Among the Orchards of the Northwest

This is the first of two articles by O. M. Morris, horticulturist, and C. B. Sprague, assistant horticulturist, of the state agricultural experiment station at Pullman, Wash., concerning top-grafting of fruit trees. Those who desire to change established varieties of trees to another variety will find this article well worth their while.

TOP Grafting and Top Working are terms used to designate the process of grafting in the tops of trees that are well established, vigorous and hardy ing that is done in the top of the tree for the purpose of changing the top of the tree over to another or other varieties. The work may be done by budding in the summer or by using scions carrying several buds set by grafting in the late winter or early spring. The need for this work arises from the fact that there are now many fruit trees that arewell established, vigorous and hardy, but are not producing profitable crops of fruit. Many of these trees can be grafted over to more profitable varieties. This work is not done for the purpose of improving the scion variety, but for the purpose of using the root system and trunk that has grown as a short cut to the fruiting of another variety. It is sometimes used as a short-cut method of growing to the fruiting stage several new or untried varieties on a few trunks and limited land areas. In this way it is a cheap method of testing varieties.

The top grafting of trees that are of fruiting size can often be used very profitably. If the work is properly done the new top will begin to fruit in three or four years and in some cases even earlier. When fruit production is re-

Fig. 1.—Stub to be grafted, being split with a cleft-grafting knife.

established it is in a tree much older and larger than would be possible to have if the old tree had been taken out and a young tree planted in its place. When the profitable and unprofitable trees are known and the unprofitable trees are of fruiting age and are strong, hardy, and well formed, top grafting can frequently be used as the best and cheapest way out of a bad situation. In very special cases trees of exceptional vigor and hardiness may be planted and grown for a few years for the purpose of forming good trunks and framework, on which more tender varieteies are to be worked.

Scion Wood.

Large open spaces in tree tops can often be filled in by top working. There are many other ways in which this can be used to advantage. It should not be used except in rare cases as a primary or principal practice, but as an aid or make-shift. It is seldom advisable to top-work trees that have been planted only two or three years. If young trees are undesirable it is better to take them out and plant again. Old trees that have passed far into decline are seldom worth this attention.

The scion wood for top grafting should be gathered from trees of the desired vigor and fruiting habit. Strong, well-ripened wood of the last season's growth is best. It should be cut from the trees several days or even months before it is to be used and stored in moist sand or earth in a cool place where it will remain dormant. It is advisable to cut this material before pruning is done so that better wood can be selected without injury to the parent tree. The scions can be cut from the parent tree and set as grafts the same day with good results, if the work is done in the spring after the buds begin to swell but before any are open. This is the best time for doing the work, but it can be done a little earlier or a little later with good results. Wood larger than three-eights of an inch in diameter or less than three-sixteenths of an inch is objectionable. The larger wood will not work well and the smaller wood is often not well matured and is not as vigorous as it is desirable. The central section of the twig usually makes the best scions, although the very tip may be used if well matured and plump.

Cleft Grafting.

The cleft graft is the most common form used. The tools needed for this work are a sharp, fine-toothed pruning saw, a sharp, thin-bladed knife with a straight edge, a cleft grafting knife or tool, and a short club or mallet. A good pockete knife can be used quite satisfactorily for cutting and shaping the scions. The best form of cleft grafting knife or tool is one similar to that shown in Fig. 1, which was made by a blacksmith from a piece of steel. The concave edge of the tool will not loosen the bark from the wood in splitting the stub as a straight edged tool will do. The best form of mallet consists of a piece of green apple branch about two inches in diameter and fifteen inches long swung over the wrist by a loop of soft cord or strap.

The scions should be set in stubs not more than two and one-half inches in diameter. It is seldom advisable to use stubs less than one inch in diameter. The stubs selected for grafting should be well distributed through the tree top. It is not a good practice to cut the top form the framework and graft into back to the three or four large limbs that form the frame work and graft into these. It is usually the best plan to graft not more than one-half of the top at one time. If one-half is grafted one spring the other half can be worked over the next spring. Many successful men find it best in working over large trees to distribute the work over three seasons, grafting one-third of it each year. By following this plan the largest proportion of scions set will grow, the best form and vigor of the tree will be maintained and the earliest fruiting of the new wood secured.

Grafting Process Simple.

The process of grafting is very simple and can be done successfully by anyone after a little practice. The branch into which the scions are to be set is cut off leaving a stub three or more inches long. The grafting knife is placed across the stub and driven down with the mallet until the stub is split about three inches, as shown in Fig. 1, and then lifted out with a stroke from the mallet on point B. The tool is then reversed and the point A is driven into the slit as a wedge and holds the split open while the scions are placed as shown in Fig. 2. A blow on the knife at point C lifts out the tool and the split closes firmly on the scions and the graft is finished and ready to be waxed over.

The scions are cut about four or five inches long. The point placed in the split is cut in a wedge shape and is a little thicker on one side. The length of the side cut is about one and one-half inches. The thick side of the scion is placed out and the line between the bark and the wood brought in as direct contact as possible. If the top of the scion is pointed slightly out, the desired contact of the cambium layers will be insured, and the tissue unite in growth. It is a good plan to cut the scion so a bud will be at the point C, as shown in Figs. 3 and 4.

Fig. 2.—The grafted stub, showing the position of the grafting knife holding the split open while the scions are being set.

