Propagation of *Ligustrum vulgare* L. by Forced Softwood Cuttings

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INTRODUCTION

A forcing solution containing 200 mg 8-hydroxyquinoline citrate (8-HQC) per liter and 2% sucrose has been demonstrated to be an effective means to produce softwood growth that can provide quality explant material for *in vitro* studies and micropropagation during the winter dormant season of woody species (Read and Yang, 1985; Yang and Read, 1989). The success of this method encouraged us to attempt to modify explant response by incorporation of appropriate growth regulating chemicals into the forcing solution (Read and Yang, 1989). The purpose of this report is to illustrate how this approach can be successfully adapted to propagation by softwood cuttings.

MATERIALS AND METHODS

The basal one-third of 22-cm long dormant stems of *Ligustrum vulgare* L. were surface disinfested by immersion in bleach solution (0.78% NaOCl) plus 20 drops of Tween-20 per liter for 15 minutes. Then stems were rinsed with distilled water for about two minutes; freshly cut to remove about 0.5 cm from the base; and placed in forcing solutions containing 200 mg 8-HQC per liter and 2% sucrose, to which various plant growth regulators had been added. GA_3, IBA, NAA, and IAA were included separately at 0, 1, 10, or 50 mg per liter of forcing solution in order to determine their effect on the rooting response by the resultant softwood growth. GA_3 and IBA were also added sequentially to the forcing solutions (GA_3 for the first 3 days and then IBA until shoots were cut for rooting). Every three days the solutions were replaced with fresh aliquots of the test solutions and approximately 0.3 cm was cut from the base of each stem being forced. The softwood outgrowths to be used for cuttings were removed when they reached 8 to 12 cm in length and were rooted in vermiculite under intermittent mist at 28°C/21°C day/night and 10 hours of natural daylight in the Horticulture Department (Nebraska) greenhouse. No rooting compounds were applied to these softwood cuttings.

Table 1. IAA in the forcing solution enhanced subsequent root initiation for the forced softwood cuttings of *Ligustrum vulgare*.

	IAA (mg/liter)			
	0	1	10	25
Root number/cutting	5.1	9.3	20.5	14.5

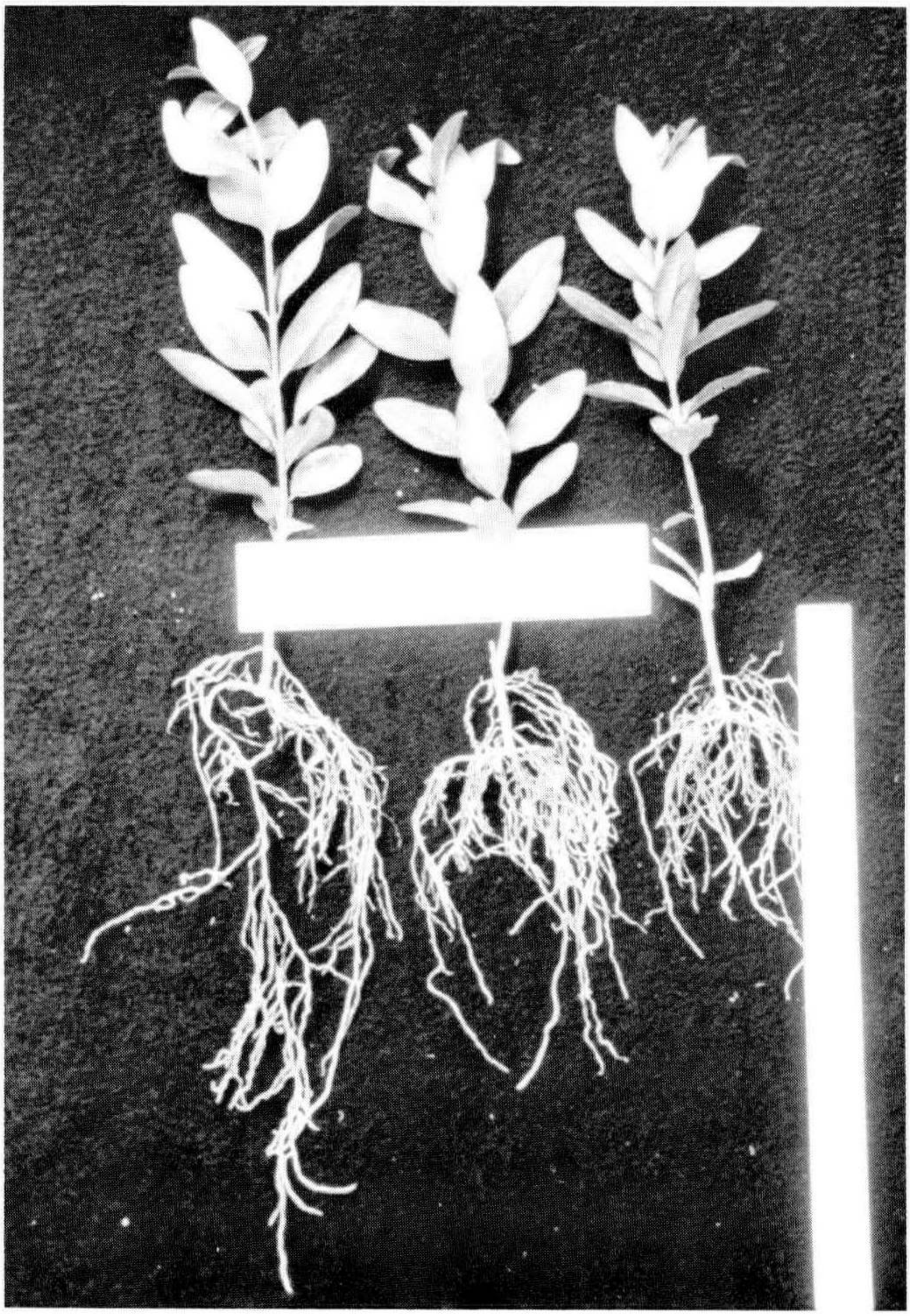

Figure 1. Influence of GA_3 in the forcing solution on rooting of softwood cuttings of *Ligustrum vulgare* L. Left, 1 mg GA_3/liter; middle, 10 mg GA_3/liter and right, 50 mg GA_3/liter.

RESULTS AND DISCUSSION

Inclusion of GA_3 in the forcing solution hastened bud break and promoted shoot elongation as expected (Yang and Read, 1989), but inhibited rooting (Fig. 1). IBA, IAA, and NAA in the forcing solution enhanced rooting of the softwood cuttings. This response was typical of auxin-type responses found when such compounds are applied directly to cuttings. Results of the IAA, IBA, and NAA treatments were similar for all three growth regulators and therefore only the IAA results are presented in Table 1.

When GA_3 and IBA were included in the forcing solution sequentially, i.e., addition of IBA following inclusion of GA_3, the GA_3-induced inhibition was

counteracted and rooting was stimulated. We propose that this protocol can be used as a potential means to expedite macropropagation of woody species in the off-season. We have also initiated research to determine the utility of using forcing solutions as an efficient delivery method for root-enhancing chemicals and to examine the potential applications for propagating recalcitrant woody species.

LITERATURE CITED

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WEDNESDAY MORNING 2 DECEMBER 1992

The morning session was convened at 8:00 p.m. with Anna Knuttel serving as Moderator.