

POSSIBILITIES OF INTENSIVE AND SUPERINTENSIVE GROWING OF DIFFERENT HYBRIDS AND SORTS DISEASE RESISTANT APPLE

Bucurean Eva*

* University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, evabucurean08@yahoo.com

Abstract

In the ecological conditions in the Oradea area were experienced several apple varieties, planted at distances of 4x3, 4x2 and 4x1 m, falling to hectare 833, 1250 respectively 2500 trees.

The increase in thickness of the trunk compared to trees planted at 4x3 m is decreasing with 11-21% at trees planted at 4x2m, respectively 4x1m.

Fruit production is superior at Romus 2 and H-3-11-41P variety, with 38-40% good results realizing also Prima and Florina varieties.

The distances of plantation positively influence fruit production, increasing the number of trees from 833-1250 per hectare, increasing fruit harvest with 36-110%.

Reduction of tree vigor and production increase while planting a larger number of trees per hectare makes possible the promotion in conditions from Oradea of Florina, Prima, Romus 2 and H-3-11-41P, varieties in intensive and superintensive culture system with densities up to 2500 trees per hectare.

Kei words: apple varieties, increase in thickness of the trunk, distances of plantation, fruit production

INTRODUCTION

The promotion in that concerns the growing of some sorts that prove generic resistance to diseases, is an issue of actual importance on which depends the success of biological pomiculture and the production of competitive fruits. Meanwhile, the correct application of the other technological verges inside the ecologically founded agricultural system imposes the knowledge of the fruit – sorts reaction to these verges.

To this purpose, under the ecological conditions of Oradea (medium multiannual temperature of 10,3 c and the annual precipitation sum of 635 mm) an experiment has been made in which, besides the disease resistance fruit – sort (besides a standard sort Jonagold) were tried tree planting distances according to the intensive and superintensive apple – growing system.

MATERIAL AND METHOD

The research sorts, Florina and Prima, alongside with Romus 2 and Romus 3 have joined the experiment when hybrids (later acknowledged as apple - sorts) as well as the Jonagold sort and the H – 3 – 11 – 41P hybrid have been engrafted on the M106 motherplant and planted in a brown soil with a clay content of 40%.

The planting distance were of 4m between rows and of 3, 2 and 1 in the row constituting as many variants with nutrition space given when planted.

The grown – like – form was freely flatamed and the soil has been planglied.

The fitosanitarian treatments consisted of those applied during the repaus, during vegetation only the insects being fought against.

The observation comprised both the tree growing and the fruit production.

RESULTS AND DISSCUSION

The growth in thickness of the tree is presented in Table No.1. On the basis of the medium data, one will notice in the table that the shorter planting distance reduce the vigour of a tree with 11 – 21% (as trees have been planted at distances of 2 and 1 m comparative to those planted at a 3 m distance).

These data allow us to state that no matter what the vigour of tree sorts and mother plants, by reducing the planting distance, the trees diminish their vigour with up to 34% in the case of Jonagold in what concerns the tree sort, the less vigorous is Romus 2 fact which justifies its planting at short distances.

The tree sorts Romus 2 and florin have a greater vigour, but this is not at a limit, which should exclude their planting at 2, respectively 1 m distance.

Tree fruit production presents in table No.2 gives us information about the productive potentiality of tree sorts and their behavior under these circumstances depending on their space at planting.

Regarding the second aspect (distances) we can notice a situation opposite the growing vigour in the sense that reducing the distance between trees on the row, the production grows on an average with the six tried tree sorts from 12,4 t/ha for the kinds with the trees planted at 4x3 m to 16,9 and 21,1 t/ha by simply reducing the distance on the row at 2 and 1 m. Romus 2 sort is the most productive one which goes over 23 and 27 t/ha when the trees were planted at 4x3 and 4x2 while at 4x1m distance the h – 3 – 11 – 41P is more

productive, giving 47 t/ha. As it is normal, the Jonagold sort gave the lowest production that is 8,8 t/ha without any treatments against diseases.

It is to be remarked the Florina tree sort, which reaches an average production of almost 20 t/ha on the tree distances of planting.