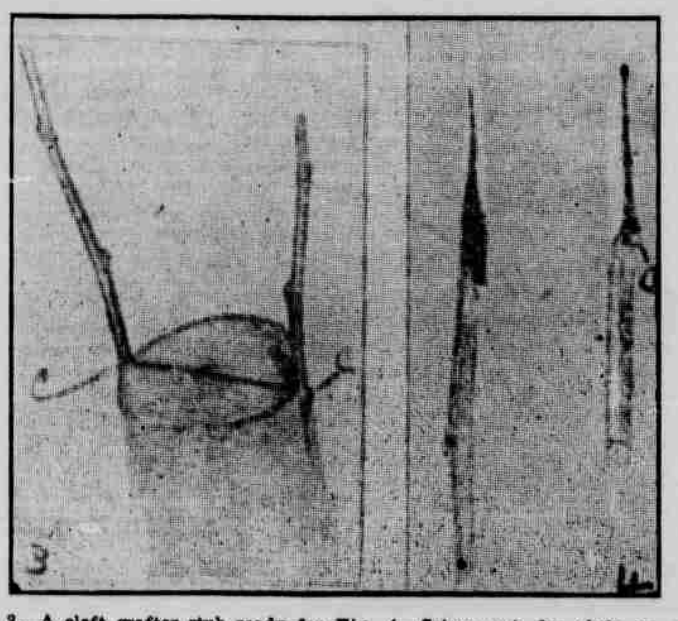

Fig. 3.—A cleft grafter stub ready for waxing.

Fig. 4.—Scious cut for cleft or saw kerfgrafting.

How To Plant Orchard Trees Told

Conclusion of Interesting Article by W. S. Thornber, Written for Newcomer to West.

In last week's issue we began an interesting article on this page by Mr. W. S. Thornber on the manner in which orchard trees should be planted. Owing to lack of space, the article was not concluded. Here are the final salient features in Mr. Thornber's remarks.

IF THE SOIL is moist enough and yet well drained, and well ripened nursery stock can be secured before cold weather sets in, fall planting is probably the best, but since our trees frequently continue to grow in the nursery until late in November it is almost impossible to get naturally ripened stock in time for fall planting. For this reason early spring planting is preferable. Secure the trees in the fall and carefully heal them in near to where they are to be planted so that during the first warm days of spring they can be properly planted.

Treatment of the Trees.

Just as soon as the trees are received from the nursery they should be well healed-in, in moist soil, even though they are to be planted within a few days. Do not stand the trees up in the original bunches and throw loose earth against them, but cut the bunches open, spread the trees thinly in trenches extending east and west that are deep enough and wide enough to hold the roots, and lean the tops toward the south at an angle of about 45 degrees. Thoroughly cover the roots, and from six to ten inches of the stems, tramp the earth firmly around the roots and the trees will not suffer. In healing-in large quantities use a series of short trenches, using the earth from one to cover the trees of the preceding row and let the tops overlap, all leaning in the same direction.

When ready to plant take the trees as needed from the pit and never permit the roots to become dry, and just before they are to be planted thoroughly prune the roots. All the ragged or bruised ends should be cut off with a sharp knife, making the cut in such a manner that the cut surface will rest on the bottom of the hole. Small or fibrous roots that may have become dry should be cut away as they will never be of further service to the tree. Trees with diseased roots should not be planted but relegated to the brush heap and burned.

Planting.

The hole must be deep enough to permit the setting of the tree from one to two inches deeper than it grew in the nursery, in order to allow for the settling of the soil and yet have the trees the same depth as they stood in the nursery. The roots should not be bent or crowded, but allowed plenty of room.

After placing the roots firmly on the bottom of the hole fill in with good, rich, loose soil until the roots are well covered and then tramp the soil just as firmly as it is possible. The dryer the soil the more firmly it should be packed. Trees should not be planted in very wet, sticky soil. Fill in with the remainder of the soil, until the hole is almost full and then tramp again; finally fill in the rest and leave the surface loose. In irrigated sections where the water is handy the firming may be done by running water into the hole after half or two-thirds of the soil has been loosely shoveled in.

Varieties.

The following list is made up from a large number of recommendations by growers in all parts of the state, based upon the general behavior of the variety in that particular section, and its color, quality and value for commercial purposes.

Western Washington.

(Winter)—Northern Spy, Olympia, Rhode Island Greening, Yellow Newtown, Yellow Bellflower. (Autumn)—King, Gravenstein. (Summer)—Yellow Transparent, Red June.

Inland Irrigated Valleys.

(Winter)—Winesap, Yellow Newtown, Jonathan, Spitzenberg, Rome Beauty, White Winter Pearmain, Delicious, Winter Banana. (Autumn)—Gravenstein, King. (Summer)—Yellow Transparent, Duchess, William's Favorite.

Inland Uplands.

(Winter)—Rome Beauty, Wagner, Jonathan, Gano, White Winter Pearmain, York Imperial. (Autumn)—King Duchess, Gravenstein, William's Favorite.

There are many other varieties that can be grown in all parts of the state, some of them equal to or even of better quality than those named, but they are as yet unknown to the market and for this reason are not safe to plant commercially.

Don't breed from birds with bad defects nor disqualifications. They will be repeated in the offspring and often be worse than in their ancestors.