

Lessons from the Development and Launch of Cut Flower Chrysanthemums

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HISTORICAL BACKGROUND

Between the two World Wars, the introduction of new cut flower cultivars was relatively simple, although grossly inefficient. Breeders had very small nurseries and existed by selling seedlings outright to leading commercial growers and by selling cuttings to amateur growers. The flower growers who bought these seedlings would discover that only a small percentage of them fulfilled the requirements of the commercial market and it took time to find the best cultivation techniques and to gain the confidence of the markets. However, once successful, most of the other growers would produce them and good cultivars (such as *Dendranthema* 'Mayford Perfection', 'Friendly Rival', and 'American Beauty') tended to last for years.

HOW YEAR-ROUND CHRYSANTHEMUMS WERE INTRODUCED

The situation changed radically with the arrival of the year-round crop into England in 1955, which involved single-stem production. Suddenly, thousands of vegetative cuttings were required each week, so the modern chrysanthemum propagator was born. I worked for Framptons where I planted the first year-round crop in Europe. The first lesson we learned was not to take the markets for granted. The market representatives thought that the first specially-bred American spray cultivars we sent them were English disbuds which had not been disbudded. Rock-bottom prices resulted! Lesson one, therefore, is to define your product and agree its specifications with the markets.

The next problems were production ones. To begin with, the American cultivars we were using only grew well in reasonable light conditions and quality was poor from January to March. Indeed, we struggled to cover the high fuel costs for January to April production. Having been employed as a propagator and developer of the year-round system, I soon found myself also in the role of breeder and made my first crosses in 1963.

I was aware that I had four sections of the industry to deal with and another lesson rapidly learned was that a new cultivar had to satisfy each one of them to be successful. These are, of course, the propagator, the grower, the salesman, and the consumer.

The propagator needed cultivars whose stock plants produced large numbers of uniform cuttings capable of travelling up to 2000 miles in cold store and to be tolerant of chemicals for pest and disease control. Flower growers needed dependable, easy-to-grow cultivars, with no peculiar growing requirements. Salesmen needed good travelling and vase-life as well as a very presentable bunch of flowers. The consumer demanded beautiful flowers in a wide range of colours and forms which lasted for weeks

Because of the slow growth of the American cultivars in winter, we could only produce three crops per year and this was not sufficient to sustain the industry in

competition with natural season chrysanthemums and other cut flower crops. The first general aim was to increase both the quality and speed of production, but to do this specific objectives had to be addressed.

Low-Light Tolerance. This was an obvious requirement since we needed to reduce the 20 weeks or so it took to grow naturally flowering Christmas cultivars from January to March. I released 'Snowdon' in 1968 which is still in production. Winter production time was reduced to 16 weeks.

Good Neighbourliness. This may seem extraordinary, but it is a fact that within some cultivars in a close-planted population (60 per m sq.), large plants will tolerate small plants and allow them to develop. Bad neighbour types were discarded.

Good Vase Life. This not only avoids wilting due to failure to take up water, but cultivars are only selected when leaves remain green whilst flowers remain fresh. Now, a new cultivar must tolerate 6 days of cold storage after cutting dry, and a lorry journey of 1,000+ miles and more than 14 days of vase-life is required after this, but we aim at 21 to 28 days.

Low Temperature Tolerance. The year 1974 was terrible for cut flower chrysanthemum growers. The oil crisis in Iran caused the price of oil to quadruple in 12 months and the industry was in extreme difficulty. Framptons reduced its breeding programme to save money, so I left to breed low-temperature tolerant cultivars at Perifleur Ltd. Now, of course, low-temperature tolerance is of little importance in North Europe because growers can afford to use temperatures of 18 or 19C at night in winter using low-priced fuel and thermal screens. I am, however, very glad to have low temperature tolerance in my cultivars, because this enables them to be grown under plastic in places like Israel and Colombia, where artificial heating is not used and temperatures can fall at night to 0C.

Stem Weight. The next goal which I became very much aware of was that the Dutch required a 70-cm stem to weigh 60 g in order to be sold as first grade. In winter, 70% of the crop is expected to be 60 g plus, with a crop time of 14 to 15 weeks. In summer, 95% should be 60 g plus, with a 9- to 10-week schedule. The Japanese use chrysanthemums more than any nation, but they require beautiful flowers on graceful but strong stems, with small dark leaves. Weight is not a top priority for that market. On the other hand, Americans require good doubles and singles, but they must be large and have long (20 cm) pedicels. In Holland, a wide range of types are grown with the emphasis on singles and anemones, but with the ever-present requirement of stem weight.

For large, production-efficient nurseries in Holland, the breeder has other headaches. For instance, the leaves should be green to the base of the stem, even in midbed. The plant should be easy to pull out of the ground at harvesting (i.e., a small but efficient root system) and the leaves should not be too brittle and fall off when the stem is grasped roughly for pulling out.

