

ECONOMIC EFFECTS IN TOBACCO SEEDLINGS' PRODUCTION

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Abstract: Production of occidental type of tobacco seedlings (*Barley* and *Virginia*) in our country, so far has been organized in traditional way. It considered tobacco seedlings production in semi hot hotbed, which has been heated with manure. Tobacco seedlings' production in qualitatively new way considers seed sowing in *Todd's systems*. The goal of this kind of researches is to compare these two ways of seedlings' production in economic way, i.e. determination of production's total costs when product is produced by traditional and by modern way, in *Todd's systems*.

Key words: tobacco seedlings, *Todd's systems* production, economic effects of production.

Introduction

The tobacco represents the source of incomes for about 3000 families and also it is among the most important plants used for industrial processing. The main and by products are used in many industrial branches, e.g. in tobacco industry, pharmacy, cosmetic industry, food processing industry, chemical industry etc. This plant is very adjustable to changed conditions of production and nowadays is grown at huge geographical area. In the tobacco production two basic ecological types dominate – oriental and occidental type. The occidental type gives higher and stable incomes, so the tendency of our agricultural producers is to change the assortment on their manufacturing areas. The change of assortment means also the accepting of new technology of tobacco seedlings developed at the beginning of 80's during last century.

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The tobacco production is decreased after privatization of tobacco industry. Serbia has small area per producer and production varies according to regions and tobacco type. The most of purchased quantities of oriental tobacco is of third class, *Berley I*, while *Virginia* type has uniform presentation of all classes. The redemption prices have been decreased from year to year with tendency to be in compliance with classes.

The goal of this paper is to mark advantages of new technology in seedlings' production and to close it to the producers. By this the pre conditions for its application in mass production will be achieved and also in compliance with ways adaptable for occidental tobaccos. In the same time, the economy of seedlings' production in modern way is compared and followed against traditional production by these researches.

Materials and Methods

Two ways of occidental tobacco seedlings' production, type *Berley*, are included by these researches. The first way represents the tobacco production in semi heated hotbeds of 10m x 1,2m, which are filled with mixture of half burnt horses' manure, sand and with fine particles of soil previously sieved. This mixture is decontaminated by methyl bromide before sowing in compliance with producers' specification. After seven days the manual sowing is done by seeds mixed with sand. Further measures of breeding and protection of crop in hotbeds are done in compliance with traditional tobacco production.

The first time when seedlings' production in Todd's systems was applied in our country was in 2003. The first knowledge and practical application of tobacco seedlings' production in Todd's systems were based on experiences of Croatian producers (Tursic, I.). The use of methyl bromide, the dangerous chemical used in soil preparation, is avoided because the soil substratum is not used. The research is done in plastic house of 30m x 8m. The styrene supporters with trays filled with peat, perlite and vermiculite, as also with particular substances which accelerate germination, emergence and further growth of plants, are set on nutritive solution. One tobacco seed is sown in every cell. Further measures of breeding and protection of tobacco were done according to recommendation of Ivan Tursic (Float system).

The phenological observations have shown that the pre seedlings in Todd's systems have grown earlier (from seven to ten days), so the harvest could be done later, i.e. in more favorable conditions. Beside previously mentioned, the seedlings were more uniformed in their growth. Such kind of seedlings is easier to replant with tobacco planters. It is important to mention that the crop in hotbeds were healthier even with smaller amount of plant protection means that were used.

Results and Discussion

Serbia is a great importer of dried tobacco leaves as also the components for cigarettes' production. According to statistic data the average annual deficit of our country is about 75 000 000 EUR. The most of the import is from EU countries, particularly from Germany, Austria and Switzerland (more than 50%). Our country is not competitive on international market at the moment, so the domestic cigarettes can be sold only in Bosnia and Herzegovina.

The production of seedlings done in more qualitative way has started in Ontario (Canada) during 80's of last century. The name of the author George Todd was taken for the name of this kind of breeding and it is called Todd's system (*Tobacopedia-Seedling production*) or Todd's cells. Better results at the very start of breeding by this method facilitated the application of this technology during 90's of last century in Europe and in our country in 2003 in manufacturing area of enterprise for production and processing of tobacco „Senta and Coka”.

Beside modern technology it is important to find the most advantageous assortment which will give the best results in our agro ecological conditions (Glamoclija, Dj.). The well known fact is that the tobacco's properties depend on applied agro techniques and conditions. So it is necessary to involve the standards in technological process of production which will preserve morphological, chemical, physiological and manufacturing properties of leaves used in processing. Technological standards should be determined for every introduced type, so it could be modulated to new breeding conditions. Producers need to create more important difference in price among classes. For example, in Virginia type the difference between 1st and 3rd class is 30 cents and for Berley that difference is 45 cents.

