

Conditions of rentability in the apricot industry of Hungary

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Summary and conclusions: Total investment costs of an up to date apricot plantation requires about 5000 thousand HUF/ha. Modern plantations yield under normal conditions 15–20 t/ha with 80% quality for fresh consumption. Consequently, taking the life span of a plantation (15 years), the internal rate of return of 15–17% per year (IRR), that means that the costs of investment will be regained in the 9–10th year, which is considered to be satisfactory. However, weather hazards (frost, hail) may occur at a probability of 20–25%, therefore, maintaining the quality (80% for fresh consumption) and yields (15–20 t/ha) are badly needed to speak about rentability. This level of yields maintains the option of feasibility up to 20–25% losses.

Key words: apricot, economy of fruit growing, competitiveness

Introduction, raising the question and setting the target

Fruit production is one of the main economic activities of Hungarian agriculture. A considerable fraction of human resources and billions, 8–10% of gross income of agricultural production and of technical capacity is represented by that branch (Z. Kiss, 2003). An important role of fruit growing is the utilisation of less fertile land and underdeveloped countrysides (Papp, 1999). The shrinking tendency of the branch is partly due to the deterioration of the conditions and technical tools of production. In addition to those negative tendencies, a new impetus started about a half decennium with new commercially advantageous varieties and intense technologies being successful and are promising marketable fruits all over Europe (Mihályka, 2004). The present Hungarian conditions do not approach the possibilities offered by the new technologies yet (Lux, 2005).

If we consider the tendencies in recent fruit growing practices, we should be prepared to meet difficulties in marketing, declining safety and producer's prices, which require increasing performance and reserves to bridge over the intermissions and consequences of hazards. Apricot production is also subject to these phenomena. We attempt to find answers to the question, what are the conditions of an economically sustainable apricot producing enterprise to be maintained. An investment for an apricot plantation is planned for a 15–20 year-long period. Therefore, the success of the investment cannot be recognised from the data of a single, nay, of a few year's economic evaluation. The data for one year do not represent all the cares and costs, which are necessary for the plantation especially when the income

of the first years is still lacking, and the balance of inputs and outputs will vary over years within wide intervals. Therefore, our aim is to consider the whole cycle, i.e. life span of an investment.

Material and method

In the present study, we chose and analysed the costs and incomes of a highly up to date plantation and cultivated on a half-(semi) intense level. The parameters of the object are explained:

- Grafts are on Myrobalan rootstock,
- Crown form: vase or compact vase,
- 5.0–6.0 m rows, 3.0–4.0 m distances, i.e. 400–650 tree/ha planting density,
- Structure of varieties: “traditional” and “up to date” varieties together,
- Irrigation (dripping or microjet system),
- Harvesting technology: manual,
- Yields of prosperous seasons, i.e. 15–20 t/ha, (80% for fresh consumption. 20% for processing),
- Product offered: M10-type trays, manually selected, immediately sold, mainly fruits of especially 35–50 mm size (no costs of storing, packing and mechanical sorting are calculated)

That type of plantation means a characterisation with extra large yields, high quality (size, maturity), high expenditure, strict cultivation technologies. It's important that these parameters are representing the upper one third level in Hungary.

The structure of expenditure (materials, manual labour, mechanised phases) was calculated as prices and prime costs on the level of 2010–2011 without turnover tax. Personal costs are taken with accessories independently from the status of family members. The sales' results are taken from the last 3–5 years' history.

The economic analysis of the investment was performed either by static terms or dynamic terms. The latter one appreciates the time component of the use of money (*Illés, 2002*). For the dynamic analysis of investment we need more components, as NPV (Net Present Value) and DPP (Discounted Payback Period), and IRR (Internal Rate of Return, which is proportional with the investment). The return of the investment should be compared with the rate of interest of the economic environment (*milieu*), which is esteemed to be 7% in our study.

It should be emphasised that the model (plantation) in question is of a good management and serious discipline as postulated, where not only mean Hungarian premises have been adopted, but progressive enterprises, which represent around 20–40% of the best apricot plantations. We do not stick to the idea to be the only valid alternative and cannot be applied to any other enterprise. It is by all means based upon realistic premises being aware to be variable on a broad scale.

