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# APPLYING SUMMER PRUNING TO THE APRICOT TREE CULTIVARS FROM THE R.S.F.G. CONSTANŢA

**Cristina MOALE**

Research Station for Fruit Growing Constanța, No.1 Pepinierei Street, 907300, Valu lui Traian, Constanța, Romania, Phone / Fax: +40.241.231.187

Corresponding author email: moalecristina@yahoo.com

***Abstract***

*Based on the study of favourable factors to the apricot tree culture, Dobrogea was outlined as an area which is highly favourable to the cultivation of this species. The apricot tree is a species which reacts very well to the applying of pruning during the vegetative stage, these cuts being a technological measure which has as goal the diminishing of the risk of losing the yield in the years when late frosts occur in spring. The research carried out at R.S.F.G. Constanța on three apricot tree cultivars, 'Augustin', 'Orizont' and 'Elmar', had the purpose of establishing the best time for performing summer pruning by carrying out in a differentiated manner, according to the type of fructification. The three cultivars reacted well to the variant which included summer pruning carried out in the middle of the month of June, which recommends this moment as being the best for this type of cuts. The 'Orizont' and 'Elmar' cultivars respond well to summer pruning carried out by shortening the annual growths by 20 cm in order to generate the forming of anticipated shoots. The fruit buds formed on these shoots are later differentiated and enter in the vegetative stage 5-6 days later, which ensures that the danger of hoarfrosts and late frosts is overcome.*

**Key words:** *anticipated shoots, growths, summer pruning.*

## INTRODUCTION

The qualitative and technological characteristics of the fruit result in the apricot tree being among the fruit-growing species which are highly appreciated by consumers. The apricot tree culture is widespread in Europe, Asia, America and Oceania; almost 40% of the global production of 3,473,710 tons obtained in 2008 was produced in Europe, followed by Asia with 32%. The largest producer in the world is Turkey (528,000 tons), other large producers being Spain (159,000 tons), the USA (81,000 tons), Italy (212,000 tons), France (180,000 tons), Greece (68,500 tons) and so on. In Romania the apricot tree production in 2008 was of 32,100 tons (Stanica F. et al., 2011). The summer pruning of the apricot trees are based upon this species' characteristic of displaying two or three growth waves in favourable pedo-climatic conditions. Thus, on the anticipated shoots which are usually formed on the superior part of the annual growths, the flowering buds are later differentiated, which means that they can escape the negative effects of hoarfrosts and late spring frosts. The biological characteristic of the apricot tree of issuing anticipated shoots is very useful in case of climatic accidents, the latter being able to partly or even totally compromise the production because of the loss of the flowering buds. On the anticipated shoots which are usually formed on the superior part of the annual growths, the flowering buds are differentiated later, which means that they can resist hoarfrosts and late spring frosts (Cociu, 1993). Previous research has shown that the impact of the climatic changes upon the fruit-growing species is already visible. For example, by the end of the nineteen nineties, the blossoming of the trees in Germany was prolonged by a couple of days (Chmielewschi et al., 2004 şi 2005). The vegetative season in Europe has also prolonged during the past ten years (Chmielewschi and Rotzer, 2002).

## MATERIAL AND METHODS

The research carried out at R.S.F.G. Constanța on three apricot tree cultivars aimed to determine the best moment for applying the summer pruning by means of

