The pruning of fruit trees - Part 3 (contd.) Deciduous fruit trees (Apples)

H. R. Powell

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3

Recommended Citation
Powell, H. R. (1955) "The pruning of fruit trees - Part 3 (contd.) Deciduous fruit trees (Apples)," Journal of the Department of Agriculture, Western Australia, Series 3: Vol. 4 : No. 6 , Article 3.
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3/vol4/iss6/3

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 3 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au, paul.orange@dpird.wa.gov.au.
THE commercial varieties of apples grown in Western Australia, are restricted in the main to Granny Smith, Cleopatra, Dunn's Seedling, Jonathan, Yates, Dougherty, Rokewood and Delicious. Other varieties such as Democrats, Rome Beauty, Williams Favourite, Lord Nelson and Golden Delicious, etc., are grown, but plantings are on a relatively small scale.

Varieties of apples differ in their habits of growth; some are upright growers and others are of a more spreading habit, and these natural characteristics must be taken into consideration when the trees are pruned, as explained in Part 2.

Systems of pruning vary a great deal. Originally in this State, apple trees were heavily "spur" pruned, that is to say the one-year-old laterals were cut back to three or four buds at each pruning. This system has gradually given way to "lateral" pruning due to a large extent to the teachings of the late G. W. Wickens, formerly Superintendent of Horticulture in this Department.

In 1939 the Wickens system of pruning which included, among other features, the non-tipping of leaders, was introduced but unfortunately the system, though widely adopted for a number of years, was not generally understood and is now rarely used. (See Part 1, and Figs. 32, 33 and 98.)

In Parts 1 and 2, the beneficial features of this system have been incorporated in the advice given, particularly with regard to the retention of untipped leaders on weak sides of uneven trees, (Fig. 12), on strong-growing trees (Fig. 29), and on leaders making weak growth or affect with die-back (Figs. 71 and 93.)

The number of leaders retained on a mature apple tree usually varies between

---

**Fig. 68.—A pruning discussion on Mr. R. Grist's orchard at Donnybrook. (Left to right) R. Grist, Inspector N. A. G. Brockman, the author, and Mr. R. L. Cailes, Horticultural Instructor. The tree is a 24-year-old Yates with good framework and lateral development. Coloured varieties need wider spacing of the leaders than do green varieties for the reason that more light is required in the centre and lower portions of the tree to bring out the characteristic colour of the fruit.**

---

Journal of agriculture Vol. 4 1955
10 and 16, depending upon the habit of growth of the variety, whether the variety is coloured or not, the vigour of individual trees, and the method of pruning used. Trees of upright-growing varieties require fewer leaders than do spreading types, and coloured varieties similarly require less leaders than green varieties of similar habit of growth for the reason that more light is required in the centre and lower portions of the tree to bring out the characteristic colour on the fruit. Obviously strong vigorous trees need more leaders than less vigorous trees of any given variety. The method of pruning used also has an important bearing on the number of leaders; as an example, trees trained on the Wickens system (Figs. 32, 33 and 98) have an inner and outer ring of leaders, and this method, modified by orthodox treatment of the leaders, is also fairly general in some districts (Figs. 80 and 81).

THE ANNUAL WOOD GROWTH

The annual wood growth consists of water shoots, wood shoots, laterals, fruit spurs, leaf spurs, fruit twigs and leaf twigs. A general description of these parts was given in Part 1, and the treatment of wood shoots and water shoots was outlined in Part 2. As the laterals and spurs and other types of annual wood growth have specific functions on apple trees, some detailed knowledge of their structure and behaviour is necessary before the trees can be confidently pruned.

Water Shoots.—Strong vigorous growths arising from dormant buds. They are caused by too severe pruning treatments, and loss of leaders through breakages, etc.
Wood Shoots.—These are strong growing shoots found on vigorous trees, usually arising from the topmost buds of leader extensions left at the last winter pruning. On severely pruned trees they can arise from any position on growth formed the previous season (Figs. 21 and 28).

Laterals.—These are weaker-growing shoots and they arise from buds on the leader extensions, below those producing wood shoots. They are also found on other parts of the trees as well, on water shoots and wood shoots, on laterals formed the previous year, and on spur formations which have been stimulated into growth by pruning treatments (Figs. 83 and 89). On most trees there is a gradual transition from weak laterals to strong wood shoots. However, the term lateral usually refers to the more horizontal growth, and weak shoots growing either obliquely or vertically. They are well illustrated in Figs. 69, 72 and 85 as the side shoots clothing the leaders and sub-leaders.

