

PROPAGATION OF TROPICAL FRUIT TREES AND OTHER PLANTS

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Propagation of Tropical Fruit Trees and Other Plants by George W. Oliver

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GEORGE W. OLIVER

**PROPAGATION OF
TROPICAL FRUIT TREES
AND OTHER PLANTS**

S. J. Smith

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF PLANT INDUSTRY—BULLETIN NO. 46.

B. T. GALLOWAY, *Chief of Bureau.*

THE PROPAGATION OF TROPICAL FRUIT
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BY

GEORGE W. OLIVER, EXPERT.

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BULLETINS OF THE BUREAU OF PLANT INDUSTRY.

The Bureau of Plant Industry, which was organized July 1, 1901, includes Vegetable Pathological and Physiological Investigations, Botanical Investigations and Experiments, Grass and Forage Plant Investigations, Pomological Investigations, and Experimental Gardens and Grounds, all of which were formerly separate Divisions, and also Seed and Plant Introduction and Distribution, the Arlington Experimental Farm, Tea Culture Investigations, and Domestic Sugar Investigations.

Beginning with the date of organization of the Bureau, the several series of Bulletins of the various Divisions were discontinued, and all are now published as one series of the Bureau. A list of the Bulletins issued in the present series follows.

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[Continued on p. 3 of cover.]

CONTENTS.

	Page
Introduction	7
The Mango:	
Prospects as a fruit tree.....	8
Propagation in India.....	9
Propagating tests at the Department.....	9
Best age for wood.....	10
Thick bark of mango as an obstacle in budding.....	10
Knife for budding the mango.....	10
Methods which show best results.....	11
Applying the buds.....	11
When to bud.....	12
Selection of budding material.....	12
A second method of attaching the bud.....	13
Raising seedling stocks.....	13
Transplanting young seedlings.....	14
Importing mango scions.....	14
The Loquat:	
Regions where the loquat may be grown.....	15
Raising seedling stocks.....	16
The Fig:	
Cuttings.....	17
Grafting and budding.....	18
Tea:	
Necessity for vegetative propagation.....	19
Veneer grafting.....	20
Herbaceous grafting.....	21
Propagating house.....	21
Cuttings.....	22
Manila Hemp:	
Importance of introduction into the United States.....	23
Raising plants from seeds.....	24
Cultivation in the Philippine Islands.....	25
Description of plates.....	28

ILLUSTRATIONS.

	Page.
Plate I. Fig. 1.—Indian method of inarching branch of improved variety of mango, using two stocks. Fig. 2.—Saddle method of inarching mango used in India. Fig. 3.—Mango plants from India, showing condition on arrival in the United States. Frontispiece.	
II. Fig. 1.—Rectangular patch method of budding the mango. Fig. 2.—Method of budding the mango used in Florida. Fig. 3.—Budded mango seedling, showing first and second growths from inserted bud.	28
III. Germination of mango, showing eight plantlets springing from one seed	28
IV. Fig. 1.—Crown grafting the loquat, showing a bad union. Fig. 2.—A 3-year-old loquat stock, budded two years. Fig. 3.—Side grafting the loquat on 6-months-old seedlings; A, scion inserted; B, scion inserted, tied, and waxed; C, scion united and growing and stock cut back	28
V. Scion budding the fig	28
VI. Veneer grafting the tea	28
VII. The propagation of tea by cuttings. Fig. 1.—Tea cuttings ready to be placed in sand. Fig. 2.—Tea cuttings ready to be placed in soil.	28
VIII. Manila hemp. Six-weeks-old seedlings	28

THE PROPAGATION OF TROPICAL FRUIT TREES AND OTHER PLANTS.

INTRODUCTION.

The purpose of this bulletin is to furnish short notes dealing with the most feasible methods of propagating such tropical and subtropical fruit trees and other economic plants as have thus far received little or no attention in the United States and its near-by tropical possessions.

Considerable progress has already been made in introducing new and improved varieties of the fruits mentioned here, and experiments are being carried on with a view to simplifying the old methods of increasing the supply of these plants.

The seeds of many varieties of trees and other plants have been sown to produce fruiting specimens, notably the mango and the loquat. The result of this method of propagation has almost invariably been only a partial success with most of the subjects and wholly unsatisfactory with others.

Where seeds of any desirable fruit trees are available, they should, of course, be sown and the seedlings planted out in permanent locations when large enough; but these seedlings should only be used as stocks on which to bud or graft varieties of known value. In few cases can seedlings be depended upon for the production of fruit; the product is almost certain to be of inferior quality. Even if the parent tree be of a superior variety, seedlings are likely to revert to the original species. Therefore, as the seedlings of tropical fruits are as a rule of healthy and vigorous growth, their best use will be to supply a good foundation on which to work scions from good trees.

