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CLEFT GRAFTING

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CLEFT GRAFTING

BY

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PREFACE

“Come, let us plant the apple tree.
Cleave the tough greensward with the spade;
Wide let its hollow bed be made;
There gently lay the roots, and there
Sift the dark mold with kindly care,
And press it o’er them tenderly.”

THE apple is one of our oldest and best fruits. It is mentioned in the Bible, and by Herodotus and Pliny, and other ancient writers. Whatever be its parent country, it was doubtless of eastern origin. Many varieties were cultivated about Rome, and they usually bore the names of those who originated or grafted them. Probably the Romans introduced the apple into England as well as the year, but the early chronicles are silent as to its subsequent history in that country until after the establishment of Christianity, when the monks and heads of religious houses planted orchards, and

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henceforth the fruit became common. The early settlers of America brought apple trees over with them, and an island in Boston harbor where they were first planted still bears their name. The Indians helped to spread the fruit through the country, and Indian orchards were common throughout New England. The first nurseries in the Ohio Valley were planted by John Chapman, familiarly known as "Johnny Appleseed," who spent several years of his life in that business.

New and choice varieties of apples are obtained by planting the seed, and only about one in 10,000 of the resulting trees will prove better than the original; hence when a desirable kind is once obtained it can be continued or reproduced by grafting. The apple tree is slow in growth, and its fruitage can be obtained much quicker by grafting than in any other way, as the grafting of new and

PREFACE.

vigorous stock on the parent tree seems to impart new vigor and vitality.

The apple has now become of great commercial importance. Its juice and pulp are known to be healthy and nutritious, and the constantly increasing demand and high prices paid for choice varieties have stimulated fruit-raisers to bestow more care and attention on their orchards than formerly. Science and experience have taught the fruit grower that he cannot any more expect to gather fine fruit from old, stunted and worthless trees than he can expect to gather grapes from thorns or figs from thistles.

As the author resides in a fruit growing district and shares in the common interest felt in fruit growing, and believing that cleft grafting is the surest and most expeditious way of producing good fruit, he has thought that that branch of the subject, if clearly explained and illustrated, might be of practical benefit to

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fruit growers. This consideration has induced him to embody the results of his observation and experience in this little book, which is now submitted for their perusal. If it shall contribute in any way to promote its object the purpose of the author will be fully attained.

CHARLES O. COUTS.

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Preliminary Remarks.

NOTHING is as valuable as practical experience, but a man cannot afford to spend his life in making experiments that other men have made before him and the results of which he should know. The propagation of fruit is its reproduction by natural or artificial means.

A knowledge of these means is of great importance to agriculturists of all classes, and especially to those engaged in the raising of different fruits.

There are, for instance, so many benefits to be gained by the local production of nursery stock that fruit growers cannot afford to neglect this art.

Scions from trees thoroughly acclimated can be obtained; the young stock will not be forced to suffer the shock of a long transportation and a change of climate, and the orchardist can have his trees grown from scions of his favorite trees.

CLEFT GRAFTING.

Cleft-grafting is such a simple process when one understands it that it is strange why more of the seedling trees and undesirable varieties are not changed to profitable ones.

Often the natural growing trees of a locality can be utilized for that purpose.

For example, the best plum trees for certain localities are obtained by top-working the common wild plum. And the native chestnuts make the best stocks upon which to graft such improved varieties as Paragon or Humbo.

Slender growing varieties of apples, such as Wealthy, Oldenburg, Gill or Esopus, make a more vigorous growth when top-worked upon some more growthy varieties.

If the grafting is properly done the cambium cells, or callus spreads outward and covers the wound, making a firm union.

Uses and Objects of Grafting.

GRAFTING serves a variety of purposes, among which are:

To change the size of trees, to make them more dwarf.

To restore lost or defective branches.

To save girdled trees.

To change an undesirable or unknown variety into one or more desirable ones.

To preserve and multiply varieties that cannot be preserved or multiplied by growing them from their seeds.

To hasten the flowering or fruiting of seedlings grown with a view to improving varieties; in this way new varieties may be developed.

To avoid insect injury to the trunk or roots, as in grafting the peach on the plum, or the European grape on the American.