As a general rule, laterals growing horizontally and obliquely are retained, whilst those growing vertically are suppressed or else "spurred" or shortened back to a few buds. The side buds are usually leaf buds, and the terminal bud can either be a leaf or a fruit bud. Often a number of the side or lateral buds on some varieties are fruit buds. The leaf buds are able to continue the vegetative growth of the lateral, and under conditions suitable for fruiting they give rise to fruit spurs, (Figs. 73, 75, 77 and 78). The fruit bud is usually much plumper.

Fig. 71.—The six-year-old Jonathan in Fig. 70 pruned. Current extensions to the leaders have been carefully chosen. One leader in the background, a weaker growth, has been left untipped to strengthen up. Horizontal laterals have been retained, care being taken that the topmost bud on any is not as high, or higher, than the topmost bud on the leader bearing it; the topmost bud even on a relatively weak shoot if left above the top of the leader can often make vigorous growth. This will result in the leader being “robbed.” Other laterals on the current extension, being too upright, or too close together, have been cut back to the growth rings at their bases.

On the older extensions, as much horizontal growth, wood shoots and laterals, as possible, have been retained untipped. In some instances upright shoots have been tied down and in others, they have been shortened back (see text).

Fig. 72.—Lateral development on a 13-year-old unpruned Granny Smith.

It will be noticed that the laterals have been left long, particularly where sufficient room existed. Series of changes in the direction of growth, particularly noticeable on the outside leaders, indicate the extensions made previously; the pruning cuts were made to outside buds.
than the leaf bud, but there are occasions when it is impossible to distinguish between them. The leaf buds on most varieties are fairly uniformly developed along the entire length of the lateral, as with Cleopatras and Dunns; but on some varieties the buds towards the base of the lateral are not well-developed, as with Jonathans. Care should always be taken in shortening Jonathan laterals, to cut to a sound bud.

Fig. 74.—A one-year-old Jonathan lateral during the following growing season. The terminal bud has set fruit and at the same time has continued the vegetative growth of the lateral. Fruit spur formation is developing on the older wood. The result at the end of the season will be similar to the two-year-old lateral shown in Fig. 73.

The terminal fruit bud on the lateral is capable of flowering and setting fruit the following growing season; at the same time it can extend the lateral by vegetative growth as a spur, a twig, a lateral, and in some instances of severe pruning, as a wood shoot (Figs. 74 and 85).

Leaf Spur.—A short growth that can be likened to a modified lateral. It terminates in a leaf bud which, under normal conditions, can form a fruit spur the following year.

Fruit Spur.—A normal transition from the leaf spur, but it can also arise directly from a leaf bud. The bud at its apex, as the name implies, is a fruit bud. These growths are the principal fruitbearing parts of the tree. Each year after flowering, the parent spur is elongated, either singly or by two similar growths. During the course of time the spurs ramify, and

Fig. 73.—Jonathan laterals. On the left a one-year-old lateral showing side buds and terminal buds. The terminal bud is often a fruit bud and in some years a number of side buds flower and set inferior fruit.

On the right a two-year-old lateral, and a one-year-old lateral grown from the terminal bud. On the older wood, fruit spurs have developed. Pruning treatment would consist of either shortening back to the junction of the old and new wood or further back on the two-year-old lateral depending upon the amount of fruiting wood available elsewhere on the tree.
BRANCH OFFICES:
MELBOURNE 272 Collins Street
SYDNEY 28 Martin Place
FREMANTLE Victoria Quay

PRIMARY PRODUCERS!
Railway wagons are YOUR ASSETS
DON'T WASTE THEM

PROMPT LOADING and UNLOADING means quicker turnaround of wagons.
QUICKER TURNROUND means increased effective wagon loading capacity.
INCREASED CAPACITY means faster and better railway service for all.
BETTER SERVICE is our aim and your need.
YOU CAN HELP yourself by helping Railways to keep the wagons moving.

