

## **ECONOMIC EFFECTS OF TOBACCO FARMING IN MACEDONIA - CASE STUDY OF 2011 CROP**

Snezana Stojanoska<sup>1</sup>, Lazar Stojanoski<sup>2</sup>

*1 "St. Kliment Ohridski" University - Bitola, Scientific Tobacco Institute - Prilep, Macedonia*

*2 "St. Kliment Ohridski" University - Bitola, , Faculty of economics-Prilep, Macedonia*

*e-mail: snezana.stojanoska @ yahoo.com*

### **ABSTRACT**

The main hypothesis of this investigation is the poll of 40 tobacco growers from the southwest and 20 from the southeast part of R. Macedonia, whose farms are larger than one hectare. The results obtained from the processing of questionnaire related to the basic data on tobacco production, cost structure and other factors which determine this production are presented and commented in this paper. Calculations are made for 2011 tobacco crop, which includes 16 typical tobacco growers. The average costs ranged from 19 300 den/kg to 4020 day/kg and the average yield from 100 kg/decare to 270 kg/decare. Some of the farmers engaged additional labor force which amounted 8640 hours, against the 2880 hours of the household members. Productivity of labor in tobacco production ranges from 36 to 200 minutes per kg. The planned revenues of the monitored group of producers ranges between 479,800 and 2,721,200 denars, in calculations based on average purchase price of 230 denars/kg and a premium of 80 denars/kg dry tobacco.

**Keywords:** production, yield, cost calculation, revenue

### **ЕКОНОМСКИ ЕФЕКТИ ОД ФАРМЕРСКОТО ПРОИЗВОДСТВО НА ТУТУН ВО РЕПУБЛИКА МАКЕДОНИЈА-СТУДИЈА НА СЛУЧАЈ ЗА РЕКОЛТА 2011 ГОДИНА**

Основна хипотеза на истражувањето претставува спроведената анкета на 40 производители на тутун од југозападниот и 20 производители од југоисточниот реон кои што одгледуваат тутун на површина поголема од еден хектар. Во продолжение презентирани и коментирани се резултати добиени од обработениот анкетен прашалник, поврзан со прашањата што се однесуваат на основните податоци за производството на тутун, прашањата поврзани за структурата на трошоците и на крај прашањата што го детерминираат ова производство. Во содржината на трудот презентирана е планска калкулација за производство на тутун за реколта 2011 година, и тоа за 16 покарактеристични производители. Просечните трошоци кај 16-те производители се движат во распон од 19 300 ден/kg до 4020 ден/kg., просечниот принос од 100 kg/декар до 270 kg/декар. Кај некои производители ангажирана е дополнителна рабитна сила која изнесува 8640 саати, наспроти 2880 саати од членовите на семејството.

Продуктивноста во производството на тутун се движи во границите од 36 до 200 минути за еден килиграм тутун. Планираната добивка кај евидентираната група производители се движи во интервал 479.800 денари до 2.721.200 денари кога во пресметките беше користена средна откупна цена од 230 ден/kg и премија од 80 ден/kg сув тутун.

**Клучни зборови:** производство, принос, трошоци, калкулација, добивка

## INTRODUCTION

Despite the aggressive antismoking campaign, tobacco still takes an important place in the agricultural and food sector of the Republic of Macedonia and is important financial source both for the households and for the state.

Global changes imposed a necessity to make strategic planning of tobacco production in the country, and as a result of that to design a conception for further

development of this crop, with intentions to produce about 35 000 tons of dry tobacco in the future. Therefore, it is necessary to direct the strategic development of tobacco production toward its expansion and quality improvement and to raise it at a level of family business (farming), which will provide employment for members of the household and for other persons.

### 1. THE AIM OF INVESTIGATION

The main objective of the research is to create conception for strategic development of tobacco production in the Republic of Macedonia. These aim will be realized through organized research, analysis, forecasts and planning in order to

prove the basic hypothesis of the paper, that R. Macedonia has suitable conditions to produce about 35 000 tons of dry tobacco, which will lead to appropriate economic effects both for the farmers and for the state.

