PROPAGATION TECHNIQUES FOR *MAHONIA* × 'ARTHUR MENZIES'

RICHARD VAN KLAVEREN

University of Washington Arboretum,
Seattle, Washington 98105

In late September 1961, the Strybing Arboretum, San Francisco, sent us a group of seedling *Mahonia* plants raised from *M. lomariifolia* seeds. These were grown for a year or so in the cold frames, then transferred to the lathhouse as they increased in size. When this last move was made one plant seemed to have a very different leaf from the rest and we speculated that it might be a hybrid, perhaps with *M. bealei* since the shape of the leaflets suggested that species. Our suspicions of its mixed parentage were strengthened in December 1964 when a drop in temperature to 11°F. and continued below-freezing conditions for several days reduced all its sister seedlings to brown pulp, but left it nearly untouched.

When this plant first flowered in late December 1967, we made a careful analysis of it and felt that we were correct in assuming the parentage to be *M. lomariifolia* × *M. bealei*. In order to be more certain we sent an inquiry to Strybing Arboretum to find if *M. bealei* or some other *Mahonia* was within pollinizing range of the seed plants. We then learned that the seed did not come from plants in the Arboretum, but rather from the garden of Mr. Arthur Menzies, Supervisor of Plant Accessions for the Strybing Arboretum. He, too, felt that the hybrid "definitely is a *M. lomariifolia* × *M. bealei* hybrid" since he did not have *M. japonica* in his garden.

This question of parentage is of some importance since there is a *M. lomariifolia* × *M. japonica* hybrid extant in Great Britain, a fine plant called *M.* × 'Charity'. There has been no complete description of this clone published, but in comparing photographs of it with our *Mahonia*, certain differences become obvious. Its leaflets are slenderer and the racemes are somewhat lax, whereas they are nearly erect in our hybrid.

It was with very great pleasure, therefore, that we named this hybrid *Mahonia* × 'Arthur Menzies' in honor of one of the most knowledgeable horticulturists in California. *Mahonia* × 'Arthur Menzies' should prove to be a welcome winter flowering shrub and if it is as hardy as we think, it may be a valuable substitute for *M. lomariifolia* in places where the latter is not thoroughly hardy.

A complete description follows:

An erect, glabrous, several stemmed shrub about six feet tall at the end of five years.

The leaves are persistent, up to 55 cm long and 15 to 20 cm broad, odd pinnate, with 7 to 9 pairs of opposite leaflets. Leaflets dull green above, yellow-green below, thick, leathery, the basal pair 3 × 3 cm, sub-rounded, the others changing to ovate and thence to oblong ovate toward the tip, increasing in length from 4 to 11 cm long and from 3.5 to 4.5 cm broad; the base obliquely truncate and often imbricate with its opposing mate, the top spinose, long acute to shortly acuminate, often somewhat recurved and falcate; the margin spinose with from 3 to 5 spines on each side. The terminal leaflet ovate, usually larger, 9 to 14 cm long, 4.5 to 6 cm broad.

Flowers faintly scented, in several (7-9) erect fascicled racemes 10 to 25 cm long, appearing in late December and continuing through January. Floral bracts ovate, 4 mm long, 2 to 3 mm wide, greenish; pedicels 6 to 8 mm long. Flowers yellow (RHS colour fan yellow group 5A), nodding, campanulate, about 1 cm. broad at anthesis, sepals 9, in three concentric rows, the outer ovate, 1.5-2 mm long and 1 mm wide, the median 3.5-4 mm long, 2.5-3 mm broad, the inner 8-9 mm long, 4-5 mm broad, oblong ovate; petals 6, ovate to oblong ovate, 7-8 mm long, 5 mm broad, tip emarginate, glands two, distinct; stamens 6, 4-5 mm long, subapiculate, ovary green, cylindric, as long as the stamens and with a sessile capitate stigma. Fruit large, purple, similar to the parents.

Once we felt the plant was a new and useful ornamental we were faced with the problem of its propagation in some quantity. There were two reasons for this:

First, the genus *Mahonia* along with *Berberis* and × *Mahoberberis* include species which carry black stem rust of wheat and hence are under quarantine restrictions established by the U.S. Department of Agriculture. It was necessary to send a number of plants of *M.* × 'Arthur Menzies' to the Cooperative Rust Laboratory in St . Paul, Minnesota for testing. It was determined there that this hybrid was not susceptible to black stem rust and we received clearance to distribute it in May, 1974.

Second, we wished to distribute the plant to a wide range of gardens throughout North America for hardiness trials. So far no hard results are in on these plants, but at least one plant was recently seen thriving in a garden in the Philadelphia area.

In order to speed up propagation of this fine new plant we felt we must find a method which was both quick and not too wasteful of our limited amount of stock. Grafting was too slow while stem cuttings required cutting the parent plant too heavily. Leaf-bud cuttings seemed to be the best method and the following techniques were worked out.

The cuttings are best taken from the end of June to late July although other times also work. A branch is cut from the outside of the plant, and about 2/3 of each compound leaf is removed while still attached to the branch. This makes handling easier, reduces water loss from the cutting and saves room on

the cutting bench. The branch is turned upside down and the top leaf and its axillary bud is removed with a sharp knife. The cut is started about 3/4 inch below the bud and extends under the leaf base at a depth of about 1/16 inch and continues for another 3/4 inch above the bud. This sliver of wood is pulled free and the ends are trimmed to a total length of about 1-1/2 inches with the bud and leaf base about in the middle.

The entire leaf base is dipped into 0.8% indole-3-butyric acid powder (Hormodin #3) which is mixed with benomyl (Benlate) in the proportion of 1 part Benlate to 5 parts Hormodin powder. The excess powder is removed by tapping.

These cuttings are inserted into a rooting medium of 3 parts coarse river sand and one part ground peat in 8 or 10 inch clay pots with 14 to 16 cuttings per pot. The pots with the cuttings are then drenched with "Truban", 1 tablespoon to 3 gallons of water, to reduce the incidence of stem rot. The clay pots are used in favor of other containers since we are not going in for large production. The pots are then placed in a mist bench with a "Mist-O-Matic" control and bottom heat set at 70-72°F.

Rooting usually takes place in 7 to 8 weeks at which time the cuttings are potted on in 2½ inch pots using a standard potting mix and no additional fertilizer. These are placed on the greenhouse bench where they stay with little or no growth apparent for 4 to 5 months during which time the roots seem to be undergoing a hardening period. At the end of this time; a mild fertilization with a diluted fish material is applied and new growth is initiated shortly after. When this growth is hardened the plants are lined out in nursery rows. Under normal conditions, the cuttings will be 1½ - 2 feet tall at the end of the growing season.