

## FORMATIVE PRUNING OF BUSH TREES

Formative pruning is essential and should be carried out in the dormant season, November-March. Its purpose is to produce a well-balanced tree with a strong branch framework capable of carrying heavy crops of fruit. Hard pruning is therefore carried out in the early years to produce strong growth *instead* of fruit. If formative pruning is not carried out the tree will tend to be weak, of poor shape with drooping branches and bare wood. Pruning in later years should be lighter to encourage fruiting.

**THE MAIDEN TREE** — If it is a maiden whip (a one year old tree with no side shoots) the tree should be pruned to a bud with at least two good buds just below it at about 75cm (30in) from ground level following planting. These buds should produce the primary branches during the tree's first growing season. If it is a feathered maiden with several well-balanced side shoots, the main stem should be pruned back to leave three or four good shoots at about 75cm (30in) from the ground. Shorten these side shoots by two thirds of their length to an outward facing bud and remove completely any shoots lower down on the main stem (see fig. 10). In the second year prune it as if it were a three year old tree.

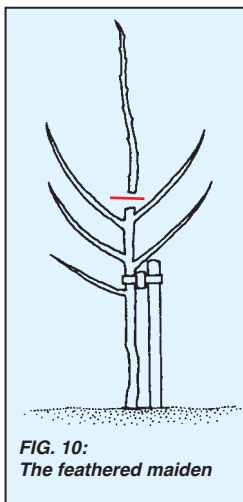


FIG. 10:  
The feathered maiden

**THE TWO YEAR OLD TREE** — Prune three to five of the best placed shoots by half to an outward facing bud, to form the primary branches (see fig. 11). Remove any shoots lower down on the main stem and any inward growing shoots. The topmost shoot is often too upright to keep as a primary branch and should be removed. If left in it would tend to become dominant and crowd the centre of the tree.

**THE THREE YEAR OLD TREE** — Prune the leading shoots (leaders) of branches selected to extend the framework by half to a bud facing in the desired direction (see fig. 12). Select up to four good laterals to fill any gaps in the framework and shorten these by half to form secondary branches. Prune any remaining laterals to four buds to form fruiting spurs.

**THE FOUR YEAR OLD TREE** — Only limited formative pruning will be necessary. The tree should now be fruiting. Shorten leaders by one third and prune laterals (side shoots arising from a branch or leader) not required to extend the framework, to four buds (see fig. 13). From the fifth year onwards, the tree may be regarded as being established and should be pruned annually as described below.

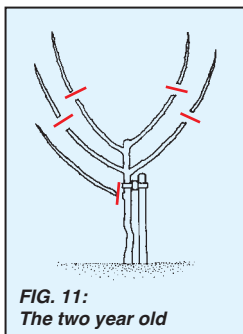


FIG. 11:  
The two year old

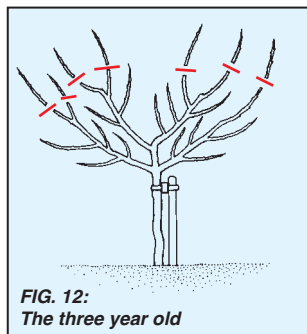


FIG. 12:  
The three year old

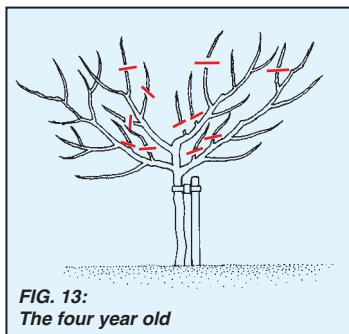


FIG. 13:  
The four year old

## WINTER PRUNING OF ESTABLISHED BUSH TREES

### AIMS

- (1) To improve air circulation and light penetration in order to ripen wood and encourage fruit bud production and at the same time reduce the incidence of pests and diseases.
- (2) To control the size and shape of the tree for ease of picking, spraying, pruning etc.
- (3) To produce regular crops of fruit of a good size.

Unpruned trees tend to produce large crops of small, worthless fruit often damaged by pests and diseases. The main part of the crop is often out of reach at the top of the tree. Branches are often broken by the weight of the crop and cropping may become biennial. Overpruned trees tend to produce light crops of large, flavourless fruits which do not store well, and too much vegetative growth. Pruning is therefore done to achieve a good balance between shoot growth and fruit production.

