

que may be considered sufficiently developed for trial by nurserymen who might benefit by its use. Furthermore, there is no reason why laminate budding should be restricted to fruits, since the principles should apply to all woody plants that are propagated by budding.

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#### ACKNOWLEDGEMENT

Seven Dwarfs Nursery, Medford, Oregon, for furnishing certain of the quince stock used in the experiment.

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(*Editor's Note:* Time did not permit the presentation of the second paper. However, it is included at this point as a matter of record.)

### **"TENANT GRAFTING", A QUICK METHOD OF PROPAGATING INTERSTEM TREES**

DONALD B. WHITE

*Department of Horticulture  
Iowa State University  
Ames, Iowa*

One of the major obstacles in producing interstem dwarf trees is the prolonged time interval between propagation and salable size. The present methods encompass a minimum of two growing seasons.

The techniques used today are essentially the same as the one described in 1665 by John Rea (1). He wrote "I have found out another expedient to help them (dwarf trees) forward, that is, by grafting the cyen of the Paradise Apple in a crab, or other apple stock, close to the ground, with one graft, and when that is grown to the bigness of a finger, graft thereon, about eight inches higher, the fruit desired . . . and will cause the trees to bear sooner, more and better fruit."

<sup>1</sup>Journal Paper No. J-3778 of the Iowa Agricultural and Home Economics Experiment Station, Ames, Iowa. Project No. 1310

Some of the schedules and methods in use today are as follows:

*Method*

*Schedule A.*

Winter 1959    bench graft interstem to root  
Summer 1959    bud variety to interstem    (1 growing season)  
Summer 1960    varietal bud grows    (1 growing season)  
Growing seasons required to produce  
a one year whip    ---    ---    ---    ---    ---    2

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*Method*

*Schedule B.*

Spring 1959    plant rootstock  
Summer 1959    bud interstem to rootstock    (1 growing season)  
Winter 59-60    cut back rootstock  
Summer 1960    interstem bud grows —  
bud variety to interstem    (1 growing season)  
Winter 1961    cut back interstem to variety  
Summer 1961    varietal bud grows    (1 growing season)  
Growing seasons required to produce  
a one year whip    ---    ---    ---    ---    ---    3

