987.

Nursery), R. Mitchell (St. Andrews Botanic Garden), R. J. Smith (Springhill Garden Centre), and H. Weston (Civic Trees).

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