performing it in a differentiated manner. The experiment was organised within the research allotment of R.S.F.G. Constanta, situated in Valu lui Traian on a flat terrain with calcareous chernozem (CZKa), with a claylike texture and a low alkaline pH (8.2) in its entire profile. The research was carried out between 2008 and 2011 on the contest crop cultivated in the spring of 2003, at a distance of 4 metres between rows and 4 metres between the trees on each row (625 trees/ha). The shape of the head was that of a vase. The climatic conditions in the area are favourable to the apricot tree culture as far as the temperature and the precipitations are concerned. Taking the latter into account, although the area is considered to be droughty, the apricot trees are constantly irrigated, which solves the issue of the necessary quantity of water. The studied cultivars are indigenous, created at R.S.F.G. Constanta: 'Augustin' (Synonym: VT 34/72), 'Orizont' (Synonym: V.T. 30/103) and 'Elmar' (Synonym: VT 92.01.10*),* grafted on the parent stock Constanța 14 and being part of the apricot tree assortment cultivated in the area. The cultivars are of medium vigour, with a globular head and solid skeleton branches, well filled with leaves. The fructification usually occurs on May bouquets and on one year old branches.

The three cultivars underwent summer cuts during the period of intense growth of the shoots, 5 trees per each cultivar and consisted of shortening all the annual growths which surpassed the length of 40 cm in three variants, as follows: V1 = the shortening of the annual shoots to a length of 20 cm (5 trees), V2 = the shortening of the annual shoots to a length of 40 cm (5 trees) and V3 = the witness (5 trees which did not undergo summer cuts) (Table 1, Figure 1 and Figure 2). After the harvesting, but no later than August 10$^{th}$, maintenance and fruiting cuts were applied to the variant considered as witness, while for the variants which had already underwent summer cuts, correction cuts were applied, consisting of removing the stubs and lessening the anticipated shoots. The number of formed anticipated shoots, their average length, the degree of occurrence and the number of formed shoots per 100 shortened shoots were calculated following measurements in the field at the end of the vegetative season.

Table 1. Experimental variants

| Cultivar | Cutting variant (5 trees) | Development stage of the annual shoots / calendar period |
|---|---|---|
| Elmar | V1= Shortening of the growths to 20 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V2= Shortening of the growths to 40 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V3= Witness (no summer cuts) | - |
| Orizont | V1= Shortening of the growths to 20 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V2= Shortening of the growths to 40 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V3= Witness (no summer cuts) | - |
| Augustin | V1= Shortening of the growths to 20 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V2= Shortening of the growths to 40 cm | Intense growth (June 10$^{th}$ – 20$^{th}$) |
| | V3= Witness (no summer cuts) | - |

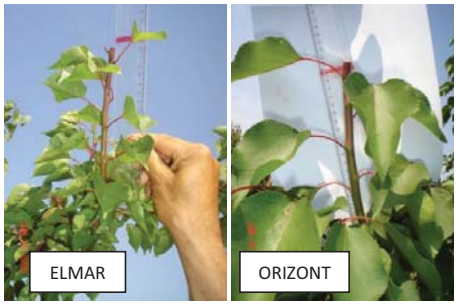

Figure 1. Shortening of the annual growths to 20 cm


Figure 2. Shortening of the annual growths at the Augustin cultivar to 20 cm (left) and 40 cm (right)

## RESULTS AND DISCUSSIONS

The applying of summer cuts generated the forming of anticipated shoots in different manners, according to the moment when the cuts were performed and the shortening of the annual shoots which surpassed the length of 40 cm. Thus, following the cuts performed on the 'Orizont' cultivar (during the period of intense growth of the shoots between June 10$^{th}$ and 20$^{th}$), 76% of the shoots shortened to 20 cm issued anticipated shoots. The figures are different for the other two cultivars: 69% for the 'Elmar' cultivar and 61% at the 'Augustin' cultivar (Table 2).

Following the shortening of the shoots to 40 cm at the 'Orizont' cultivar, 72% of them issued anticipated shoots, while for the other two cultivars the figures are again different: 61% for the 'Elmar' cultivar and 48% for the 'Augustin' cultivar.

As for the variant which did not undergo summer cuts (witness), the 'Orizont' cultivar formed the fewest anticipated shoots (38%), while 'Elmar' formed 48% and 'Augustin', 51%.