USE Government Railways Insured Parcels and Cash on Delivery Parcels systems
ALSO, consign your goods at "Commission's Risk" and safeguard yourself

WESTERN AUSTRALIAN GOVERNMENT RAILWAYS
GRUBBING
TREES AND STUMPS
and doing speedily what is otherwise slow and laborious work

Tremendous power exerted by

The Monkey Grubber

tears them quickly and cleanly from the earth with roots intact. A thorough and workmanlike job, and the unrivalled method of dealing with your timbered land.

A GRUBBING MACHINE equipped with cable of correct length, size and weight for ease of handling and embodying such features as multiple speeds, automatic releasing gear, rope shortener, snatch block, and simple sturdy rope couplings.

Each one a time saver and a labour saver, and to which the effectiveness gained by portability and ease of operation must be added.

With the MONKEY GRUBBER a day's work can be done in an hour.

It will surely be to your advantage to know about it from

THE JACK PEOPLE

TREWHELLA BROS. Pty. Ltd.
TRENTHAM, VIC.

W.A. Stockists: HARRIS SCARFE & SANDOVERS LTD.
McLEAN BROS. & RIGG LTD. CO-OPERATIVE WHOLESALE SERVICES LTD.
J. & W. BATEMAN LTD. THE BAIRDS CO. LTD. McPHERSON'S LTD.
ultimately become so numerous and weakened that the fruitfulness of the tree is affected, (Figs. 77, 78, 94, 95, 96 and 97).

**Fruit Bud.**—On the apple and pear, the fruit bud differs widely from the fruit buds found on stone fruit trees. At flowering time, the bud produces a cluster of flowers and one or two small vegetative shoots. The average number of flowers in the cluster is five, and the small shoots elongate the parent spur by similar growths. When

stimulated by a strong sap flow after pruning laterals and even strong wood shoots can be formed instead of spurs.

**Fruit and Leaf Twigs.**—These are short weak growths with a terminal fruit bud or leaf bud as the case may be and usually no other buds are present.

**TREATMENT OF THE ANNUAL WOOD**

Hard pruning will cause most of the annual growth to consist of water shoots and wood shoots which, if the same method of pruning is continued, will have to be cut away at the next pruning. The growth will be dense and most of the laterals that are formed will be too shaded to develop properly (see Figs. 28 and 70).

Should trouble be experienced in coping with strong growth on vigorous trees, even with the more orthodox treatments, the leaders should be left untipped until some stability has been reached. Young trees, particularly in their third or fourth year, often make vigorous growth, and this growth can be utilised to better advantage by retaining the leaders untipped (see Part 2 and Fig. 29).

On any systematically-pruned tree the leaders will consist of yearly extensions, the number depending on the age of the
tree (see Figs. 72, 83, 86 and 87). Thus at the top will be the current extension; below that the extension kept at the previous pruning and so on each extension being a year older than the one above it. For the sake of convenience, the following description of pruning the annual wood will be divided into four sections. The description will commence at the top of the leader with the current extension and then cover in turn the same growth as it could be at

Fig. 77.—Granny Smith laterals. On the left is a three-year-old lateral showing three stages of development. The basal portion is three years old, the middle portion two years and the top extension, one year old. On the left on the three-year-old wood can be seen the beginning of a spur formation. When shortening back the cut would be made to a well developed spur on the two year wood, probably midway, depending on the amount of fruiting wood available elsewhere.

The lateral on the right is also three years old, but it was previously shortened back to a fruit spur. The fruit spur can, in addition to flowering and setting fruit, extend itself vegetatively by either one or two similar growths or if stimulated into growth by pruning, make stronger growth. This can be seen in the illustration; the shoot on the left a weak lateral and on the right a spur formation; both are two years old. The lateral fruited terminally and the spur bore fruit and extended itself by two similar growths. Another spur, below, similarly fruited but only extended itself once.

This type of growth would not require any pruning at this stage.

Fig. 78.—Fruiting wood on Yates. On the left a two-year-old lateral showing spur development, and three weak one-year-old laterals. The terminal bud fruited and continued growth by two small laterals. Yates respond to lateral pruning and better fruit is obtained than from spurs on the framework branches. At this pruning the lateral could be shortened back to the first spur from the top.