Uniformity. This is one of the most difficult objectives to breed for, but is more and more necessary. Modern harvest machines need to harvest the whole crop in one go in summer and growers tolerate only two cuts in winter. This means

a close observation of stock plants which produce uniform, easy-to-take cuttings, in places as far apart as Costa Rica, South Africa, and Kenya. A new cultivar now needs speed, weight, and uniformity and, of course, the requirements already mentioned.

LAUNCHING NEW CULTIVARS

The objectives of breeding have largely been covered but this is usually only half the story. It is perhaps easier to produce a new cultivar than to get it into commerce.

I am fortunate in that I work on a large nursery and new cultivars are easily compared with the current mainline cultivars. Southern Glasshouse Produce Ltd. is also a propagator, so that promising lines can be bulked-up rapidly, according to the requirements of the industry.

The breeder can have two basic approaches, one being relatively simple but with limited rewards and the second being more speculative but with potentially greater rewards. The first is to introduce better cultivars for existing programmes so that growers have no new growing conditions to meet. However, the second option offers real progress when a new cultivar can be grown on a shorter schedule so that increased production is possible. This usually involves some changes to husbandry techniques and the new and potentially better cultivar might fail if grown in existing programmes which do not suit it. In this case, the breeder must persuade a top grower into production, often on a large scale so that the specific programming can be used. The breeder may have to travel, perhaps to Holland, to give advice as the crop progresses, so that the new cultivar has a good chance of making an impact on the auction. If the new cultivar is pink and, unluckily, competes with a surplus of pink cultivars in any particular week, the price on the auction will not reflect the true value of the cultivar. Much hard work to recover the situation then needs to be done.

FUTURE WORK

There is much more breeding and development work to do in the next few years to ensure the prosperity of the year-round chrysanthemum industry.

I have long been interested in the direct short-day planting system. This involves the rooting of cuttings in a nutrified container and planting directly into a short-day regime in the flowering house. The trick is to have sufficient leaves developed in the plant in the propagation house so that, with good growing conditions, internodes will lengthen sufficiently to give a crop height of 75 to 80 cm in the flowering house, with sufficiently heavy stems.

In 1973, when I produced a thesis on the technique, only the nutrified peat block part of the system was successful, because of the 60 g per stem requirement which had recently been introduced and the consequent need for some long days in the flowering area. However, I can now release cultivars which will produce 60 g, 70 cm stems planted direct into short days. This reduces summer crops to 8 weeks and winter crops to 11 weeks and radically changes the economics of production. From three crops per year in 1967 we are now in easy reach of five crops per year.

CONCLUSION

The breeder must be aware of both production and consumer requirements in all major chrysanthemum production areas in the world. He must be able to influence sales by demonstration and by providing production information and must be

prepared to travel to do so. This is much easier if he is involved with a substantial firm with world-wide interests. It is a long way from the small independent breeder of 60 years ago. The stakes are high, because a good new cultivar will soon sell in many millions per year. Because the cost of the breeding programme is also high, there are relatively few breeders of year-round chrysanthemums.

The main lesson I have learned is that one must find out what is required before one makes a cross. Then one must select and trial the seedlings to meet modern specifications without personal preference. From the very short list emerging, the industry must finally choose the cultivars to keep it viable.

Intellectual Property Rights for Plant Raisers

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INTRODUCTION

This paper will look at different forms of intellectual property, that is patents, designs, copyright, and trade marks. Particular attention will be given to trade marks, contrasting this form of protection with variety rights and varietal names. The information contained in this paper is based on U.K. practice, although customs and laws in other countries and states are much the same.

Patents relate to inventions, that is the way things work, as opposed to how they look. The typical cartoon showing a line of people queuing outside the Patent Office with contraptions they have invented is apocryphal but incorrect. The Patent Office only deals with written documents (though sometimes machinery is demonstrated to an examiner in order to persuade him or her of the merits of a particular invention). To gain a valid patent an invention has to be novel and non-obvious.

Generally you must file a patent before you disclose your invention to the public anywhere in the world. Patents have a maximum term in the U.K. of 20 years, after the expiry of which the invention is free for everyone to use.

Designs and Copyright, which are closely allied, relate to the appearance of "art works". The artistic content need not be high. The way something works is irrelevant to design and copyright protection. Copyright can vest in films, drawings, books, true art works, mass-produced articles of "pleasing" shape and, of particular relevance to industry (including the nursery industry), plans, and diagrams.

DIFFERENT FORMS OF INTELLECTUAL PROPERTY

There are three forms of intellectual property which plant raisers need to consider: copyright, design right, and registered design.

Copyright and Design Right. These two forms of intellectual property are automatic in that as soon as you make an original sketch (not copied from any other work) you have copyright and/or design right. When you make a sketch, for example of a new shape of plant container or box for carrying such plant containers, or a new watering can, copyright subsists in such a sketch.

You should sign and date your sketch and all original sketches should be retained in a safe place. Because this form of intellectual property is automatic you have to