

Blangstedgaard, Odense (Dir. E. Poulsen)

A pruning trial with plums

Beskæring af blommer

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Summary

The effect of pruning on yield and other characters was studied. Entirely unpruned trees were compared with regulated pruned open-centre bush trees and trees which had all vigorous shoots cut back in July; in the open centre trees time of pruning was also compared, November, January and April. The scion varieties 'Althans', 'Kirke' and 'Opal' were used on Myrobalan B rootstocks.

Unpruned trees gave a considerably higher yield than did pruned trees, particularly in the first years of cropping. It is concluded that omission of pruning during the first 4-6 years after planting, depending on cultivar, followed by a light regulated pruning, is probably the most profitable pruning system. Time of pruning did not affect yield or incidence of disease.

Introduction

Few pruning experiments have been carried out with plums and none appear to have been published in Denmark. In Danish orchards plum trees are normally headed back after planting and shaped as regulated open-centre bush-trees. The purpose of this pruning has been to aid development of fruit colour and to facilitate fruit thinning and picking. The pruning has not been considered important in influencing fruit size.

There has been uncertainty about the time of pruning plums. To lessen the risk of infection by bacterial canker (*Pseudomonas mors-prunorum*) and frost injury pruning has traditionally been carried out later than with apples and pears, normally in March/April.

In 1965 a plum pruning experiment was planted out at the research station Blangstedgaard to study the effect of pruning method and pruning time.

Material and methods

Three varieties of plum representing three differing growth habits were used. 'Althans' is a

vigorous, pyramidalshaped variety and is shy to bear fruit. 'Kirke' is weak growing and of medium fruitfulness. 'Opal' is intermediate in vigour, but early and heavy cropping.

Low-worked trees on the vigorous rootstock 'Myrobalan B' were planted as two-year cut-back during the winter 1964-65 at a distance of 6×4 m. The trial was designed with 9 trees of each treatment, distributed within 3 randomized blocks.

Unpruned. Apart from the removal of broken branches, the trees received no pruning at all.

Summer pruned. The trees had their one-year leaders headed back in the year of planting to about half their length. In the beginning of July branch leaders and vigorous laterals were shortened to about half their length. When cropping began some branch thinning was done. The method is a modification of the pyramid-pruning described by Beakbane and Preston (1962).

Regulated open-centre. In the year of planting and the next 2-3 years the main branch leaders were pruned back to $1/2$ - $1/3$ of their length. After the first 3-4 seasons, crowded laterals were thinned out. This method, is common standard practice in Danish orchards and was carried out in November, January and April. However, as an

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analysis of variance showed no significant differences between times of pruning, all regulated-trees are grouped as one treatment in the following tables.

The fruits were hand thinned to uniform distance, since earlier experience had shown that good fruit size could not be obtained by means of pruning alone.

Results

'Opal' gave its first crop in 1966, whereas 'Althans' and 'Kirke' did not come into bearing until 1968. Pruning caused a considerable reduction of yield in the first year of bearing (Table 1).

Table 1. Yield per tree in the first fruiting year (kg)

Treatment	Variety		
	Althans	Kirke	Opal
Unpruned	2.3	8.0	6.9
Summer pruned . .	0.8	1.8	0.1
Regulated	0.8	1.3	0.1

At five years also the unpruned trees had cropped more heavily than had the pruned trees for all varieties (Table 2) Pruned trees of both 'Opal' and 'Kirke' began to yield useful crops but the yield from 'Althans' was low.

Table 2. Accumulated yield per tree at 5 years (kg)

Treatment	Variety		
	Althans	Kirke	Opal
Unpruned	11.9	46	88
Summer pruned . .	2.6	15	42
Regulated	3.6	17	52
LSD ₉₅	3.4	7	13

During the last three years of the trial the difference in yield between, the pruned and unpruned trees was lessened considerably. The accumulated yield at eight years was for all varieties significantly ($P < 0.05$) higher from unpruned trees (Table 3). The two pruning systems did not differ significantly.

Table 3. Accumulated yield per tree at 8 years (kg)

Treatment	Variety		
	Althans	Kirke	Opal
Unpruned	131	185	213
Summer pruned . .	95	128	195
Regulated	96	117	182
LSD ₉₅	26	11	25

Fruit size Fruit size was determined each day of picking on samples of 50 fruits per tree taken at random. The average for five years is shown in Table 4.

Table 4. Fruit size, 1968-72, g per fruit

Treatment	Variety		
	Althans	Kirke	Opal
Unpruned	44	36	25
Summer pruned . .	42	39	25
Regulated	43	40	27

The results show that the higher yield from unpruned trees was not achieved at the expense of reduction in fruit size. Satisfactory fruit size has, as earlier stated, been aimed at by means of fruit thinning.

Discussion

The delay in the onset of heavy bearing that resulted from the pruning treatments is in accordance with the results from similar pruning experiments on apples, although the effect in this case with plums was more pronounced. In a comparable experiment in England *Beakbane and Preston* (1962) also obtained the highest yield on unpruned trees of 'Victoria' plum.

The trees, which had their leaders pruned back in July (Summer pruned) were more compact and somewhat smaller than the other trees. These advantages, however, may not compensate for the considerable reduction in yield and the more labourious pruning treatment involved.

The regulated open-centre trees were easier to harvest and better adapted to fruit thinning by hand than were unpruned trees.

Several workers e.g. *Montgomery et al* 1943,

Moore 1945, Grosse 1954, recommend that the pruning of plums should be avoided in autumn and winter, which are the most vulnerable seasons for infection by Bacterial Canker. However in the comparison of autumn, winter and spring pruning there was, in accordance with *Montgomery et al* (1943), not observed any incidence of Canker. Furthermore, there was no influence of pruning on frost injury or dieback of shoots.

A profitable pruning method would probably take advantage of the considerably higher yield obtained from young unpruned trees by omitting pruning the first 4-6 years after planting. Thereafter the light regulated pruning may facilitate fruit thinning and picking.

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Resumé

Formålet med forsøget var at undersøge beskæringens indflydelse på vækst og bæring hos blommer. Der indgik 3 beskæringsmetoder: Ingen beskæring, tilbageskæring af kraftige skud i juli måned og almindelige kronetræer. Til sidstnævnte metode prøvedes

desuden 3 tidspunkter for beskæringen: november, januar og april. Der benyttedes 3 sorter: 'Althans', 'Kirkes' og 'Opal'.

Ubeskårne træer gav navnlig de første år et betydeligt større udbytte end beskårne træer. Der konkluderes, at ingen beskæring de første 4-6 år efter plantning, afhængig af sortens frugtbarhed, efterfulgt af en årlig grenudtynding formodentlig er den mest fordelagtige beskæringsmetode for blommer.

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