On the right, spur formations. Unless thinned out the spurs will ramify and fruit quality will suffer. The variety often sets heavily and requires drastic thinning, particularly when not irrigated or not on moist land. The degree of thinning out the spurs will depend on local conditions, but with the two examples shown, the formations could be reduced, leaving two well-developed spurs on each.


PROVED and IMPROVED

THOUSANDS OF DAIRY FARMS THROUGHOUT AUSTRALIA

... use ...

SIGMA PENIJEC

because...

- SIGMA PENIJEC is the MASTER Treatment for MASTITIS.
- SIGMA PENIJEC has contained procaine penicillin since 1949 when it was found that procaine penicillin proved more effective in the treatment of mastitis.
- SIGMA PENIJEC is easier to use... packed in “easy-squeeze” tubes which are not affected by varying weather conditions...

And here are some more hard hitting facts why SIGMA PENIJEC for the treatment of mastitis is a byword with thousands of Dairyfarmers—

NATURAL SHAPE NOZZLE. As photographed on left the “natural shape” nozzle fits easily into the teat without damaging it, and SIGMA PENIJEC is injected by simply squeezing the tube.

PACKED UNDER STRICT SUPERVISION. SIGMA PENIJEC is packed under strict supervision thus ensuring a product of the highest quality.

TWO STRENGTHS. Regular—50,000 units. Strong—110,000 units.

SIGMA PENIJEC hits hard and gives greater economy.

SOLD ONLY BY CHEMISTS. Ask for Sigma Penijec and get the BEST for only 12/6 per dozen.

Refuse all substitutes

PREPARED IN THE PENICILLIN LABORATORIES OF

SIGMA CO. LTD.
MELBOURNE
SP22HP
the only tractor tyre with these FOUR important features

1. Open-centre tread wider at the buttress than at the centre squeezes out all trash.
2. Angle-set reinforced buttresses relieve buttress tension under extreme deflection.
3. Massive deeper and wider tread bars heavily reinforced at open centre base for immense resistance to abnormal bar distortion under load.
4. Broader treads of super-toughened rubber for long life and powerful traction.

DUNLOP Super Trakgrip TRACTOR TYRES

THE GREATEST GRIP ON EARTH!
Fig. 79.—A five-year-old Granny Smith unpruned. At the previous pruning, long laterals were twisted together in the centre of the tree by the owner of the orchard, Mr. G. Parke, of Donnybrook. (See Figs. 83 and 84.) Two illustrations of pruning this tree are given in Figs. 80 and 81. The first with untipped leaders and the other, the more orthodox treatment.

the end of one growing season, at the end of two growing seasons and finally, when it is some years older.

LEADER EXTENSIONS—CURRENT SEASON

The leaders are extended each year by suitable wood shoots and other wood shoots are suppressed, as was discussed in Part 2. The degree of shortening will depend upon the vigour of the tree but it should be borne in mind that one of the main reasons for shortening back is the need to force out the leaf buds other than the topmost buds, into desirable lateral growths during the following growing season. The topmost buds will normally be forced out into strong-growing wood shoots, but, if the pruning is too severe, all or most of the buds retained on the extension will grow into wood shoots (Figs. 28, 70 and 82). Conversely, if the shortening back is too light, a high proportion of the buds may remain dormant and growth will be made mostly from the topmost buds. When growth is strong it is preferable to let the leaders run rather than to shorten them lightly.

When symptoms of pruning die-back appear, or when vigour wanes, it is also advisable to leave the leader extensions unpruned. Evidence is available that growth cannot be forced into declining leader extensions by removing all spurs and laterals, rather, it seems that the retention of these growths will eventually be a means of delaying the decline, provided all fruit is removed soon after it sets. (See Figs. 92 and 93.)
Fig. 81.—Five-year-old Granny Smith pruned and with leaders shortened. The tree is not sufficiently vigorous to leave the leaders untipped; control of normal growth can be maintained by a commonsense approach at subsequent prunings.

It will be noticed that some laterals on the current extensions have been retained and the leader right foreground, has been cut to a shortened lateral to spread new growth outwards. (See Fig. 20.)

Fig. 82.—Strong wood shoots on a Dougherty graft. A number were removed before the photograph was taken in order that the framework branches could be more clearly seen.