### SPUR BEARERS & TIP BEARERS

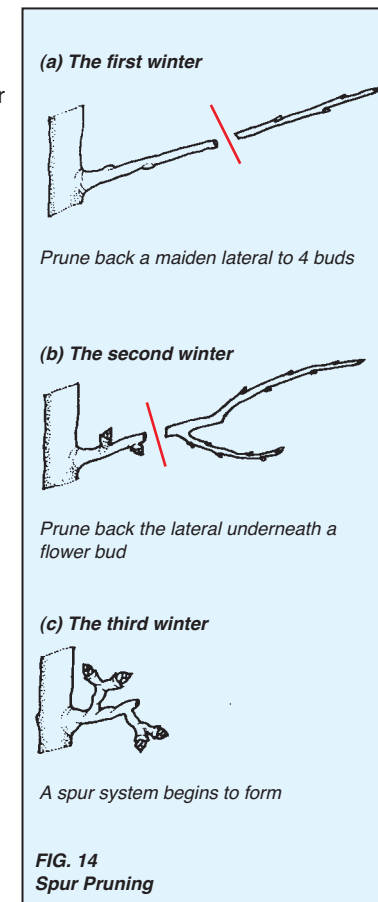
Apples and pears fall into two groups according to their fruiting habit — spur bearers and tip bearers. Spur bearers produce most of their fruit on short spurs on the older wood, for example the apple variety 'James Grieve' and the pear variety 'Conference'. Tip bearers produce most of their fruit on the tips of the previous season's growth (although they produce some spurs). Some apple varieties, like 'Bramley's Seedling' and 'Discovery', are partial tip bearers, producing some spurs and some fruit on the tips. Spur bearers and tip bearers should be pruned differently.

### PRUNING OF SPUR BEARERS

Spur bearers are pruned by a combination of regulative pruning and spur pruning. The tree is composed of a main framework of branches with secondary branches about 38-45cm (15-18in) apart with spur systems about 23cm (9in) apart.

### REGULATIVE PRUNING

Regulative pruning involves shortening or removing dead, diseased, broken, crowded and crossing branches, keeping the centre clear and controlling the height and spread of the tree. Branch leaders are normally tipped. If the tree becomes too large it may be necessary to remove an entire branch. If this is the



(a) The first winter

Prune back a maiden lateral to 4 buds

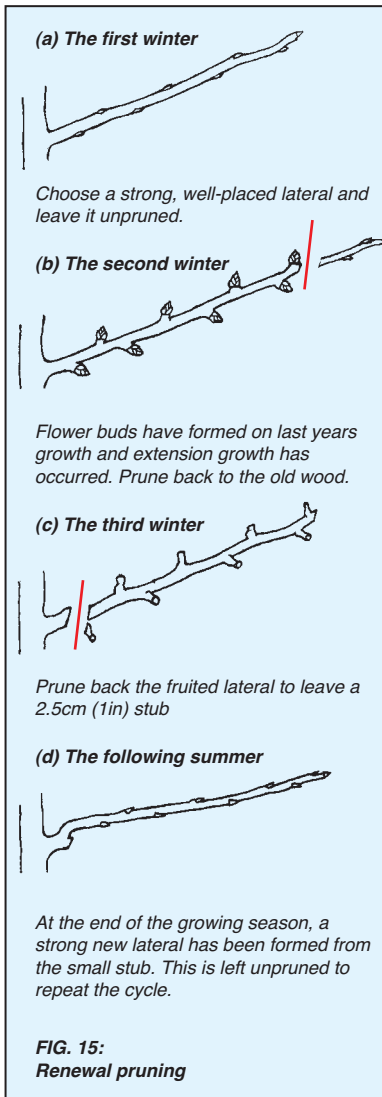
(b) The second winter

Prune back the lateral underneath a flower bud

(c) The third winter

A spur system begins to form

FIG. 14  
Spur Pruning



case the branch should be cut out either at its point of origin or to a suitably placed secondary branch which is at least one third of the diameter of the branch being removed.

## SPUR PRUNING

Spur pruning involves shortening lateral shoots produced in the previous summer to four to six buds to encourage fruit bud formation close to the framework branches. As the tree gets older it may be necessary to thin out the number of fruiting spurs, or small fruit will result. This is done by pruning back to a fruit bud on two year old wood or removing portions of the spurs (see fig. 14).