### 2. MATERIAL AND METHODS

The basic material for realization of this aim are the official data published in statistical yearbooks of R. Macedonia, and data obtained in the poll of tobacco farmers conducted from 15 to 30 September 2011 using a structured

questionnaire consisting of three sections with 27 questions.

The above sources were used to collect relevant data about area under tobacco and its average yields, quantity and value.

### 3. RESULTS AND DISCUSSION

With regard to the denoted issue and the basic hypothesis of the study, it was necessary to make a poll among tobacco

growers. Respondents were 40 tobacco farmers from the southwest and 20 farmers from the southeast production area which

grow tobacco on lands larger than one hectare. These regions were selected due to their highest contribution in the total tobacco production of R. Macedonia. Special attention in processing the

collected data was paid to tobacco growers who use a farm model of production, with contemporary agro-techniques, and who engage additional force of labor besides that of their own household.

### **3. 1. The structure of tobacco production costs**

Tobacco production is associated with costs and the following components of production calculation will be presented here: rent for land, ploughing and number of ploughings, manure (artificial and organic), irrigation (number of irrigations, costs for using water from hydro-systems), threads for stringing tobacco leaves, curing

barns, costs for insurance, other costs (for transportation, protection products, polyethylene, seedlings) and costs for labor force.

In order to protect the personal data, planning calculation of tobacco production for 2011 was made for 16 typical tobacco growers who will remain unnamed.

Table 1- Calculation of planning of dry tobacco production in 2011 crop

No. of tobacco grower	Planted area, decares	Rent	Ploughing	Fertilization	Irrigation	Transportation	Threads	Curing	Additional labor costs	Other costs	Total costs	Average costs per decares
1	55	38.500	176.000	51.000	60.000	20.000	14.000	55.000	600.000	47.000	1.061.500	19.300
2	40	20.800	96.000	30.000	42.000	15.000	8.000	20.000	360.000	35.000	626.800	15.670
3	22	44.000	52.800	30.000	23.000	15.000	4.000	20.000	147.000	35.000	370.800	16.854
4	27	16.200	64.800	26.000	-	9.000	12.000	18.000	120.000	15.000	281.000	10.407
5	60	36.000	144.000	72.000	-	150.000	7.000	12.000	432.000	30.000	883.000	14.716
6	40	120.000	96.000	30.000	-	130.000	20.000	30.000	216.000	12.000	654.000	16.350
7	15	45.000	36.000	28.000	-	20.000	4.000	7.000	-	5.000	145.000	9.666
8	12	24.000	33.600	18.000	-	30.000	2.500	4.000	-	22.000	134.100	11.175
9	20	20.000	42.000	13.000	4.000	20.000	10.000	10.000	40.000	5.000	164.000	8.200
10	18	24.300	43.200	12.500	2.000	18.000	7.000	7.000	-	2.100	116.100	6.450
11	14	16.800	29.400	9.100	-	10.000	7.000	6.000	-	3.000	81.300	5.807
12	20	10.000	36.000	-	6.000	15.000	3.000	12.000	25.000	6.000	113.000	5.650
13	20	10.000	36.000	7.000	7.000	15.000	3.500	12.000	24.000	6.000	120.500	6.025
14	20	12.000	36.000	7.500	-	5.000	4.000	8.000	-	9.000	81.500	4.075
15	25	15.000	45.000	10.500	-	5.000	5.000	10.000	-	10.000	100.500	4.020,
16	20	12.000	36.000	7.500	-	14.000	4.000	8.000	-	9.000	90.500	4.525
Average	26,75	29.038	62.675	22.006		30.688	7.188	14.938		15.694	313.975	9.931

According to the the above calculation, the total cost of tobacco production ranged between 1 061 500 denars for 55 decare to 81 500 denars for 20 decare. The average costs ranged from 19 300 denars/decare to 4020 denars/decare. The big difference in production costs is due to the fact that tobacco grower No 1 applies the most contemporary cultural practices and hires 15 workers as additional labor in a period of 100 days and 5 hours daily work, which

makes a total of 7500 additional labor hours. The average cost of the first five tobacco growers was 16,578 denars/decare, while that of the growers who engage none or negligible additional labor approximated 5 250 denars/decare. The expected yields in the analyzed group of tobacco growers ranged from 2000 kg to 11 000 kg, which gives an average yield of 100 kg - 270 kg/decare.