Results

The investment costs of an up to date semi-intensive plantation may vary in its properties between opposite extremities (*Table 1*). As using Myrobalan rootstocks, the necessity of a supporting system could be neglected. However, the thrifty dripping irrigation system is an organic component of the modern system. The majority of costs is due of the planting material. Traditional varieties cost 600–800 HUF per graft, while new, modern varieties much more, i.e. 2000–2500 HUF/graft. The planting density may vary between 417 and 666 tree/ha. We may find large differences (possibly 500–700 thousand HUF/ha) depending on the varieties chosen. As for a new apricot plantation we may calculate 1.5 million as well as 3.5–4.0 million Ft investment. For the present model we postulated a mixed composition and take 1400 HUF/tree as a mean, which makes 2.5 million Ft for planting material. (*Table 1*).

Table 1 – Investment costs of a semi-intense apricot plantation with mixed varieties for 1 hectare

Items	Min.–max. planting costs (1000 HUF/ha)	Mean (1000 HUF/ha)
Soil preparation	400–600	500
Supporting system	0	0
Grafts and Planting	350–1300	750
Irrigation system	600–1200	900
Other	200–500	350
Investment altogether	1550–3600	2500

Source: original data & calculation

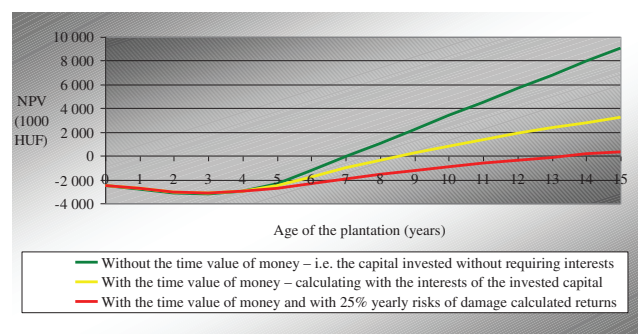
Table 2 – Money flow of the enterprise studied around the start of fruiting

Age of the planting	Yield (t/ha)	Expense (1000 HUF/ha)	Income* (1000 HUF/ha)	Revenue (1000 HUF/ha)
1. year	0	300	0	–300
2. year	0	350	0	–350
3. year	2	400	300	–100
4. year	5	600	750	150
5. year	10	850	1500	650
Total	17	2500	2550	50
Clean costs of investment (to be amortized) = 2500–50 = 2450 thousand HUF/ha				

Source: original data & calculation

In *Table 2* we showed the process of the first 5 years of starting yields, when the expenses of cultivation are nearly equal with the sums of income, consequently, the basis of amortization will be the investment of the planting. The first 2–3 years bring no income at all, but beginning with the 4th year the yield grows precipitously and cover the costs of cultivation.

The calculations of economy for single years do not reflect clearly the economy of the enterprise, because the costs of investment should be equalised too, not only the years without income, nay, also the bad seasons, when losses may outstrip the incomes. The main aim of our analysis is to evaluate the economy of the whole life cycle of the plantation. This is expressed in *Figures 1–3*, where the NPV values are shown in a 15 year old plantation, as the cash flow is presented already diminished by the interests of the amortization subtracted already. The investment will be paid off, when the NPV will be less than the income.

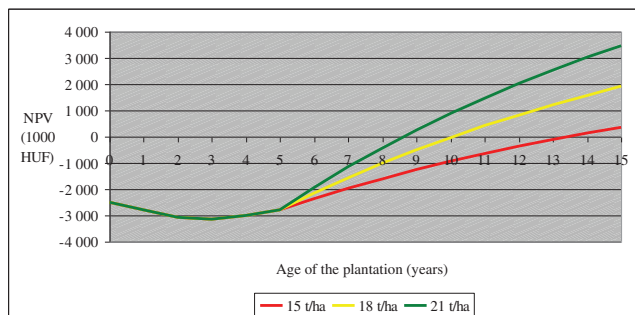


Source: original calculations

Figure 1 – Calculation of the conditions of returns in a semi-intense, up to date apricot plantation

Figure 1 is aimed to show how the economy of an enterprise could be characterised on the long run with and without the appreciation of the DPP (the time value of money).

