Pruning citrus trees. 2. Pruning the mature tree

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2. PRUNING THE MATURE TREE

EXAMINATION of a mature tree in full production will show the natural pattern of growth already explained. It will be seen that over the years the frame has developed by a system of layers with new growth, stimulated by sunlight, constantly appearing on the top side of the older wood. Eventually the terminal portions of the older layers are weakened by lack of light, they become unproductive and in turn adversely affect the general fruitfulness of the rest of the tree by shading and crowding.

It is in the best interests of the tree to remove this wood at regular intervals of about three or four years.

The amount of pruning done at any one time is not great and, subject to existing crops, can be done at any convenient time of the year. If, on the other hand, pruning is neglected indefinitely the inner parts of the tree become filled with dead and wasted growth. Apart from being an unnecessary drain on the tree this interferes with harvesting, causes blemish on the fruit and is a harbour for scale insects and disease.

Pruning a tree like the one shown in Fig. 5 is best done with the operator working from inside the tree. Weak and unfruitful wood which is mostly covered by
succeeding growth cycles is more readily located from this position. On the sides of the tree shown in Fig. 6, pruning becomes a process of undercutting and removal of the old growth layers. With more light inside the tree new growth is stimulated and the fruiting fringe on the tree perimeter deepened.

On the tree-top growth is more active because this gets more sunlight. The leaf canopy is considerably deeper than on the sides, and the limbs tend to support each other in an erect position. The inclination for the branches to lie in layers is not so pronounced and the selection of the branches to be removed less obvious. The problem here is density of growth and the shading effect on lower parts of the tree. To overcome this some thinning of healthy material may be advisable; the objective is to promote a semi-shade condition without exposing any of the main limbs to direct sunlight.

The Lemon

Whilst the general attitude towards pruning citrus trees is to favour caution and moderation, a less conservative approach is recommended in handling the lemon. Other citrus varieties normally develop a satisfactory framework of limbs with little or no assistance from pruning.

Fig. 6.—Close up of fringe branches before and after thinning. Note that all the material removed came from the lower side of each branch. More sunlight will stimulate new growth from dormant buds on the upper side of these branches.

Fig. 7.—This comparatively small but importantly placed branch is sagging badly with the weight of fruit and new growth. To allow the base of this limb to strengthen before the position becomes worse the terminal growth should be shortened back to one of the strong laterals before the next crop.
However the vigorous growth of the Eureka and Lisbon lemon varieties often justifies some control by pruning. If this is not done from time to time the main limbs, because of the weight of fruit and foliage, are borne down until they rest on the ground or even break or split the tree at the crotch.

When a limb shows a tendency to sag it should be pruned. The overhang should be shortened by cutting back to a suitably placed upright shoot or a well developed bud on the upper side of the branch. Figure 7 is an example of a branch of a young Eureka lemon which is being pulled down by the weight of fruit and new foliage. Temporary relief will be gained when the fruit is removed but the new shoots, particularly two of them, are still growing strongly. If unchecked, these also will become pendulous and weigh the whole branch further towards the ground. With an eye to the future it would be better to cut off some of this growth and allow the parent limb to strengthen before becoming fully productive.

After the fruit has been removed this limb could be pruned back to the larger of the two strong erect shoots in the centre of the picture. Next season this shoot is likely to produce fruit on the tip and will start to bend over. However, what is important is that the older growth nearer to the main trunk has by this time become stronger and is now better able to sustain the whole limb.

Lemon trees allowed to grow unchecked will often grow too big for efficient management. Periodical pruning to keep the tree at a workable size also helps maintain good fruit size and quality. The best quality lemons come from young fruiting wood so old growth should not be allowed to accumulate. Always shorten back to a selected vertical or lateral shoot.

If strong water shoots develop in the top of the tree (Fig. 8)—and this may happen after a general pruning—some
check may be needed to stop this growth getting out of hand. Shortening back these shoots will only accentuate the condition. The shoots not needed should be completely removed, leaving the well placed weaker shoots in preference to the stronger ones.

The Mandarin

Mandarins have a more upright growth than oranges and in time the upper parts of the tree tend to become over-crowded and unthrifty. The removal of some of the lighter branches to give more light and growing space inside the tree helps keep the tree productive and maintain fruit size.

Some mandarins have the bad habit of setting more fruit than they can carry to maturity, causing distress and resulting in extensive defoliation and die-back of the fruiting twigs. If this happens pruning is necessary to remove injured wood. This condition known as scalding can be limited by moderate thinning of the fruiting wood and if necessary thinning of young fruit to more normal proportions.

Usually the lower branches of mandarins lose much of their vigour with age; pruning here should be restrained as the development of new wood to replace that cut away can be disappointing.

When for some reason severe pruning is decided on, heavy thinning is preferable to other means of reducing unwanted growth.