### 3.1.1. Labor force engaged in tobacco production

In this investigation efforts were made to determine the engaged labor force in tobacco production among the above mentioned 16 producers. The processed data are concerning the total engaged labor

(estimated in hours), as a sum of labor of the household members and additionally engaged labor force in 2011 crop. The participation of the above labor categories will be presented in Table 2.

**Table 2 - Engaged labor force**

No. of tobacco grower	Engaged labor force, in hours		Total hours
	Household members	Additional labor force	
1	3.400	7.500	10.900
2	1.920	4.500	6.420
3	2.400	1.840	4.240
4	6.000	1.500	7.500
5	2.880	8.640	11.520
6	9.000	4.320	13.320
7	7.200	-	7.200
8	5.175	-	5.175
9	2.880	4.000	6.880
10	5.040	-	5.040
11	3.900	-	3.900
12	4.000	250	4.250
13	4.800	240	5.040
14	4.410	-	4.410
15	5.880	-	5.880
16	4.410	-	4.410
Average	4.581	2.049	6.630

It is evident from the above data that some tobacco growers engage extra manpower, e.g. the tobacco grower No. 5 engaged

8640 hours additional labor, against 2880 hours labor of his household members. In general, it can be concluded that tobacco

growers who accepted the farm production engage more additional labor in 2:1ratio. There is a clear tendency among the growers to increase the area planted with

tobacco and to use additional labor for its processing. The average hourly wages in 2011 crop was around 90 denars.

### 3.1.2. Productivity of individual tobacco growers

Productivity in tobacco growing will be estimated by the following model, using the tobacco grower No. 1 as an example:

$$\text{Productivity (P)} = \frac{\text{Total labor force in hours}}{\text{Total production in kg}} = \frac{10\,900}{11\,000} = 0,99 \text{ hours}$$

$$P = 0,99 \text{ hours} = 59,45 \text{ minutes/kg}$$

The above estimation, expressed through the time required for production of 1 kilogram dry tobacco will be presented in Table 3:

**Table 3 - Time required for production of 1 kg dry tobacco**

No. of tobacco grower	Time required for production of 1 kg dry tobacco	
	hours	minutes
1	0,99	59
2	0,60	36
3	0,85	51
4	1,82	109
5	1,92	115
6	3,33	200
7	2,77	166
8	2,59	155
9	0,82	49
10	1,87	112
11	1,70	102
12	1,42	85
13	1,26	76
14	1,47	88
15	1,55	93
16	1,47	88
Average	1,65	99

According to the table, productivity of dry tobacco production in the investigated group of growers ranges from 36 to 200 minutes/kg. Big differences in productivity are determined by the mode of tobacco production. Tobacco growers who apply modern cultural practices and appropriate irrigation achieved high productivity ranging in an interval from 30 to 50

minutes for production of one kilogram dry tobacco. The productivity of the majority of growers ranged between 50 and 100 minutes, or in average it takes 70 minutes to produce 1 kg dry tobacco. Very few manufacturers achieved a productivity of over 100 minutes per kilogram tobacco, which is a result of the untimely irrigation and labor intensive mode of production.

### 3.1.3. Economic effects of tobacco farming

The economic effects of tobacco will be presented in Table 4.