We can state that – without the time value of money – until the end of the 15 year long period an additional sum of money has been raised over the sum of the investment, which is equal with a 9 000 thousand HUF/ha cash flow, the static time of its return was 8 years. If we calculate



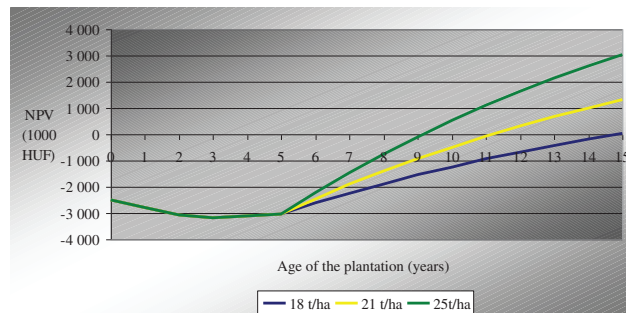
Source: original calculations

Figure 2 – Calculation of returns as a function of yields at the same prices (yearly 25% damages calculated as a realistic risk)

the interests of the invested capital, it reproduces the costs of the investment, the whole picture become more comprehensive, as the set target of 7% interest was reproduced, moreover, the additional income is 3200 thousand HUF (the latter being the NPV). All those are the revenue of the 9th year, when the dynamic payback period (DPP) expired and the capital-proportional cash flow (IRR), 16% is also involved, so the whole business could be judged to be prosperous. Up to this point, we calculated for each year 15 t/ha yields, which is hardly realistic because climatic risks (frost and hails) or other accidents may cause damages for more than a single year. Estimation of experts justify the probability of 25% damages on the long run, which have consequences as 400 thousand HUF/ha NPV, its dynamic return needs 14 years and the NPV is only a modest 400 thousand HUF/ha, whereas the IRR approaches the minimum of rentability of 8.3%. In *Figure 2–3*, we consider this last situation as more realistic (red line) as a basis to deal with the economy of the enterprise.

In *Figure 2*, it is clearly expressed that on the long run, we have to calculate 25% probability of damages, which require, at mediocre prices, 18–21 t/ha yields and 13–16% IRR to regain the money invested after 9–11 years (DPP) and 2000–35000 thousand HUF/ha NPV, which is considered to be an acceptable result.

Under circumstances of unfavourable conditions, especially low producer's prices presented in *Figure 3*, yields more than 20 t/ha are needed. Soon as the producer's prices diminish by 15%, the mean yields of the prosperous years, 18 t/ha, (and the yearly calculated 25% damage) will be sufficient only for gaining the minimum needed to be successful, and taking yields of 21 t/ha, we will earn 1330 thousand HUF/ha NPV in the 12th year of the plantation with 11.1% IRR. In order to gain a revenue, which is considered acceptable, i.e. 3000 thousand HUF/ha NPV, about 15% IRR and a return in the 10th year, we need in a prosperous year about 25 t/ha yields at least.



Source: original calculations

Figure 3 – Development of the economy of apricot growing as a function of yields at low producer's prices (when prices are lower by 15% than the average)

Conclusions and suggestions

The investment of an up to date apricot plantation is around 5000 thousand HUF/ha. This type of plantation is able to yield 15–20 t/ha with 80% best quality for fresh consumption. For the whole life span of a planting (15 years), 15–17% of inner rate of return (IRR) and a full return of investments in the 9–10th year, is rated as acceptable. The probability of weather hazards (frost and hail) is about 20–25%, therefore they need a compensation in prosperous years. Taking the 80% of best quality, the yields should attain 15–20 t/ha at least in order to maintain an economically sustainable apricot production. If yields could be maintained on this level, the 20–25% hazards would not jeopardize the prosperity of enterprise.

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