Vegetative Propagation in the Vegetable Seed Industry©

Daniel Trimboli
Enza Zaden Australia P/L, Ltd., 218 Eumungerie Rd., Narromine New South Wales 2821
Email: d.trimboli@enzazaden.com.au

INTRODUCTION

Vegetative propagation is used in certain aspects of the vegetable seed industry, with the majority being for plant breeding purposes. The uses are for:

- Plant rescue
- Multiplication and maintenance
- Selection
- Embryo rescue
- Inbred development
- Grafted seedlings

VEGATIVE PROPAGATION

Vegetative Cuttings. These are used in brassicas, lettuce, cucurbits, and solanaceous crops for plant rescue, multiplication/maintenance, and selection. Cuttings are placed in Growool® (or similar) blocks under mist and potted immediately when root production is apparent. This ensures the highest seed yield by maintaining the vegetative stage for as long as possible.

Tissue Culture. Tissue culture is employed for plant rescue, multiplication/maintenance, selection, embryo rescue, and inbred development. Plants grown by tissue culture are more suited to transport domestically and internationally than those produced vegetatively. Tissue culture is slower to produce transplantable plants than conventional vegetative propagation.

- The **maintenance and multiplication** of genetically male-sterile breeding and stock seed lines are carried out by both tissue culture and vegetative propagation.
- **Embryo rescue** is a tool for plant production by means of tissue culture from interspecific crosses usually between species within the one genus. Also seedlings emerging from seed which has lost vigour can be cultured by tissue culture but strictly it is plant rescue and not embryo rescue and is only used for varietal preservation.
- **Inbred development** is accelerated by producing haploid plants on culture media by microspore culture in brassica and solanaceous crops and by ovule culture in onions. Haploid plants can be converted to diploids by spontaneity or chemical treatment. Inbred plants are used as parents for production of hybrids.

Grafting. This is used mainly as a commercial technique in the seed industry in cucurbits and solanaceous crops and is carried out at the cotyledon stage for the rootstock and first true leaf for the scion. The technique is used for expensive varieties where rootstocks are developed or selected because they provide resistance to soil-borne diseases, provide yield increases, overcome adverse environmental effects and, on occasion, alter fruit shape and flavour.

Grafting often employs the use of a rootstock from one genus and the scion from another, within the same family. The successful compatibility between rootstock and scion can be quite indiscriminate and random.