Wild grape vines may be grafted by sawing off the stock near the ground and inserting scions in the cleft.

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Wet clay should be banked over end of stock after it is waxed.

Our improved varieties make a very heavy growth if grafted on a strong root.

This applies to most varieties of fruit. If they are seedlings we are uncertain what kind of trees we shall have.

For this reason grafting is often resorted to as more expedient in changing to a desirable variety than growing new trees.

Very often there are desirable varieties of fruit in localities, which we are unable to obtain from nurseries, hence we must resort to grafting to preserve them.

Some varieties will not do well on their own roots in certain soils.

They may not be adapted to the soil; this may be overcome by grafting them upon the kind which does well in that region.

Have not many trees which have been purchased of nurseries proved to be un-

USES AND OBJECTS OF GRAFTING.

profitable, either from not being adapted to the locality, or by not being true to name? Why not graft them with fruit of your own choice, from your own or your neighbor's orchard? The task is neither difficult nor requires much time.

If you depend on some one to do your grafting you may not get it done at the best time or in the best way. You can do it while you wait.

A top-grafted tree will bear in three or four years, if thrifty, and three or more inches in diameter at but when grafted.

There are few orchards that have not a number of such trees which should be grafted.

Top-working undesirable trees with a good variety is a paying investment.

Kinds of Cleft Grafting.

THERE are four different methods of cleft-grafting, according to the position of the scions on the tree, to-wit:

First. If on the root, it is called root-grafting.

Second. At the surface of the ground, crown-grafting.

Third. On the stem, the scions may be set anywhere along the stem and it is stem-grafting.

Fourth. In the top or branches of the tree, top-grafting.

Double Grafting.

Double-grafting is grafting upon a grafted tree and is used to secure a top which will not unite with the root, which some other variety will.

Double-grafting may also be used to secure some characteristic of root trunk or framework.

Plants That Unite by Grafting.

NOT all fruits can be intergrafted. There must be a relation between stock and scion.

In general plants of the same species but of different varieties may be intergrafted, as any variety of apple, plum or pear, upon another. (Which is most commonly practiced.)

Plants of the same genus but of different species will almost always unite also.

The apple, pear and quince, or the cherry, plum and peach may be intergrafted.

And sometimes plants of different genera may be grafted together, as apples or pears on thorns, or oak on chestnut; also occasionally plants of different families are made to unite.

The apparent resemblance of two plants of different species is not always evidence that they will unite.

CLEFT GRAFTING.

Many plants unite freely when grafted in one direction, that fail to unite when worked in the opposite direction.

The only certain way to determine what plants will unite is by careful trials.

Cleft Grafting.

THE following explanation of grafting is intended to aid the amateur rather than the expert.

The limb to be grafted is sawed off squarely and split in the center (care should be taken that the bark be not loosened from any portion of the stock when sawing it off), the cleft being made two or three inches long, according to the size of the stock and scions.

This is best made with the knife shown (see cut, page 21), specially made for this purpose.

No mallet is needed; the cleft can be easily made with the knife (see cut, page 23). The wedge, which is on the end of the stem, can be inserted in the center of the cleft to hold it open (see cut, page 25).

Cut the scions with two buds on each, and cut their bases to a sharp, even wedge, slightly thicker at the outside

CLEFT GRAFTING.

(see cut, page 27, Fig. 1). (Fig. 2 is inside of scion.) It is a good plan to cut the scions so that the lowest bud will come just at the top of this wedge, in order that it be near the top of the stock.

This wedge should be at least an inch long; now insert in the cleft (see cut, page 29), so that the thick side of the wedge is to the outside and that it sets just a trifle within the cleft, as the bark is thickest on the stock, and this will bring the cambium layers in contact, which is the particular part of grafting. The sap of the scion and stock must be put together. See that all the cut surface of the scions is within the cleft.

Carefully remove the wedge; the spring of the stock will hold the scions firmly in place (see cut, page 31). Wax the end of the stock carefully about the base of the scions and down the edges of the cleft, covering all cut surfaces (see cut, page 33).

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If the tree is too large to graft when standing on the ground, get in the top and go out on the limbs where they are about one or one and a half inches in diameter and saw them off.

