

# THE INFLUENCE OF FRUIT EARLY PRODUCTION ON CAPITAL INVESTMENTS RECOVERY

## INFLUENȚA PRODUCȚIEI PRECOCE DE FRUCTE ASUPRA RECUPERĂRII INVESTIȚIILOR CAPITALE

**PEȘTEANU A.**

State Agrarian University of Moldova

**Abstract.** *The investigations were made in the orchard of Ltd “Codru-ST” founded in 2004 with “knip-baum” apple trees of Idared, Golden Reinders, Jonagold Decosta, and Țampion varieties, grafted on M9 rootstock. It was also studied the plantations productivity in the first four year after plantation and its capital investments recovery. It was established that the precociousness of the plantation fructification and soil biologic features diminishes the period on the recovery of directed capital investments. The obtained production of at the varieties under consideration in the first four years after plantation was 57,00-69,11 t/ha. The best results registered the variety Golden Reinders, which is 69,11 t/ha. High qualitative production the fourth year after plantation to recover the capital investments to have an index of 112,6-134,7%, registering a considerable profit for Golden Reinders variety.*

**Rezumat.** *Investigațiile au fost efectuate în livada SRL „Codru-ST” fondată în anul 2004 cu pomi de măr de tipul „knip baum” soiurile Idared, Golden Reinders, Jonagold Decosta și Țampion altoite pe portaltoiul M 9. S-a studiat productivitatea plantației în primii 4 ani după plantare și influența ei asupra recuperării investițiilor capitale. S-a stabilit că precocitatea fructificării plantației și particularitățile biologice ale soiului diminuează perioada recuperării investițiilor capitale direcționate la înființarea livezilor. Producția cumulată la soiurile în studiu în primii 4 ani după plantare a constituit 57,00-69,11 t/ha. Cele mai înalte rezultate s-au obținut la soiul Golden Reinders 69,11 t/ha. Producția înaltă, calitativă și fructificarea precoce a permis ca în anul 4 după plantare recuperarea investițiilor capitale a constituit 112,6-134,7 % înregistrând un profit considerabil la soiul Golden Reinders.*

The concept and program of fruit-growing development in the Republic of Moldova foresee that till 2020, orchards surface to be about 100000 ha, and the global fruit yield 980000 tones (7). To find solution for these decisions, it is recommended that the plantations with a higher productivity to be maintained, and on the new lots to plant the new ones that have a perspective with a higher productivity potential (1,2).

Fruit growing plantation establishment with effective varieties the use of modern technologies permit to have an early yield in the second and third year after plantation, a productivity of 30-35 t/ha of high qualitative fruit and a total reimbursement of investments for plantation foundation and supervision in the given period (3,5,7).

Lately, in the countries with an advanced fruit-growing, the producers of fruits more and more often create orchards with 2-year old planting material of “knip-baum” type that correspond to the mentioned requirements and permit to obtain early production of 4-5 kg/tree, and in the fourth year -15-18 kg/tree (4,7).

## MATERIAL AND METHOD

The investigations were made in an orchard founded in 2004 at Ltd "Codru-ST" with the support of Holland government. For plantation were used crowned 2-year old apple trees of "knip-baum" type imported from Holland of varieties: Idared (variant control), Golden Reinders, Jonagold Decosta, and Čampion, bench grafted on rootstock M9. The apple tree are formed after the thin ameliorated fusiform crown and planted at a distance of plantation 3,25 x 1,25m.

Plantation productivity was established in the harvesting period for all variants taken into the study. Capital investments recovery were made by determining real expenses when was established fruit growing plantation. The cost for planting material, supporting elements, system of irrigation and the price by selling fruits have corresponded in that year with the real prices of the market from the Republic Moldova (3,5).

## REZULTS AND DISCUSSIONS

For the accomplishment of the concept about fruit growing development, the next following years it is planned to enlarge the surface of the plantation. The intensive culture of fruit growing varieties requires significant capital the beginning of fruit bearing.

The obtained results (table 1) demonstrable the apple-trees have fructification from the 1 year after plantation on terminal buds of the obtained selleptic shoots in the fruit nursery. According to the variety biologic characteristic features, the yield was 0,71 – 1,03 t/ha.

With plantation age, the fruit productivity increases. In 2005 the fruit production was 11,91 – 18,11 t/ha. The highest productivity was registered at Jonagold Decosta variety – 18,11 t/ha, and the lowest one registered the Golden Reinders variety – 11,91 t/ha. The varieties Idared and Čampion the fruit yield constituted 13,53 and respectively 13,88 t/ha.

In 2006 the fruit production of varieties under the study constituted 17,62 – 26,60 t/ha. The highest yield was registered at Golden Reinders variety – 26,60 t/ha. Idared and Jonagold Decosta varieties productivity constituted 19,56 – 20,59 t/ha. Čampion variety the yield constituted 17,62 t/ha.

The 2007 year was a very difficult year for fruit – growing plants and not only, because of the atmospheric rain – fall insufficiency and with high temperature of + 30<sup>0</sup>C that both have stopped the photosynthesis process and diminished the plantation productivity with 30 – 35%.

The most productive variety was Golden Reinders with 29,57 t/ha. Next varieties were Čampion, Idared and Jonagold Decosta where the fruit production constituted 27,82; 23,20 and respectively 23,05 t/ha.

The obtained results regarding the productivity of apple tree plantation founded with "knip baum" apple trees, demonstrates us that in the second year after plantation productivity can be of 30-35 t/ha of qualitative fruit, in case when the favorable climatic conditions for apple tree development.