Other economic plants, such as tea and Manila hemp, have also been found to yield better products when propagated vegetatively than when grown from seeds. The hemp plant belongs to a division of the vegetable kingdom the members of which do not readily lend themselves to either budding or grafting, but it can be propagated quickly by other means of vegetative reproduction. The tea plant may also be multiplied vegetatively without resorting to budding or grafting.

As the propagation of most of the trees and plants dealt with in

this paper can be accomplished by the use of but few of the methods of budding and grafting, only those methods which it is necessary to employ will be described in detail.

THE MANGO.

PROSPECTS AS A FRUIT TREE.

The Department of Agriculture is constantly in receipt of letters from present or prospective growers of the mango in the subtropical regions of the United States and its tropical possessions, asking for instructions as to the best method of propagating the finer varieties of the mango. Like most other fruit trees, it has been found that even when the seeds of good varieties are planted the fruit of the resulting seedlings is almost invariably inferior to that of the parent.

The mango will undoubtedly grow in popular favor. At present, unfortunately, it is suffering from a bad reputation, owing to the fact that the fruits which have been placed before the public in recent years have been grown mainly from seedling trees that are only fit to be used as stocks or wind-breaks. They are in fact wild or jungle mangoes and bear the same relation to the improved forms that the crab apple does to the Baldwin or Ben Davis apple. The prejudice which exists against them will, it is believed, disappear when the finer varieties become known. This will not be in a year or two, because there are comparatively few plants in the country which are worthy of growing, and so far as the writer is aware the fruit of only one of them has found its way North.

A short cut to success in raising a large number of trees of any approved variety is found in budding, or transferring a single bud, with a good-sized piece of bark attached, from a good variety to the stem or branch of a healthy stock plant raised from seed. In this way, from the growth made by the bud, exactly the same fruit is obtained as that produced by the tree from which the bud was taken. The stock on which the bud is inserted may be dwarf or tall; it may be vigorous or otherwise, and to the extent that these peculiarities occur in the stock it will, in a large measure, transmit similar peculiarities to the growth of the scion. But if the fruit of the stock should be of a fibrous nature and of an undesirable flavor, these characteristics exercise no influence whatever upon the fruit of the scion. Therefore nothing is gained by propagation from seed beyond perhaps the raising of new forms arising from artificially pollinated flowers or otherwise.

There is every probability that the finer varieties of Asiatic origin will soon be grown in the South much more extensively than heretofore. Not only has the Department of Agriculture had its agents on the lookout for improved varieties in India and elsewhere, resulting

in several consignments to the Department greenhouses of many kinds reputed to be of great value, but a few private growers have also been importing some varieties which are highly praised. The acquisition by the United States of tropical possessions will render the cultivation of the mango of greater importance than ever. The fruit can not be imported from the Philippines, but it will be an easy matter to import young plants of the best of the many varieties growing there. In Porto Rico the tree thrives very luxuriantly and the fruit grown there can be landed in New York within five days; but there is a large tract of land in southern Florida where the mango thrives to perfection, and when once the growers become acquainted with the best methods of propagation, so that only the finest kinds shall be grown, the establishment of a large and profitable industry may be expected, for it is reasonably certain that the demand for mangoes of good variety will always keep pace with the supply.

PROPAGATION IN INDIA.

In India, the home of mango growing, propagation is effected by very crude methods, grafting by approach being the principal one. The union is made in several ways. Sometimes two stocks are planted close enough together so that a union may be secured on both with a single branch of a desirable variety. The method is shown in Plate I, figs. 1 and 3. Another method, shown in Plate I, fig. 2, consists in preparing the stock as in saddle grafting; an incision is then made in the thick part of a branch of the variety to be propagated, and this is fitted over the wedge-shaped top of the stock. The percentage of successful unions by these devices is said to be sometimes quite high compared with more rational methods, but the unions are never as satisfactory as could be desired. The young trees have to be supported by tying them to stout sticks, as there is danger of their being snapped off at the union by windstorms.

Grafting by approach or inarching has hitherto been the principal method of grafting in Florida and elsewhere in America, but for the reasons indicated above very little progress has been made in increasing the supply of first-class varieties.

PROPAGATING TESTS AT THE DEPARTMENT.

Numerous budding and grafting tests have been conducted in the greenhouses of the Department of Agriculture, beginning in the latter part of 1901 and continuing through the following summer. The trials were not as extensive as could be wished, owing to lack of good material. In spite of this drawback the results were not without value, and it is doubtful whether they would have been different had the trials been on a much larger scale. The experiments were