The Grapefruit

The same treatment as recommended for oranges can be applied to grapefruit until they are in full production. When fully grown the canopy is heavy and shaded and unlike oranges most of the fruit—and the best quality fruit—is produced inside the tree. A well shaded interior is natural to the grapefruit tree and though thinning is needed to remove dead and expended wood too much opening-up of the sides of the tree should be avoided. New growth inside the tree is best encouraged by allowing a little light to penetrate through the top branches. Heavy pruning for rejuvenation does not suit grapefruit and all other means of restoring health should be given a thorough trial before any heavy pruning is done.

REJUVENATION

Old orchards which have become unfruitful because of some abnormality or faulty management can often be brought back to health by pruning. In old orchards pruning should only be undertaken after the reasons for decline have been thoroughly investigated. Pruning alone without rectifying the underlying cause of ill-health may be followed by what seems to be a favourable response but often the recovery is not sustained and the tree reverts to its previous condition.

Generally the unthrifty appearance of the trees is a reflection of a damaged root system caused by excessive cultivation, poor drainage, malnutrition or disease. If the cause of the decline is known and successfully corrected then pruning can play a valuable part in hastening recovery. If heavy pruning is necessary it should first be borne in mind that old trees have lost much of their early vegetative vigour. If most of the larger limbs are destroyed they will not be fully replaced and the capacity of the tree to carry a full crop of fruit is impaired.

Depending on the condition of the tree it can be rejuvenated by moderate to heavy thinning of the canopy; this is the safest procedure as the main frame is not interfered with and the subsequent crop is not completely lost. A more extreme measure is skeletonising, as shown in Fig. 9. Here all the foliage is removed and branches headed back to stubs of a predetermined diameter, usually from \( \frac{1}{2} \) to \( \frac{3}{4} \) inches.

Either method preserves the original framework of the tree which should be kept because if this is lost it is unlikely to be readily replaced. Skeletonised trees will not produce again for at least two years.

Pollarding of the main limbs to rejuvenate an unthrifty tree has no place in citrus pruning and is a practice to be condemned.

Heavy pruning should be done in late winter or early spring, allowing new growth to be maintained uninterrupted over as long a growing period as possible. In areas subject to frost, pruning should be delayed until the frost danger to new shoots is past. Large limbs left exposed to direct sunlight are also liable to damage and
should be protected by a good cover of whitewash.

Fertiliser applications, particularly nitrogen, timed to precede rejuvenation work can also play a valuable part.

Lemons especially and also oranges can respond well to this type of pruning. Mandarins and grapefruit are more sensitive and cutting should be more restrained.

SKIRTING

Most of the common varieties of citrus have a shrub-like growth habit. They branch low and it is natural, as the tree grows, for some of the limbs and foliage to rest on the ground. In a hot summer climate such as ours in Western Australia a low canopy of leaves gives valuable protection to the trunk and to a large part of the rooting zone. The effect of shade helps depress the growth of weeds, which can be highly competitive in this area.

However a low canopy can also have disadvantages; access to the tree is made easy for ants, snails and other insect pests and can encourage the spread of the fungus disease brown rot. A low canopy may also impede cultivation and for one or more of these reasons skirting of the canopy may be desirable.

Skirting is the removal of branches lying on and within about a foot of the ground. The parts removed are usually subject to injury from passing implements, or are branches going out of production by shading from later overgrowth. After pruning, the skirt will gradually drop again from weight of foliage and recurring crops and the operation may have to be repeated every two or three years. When skirting is necessary, there should be a compromise between the preservation of shade and shelter, and measures to assist in the control of pests and disease.

Figure 10 shows an example of skirting which has been carried to excess. Here the lower fringe of the leaf canopy has been cut away three feet and more above the ground leaving only a small part of the fruiting area which can be reached without a ladder. In addition to the added cost of harvesting the crop, much of the natural shelter has been lost and some of the most fruitful parts of the tree destroyed.
REDUCING OVERSIZE TREES

The lower parts of still-vigorous old trees often suffer from lack of sunlight because of their height and expanse. If the original planting distance was so close that adjoining trees overshadow one another, then production on the lower half of the tree is likely to suffer and vigour is confined to the tree tops where sunshine is unrestricted. Problems such as this usually involve large high trees and several feet may be cut from the top to bring them down to a lower level.

This is probably the most difficult type of pruning to do with confidence. Large branches may have to be sacrificed and if this is so, rather than expose the whole of the inside of the tree, the operation would be better done over two or more seasons. Too much cutting at any one time may result in a dense regrowth, which, if not thinned, will eventually produce a situation just as undesirable as the condition being corrected.

Pruning over several seasons allows the operator to assess the final outcome as work progresses and at the same time avoid many of the risks attached to laying open the tops of large trees. Whatever the method of approach when dealing with these trees it is often impossible to avoid gaping holes where branches have been removed and, for a period, an unsightly tree. With cautious and patient pruning the tree will reshape itself and the exposed areas will respond to increased sunlight.