The investments made demonstrate us that the volume of investments for plantation foundation is determined by the effective expenses for preparing the lot, plant material cost, supporting elements of apple trees, system of irrigation and no biological features of the soil.

The expenses of the varieties under the study for the foundation of 1 ha of orchard constituted 157400 lei, including for the lot preparation and apple tree plantation 13900 lei, plant cost for planting material 111700 lei, elements for supporting the apple trees 28700 lei, system of irrigation 13400 lei.

*Table 1*

**The fruit productivity on plantation at different apple tree varieties planted with trees of “knip-baum” type**

Variety	2004	2005	2006	2007	Accumulated production
Idared	0,71	13,53	19,56	23,2	57,00
Golden Reinders	1,03	11,91	26,60	29,57	69,11
Jonagold Decosta	0,73	18,11	20,59	23,05	61,48
Čampion	0,78	13,88	17,62	27,82	60,10
DI 5%	0,21	1,75	2,64	3,24	-

The expenses of orchard supervision during the four years after plantation depend on biological features of the soil. The greatest expenses of supporting the plantation in the given period were registered at Golden Reinders variety 86000 lei due to a high yield fruit production of 69,11 t/ha. For the other varieties, the expenses were 70500 - 73700 lei/ha.

The total investments are very linked with the expense made for supporting the plantations depending on variety, because those from its foundation are identical. The mentioned indicator for Golden Reinders variety constituted 237400 lei/ha. At the varieties Idared, Jonagold Decosta and Čampion the obtained values constituted 227900, 230100 and respectively 231100 lei/ha (table 2).

*Table 2*

**Capital investments recovery for apple tree foundation and supporting with “knip-baum” apple trees depending on the biological features of the soil, 2004-2007 year.**

Variety	Investments at orchard foundation, thousand lei/ha	Investments for supporting the orchard, thousand lei/ha	Total Investments, thousand lei/ha	Producti on value, thousan d lei/ha	Investments recovery, %
Idared	157,4	70,5	227,9	256,5	112,6
Golden Reinders	157,4	80,6	237,4	319,6	134,7
Jonagold Decosta	157,4	72,7	230,1	274,7	119,4
Čampion	157,4	73,7	231,1	271,2	117,4

The value of the global production depends directly on the obtained yield quantity, quality and selling price. The highest values during the investigations registered Golden Reinders variety 319600 lei/ha, then Jonagold Decosta 274700 lei/ha, Čampion 271200 lei/ha and Idared 256500 lei/ha.

The investments recovery is the main indication of the entire activity of the fruit growers. For the recovery acceleration of the extremely high expenses appears the necessity to reduce the period of entering of early fruit production and to obtain high and qualitative production in the first years after plantation.

In the forth year of exploitation of the plantation, the total investments were completely recovered and Golden Reinders variety registered 134,7 %, Jonagold Decosta 119,4 %, Čampion 117,4 % and Idared 112,6 %.

It was established that the early fruit production will permit to recover all the investments for plantation foundation with apple trees of “knip-baum” type in the fourth year after plantation and show the tendency to obtain a sort of profit.

## CONCLUSIONS

1. The first yield was registered in the year when the orchard was planted, the fruit production was 0,71 - 1,03 t/ha. The accumulated fruit production was registered at the variety Golden Reinders – 69,11 t/ha, followed by the varieties Jonagold Decosta – 61,48 t/ha, Čampion – 60,10 t/ha and Idared – 57,00 t/ha.

2. To accelerate the investments recovery it is suggested to reduce the period of entering on early fruit production and to obtain high and qualitative yields (10 t/ha) from the second year after plantation. The requirements correspond to the founded plantations with apple trees of “knip-baum” type.

3. Formation of modern apple plantations of “knip-baum” type require significant capital investments – 157400 lei/ha.

4. In the fourth year after plantation foundation, the total investments recovery constituted 112,6 - 134,7 % depending on the biological features of the soil.

5. It was established that the early harvest permit in the fourth year of plantation exploitation to have a complete recovery of the total investments and to obtain a sort of profit.

## REFERENCES

1. Babuc V., 2000 - *Arhitectura plantației pomicole – factor determinativ al productivității*. Probleme și perspective în pomicultură, Chișinău, p. 22-29.
2. Balan V., Gh. Cimpoeș, M. Barbăroșie, 2001 - *Pomicultura*. Chișinău, 453 p.
3. Barbaroș, M., Barbaroș, N., 2003 - *Eficiența economică a investițiilor capitale în cultura speciilor bacifere //70 ani ai UASM/ Simpozion Științific Internațional*. Chișinău, p.89-91.
4. Ghena N., Braniște N., Stănică F., 2006 - *Pomicultura generală*. București, p. 470-483.
5. Peșteanu A., 2004 - *Eficiența economică de producere a merilor în funcție de structura plantației*. Lucrări Științifice UASM/ Chișinău, vol. 12, p.54-58.
6. Rapcea M., Mladinovi V., Babuc V., Dadu C., Donica I., Bucarciuc V., Țurcanu I., 2002 - *Concepția dezvoltării pomiculturii în Republica Moldova pe anii 2000-2020 / Cercetări în Pomicultură*. Chișinău, Vol. 1, p. 4-17.
7. Sadowski A., Bernacki A., Zoltowski T., 2005 - *Effectiveness of use of different types of trees for establishment of apple orchards/ International Conference „Environmentally Friendly Fruit Growing”*. Tartu, p. 36-44.