PROPAGATION OF JUGLANDS REGIA CLONES BY CUTTINGS

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Some *Juglans regia* clones can be propagated by either softwood leafy cuttings under mist or by dormant hardwood cuttings. Rooting of softwood cuttings could only be obtained in late summer. This timing causes difficulties in maintaining the cuttings through the winter for them to be able to resume growth in the spring. Emphasis has been placed, therefore, in rooting hardwood cuttings. Rooting is best with cuttings taken in January. This permits planting in early spring, allowing growth through the summer, with budding in late summer.

There is considerable variation among *J. regia* clones in producing adventitious roots. In one test Serr gave 50% rooting; Vina, 22%; Ashley, 10%; Hartley, Eureka, and Chico, 0%. In comparison, 60% rooting was obtained with B. K. Paradox, 80% with *J. hindsii* and 0% with *J. nigra*.

The type of wood used for hardwood cuttings is important. Previous summer's growth is used, taken from shoots with vigorous growth. Cuttings about 3/4 inch in diameter from the base of the shoots with a small pith, are more likely to root than smaller cuttings from terminal growth.

Treatment of walnut cuttings with a rooting hormone is essential. Rooting has never been obtained in untreated lots. Soaking the base of the cuttings for 24 hours in a 300 ppm solution of indolebutyric acid (IBA) has been best. A treatment of 1M sulfuric acid for 10 sec., followed by a water rinse prior to the IBA treatment, has increased rooting with Serr cuttings from 40% to 60%.

Following the IBA treatment, initiation of roots at the base of the cuttings is done by placing them upright in lug boxes filled with a rooting medium. The boxes are set over bottom heat to obtain 75°F to 80°F at the base of the cuttings. This frame is in a covered, unheated and open-sided shed. The temperature of the buds at the top of the cuttings in January is the same as the ambient air temperature, in the range of 32°F to 50°F. This low temperature is important in preventing bud development at the rooting stage.

The rooting medium is important. For walnuts it must be quite porous to allow good aeration. The moisture level is critical. Excessive moisture causes deterioration of the tissues. This proved to be a problem in our 1977-78 tests. That year we used a 3:1 perlite/vermiculite mixture. In the 1978-79 tests this was increased to 5:1. In addition, a LIC electronic soil moisture probe (120 S. 52nd St., Lincoln, Nebraska 68510) was used. The reading taken at the moisture level of the medium judged to be optimum was maintained throughout the rooting period.

Any disturbance of newly-formed adventitious roots on walnut cuttings is fatal. To avoid this, two approaches were taken in the 1978-79 tests. One is to insert the cuttings for rooting into 1 quart milk cartons with the bottoms cut out. After sufficient time in the bottom heat bed the undisturbed cutting, plus the milk carton, is planted directly in the nursery. The second method is to leave the cuttings (not in milk cartons) over bottom heat until adventitious roots form, but before they emerge, then plant them in the nursery.