The seedlings' production in semi hot hotbeds. It is necessary to construct four to six hotbeds (10m x 1,2m) per ha in which the seedlings will be produced (table 1.). For 1m is necessary 1,5 to 2,0g of seeds. The price of one stipe of seedlings is 0,0001 .

Tab. 1. – Expense Specification (Traditional Seedling Production)

PRODUCTION MATERIALS	PRICE (€)
Plastic wrap 10m x 1,2m	10,50
Sieved manure	1,88
Methyl bromide	9,00
Sieved sand	0,30
Tobacco's seeds (non pilled)	66,00
Water	0,25
KAN	0,63
Confidor	1,88
Cineb	0,63
Sal 12	0,25
Physical work	50,00
TOTAL	141,32

The seedlings' production in Todd's cells. It is necessary to have 116 containers per one ha or in other words about 22000 plants (Table 2). Comparing with traditional way of seedlings' production less space is necessary because the traditional way needs five hotbeds for 25000 stipes (plants). Every container has 209 openings in every opening is per one pilled seed. 95% of plants emerge which is better comparing to traditional way (for 20%). The price of one container is 1,25 . For producers the most important thing is that this kind of production gives more uniform growth of seedlings, better developed root system and earlier maturing of plants. Beside the fact that expenses of modern way of seedlings' production are higher, we must have on mind that the yield of tobacco is higher for 30-35%. Increased total expenses for construction of plastic house in the first year should be arranged during ten years which is the life time of the object. So the expenses for creation of Todd's cell are following (table 2).

Tab. 2. – Expense Specification (Todd's systems)

PRODUCTION MATERIAL	PRICE (€)
Plastic house 30m x 8m x 3,6m	4762,47
TUV white plastic wrap 12m	191,06
Black plastic wrap 8m	121,10
Circular pump	65,85
Timber 2 (9m)	34,60
Timber 1 (4m)	15,35
Okiten pipes	15,60
HNO ₃	13,41
CaNO ₃	14,76
Ferticare IV	40,76
Containers (supporters)	681,19
Seed	352,74
Basic substrata	366,76
Physical work and electric energy costs	187,00
TOTAL EXPENSES	6877,15

For comparison of these two ways of seedlings' production it is necessary to do differential (organic) calculation by which all changes in incomes and expenses are contained. If previously mentioned ways would be applied to more types, the methodology is then changed and includes methods of operational researches. For full calculation of tobacco's production we do need average production and expenses of production. The difference of 90 per ha can be easily refunded by mentioned fact – difference in emerged plants (20%), production (30-35%) and redemption price (according to classes from 20 to 40%). For our conditions the year of 2006 is below the average in production performance. The average production of tobacco of Berley type was about 1800 kg per ha at south

of Serbia. The difference of 90 can be eliminated with almost 60 kg of 1st class Berley (redemption price 1,55). In a way to stimulate the producers the enterprises give equipment necessary for Todd's cells. The obligation of producers is to deliver the tobacco in equivalent value.

Conclusion

According to analysis of two basic ways of tobacco seedlings' production (Todd's cells and semi hot hotbeds) the following conclusions are:

Production of tobacco seedlings in Todd's cells has many advantages against traditional way in semi hot hotbeds.

The income and quality of tobacco is higher using the Todd's systems.

If we propose that the average production is 1800 kg and that is 1st class mainly, it is necessary to invest the total income got from 2,5ha in equipment and basic material.

Smaller producers will not have means for applying of this system because of money, so the solution is to form associations of tobacco's producers (but also vegetables' producers) which will invest commonly in modern objects for seedlings' production (Todd's cells).

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EKONOMSKI EFEKTI U PROIZVODNJI RASADA DUVANA

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R e z i m e

Dosadašnja proizvodnja rasada okcidentalnih tipova duvana *Berley* i *Virđžinija* u našoj zemlji bila je organizovana na klasični (tradicionalni) način. To je podrazumevalo proizvodnju rasada duvana u polutopl原因 lejava koje su zagrevane stajnjakom. Proizvodnja rasada duvana na savremeni način podrazumeva setvu semena u *Todovim čelijama*. Cilj ovih istraživanja je poređenje ova dva načina proizvodnje rasada sa ekonomskog stanovišta, odnosno utvrđivanje ukupnih troškova proizvodnje na dosadašnji, tradicionalni i savremeni način u *Todovim čelijama*.

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