PROPAGATION OF AMERICAN ELM FROM CUTTINGS

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Interest in propagating strains of disease resistant American Elm is evident in one of the first papers in recent years dealing with vegetative means of propagating *Ulmus americana.* Doctor T. W. Bretz (2), 1949, used leaf bud cuttings from 8 year old trees of 17 resistant selections. Cuttings were taken in May, treated with N.A.A. rooted to 60% in 6 weeks. Some rooting took place in all 17 strains as well as with *U. pumila, U. Thomasii,* and *U. fulva,* but not with Buisman Elm.

W. L. Dorman and M. A. McKenzie (4) treated new June shoots 4 to 6″ in length with I.B.A. 50 ppm. These rooted 53% (untreated 34%) while root cuttings were useful in 97.5% of cuttings whose proximal end was exposed. Stem cuttings of *U. pumila, U. parvifolia* and *U. japonica* rooted from June cuttings. Buisman Elm failed to respond.

Beginning in 1959 a project of the British Forestry Commission, "Propagation of Elms and Poplars" was reported in their yearbook by J. Jobling (6-11) and has continued through the 1963 report (10). The authors (11) report propagating 620 plants from 24 clones with an average rooting of 57% and for easily rooted clones 80%. Sturdy one year wood as 5″ cuttings was treateed with I.B.A. 1000ppm in talc. The soft wood cuttings were inserted under mist within 2 hours of removal from young wood from young trees preferably terminal cuttings. Storage of cutting wood at 35° - 37° F. for as long as 16 days to 90 days improved survival in the cutting bed and later in lining out when 69% survived. Rooting over 60% was rated good and below 30% poor. *Ulmus hollandica* var. hollandica and other varieties were successfully propagated including *U. glabra, U. procera,* and *U. carpinifolia* but not *U. americana.*

Recent work with American elm by Ouellet (12) in Canada is based on young cutting wood taken in June until late July treated with I.B.A. 50 ppm for 24 hours using coarse sand, humid air at 70° F. - 75° F. and illuminated by 1200-2000 foot candles. A maximum of 80% rooting occurred in young one year wood but 20% in cuttings of older (5 year) wood. Cuttings made in August rooted poorly while other species rooted under the conditions noted and include *U. pumila, U. japonica, U. hollandica,* and Buisman (19%).

In studies at Cornell both root cuttings and stem cuttings have been used with results essentially as noted above. Procedures used in 1964 included collection of 1964 wood and immediate immersion in cool water followed by enclosure in polyethylene bags then storage in cool shaded spot for up to an hour or two, later stock piling in refrigerators at 35° F. until they could be prepared for sticking.

Cuttings were removed and stuck in perlite vermiculite 1:1 mix in 4 x 8″ Market Pac trays, 10 per tray. The cuttings were dipped stem end in N.A.A. 1000 ppm solution made by dissolving the acid in a tablespoonful of carbowax 1400* and bringing to volume with warm distilled water. Treatment was by dipping and holding in the solution for 2 to 4 seconds.

Trays of cuttings were placed under constant mist from Florida nozzels for 24 hours then to intermittent mist. Rooting took place in six weeks and the cuttings moved from the pac to individual 3″ pots of peat or plastic and returned to the mist. Weekly foliar feeding was used during the propagation and was based on 1 gram N per pac per week.

Fertilizer was used during the 6 weeks rooting period and continued after potting up in larger containers, usually gallon size or #10 size plastic plots.

Cuttings were left in the Market Pac till roots were obvious along the base of the pac both inside and out. American Elms usually produce 3 to 5 roots of which 1 or more tends to elongate to 8″ and more with relatively sparce branching. Propagating in 2-3″ peat pots or cylinders could be an advantage in carrying cuttings through to field planting stage in one season.

Rooting to the order of 50% and better held for cuttings taken in May and June but fell off to occasional rooting from July and August cuttings in which outer bark was no longer green but light brown. Winter root cuttings were successful (25%) but poor in June.

On the basis of present evidence propagation of American Elm clones of disease resistant type may be propagated from soft wood cuttings during early growth beginning when first leaves approach mature leaf area for the clone, and continuing through a period of a month or more. Stock piling of soft wood cuttings may be done and cuttings placed in individual containers of light weight media with foliar feeding during propagation so that well rooted liners of 6″ to 12″ stem can be fall planted under appropriate conditions.

One method of propagation reported in Agricultural Research (1) for poplar may have significance in propagation of American Elm. The method is to select sprouts from the base of stumps. The report indicates that early spring sprout cuttings of poplar rooted 80% to 100% in 3 to 4 weeks and grew 5 to 5½ foot in two months. Limb sprouts of elm taken in 1964 at Ithaca rooted as did soft wood cuttings in general but basal shoots from the stump or from cutting roots near the stump to stimulate shoots was not reported. Jobling reported stooling for producing of cutting wood. Wright (15) succeeded in producing elm seed on cut branches.

*Product of Union Carbide Co.

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MODERATOR DUGAN: Just to show you the progress that our Society has made, a few years ago the next subject nearly caused a riot. Nobody dared bring it up on the floor. Here it is as part of the printed program. Dr. Reisch is going to speak to us on the use of Anti-dessicants in the establishment of liners.

THE USE OF ANTI-DESICCANTS IN ESTABLISHING LINERS

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Transpiration, or water loss from various plant parts, is a natural process which can, under certain conditions, result in damage to or death of plants. Rapidly transpiring plants often lose water to the extent that leaf cells lose turgor and wilting results. If water loss exceeds absorption beyond the extent of recovery, death from dehydration will eventually occur. Even a moderate loss of turgidity causes premature closure of stomates which interfers with photosynthesis and other metabolic processes. Water loss can become very critical when roots are damaged or removed as in bare-root transplanting, and are not sufficient to compensate for the water lost in transpiration.

The objective of this study was to determine the feasibility