Fig. 83.—Dougherty graft shown in Fig. 82 pruned. Strong wood shoots have been removed except those chosen as current extensions to the leaders; suitable laterals on the extensions have been retained; others being more vertical were cut to the basal rings or else well shortened back to single buds for replacement purposes. Wherever possible, long laterals have been twisted together on the same horizontal level to encourage spur formation. Weaker wood shoots in favourable positions have been shortened back to four or five buds, the cuts being made to underneath buds to minimise the possibilities of further strong growth. (See Fig. 84.)

Some laterals found on strong extensions should be retained, provided they are in a horizontal position and their terminal buds are not as high as the topmost buds on the leaders concerned (See Figs. 70, 71, 82 and 83). The treatment of laterals on untipped leaders on strong-growing trees will be much the same as the method described in the next section. (Fig. 80.)

Fruit twigs are often numerous on certain varieties, particularly Granny Smiths. When this is so, they should be thinned out to reduce hand-thinning should fruit set.

On untipped leaders, particularly Granny Smiths, the terminal bud and topmost side buds are sometimes fruit buds and fruit often sets, affecting normal growth. When this happens the fruit should be removed early. A suitable grow-
ing shoot should be selected to carry on the extension, and the tips of competing shoots pinched out to reduce competition.

**LEADER EXTENSION—ONE YEAR LATER**

**Wood Shoots.**—On pruned trees, the topmost buds on the leader extension will have grown into wood shoots, the vigour depending on the condition and age of the tree. A selection of a suitable extension, and when necessary sub-leaders, should be made as described in Part 2 and Figs. 16, 19, 25, 27, 71, 83 and 87. Other wood shoots should be suppressed, but there will be occasions when sufficient laterals are not available and it may be necessary to use weaker wood shoots for future fruit production. When this is the case, those in a more horizontal position should be shortened or spurred back to five or six buds, cutting to an underneath bud (Fig. 84).

**Laterals.**—The weaker and more horizontally-growing shoots — laterals — will have grown from buds, below those which have produced wood shoots, the change from one to the other being more or less transitional.

On strong-growing trees and on trees previously pruned too severely, as much of the lateral growth as possible should be retained unpruned and either tied down in an inferior position or else twisted together to reduce the possibility of strong growth during the next growing season (Figs. 71, 81, 83 and 84).

With trees more or less normally pruned, the degree of shortening back of the one-year-old lateral will depend a great deal upon its position. If it is hanging on the outer face of the leader it can be left long, but between the framework branches and inside the tree it should be shortened back according to the space available.

Some idea of spacing of the laterals can be obtained from Fig. 85. It is difficult to generalise, but normally six to eight inches should be allowed for spacing, between one shoot and another more or less directly above it. When it is necessary to thin out, preference should be given to the stronger growths, and the weaker should be removed. Care should be taken, when removing these and other growths, to cut above the growth rings at the base of the shoots as this will not remove the dormant basal buds, which may later be required for purposes of regeneration. When in doubt whether to remove or not, it would be wise to cut the lateral back to the nearest sound bud to the leader.

**Laterals—Second Year.**

The treatment of the laterals left on the leader extension—current season—which will now be their second year, will be discussed in the next section.

**LEADER EXTENSION—TWO YEARS LATER**

**Wood Shoots.**—On vigorous trees previously pruned too severely, strong growth will arise from the basal buds of wood shoots suppressed at the previous pruning, and also from the similar shoots cut back at the same time.

Wood shoots arising from the basal buds, if not required for framework purposes as for instance as a subsidiary leader, should
Fig. 85.—The fruiting system of a mature Granny Smith. The laterals are well distributed and the tree is capable of carrying a full crop of fruit. Intelligent shortening back, only where necessary, will minimise over-cropping and at the same time stimulate weaker wood into growth for replacement purposes. Over-stimulation by pruning should be avoided. Some of the lower laterals were shortened back too severely at the previous pruning. The result can be seen in the illustration—two wood shoots above the handerchief and a weaker shoot at the base of the leader on the left.

be removed, but if the growths are not too strong and space permits they can be shortened back to four or five buds as described in the previous section. Often too, on more balanced trees, the growth from the basal buds are laterals and if this is so, complete control has been obtained.

When wood shoots arise from similar shoots pruned short the previous year, control can often be made easier by cutting back to a lateral, spur, or dormant leaf bud on the wood left the year previously. Where possible the cut should be

made to an underneath lateral, spur, or leaf bud to minimise strong growth next growing season.