About half of the top should be grafted.

The more or less horizontal branches should generally be selected for grafting.

Choose the smoothest limbs, omitting the less thrifty inside branches, and being careful to leave enough limbs to keep up the growth of the tree.

When the limbs to be grafted are sawed off, a number of scions may then be trimmed ready for use.

Commence setting scions in the top to avoid displacing them.

As growth starts, sucker sprouts from the stock must be lopped off at intervals during the summer to throw growth into scions.

Each spring following, cut thrifty

CLEFT GRAFTING.

growing scions back about half way, for two or more years.

The spring following the grafting, all of the branches left on the tree when grafted should be sawed off, to encourage growth of the scions.

But if the tree is large and a vigorous variety, it is wise to leave a part of these branches until the second spring.

With a little practice any one can learn how to proceed for the best results.

A man must use his own judgment to suit each case, from his general knowledge of tree growth.

If both the scions in a branch or stock grow, the weaker one should be sawed off later, when the stock is healed over.

An eighteen-inch pruning saw should be used for sawing off the stock or limbs which are to be grafted. (See cut, page 35.)

GRAFTING KNIFE (PATENTED)

MAKING THE CLEFT.

WEDGE INSERTED IN CLEFT.

SCIONS.

SCIONS INSERTED IN CLEFT.

STOCK HOLDING SCIONS IN PLACE.

STOCK WAXED.

PRUNING SAW.

When to Graft.

THE grafting of plum, cherry, pear, apple and similar trees, can be done successfully any time from March until June, but during warm days in April when the buds begin to swell is preferable.

It is usually most successful when performed just before or during the resumption of active growth in spring.

This occurs early in the plum and cherry and later in the pear and apple.

The operation depends upon the fact that two live portions of cambium from trees closely related will unite when placed in intimate relation with each other, and the shoot growing from the scion thus inserted is of the same kind as the tree from which the scion was taken.

Trees should be grafted as soon as they are known to be not what is wanted.

Small trees from two to four inches in diameter at but are much easier grafted than larger ones, and usually give better results.

When to Cut Scions.

SCIONS are usually cut in February or March, during mild weather when they are not frozen; they should be labeled and stored away until needed for use, in a cool cellar, packed in moist sawdust, moss or leaves.

It will do in some seasons as late as the middle of April, any time before the buds swell much.

Some prefer cutting them in the fall, after the leaves have fallen, but before severe freezing begins.

They should not be left so moist as to cause swelling of the buds or the formation of callus, nor so dry as to cause shriveling.

They should be taken from trees of known good qualities; some bear better fruit than others of the same variety, and by grafting from these peculiar trees we may greatly improve well known varieties.

WHEN TO CUT SCIONS.

Thrifty growths of the previous year should be cut, as shown by the color of the bark, and the last ring denoting the position of last year's bud scales. Avoid water sprouts and weak growths in selecting scions.

It is best to take them from the top of the tree, taking only the largest shoots and discarding the tops of these.

Grafting Wax.

THIS wax is prepared as follows:
Take seven parts rosin, by weight;
five parts yellow beeswax, by weight;
three parts tallow, by weight. Put rosin
and beeswax in a vessel with some water,
and boil slowly until all is melted. Then
add the tallow and continue to boil slowly
until it foams and begins to raise in
the vessel (stirring all the time), then
pour into a vessel of cold water, and in
a few moments it can be thoroughly
worked with the hands by greasing them
with a little tallow.

Some prefer getting leaf tallow and
rendering it themselves to have it fresh.

If a harder wax is wanted use

Ten parts rosin..... 8

Five parts beeswax.... 4

Two parts tallow..... 2

Caution—Be careful not to allow it to
boil over as it is very inflammable.

Home Grown Apple Seedlings.

IF you wish to grow apple seedlings, get pomace from the cider mill when it comes from the press. If it heats the seeds will not grow. Open trenches in well prepared soil with a shovel plow about three feet apart. Scatter the pomace thickly in the rows and cover very lightly, or take fresh pomace, preferably of Philip Sweet or Northern Spy apples, they being the most thrifty. Wash the seeds free and put them in an earthen jar and set in cellar, taking care to keep them moist and not to allow them to become dry or to mold. By early garden making time sow in rows convenient for cultivation.