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*Method*

*Schedule C.*

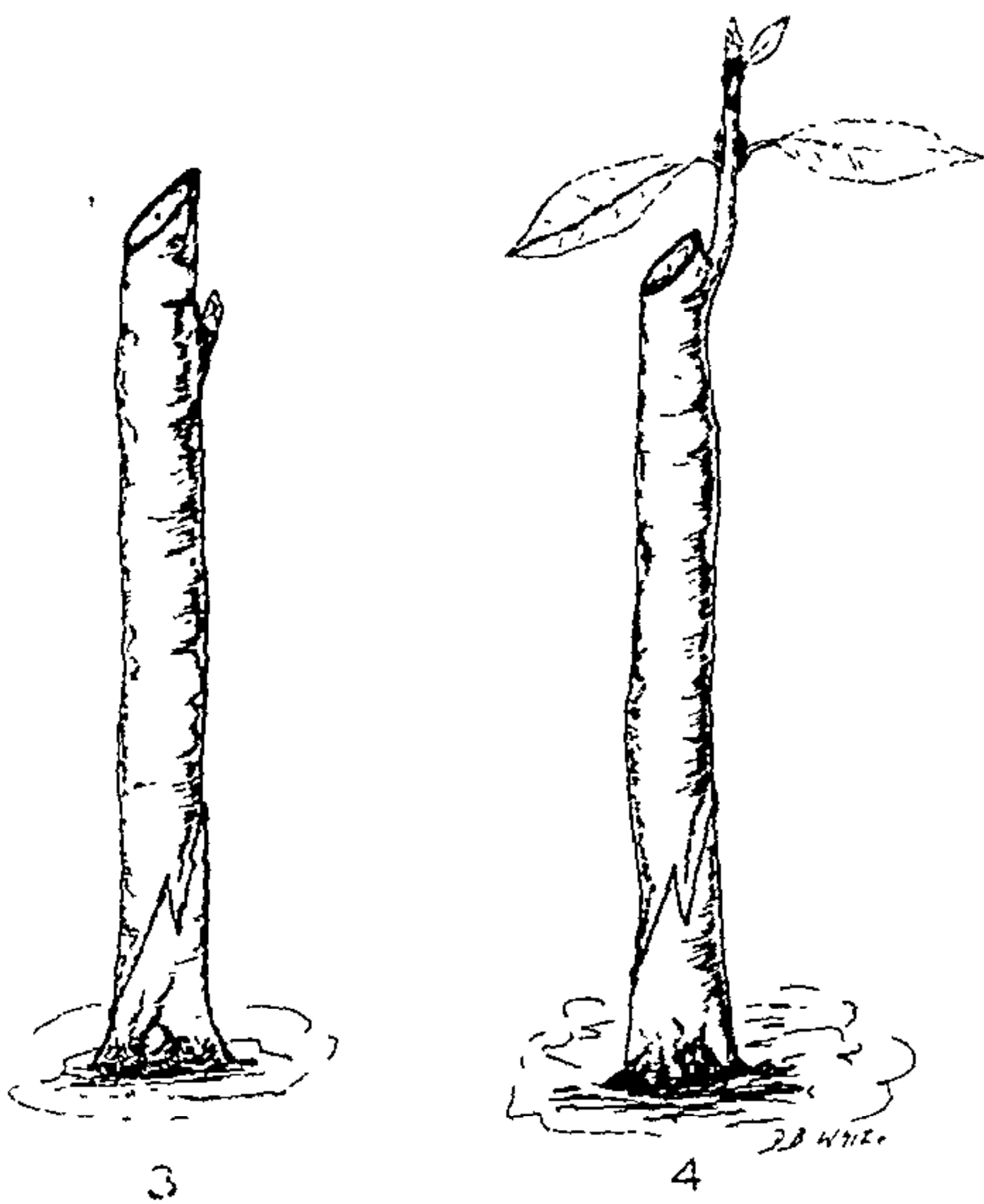
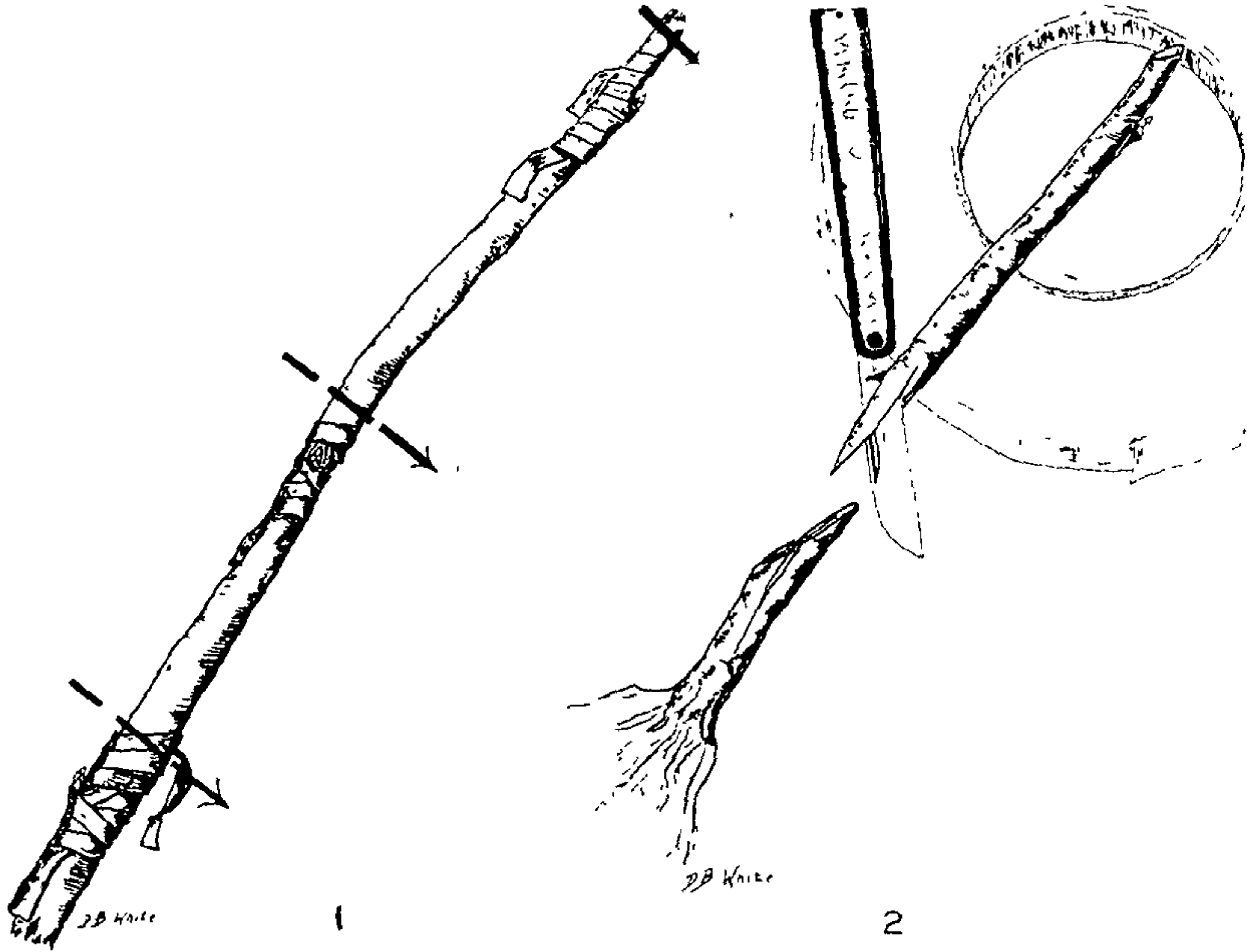
Winter 59-60    bench graft the variety to the interstem and  
the rootstock simultaneously in the winter and  
plant the double graft in the spring.  
Growing seasons required to produce  
a one year whip    ---    ---    ---    ---    ---    1

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The shortest time lapse, as well as the highest percentage of failure are realized by employing the latter method (Schedule C).