FROST INJURY

Widespread frost damage to citrus has happened only rarely in Western Australia. Generally damage to healthy trees has been confined to the lighter fringe growth; the setback has been temporary and without serious injury to the main framework.

Regardless of the extent of injury pruning of any sort should not be done until regrowth is re-established. Usually it is best to leave the tree alone for at least a full growing season. The dead and damaged wood can then be cut back to the new growth. With a moderately frosted tree this should be all the pruning needed for the tree to return to normal.

Where main branches have been damaged much of the new growth may be overcrowded and poorly situated. The natural inclination to remove some of the multitude of new shoots at the same time as the dead wood should be foregone at this time as this would be an additional shock to the tree. All new growth should be preserved until the tree has completely settled down. Early in the following spring the misplaced and weaker shoots can be removed.

IN BRIEF

Pruning is not essential to the established citrus tree which is healthy and productive. When pruning is necessary each tree should be treated as an individual rather than one of a group subject to a fixed plan.
The successful establishment of freshly planted young trees depends largely on comparatively heavy pruning. Pruning at this time assists the development of a well shaped framework. It also safeguards the tree from moisture stresses which may be likely while the root system remains inactive.

After the framework of the young tree is formed it will usually develop satisfactorily without additional pruning.

Young lemons sometimes outgrow their strength. They react well to pruning and may benefit by some control during their early development.

The aim of pruning is to remove spent, diseased and unwanted wood and to promote new growth. In this way it is valuable for maintaining health and production.

Pruning does not increase the vigour of a healthy tree.

With age trees lose much of their earlier vegetative vigour and fruit production tends to diminish. New fruiting wood is encouraged by a programme of periodic thinning.

When rejuvenating an old or unthrifty tree, as much of the old framework as possible should be retained. Look for the underlying cause of decline; pruning alone is seldom the complete remedy. Severe pruning is a shock to the tree and should be avoided; afterwards regrowth is often hard to manage and losses in crops accentuated and prolonged.

Confine heavy pruning to late winter or spring. Serious injury from sunburn and frost can follow pruning; protect major branches from direct sunlight and in frost areas postpone operations until the risk of damage is passed.

Pruning is unnecessary unless the purpose is clearly defined.
FARM SAFETY

Careful investigation has been made into the causes of tractors overturning. The most common types of accident are set out below, with advice on how to avoid them.

### CAUSES

1. Tractors were DRIVEN TOO FAST; a wheel hit an obstruction, the tractor became uncontrollable and turned over.
2. Tractors were driven too near to a DITCH OR BANK; one or more wheels slipped over the edge and the tractor overturned.
3. Tractors drawing trailers or machines ON A HILLSIDE got out of control and were overrun by their load, which pushed or pulled them over sideways.
4. Tractors were driven UP STEEP HILLSIDES and somersaulted backwards.
5. Tractors were driven ALONG STEEP HILLSIDES and rolled over sideways.
6. Tractors were used to consolidate SILAGE OR MANURE HEAPS; one edge of the heap fell away and the tractor turned over.
7. A chain or tow-rope was HITCHED HIGH above the tractor drawbar; the drag on this pulled the tractor over backwards.
8. The clutch was engaged suddenly and the SNATCH overturned the tractor.
9. Tractors with mounted WINCHES were set out of line with the wire rope; the sideways pull turned the tractor over.

### PREVENTION

1. Drive slowly over rough surfaces, when cornering, and when using the steering brakes. The lower your speed the less your danger.
2. Do not drive too near to ditches or banks particularly if the surface is loose or wet. Make the headlands a bit wider.
3. Do not drive your tractor on steep hillsides with a heavy load behind unless the trailer or towed machine is fitted with good brakes. Remember that rubber tyres have poor grip on short dry grass, on wet or juicy herbage, and on loose or muddy surfaces.
4. Your tractor is less likely to rear up when climbing a steep hillside if you attach extra weight to the front of it.
5. It is much less dangerous when driving along a hillside if the wheels are extended to their widest position.
6. If you must consolidate the silage or manure heap with the tractor, make sure the sides of the heap are properly supported or keep well away from the edges.
7. Never hitch anything to the tractor above the proper drawbar level.
8. Let the clutch in slowly and avoid snatching. Remember that, even with a straight pull, your tractor can be overturned.
9. When winching always see that the tractor is set straight for the pull.

### OTHER SAFETY PRECAUTIONS

- Keep your tractor in good condition, particularly the brakes, steering and tyres.
- Make quite sure you understand all the controls and remember their positions.
- Remember when turning, you can greatly increase your safety by going a little slower.
- Don’t allow passengers on your tractor, or carry goods or loose tools which may foul the controls.

### FINALLY

THINK SERIOUSLY BEFORE DOING ANYTHING UNUSUAL WITH YOUR TRACTOR. IF IT IS LIKELY TO BE DANGEROUS – DON’T DO IT.

SAFETY FIRST