Orchard Suggestions.

THE apple is the leading money-making orchard crop of America, the fruit of fruits.

There is never an over-supply of good apples. The over-supply is of poor fruit.

It generally takes a young apple orchard from six to twelve years, according to variety, before profitable returns can be obtained, but when once bearing it will bring good returns for many years.

Select the best paying varieties and not have too many kinds.

There are hundreds of varieties of apples.

You can have varieties that ripen continuously, from the earliest to the latest.

One of the most important features in starting a first-class apple orchard is to select the varieties best suited to your locality.

It is not advisable to plant a solid block

ORCHARD SUGGESTIONS.

of one variety; some varieties are self-fertile and will give satisfactory results if planted alone; but it is safer to provide for cross-fertilization by planting at least every third or fourth row with a different variety.

The fruit grower or general farmer usually buys his stock from a nursery already grafted, but many fruit growers claim that in planting an apple orchard much better results may be obtained by setting out good, thrifty trees and top-working them, than by planting the desired varieties as they come from the nursery. There are several reasons for this. One is that some varieties are made more hardy. Some kinds, for instance, are subject to a disease which attacks the trees near the roots and kills them. By grafting such a variety on vigorous, hardy stock a strong body is secured which is immune to the disease. Much longer lived trees are thus obtained.

Another advantage is that we get trees that are earlier in coming into bearing than by taking them as they come from the nursery.

Some trees commence bearing at an earlier age than others of the same variety; some have fruit of a better quality; some are more vigorous than others, and more symmetrical in form.

By taking scions from a tree possessing the most perfect qualities in all of these particulars, and working them onto stock that is hardy and vigorous, we are combining the most essential characteristics and are certain to secure the most desirable trees obtainable.

In working over trees in large quantities, as nurserymen do, it is hardly feasible for them to select all of their scions with the necessary care and discrimination, and were one of them to undertake to do this he would necessarily be obliged to demand a higher price for his trees,

ORCHARD SUGGESTIONS.

and then the fellow who sold his trees at the lowest price would capture the sales regardless of quality or pedigree.

Farmers should give more attention to the planting and care of their orchards. No fruit known can take the place of the apple as a food product.

In its numerous varieties, its seasons of maturity extend throughout the year.

As a culinary fruit few equals and none excels it.

The apple is the finest and most useful fruit grown and deserves and will well repay all the care given it.

Pruning.

PRUNING should be done toward the end of the dormant period, in early spring, because healing is most rapid at the beginning of the growing season.

The wounds dry and check when the pruning is done before severe freezing is over, and pruning when the leaves are on, or when the trees are in bloom, will induce fruitfulness for the present year at the expense of the tree. Either extreme is robbing the tree of much vitality, except when rejuvenating old orchards.

Before commencing to prune a tree an experienced pruner will look it over and adapt his methods to the needs of that particular tree and decide what treatment it needs.

We should get it fixed in our minds why we prune. We prune to modify the vigor of the plant, to produce larger and

better fruit, to train the tree to some desired form.

The habit of the tree must be taken into consideration when pruning, and such pruning given as will retain the natural habit of the tree and remedy its defects.

If heavy pruning is practiced at long intervals, the balance between root and top is disturbed, the roots supplying more food than the top can utilize, hence water sprouts are formed. Light pruning every year does not do this.

The annual trimming of fruit trees will stimulate the growth of fruit spurs and off trees can be made to bear more regularly.

Trees expected to support heavy crops of fruit or to endure high winds, should have branches developed with special reference to strength. Several small branches are better able to endure the strain than a few large ones.

CLEFT GRAFTING.

Heading-in or cutting-back induces fruitfulness by checking long growth and causing the formation of short lateral fruit-bearing branches.

The greatest mistake in pruning is usually made in cutting off the branch. It is invariably cut too far from its origin. The cut should be made as close as possible to the trunk of the tree.

A wound at this point will be larger, but will heal over sooner; food in passing the cambium layer is constantly passing the wound and pushes out callus over it.

All limbs cut off that are two inches or more in diameter should be painted with white lead and oil, about twice the consistency of house paint.

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