## PRUNING OF TIP BEARERS

### REGULATIVE & SPUR PRUNING

Tip bearers are also pruned on the regulative system, but only limited spur pruning is required. The previous year's shoots of 23cm (9in) or less (roughly secateurs length) should be left unpruned. Longer shoots are spur pruned to prevent crowding and to stimulate the production of more short tip-bearing shoots in the following years. The branch leaders are 'tipped', removing the top three to four buds, pruning to a bud facing in the desired direction to make them branch out and so produce more tip-bearing shoots. Partial tip bearers require some light spur pruning.

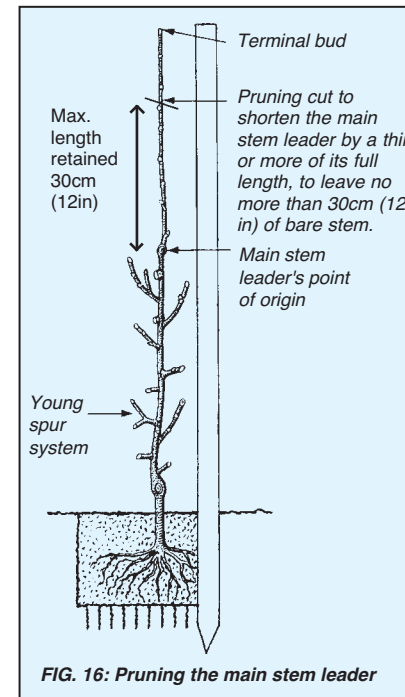
### RENEWAL PRUNING

Renewal pruning involves cutting back a proportion of old branches that have produced fruit to a young strong shoot or a basal bud to promote fresh growth. This ensures that plenty of new growth is produced the following season (see fig. 15).

## PRUNING & TRAINING OF MINARETTES

Minarettes are supplied already pruned; further pruning will not be required before midsummer. With proper management a Minarette will continue to grow as a single column to about 1.8-2.5m (6-8ft) high with short fruit bearing spurs up and down its length. A small amount of trimming of the shoots to make sure it keeps to the desired size and shape will be necessary during the summer, as well as a minimum amount of pruning in the winter or early

spring. This will help to ensure that the tree bears well-coloured, good sized, ripe fruit every year. With Minarettes practically all the pruning is carried out in the summer with the purpose of retarding their growth and encouraging the formation of fruit buds.

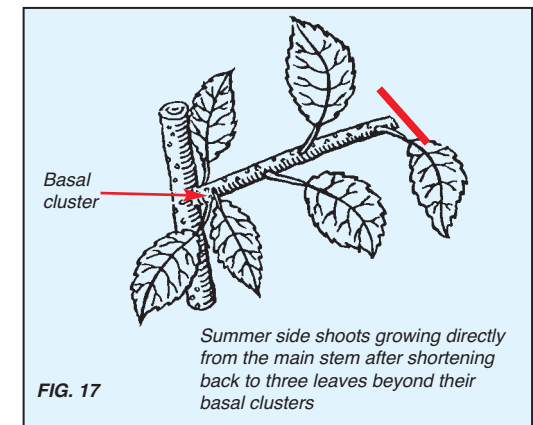


## PRUNING THE MAIN STEM LEADER

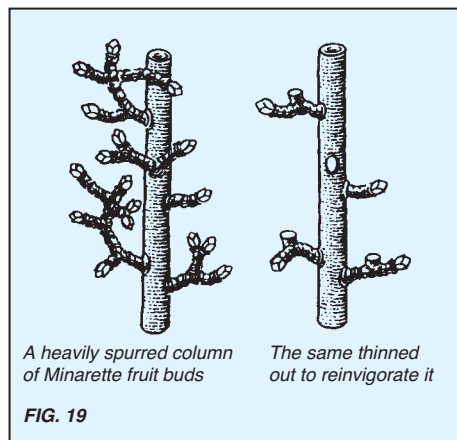
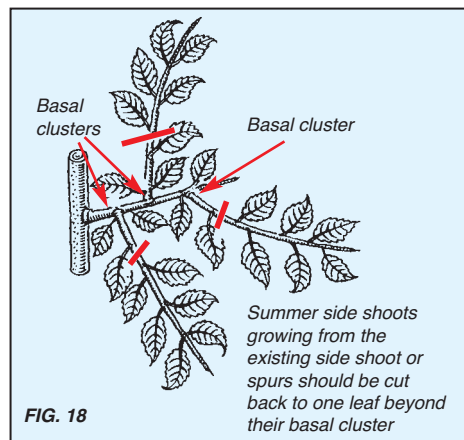
The term 'main stem leader' refers to the new growth which leads a Minarette upwards at the top of the tree (see fig. 16). The leader of a Minarette should be tied to a stake or cane at intervals throughout the summer months whilst it is soft and pliable and still growing, to keep it upright and from growing out at an angle to the main stem. This leader is only pruned in the winter or early spring and involves the removal of one third or more of the growth it made during the previous summer. It should be cut to a bud on the opposite side to the stake. The length of bare stem left after pruning should be no more than 30cm (12in). Once the tree has reached the required height, the leader should be shortened during winter or early spring to about 1cm (1/2in) from the point of origin. The leader is not pruned during the summer months. Pruning of the leader encourages the furnishment of side shoots along its length from which fruiting spurs are made.