Fig. 86.—The top portion of a leader on an aged Granny Smith unpruned, showing eight years' growth. In this instance the aim has been to stimulate new leader growth and to restrict fruit production near the extremities of the leaders.

Fig. 87.—Top portion leader, aged Granny Smith shown in Fig. 86 pruned. The leader extension is short and all upright growth has been cut back. The two-year-old lateral on the left has been shortened back to a spur on the two-year-old wood. In time, leader growth will weaken and it will then be essential to prune much more lightly, leaving the leader extensions untipped. Compare with Figs. 92 and 93.
A PLOUGHING TASK-FORCE

Nuffield Universal Tractor in action, equipped with 4-furrow set plough. This is one of the many “approved - after - test” matched implements available that speed up your work . . . make it easier.

DO YOU KNOW THESE MONEY-SAVING FACTS?

The Nuffield Universal Tractor (kerosene-powered) equipped with 13.50 x 24 rear and 6.00 x 16 front tyres costs only £1,015/18/- (Cap. City)

At this low cost your Nuffield tractor includes the following standard equipment: Hydraulic lift, 3-point linkage, p.t.o., belt pulley, drawbar, drawbar extension, seat cushion, canvas tractor cover, electric starter and horn, headlight, agricultural rear light, tail and side lights, heat gauge, hour meter, foot plates, chaff screens and radiator shutters. (Alternative magneto ignition can be supplied at slightly extra cost.)

Other tyre sizes available: 11 x 36R, 6.00 x 19F; 13 x 26R, 6.00 x 16F; 14 x 30R, 7.50 x 18F; 11 x 36 Dual Rear, 6.00 x 19F. (Tractor, when fitted with these alternative sizes, varies accordingly in price.)

NUFFIELD

UNIVERSAL TRACTOR

Sold and Serviced by Authorised Nuffield Distributors and Dealers Everywhere

PARK LANE MOTORS PTY. LTD.

926-928 Hay Street, PERTH

Please mention the “Journal of Agriculture, W.A.” when writing to advertisers
A 2,4-D Ester selective weed killer for the control of those weeds which are hardest to eradicate in pastures, crops and drainage systems.
Fig. 88.—The lower portion of a leader on an unpruned aged Granny Smith illustrated in Figs. 86 and 87, showing that lateral formations can be maintained on an old tree. Some new growth has been obtained for replacement purposes.

On occasions the strong growth will be difficult to handle and it is suggested that if this is so, and if room cannot be found for a sub-leader, the whole growth be removed.

Laterals—Second Year.

The laterals left at the previous pruning can now be regarded as two year laterals. During the past growing season development proceeded—in some instances fruit was carried on terminal and lateral buds, spurs were formed and growth took place from the terminal buds (see Figs. 73, 74, 75, 76 and 78).

Treatment at this pruning is important, for the reason that an important stage in fruitfulness has been reached. Many will have developed sufficient spurs to justify shortening back, otherwise too much fruit will set. Should the shortening back be too severe, strong vegetative growth may eventuate and the previous balance will be lost.

In shortening back, sufficient spurs should be retained for fruit, having in mind the capacity of the lateral to mature its crop. Knowledge can only be obtained by experience and it is suggested that in the first few years when experience is being obtained, the shortening back be done gradually and that it be no more than the junction of the old and new wood, or, in the case of long laterals, the shortening back on the older wood to include several well developed spurs (see Figs. 73, 75 and 78). When shortening back it is advisable to cut to a spur on the underneath side of the lateral to minimise the chances of strong growth next season. There will be many occasions when the extension is left entirely. Ultimately the length retained will depend on the vigour of the shoot and the quantity and quality of fruit required to be carried (Fig. 85).

The best fruit on Jonathan trees is carried on the two-year-old laterals and it is usual to make provision at each annual pruning for some new growth, much the same as is done on peach trees. Wherever possible a proportion of one-year-old laterals are cut back to sound buds to produce a supply of laterals the following year; at the same time, the remainder—if all are required—are left to mature as two-year-old laterals. The shortening back is normally to the junction of the one-year-old and two-year-old wood, but in certain years when fruit spurs are numerous the shortening back will be more severe. The degree of shortening

Fig. 89.—The lower portion of a leader on an aged Granny Smith pruned. Spur formations on the older laterals have been thinned out and spent wood removed; at the same time some one-year-old laterals have been left and those not required have been shortened to provide similar growths next year.
back, as mentioned earlier, is based on experience, but it should be sufficiently severe to ensure new lateral growth (see Figs. 73, 90 and 91).