Table 2. The impact of summer cuts upon the forming of anticipated shoots (average values for the period 2008-2011)

| Cultivar | Variant | Average length of annual growths (cm) | Capacity of shortened shoots of issuing anticipated shoots (%) | | | | | Shoots which issued anticipated shoots (%) | Total number of anticipated shoots per 100 shortened shoots |
|---|---|---|---|---|---|---|---|---|---|
| | | | Number of issued anticipated shoots | | | | | | |
| | | | 0 | 1 | 2 | 3 | 4 | | |
| Elmar | V1 = Shortening of the growths to 20 cm | 73 | 31 | 19 | 24 | 19 | 5 | 69 | 73 |
| | V2 = Shortening of the growths to 40 cm | 67 | 39 | 12 | 23 | 21 | 5 | 61 | 65 |
| | V3 = Witness (no summer cuts) | 55 | 52 | 21 | 19 | 8 | - | 48 | 56 |
| Orizont | V1 = Shortening of the growths to 20 cm (5 trees) | 94 | 24 | 32 | 29 | 11 | 4 | 76 | 83 |
| | V2 = Shortening of the growths to 40 cm | 78 | 28 | 16 | 21 | 27 | 8 | 72 | 72 |
| | V3 = Witness (no summer cuts) | 68 | 62 | 13 | 19 | 6 | - | 38 | 61 |
| Augustin | V1 = Shortening of the growths to 20 cm (5 trees) | 73 | 39 | 19 | 29 | 11 | 2 | 61 | 71 |
| | V2 = Shortening of the growths to 40 cm | 77 | 41 | 29 | 20 | 7 | 3 | 59 | 61 |
| | V3 = Witness (no summer cuts) | 75 | 49 | 33 | 12 | 6 | - | 51 | 58 |

Considering the studied cultivars, we notice that the 'Orizont' cultivar, a vigorous cultivar with numerous vegetative growths formed more anticipated shoots on the shoots shortened to 20 cm and 40 cm. the number of anticipated shoots varied from 1 to 4 and the data recorded in the field allowed for the calculation in percentages of the degree of occurrence. Also, the percentage of shortened shoots which did not form anticipated shoots ranged between 24% and 62%. The shortened shoots within the three variants (to 20 cm, to 40 cm and without cuts) which issued only one anticipated shoot registered values ranging between 12% and 33%, followed by the shoots which produced two anticipated shoots (values ranging between 12% and 29%).

The shortened shoots within the three variants (to 20 cm, to 40 cm and without cuts) which issued three anticipated shoots registered values ranging from 6% to 27%, followed by the shoots which produced 4 anticipated shoots (low values, ranging from 2% to 8%).

The data concerning the total number of anticipated shoots per 100 shortened shoots

reveal the fact that the cuts applied during the period of intense growth (June $10^{th}$ – $20^{th}$) recorded values ranging between 71 and 83 (for the shoots shortened to 20 cm) and between 61 and 72 (for the shoots shortened to 40 cm).

Taking into account the cultivar, the 'Orizont' cultivar generated the largest number of anticipated shoots when the shoots were shortened to 20 cm (83 anticipated shoots); there 72 anticipated shoots when the shoots were shortened to 40 cm and 61 anticipated shoots when there were no summer cuts performed. The average length of the shoots varied between 55 cm (the 'Elmar' cultivar – the witness variant) and 94 cm (the 'Orizont' cultivar – V1).

## CONCLUSIONS

The studied apricot tree cultivars react well to summer cuts, the best moment for carrying out these cuts being the phenophase of intense growth of the shoots which generally occurs at the middle of the month of June.

The shortening of the growths to 20 cm at the 'Orizont' cultivar generated the forming of anticipated shoots (83%), which differentiated the fruiting buds. These cuts favour the appearance of anticipated shoots and May bouquets (the future fruit formations) from mature buds on the middle third of the shortened shoots (buds with a high potential of becoming fruit formations). The fruit is kept close to the base of the tree, avoiding the fruiting alternation.

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