## PRUNING THE SIDE SHOOTS

This task is carried out in the summer. A Minarette will start to produce these side shoots from May onwards. The side shoot from a Minarette apple tree will have matured by early to mid-August in the south of England and approximately ten days later in the north. With pears, the shoots will have matured a week or so earlier. When this stage has been reached, summer pruning should commence. The shoots will have woody bases with a basal cluster of leaves and then light green leaves from the young shoots. Any shoots which are less than 20cm (8in) in length should not be pruned. New shoots growing **directly from the main stem** which are more than 20cm (8in) in length should be cut back to about three leaves above the basal cluster (see fig. 17). Any shoots growing **from existing side shoots or spurs** which are similarly in excess of 20cm (8in) in length should be cut back to **one leaf**, about



2.5cm (1in) or more beyond their basal cluster (see fig. 18). The basal cluster is easy to recognise — it is a small cluster of two to four closely spaced leaves at the base of a shoot.



## THINNING THE FRUIT SPURS

As the tree gets older it may be necessary to thin out the number of fruiting spurs, if there are too many (see fig. 19). They should be thinned out during winter months. Reducing the number of fruit buds increases the size of fruit but it must not be overdone.

## PRUNING & TRAINING OF CORDONS

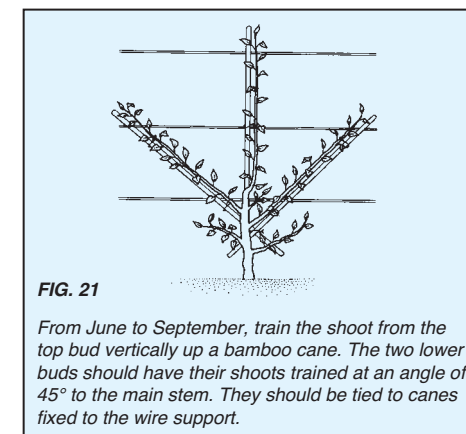
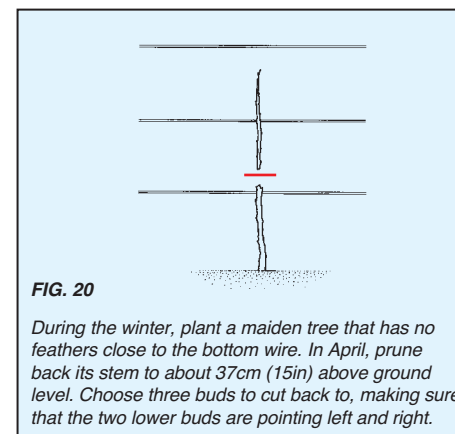
Cordons are usually grown as oblique cordons at an angle of about 45° (see fig. 9). They are trained to canes fixed to horizontal wires 60cm (2ft) apart (three wires for a 1.8m [6ft] fence). Cordons can be trained against fences, walls or on freestanding posts and wires in which case ideally they should be orientated north-south. The tree should be planted with the top of the cordon towards the north so the sun reaches all along its length. If an east-west orientation is unavoidable, the cordon should be inclined towards the east. The tree should be planted at an angle with its scion uppermost; the leader should be pruned by one third to a suitable bud and any side shoots greater than 15cm (6in) in length should be pruned to three or four buds beyond their basal cluster. Formative pruning is largely the same as for Minarettes.