In heavy crop years, the side buds on one-year-old laterals flower and set. This is unfortunate with Jonathans for the reasons that, the previous balance between one and two-year-old wood is lost, and the quality of fruit is inferior and drastic thinning is necessary. The result the following year is usually a very light crop.

**LEADER EXTENSION—LATER YEARS**

**Wood Shoots.**—The remarks made earlier still apply—should trouble still be experienced, it is evident that the trees should be more lightly pruned.

In addition, it should be realised that wood shoots cannot be controlled by severe shortening back at each annual pruning. Where possible, they should be cut back on the older wood to a weaker shoot, or to include several shoots growing horizontally or downwards and preferably left untipped. The resulting growth can then very often be handled more satisfactorily by removing the upright and strong growth and retaining those shoots, generally untipped, which are growing in an inferior position. When good spur formation occurs, the effect of maturing the fruit, and the weight of the fruit forcing the growth downwards, will reduce the possibility of further strong growth.

**Water Shoots.**—With the removal of branches either by breakages or by pruning water shoots will grow from dormant buds. If the water shoot is in a favourable position it is a valuable replacement of a damaged framework branch. Otherwise it is better to remove them during the growing season, preferably by rubbing or breaking them off while the growth is young.
New growth after application

Systox applied to foliage

Systox applied to soil

Absorbed through foliage or roots, "Systox" is translocated through the whole plant, including any new growth after application!

*Does not kill bees or useful predators.*


WRITE FOR INFORMATION TO . . .

TROPICAL TRADERS and
PATERSON'S PTY. LTD.
WELLINGTON STREET, PERTH
Above every acre of land there floats an estimated 37,500 tons of free or atmospheric nitrogen. In this form it is worthless to your plants. But with the help of legume crops that have been inoculated with Nodulaid this nitrogen can be converted into a form easily absorbed by all plant life. Results show that Nodulaid-inoculated legume crops can add more than 100lb. of nitrogen to every acre of your soil under average conditions. This is more nitrogen than you get out of nearly 5 cwts. of Sulphate of Ammonia, worth £10.

If Nodulaid is not available from your local seed merchant contact your State Distributor. He will be glad to help you.

A PRODUCT OF AGRICULTURAL LABORATORIES PTY. LTD.
Carlingford Road, Sefton, N.S.W.

Distributed by:

N.S.W. and QUEENSLAND: Eggsins Foster Pty. Ltd.
194 Sussex Street, Sydney.

S.A.: M. F. Hodge & Son Limited.
23 Grenfell Street, Adelaide.

VIC.: F. H. Brunning Pty. Ltd.
22 Hanna Street, South Melbourne.

111-113 St. George's Terrace, Perth.

TO EVERY FARMER USING . . .

NODULAILD

. . . DRY POWDER LEGUME INOCULANT

Please mention the "Journal of Agriculture, W.A.,” when writing to advertisers.
Laterals.—Laterals should be shortened back when necessary, having in mind the strength and vigour of the shoot, and the position and interference of other laterals which by contact will blemish the fruit. No hard and fast rules can be given, but reference to Figs. 86, 87, 88 and 89 will give some indication of spacing and the degree of shortening back on older trees. There will be many opportunities to shorten back to new laterals nearer the framework branches.

It should be the aim, when pruning, to stimulate each year a certain amount of fresh lateral growth to replace worn-out or weak fruiting wood and this can be done by the judicious shortening back of the older laterals.

Spurs.—With time, spurs on the laterals and framework branches will ramify and unless they are systematically thinned-out they will become progressively weaker and cropping will become affected. Figs. 94, 95, 96 and 97). The thinning-out process is important with the variety Yates. This variety tends to set very heavily, and unless the spurs are well thinned out at each pruning, a great deal of hand thinning will be necessary.