Considerable saving in time, money, and overhead would be realized if one growing season could be eliminated from the schedules commonly employed, provided stands were not reduced. With this in mind, an experiment was conducted at Iowa State University to ascertain the practicability of producing interstem dwarfs by a method we term the "tenant graft." The "tenant graft" is so named because the interstem piece to be grafted on the rootstock has a varietal bud already healed in place as a "tenant," so to speak, at the time of grafting.

The process utilizes a manufactured bud stick, (2) which is made by inserting buds of the variety up and around the limbs of the interstem stock in a spiral, at intervals of approximately seven inches. These



1. Manufactured bud stick (Variety on stock).
2. Whip and Tongue Tenant graft.
3. Tenant graft after planting.
4. Tenant graft after bud break.

buds are best held in place by a "Speed Easy" type bud tie. Thus each branch of the interstem stock, growing in a scion orchard, is made into a bud stick of the desired variety.

The following winter, these manufactured bud sticks are cut into sections, each section having one bud of the variety about one inch below the apex of the section and approximately six inches of the interstem below the bud. These "tenant" scions are then bench grafted onto hardy rootstocks, callused and held in storage for spring planting.

A sample schedule is as follows:

Summer, 1959	place variety buds on branches of interstem stock in the stool block (scion orchard)
Winter, 1959	tenant graft (scion with bud tenant) to rootstock
Spring, 1960	plant grafts
Summer, 1960	variety buds grow (this is the first growing season in the field)
Fall, 1960	dig one year whips
Growing seasons required to produce a one year whip	----- 1

This procedure requires that a scion block of the interstem stock be maintained in a manner which ensures the production of vigorous growth onto which the buds may be placed every year. Both the space and field requirements will be much less than needed for the present methods of propagation. The "tenant" method also takes one less growing season in the field for the production of one year whips or two year cut backs.

Table 1. Influence of tenant grafting on field survival of apple trees

Number of tenant scions	%take	Final field survival % (buds and grafts)
52	90.4	80.8*

\* Average height at end of one growing season was 16½ inches

The use of this method need not be restricted to the propagation of apples, for it should do well wherever interstem grafts are employed, whether to dwarf a plant or overcome an incompatibility between stock and scion.

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#### ACKNOWLEDGEMENT

Interstate Nurseries, Hamburg, Iowa. For furnishing the material for this experiment.

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MODERATOR BLAUW: We next have Mr. Nordine who will discuss the budding of hawthorns.

PRESIDENT ROY M NORDINE: I happen to be one of those individuals who came to the convention with certain ideas and certain techniques and found out I wasn't quite one hundred per cent right.

I will read what I have written and then I will comment.

President Nordine read his paper on "Budding Hawthorns." (Applause)

### BUDDING HAWTHORNS

ROY M. NORDINE

*Morton Arboretum*

*Lisle, Illinois*

The questionnaire inviting this topic asked for the "Propagation of Hawthorns." Because of the slow growth resulting from any method of grafting and the failures of cuttings we have selected the only profitable method.

*Crataegus phaenopyrum*, previously called *C. cordata* or Washington Hawthorn is used for the understock. This species provides a good root system, it transplants easily, and the bark peels well over a long period of time. Seedlings are easily raised from fresh, clean fall sown seeds that have not been allowed to dry too much. Dry seeds may become dormant and require stratification for a year.

Seedlings can be lined out in the early spring and budded during August or the first half of September. Hawthorns vary a great deal in the size and shape of the buds making peeled buds difficult to fit and tie. Therefore, all buds are cut out with a sliver of wood attached to the bud, some refer to this as a wood bud. Buds are tied with a rubber band and waxed with paraffin and covered with soil. In the following early spring the understock is cut off about six inches above the bud. This stub is used to provide the growing bud with its only tie during its growth. This stub can be cut off during the fall or winter.

Several native and exotic species and numerous varieties have been budded and all produce excellent results. I can't recall a case of incompatibility.

During the first year whips of three to four feet or more are average growth. In the second year whips and branched plants of four to six feet are produced.

I wish to quote from a letter from Wayne McGill of A. McGill and Son, Fairview, Oregon.

"We note your inquiry regarding the understock used for propagation of Paul's Scarlet Thorn and are glad to advise you that we have always used the *Crataegus oxycantha* and find it very satisfactory, as of course, Paul's Scarlet Thorn is a variety of *C. oxycantha*. However, one year we were unable to secure all the *Crataegus oxycantha* that we desired and substituted *Crataegus cordata* and the trees are being dug this year as two year olds. We might say that our experience was quite