## PRUNING & TRAINING OF ESPALIERS

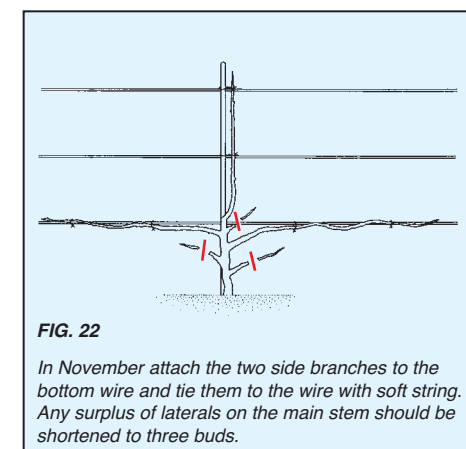
Espaliers can be trained against fences or walls or on freestanding posts and wires. They consist of a central stem with a series of horizontal tiers of branches at intervals of 38-45cm (15-18in). They should have a space of 3.5 to 4.5m (12-15ft) wide.

## FIRST YEAR

It is best to start off with a maiden whip (a one year old tree without side shoots). In April following planting cut back the central stem to a bud at about 37cm (15in) from the ground, ensuring there are two more good buds below on either side facing parallel with the wall. These will form the first two ribs (see fig. 20). In the summer, three shoots should be produced. The topmost should be trained vertically to a cane and the other two to canes at 45°. Any other shoots should be summer pruned to three leaves from the basal cluster of leaves, in early to mid-August (see fig. 21).



Where a feathered maiden is used, if there are two suitably placed side shoots one on each side at around 37-45cm (15-18in) from the ground, these can be used to form the first tier and tied horizontally. The leader should be pruned to three good buds at 37-45cm (15-18in) above this tier. All other side shoots should be shortened to about three buds. Using a feathered maiden effectively saves one year of training but the results might not be so good.



## SECOND YEAR

In the second winter the leader should be pruned back to the second wire to three good buds (normally 37-45cm [15-18in] above the first tier). The side branches should be lowered to the horizontal (see figs. 22 & 23). In the summer the second horizontal tier should be trained in the same way and the extension shoots at the ends of the first tier should be trained at 45°. Any other laterals should be summer pruned to three leaves from the basal cluster of leaves if they arise from the main stem and one leaf from the basal cluster if they arise from an existing spur. This process is repeated until the required number of tiers has been produced (see figs. 24-26).

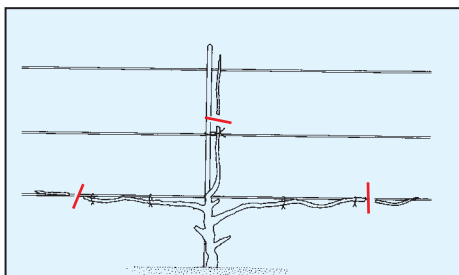


FIG. 23

At the same time, prune back the main stem leader to within 45cm (18in) at the middle wire, ensuring that three good buds are left to form the main leader and two new horizontal branches. If the side branches have not grown well, they should be cut back to one third to downward pointing buds.

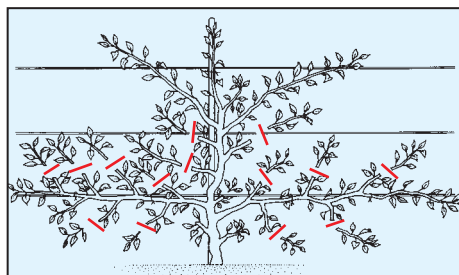


FIG. 24

From July to September, the second tier of branches are trained in the same way as in the previous year. Any growths arising from the main side branches should be pruned back to three or four leaves above the basal cluster. Growth arising from the main stem should be shortened back to three leaves.

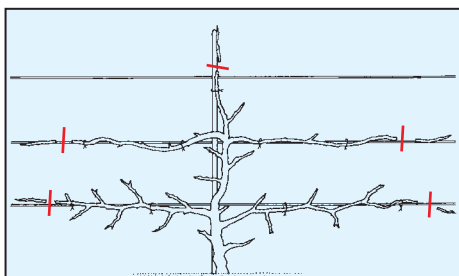


FIG. 25

In the autumn cut back the main stem leader to within 45cm (18in) of the uppermost side branch, ensuring that three good buds are left to form both a new leader and two horizontal branches. Continue as before.