**Table 4-Planned revenue in denars**

No. of tobacco grower	Total planned production, in kg	Total planned revenue, in denars	Planned expenditures	Planned profit	Hourly wage for all household members	Number of household members	Hourly wage per member of the household
1	11.000	3.410.000	1.061.500	2.348.500	691	4	172,82
2	10.800	3.348.000	626.800	2.721.200	1.417	4	354,24
3	5.000	1.550.000	370.800	1.179.200	492	5	98,40
4	4.100	1.255.500	281.000	974.500	162	4	40,59
5	6.000	1.860.000	883.000	977.000	339	2	169,74
6	4.000	1.240.000	654.000	586.000	66	5	12,92
7	2.600	790.500	145.000	645.500	90	5	17,84
8	2.000	613.800	134.000	479.800	93	3	31,37
9	4.000	1.240.000	164.000	1.076.000	374	3	124,85
10	2.700	837.000	116.200	720.800	143	6	23,99
11	2.300	694.400	81.300	613.100	158	5	31,37
12	3.000	930.000	113.000	817.000	204	4	51,05
13	4.000	1.000.240	120.500	879.740	233	5	47,37
14	3.000	930.000	81.500	848.500	192	3	63,96
15	3.800	1.162.500	100.500	1.062.000	181	4	44,90
16	3.000	930.000	90.500	839.500	190	3	63,35

The table shows variations in planned profits of tobacco growers in 2011 crop. Estimations were made with projected average price of 230 denars/kg and premium of 80 denars/kg dry tobacco. The projection was based on the data from the poll, but the factual situation still can not be determined because the purchase of tobacco from 2011 crop has not been finished yet. The planned profit ranges from 479 800 denars to 2 721 200 denars. In this case, too, high disproportions are resulting from the mode of tobacco

production. The lowest profit was realized by the grower who applies labor intensive mode of production and to whom tobacco is additional source of income in the family budget, beside the incomes from other agricultural crops (cereals, garden crops, etc.).

Especially interesting is the data on planned hourly wage of the household members engaged in tobacco production. This wage is determined for tobacco grower No. 1 through the following algorithm:

$$\text{Hourly wage of household members} = \frac{\text{planned profit}}{\text{total number of hours of household members}} =$$

$$= \frac{2\,348\,500}{3\,400} = \mathbf{691 \text{ denar/hour}}$$

or

$$\mathbf{691 : 4 = 172.82 \text{ denars/hour.}}$$

Since this grower has engaged four household members in production of tobacco, the hourly rate is 172.82 denars, or 2,81 EUR. per person. Considering the fact that household members are engaged 8 hours per day in production of tobacco, the daily wage per household member is

$$2.81 \times 8 = 22.46 \text{ EUR, i.e. 1381 denars.}$$

It can be seen in Table 4 that hourly rate per household member ranges between 12.92 and 354.24 denars. This disproportion appears as a result of the same reasons that were given for the planned profit.

## CONCLUSIONS

It is undeniable fact that a great number of growers find their economic existence in production of tobacco and for others the production of this crop is additional source to supplement their family budget. Therefore, the importance of this branch of agriculture in the Republic of Macedonia will increase, which will be reflected in improvement of the social status of the poorest part of the population. Therefore, it is necessary to direct the strategic development of tobacco production toward its expansion and quality improvement and to raise it at a level of family business (farm production), which will provide employment not only for members of the household but for other persons too.

The findings from the poll lead to conclusion that tobacco production of the Republic of Macedonia is performed on small plots by individual tobacco growers or in private farms with an average area of 1.5 hectares per farmer. In the last period

there was an increase of area planted with tobacco and its cultivation in a model of farm. It can be stated from the poll that 22,86% of the farmers grow tobacco on an area of about 3 hectares and four of the farmers grow this crop on an area larger than 5 hectares.

In accordance with the above data, it can be concluded that for development and establishment of tobacco production in the Republic of Macedonia, it is necessary to concentrate on varietal structure of tobacco, to create responsible partnership between tobacco growers and companies that purchase and process tobacco and to pay for purchased tobacco on time, at prices which should be economically justified and with positive reflection on producers profitability. From the above elaboration that is aimed towards increasing the production of tobacco, the need for government support to tobacco growers becomes more evident.



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