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ROOTING CUTTINGS OF BROWSE PLANTS

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SOUTHERN FOREST EXPERIMENT STATION¹

Under greenhouse conditions, stem cuttings from American beautyberry, flowering dogwood, black willow, and common greenbrier rooted consistently enough to warrant recommendation for vegetative propagation. Rooting of 11 other species was erratic or poor, varying considerably between seasons and years. Two species did not root at all.

For 3 consecutive years beginning in 1962, stem cuttings were taken in May, September, and January from plants of 17 species that are commonly browsed by deer in pine-hardwood forests of the South. All cuttings were collected at the Stephen F. Austin Experimental Forest and tested for rooting ability in a greenhouse.

The May cuttings were, in general, collected when twigs were actively growing and after leaves had fully expanded. The September cuttings were taken after growth had ceased and the wood was partially matured. January cuttings were from dormant twigs formed the previous year.

Cuttings were approximately 6 inches long. Those from shrubs and trees were restricted to the distal extremity. Vine stems were usually sectioned, so that several cuttings were taken from one stem. All leaves except one or two terminals were removed before stems

were stuck into the propagation bed. Each species was represented by cuttings taken from several plants (a different set of plants at each collection period), with no distinction between terminals and laterals.

To stimulate root initiation, the proximal end of each cut stem was dipped into a commercial preparation of indolebutyric acid and then set upright to a depth of 2 inches in a 3:1 mixture (by volume) of sand and peat. Forty-eight sand-peat flats were grouped into four blocks. Within each block, 60 cuttings of each species were arranged in rows of 15 each, with stems approximately 2 inches apart in rows. Rows within blocks were randomly located.

The greenhouse was covered with saran cloth that produced 30 percent actual shade. Insofar as possible, the air was kept at 80° F., but on hot summer days the temperature occasionally rose to 100° for 1 or 2 hours. Infrequently, during the coldest winter nights it dropped to 55°.

Watering was by an overhead intermittent mist that was regulated to spray for an average of 12 seconds at 2½-minute intervals. The spray time was lengthened slightly in summer and shortened in winter.

After 13 weeks the cuttings were removed and examined for presence, number, and maximum length of live roots.

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The planting mixture was reworked before it was used for a new batch of cuttings.

RESULTS

American beautyberry, black willow, common greenbrier, and flowering dogwood were consistent rooters. Though better in some trials than in others, cuttings of these species rooted from 51 to 75 percent of the time (table 1).

September was definitely the best month for making American beautyberry cuttings, as 96

Table 1.—Root formation from stem cuttings of southern deer browse plants

CONSISTENT ROOTERS

Species	Average proportion rooting
	Percent
American beautyberry, <i>Callicarpa americana</i> L.	75
Black willow, <i>Salix nigra</i> Marsh.	65
Common greenbrier, <i>Smilax rotundifolia</i> L.	55
Flowering dogwood, <i>Cornus florida</i> L.	51

ERRATIC ROOTERS

Saw greenbrier, <i>Smilax bona-nox</i> L.	32
Winged elm, <i>Ulmus alata</i> Michx.	23
Yaupon, <i>Ilex vomitoria</i> Ait.	14
Sweetbay, <i>Magnolia virginiana</i> L.	11
Rusty blackhaw, <i>Viburnum rufidulum</i> Raf.	10
Red mulberry, <i>Morus rubra</i> L.	7
White ash, <i>Fraxinus americana</i> L.	7

POOR ROOTERS

Pawpaw, <i>Asimina triloba</i> (L.) Dunal	3
Fringetree, <i>Chionanthus virginicus</i> L.	3
Cat greenbrier, <i>Smilax glauca</i> Walt.	1
Blackgum, <i>Nyssa sylvatica</i> Marsh.	1

percent success was achieved. May and September, when rooting percentages ranged from 58 to 67, were usually better than January for collecting common greenbrier and flowering dogwood, but results were not always consistent between years. Black willow tended to root best from January cuttings, averaging 74 percent.

Seven species were classed as erratic rooters (table 1). Rooting percentages in the individual trials ranged from 0 to 75; the averages varied from 7 for red mulberry and white ash to 23 for winged elm and 32 for saw greenbrier. With the exception of rusty blackhaw and saw greenbrier, which rooted best from September cuttings, the results were inconsistent between years and seasons.

Cuttings from the four poor rooters usually failed to form any roots. Infrequently a small percentage of fringetree, blackgum, and cat greenbrier grew roots but on no more than 9 percent of the cuttings. Pawpaw rooted only once in 9 trials—in cuttings taken in May 1963—when 29 percent rooted. For these four species the cuttings made in May appeared somewhat better than those made in September; the January cuttings were all failures.

Sassafras (*Sassafras albidum* (Nutt.) Nees) and laurel greenbrier (*Smilax laurifolia* L.) cuttings failed to produce roots at any time.

Why some species rooted better at one season or year than at another is not known. Weather conditions prior to taking the cuttings do not offer a reliable explanation. Environment within the greenhouse was held constant within reasonable limits and therefore does not account for variability in rooting among years. Perhaps the differences are attributable to physiological condition and growth stage of cuttings and to position of cuttings on parent plant (lateral or terminal branch), factors which were not measured or controlled.

With the exception of saw greenbrier, red mulberry, and white ash, the May cuttings had longer and frequently more numerous roots than those collected in September and January—hence presumably a better chance of surviving if outplanted. Conditions in the field, however, are apt to be harsh at the time of year May cuttings would be transplanted. This disadvantage would be less serious if rooted cuttings could be kept in the greenhouse or nursery to await planting the following spring.