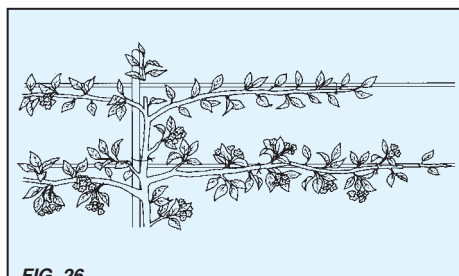


FIG. 26

In late spring, when the last of the tiers have been formed and the tree has covered the space allotted to it, the new terminal growths of the vertical and horizontal branches should be cut back to their origins. Thereafter the side branches should be pruned as if they were cordons.

## FRUIT THINNING

**IN THE FIRST SUMMER** — After planting, fruitlets should be removed at an early stage.

**IN SUBSEQUENT YEARS** — If there is a good fruit set, thinning should be carried out after the natural thinning of fruits (the June drop) at the end of June to the beginning of July. Failure to thin can result in small, poor quality fruit and a tendency for the tree to crop biennially. The small, diseased and misshapen fruit should be removed, leaving the large, well-shaped ones. Thin to one or two fruits per cluster 10-15cm (4-6in) apart for dessert apples and pears, and 15-23cm (6-9in) apart for culinary apples.

## MANURING

In early February each year broadcast over the rooting area:

*25g/m<sup>2</sup> (1oz/yd<sup>2</sup>) of sulphate of potash.*

and in late February for dessert apples:

*35g/m<sup>2</sup> (1¼oz/yd<sup>2</sup>) of Nitro-Chalk (calcium ammonium nitrate) or sulphate of ammonia;*

and for trees grown in grass, pears and culinary apples:

*70g/m<sup>2</sup> (2½oz/yd<sup>2</sup>) of Nitro-Chalk (calcium ammonium nitrate) or sulphate of ammonia;*

and every third year:

*70g/m<sup>2</sup> (2½oz/yd<sup>2</sup>) of superphosphate.*

Alternatively a compound fertilizer may be used annually following the manufacturer's recommendations.

If magnesium deficiency is a persistent problem, in early April each year apply:

*50g/m<sup>2</sup> (1¾oz/yd<sup>2</sup>) of magnesium sulphate (Epsom salts).*

## HARVESTING & STORAGE

### APPLES

To assess when to pick, watch for the first true windfalls (not premature drop due to codling moth). Lift the fruit in the palm of the hand and if it leaves the spur easily with its stalk intact, it is ready for picking. Early apples should be picked before they are fully ripe, and before they become soft and mealy (the pips are often not fully brown when picked). Pick the ripest, best coloured fruits first, usually those near the top of the tree on the south (sunny side). Late varieties should be allowed to hang on the tree as long as possible and their pips should be fully brown when picked but most should be harvested by the end of October except the very late varieties. Fruit should be stored in a cool, dark but frost-free place such as a garage or shed. Apples are best laid on trays and inspected regularly for rot. They will keep longer if wrapped in tissue paper. Apples can also be stored in polythene bags which reduces shrivelling and keeps the fruit clean. Thin polythene bags which hold about 2.5kg (5½lb) of fruit should be used. After filling the bag, the mouth of the bag should be folded over, but not sealed. One 5mm (¼in) diameter hole should be made for every 1kg (2¼lb) of fruit. The holes should be made in different parts of the bag. If the variety 'Bramley's Seedling' is stored in this way twice as many holes should be made, as the fruit can be spoiled by an excessive build up of carbon dioxide. As with other methods of storage, it should be kept in a cool, dark, frost-free place and inspected regularly for rot.

# APPLES & PEARS

## *PEARS*

It is difficult to judge when to pick pears. Early and mid-season varieties should be picked when they are almost ready but still hard. If they are left on the tree too long they become soft and mealy in the centre. There is a very slight colour change from green to pale green with many varieties when they are ready for harvesting. Lift the pear in the palm of the hand and give it a slight twist and a tug. If it is ready it should leave the spur with the stalk intact. The fruit should be stored in a cool, dark place and inspected regularly for rot; early pears ripen a week or so after picking; late pears are picked when they leave the spurs easily and windfalls are a good indication that they are ready. They should be stored in a cool, dark, frost-free place until ripe. Ripening can be hastened, if desired, by subjecting them to normal living room temperatures.