By planting a large number of trees, the production of this tree sort doubles and triples increasing from 8,3 t/ha for the kind with 833 trees to 17,2 t/ha for the kind with 1250 trees/ha and to 27,6 t/ha when 2500 trees/ha were planted.

CONCLUSIONS

The tree sorts and the hybrids with genetic resistance to diseases (*Venturia* and *Podosfera* species) analysed under the conditions of Oradea and planted at distances of 4x3, 4x2, 4x1 have involved differently in respect of the vigour of trees and of the obtained production of fruits.

After eight years, the Romus 2 sort has not reached at covering the reserved place by the planting at 4x3 because of its reduced vigour, a fact that imposed it to be planted at smaller distances.

The production of fruits has enormously increased as more trees/ha have been planned, the production being of 12,4 t/ha for the sort with 833 trees, of 16,9 t/ha when 1250 trees/ha were planted. The weakest response was given by Romus 2 which has not offered a significant production according to the number of planted trees although is offered the best average crop of 26,4 t/ha on the trees planting distances on a row.

The Florina and Prima sorts gave an average production of 19,8 and 17,2 t/ha, which is over the average of tree – sorts or very close to it.

The results referring to the vigour of tree – sorts and to the production of fruits make us recommend their expansion in planting and the promotion of the superintensive system with planting of over 1560 trees/ha.

Taking into account the making of the fruits, the proportion will be more reduced for the summer and bigger for the Prima and florin sorts in autumn and winter.

These five sorts with genetic resistance to diseases may constitute the sort for future orchards, intensive and superintensive orchards in the biological pomiculture system.

The growth in thickness was much obvious at the trees with a bigger place of nutrition (4x3 m = 833 trees/ha) and it has been diminished with up to 21% as the place of nutrition was reduced by planting 1250 and 2500 trees/ha. According to the place of nutrition, the much vigorous sorts: Prima, Florina and Romus 2 have occupied it in the first four years since planting and they have been kept in the limits of distances reserved at planting by yearly cuttings.

Table .1

The growth in thickness of the trunk at some sorts and hybrids of apple depending on the place of nutrition reserved at planting

Nr. crt.	The apple sort (hybrid)	V1=4x3m=833 trees/ha		V2=4x2m=1250 trees/ha		V3=4x1m=2500 trees/ha		The average sort x distance	
		cm	%	cm	%	cm	%	cm	%
1.	Jonagold	42	111	34	100	28	93	35	103
2.	Florina	40	105	34	100	27	90	34	100
3.	Prima	40	105	36	106	31	103	36	106
4.	Romus 2	40	105	38	112	33	110	37	100
5.	Romus 3	31	82	27	79	30	100	29	85
6.	H - 3 - 11 - 41P	35	92	38	112	30	100	34	100
The Medium	cm	38	100	34	100	30	100	34	100
	%	100	-	80	-	79	-	-	-

DL	5% = 4,5	4,1	3,6	4,1
DL	1% = 6,9	6,2	5,5	6,2
DL	0,1% = 11,1	9,9	8,8	9,9

Table 2

The production of fruits at some sorts and hybrids of apple depending on the place of nutrition reserved at planting

Nr. crt.	The apple sort (hybrid)	V1		V2		V3		The average distance x sort, hybrid	
		4x3m – 833 trees/ha		4x2m – 1250 trees/ha		4x1m – 2500 trees/ha		T/ha	%
		T/ha	%	T/ha	%	T/ha	%		
1.	Jonagold	6.3	51	8.3	49	11.5	42	8.8	47
2.	Florina	8.3	67	17.2	102	27.6	106	19.8	105
3.	Prima	14.6	118	15.1	89	22.0	84	17.2	91
4.	Romus 2	23.4	189	27.2	16	28.7	110	26.4	140
5.	Romus 3	10.8	87	14.2	89	19.7	75	14.9	79
6.	H – 3 – 11 – 41P	11.4	92	19.3	117	47.2	181	25.9	138
The average sort x distance		12.4	100	16.9	100	26.1	100	18.8	100
The different of V1%			100	4.5	136	13.7	210	-	-

DL	5% = 1,5	2,0	3,1	2,3
DL	1% = 2,2	3,0	4,7	3,4
DL	0,1% = 3,6	4,9	7,6	5,5

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