PROPAGATION AND PRODUCTION OF CRABAPPLES ON THEIR OWN ROOTS

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Traditionally, crabapples have been commercially propagated by two methods: field budding in July or August, or bench grafting during the winter. Other methods of propagation used are seed, top working, and root grafting. All of these methods, except for seed, pose three common problems; understock suckering, graft incompatibility, and crooks in the trunk.

Producing crabapples on their own roots can eliminate these problems with some advantages over budding and grafting. Multistem crabapples can be easily grown from own-root crabapples. Other advantages of own-root are lower costs in the making of cuttings, and the production of a more fibrous and massive root system. With a better root system, transplanting of balled and burlapped stock will be more successful.

When propagating by cuttings, good vigorous stock plants are needed to promote softwood growth. Stock plants should be fertilized and pruned in late winter or early spring, and should be irrigated to increase the amount of cutting material. The drought in 1988 caused an early hardening of cutting wood where irrigation was not used.

Softwood cuttings are made from the current season's growth in mid-May to mid-June. Timing of the cuttings may vary from year to year depending on the season. Cuttings that have been taken in July and early August have lower rooting percentages. At this time, cutting wood is hard, and although callus is formed, roots may not be initiated.

Cutting material from 6 to 24 in. in length is taken from field or stock plants. After collection, the cutting material is sprayed with water and refrigerated at 40°F. until they are prepared for sticking. Two node cuttings are then made with the basal portions being 1 to 1½ in. long. Wounding the cuttings does not seem to benefit rooting so is not practiced. The cuttings are then bundled and tied with a rubber band.

Rooting hormone is prepared in liquid forms. Concentrations of 1200, 2500, 5000, and 10,000 ppm IBA have all been used. A concentration of 2500 ppm IBA encourages the best rooting when cutting wood is taken at the proper time. If cuttings are taken later in the season, a higher concentration of IBA may be needed to promote rooting. The bundles of cuttings are given a 5 sec dip in the IBA solution.

Cuttings are taken to a 50 to 60% shaded polyhouse and stuck in 2⅜ in. band pots. The potting medium is 50% peat and 50% perlite. The depth of the band pot is 5 in. which allows for good drainage. Eddy-mist nozzles provide adequate mist until the cuttings are well-rooted.

The rooting time varies with cultivars and rooting conditions. Generally, roots are initiated in 3 to 4 weeks. When the majority of cuttings show roots, mist should be decreased, as excess moisture may cause root decay.

Cuttings that are taken early in the season should continue to grow. At the end of the growing season 8 to 12 in. of growth can be obtained. If a rooted cutting does not put out any new growth, it will stay dormant until the following spring. Cuttings taken in July and August usually will not produce new growth.

Some of the red- and pink-flowered types ('Adams', 'Indian Magic', Indian Summer', 'Robinson', and 'Profusion') have consistently rooted 90 to 100%. Table 1 shows the rooting ease among different crabapple taxa.

The rooted cuttings are stored in a minimally heated polyhouse for the first winter. Heat is provided so that temperatures do not fall below 30°F. In the winter and early spring the young plants are potted into 3⅝ in. square band pots. Band pots encourage roots to go deep, which will help in the anchorage of the tree.

Polyhouses promote an earlier than normal flush of growth in the spring. This growth can be used as a source of cutting wood. When the danger of frost is past, the potted crabapples are placed outside under irrigation. Liquid fertilizer is applied twice a week and is gradually decreased in September. Aphids can be a constant

Table 1. Rooting ease among different crabapple cultivars and species.

Best rooting	
Adams	Robinson
Donald Wyman	Snowdrift
Indian Summer	Snow Magic P.P. 4815
Indian Magic	*M.* × *zumi* 'Calocarpa'
Profusion	
Good rooting	
M. × *atrosanguinea*	Ralph Shay
Beverly	Red Baron
David	Red Jade
M. floribunda	Red Jewel P.P. 3267
Mary Potter	*M. sargentii*
Prairifire	
Difficult-to-root	
Burgandy	
Royalty	
Selkirk	

problem on the succulent growth of young plants if control measures are not applied.

Many cultivars can reach 6 to 8 ft in height by the end of the first year. The growth is comparable to that of a one-year budded plant, but without understock suckering. A one-year budded plant has a three-year root system, while the own-root crab has only a two-year.

There are many crabapples that do well on their own roots. The growth is the same or better than a budded type. With different propagation and cultural techniques, production of crabapples on their own roots can be commercially practiced with many taxa.

GROWTH COMPARISON OF CRABAPPLES: OWN ROOTS VS. APPLE ROOTSTOCK

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INTRODUCTION

The merits of propagation methods of a particular plant should be based not only on the ease with which a plant can be propagated by a particular method but also on how well that plant does in its eventual planting site. Crabapples historically have been propagated by T-budding on apple rootstock and, more recently, by chip budding on apple roots. Tom Simpson described these methods in detail in a paper preceding this one. In recent years some nurserymen have used rooted cuttings as a means of propagating crabapples. The two main reasons for shifting to cuttings are: 1) cuttings require less skill to take than budding, and 2) crabapples on their own roots should have less root suckers when the plants are grown on to maturity (1). It is fairly easy to train a person to take cuttings, but T-budding or chip budding requires a longer training period and the chances of a successful take, coupled with some degree of speed, is not too great for the novice propagator. Brian Bunge described his method of cutting propagation in his paper.

Since there has been some debate as to which method produces the best landscape crabapple, our research project compares growth characteristics of crabapples propagated by budding onto apple rootstock vs. crabapples grown on their own roots.