BIENNIAL BEARING

Most varieties of apples tend to off-year and on-year bearing. This condition is difficult to overcome, but it has been noticed that, provided such an essential as cross-pollination is assured, careful pruning and early thinning will tend to even out the crops. In years when on-year crops are expected, a heavy reduction of the fruiting wood is essential. This will apply to the thinning out of spurs, a reduction in the length of bearing laterals and a shortening back of one year laterals which will often in the on-year set fruit on terminal and side buds. In the off-year the pruning should be much lighter, and, as good fruit buds will be much reduced in number, more fruiting wood than usual should be left, and the one-year laterals should be left untipped.
It is realised that weather and other hazards can significantly reduce prospects, and that the expected heavy crop may not materialise. This has happened in this State several times in recent years, due to frost, attacks by thrips, and through hailstorms. However, it is suggested that the pruning of the fruiting wood be determined by the number and quality of the fruit buds; when prospects are good the reduction to be substantial, and that in the off-year every attempt be made to retain sufficient fruit buds, even if it means little or no reduction of the fruiting wood.

**DISEASE CONTROL**

In some districts, particularly in certain years, the disease, powdery mildew, causes damage. The disease is carried over by infected spurs, and laterals, particularly the terminal buds on one-year-old laterals. In these instances it would be wise to remove and destroy by burning all obviously infected material at each pruning.

**SUMMARY**

One-year-old laterals should be retained on all varieties, as it is considered that lateral pruning has many advantages over "spur" pruning.

As the spurs form, the lateral is judiciously shortened back towards the framework branches. The length eventually retained is dependent upon the vigour and position of the lateral.

It is considered wise to stimulate at each pruning a supply of one-year-old laterals to take the place of existing fruiting wood as it becomes worn out.

Spur formations should be rigorously thinned out, and they should never be allowed to become so branched and weakened that fruitfulness is impaired.

In the on-year the fruiting wood should be carefully controlled to reduce the work of hand thinning and the danger of overcropping. In the off-year the process should be reversed and little if any thinning out of the fruiting wood will be necessary.

Strong vigorous trees can best be trained with untipped leaders. It is suggested that when growth becomes less vigorous the leaders be winter pruned each year until the stage is reached when the annual extension growth shows signs of weakness; at this stage it is suggested they be again left unpruned.
The framework branches of the coloured varieties should be so spaced that ample supplies of light and air are accessible to the fruit to ensure that the characteristic colour is fully developed.

Horticultural Instructors are stationed in the commercial fruit-growing districts and are available for advice on pruning and other orchard problems. It is suggested that when in doubt as to pruning treatments, growers should contact their District Fruit Officer.

Though an attempt has been made to clarify pruning treatments, no mention has been made of the Cleopatra. This variety, owing to the prevalence of the physiological disease, "Bitter pit," is best left unpruned once the framework branches have been formed. Annual treatment usually consists of thinning out badly-placed branches and the stimulation of some new growth to take the place of the older fruiting wood as it becomes extended and weakened.

Fig. 99.—An orchard giant on Illawarra, Karragullen. The tree is a Granny Smith, 52-year-old top, worked on Dougherty, 16 years previously. The largest crop was 62 packed cases obtained during the 1949 season. On the left, Mr. J. Bloomfield, Senior Packing Instructor.
The safest fence for every class of stock

LONGER LASTING. “Cyclone” Ringlock Fencing of highest tensile quality galvanised wire is practically everlasting. The “Ringlock” joint binds hard-steel upright and horizontal wires immovably together, giving immense strength.

FIRE RESISTANT. Because of its unique construction from hard-steel wire, “Cyclone” Ringlock Fencing will not sag, break or twist in a fire like normal fencing. As no droppers are required, and fewer posts, there is less chance of dangerous tangles resulting from burnt-out wire supports.

STOCK-PROOF. Upright and horizontal strands are clamped together, giving a stock-proof enclosure. Alternative types are available for Sheep, Lambs, Pigs and Cattle. Prices, heights and all details are available on request.

... and costs you less to erect!

With fewer post holes to dig, and the fence strained up in one operation, erection time and costs are much lower.

See your local “Cyclone” distributor or

CYCLONE COMPANY
OF AUSTRALIA LTD.
BF 1454
and at Melbourne, Sydney, Adelaide, Brisbane, Townsville.

MAKERS OF THE FAMOUS “CYCLONE” GATES

Please mention the “Journal of Agriculture, W.A.,” when writing to advertisers